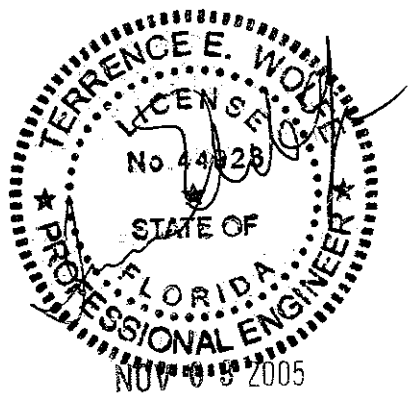
MBCI®
Metal Roof and Wall Systems

PRODUCT EVALUATION REPORT

PBR Panel

State of Florida Professional Engineer:
Terrence E. Wolfe, P.E. # 44923
2405-a S. Houston Ave., Suite 500
Humble, TX 77396

Validator:
Dan Farabaugh
515 Braddock Avenue
Turtle Creek, PA 15145



Manufacturer:

MBCI, L.P. *a division of NCI, L P.*

Houston
14031 West Hardy
Houston, TX 77064

Lubbock
5711 FM-40
Lubbock, TX 79401

Oklahoma City
7000 S. Eastern Ave.
Oklahoma City, OK 73149

San Antonio
8677 I-10 East
Converse, TX 78109

Atlanta
2280 Monier Ave.
Lithia Springs, GA 30057

Tampa
402 N. Frontage Road
Plant City, FL 33563

Richmond
801 South Ave.
Colonial Heights, VA 23834

Indianapolis
1780 McCall Drive
Shelbyville, IN 46176

Omaha
1011 Ellison Ave.
Omaha, NE 68110

Memphis
300 Highway 51 North
Hernando, MS 38632

Rome
6168 State Route 233
Rome, NY 13440

Adel
1600 Rogers Road
Adel, GA 31620

Phoenix
660 South 91th street
Tolleson, AZ 85353

Salt Lake City
1155 West 2300 North
Salt Lake City, UT 84116

Jackson
201 Apache Dr.
Jackson, MS 39272

Midland Metals
515 13th Ave E.
Oskaloosa, IA 52577

Big Rapids
560 North Bronson Ave
Big Rapids, MI 49307-9311

Atwater
550 Industry Way
Atwater, CA 95301

Ennis
1804 Jack McKay Blvd
Ennis, TX 75119

Nicholasville
6975 Danville Rd.
Nicholasville, KY 40340

SUBJECT:

Cold-formed, through-fastened, steel roof panels/cladding.

DESCRIPTION:

PBR Panel – a 36", wide, through-fastened, structural, metal roof panel, available in 29-ga. (0.015), 26-ga. (.019), 24-ga. (0.023"), or 22-ga. (0.029"). PBR is typically applied over open framing. PBR is through-fastened roof system.

CODE CRITERIA:

CHAPTER 15, FLORIDA BUILDING CODE 2004, ROOF ASSEMBLIES AND ROOFTOP STRUCTURES

SECTION 1504
PERFORMANCE REQUIREMENTS

1504.1 Wind resistance of roofs. Roof decks and roof coverings shall be designed for wind loads in accordance with Chapter 16 and Sections 1504.3.
See attached installation manual.

1504.3 Wind resistance of non-ballasted roof. Roof coverings installed on roofs in accordance with Section 1507 that are mechanically attached or adhered to the roof deck shall be designed to resist the design wind load pressures for cladding in Chapter 16.

1504.3.2 Metal panel roof systems. Metal panel roof systems through fastened or standing seam shall be tested in accordance with UL 580 or ASTM E 1592.
See attached UL Construction No. 30, 54, 79, 104, 112, 161, 167, 184, and 542.

1504.6 Physical properties. Roof coverings installed on low slope roofs (roof slope < 2:12), in accordance with 1507 shall demonstrate physical integrity over the working life of the roof based upon 2,000 hours of exposure to accelerated weathering tests conducted in accordance with ASTM G 152, ASTM G 153, ASTM G 155 or ASTM G 154.
See attached paint technical data sheet.

SECTION 1505
FIRE CLASSIFICATION

1505.1 General. Roof assemblies shall be divided into the classed defined below. Class A, B, and C roof assemblies and roof coverings required to be listed by this section shall be tested in accordance with ASTM E 108 or UL 790.
See attached UL Fire Ratings data sheet.

SECTION 1506
MATERIALS

1506.1 Scope. The requirements set forth in this section shall apply to the application of roof covering materials specified herein. Roof coverings shall be applied in accordance with this chapter and the manufacturer's installation instructions.
See attached installation details.

1506.3 Material specifications and physical characteristics.
See attached section properties chart.

1506.4 Product identification. Roof covering materials shall be delivered in packages bearing the manufacturer's identifying marks and approved testing agency labels required in accordance with 1505.
See attached product label.

SECTION 1507
REQUIREMENTS FOR ROOF COVERINGS

1507.4 Metal roof panels. The installation of metal roof panels shall comply with the provisions of this section.

1507.4.1 Deck requirements. Metal roof panel roof coverings shall be applied to a solid or closely fitted deck, except where the roof covering is specifically designed to be applied to spaced supports.
See attached limits of use.

1507.4.2 Deck slope. The minimum slope for standing seam of roof systems shall be one-quarter unit vertical in 12 unit's horizontal (2-percent slope).
See attached limits of use.

1507.4.3 Material standards. Metal-sheet roof covering systems that incorporate supporting structural members shall be designed in accordance with Chapter 22. Metal-sheet roof coverings installed over structural decking shall comply with Table 1507.4.3.

Table 1507.4.3 Metal Roof Coverings

Roof Covering Type	STANDARD APPLICATION RATE
Galvanized Steel	ASTM A 653 G-90 zinc coated
Prepainted Steel	ASTM A 755
Aluminum-zinc alloy coated steel	ASTM A 792
Lead-coated copper	ASTM B 101
Aluminum	ASTM B 209

See attached Galvalume spec. data sheet.

1507.4.4 Attachment. Metal roofing fastened directly to steel framing shall be approved manufacturers' fasteners.
See attached fastener data sheets.

CHAPTER 22
STEEL

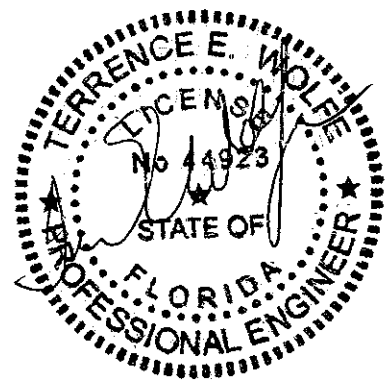
SECTION 2209
COLD-FORMED STEEL

2209.1 Regular cold-formed steel. The design of cold-formed carbon or low alloy steel structural members shall be in accordance with the *North American Specification for the Design of Cold-Formed Steel Structural Members (AISI-NASPEC).* The design of cold-formed stainless-steel structural members shall be in accordance with ASCE 8.

LIMITATIONS OF USE FOR NON-HIGH VELOCITY HURRICANE ZONES

Minimum Slope:	1/2:12 (per FBC 2004).
Substrate:	Steel
Substrate Description:	Purlins or FL P.E. designed equal. To achieve a UL rating purlin spacing cannot exceed 5'-0".
Substrate Attachment:	Designed by FL P.E.
Fire Barrier:	(Optional) ¼" Georgia Pacific "Dens Deck", or 5/8" water resistant type X gypsum sheathing with treated core and facer, or manufacturer approved equal.
Insulation:	per manufacturer's instructions.
Minimum Substrate Thickness:	16-ga. purlins or FL P.E. designed equal.
Application:	Install PBR Panel per the manufacturers approved details.

Design Procedure: Based on the dimensions of the structure, appropriate loads are determined using Chapter 16 of the FBC. Loads include, roof live load, dead load and wind load. These loads are compared to the *panel load tables* (section properties for through-fastened panels and ASTM E 1592 for standing seam panels) in order to determine the appropriate panel span/fastener spacing. Based on the tributary area of the attachment, the fastener load is determined. The fastener load is compared to the allowable fastener capacity (pullout and pullover) from the *fastener manufacturer's data sheet* based on the substrate used. An appropriate factor of safety is applied to the calculation (typically 3.0). If the initial fastener spacing is too great, it is reduced until the fastener capacity is shown to be adequate. Fastener spacings are typically reduced in the edge zones of the structure to account for greater wind loads.



NOV 0 3 2005

APPENDIX

1. Design/Installation Manual
2. Section Properties
3. UL Construction Number *30, 54, 79, 104, 112, 161,167, 184,* and 542.
4. Galvalume Spec Data Sheet
5. Paint Spec Data Sheet
6. UL Impact Resistance
7. UL Fire Rating
8. Material Label
9. ASTM G 154 Test Report
10. Fastener Data Sheets

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Descriptions and specifications contained herein were in effect at the time this publication was approved for printing. In a continuing effort to refine and improve products, MBCI reserves the right to discontinue products at any time or change specifications and/or designs without incurring obligation. **To insure you have the latest information available, please inquire or visit our Web Site at www.mbci.com.** Application details are for illustration purposes only and may not be appropriate for all environmental conditions, building designs, or panel profiles. Projects should be engineered to conform to applicable building codes, regulations, and accepted industry practices. Insulation is not shown in these details for clarity. **If there is a conflict between this manual and the erection drawings, the erection drawings will take precedence.**

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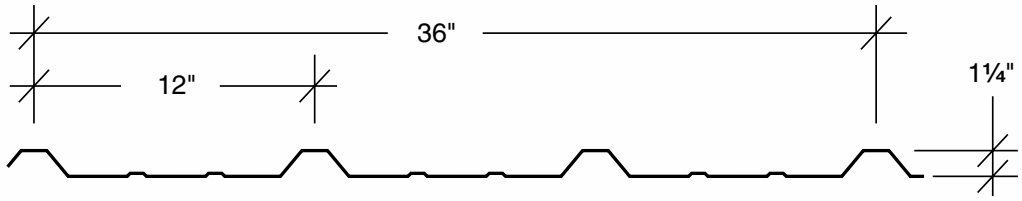
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PRODUCT INFORMATION "PBR" PANEL

ARCHITECT/ENGINEER INFORMATION

1. "PBR" panel is a structural roof and wall panel. This panel can be installed directly over purlins or joists. Several different UL 90 construction numbers are available for this panel.
2. "PBR" panel is recommended for ½:12 or greater roof slopes.
3. Field applied sealant is required at panel sidelaps and endlaps.
4. "PBR" panel is a through-fastened panel. For proper fastener application, see page 6.
5. The information in this manual is believed to be correct and accurate. It should not be used for any specific application without being reviewed by a registered professional engineer.

GENERAL DESCRIPTION



Coverage Width - 36"

Minimum Slope - ½:12

Panel Attachment - See page 6

Panel Substrate - Galvalume®

Gauge - 26 standard - 29, 24 and 22 also available

Coatings- Galvalume Plus®, Signature® 200* and Signature® 300*

PRODUCT SELECTION CHART

GAUGE	GALVALUME PLUS®	SIGNATURE® 200*	SIGNATURE® 300*
22 gauge	●	■	■
24 gauge	●	■	■
26 gauge	●	●	●
29 gauge	●	●	■

● - Available in any quantity.
■ - Minimum quantity may be required.
*See Commercial/Industrial color chart for available colors.

