**VERTICAL SEAM**  
**IMPORTANT INFORMATION**

The application and detail drawings in this manual are strictly for illustration purposes and may not be applicable to all building designs or product installations. All projects should conform to applicable building codes for that particular area. It is recommended to follow all building regulations and standard industry practices.

Metal Sales Manufacturing Corporation is not responsible for the performance of the roof system if it is not installed in accordance with the suggested instructions referenced in this manual. If there is a conflict between this manual and the Metal Sales approved erection drawings, the approved erection drawings are to take precedence.

Prior to ordering and installing materials, all dimensions should be verified by field measurements.

Metal Sales reserves the right to modify, without notice, any details, recommendations or suggestions. Any questions you may have regarding proper installation of the Vertical Seam roofing system should be directed to your Metal Sales representative, see page 3.

Oil canning is not a cause for rejection. Oil canning can be described as the amount of waviness found in the flat areas of metal panels. Oil canning is an inherent characteristic of light gauge cold formed metal products, particularly those with broad flat areas. There are many factors which may contribute to oil canning that Metal Sales is not able to control. These factors include: misalignment of the support system, over-driving of fasteners used on the panels, stress (whether inherent in the panel or induced), thermal expansion and contraction of the panel, material handling, width, gauge, length, color of panels and installation. (Reference Metal Construction Association “Oil Canning Position Paper” - Appendix A).

Consult Metal Sales for any additional information not outlined in this manual.

This manual is designed to be utilized as a guide when installing Vertical Seam roofing system. It is the responsibility of the erector to ensure the safe installation of this product system.

---

**SAFETY**

**STUDY APPLICABLE OSHA AND OTHER SAFETY REQUIREMENTS BEFORE FOLLOWING THESE INSTRUCTIONS.**

The installation of metal roof systems is a dangerous procedure and should be supervised by trained knowledgeable erectors. USE EXTREME CARE WHILE INSTALLING ROOF PANELS. It is not possible for Metal Sales to be aware of all the possible job site situations that could cause an unsafe condition to exist. The erector of the roof system is responsible for reading these instructions and determining the safest way to install the roof system.

These instructions are provided only as a guide to show a knowledgeable, trained erector the correct parts and placement one to another. If following any of the installation steps would endanger a worker, the erector should stop work and decide upon a corrective action.

Provide required safety railing, netting or safety lines for crew members working on the roof.

Do not use the roof panel as a walking platform. The roof panels will not withstand the weight of a person standing at the edge of the panel.

Do not stand on a roof panel until it has been securely attached.
Metal Sales offers a complete line of metal roof, wall, and fascia panel systems for the commercial, architectural, industrial, residential, and agricultural markets. We offer over 75 profiles with a wide selection of widths, colors and gauges – new construction or retrofit. In addition, Metal Sales offers a 45 year paint warranty and a series of panels that are tested for wind, fire and uplift.
<table>
<thead>
<tr>
<th>VERTICAL SEAM</th>
<th>CUSTOMER SERVICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>METAL SALES LOCATIONS</td>
<td></td>
</tr>
<tr>
<td><strong>1. DENVER</strong></td>
<td>8. SPOKANE</td>
</tr>
<tr>
<td>7990 East I-25 Frontage Road</td>
<td>2727 East Trent Avenue</td>
</tr>
<tr>
<td>Longmont, CO 80504</td>
<td>Spokane, WA 99202</td>
</tr>
<tr>
<td>303.702.5440</td>
<td>509.536.6000</td>
</tr>
<tr>
<td>800.289.7663</td>
<td>800.572.6565</td>
</tr>
<tr>
<td>800.289.1617 /FAX</td>
<td>509.534.4427 /FAX</td>
</tr>
<tr>
<td><strong>2. JACKSONVILLE</strong></td>
<td><strong>9. SEATTLE</strong></td>
</tr>
<tr>
<td>7110 Stuart Avenue</td>
<td>20213 84th Avenue, South</td>
</tr>
<tr>
<td>Jacksonville, FL 32254</td>
<td>Kent, WA 98032</td>
</tr>
<tr>
<td>904.783.3660</td>
<td>253.872.5750</td>
</tr>
<tr>
<td>800.394.4419</td>
<td>800.431.3470 (outside WA)</td>
</tr>
<tr>
<td>904.783.9175 /FAX</td>
<td>800.742.7900 (inside WA)</td>
</tr>
<tr>
<td><strong>3. JEFFERSON</strong></td>
<td><strong>10. NEW ALBANY</strong></td>
</tr>
<tr>
<td>352 East Erie Street</td>
<td>999 Park Place</td>
</tr>
<tr>
<td>Jefferson, OH 44047</td>
<td>New Albany, IN 47150</td>
</tr>
<tr>
<td>440.576.9070</td>
<td>812.944.2733</td>
</tr>
<tr>
<td>800.321.5833</td>
<td>812.944.1418 /FAX</td>
</tr>
<tr>
<td>440.576.9242 /FAX</td>
<td><strong>11. ROCK ISLAND</strong></td>
</tr>
<tr>
<td>800.233.5719 /FAX</td>
<td>8111 West 29th Street</td>
</tr>
<tr>
<td><strong>4. INDEPENDENCE</strong></td>
<td>Rock Island, IL 61201</td>
</tr>
<tr>
<td>1306 South Powell Road</td>
<td>309.787.1200</td>
</tr>
<tr>
<td>Independence, MO 64057</td>
<td>800.747.1206</td>
</tr>
<tr>
<td>816.796.0900</td>
<td>309.787.1833 /FAX</td>
</tr>
<tr>
<td>800.747.0012</td>
<td><strong>12. DEER LAKE</strong></td>
</tr>
<tr>
<td>816.796.9096 /FAX</td>
<td>29 Pinedale Industrial Road</td>
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<tr>
<td><strong>5. SELLERSBURG</strong></td>
<td>Orwigsburg, PA 17961</td>
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<tr>
<td>7800 State Road 60</td>
<td>570.366.2020</td>
</tr>
<tr>
<td>Sellersburg, IN 47172</td>
<td>800.544.2577</td>
</tr>
<tr>
<td>812.246-1866</td>
<td>570.366.1648 /FAX</td>
</tr>
<tr>
<td>800.999.7777</td>
<td>800.544.2574 /FAX</td>
</tr>
<tr>
<td>812.246.0893 /FAX</td>
<td><strong>13. TEMPLE</strong></td>
</tr>
<tr>
<td>800.477.9318 /FAX</td>
<td>3838 North General Bruce Drive</td>
</tr>
<tr>
<td><strong>6. ROGERS</strong></td>
<td>Temple, TX 76501</td>
</tr>
<tr>
<td>22651 Industrial Boulevard</td>
<td>254.791.6650</td>
</tr>
<tr>
<td>Rogers, MN 55374</td>
<td>800.543.4415</td>
</tr>
<tr>
<td>763.428.8080</td>
<td>254.791.6655 /FAX</td>
</tr>
<tr>
<td>800.328.9316</td>
<td>800.543.4473 /FAX</td>
</tr>
<tr>
<td>763.428.8525 /FAX</td>
<td><strong>14. WOODLAND</strong></td>
</tr>
<tr>
<td>800.938.9119 /FAX</td>
<td>1326 Paddock Place</td>
</tr>
<tr>
<td><strong>7. NASHVILLE</strong></td>
<td>Woodland, CA 95776</td>
</tr>
<tr>
<td>4314 Hurricane Creek Boulevard</td>
<td>530.668.5690</td>
</tr>
<tr>
<td>Antioch, TN 37013</td>
<td>800.759.6019</td>
</tr>
<tr>
<td>615.641.7100</td>
<td>530.668.0901 /FAX</td>
</tr>
<tr>
<td>800.251.8508</td>
<td><strong>15. FONTANA</strong></td>
</tr>
<tr>
<td>615.641.7118 /FAX</td>
<td>14213 Whittram Avenue</td>
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<tr>
<td><strong>TECHNICAL SERVICES</strong></td>
<td>Fontana, CA 92335</td>
</tr>
<tr>
<td>7800 State Road 60</td>
<td>909.829.8618</td>
</tr>
<tr>
<td>Sellersburg, IN 47172</td>
<td>800.782.7953</td>
</tr>
<tr>
<td>502.855.4300</td>
<td>909.829.9083 /FAX</td>
</tr>
<tr>
<td><strong>TECHNICAL SUPPORT</strong></td>
<td><strong>16. ANCHORAGE</strong></td>
</tr>
<tr>
<td><strong>800.406.7387</strong> • metalsales.us.com</td>
<td>4637 Old Seward Highway</td>
</tr>
<tr>
<td>© Metal Sales Manufacturing Corporation • Subject to change without notice • Effective Date 4/22</td>
<td>Anchorage, AK 99503</td>
</tr>
<tr>
<td>800.406.7387</td>
<td>866.640.7663</td>
</tr>
<tr>
<td><strong>17. BAY CITY</strong></td>
<td>907.646.7663</td>
</tr>
<tr>
<td>5209 Mackinaw Road</td>
<td>907.646.7664 /FAX</td>
</tr>
<tr>
<td>Bay City, MI 48706</td>
<td><strong>18. DETROIT LAKES</strong></td>
</tr>
<tr>
<td>989.686.5879</td>
<td>1435 Egret Avenue</td>
</tr>
<tr>
<td>888.777.0112 /FAX</td>
<td>Detroit Lakes, MN 56501</td>
</tr>
<tr>
<td><strong>19. MOCKSVILLE</strong></td>
<td>218.847.2988</td>
</tr>
<tr>
<td>188 Quality Drive</td>
<td>888.594.1394</td>
</tr>
<tr>
<td>Mocksville, NC 27028</td>
<td>218.847.4835 /FAX</td>
</tr>
<tr>
<td>336.751.6381 Phone</td>
<td>888.594.4835 /FAX</td>
</tr>
<tr>
<td>800.228.6119 Toll Free</td>
<td><strong>20. FORT SMITH</strong></td>
</tr>
<tr>
<td>336.751.6301 Fax</td>
<td>7510 Ball Road</td>
</tr>
<tr>
<td>800.228.7916 Toll Free Fax</td>
<td>Fort Smith, AR 72908</td>
</tr>
<tr>
<td><strong>21. SIOUX FALLS</strong></td>
<td>479.646.1176</td>
</tr>
<tr>
<td>2700 West Third Street, Suite 4</td>
<td>877.452.3915</td>
</tr>
<tr>
<td>Sioux Falls, SD 57104</td>
<td>479.646.5204 Fax</td>
</tr>
<tr>
<td>605.335.2745</td>
<td>888.902.8320</td>
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### 12" COVERAGE

**Panel Profiles**

<table>
<thead>
<tr>
<th>Finish</th>
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* Represents color code designation.  
** Requires additional lead time.

---

### 16" COVERAGE

**Panel Profiles**

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<td>16&quot;</td>
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<td>170</td>
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</tbody>
</table>

* See Metal Sales color guides for color selection.

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1. All square pricing is based on net coverage. (12”, 100 LF = 1 square; 16”, 75 LF = 1 square; 18”, 66.67 LF = 1 square)
2. For panel lengths shorter than 5'-0" a cutting charge may apply.
3. All panels will be invoiced by the lineal foot in U.S. dollars.
4. All prices F.O.B. See pages 2 and 3 for locations.
5. Flat Sheet pricing available on request.

Panel Pricing

1. Panel pricing DOES NOT include packaging charges. Packaging cost will vary depending upon quantity and length of panels.
2. Special packaging is available, please inquire.

Availability

1. 26 and 24 gauge Acrylic-Coated Galvalume® (ACG) and 26 and 24 gauge stocked colors, approximately 10 working days.
2. 26, 24 and 22 gauge non-stock colors (minimum order required), please inquire.
3. All other gauges and colors, please inquire.

Notes

1. For panel lengths over 45'-0", please inquire. See page 3.
2. All panels have factory-applied sealant.
3. Oil canning is not a cause for rejection. Thicker gauges, narrower widths, and striations help minimize oil canning.
4. Finishes: a. MS Colorfast45®
   b. PVDF (meets Kynar 500/Hylar 5000 Spec)
5. Factory Rib Notching available at Denver, Deer Lake, and Woodland branches only.
VERTICAL SEAM

<table>
<thead>
<tr>
<th>GAUGE</th>
<th>FINISH</th>
<th>PRODUCT NO.</th>
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<tr>
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<td>ACG</td>
<td>5506541</td>
<td>5.2 lbs</td>
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<td>26</td>
<td>MS Colorfast45®</td>
<td>55065</td>
<td>5.2 lbs</td>
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<td>26</td>
<td>PVDF</td>
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<td>5.2 lbs</td>
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<td>ACG</td>
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<td>6.3 lbs</td>
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<td>PVDF</td>
<td>58065___</td>
<td>6.3 lbs</td>
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* See chart on page 11.

EXTENDED EAVE

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<td>55073</td>
<td>7.6 lbs</td>
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<td>56073___</td>
<td>7.6 lbs</td>
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<td>PVDF</td>
<td>58073___</td>
<td>9.5 lbs</td>
<td>10'-2&quot;</td>
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* See chart on page 11.