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"PBR" PANEL PRODUCT INFORMATION

UL 90 REQUIREMENTS
"PBR" PANEL

Construction #30

26 MSG Min. Gauge "PBR" Panel Over Purlins at 5'- 0 ¼" O.C.

1. **For Class 90** - Panel to purlin connections to be #14 Hex Head with a ⅝" O.D. washer in a 4-8-4-8 in. pattern. Panel to panel connection to be 20" O.C. with faster located over each purlin.
2. **Purlins** - No. 14 MSG min. gauge steel, (55,000 psi min. yield strength.)

Construction #79

26 MSG Min. Gauge "PBR" Panel Over Purlins at 5'- 0 ¼" O.C.

1. **Panel Fasteners** - Panel to purlin connections to be #14 Hex Head with a ⅝" O.D. washer, 6" O.C. in 5-7-5-7 in. pattern. Endlap spacing to be 6 in. O.C. Spacing for panel to panel connection to be 20" O.C.
2. **Purlins** - No. 16 MSG min. gauge steel. (55,000 psi min. yield strength); or min. H series open web steel joists.

Construction #161

26 MSG Min. Gauge "PBR" Panel Over Purlins at 5'- 0 ¼" O.C.

1. **Panel Fasteners** - Panel to purlin connections to be 12-14 x 1" self-drilling Hex Head with a ⅝" O.D. washer, 12" O.C. Spacing at endlap to be in a 5-7-5-7 in. patterns. Spacing for panel to panel connection to be 20" O.C. with a fastener located over each purlin.
2. **Purlins** - No. 16 MSG min. gauge steel. (55,000 psi min. yield strength).

Construction #542

26 MSG Min. Gauge "PBR" Panel Over Purlins at 5'- 0 3⁄16" O.C.

1. **Panel Fasteners** - Panel to purlin connections to be 12-14x1" self-drilling Hex Head with a ⅝" O.D. washer,12" O.C. Spacing at endlap to be in a 5-7-5-7 in. pattern. Spacing for panel to panel connection to be 20" O.C. with a fastener located over each purlin.
2. **Building Units** - Translucent Panels.
3. **Translucent Panel Rib and Purlin Reinforcement** - See UL 90 light transmitting panel installation instructions.
4. **Purlins** - No. 16 MSG min. gauge steel. (55,000 psi min. yield strength).

IMPACT RESISTANCE

"PBR" panels carry a Class 4 rating under UL-2218 "Test Standard For Impact Resistance"

FIRE RESISTANCE RATING

1. **Deck: NC** **Class A**
   Incline: Unlimited
   The panel qualifies for a Class A Fire Rating in compliance with Underwriters laboratories Standard UL-263 when installed over a non-combustible substrate. A Class C Fire Rating will be qualified for over combustible substrate.

Look for classification marking on product.

CAUTION

The above listings are summaries of Construction Numbers. For UL 90 rated roof requirements and complete design information, see the Underwriters Laboratories Building Materials Directory. If you have any questions, call MBCI before proceeding.

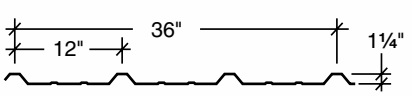
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PRODUCT INFORMATION "PBR" PANEL

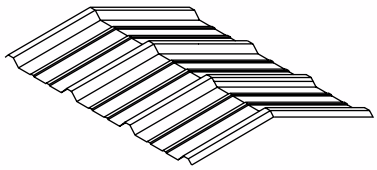
PRODUCT CHECKLIST

"PBR" Panel



"PBR" Panel ☐

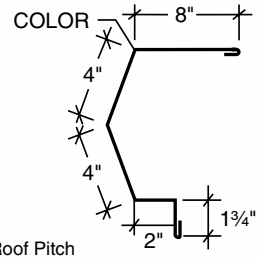
Ridge Cap



Maximum Roof Pitch 6:12
Specify Pitch

FL-49 2'-6" ☐
FL-51 3'-0" ☐

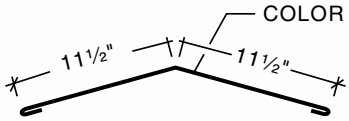
Sculptured High Side Eave



Specify Roof Pitch
High Eave part at corner to be mitered
Specify Left or Right

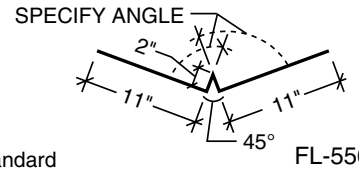
FL-17 ☐

Flat Ridge/Hip Flashing

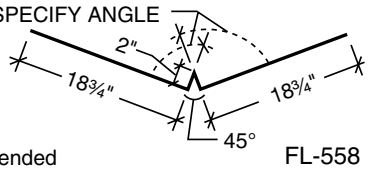


FL-38 ☐

Valley Flashing

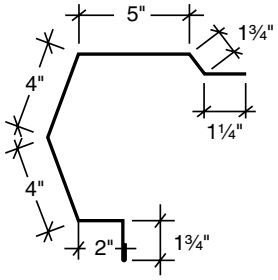


Standard FL-556 ☐



Extended FL-558 ☐

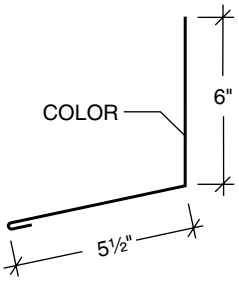
Sculptured Rake



Rake part at corner to be mitered.
Specify Left or Right

FL-16 ☐

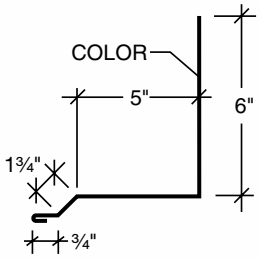
Parapet High Eave



Specify Roof Slope

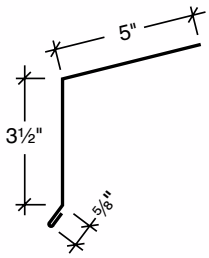
FL-874 ☐

Parapet Rake



FL-952 ☐

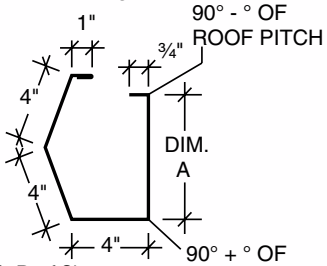
Eave Trim



Specify Roof Pitch

FL-19 ☐

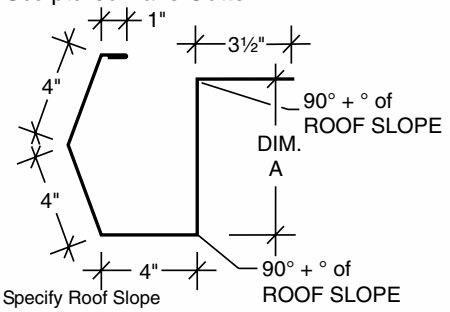
Sculptured Hang-On Gutter



Specify Roof Slope
Gutter part at corner to be mitered.
Specify Left or Right.

FL-180 ☐

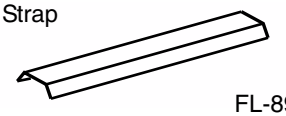
Sculptured Eave Gutter



Specify Roof Slope
Gutter part at corner to be mitered.
Specify Left or Right.

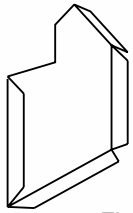
FL-18 ☐

Gutter Strap



FL-893 ☐

Gutter End



Specify Left or Right
Specify Gutter part no.

FL-18A ☐

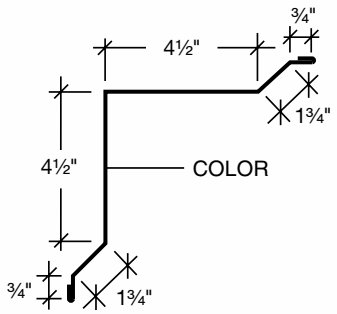
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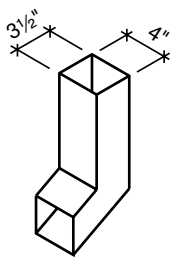
PRODUCT CHECKLIST

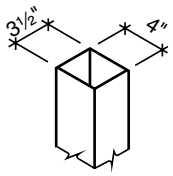
Inside Corner Trim



FL-800 ☐

Downspouts

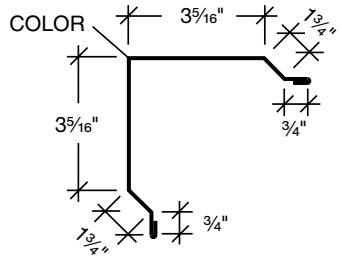




FL-31 - Straight ☐

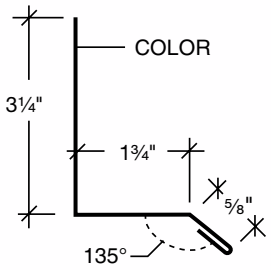
FL-31A - With Kick-Out ☐

Corner Trim - Outside



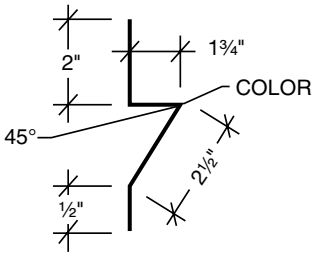
FL-830 ☐

Base Trim (With Sheeting Notch)



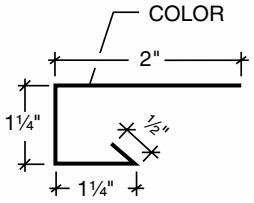
FL-72 ☐

Base Trim (Without Sheeting Notch)



FL-530 ☐

Jamb Trim



FL-23 ☐

Fasteners

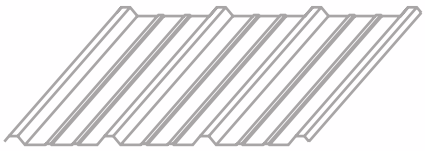
12-14 X 1¼" Driller
#17A ☐

¼"-14 X ⅞" Lap Tek
#4A ☐

12-14 X 1¼" Long Life Driller
#3 ☐

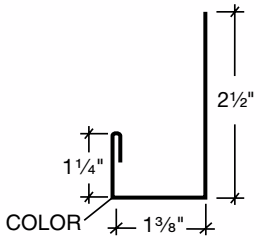
¼"-14 X ⅞" Long Life Lap Tek
#4 ☐

LTP



Non-Reinforced Fiberglass ☐
High Strength Fiberglass ☐
High Strength AcryLit/U.V. Resistant ☐