OFFSET CLEAT

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<td>2.0 lbs</td>
<td>10'-2&quot;</td>
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<tr>
<td>24</td>
<td>Supplied in Various Colors</td>
<td>5806499</td>
<td>2.4 lbs</td>
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CLEAT

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<td>24</td>
<td>Supplied in Various Colors</td>
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BOX GUTTER

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<td>ACG</td>
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<td>28.0 lbs</td>
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<td>MS Colorfast45®</td>
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<td>10'-2&quot;</td>
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* See chart on page 11.

BOX GUTTER END

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## VERTICAL SEAM

### Flashing Profiles

#### Universal Gutter/Downspout Strap

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#### 3 1/2" x 4" Downspout

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**95 Degree**

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**45 Degree**

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#### Valley

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* See chart on page 11.
# VERTICAL SEAM

## Flashing Profiles

### RAKE

- **Gauge:** 26
- **Finish:** ACG
- **Product No.:** 5503441
- **Weight:** 8.2 lbs
- **Length:** 10'-2"

- **Gauge:** 26
- **Finish:** ACG
- **Product No.:** 5503641
- **Weight:** 16.5 lbs
- **Length:** 20'-3"

- **Gauge:** 26
- **Finish:** MS Colorfast45®
- **Product No.:** 55034
- **Weight:** 8.2 lbs
- **Length:** 10'-2"

- **Gauge:** 26
- **Finish:** MS Colorfast45®
- **Product No.:** 55036
- **Weight:** 16.5 lbs
- **Length:** 20'-3"

- **Gauge:** 26
- **Finish:** PVDF
- **Product No.:** 56034
- **Weight:** 8.2 lbs
- **Length:** 10'-2"

- **Gauge:** 26
- **Finish:** PVDF
- **Product No.:** 56036
- **Weight:** 16.5 lbs
- **Length:** 20'-3"

- **Gauge:** 24
- **Finish:** ACG
- **Product No.:** 5703441
- **Weight:** 9.9 lbs
- **Length:** 10'-2"

- **Gauge:** 24
- **Finish:** ACG
- **Product No.:** 5703641
- **Weight:** 19.9 lbs
- **Length:** 20'-3"

- **Gauge:** 24
- **Finish:** PVDF
- **Product No.:** 58034
- **Weight:** 9.9 lbs
- **Length:** 10'-2"

- **Gauge:** 24
- **Finish:** PVDF
- **Product No.:** 58036
- **Weight:** 19.9 lbs
- **Length:** 20'-3"

### RAKEWALL

- **Gauge:** 26
- **Finish:** ACG
- **Product No.:** 5505641
- **Weight:** 6.9 lbs
- **Length:** 10'-2"

- **Gauge:** 26
- **Finish:** MS Colorfast45®
- **Product No.:** 55056
- **Weight:** 6.9 lbs
- **Length:** 10'-2"

- **Gauge:** 26
- **Finish:** PVDF
- **Product No.:** 56056
- **Weight:** 6.9 lbs
- **Length:** 10'-2"

- **Gauge:** 24
- **Finish:** ACG
- **Product No.:** 5705641
- **Weight:** 8.3 lbs
- **Length:** 10'-2"

- **Gauge:** 24
- **Finish:** PVDF
- **Product No.:** 58056
- **Weight:** 8.3 lbs
- **Length:** 10'-2"

### COUNTER FLASHING

- **Gauge:** 26
- **Finish:** ACG
- **Product No.:** 5505241
- **Weight:** 2.7 lbs
- **Length:** 10'-2"

- **Gauge:** 26
- **Finish:** MS Colorfast45®
- **Product No.:** 55052
- **Weight:** 2.7 lbs
- **Length:** 10'-2"

- **Gauge:** 24
- **Finish:** ACG
- **Product No.:** 5705241
- **Weight:** 3.3 lbs
- **Length:** 10'-2"

- **Gauge:** 24
- **Finish:** PVDF
- **Product No.:** 58052
- **Weight:** 3.3 lbs
- **Length:** 10'-2"

### REGLET FLASHING

- **Gauge:** 26
- **Finish:** ACG
- **Product No.:** 5505441
- **Weight:** 2.6 lbs
- **Length:** 10'-2"

- **Gauge:** 26
- **Finish:** MS Colorfast45®
- **Product No.:** 55054
- **Weight:** 2.6 lbs
- **Length:** 10'-2"

- **Gauge:** 26
- **Finish:** PVDF
- **Product No.:** 56054
- **Weight:** 2.6 lbs
- **Length:** 10'-2"

- **Gauge:** 24
- **Finish:** ACG
- **Product No.:** 5705441
- **Weight:** 3.2 lbs
- **Length:** 10'-2"

- **Gauge:** 24
- **Finish:** PVDF
- **Product No.:** 58054
- **Weight:** 3.2 lbs
- **Length:** 10'-2"

### 11" RIDGE/HIP COVER

- **Gauge:** 26
- **Finish:** ACG
- **Product No.:** 5500241
- **Weight:** 7.9 lbs
- **Length:** 10'-2"

- **Gauge:** 26
- **Finish:** ACG
- **Product No.:** 5500441
- **Weight:** 15.8 lbs
- **Length:** 20'-3"

- **Gauge:** 26
- **Finish:** MS Colorfast45®
- **Product No.:** 55002
- **Weight:** 7.9 lbs
- **Length:** 10'-2"

- **Gauge:** 26
- **Finish:** MS Colorfast45®
- **Product No.:** 55004
- **Weight:** 15.8 lbs
- **Length:** 20'-3"

- **Gauge:** 26
- **Finish:** PVDF
- **Product No.:** 56002
- **Weight:** 7.9 lbs
- **Length:** 10'-2"

- **Gauge:** 26
- **Finish:** PVDF
- **Product No.:** 56004
- **Weight:** 15.8 lbs
- **Length:** 20'-3"

- **Gauge:** 24
- **Finish:** ACG
- **Product No.:** 5700241
- **Weight:** 9.5 lbs
- **Length:** 10'-2"

- **Gauge:** 24
- **Finish:** ACG
- **Product No.:** 5700441
- **Weight:** 19.0 lbs
- **Length:** 20'-3"

- **Gauge:** 24
- **Finish:** PVDF
- **Product No.:** 58002
- **Weight:** 9.5 lbs
- **Length:** 10'-2"

- **Gauge:** 24
- **Finish:** PVDF
- **Product No.:** 58004
- **Weight:** 19.0 lbs
- **Length:** 20'-3"

*See chart on page 11.

### SSR RIDGE

- **Gauge:** 24
- **Finish:** ACG
- **Product No.:** 5775141
- **Weight:** 15.2 lbs
- **Length:** 10'-2"

- **Gauge:** 24
- **Finish:** ACG
- **Product No.:** 5775341
- **Weight:** 30.4 lbs
- **Length:** 20'-3"

- **Gauge:** 24
- **Finish:** PVDF
- **Product No.:** 58751
- **Weight:** 15.2 lbs
- **Length:** 10'-2"

- **Gauge:** 24
- **Finish:** PVDF
- **Product No.:** 58753
- **Weight:** 30.4 lbs
- **Length:** 20'-3"

*See chart on page 11.
### VENTED RIDGE COVER

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* See chart on page 11.

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* See chart on page 11.

### PEAK

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* See chart on page 11.

### PITCH BREAK

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* See chart on page 11.

### Z-CLOSURE

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<td>ACG</td>
<td>5570241</td>
<td>3.0 lbs</td>
<td>10'-2&quot;</td>
</tr>
<tr>
<td>26</td>
<td>MS Colorfast45°</td>
<td>55702_</td>
<td>3.0 lbs</td>
<td>10'-2&quot;</td>
</tr>
<tr>
<td>26</td>
<td>PVDF</td>
<td>56702_</td>
<td>3.0 lbs</td>
<td>10'-2&quot;</td>
</tr>
<tr>
<td>24</td>
<td>ACG</td>
<td>5770241</td>
<td>4.1 lbs</td>
<td>10'-2&quot;</td>
</tr>
<tr>
<td>24</td>
<td>PVDF</td>
<td>58702_</td>
<td>4.1 lbs</td>
<td>10'-2&quot;</td>
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</tbody>
</table>

### 2.25" SILL/HEAD

<table>
<thead>
<tr>
<th>GAUGE</th>
<th>FINISH</th>
<th>PRODUCT NO.</th>
<th>WT</th>
<th>LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>ACG</td>
<td>5511641</td>
<td>5.9 lbs</td>
<td>10'-2&quot;</td>
</tr>
<tr>
<td>26</td>
<td>MS Colorfast45°</td>
<td>55116_</td>
<td>5.9 lbs</td>
<td>10'-2&quot;</td>
</tr>
<tr>
<td>26</td>
<td>PVDF</td>
<td>56116_</td>
<td>5.9 lbs</td>
<td>10'-2&quot;</td>
</tr>
<tr>
<td>24</td>
<td>ACG</td>
<td>5711641</td>
<td>7.1 lbs</td>
<td>10'-2&quot;</td>
</tr>
<tr>
<td>24</td>
<td>PVDF</td>
<td>58116_</td>
<td>7.1 lbs</td>
<td>10'-2&quot;</td>
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</tbody>
</table>
### Flashing Angle Chart

<table>
<thead>
<tr>
<th>PROFILE/FLASHING</th>
<th>1/4&quot;:12</th>
<th>1/2&quot;:12</th>
<th>1:12</th>
<th>2:12</th>
<th>3:12</th>
<th>4:12</th>
<th>5:12</th>
<th>6:12</th>
<th>7:12</th>
<th>8:12</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIDGE</td>
<td>178°</td>
<td>175°</td>
<td>170°</td>
<td>161°</td>
<td>152°</td>
<td>143°</td>
<td>*135°</td>
<td>*127°</td>
<td>*119°</td>
<td>*113°</td>
</tr>
<tr>
<td>SSR RIDGE</td>
<td>178°</td>
<td>175°</td>
<td>170°</td>
<td>161°</td>
<td>152°</td>
<td>143°</td>
<td>*135°</td>
<td>*127°</td>
<td>*119°</td>
<td>*113°</td>
</tr>
<tr>
<td>VENTED RIDGE COVER</td>
<td>178°</td>
<td>175°</td>
<td>170°</td>
<td>161°</td>
<td>152°</td>
<td>143°</td>
<td>*135°</td>
<td>*127°</td>
<td>*119°</td>
<td>*113°</td>
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<tr>
<td>HIP</td>
<td>177°</td>
<td>173°</td>
<td>167°</td>
<td>160°</td>
<td>154°</td>
<td>148°</td>
<td>143°</td>
<td>138°</td>
<td>134°</td>
<td></td>
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<tr>
<td>VALLEY</td>
<td>178°</td>
<td>175°</td>
<td>170°</td>
<td>161°</td>
<td>152°</td>
<td>143°</td>
<td>*135°</td>
<td>*127°</td>
<td>*119°</td>
<td>*113°</td>
</tr>
<tr>
<td>EAVE</td>
<td>91°</td>
<td>92°</td>
<td>95°</td>
<td>99°</td>
<td>104°</td>
<td>108°</td>
<td>113°</td>
<td>117°</td>
<td>120°</td>
<td>124°</td>
</tr>
<tr>
<td>EXTENDED EAVE</td>
<td>91°</td>
<td>92°</td>
<td>95°</td>
<td>99°</td>
<td>104°</td>
<td>108°</td>
<td>113°</td>
<td>117°</td>
<td>120°</td>
<td>124°</td>
</tr>
<tr>
<td>SCULPTURED EAVE</td>
<td>99°</td>
<td>98°</td>
<td>95°</td>
<td>91°</td>
<td>86°</td>
<td>82°</td>
<td>*77°</td>
<td>*73°</td>
<td>*70°</td>
<td>*66°</td>
</tr>
<tr>
<td>SSR SCULPTURED</td>
<td>99°</td>
<td>98°</td>
<td>95°</td>
<td>91°</td>
<td>86°</td>
<td>82°</td>
<td>*77°</td>
<td>*73°</td>
<td>*70°</td>
<td>*66°</td>
</tr>
<tr>
<td>HIGH SIDE EAVE</td>
<td>89°</td>
<td>88°</td>
<td>85°</td>
<td>81°</td>
<td>76°</td>
<td>72°</td>
<td>67°</td>
<td>63°</td>
<td>60°</td>
<td>56°</td>
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<tr>
<td>PEAK</td>
<td>91°</td>
<td>92°</td>
<td>95°</td>
<td>99°</td>
<td>104°</td>
<td>108°</td>
<td>113°</td>
<td>117°</td>
<td>120°</td>
<td>124°</td>
</tr>
<tr>
<td>PITCH BREAK</td>
<td>91°</td>
<td>92°</td>
<td>95°</td>
<td>99°</td>
<td>104°</td>
<td>108°</td>
<td>113°</td>
<td>117°</td>
<td>120°</td>
<td>124°</td>
</tr>
<tr>
<td>HIGH SIDE PITCH BREAK</td>
<td>91°</td>
<td>92°</td>
<td>95°</td>
<td>99°</td>
<td>104°</td>
<td>108°</td>
<td>113°</td>
<td>117°</td>
<td>120°</td>
<td>124°</td>
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<tr>
<td>GUTTER DRIP</td>
<td>91°</td>
<td>92°</td>
<td>95°</td>
<td>99°</td>
<td>104°</td>
<td>108°</td>
<td>113°</td>
<td>117°</td>
<td>120°</td>
<td>124°</td>
</tr>
<tr>
<td>BOX GUTTER</td>
<td>91°</td>
<td>92°</td>
<td>95°</td>
<td>99°</td>
<td>104°</td>
<td>108°</td>
<td>113°</td>
<td>117°</td>
<td>120°</td>
<td>124°</td>
</tr>
</tbody>
</table>
### VERTICAL SEAM CLIP