Head Trim



FL-24 ☐

Fasteners

¼"-14 X 1¼" Driller with 1⅛"O.D. washer
#43 ☐

¼"-14 X ⅞" Lap Tek with 1⅛"O.D. washer
#44 ☐

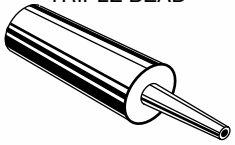
⅛ X 3⁄16 Stainless Steel Pop Rivet
#14 ☐

Sealant

½" x 3⁄32" HW-507 ☐

TRI-BEAD
Tri-Bead HW-504 ☐

TRIPLE BEAD
Triple Bead HW-502 ☐



Urethane White HW-540
Other Colors Available ☐

TUBE SEALANT 11 OZ.
NOTE: 25' Per tube at ¼" bead

Closures

Inside HW-455 ☐



Outside HW-456 ☐

Beveled Inside* ☐





Beveled Outside* ☐

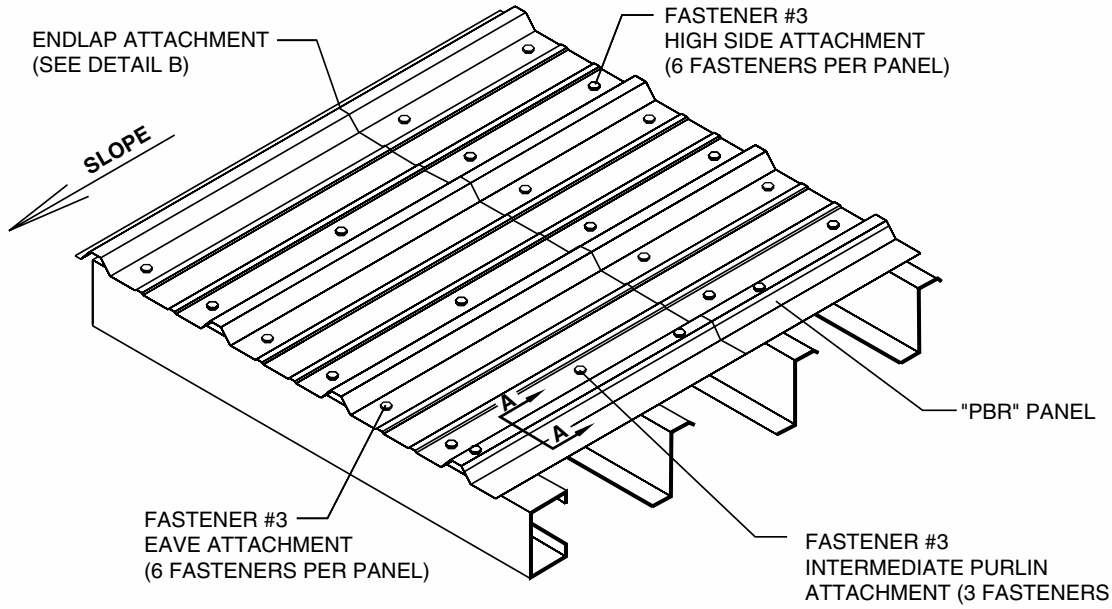
*Special order - requires two-week lead time

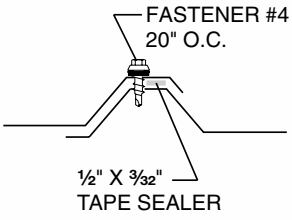
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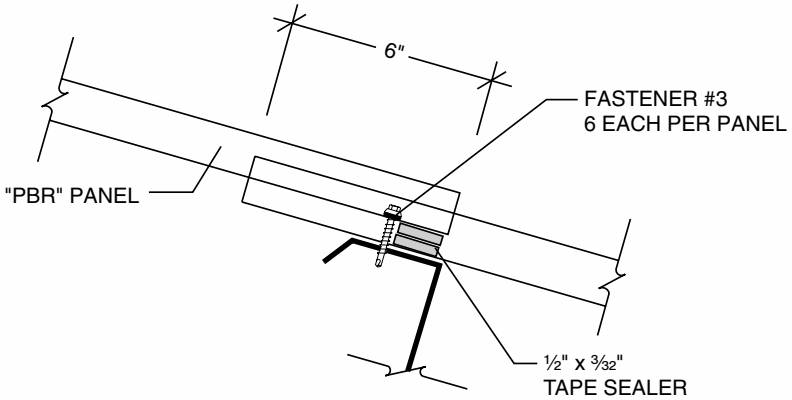
PRODUCT INFORMATION "PBR" PANEL

ATTACHMENT
"PBR" PANEL





DETAIL "A"



DETAIL "B"

NOTES:

Sidelap

1. ½" X 3⁄32" tape sealer must be installed between weather infiltration point and fastener.
2. Install Fastener #4 (¼"-14 X ⅞ " Long Life Lap Tek) at 20" on center.
3. When possible, install panels such that sidelaps are nested away from prevailing winds.
4. Fastener #4A (¼"-14 X ⅞ " Lap Tek) are available as an alternate when long life fasteners are not desired.

Endlap

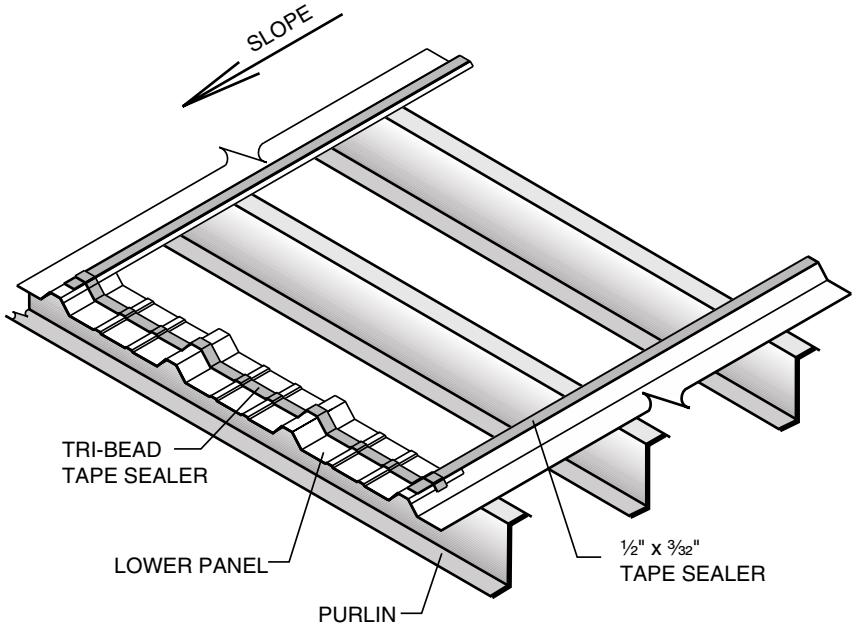
1. Stack 2 continuous layers of ½" x 3⁄32" tape sealer on top of each other and must be installed between weather infiltration point and fastener.
2. Install Fastener #3 (12-14 X 1¼" Long Life driller) on each side of major ribs of panel (two fasteners per foot).
3. Fastener #17A (12-14 X 1¼" driller) are available as an alternate when long life fasteners are not desired.

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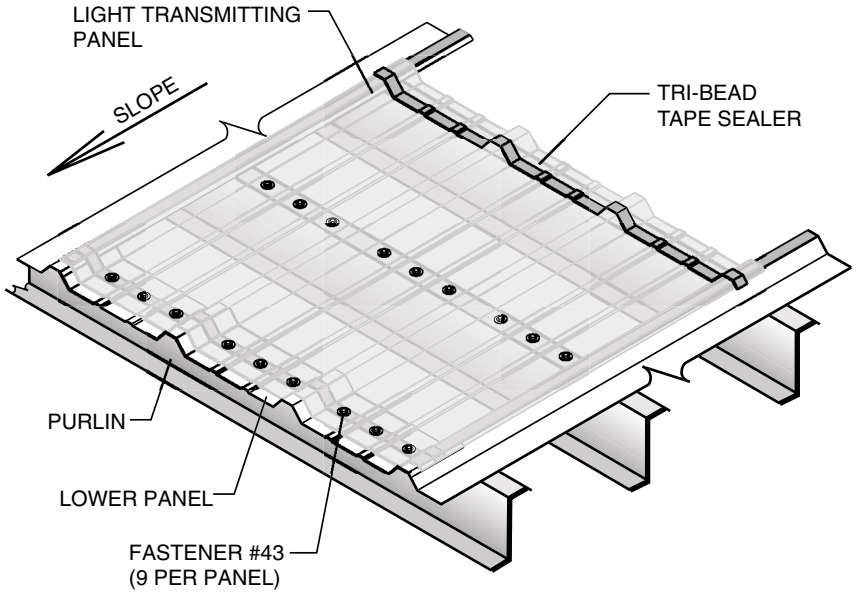
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"PBR" PANEL PRODUCT INFORMATION

CONSTRUCTION NO. 542
UL 90 LIGHT TRANSMITTING PANEL INSTALLATION



Install roof panels, leaving the light transmitting panel run open, except for lower light transmitting panel run panel. Install tape sealer to panel sidelaps and across panel width as normal.



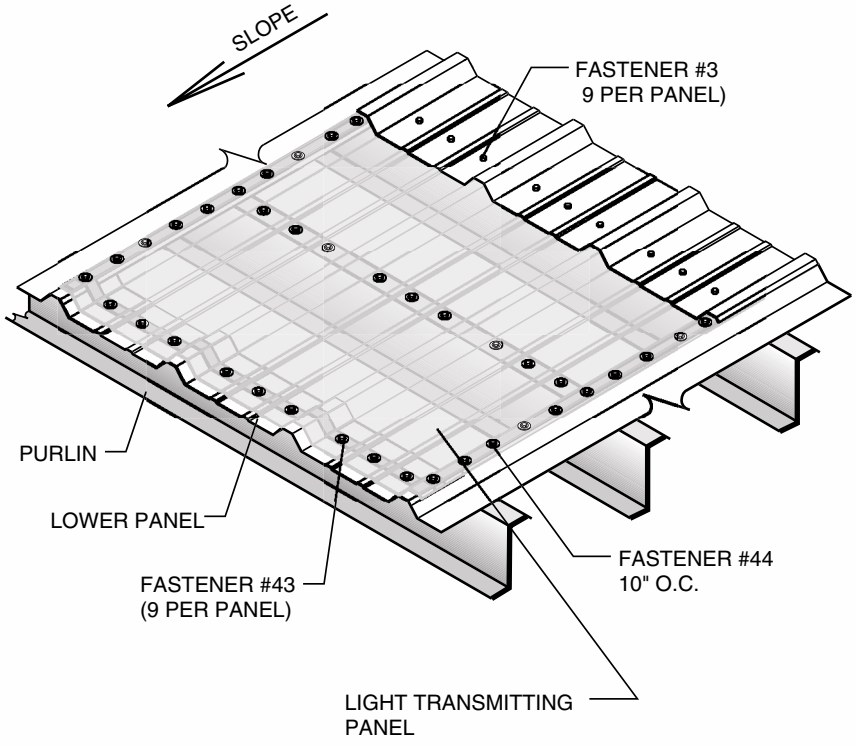
Attach light transmitting panels at the low and mid-slope connection to the purlin with nine Fastener #43 (¼ - 14 x 1¼" driller with 1⅛" O.D. washer).