<table>
<thead>
<tr>
<th>SIZE</th>
<th>FINISH</th>
<th>PRODUCT NO.</th>
<th>WT/CARTON</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 1/4&quot;</td>
<td>Galvanized</td>
<td>4923565</td>
<td>37.5 lbs</td>
</tr>
<tr>
<td>1 1/4&quot;</td>
<td>Stainless</td>
<td>4923570</td>
<td>37.5 lbs</td>
</tr>
</tbody>
</table>

### FLOATING RAKE ANGLE

<table>
<thead>
<tr>
<th>SIZE</th>
<th>FINISH</th>
<th>TYPE</th>
<th>PRODUCT NO.</th>
<th>WT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 1/4&quot;x16 Ga.</td>
<td>Galvanized</td>
<td>Utility 10'-0&quot;</td>
<td>4923805</td>
<td>7.4 lbs</td>
</tr>
</tbody>
</table>

### BACK-UP CHANNEL

<table>
<thead>
<tr>
<th>SIZE</th>
<th>FINISH</th>
<th>LENGTH</th>
<th>PRODUCT NO.</th>
<th>WT</th>
</tr>
</thead>
<tbody>
<tr>
<td>3&quot; x 3/8&quot;x16 Ga.</td>
<td>Galvanized</td>
<td>48&quot;</td>
<td>4923640</td>
<td>2.00 lbs</td>
</tr>
<tr>
<td>3&quot; x 3/8&quot;x16 Ga.</td>
<td>Galvanized</td>
<td>72&quot;</td>
<td>4923645</td>
<td>4.00 lbs</td>
</tr>
</tbody>
</table>

### BEARING PLATE

<table>
<thead>
<tr>
<th>SIZE</th>
<th>FINISH</th>
<th>PRODUCT NO.</th>
<th>WT/100</th>
</tr>
</thead>
<tbody>
<tr>
<td>4&quot; x 5&quot; x 20 Ga.</td>
<td>Galvanized</td>
<td>4923886</td>
<td>30.0 lbs</td>
</tr>
</tbody>
</table>

### VENT MATERIAL

<table>
<thead>
<tr>
<th>SIZE</th>
<th>TYPE</th>
<th>PRODUCT NO.</th>
<th>WT/CARTON</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 3/8&quot; x 7/8&quot; x 4'</td>
<td>Black</td>
<td>6852406</td>
<td>30.0 lbs</td>
</tr>
</tbody>
</table>

*V-600 T by Cor-A-Vent*  
For use on roof with a 3:12 or greater slope.

### RUBBER ROOF JACK

<table>
<thead>
<tr>
<th>TYPE</th>
<th>SIZE</th>
<th>BASE DIAM.</th>
<th>PRODUCT NO.</th>
<th>WT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rubber #1</td>
<td>1/4&quot; - 2&quot;</td>
<td>68501</td>
<td>*</td>
<td>3.0 lbs</td>
</tr>
<tr>
<td>Rubber #2</td>
<td>1 1/4&quot; - 3 1/2&quot;</td>
<td>68502</td>
<td>*</td>
<td>3.0 lbs</td>
</tr>
<tr>
<td>Rubber #3</td>
<td>1/4&quot; - 5&quot;</td>
<td>68503</td>
<td>*</td>
<td>3.0 lbs</td>
</tr>
<tr>
<td>Rubber #4</td>
<td>3&quot; - 6 1/2&quot;</td>
<td>68504</td>
<td>*</td>
<td>3.0 lbs</td>
</tr>
<tr>
<td>Rubber #5</td>
<td>4 1/4&quot; - 7 1/2&quot;</td>
<td>68505</td>
<td>*</td>
<td>5.0 lbs</td>
</tr>
<tr>
<td>Rubber #6</td>
<td>5&quot; - 9&quot;</td>
<td>68506</td>
<td>*</td>
<td>9.0 lbs</td>
</tr>
<tr>
<td>Rubber #7</td>
<td>6&quot; - 11&quot;</td>
<td>68507</td>
<td>*</td>
<td>11.0 lbs</td>
</tr>
<tr>
<td>Rubber #8</td>
<td>7&quot; - 13&quot;</td>
<td>68508</td>
<td>*</td>
<td>13.0 lbs</td>
</tr>
<tr>
<td>Rubber #9</td>
<td>10&quot; - 19&quot;</td>
<td>68509</td>
<td>*</td>
<td>13.0 lbs</td>
</tr>
</tbody>
</table>

### ms-HT UNDERLAYMENT

<table>
<thead>
<tr>
<th>TYPE</th>
<th>SIZE</th>
<th>PRODUCT NO.</th>
<th>WT/ROLL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peel-and-Stick</td>
<td>36&quot; x 66.67&quot;</td>
<td>4121200</td>
<td>44.0 lbs</td>
</tr>
</tbody>
</table>
### Vertical Seam Accessories

#### Tube Sealant

<table>
<thead>
<tr>
<th>SIZE</th>
<th>COLOR</th>
<th>PRODUCT NO.</th>
<th>QTY/BOX</th>
<th>WT/BOX</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.3 oz</td>
<td>Urethane White</td>
<td>6402830</td>
<td>30</td>
<td>19.3 lbs</td>
</tr>
<tr>
<td>10.3 oz</td>
<td>Urethane Bronze</td>
<td>6402999</td>
<td>30</td>
<td>19.3 lbs</td>
</tr>
<tr>
<td>10.3 oz</td>
<td>Urethane Gray</td>
<td>6402829</td>
<td>30</td>
<td>19.3 lbs</td>
</tr>
<tr>
<td>10.3 oz</td>
<td>Acrylic Clear</td>
<td>6402800</td>
<td>30</td>
<td>19.3 lbs</td>
</tr>
</tbody>
</table>

#### Double Bead Tape Sealant

<table>
<thead>
<tr>
<th>SIZE</th>
<th>TYPE</th>
<th>PRODUCT NO.</th>
<th>QTY/BOX</th>
<th>WT/BOX</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/8&quot; x 3/16&quot; x 25'</td>
<td>Butyl</td>
<td>6403899</td>
<td>20 rolls</td>
<td>40.0 lbs</td>
</tr>
</tbody>
</table>

#### Touch-Up Paint

<table>
<thead>
<tr>
<th>TYPE</th>
<th>SIZE</th>
<th>PRODUCT NO.</th>
<th>WT</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS CF45</td>
<td>Pint</td>
<td>66004_ _</td>
<td>1.6 lbs</td>
</tr>
<tr>
<td>PVDF</td>
<td>Pint</td>
<td>66010_ _</td>
<td>1.6 lbs</td>
</tr>
<tr>
<td>PVDF</td>
<td>2 oz. Bottle</td>
<td>66005_ _</td>
<td>0.1 lbs</td>
</tr>
</tbody>
</table>

_ ___ Represents color code designation.

#### Hemming Tool

<table>
<thead>
<tr>
<th>TYPE</th>
<th>SIZE</th>
<th>PRODUCT NO.</th>
<th>WT/100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc Plated</td>
<td>20&quot;</td>
<td>6560102</td>
<td>4.0 lbs</td>
</tr>
</tbody>
</table>

Used for bending lower end of the metal panel to engage Offset Cleat or Extended Eave flashings for concealed-fastened applications.

#### Dual-Bar Hemming Tool

<table>
<thead>
<tr>
<th>TYPE</th>
<th>SIZE</th>
<th>PRODUCT NO.</th>
<th>WT/100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc Plated</td>
<td>20&quot;</td>
<td>6531299</td>
<td>4.0 lbs</td>
</tr>
</tbody>
</table>

Used for bending lower end of the metal panel to engage Offset Cleat or Extended Eave flashings for concealed-fastened applications.
# POP RIVET

<table>
<thead>
<tr>
<th>SIZE</th>
<th>TYPE</th>
<th>FINISH</th>
<th>PRODUCT NO.</th>
<th>WT/250</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8&quot; x 3/8&quot;</td>
<td>Stainless Steel</td>
<td>Unpainted</td>
<td>8240901</td>
<td>0.8 lbs</td>
</tr>
<tr>
<td>1/8&quot; x 3/8&quot;</td>
<td>Stainless Steel</td>
<td>Painted</td>
<td>824091_ _</td>
<td>0.8 lbs</td>
</tr>
<tr>
<td>1/4&quot; x 3/8&quot;</td>
<td>Stainless Steel</td>
<td>Unpainted</td>
<td>8240901</td>
<td>0.8 lbs</td>
</tr>
<tr>
<td>1/4&quot; x 3/8&quot;</td>
<td>Stainless Steel</td>
<td>Painted</td>
<td>824091_ _</td>
<td>0.8 lbs</td>
</tr>
</tbody>
</table>

# PANCAKE HEAD WOOD SCREW (PHWS)

<table>
<thead>
<tr>
<th>SIZE</th>
<th>TYPE</th>
<th>FINISH</th>
<th>PRODUCT NO.</th>
<th>WT/250</th>
</tr>
</thead>
<tbody>
<tr>
<td>#10-12 x 1&quot;</td>
<td>Type A</td>
<td>Plated</td>
<td>8243100</td>
<td>1.9 lbs</td>
</tr>
<tr>
<td>#10-12 x 1&quot;</td>
<td>Type A</td>
<td>Stainless Steel</td>
<td>8243101</td>
<td>1.9 lbs</td>
</tr>
<tr>
<td>#10-12 x 2&quot;</td>
<td>Type A</td>
<td>Plated</td>
<td>8243100</td>
<td>2.2 lbs</td>
</tr>
</tbody>
</table>

# PANCAKE HEAD DRILLER (PHD)

<table>
<thead>
<tr>
<th>SIZE</th>
<th>TYPE</th>
<th>FINISH</th>
<th>PRODUCT NO.</th>
<th>WT/250</th>
</tr>
</thead>
<tbody>
<tr>
<td>#10-16 x 1&quot; (#2 Point)</td>
<td>Driller</td>
<td>Plated</td>
<td>8242100</td>
<td>1.9 lbs</td>
</tr>
</tbody>
</table>

# SELF DRILLER XL (SD XL)

<table>
<thead>
<tr>
<th>SIZE</th>
<th>TYPE</th>
<th>FINISH</th>
<th>PRODUCT NO.</th>
<th>WT/250</th>
</tr>
</thead>
<tbody>
<tr>
<td>#12-14 x 1&quot;</td>
<td>Driller</td>
<td>XL</td>
<td>823520_ _</td>
<td>5.7 lbs</td>
</tr>
<tr>
<td>#12-14 x 1 1/2&quot;</td>
<td>Driller</td>
<td>XL</td>
<td>823530_ _</td>
<td>6.0 lbs</td>
</tr>
<tr>
<td>#12-14 x 1 1/2&quot;</td>
<td>Driller</td>
<td>XL</td>
<td>823540_ _</td>
<td>6.5 lbs</td>
</tr>
<tr>
<td>#12-14 x 2&quot;</td>
<td>Driller</td>
<td>XL</td>
<td>823550_ _</td>
<td>7.0 lbs</td>
</tr>
<tr>
<td>1/4&quot;-14 x 1 1/2&quot;</td>
<td>Driller</td>
<td>XL</td>
<td>825120_ _</td>
<td>7.2 lbs</td>
</tr>
<tr>
<td>#12-14 x 1 1/2&quot;</td>
<td>Driller</td>
<td>XL(Painted)</td>
<td>82353_ _</td>
<td>6.0 lbs</td>
</tr>
<tr>
<td>#12-14 x 1 1/2&quot;</td>
<td>Driller</td>
<td>XL(Painted)</td>
<td>82354_ _</td>
<td>6.5 lbs</td>
</tr>
<tr>
<td>#12-14 x 2&quot;</td>
<td>Driller</td>
<td>XL(Painted)</td>
<td>82355_ _</td>
<td>7.0 lbs</td>
</tr>
<tr>
<td>1/4&quot;-14 x 1 1/2&quot;</td>
<td>Driller</td>
<td>XL(Painted)</td>
<td>82512_ _</td>
<td>7.2 lbs</td>
</tr>
</tbody>
</table>

# STITCH SCREW XL

<table>
<thead>
<tr>
<th>SIZE</th>
<th>TYPE</th>
<th>FINISH</th>
<th>PRODUCT NO.</th>
<th>WT/250</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4&quot;-14 x 7/8&quot; Stitch XL</td>
<td>Stitch</td>
<td>XL</td>
<td>823680_ _</td>
<td>5.2 lbs</td>
</tr>
</tbody>
</table>

# DECK SCREW

<table>
<thead>
<tr>
<th>SIZE</th>
<th>TYPE</th>
<th>FINISH</th>
<th>PRODUCT NO.</th>
<th>WT/1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>#14-13 x 2&quot;</td>
<td>Driller</td>
<td>Black</td>
<td>8242506</td>
<td>28.0 lbs</td>
</tr>
<tr>
<td>#14-13 x 4&quot;</td>
<td>Driller</td>
<td>Black</td>
<td>8241706</td>
<td>84.0 lbs</td>
</tr>
<tr>
<td>#14-13 x 5&quot;</td>
<td>Driller</td>
<td>Black</td>
<td>8241806</td>
<td>102.0 lbs</td>
</tr>
<tr>
<td>#14-13 x 6&quot;</td>
<td>Driller</td>
<td>Black</td>
<td>8241906</td>
<td>120.0 lbs</td>
</tr>
<tr>
<td>#14-13 x 8&quot;</td>
<td>Driller</td>
<td>Black</td>
<td>8242206</td>
<td>140.0 lbs</td>
</tr>
</tbody>
</table>
1. Metal Roof Deck Panels* No. 24 MSG min coated steel. Max panel width 18 in., rib height 1-3/4 in. Panels continuous over two or more spans. Endlap for panels to be overlapped 6 in. A bead of sealant may be used at panel ends and side joints.
   METAL SALES MFG CORP - “Vertical Seam”

2. Roof Deck Fasteners* - (Panel Clips) One piece assembly, 3-1/2 in. wide by 1-7/8 in high. Clip spacing to be 48 in. OC.
   METAL SALES MFG CORP - “Vertical Seam Clip”

3. Fasteners - (Screws) Screws used to attach the panel clips to Substructure (Item 4) to be No. 10 by 1 in long Pancake head wood screws with a No. 2 Phillips head or 10x1 in., 1/4 in. Hex Head Woodgrip. Two screws per clip. Screws used to attach Substructure (Item 4) to wood trusses or joists (Item 6) to be No. 8 by 2 in. Bugle head screws. As an optional fastener, 2-1/2 in. long 8d common deformed shank nails may be used. Fasteners used at endlaps to be 14x1 in. Type AB or 10x1 in. woodgrip.

When light gauge structural steel joists are used, screws to be No. 12 by 1-5/8 in. long with a Phillips head. Spacing of screws to be 6 in. OC at plywood or OSB ends and 12 in. OC at interior joists.

4. Substructure (Plywood or OSB) Plywood decking or oriented strand board (OSB) to be a nom 5/8 in. thick, exposure sheathing span C-D, 40/20 plywood. (All butt joints to be sealed against leakage by using tape and/or caulking). In lieu of plywood, 1 in. tongue and groove decking may be used.

5. Moisture Barrier - (Optional) Any suitable membrane to protect Substructure (Item 4).

6. Joists Joists, spaced at 2 ft, 0 in. OC max (when tongue and groove decking is used, joist spacing may be 30 in. OC max), may be one of the following:
   A. Nom 2 by 6 in. wood joists, No. 2 or better.
   B. Nom 2 by 4 in wood when used on a top chord of a wood truss, No. 2 or better.
   C. Light gauge structural steel framing with the member against the plywood to be a min No. 22 MSG coated steel.

Refer to General Information, Roof Deck Constructions, for Items Not Evaluated.
*Bearing the UL Classification Mark
1. **Metal Roof Deck Panels** - No. 24 MSG min coated steel. Max panel width 18 in., rib height 1-3/4 in. Panels continuous over 2 or more spans. No endlaps. A bead of sealant may be used at the panel ends and side joints.

2. **Roof Deck Fasteners** - (Panel Clips) - One piece assembly, 3-1/2 in. wide by 1-7/8 in. high. Clip spacing to be 48 in. OC.

3. **Panel Fasteners** - (Screws) - Screws used to attach panel clips (Item 2) to purlins to be No. 10 by 1 in. long No. 3 self-drilling point, No. 2 Phillips Pancake head. Two screws per clip.

4. **Purlins** – No. 16 MSG min thickness steel (min yield 50 ksi) spaced 48 in. OC.

5. **Insulation** – (Optional)(not shown) – 3 in. thick vinyl faced blanket insulation. To be installed between metal panels (Item 1) and purlins (Item 4).

5A. **Insulation** – (Optional)(not shown) – 1/4 in. thick closed/microcellular polyethylene insulation with foil facing designated “Low-E Insulation™.” To be installed between metal panels (Item 1) and purlins (Item 4).

6. **Batten Clips and Cap** -
   A. **Batten Clips** - Slipped over ribs formed by roof deck panels. One piece assembly formed to engage ribs of panels (Item 1) and Batten Cap (Item B) spaced 48 in. OC.
   B. **Batten Cap** - Slipped over batten clip (Item A), formed to snap over and engage Batten clip.

Refer to General Information, Roof Deck Constructions, for Items Not Evaluated.
1. **Metal Roof Deck Panels** - No. 24 MSG min coated steel. Max panel width 18 in., rib height 1-3/4 in. Panels continuous over three or more spans. Endlaps for panels to be overlapped 6 in. and to include back-up plate (Item 2B). A bead of sealant may be used at the panel ends and side joints.

2. **Roof Deck Fasteners (Panel Clips)** - One piece assembly, 3-1/2 in. wide by 1-7/8 in. high. Clip spacing to be 48 in. OC.

2A. **Bearing Plate (Optional)** - To be used in lieu of plywood or OSB (Item 4A) with rigid insulation (Item 4). Bearing plates to be 16 MSG min coated steel. Located under each clip (Item 2) for support.

2B. **Endlap Back-Up Plate (not shown)** - No. 16 MSG min coated steel, width of back-up plate to correspond to width of panel. Two 1 in. wide by 3/4 in. long tabs are used for sliding over end panels.

3. **Panel Fasteners (Screws)** - Screws used to attach panel clips and bearing plates (Items 2 and 2A) through rigid insulation and into metal deck (Item 5). Screws to be No. 14 Truss head with No. 3 Phillips drive. Length to be a min of 1/2 in. longer than thickness of rigid insulation and metal deck. Two screws per clip. Fasteners used at endlaps to be one of the following: 14x1 in. Type AB self-tapper; 14x1-1/4 in. Hex washer head self-driller; 14x1 in. Type AB Phillips stainless steel self-tapper.

4. **Rigid Insulation (Optional)** - Foamed plastic, max thickness 4 in. Density to be a min of 2 PCF.

4A. **Plywood or OSB (Optional)(not shown)** - Min APA rated plywood, exposure sheathing span C-D 40/20, nom 1/2 in. thick, or Oriented Strand Board (OSB), nom 7/16 in. thick. 4x8 ft. Sheets to be installed on top of rigid insulation (Item 4) in lieu of bearing plates (Item 2A).

4B. **Gypsum Board (Optional)** - Any 5/8 in. thick gypsum wallboard supplied in sheets 2x4 ft to 4x12 ft. Applied perpendicular to steel roof deck direction with adhesive. End joints to occur over crests of steel roof deck and be staggered 2 ft. in adjacent rows. The total cumulative thickness of the rigid board (Item 4) and the gypsum may not exceed 4 in.

5. **Metal Deck** - No.22 MSG min thickness coated steel. Min yield strength 33 KSI. Min depth 1-1/2 in. Max pitch 6 in.

6. **Vapor Barrier (Optional)** – Installed on top of metal deck (Item 5) or on top of gypsum wallboard (Item 4B) if used. Min 6 mil plastic sheet.

6A. **Bearing Plate (Optional)(not shown)** – Used to protect plywood or OSB (Item 4A). Installed under panels (Item 1).

7. **Supports (not shown)** – Used to support metal deck, spaced per deck manufacturer’s specifications.

8. **Batten Clips and Cap** -
   A. **Batten Clips** - Slipped over ribs formed by roof deck panels. One piece assembly formed to engage ribs of panels (Item 1) and Batten Cap (Item B) spaced 48 in. OC.
   B. **Batten Cap** - Slipped over batten clip (Item A), formed to snap over and engage batten clip.

Refer to General Information, Roof Deck Constructions, for Items Not Evaluated.

* Bearing the UL Classification Mark
**VERTICAL SEAM**

## DESIGN INFORMATION

### TESTING AND APPROVALS

- UL 2218 Impact Resistance - Class 4
- UL 790 Fire Resistance Rating - Class A, per building code
- UL 263 Fire Resistance Rating - per assembly
- ASTM E 283 Air Leakage - 0.035 cfm/ft² at 1.57 psf
- ASTM E 331 Water Penetration - none at 12 psf
- ASTM E 1680 Air Leakage - 0.0036 cfm/ft² at 6.24 psf
- ASTM E 1646 Water Penetration - none at 6.24 psf
- ASTM E 1592 Structural Performance
- UL 580 Uplift Resistance - Class 0 Constructions: #436, #446 and #448
- Texas Windstorm - Evaluation RC-412
- 2020 FBC Approvals - FL11560.8, FL11560.9, FL11560.10, FL11560.11, FL11560.12, FL40264.7 and FL40264.8
- Miami-Dade County, Florida - NOA 18-1227.01, expires 3/8/2024
- ICC Evaluation Report - ESR-2385

### FASTENING INFORMATION

- **Clips**
  1. Clip spacing is based upon the design loads, the spanning capacity of the panels, the fasteners and the support members.
  2. Clips are 0.050” thick. G90 is standard, 304 stainless is optional. 2 fastener holes is standard, 3 holes is optional.
  3. Clips can accommodate practically unlimited thermal movement.

- **Fasteners**
  1. Overdriven fasteners will cause panel distortions.
  2. Fasteners to wood and steel should extend 1/2” or more past the inside face of the support material.

  **Clips and Concealed End Fasteners:**
  - Attaching to Wood:
    - #10-12 Pancake Head Wood Screw
  - Attaching to Steel:
    - <18 ga: 1/4”-14 Deck Screw
    - >=18 ga, <=12 ga: #10-16 Pancake Head Driller
  - Attaching to Concrete:
    - 3/16” or 1/4” TapCon, Phillips Flat Head

  **Exposed End Fasteners:**
  - Attaching to Wood:
    - #10-14 XL Wood Screw
  - Attaching to Steel:
    - #12-14 XL Driller

  **Trim Fasteners:**
  - 1/4”-14 x 7/8” XL Stitch Screw
  - 1/8” x 3/16” Pop Rivet

### SECTION PROPERTIES

<table>
<thead>
<tr>
<th>Ga</th>
<th>Width in</th>
<th>Yield ksi</th>
<th>Weight psf</th>
<th>Top In Compression</th>
<th>Bottom In Compression</th>
<th>Inward Load</th>
<th>Outward Load</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Ixx in⁴/ft</td>
<td>Sxx in³/ft</td>
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<td>0.94</td>
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<td>0.1113</td>
<td>0.0737</td>
<td>189</td>
<td>132</td>
</tr>
</tbody>
</table>

1. Theoretical section properties have been calculated per AISI 2016 ‘North American Specification for the Design of Cold-Formed Steel Structural Members’.
2. Allowable loads are calculated in accordance with AISI 2016 specifications considering bending, shear, combined bending & shear, deflection and ASTM E 1592 uplift testing for 24 ga and 22 ga and UL 580 uplift testing for 26 ga. Allowable loads do not address web crippling, fasteners or support material.
3. Allowable loads consider the three or more equal spans condition. Panel weight is not considered.
4. Deflection consideration is limited by a maximum deflection ratio of L/180 of span.
5. Allowable loads do not include a 1/3 stress increase for wind.
6. Indicates that no testing is available for the application.

### ALLOWABLE UNIFORM LOADS, psf

For various clip spacings

<table>
<thead>
<tr>
<th>Ga</th>
<th>Width in</th>
<th>Yield ksi</th>
<th>Weight psf</th>
<th>Top In Compression</th>
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<td>189</td>
<td>132</td>
</tr>
</tbody>
</table>
**VERTICAL SEAM**

**HANDLING MATERIAL**

**RECEIVING MATERIAL**

It is the responsibility of the installer to unload material from the delivery truck. The installer shall be responsible for providing suitable equipment for unloading of material from the delivery truck.

After receiving material, check the condition of the material, and review the shipment against the shipping list to ensure all materials are accounted for. If damages or shortages are discovered, it should be noted on the Bill of Lading at the time of delivery. A claim should be made against the carrier as soon as possible. **Metal Sales is not responsible for any damages or shortages unless they are documented in writing and presented to Metal Sales within 48 hours of delivery.**

**GENERAL HANDLING**

Each bundle should be handled carefully to avoid being damaged. Care should be taken to prevent bending of the panel or abrasion to finish. Whenever possible, the bundle should remain crated until it is located in its place of storage. If bundles must be opened, we recommend you recrate them before lifting. To avoid damage, please lift the bundle at its center of gravity.

**CAUTION**

Improper loading and unloading of bundles and crates may result in bodily harm and/or material damage. Metal Sales is not responsible for bodily injuries and/or material damages resulting from improper loading and unloading.