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CONSTRUCTION NO. 542 UL 90 LIGHT TRANSMITTING PANEL INSTALLATION (Continued)

Be sure the light transmitting panel sidelaps have complete run of (½" x 3⁄32") tape sealer between the light transmitting panel and the "PBR" panel. See Page 6 for lap detail.



Fasten light transmitting panel with Fastener #44 (¼" - 14 x 1¼" Lap Tek with 1⅛" O.D. washer) at 10" O.C. down each side lap.

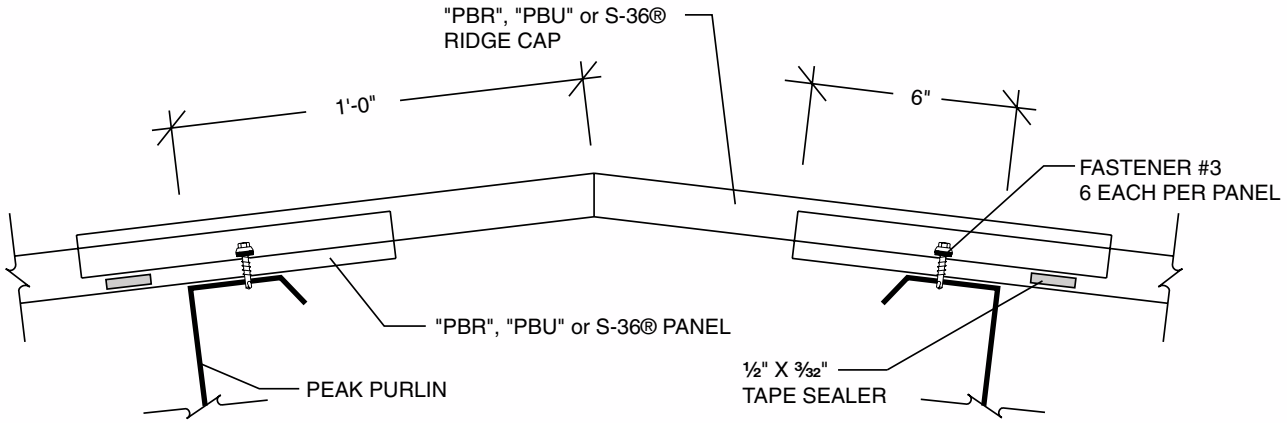
Install upper metal panel in light transmitting panel run and fasten as at a normal endlap with nine Fastener #3 (12 - 14 X 1¼" Long Life driller).

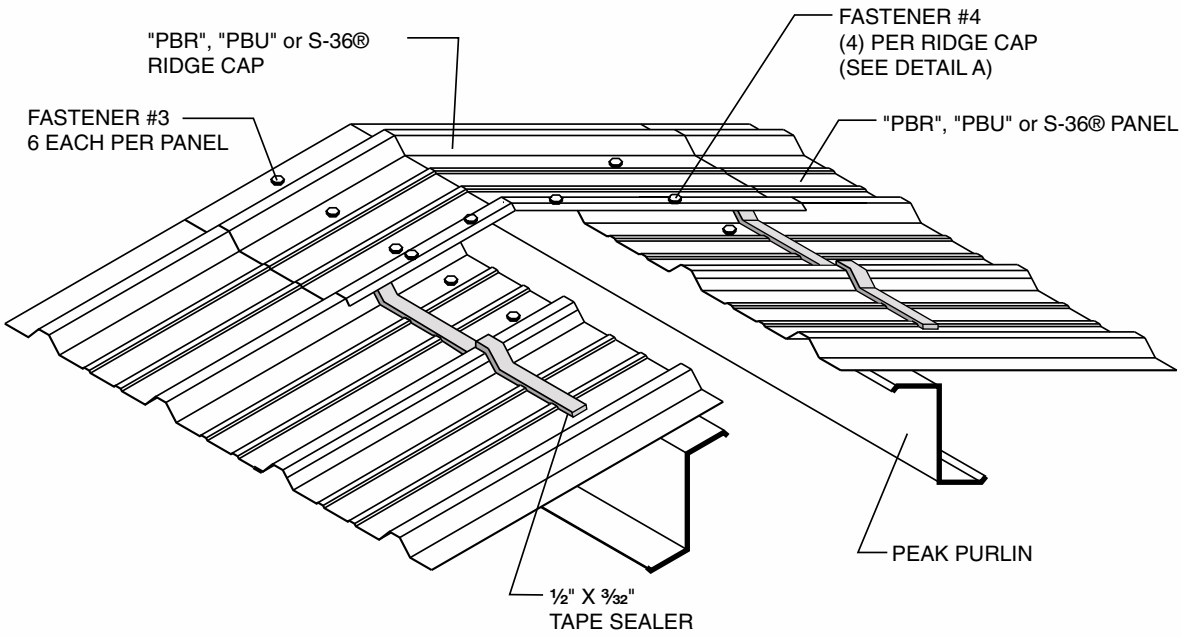
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"PBR" PANELS PRODUCT INFORMATION

TYPICAL DETAILS
Ridge





NOTES:

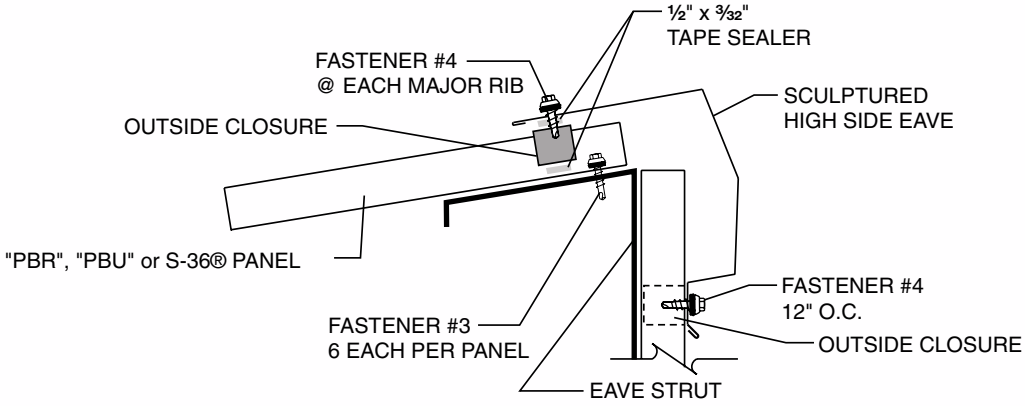
1. When ordering ridge caps, specify roof slope. Refer to MBCI price pages for maximum slope for each ridge cap.
2. Install ½" X 3⁄32" tape sealer across full with of ridge cap on both sides. Tape sealer must be installed between weather infiltration point and fasteners.
3. Install ½" X 3⁄32" tape sealer to the sidelap of the ridge cap that will lap onto adjacent ridge cap. Tape sealer must be installed between weather infiltration point and fasteners.
4. Install Fastener #3 (12-14 X 1¼" Long Life driller) on both sides of major ribs (two per foot).
5. Install four Fastener #4 (¼"-14 X ⅞" Long Life Lap Tek) in each ridge cap sidelap. Place (1) one Lap Tek in high rib on each side of the ridge cap centerline and one in line with purlin fastener on each side of ridge line.

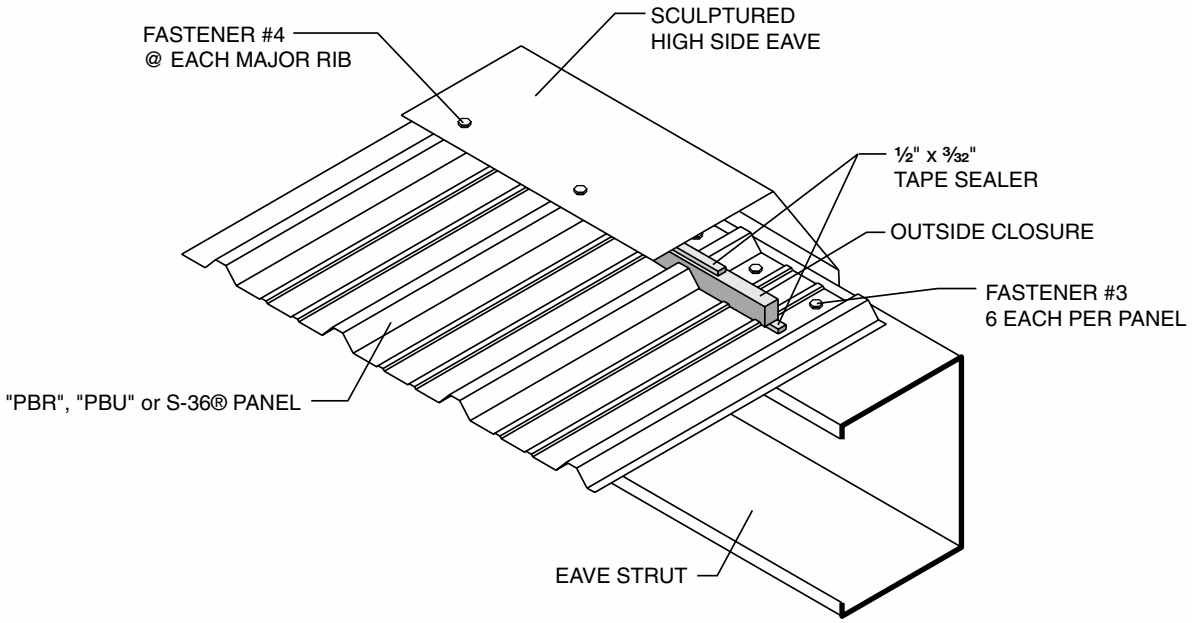
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PRODUCT INFORMATION "PBR" PANELS

TYPICAL DETAILS
High Side Eave





NOTES:

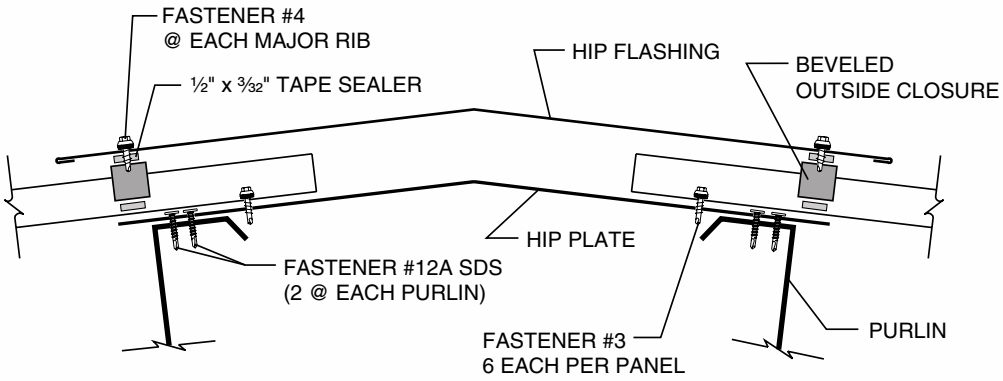
1. Install outside closure, with ½" X 3⁄32" tape sealer top and bottom, across width of "PBR", "PBU" , or S-36® panels.
2. Install Sculptured High Side Eave to "PBR", "PBU", S-36® panels at each major rib with Fastener #4 (¼"-14 X ⅞" Long Life Lap Tek). Sculptured high side eave trim should overhang outside closures ½" - 1".
3. Attach front face of sculptured high side eave trim to wall with fasteners or cleat as required for wall substrate.
4. Trim laps should be approximately 3" with sufficient pop rivets to hold lap together. Apply bead of urethane sealant between trim at 3" lap.

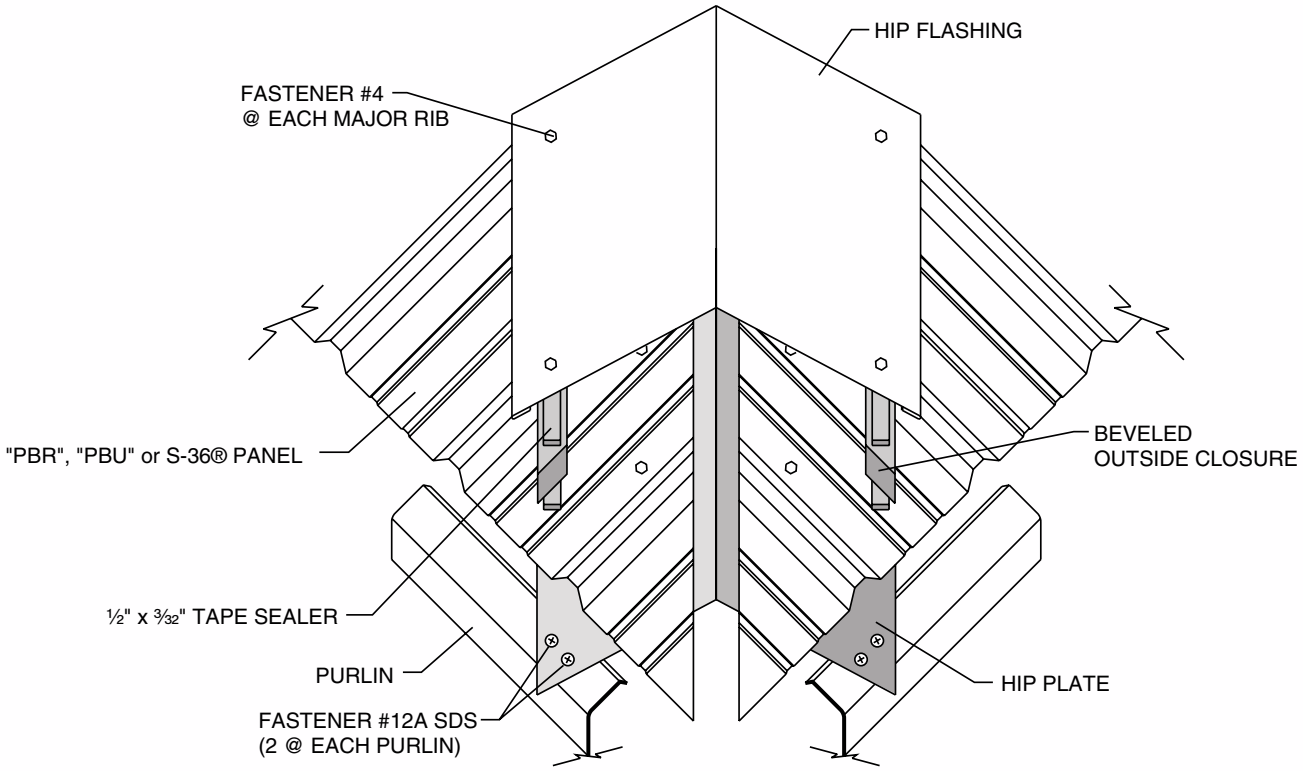
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"PBR" PANELS PRODUCT INFORMATION

TYPICAL DETAILS
Hip





NOTES:

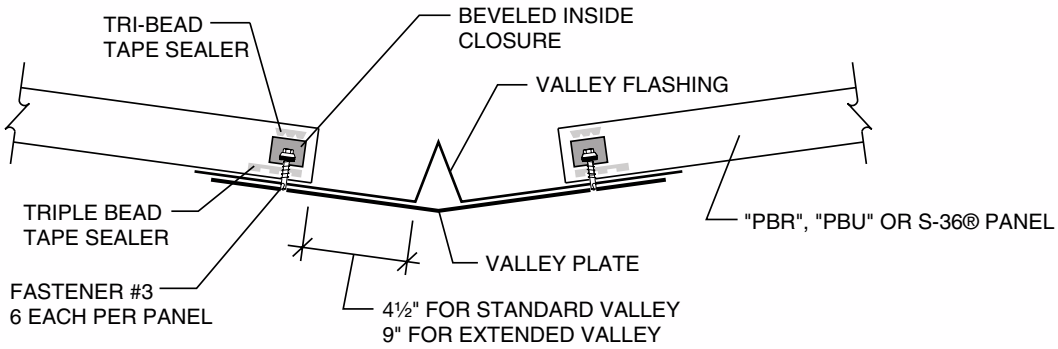
1. Bevel cut and install "PBR", "PBU", or S-36® panels to follow bevel of hip.
2. Install beveled outside closures to panels, with ½" x 3⁄32" tape sealer top and bottom, following bevel of hip. Beveled closures must be special ordered and require a two week lead time.
3. Install hip flashing to panel at each major rib with Fastener #4 (¼"-14 X ⅞" Long Life Lap Tek). Hip flashing should overlap outside closures ½"-1".
4. Trim laps should overlap approximately 3" with a bead of urethane sealant in between. Install a sufficient amount of pop rivets to hold lap together.

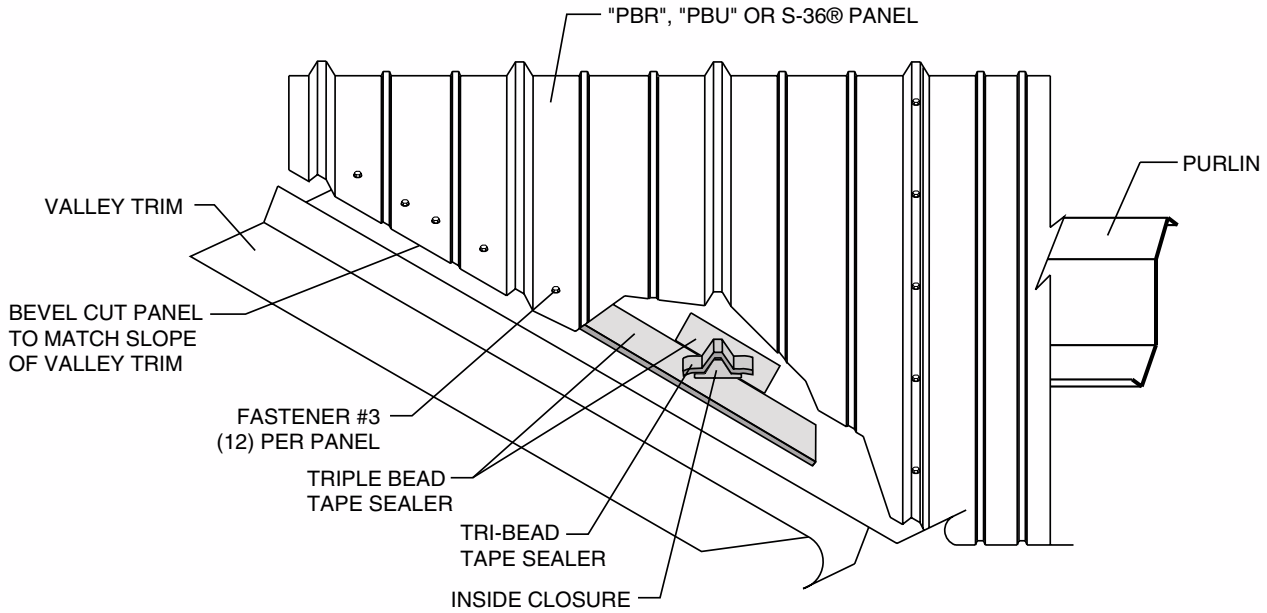
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PRODUCT INFORMATION "PBR" PANELS

TYPICAL DETAILS
Valley





NOTES:

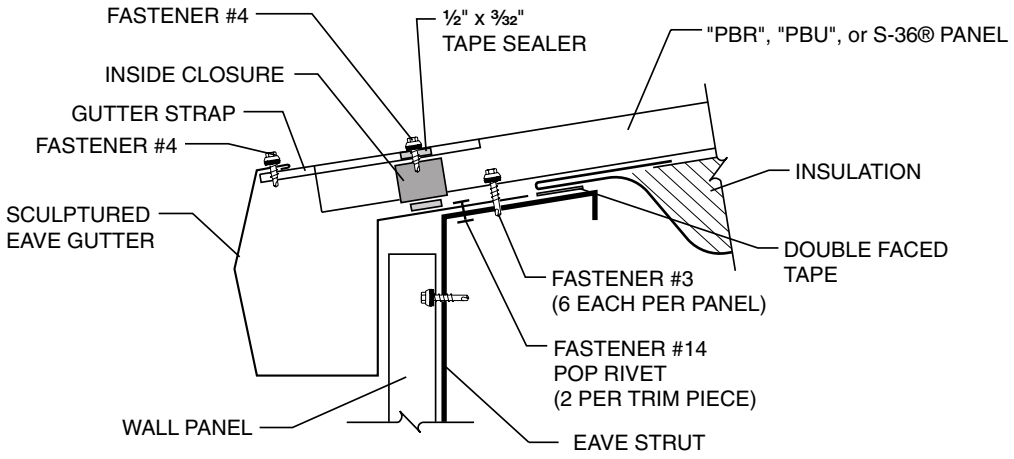
1. For valleys 30' or less in length, use standard valley trim. Valleys over 30' in length require extended valley trim.
2. Apply triple bead tape sealer to valley trim parallel to the slope of the valley. Lower edge of tape sealer should be 4½" from center of valley for standard valleys and 9" from the center of the valley for extended valleys.
3. Install high rib section of inside closure that has been field cut from standard 3'-0" straight closure. Place the cut closure square with the rib of the panel. Install Tri-Bead tape sealer to top of inside closure prior to laying panel edge down on top of the cut closure. The triple bead tape with proper fastener sequence will seal the minor ribs of the panel that are between the major ribs.
4. Bevel cut "PBR", "PBU", or S-36® panels to fit slope of valley and install to valley with Fastener #3 (12-14 X 1¼" Long Life driller) at 4" on center. Fasteners must be installed through the closures and into triple bead tape sealer.
5. Trim laps should overlap approximately 6" with a bead of urethane sealant in between. Do not rivet valley laps together. If laps gap open, install Fastener #4 (¼"-14 X ⅞" Long Life Lap Tek) into each side of water diverter while holding lap tightly together.