**MECHANICAL HANDLING**

**Forklift** - A forklift may be used for panels up to 20'-0" long. Please make sure the forks are at their maximum separation. Do not transport open bundles. When transporting bundles across rough terrain, or over a longer distance, some means of supporting the panel load must be used.

**Crane** - A crane should be used when lifting panels with lengths greater than 20'-0". Please be sure to utilize a spreader bar to ensure the even distribution of the weight to the pick up points. As a rule when lifting panels, no more than $\frac{1}{3}$ of the length of the panel should be left unsupported. Never use wire rope because this will damage the panels.
When handling painted steel, care should be taken to prevent scratching of material. Clean gloves should be worn at all times to prevent a reaction with salts found on bare skin. Installers should wear rubber sole shoes to keep from scuffing material while walking on the roof.

Handling of individual panels should be done carefully and properly to avoid bending or damaging. Vertical Seam panels should be carried by grasping the edge of the panel so that the Vertical Seam panel is vertical to the ground. The Vertical Seam panel should not be carried with the panel horizontal to the ground as this could cause the panel to buckle or bend in the center.

Normally individual panels can be handled by people placed every 6'-0" to 8'-0" along the length of the panel.
Please inspect panels for moisture accumulation. If moisture has formed, the panels should be unbundled, wiped dry, and allowed to dry completely. Once dry, carefully restack the panels and loosely recover allowing for ample air circulation.

Bundled sheets should be stored high enough off of the ground to allow for air circulation and prevent contact with accumulating water. If possible, elevate one end of the bundle to allow any moisture to run off the panels. Metal Sales recommends covering the bundle with a tarp. Do not use tight fitting plastic-type tarp as panel bundle covers. While they may provide protection from heavy downpours, they can also retard necessary ventilation and trap heat and moisture that may accelerate metal corrosion. If panels are to be stored in possible bad weather, we suggest they be stored inside. Extended storage of panels in a bundle is not recommended. Under no circumstances should the sheets be stored near or come in contact with salt water, corrosive chemicals, ash, or fumes generated or released inside the building or nearby plants, foundries, plating works, kilns, fertilizer and wet or green lumber.
To facilitate the handling of Vertical Seam panels, panel bundles may be lifted and placed on the roof. Loading capabilities of the roof structure must be checked. Bundles need to be placed on the roof in areas that the roof structure can handle the weight.

When lifting packaged sheets, make certain they are adequately supported. Panels less than 20'-0" in length can normally be lifted with a forklift; however, when lifting panels in excess of 20'-0", it is recommended that a spreader bar and slings be used. As a rule, when lifting, no more than 1/3 of the length of the panel should be left unsupported.

Make a plan for bundle placement by determining how much area a bundle of panels will cover. Bundles should be placed on the roof in accordance with the direction the panel will be installed. Consider where the string line, if any, is to run at the eave to set roof panels by. Roof bundles should not interfere with this string line.
VERTICAL SEAM  FOOT TRAFFIC

Care of metal panels and flashings must be exercised throughout erection. Foot traffic can cause distortion of panel and damage to finish. Traffic over the installed system must be kept to an absolute minimum. If continuous foot traffic is necessary for maintenance over certain areas of the roof, then a permanent walkway should be installed.

If metal panels are installed over open framing, do not use the roof panel as a walking platform. The roof panels will not withstand the weight of a person standing at the edge of the panel. Provide walking platforms to avoid any panel damage as shown below.

When walking on the roof panels is unavoidable, walk only in the flats of the panel. Walking on the ribs can cause damage to the panels. If Vertical Seam is installed over open framing, step in the flat of the panel only and as close to the framing as possible.

OVER OPEN FRAMING

Walking Platforms

Foot Traffic

Vertical Seam Panels

Framing
VERTICAL SEAM  FIELD CUTTING AND TOUCH-UP

FIELD CUTTING
Tin snips or a “nibbler” type electric tool are recommended for field cutting Vertical Seam panels. Cutting the steel generates slivers or metal chips. These slivers and metal chips must be immediately removed from the Vertical Seam panels because they will damage the finish and shorten the life of the product.

One method of preventing this problem is to flip the Vertical Seam panels over when cutting. This allows the slivers and metal chips to be brushed from the back side and avoids damaging the paint on the top side of the panels.

When cutting Vertical Seam panels, goggles must be worn for eye protection.

CAUTION
All product surfaces should be free of debris at all times. Installed surfaces should be wiped clean at the end of each work period. Never cut panels over metal surfaces. Metal shavings will rust on the surface, voiding the warranty.

TOUCH-UP PAINT
All painted panels and flashings have a factory applied baked on finish. Handling and installing panels may result in some small scratches or nicks to the paint finish. Touch-up paint is available in matching colors from Metal Sales. It is recommended that a small brush be used to apply touch-up paint to those areas that are in need of repair. Touch-up paint does not have the superior chalk and fade resistance of the factory applied paint finish and will normally discolor at an accelerated rate. Aerosol paint should not be used because of the overspray that may occur.

SPRAY PAINT
TOUCH-UP PAINT
VERTICAL SEAM

TECHNIQUE

Recommended Tool Type - Use depth locating nose or adjustable clutch on screw gun to prevent overdrilling and strip out. Do not use impact tools or runners.

Seating the washer - Apply sufficient torque to seat the washer - do not overdrive the fastener.

<table>
<thead>
<tr>
<th>CORRECT</th>
<th>TOO LOOSE</th>
<th>TOO TIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sealing material slightly visible at edge of metal washer; Assembly is watertight.</td>
<td>Sealing material not visible; not enough compression to seal properly.</td>
<td>Metal washer deformed; sealing material pressed beyond washer edge.</td>
</tr>
</tbody>
</table>

To prevent wobbling - Make sure fastener head is completely engaged in the socket. If the head does not go all the way in the socket - tap the magnet deeper into the socket to allow full head engagement. Metal chips will build up from drilling and should be removed from time to time.

Protect drill point - Push only hard enough on the screw gun to engage clutch. This prevents excess friction and burn out of the drill point. Correct pressure will allow screw to drill and tap without binding.

Drilling through sheet and insulation - Ease up on pressure when drilling through insulation to avoid striking the purlin or girt with the point - apply more pressure after drill point contacts purlin or girt.

Drilling through purlin overlaps - Drilling through lapped purlins requires extra care. Excessive voids between purlins sometimes damages drill points and two self-drillers might be necessary to complete the operation. It is sometimes advantageous to predrill.

CONDITION OF SUBSTRUCTURE

Whether over solid decking or open structural framing, panel distortion may occur if not applied over properly aligned and uniform substructure.

The installer should check the roof deck for squareness before installing Vertical Seam panels. Several methods can be used to verify squareness of the structure for proper installation of the panels.

METHOD "A" - One method for checking the roof for squareness is to measure diagonally across one slope of the roof from similar points at the ridge and eave and obtain the same dimension.

METHOD "B" - The 3-4-5 triangle system may also be used. To use this system measure a point from the corner along the edge of the roof at a module of three (3). Measure a point from the same corner along another edge at a module of four (4). Then by measuring diagonally between the two points established, the dimension should be exactly a module of five (5) to have a square corner. Multiple uses of this system may be required to determine building squareness. If the endwall cannot be made square, the roof system cannot be installed as shown in these instructions.
Proper design and installation of vapor barriers and ventilation systems are important to prevent condensation and the resulting problems of moisture damage and loss of insulation efficiency.

Condensation occurs when moisture laden air comes in contact with a surface temperature equal to or below the dew point of the air. This phenomenon creates problems that are not unique with metal buildings; these problems are common to all types of construction.

The underside of the metal roof on a typical metal building (no attic) should be protected from condensation by insulating with a faced insulation. This should reduce the potential of condensation forming on the underside of the panels.

On buildings that have an attic space or are being retrofitted with a metal roofing system, vents should be placed at both the eave and peak of the roof in order to prevent a buildup of moisture (humidity) in the attic space.

**CAUTION**
Use extreme care when working next to insulation. The insulation will provide a false sense of security by hiding the view of the ground below the insulation.
**SELECTED SYSTEM COMPONENTS**

**Vertical Seam Panel Clip** - Clips are placed along the underlap rib of each panel prior to installing adjacent panels. Design wind uplift must be considered for proper clip spacing.

**VERTICAL SEAM UL-90 CLIP**
(2 Fasteners Required)

The following chart should be used to determine proper fasteners required for clip installation on the selected applications (see page 14 for other available fasteners).

<table>
<thead>
<tr>
<th>APPLICATION</th>
<th>INSTALLATION REQUIREMENTS</th>
<th><strong>CLIP SPACING</strong></th>
<th>TYPE OF FASTENER</th>
<th># REQ.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLIPS OVER PURLINS (16 GA. MIN)</td>
<td>UL-90 24 GAUGE</td>
<td>4'-0&quot; O.C.</td>
<td>#10 x 1&quot; PANCAKE HEAD DRILLER - 2 FASTENERS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>UL-90 22 GAUGE</td>
<td>4'-0&quot; O.C.</td>
<td>#10 x 1&quot; PANCAKE HEAD DRILLER - 2 FASTENERS</td>
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<tr>
<td></td>
<td>UL-90 22 GAUGE</td>
<td>5'-0&quot; O.C.**</td>
<td>#10 x 1&quot; PANCAKE HEAD DRILLER - 2 FASTENERS</td>
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</tr>
<tr>
<td>CLIPS OVER 5/8&quot; WOOD DECK</td>
<td>UL-90 24 GAUGE</td>
<td>4'-0&quot; O.C.</td>
<td>#10 x 1&quot; PANCAKE HEAD WOOD - 2 FASTENERS</td>
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<tr>
<td></td>
<td>UL-90 22 GAUGE</td>
<td>4'-0&quot; O.C.</td>
<td>#10 x 1&quot; PANCAKE HEAD WOOD - 2 FASTENERS</td>
<td></td>
</tr>
<tr>
<td>CLIP OVER RIGID INSULATION / METAL DECK</td>
<td>UL-90 24 GAUGE</td>
<td>4'-0&quot; O.C.</td>
<td>#14-13 DECK SCREWS* - 2 FASTENERS</td>
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<tr>
<td></td>
<td>UL-90 22 GAUGE</td>
<td>4'-0&quot; O.C.</td>
<td>#14-13 DECK SCREWS* - 2 FASTENERS</td>
<td></td>
</tr>
</tbody>
</table>

* Length of Deck Screws will vary depending on the total thickness of the rigid insulation and metal.
** Contact your local Metal Sales branch representative for more information (see pages 2 and 3).
*** 12" Panel Only.

**BEARING PLATE**
(Flat)

**PANEL LENGTH**

**Length** - Minimum factory cut length is 5'-0" on panels. Panels over 45'-0" require additional consideration in packaging, shipping, and erection. Please consult Metal Sales for recommendations.

There are two critical measurements involving Vertical Seam roof panels: the length of panel overhang required at the eave, and the peak end. In each case a certain measurement is required. Check each measurement to ensure panel placement gives you the distance required at the eave and peak condition. In most cases any variance can be taken out at the eave or peak ends.
The following procedures (pages 29 to 59) are presented as a general guide for installing Vertical Seam panels, flashings and accessories on a typical building or residence. Details are shown for installing Vertical Seam and related flashings over solid decking and over open framing. For other applications please contact Metal Sales.

The installation procedures will include the following conditions:

1. Floating Rake Angle, pages 29 and 44
2. Panel, installed from left to right (looking from eave to peak), pages 29, 30, 44 and 45
3. Panel Clip, pages 30 and 45
4. Eave, pages 31 and 46
5. Extended Eave, pages 32 and 47
6. Box Gutter, pages 33 and 48
7. Valley, pages 34 and 49
8. Rake, pages 35, 36, 50 and 51
9. Rakewall, pages 37, 38, 52 and 53
10. Ridge / Hip, pages 39 and 54
11. Vented Ridge, pages 40 and 55
12. Peak, page 41
13. Highside Parapet, pages 42 and 56
14. Transition, page 43
15. Z-Closure, page 57
16. Panel Hemming, page 58
17. Roof Penetration, page 59
VERTICAL SEAM  INSTALLATION OF PANEL OVER DECKING

INSTALLING FLOATING RAKE ANGLE

**STEP 1**

1. Install Floating Rake Angle at all rake and rake parapet conditions. Square Floating Rake Angle to rake condition. **It is critical that Floating Rake Angle be square to building as this will control alignment of panels (see page 25 to check building square).**
2. Fasten to decking with #10-12 x 1” Pancake Head Wood Screws, 1'-0” o.c. **Do not over tighten screws for it is imperative that the Floating Rake Angle be free to slide.**
3. If two or more Floating Rake Angles are required, butt ends. **Do not overlap Floating Rake Angles.**

![Diagram of Floating Rake Angle Installation](image)

**INSTALLING FIRST PANEL**

**STEP 2**

Note: Moisture Barriers, Eave, Gutter and Valley flashings must first be installed before panel installation can begin (see pages 31 to 34). Vertical Seam panels must be installed going from left to right when looking from eave to peak.