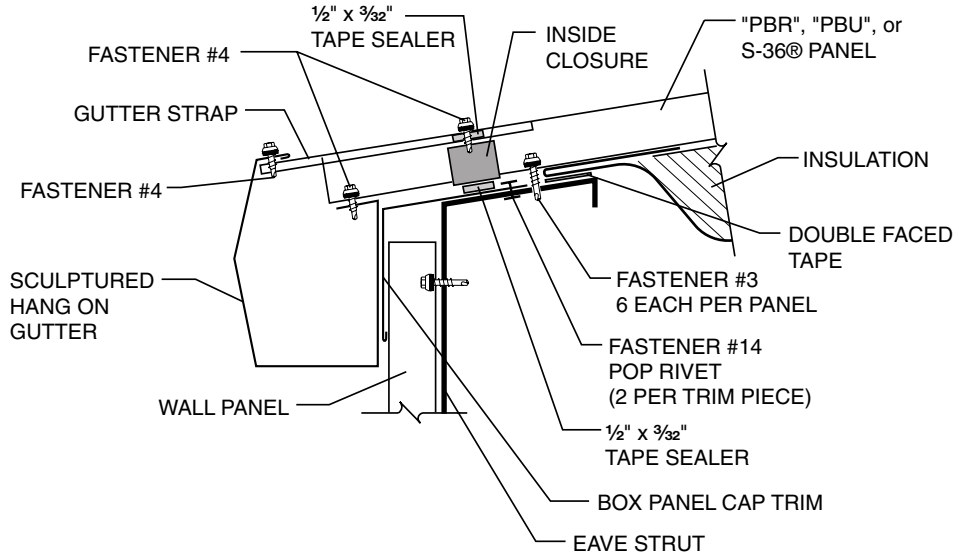
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"PBR" PANELS PRODUCT INFORMATION

TYPICAL DETAILS
Gutter





NOTES:

Eave Gutter

1. Attach gutter to eave strut with three Fastener #14 pop rivets per section.
2. Install inside closures to top leg of gutter with ½" x 3⁄32" tape sealer top and bottom.
3. Install "PBR", "PBU", or S-36® panel with Fastener #3 (12-14 X 1¼" Long Life driller) on each side of major ribs (two fasteners per foot). Fasteners must be installed up slope from inside closures.
4. Gutter laps should be approximately 3" with a bead of urethane sealant in between. Install a sufficient amount of pop rivets to hold lap together.
5. Install gutter straps 3'-0" on center with Fastener #4 (¼"-14 X ⅞" Long Life Lap Tek) fasteners at each end.

Hang-on Gutter

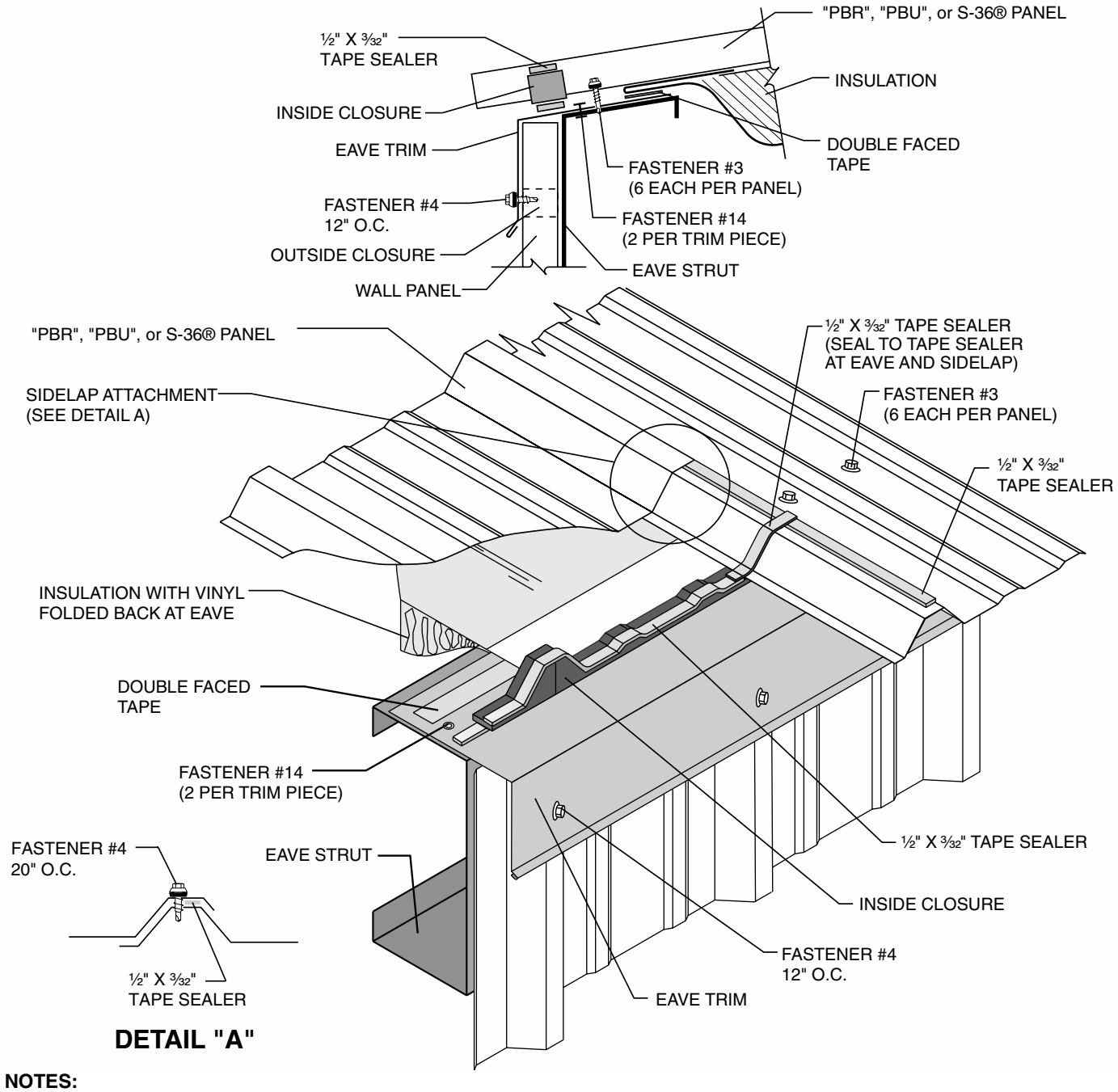
1. Attach Box Panel Cap Trim to top of eave strut with pop rivet #14 (three per 10'-0" section).
2. Install inside closure on top of Box Panel Cap Trim with ½" x 3⁄32" tape sealer top and bottom of closure.
3. Install "PBR", "PBU", S-36® panels with Fastener #3 (12-14 X 1¼" Long Life driller)on each side of the major ribs (two fasteners per foot). Fasteners must be installed up slope from inside closures.
4. Attach gutter to roof panels with Fastener #4 (¼"-14 X ⅞" Long Life Lap Tek) at each end.
5. Gutter laps should be approximately 3" with a bead of urethane sealant in between. Install a sufficient amount of Fastener #14 (pop rivets) to hold lap together.
6. Install gutter straps 3'-0" on center with Fastener #4 (¼"-14 X ⅞" Long Life Lap Tek) at each end.

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PRODUCT INFORMATION "PBR" PANELS

TYPICAL DETAILS
Eave Trim



DETAIL "A"

NOTES:

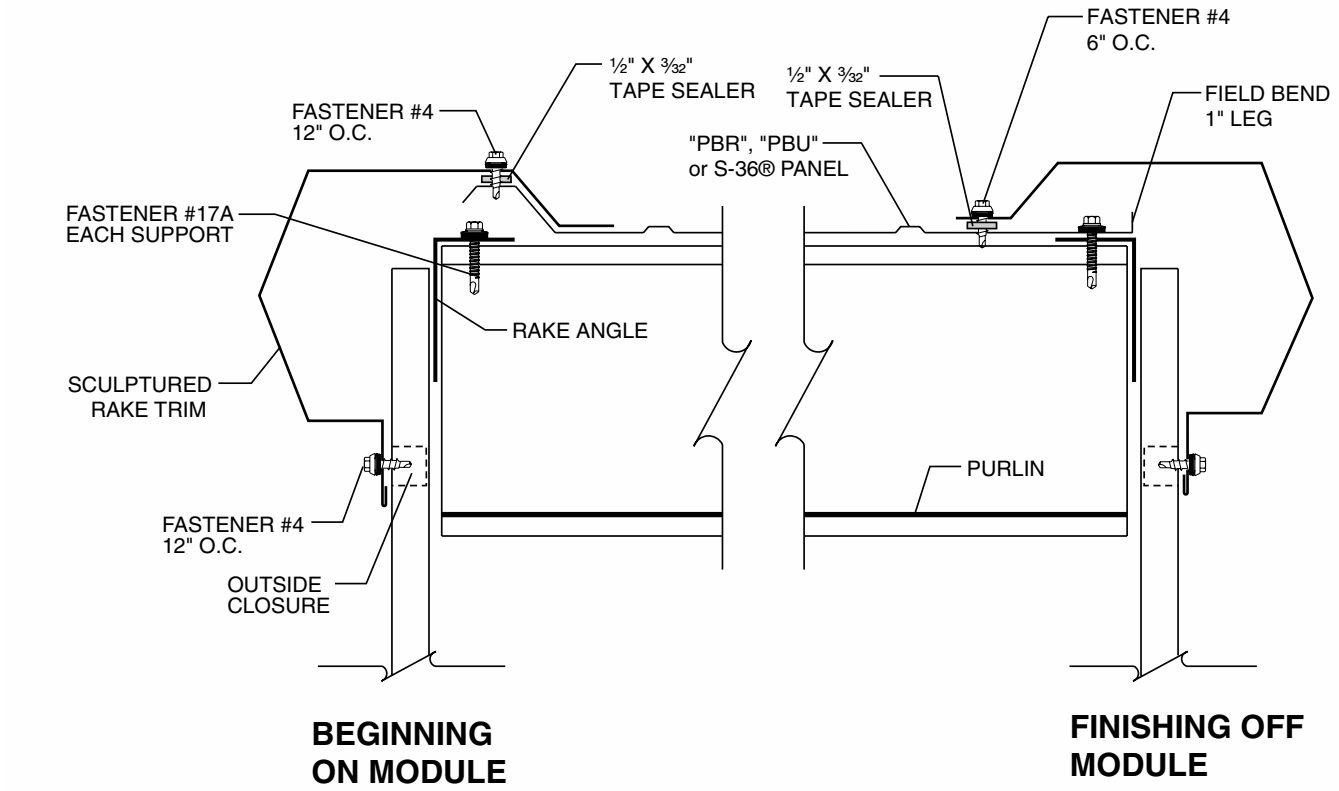
1. Install eave trim to structure with three pop rivets per section.
2. Install inside closures along top leg of eave trim with ½" x 3⁄32" tape sealer top and bottom.
3. Install "PBR", "PBU", or S-36® panel with Fastener #3 (12-14 X 1¼" Long Life driller) on each side of major ribs (2 fasteners per foot) allowing panel to overhang 1½" plus wall thickness. Fasteners must be installed up slope from inside closures.
4. Attach front face of eave trim to wall with fasteners or cleat as required for wall substrate.
5. Trim laps should overlap approximately 3" with a bead of urethane sealant in between. Install a sufficient amount of Fastener #14 pop rivets to hold lap together.