1. Field notch and hem the Vertical Seam panel (as shown on page 58). Apply a single bead of Tube Sealant inside the open hem of the Vertical Seam panel.
2. Position the first panel so overlap rib is on top of the Floating Rake Angle. Slide the panel toward the peak of the roof engaging the Vertical Seam panel and the Offset Cleat. Offset Cleat must be fully engaged into the Vertical Seam panel. Additional overhang must be considered if using wall panels.

![Diagram of First Panel Installation](image)
VERTICAL SEAM  INSTALLATION OF PANEL OVER DECKING

INSTALLING VERTICAL SEAM CLIP

1. Once the first panel has been installed, roll the first clip into lock position over the underlap rib of the panel (see below).

2. Fasten the Vertical Seam clip to the deck with the proper type and number of fasteners (see chart on page 27). If a fastener strips out, remove the clip and reposition it so the fastener can drill a new hole at least 3/8” from the stripped hole or install an oversized fastener into the stripped hole. Failure to do so will impact the system to resist the applied loads.

3. Repeat steps 1 and 2 to install clips along the underlap rib of the panel from eave to peak. For certain building codes and state or county specifications, special clip spacing may be required. Please contact Metal Sales for specific clip and fastener spacing.

INSTALLING SECOND PANEL

1. Prior to installing the second Vertical Seam panel, Tube Sealant must be placed on the underlap rib of the first panel (see below).

2. Place the second panel on top of previously installed panel so that the second hemmed panel can be engaged with the Offset Cleat.

3. Begin snapping the panels together working from eave to peak. It is critical that panels only be snapped in one direction.

4. Repeat steps 2 and 3 for remaining panels.

5. Make sure all panels are properly snapped into place. Also clean any debris and excess sealant before continuing to the next section of the roof.

6. Once installation is complete, fill the end of each panel rib with Tube Sealant (as shown below).
VERTICAL SEAM  EAVE WITH OFFSET OVER DECKING

1:12 Slope Minimum over Solid Decking

Note:
The high end of the panels must be direct fastened to secure the panels to the decking.

Note:
Panel ribs must be field notched and the flat part of the panel must be field hemmed to accept Offset Cleat (see page 58).

INSTALLATION NOTES

All Eave flashings must be installed prior to panel installation.
1. Position and install Cleat to wall with appropriate fastener, 1'-0" o.c. Make sure Cleat location allows proper Eave attachment.
2. Install Eave flashing by sliding open hem onto Cleat and resting the Eave flashing against the decking and fasten with #10-12 x 1" Pancake Head Wood Screws, 4'-0" o.c. to hold the Eave Flashing in place during installation.
3. Apply a row of Double Bead Tape Sealant on the bottom leg of the Offset Cleat and fasten to decking with #10-12 x 1" Pancake Head Wood Screw through top of Eave flashing and into decking, 1'-0" o.c. Make sure Offset Cleat is lined up to properly accommodate hemmed panel.
4. Install panel by engaging field-hemmed end of panel (see page 58) to Offset Cleat (see pages 29 and 30 for panel installation).
5. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with 1/8" Pop Rivets spaced 2'/2" o.c.
VERTICAL SEAM  EXTENDED EAVE OVER DECKING

1:12 Slope
Minimum over Solid Decking

All Extended Eave flashings must be installed prior to panel installation.
1. Position and install Cleat to wall with appropriate fastener, 1'-0" o.c. Make sure Cleat location allows for proper Extended Eave attachment.
2. Install Extended Eave flashing by sliding open hem onto Cleat and resting Extended Eave flashing back against decking.
   Fasten to decking with #10-12 x 1" Pancake Head Wood Screw, 1'-0" o.c.
3. Apply a row of Double Bead of Tape Sealant to extended leg of the Extended Eave flashing.
4. Install panel by engaging field-hemmed end of panel (see page 58) to Extended Eave (see pages 29 and 30 for panel install).
5. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with 1/8" Pop Rivets spaced 21/2" o.c.

INSTALLATION NOTES

Note:
The high end of the panels must be direct fastened to secure the panels to the decking.

Note:
Panel ribs must be field notched and the flat part of the panel must be field hemmed to accept Extended Eave (see page 58).
**VERTICAL SEAM**

**Box Gutter Over Decking**

1:12 Slope
Minimum over Solid Decking

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**INSTALLATION NOTES**

All Box Gutter flashing must be installed prior to panel installation.

1. Install Box Gutter flashing back against decking. To hold Box Gutter flashing in place, fasten to decking with #10-12 x 1” Pancake Head Wood Screw, 4’-0” o.c.

2. Install Universal Gutter/Downspout Straps every 3’-0” of gutter length to decking with #10-12 x 1” Pancake Head Wood Screw and fasten to Box Gutter with (1) 1/8” Pop Rivet per strap.

3. Apply a row of Double Bead of Tape Sealant to bottom leg of Offset Cleat, position on back leg of Box Gutter and fasten to decking with #10-12 x 1” Pancake Head Wood Screw, 1’-0” o.c.

4. Install panel by engaging field-hemmed end of panel (see page 58) to Offset Cleat (see pages 29 and 30 for panel installation).

5. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2” placing a bead of Tube Sealant between the flashings and securing with 1/8” Pop Rivets spaced 2’-0” o.c.

6. Note: Size and gauge of Box Gutter must be designed to applicable governing building code.

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Note:
The high end of the panels must be direct fastened to secure the panels to the decking.

Note:
Panel ribs must be field notched and the flat part of the panel must be field hemmed to accept Offset Cleat (see page 58).

**CAUTION**

In locations where heavy rainfall or severe ice and snow may occur, Metal Sales’ standard gutters may not be suitable for use.

Note:
Expansion Joint spacing for Box Gutter should be no more than 50’. Down Spout spacing should be no more than 50’.
VERTICAL SEAM  VALLEY OVER DECKING

All Valley flashings must be installed prior to panel installation. If two or more Valley flashings are required, Valley flashing must be installed working from eave to peak. It is recommended that ms-HT be installed under Valley flashing for added moisture protection.

1. Install Valley flashing against decking. To hold Valley flashing in place, fasten to decking with #10-12 x 1" Pancake Head Wood Screw, 4'-0" o.c.

2. Apply a row of Double Bead Tape Sealant across both sides of Valley flashing approximately 5" from center of valley.

3. Properly align and install Offset Cleat on both sides of Valley flashing to accommodate panel hem and fasten to decking with #10-12 x 1" Pancake Head Wood Screw, 1'-0" o.c.

4. Install panel by engaging field-hemmed end of panel (see page 58) to Offset Cleat (see pages 29 and 30 for panel installation).

5. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2", placing a bead of Tube Sealant between the flashings and securing with (2) Pop Rivets in the 2" water diverter.
VERTICAL SEAM RAKE (ON MODULE) OVER DECKING

1:12 Slope Minimum over Solid Decking

VERTICAL SEAM

1. Apply a row of Double Bead of Tape Sealant to vertical leg of Vertical Seam panel.
2. Position and install Rake Cleat through panel and into the Floating Rake Angle with #12-14 x 1 1/4" Self-Driller XL, 1'-0" o.c.
3. Position and install Cleat to wall with appropriate fastener, 1'-0" o.c. Make sure Cleat location allows for proper Rake trim attachment.
4. Apply a row of Double Bead Tape Sealant to top leg of Rake Cleat.
5. Install Rake by sliding the open hem onto the Cleat and then attaching to the Rake Cleat with 1/8" Pop Rivets, 1'-0" o.c.
6. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with 1/8" Pop Rivets spaced 2 1/2" o.c.

INSTALLATION NOTES

Vertical Seam panels and Floating Rake Angles must be installed prior to Rake installation (see pages 29 and 30).

Note:
Do not overtighten Floating Rake Angle fasteners. Fasteners must be loose enough to allow Floating Rake Angle to move back and forth.
VERTICAL SEAM RAKE (OFF MODULE) OVER DECKING

1:12 Slope Minimum over Solid Decking

- Vertical Seam Panel
  - Field bend panel rib up 1 3/4"

- 1/8" Pop Rivet (1'-0" o.c.)

- Double Bead Tape Sealant

- Rake Cleat

- Floating Rake Angle

- #12-14 x 1 1/4" SD XL (1'-0" o.c.)

- Moisture Barrier (by others)

- #10-12 x 1" PHWS (1'-0" o.c.)

- Cleat

- #10-12 x 1" PHWS (1'-0" o.c.)

- Rake

Note:
Do not overtighten Floating Rake Angle fasteners. Fasteners must be loose enough to allow Floating Rake Angle to move back and forth.

INSTALLATION NOTES

Vertical Seam panels and Floating Rake Angles must be installed prior to Rake installation (see pages 29 and 30).

1. Field cut and bend off module panel up 1 3/4".
2. Apply a row of Double Bead of Tape Sealant to vertical leg of Vertical Seam panel.
3. Position and install Rake Cleat through panel and into the Floating Rake Angle with #12-14 x 1 1/4" Self-Driller XL, 1'-0" o.c.
4. Position and install Cleat to wall with appropriate fastener, 1'-0" o.c. Make sure Cleat location allows for proper Rake trim attachment.
5. Apply a row of Double Bead Tape Sealant to top leg of Rake Cleat.
6. Install Rake trim by sliding the open hem onto the Cleat and then attaching to the Rake Cleat with 1/8" Pop Rivets, 1'-0" o.c.
7. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with 1/8" Pop Rivets spaced 2 1/2" o.c.

Note:
Do not overtighten Floating Rake Angle fasteners. Fasteners must be loose enough to allow Floating Rake Angle to move back and forth.
VERTICAL SEAM
RAKE PARAPET (ON MODULE) OVER DECKING

1:12 Slope
Minimum
over Solid
Decking

Vertical Seam panels and Floating Rake Angles must be installed prior to Rakewall installation (see pages 29 and 30).
1. Apply a row of Double Bead of Tape Sealant to vertical leg of Vertical Seam panel.
2. Position and install Rake Cleat through panel and into Floating Rake Angle with #12-14 x 1 1/4" Self Driller XL, 1'-0" o.c.
3. Apply a row of Double Bead Tape Sealant to top leg of Rake Cleat.
4. Install Rakewall to the Rake Cleat with 1/8" Pop Rivets, 1'-0" o.c.
5. Install Counter Flashing, Reglet or wall panel and fasten to parapet wall with appropriate fastener, 1'-0" o.c. If Counter Flashing or Reglet is used, seal to parapet wall with Tube Sealant. Do NOT fasten Rakewall to wall.
6. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with 1/8" Pop Rivets spaced 2 1/2" o.c.

Note:
Do not overtighten Floating Rake Angle fasteners. Fasteners must be loose enough to allow Floating Rake Angle to move back and forth.

INSTALLATION NOTES
VERTICAL SEAM RAKE PARAPET (OFF MODULE) OVER DECKING

1:12 Slope Minimum over Solid Decking

Vertical Seam panels and Floating Rake Angles must be installed prior to Rakewall installation (see pages 29 and 30).
1. Field cut and bend off module panel up 1 3/4".
2. Apply a row of Double Bead of Tape Sealant to vertical leg of Vertical Seam panel.
3. Position and install Rake Cleat through panel and into the Floating Rake Angle with #12-14 x 1 1/4" SD XL, 1'-0" o.c.
4. Apply a row of Double Bead Tape Sealant to top leg of Rake Cleat.
5. Install Rakewall to the Rake Cleat with 1/8" Pop Rivets, 1'-0" o.c. Do NOT fasten Rakewall to parapet wall.
6. Install Counter Flashing, Reglet or wall panel and fasten to parapet wall with appropriate fastener, 1'-0" o.c. If Counter Flashing or Reglet is used, seal to parapet wall with Tube Sealant. Do NOT fasten Rakewall to wall.
7. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with 1/8" Pop Rivets spaced 2 1/2" o.c.

INSTALLATION NOTES

Note:
Do not overtighten Floating Rake Angle fasteners. Fasteners must be loose enough to allow Floating Rake Angle to move back and forth.
VERTICAL SEAM 11" RIDGE/HIP OVER DECKING

1:12 Slope Minimum over Solid Decking

1. Once panels have been installed, field cut the Z-Closure (see page 57) to fit between the panel ribs.
2. Place a row of Double Bead Tape Sealant across panel and over each panel rib approximately 2" from panel end. Before proceeding make sure Z-Closure location will accommodate 11" Ridge/Hip cover.
3. Install field cut Z-Closure (see page 57).
4. Fasten Z-Closure through panel with (4) #10-12 x 1" PHWS (4 per panel)
5. Apply a row of Double Bead Tape Sealant across top leg of Z-Closure filling any gaps or openings around panel ribs.
6. Position and install 11" Ridge/Hip Cover flashing to Z-Closure with 1/8" Pop Rivets (as shown).
7. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with 1/8" Pop Rivets spaced 2 1/2" o.c.

CAUTION
Additional screws and pop rivets may be required for high snow / wind loading and steep slopes.