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"PBR" PANELS PRODUCT INFORMATION

TYPICAL DETAILS
Rake



BEGINNING ON MODULE

FINISHING OFF MODULE

NOTES:

Beginning on Module

1. Install ½" x 3⁄32" tape sealer to top of "PBR", "PBU", or S-36® panel rib.
2. Install rake trim to "PBR", "PBU", or S-36® panel rib with Fastener #4 (¼"-14 X ⅞" Long Life Lap Teks) at 1'-0" on center.
3. Attach front face of rake trim to wall with fasteners or cleat as required for wall substrate.
4. Trim laps should overlap approximately 3" with a bead of urethane sealant in between. Install a sufficient amount of Fastener #14 pop rivets to hold lap together.

Finishing off Module

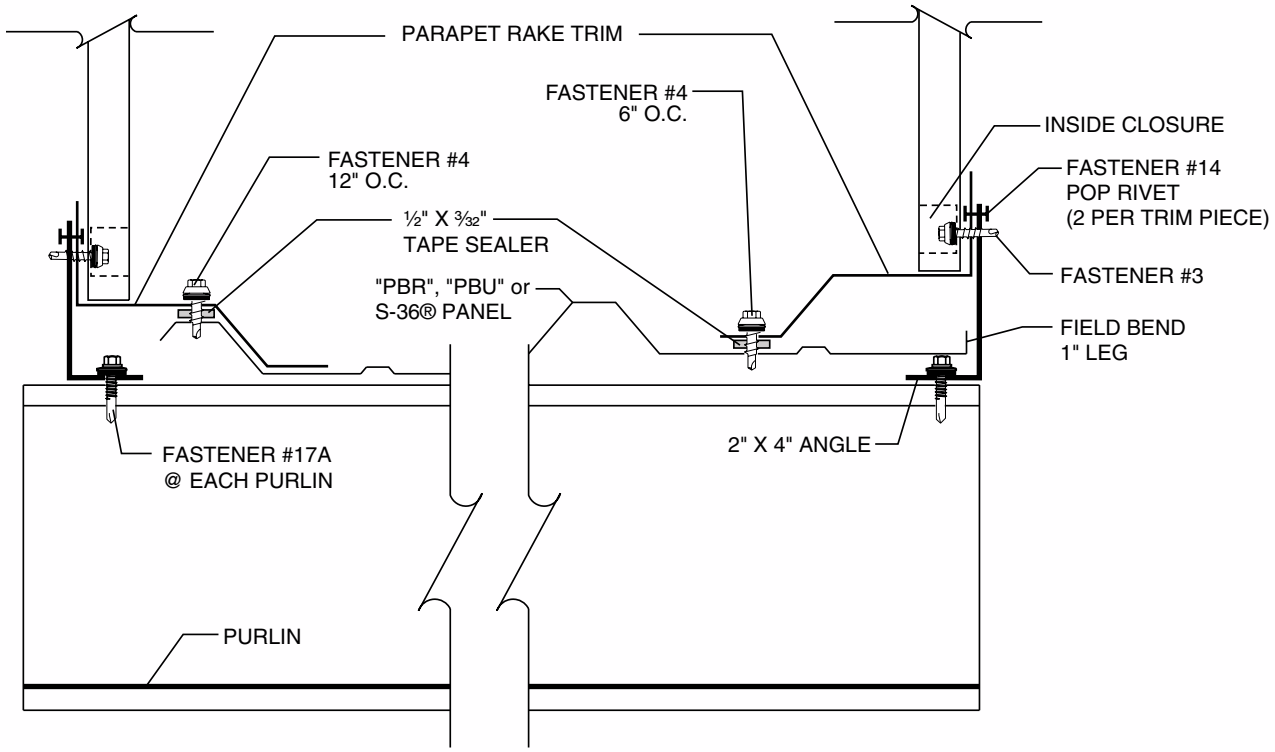
1. Cut and field bend a 1" leg on "PBR", "PBU", or S-36® Panel.
2. Install ½" x 3⁄32" tape sealer to top of "PBR", "PBU", or S-36® panel.
3. Install rake trim to "PBR", "PBU", or S-36® panel with Fastener #4 (¼"-14 X ⅞" Long Life Lap Teks) at 6" on center.
4. Attach front face of rake trim to wall with fasteners or cleat as required for wall substrate.
5. Trim laps should overlap approximately 3" with a bead of urethane sealant in between. Install a sufficient amount of pop rivets to hold lap together.

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Rome, NY: 800/559-6224
Salt Lake City, UT: 800/874-2404
San Antonio, TX: 800/598-6224
Tampa, FL Sales Office: 800/359-6224

MBCI®
Metal Roof and Wall Systems

"PBR" PANELS PRODUCT INFORMATION

TYPICAL DETAILS
Parapet Rake



NOTES:

Beginning on Module

1. Install ½" x 3⁄32" tape sealer to top of "PBR", "PBU", or S-36® panel rib.
2. Install parapet rake trim to "PBR", "PBU", or S-36® panel rib with Fastener #4 (¼"-14 X ⅞" Long Life Lap Teks) at 1'-0" on center.
3. Attach top leg of parapet rake trim to 2" X 4" angle with Fastener #14 pop rivet. Elevate horizontal leg of parapet trim slightly, to provide for positive drainage of water.
4. Trim laps should overlap approximately 3" with a bead of urethane sealant in between. Install a sufficient amount of Fastener #14 pop rivets to hold lap together.

Finishing off Module

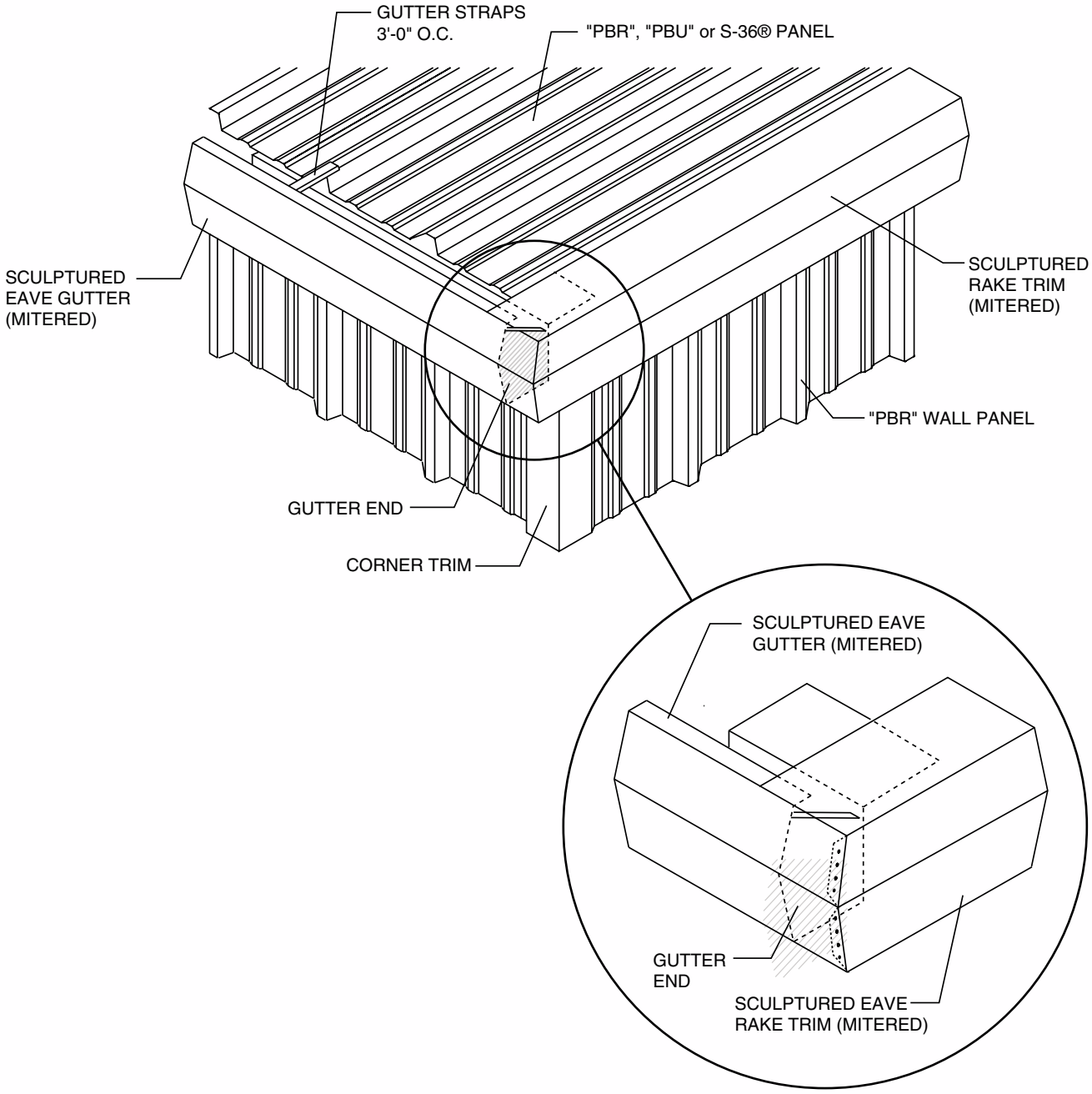
1. Cut and bend a 1" leg on "PBR", "PBU", or S-36® Panel.
2. Install ½" x 3⁄32" tape sealer to top of "PBR", "PBU", or S-36® panel.
3. Install parapet rake trim to "PBR", "PBU", or S-36® panel with Fastener #4 (¼"-14 X ⅞" Long Life Lap Teks) at 6" on center.
4. Attach top leg of parapet rake trim to 2" X 4" angle with pop rivets. Elevate horizontal leg of parapet trim slightly, to provide for positive drainage of water.
5. Trim laps should overlap approximately 3" with a bead of urethane sealant in between. Install a sufficient amount of Fastener #14 pop rivets to hold lap together.

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MBCI®
Metal Roof and Wall Systems

"PBR" PANELS PRODUCT INFORMATION

TYPICAL DETAILS
Corner Box



NOTES:

1. Gutter and rake trim must be ordered with a left and right mitered end. To determine left or right, stand on ground and look toward eave. **Roof slope must also be specified.**

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PRODUCT INFORMATION "PBR" PANELS

INSTALLATION GUIDELINES

I. Pre-Order

A. Prior to ordering panels, all dimensions should be confirmed by field measurement.

II. Job Site Storage and Handling

A. Check the shipment against the shipping list.

B. Damaged material must be noted on bill of lading.

C. Panels should be handled carefully. A spreader bar of appropriate length is recommended for hoisting.

D. Check to see that moisture has not formed inside the bundles during shipment. If moisture is present, panels should be wiped dry, then restacked and loosely covered so that air can circulate between the panels.