INSTRUCTION NOTES

Note: The low end of the panels must not be direct fastened to the decking.
1. Once panels have been installed, field cut the Z-Closure (see page 57) to fit between the panel ribs.
2. Place a row of Double Bead Tape Sealant across panel and over each panel rib approximately 2" from panel end. Before proceeding, make sure Z-Closure location will accommodate Vented Ridge cover.
3. Install field-cut Z-Closure (see page 57).
4. Fasten Z-Closure through panel with (4) #10-12 x 1" Pancake Head Wood Screws per panel.
5. Apply a row of Double Bead Tape Sealant across top leg of Z-Closure filling any gaps or openings around panel ribs.
6. Install Vent Drip, Vent Material and Offset Cleat, as shown above with #14-13 Deck Screws, 1'-0" o.c. and apply a row of Double Bead Tape Sealant to the top leg of the Offset Cleat.
7. Install Vented Ridge Cover to Offset Cleat with 1/8" Pop Rivets, 1'-0" o.c.
8. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with 1/8" Pop Rivets spaced 2 1/8" o.c.

Note: The low end of the panels must not be direct fastened to the decking.

CAUTION
Additional screws and pop rivets may be required for high snow / wind loading and steep slopes.

INSTALLATION NOTES

1. Once panels have been installed, field cut the Z-Closure (see page 57) to fit between the panel ribs.
2. Place a row of Double Bead Tape Sealant across panel and over each panel rib approximately 2" from panel end. Before proceeding, make sure Z-Closure location will accommodate Vented Ridge cover.
3. Install field-cut Z-Closure (see page 57).
4. Fasten Z-Closure through panel with (4) #10-12 x 1" Pancake Head Wood Screws per panel.
5. Apply a row of Double Bead Tape Sealant across top leg of Z-Closure filling any gaps or openings around panel ribs.
6. Install Vent Drip, Vent Material and Offset Cleat, as shown above with #14-13 Deck Screws, 1'-0" o.c. and apply a row of Double Bead Tape Sealant to the top leg of the Offset Cleat.
7. Install Vented Ridge Cover to Offset Cleat with 1/8" Pop Rivets, 1'-0" o.c.
8. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with 1/8" Pop Rivets spaced 2 1/8" o.c.
1. Once panels have been installed, field cut the Z-Closure (see page 57) to fit between the panel ribs.
2. Place a row of Double Bead Tape Sealant across panel and over each panel rib approximately 2" from panel end. Before proceeding make sure Z-Closure location will accommodate Peak trim.
3. Install field-cut Z-Closure (see page 57).
4. Fasten Z-Closure through panel with (4) #10-12 x 1" Pancake Head Wood Screws per panel.
5. Apply a row of Double Bead Tape Sealant across top leg of Z-Closure filling any gaps or openings around panel ribs.
6. Position and install Cleat to the wall with the appropriate fastener, 1'-0" o.c. Make sure Cleat allows for proper Peak attachment.
7. Install Peak flashing by sliding the open hem onto the Cleat and then attaching to the Z-Closure with 1/8" Pop Rivets, at the spacing shown above.
8. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with 1/8" Pop Rivets spaced 2 1/2" o.c.

Note:
The low end of the panels must not be direct fastened to the decking.

CAUTION
Additional screws and pop rivets may be required for high snow / wind loading and steep slopes.
1. Once panels have been installed, field cut the Z-Closure (see page 57) to fit between the panel ribs.
2. Place a row of Double Bead Tape Sealant across panel and over each panel rib approximately 2" from panel end. Before proceeding make sure Z-Closure location will accommodate Pitch Break flashing.
3. Install field-cut Z-Closure (see page 57).
4. Fasten Z-Closure through panel with (4) #10-12 x 1" Pancake Head Wood Screws per panel.
5. Apply a continuous bead of Tube Sealant across top leg of Z-Closure filling any gaps or openings around panel ribs. Position and install Pitch Break flashing to Z-Closure with 1/8" Pop Rivets (as shown).
6. Fasten vertical leg of Pitch Break to the parapet wall with the appropriate fastener, 1'-0" o.c.
7. Install Counter Flashing, Reglet or wall panel and fasten to parapet wall with appropriate fastener, 1'-0" o.c. If Counter Flashing or Reglet is used, seal to parapet wall with Tube Sealant. Do NOT fasten Rakewall to wall.
8. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with 1/8" Pop Rivets spaced 2 1/2" o.c.

Note:
The low end of the panels must not be direct fastened to the decking.

CAUTION
Additional screws and pop rivets may be required for high snow / wind loading and steep slopes.

INSTALLATION NOTES
1/12 Slope Minimum over Solid Decking

- Tube Sealant
- Counter Flashing
- Fasteners (by others)
- Pitch Break
- #10-12 x 1" PHWS (4 per panel)
- Tube Sealant
- Double Bead Tape Sealant
- 1/8" Pop Rivet (see below)
- Z-Closure
- Vertical Seam Clip
- Vertical Seam Panel
- Moisture Barrier (by others)
VERTICAL SEAM
TRANSITION OVER DECKING

1:12 Slope
Minimum over
Solid Decking

Note:
The high end of the roof panels must be direct fastened to the decking.

INSTALLATION NOTES

1. ms-HT underlayment is recommended shingled up the wall and at least one run on the roof.
2. Cut panel ribs square across the width of the panel at the proper location along the length and bend the panel flat at the cut ribs.
3. Install panel with a Vertical Seam clip on the roof section of within 6” of the eave. In the wall section, install Vertical Seam clip 3’ from the roof to permit thermal expansion of the roof panels. Use Panel Starter (not shown) at the bottom end of the wall panels by cutting a slot at the bottom of the panel ribs and inserting the panel flat into the Panel Starter hem.
4. For long roof panels, a gap between the panel and the top of the wall may be required to allow for thermal contraction of the roof panel.
5. Cut the Rib Cover and bend as shown so that it fits on the panel ribs across the transition and has room for 1/8” Pop Rivets. The roof legs of the Rib Cover must overlap the wall legs of the Rib Cover.
6. Prior to installing the Rib Cover, apply Tube Sealant as shown across panel ribs and at the base of each side of the ribs.
7. Install 1/8” Pop Rivets on each side of the Rib Cover to the roof panel rib, the wall panel rib and at the Rib Cover leg lap.
**VERTICAL SEAM INSTALLATION OF PANEL OVER OPEN FRAMING**

**INSTALLING FLOATING RAKE ANGLE**

**STEP 1**

1. Install Floating Rake Angle at all rake and rake parapet conditions. Square Floating Rake Angle to rake condition. **It is critical that Floating Rake Angle be square to building as this will control alignment of panels (see page 25 to check building square).**
2. Fasten to framing with ¼"-14 × 1⅛" Shoulder Self Driller screws, 1'-0" o.c. **Do not over tighten screws for it is imperative that the Vertical Seam roof system be allowed to float.**
3. If two or more Floating Rake Angles are required, butt ends. **Do not overlap Floating Rake Angles.**

**INSTALLING FIRST PANEL**

**STEP 2**

1. **Note:** Insulation, Eave, Box Gutter and Valley flashings must first be installed before panel installation can begin (see pages 46 to 49). Vertical Seam panels must be installed going from left to right when looking from eave to peak.
2. Apply a row of Double Bead Tape Sealant along the top segment of the Eave, Extended Eave or Box Gutter flashing.
3. Install the first panel so that the overlap rib is on top of the Floating Rake Angle and has the proper overhang. Make sure that the panel is square to the eave and rake.
4. Fasten Vertical Seam panel with (4) #12-14 × 1⅛" Self Driller XL per panel through the Double Bead Tape Sealant, flashing and into the framing (as shown below).
INSTALLING VERTICAL SEAM CLIP

1. Once the first panel has been installed, roll the first clip into lock position over the underlap rib of the panel (see below).
2. Fasten the Vertical Seam clip to the framing with the proper type and number of fasteners (see chart on page 27). If a fastener strips out, remove the clip and reposition it so the fastener can drill a new hole at least 3/8” from the stripped hole or install an oversized fastener into the stripped hole. Failure to do so will impact the system to resist the applied loads.
3. Repeat steps 1 and 2 to install clips along the underlap rib of the panel from eave to peak at every framing member. For certain building codes and state or county specifications, special clip spacing may be required. Please contact Metal Sales for specific clip and fastener spacing.

INSTALLING SECOND PANEL

1. Prior to installing the second Vertical Seam panel, Tube Sealant must be placed on the underlap rib of the first panel (see below).
2. Snap the second panel in place making sure panel ends at eave are properly aligned. It is critical that panels only be snapped in one direction.
3. Fasten Vertical Seam panel with (4) #12-14 x 1 1/4” Self Driller XL per panel through the Double Bead Tape Sealant, flashing and into the framing, as shown below.
4. Repeat steps 2 and 3 for remaining panels.
5. Make sure all panels are properly snapped into place. Also clean any debris and excess sealant before continuing to the next section of the roof.
6. Once installation is complete, fill the end of each panel rib with Tube Sealant (as shown below).
All Eave flashings must be installed prior to panel installation.
1. Position and install Cleat to wall with appropriate fastener, 1'-0" o.c. Make sure Cleat location allows proper Eave attachment.
2. Install Eave flashing by sliding open hem onto Cleat and resting the Eave flashing against the framing and fasten with #10-16 x 1" Pancake Head Driller, 4'-0" o.c. to hold the Eave flashing in place during installation.
3. Apply a row of Double Bead Tape Sealant along the top leg of the Eave flashing about 2" from the end.
4. Install panel by fastening through with #12-14 x 1 1/4" Self Driller XL screws (see pages 44 and 45 for panel installation).
5. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with 1/8" Pop Rivets spaced 2 1/2" o.c.

Note: The high end of the panels must not be direct fastened to the framing.

CAUTION
Additional screws may be required for high snow loading and steep slopes.
VERTICAL SEAM  EXTENDED EAVE OVER OPEN FRAMING

3:12 Slope
Minimum

- Vertical Seam Panel
- Tube Sealant
- #12-14 x 1 1/4" SD XL (see below)
- Double Bead Tape Sealant
- Extended Eave
- Cleat
- #10-16 x 1" PHD (1'-0" o.c.)

Note:
The high end of the panels must not be direct fastened to the framing.

CAUTION
Additional screws may be required for high snow loading and steep slopes.

INSTALLATION NOTES

All Extended Eave flashings must be installed prior to panel installation.

1. Position and install Cleat to wall with appropriate fastener, 1'-0" o.c. Make sure Cleat location allows for proper Extended Eave attachment.

2. Install Extended Eave flashing by sliding open hem onto Cleat and resting Extended Eave flashing back against framing.
   Fasten to framing with #10-16 x 1" Pancake Head Driller, 4'-0" o.c. to hold Extended Eave flashing in place during installation.

3. Apply a row of Double Bead of Tape Sealant to the Extended Eave flashing.

4. Install panel by fastening through with #12-14 x 1 1/4" Self Drillers XL Screws (see pages 44 and 45 for panel installation).

5. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with 1/8" Pop Rivets spaced 2 1/2" o.c.
Box Gutter Over Open Framing

All Box Gutter flashings must be installed prior to panel installation.

1. Install Box Gutter flashing against the eave framing. To hold Box Gutter flashing in place, fasten to framing with #10-16 x 1” Pancake Head Drillers, 4'-0" o.c.
2. Install Universal Gutter/Downspout Straps every 3'-0" of gutter length to framing with #10-16 x 1” Pancake Head Drillers and fasten to Box Gutter with (1) ⅛” Pop Rivet per strap.
3. Install panel by fastening through with #12-14 x 1½” Self Driller XL screws (see pages 44 and 45 for panel installation).
4. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2” placing a bead of Tube Sealant between the flashings and securing with ⅛” Pop Rivets spaced 2½” o.c.

Note:
The high end of the panels must not be direct fastened to the framing.

Note:
Expansion Joint spacing for Box Gutter should be no more than 50’. Down Spout spacing should be no more than 50’.

Installation Notes

Insert all Box Gutter fasteners using ⅛” Pop Rivets spaced 2½” o.c.

3:12 Minimum Slope

CAUTION
In locations where heavy rainfall or severe ice and snow may occur, Metal Sales’ standard gutters may not be suitable for use.
VERTICAL SEAM VALLEY OVER OPEN FRAMING

3:12 Slope Minimum

All Valley flashings must be installed prior to panel installation. If two or more Valley flashings are required, Valley flashing must be installed working from eave to peak.

1. Install Valley flashing back against framing and fasten with #10-16 x 1" Pancake Head Driller, 4'-0" o.c. to hold flashing place during installation.
2. Apply a row of Double Bead Tape Sealant across both sides of Valley flashing about 3" from the center of the valley.
3. Field cut the Vertical Seam panel to the appropriate angle and install over the Valley flashing, with (5) #12-14 x 1 1/4" Self Driller XL screws, as shown above (see pages 44 and 45 for panel installation).
4. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with (2) 1/8" Pop Rivets in the 2" water diverter.

CAUTION
Additional screws may be required for high snow loading and steep slopes.
Vertical Seam panels and Floating Rake Angles must be installed prior to Rake installation (see pages 44 and 45).

1. Apply a row of Double Bead of Tape Sealant to vertical leg of Vertical Seam panel.
2. Position and install Rake Cleat through panel and into the Floating Rake Angle with #12-14 x 1⅛" Self-Driller XL, 1'-0" o.c.
3. Position and install Cleat to wall with appropriate fastener, 1'-0" o.c. Make sure Cleat location allows for proper Rake attachment.
4. Apply a row of Double Bead Tape Sealant to top leg of Rake Cleat.
5. Install Rake by sliding the open hem onto the Cleat and then attaching to the Rake Cleat with ⅛" Pop Rivets, 1'-0" o.c.
6. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with ⅛" Pop Rivets spaced 2½" o.c.
VERTICAL SEAM RAKE (OFF MODULE) OVER OPEN FRAMING

3:12 Slope Minimum

Vertical Seam Panel

1/8" Pop Rivet (1'-0" o.c.)

Double Bead Tape Sealant

Rake Cleat

Rake

#12-14 x 1 1/4" SD XL (1'-0" o.c.)

Floating Rake Angle

1/4"-14 x 1 1/4" Shoulder SD (1'-0" o.c.)

Rake Angle (by others)

Cleat

#10-16 x 1" PHD (1'-0" o.c.)

INSTALLATION NOTES

Vertical Seam panels and Floating Rake Angles must be installed prior to Rake installation (see pages 44 and 45).

1. Field cut and bend off module panel up 1 1/4".

2. Apply a row of Double Bead of Tape Sealant to vertical leg of Vertical Seam panel.

3. Position and install Rake Cleat through panel and into the Floating Rake Angle with #12-14 x 1 1/4" Self-Driller XL, 1'-0" o.c.

4. Position and install Cleat to wall with appropriate fastener, 1'-0" o.c. Make sure Cleat location allows for proper Rake attachment.

5. Apply a row of Double Bead Tape Sealant to top leg of Rake Cleat.

6. Install Rake by sliding the open hem onto the Cleat and then attaching to the Rake Cleat with 1/8" Pop Rivets, 1'-0" o.c.

7. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with 1/8" Pop Rivets spaced 2 1/2" o.c.
VERTICAL SEAM  RAKE PARAPET (ON MODULE) OVER OPEN FRAMING

3:12 Slope
Minimum

Vertical Seam panels and Floating Rake Angles must be installed prior to Rakewall installation (see pages 44 and 45).
1. Apply a row of Double Bead of Tape Sealant to vertical leg of Vertical Seam panel.
2. Position and install Rake Cleat through panel and into Floating Rake Angle with #12-14 x 1 1/4" Self Driller XL, 1'-0" o.c.
3. Apply a row of Double Bead Tape Sealant to top leg of Rake Cleat.
4. Install Rakewall to the Rake Cleat with 1/8" Pop Rivets, 1'-0" o.c.
5. Install Counter Flashing, Reglet or wall panel and fasten to parapet wall with appropriate fastener, 1'-0" o.c. If Counter Flashing or Reglet is used, seal to parapet wall with Tube Sealant. Do NOT fasten Rakewall to wall.
6. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with 1/8" Pop Rivets spaced 2 1/2" o.c.

INSTALLATION NOTES
VERTICAL SEAM RAKE PARAPET (OFF MODULE) OVER OPEN FRAMING

3:12 Slope Minimum

Vertical Seam panels must be installed prior to Rake installation (see pages 44 and 45).

1. Field cut and bend off module panel up 1 3/4".
2. Apply a row of Double Bead of Tape Sealant to vertical leg of Vertical Seam panel.
3. Position and install Rake Cleat through panel and into the Floating Rake Angle with #12-14 x 1 1/4" Self Driller XL, 1'-0" o.c.
4. Apply a row of Double Bead Tape Sealant to top leg of Rake Cleat.
5. Install Rakewall to the Rake Cleat with 1/8" Pop Rivets, 1'-0" o.c. Do NOT fasten Rakewall to parapet wall.
6. Install Counter Flashing, Reglet or wall panel and fasten to parapet wall with appropriate fastener, 1'-0" o.c. If Counter Flashing or Reglet is used, seal to parapet wall with Tube Sealant. Do NOT fasten Rakewall to wall.
7. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with 1/8" Pop Rivets spaced 2 1/2" o.c.

INSTALLATION NOTES
1. Once panels have been installed, slide Back-Up Channel under upper edge of panels. Locate Back-Up Channel to allow proper installation of Ridge/Hip assembly. Use C-Clamps to hold Back-Up Channel in place.

2. Apply a row of Double Bead Tape Sealant across panel, up and over all ribs approximately 2” from panel end on both sides of Ridge/Hip.

3. Install Z-Closures over Double Bead Tape Sealant. Before continuing make sure Z-Closure location will accommodate SSR Ridge/Hip Cover (see page 57).

4. Once Z-Closure is set in Double Bead Tape Sealant, fasten through Z-Closure, Double Bead Tape Sealant, Vertical Seam panel and into Back-Up Channel with (4) #10-16 x 1” PHD per panel. C-Clamps may be removed once Z-Closures have been fastened.

5. Once all Z-Closures have been installed, place a row of Double Bead Tape Sealant across top of the Z-Closure on both sides of the Ridge/Hip. Tube Sealant must be used to fill any and all gaps left around the Z-Closures.

6. Install SSR Ridge/Hip Cover and secure to top leg of Z-Closure with 1/8” Pop Rivets as shown above.

7. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2” placing a bead of Tube Sealant between the flashings and securing with 1/8” Pop Rivets spaced 2 1/2” o.c.

Note:
The low end of the panels must be direct fastened to the framing.
1. Once panels have been installed, slide Back-Up Channel under upper edge of panels. Locate Back-Up Channel to allow proper installation of Vented Ridge assembly. Use C-Clamps to hold Back-Up Channel in place.
2. Apply a row of Double Bead Tape Sealant across panel, up and over all ribs approximately 2” from panel end on both sides of ridge.
3. Install Z-Closures over Double Bead Tape Sealant. Before continuing make sure Z-Closure location will accommodate Vented Ridge Cover (see page 57).
4. Once Z-Closure is set in Double Bead Tape Sealant, fasten through Z-Closure, Double Bead Tape Sealant, Vertical Seam panel and into Back-Up Channel with (4) #10-16 x 1” PHD per panel. C-Clamps may be removed once Z-Closures have been fastened.
5. Once all Z-Closures have been installed, place a row of Double Bead Tape Sealant across top of the Z-Closure on both sides of the ridge. Tube Sealant must be used to fill any and all gaps left around the Z-Closures.
6. Install Vent Drip, Vent Material and Offset Cleat and fasten to top leg of Z-Closure with (4) #10-16 x 1” PHD per panel. C-Clamps may be removed once Z-Closures have been fastened.
7. Apply a row of Double Bead Tape Sealant across outer leg of Offset Cleat.
8. Install Vented Ridge Cover and secure to outer leg of Offset Cleat with 1/8” Pop Rivets as shown above.
9. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2” placing a bead of Tube Sealant between the flashings and securing with 1/8” Pop Rivets spaced 2½” o.c.
3:12 Slope
Minimum

VERTICAL SEAM
HIGHSIDE PARAPET OVER OPEN FRAMING

1. Once panels have been installed, slide Back-Up Channel under upper edge of panels. Locate Back-Up Channel to allow proper installation of Endwall assembly. Use C-Clamps to hold Back-Up Channel in place.
2. Place a row of Double Bead Tape Sealant across panel and over each panel rib approximately 2" from panel end.
3. Install field-cut Z-Closure over Double Bead Tape Sealant. Before continuing, make sure Z-Closure location will accommodate Pitch Break flashing (see page 57).
4. Once Z-Closure is set in Double Bead Tape Sealant, fasten through Z-Closure, and into Back-Up Channel with (4) #10-16 x 1" PHD (4 per panel).
5. Apply a continuous bead of Tube Sealant across top leg of Z-Closure filling any gaps or openings or openings around panel ribs. Position and install Pitch Break flashing to Z-Closure with 1/8" Pop Rivet as shown.
6. Fasten vertical leg of Pitch Break to the parapet wall with the appropriate fastener, 1'-0" o.c.
7. Install Counter Flashing, Reglet or wall panel and fasten to parapet wall with appropriate fastener, 1'-0" o.c. If Counter Flashing or Reglet is used, seal to parapet wall with Tube Sealant. Do NOT fasten Rakewall to wall.
8. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 2" placing a bead of Tube Sealant between the flashings and securing with 1/8" Pop Rivets spaced 2½" o.c.

CAUTION
Additional screws may be required for high snow loading and steep slopes.

INSTALLATION NOTES

Note:
The low end of the panels must be direct fastened to the framing.
VERTICAL SEAM  

Z-CLOSURE INSTALLATION

Minimum Slope:
3:12 over Open Framing
1:12 over Solid Decking

#10-16 x 1" PHD or
#10-12 x 1" PHW

Z-Closure

Field cut and bend back 1"

Double Bead Tape Sealant

1. Place a row of Double Bead Tape Sealant across panel and over each rib approximately 4" from panel end. Before proceeding, make sure Z-Closure placement will accommodate flashing.
2. Field cut the Z-Closure 2" longer than the clear width between ribs. Snip the top and bottom leg of the Z-Closure and bend both sides back, as shown above.
3. Fasten through the Z-Closure, Tape Sealant, Vertical Seam panel and support material with (4) #10-12 x 1" PHWS per panel for solid decking or (4) #10-16 x 1" PHD per panel for open framing.
   
   Note: For open framing, the support is a Back-Up Channel as shown in the details.
4. Apply a row of Double Bead Tape Sealant across the top of the Z-Closure filling any gaps or openings around the panel ribs with Tube Sealant. This will be fastened through when the flashing is installed.

INSTALLATION NOTES
Panels must be field notched and hemmed when using an Offset Cleat or Extended Eave.

**FIELD HEMMING STEPS**

1. Field notch underlap and overlap ribs of panel up to 1½” from end of panel.
2. Place the hemming tool onto the protruding pan of the panel and bend down to form an open hem.
3. Place a continuous bead of Tube Sealant inside the open hem.
4. Engage Offset Cleat or Extended Eave into open hem at the end of the panel to start panel installation.
Size and location of all roof penetrations should be an important consideration. Areas around roof vents or rooftop units may show that corrosive fumes are emitted from a process within the building.

**INSTALLATION NOTES**

Note: The following procedures are for vent pipes 6" or less and not transmitting extremely hot or caustic materials.

**When installing vent pipes abide by the local plumbing codes.**

1. Determine the size and length of the vent pipe to be raised.
2. Take the appropriate measurements for the vent location and mark them on the Vertical Seam panel. The vent pipe must extend through the flat of the roof panel. If the vent pipe extension cannot be raised directly into the flat of the new roof panel, elbows should be used to offset the pipe. Cut the panel to fit the vent pipe properly.
3. Use a light gauge angle to secure and plumb the vent pipe to the framing system.
4. Flash the vent pipe with a Rubber Roof Jack or similar pipe flashing.
5. Apply Tube Sealant between the panel and the base of the Rubber Roof Jack as well as the top where the boot meets the pipe.
6. Attach the base of the Rubber Roof Jack to the panel using 1/4"-14 x 7/8" Stitch XL fasteners spaced 2" o.c.

### GENERAL NOTES

#2 (1 3/4" TO 3" O.D. Pipe)
#4 (3" TO 6" O.D. Pipe)
#6 (6" TO 9" O.D. Pipe)
#8 (7" TO 13" O.D. Pipe)

Temp Range: -30° to +250°
Though factory applied pre-painted finishes are very durable and will last many years, eventually it may be desirable to thoroughly clean or repaint them.

Dirt pickup may cause apparent discoloration of the paint when it has been exposed in some dirt laded atmospheres for long periods of time. In areas of strong sunlight, slight chalking may cause some change in appearance. A good cleaning will often restore the appearance of these buildings and render repainting unnecessary. An occasional light cleaning will help maintain a good appearance.

In many cases, simply washing the building with plain water using a hose or pressure sprayer will be adequate. In areas where heavy dirt deposits dull the surface, a cloth or soft bristle brush and solution of water and detergent (1/3 cup of laundry detergent per gallon of water for example) may be used. This should be followed by an adequate rinse of water. Do not use wire brushes, abrasives, or cleaning tools which will damage the coating surface.

Mildew may occur in areas subject to high humidity but is not normally a problem due to the high inherent mildew resistance of the baked finish that is used. However, mildew can grow on dirt and spore deposits in some cases. To remove mildew along with the dirt, the following solution is recommended.

- 1/3 cup detergent (Tide® or equivalent)
- 2/3 cup trisodium phosphate (Solex® or equivalent)
- 1 quart of 5% sodium hypochlorite solution (Clorox® or equivalent)
- 3 quarts of water

Strong solvents and abrasive type cleaners should be avoided. Most organic solvents are flammable and toxic and must be handled accordingly. When using a solvent, consult maintenance professionals and label instructions for proper handling and disposal of washings. If required, a mild solvent such as mineral spirits can be used to remove caulking compounds, oil, grease, tars, wax, and similar substances. Use a cloth dampened with mineral spirits and apply only to areas which are contaminated. Follow up the use of this mild solvent with detergent cleaning and rinsing.