III. Application Checklist

A. Check substructure for proper alignment and uniformity to avoid panel distortion.

B. Periodic check of panel alignment is crucial to proper panel installation.

C. For proper appearance, ribs should line up at hips, valleys and ridges.

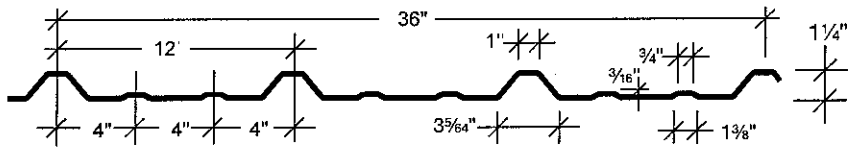
D. Panels should be cut on ground to minimize cut filings on roof. Keep panels clean during installation. Do not allow panels to come into contact with water runoff from lead, copper or graphite.

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COMMERCIAL / INDUSTRIAL ENGINEERING

PBR PANEL



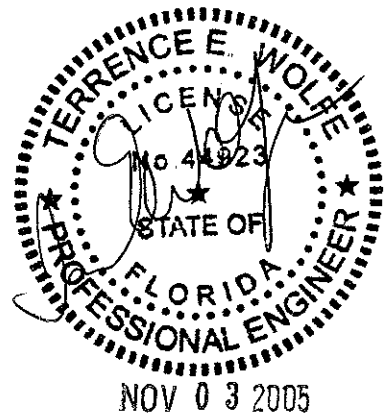
SECTION PROPERTIES								
			NEGATIVE BENDING			POSITIVE BENDING		
PANEL	Fy	WEIGHT	Ixe	Sxe	Maxo	Ixe	Sxe	Maxo
GAUGE	(KSI)	(PSF)	(IN.4/FT.)	(IN.3/FT.)	(KIP-IN.)	(IN.4/FT.)	(IN.3/FT.)	(KIP-IN.)
29	60*	0.75	0.0219	0.0357	1.2835	0.0242	0.0234	0.8423
26	60*	0.94	0.0302	0.0511	1.8366	0.0369	0.0372	1.3373
24	50	1.14	0.0404	0.0733	2.1953	0.0506	0.0521	1.5594
22	50	1.44	0.0544	0.1042	3.1201	0.0709	0.0749	2.2427

* Fy is 80-ksi reduced to 60-ksi in accordance with the 2001 edition of the North American Specification For Design Of Cold-Formed Steel Structural Members - A2.3.2.

NOTES:

1. All calculations for the properties of PBR panels are calculated in accordance with the 2001 edition of the North American Specification For Design Of Cold-Formed Steel Structural Members.
2. Ixe is for deflection determination
3. Sxe is for bending.
4. Maxo is allowable bending moment.
5. All values are for one foot of panel width

The Engineering data contained herein is for the expressed use of customers and design professionals. Along with this data, it is recommended that the design professional have a copy of the most current version of the *North American Specification for the Design of Cold-Formed Steel Structural Members* published by the American Iron and Steel Institute to facilitate design. This Specification contains the design criteria for cold-formed steel components. Along with the Specification, the designer should reference the most current building code applicable to the project jobsite in order to determine environmental loads. If further information or guidance regarding cold-formed design practices is desired, please contact the manufacturer.



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ENGINEERING COMMERCIAL / INDUSTRIAL

PBR PANEL

ALLOWABLE UNIFORM LOADS IN POUNDS PER SQUARE FOOT

29 Gauge (Fy = 60 KSI)

SPAN TYPE	LOAD TYPE	SPAN IN FEET						
		3.0	4.0	5.0	6.0	7.0	8.0	9.0
SINGLE	NEGATIVE WIND LOAD	95.1	53.5	34.2	23.8	17.5	13.4	10.6
	LIVE LOAD/DEFLECTION	60.3	33.1	16.9	9.8	6.2	4.1	2.9
2-SPAN	NEGATIVE WIND LOAD	62.4	35.1	22.5	15.6	11.5	8.8	6.9
	LIVE LOAD/DEFLECTION	51.6	33.8	21.9	15.3	11.3	8.7	6.9
3-SPAN	NEGATIVE WIND LOAD	78.0	43.9	28.1	19.5	14.3	11.0	8.7
	LIVE LOAD/DEFLECTION	58.6	41.6	27.1	18.5	11.6	7.8	5.5
4-SPAN	NEGATIVE WIND LOAD	72.8	41.0	26.2	18.2	13.4	10.2	8.1
	LIVE LOAD/DEFLECTION	56.4	39.0	25.4	17.8	12.4	8.3	5.8

26 Gauge (Fy = 60 KSI)

SPAN TYPE	LOAD TYPE	SPAN IN FEET						
		3.0	4.0	5.0	6.0	7.0	8.0	9.0
SINGLE	NEGATIVE WIND LOAD	136.0	76.5	49.0	34.0	25.0	19.1	15.1
	LIVE LOAD/DEFLECTION	99.1	50.4	25.8	14.9	9.4	6.3	4.4
2-SPAN	NEGATIVE WIND LOAD	99.1	55.7	35.7	24.8	18.2	13.9	11.0
	LIVE LOAD/DEFLECTION	87.3	54.6	35.2	24.5	18.1	13.9	10.7
3-SPAN	NEGATIVE WIND LOAD	123.8	69.7	44.6	31.0	22.7	17.4	13.8
	LIVE LOAD/DEFLECTION	99.2	67.7	43.8	28.2	17.7	11.9	8.3
4-SPAN	NEGATIVE WIND LOAD	115.6	65.0	41.6	28.9	21.2	16.3	12.8
	LIVE LOAD/DEFLECTION	95.5	63.4	40.9	28.6	18.8	12.6	8.9

24 Gauge (Fy = 50 KSI)

SPAN TYPE	LOAD TYPE	SPAN IN FEET						
		3.0	4.0	5.0	6.0	7.0	8.0	9.0
SINGLE	NEGATIVE WIND LOAD	162.6	91.5	58.5	40.7	29.9	22.9	18.1
	LIVE LOAD/DEFLECTION	115.5	65.0	35.4	20.5	12.9	8.6	6.1
2-SPAN	NEGATIVE WIND LOAD	115.5	65.0	41.6	28.9	21.2	16.2	12.8
	LIVE LOAD/DEFLECTION	109.4	64.2	41.3	28.7	21.1	16.2	12.8
3-SPAN	NEGATIVE WIND LOAD	144.4	81.2	52.0	36.1	26.5	20.3	16.0
	LIVE LOAD/DEFLECTION	124.3	79.8	51.4	35.8	26.4	16.3	11.4
4-SPAN	NEGATIVE WIND LOAD	134.8	75.8	48.5	33.7	24.8	19.0	15.0
	LIVE LOAD/DEFLECTION	119.6	74.7	48.1	33.5	24.6	17.3	12.2

22 Gauge (Fy = 50 KSI)

SPAN TYPE	LOAD TYPE	SPAN IN FEET						
		3.0	4.0	5.0	6.0	7.0	8.0	9.0
SINGLE	NEGATIVE WIND LOAD	231.1	130.0	83.2	57.8	42.5	32.5	25.7
	LIVE LOAD/DEFLECTION	166.1	93.4	49.6	28.7	18.1	12.1	8.5
2-SPAN	NEGATIVE WIND LOAD	166.1	93.4	59.8	41.5	30.5	23.4	18.5
	LIVE LOAD/DEFLECTION	163.1	92.5	59.4	41.3	30.4	23.3	18.4
3-SPAN	NEGATIVE WIND LOAD	207.7	116.8	74.8	51.9	38.1	29.2	23.1
	LIVE LOAD/DEFLECTION	200.6	115.1	74.1	51.6	34.1	22.8	16.0
4-SPAN	NEGATIVE WIND LOAD	193.9	109.1	69.8	48.5	35.6	27.3	21.5
	LIVE LOAD/DEFLECTION	189.5	107.6	69.2	48.2	35.5	24.2	17.0

NOTES:

1) Allowable loads are based on uniform span lengths and Fy = 50 and 60-ksi.
2) LIVE LOAD is limited by bending, shear, combined shear & bending and web crippling.
3) **NEGATIVE WIND LOAD does not contain a 33.333% increase and does not consider fastener pullout or pullover.**
4) Above loads consider a maximum deflection ratio of L/180.
5) The weight of the panel has not been deducted from the allowable loads.
6) The use of any accessories other than those provided by the manufacturer may damage panels, void all warranties and will void all engineering data.
7) This material is subject to change without notice. Please contact MBCI for most current data.

The Engineering data contained herein is for the expressed use of customers and design professionals. Along with this data, it is recommended that the design professional have a copy of the most current version of the *North American Specification for the Design of Cold-Formed Steel Structural Members* published by the American Iron and Steel Institute to facilitate design. This Specification contains the design criteria for cold-formed steel components. Along with the Specification, the designer should reference the most current building code applicable to the project jobsite in order to determine environmental loads. If further information or guidance regarding cold-formed design practices is desired, please contact the manufacturer.

TERRENCE E. WOLFE LICENSE No. 44923 STATE OF FLORIDA PROFESSIONAL ENGINEER

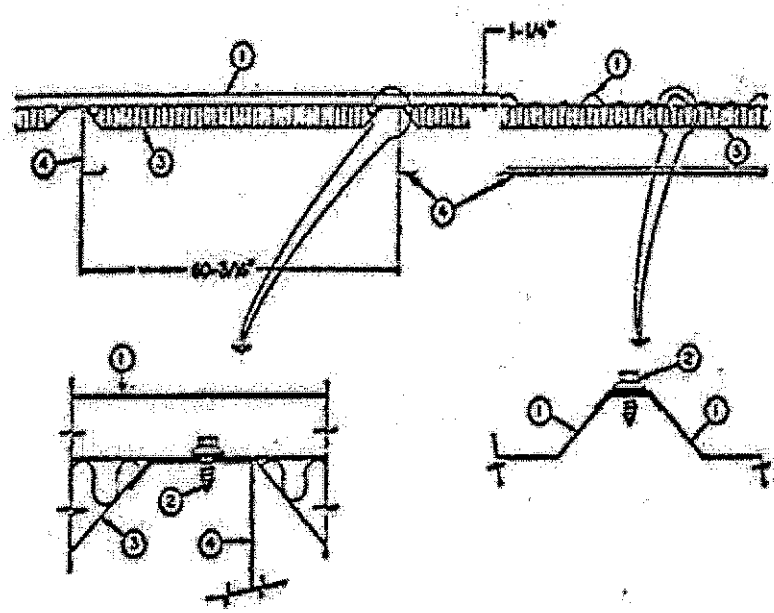
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Metal Roof and Wall Systems
w w w . m b c i . c o m

Construction No. 30

Uplift - Class 90 or Class 30

Fire Not Investigated



1. Metal Roof Deck Panels* No. 26 MSG min gauge coated steel. Panels continuous over two or more spans. End laps to occur over purlins with panels overlapped 6 in. with lap beginning even with purlin web and extending across purlin flange. A bead of sealant may be used at panel end and side laps.

- A&S BUILDING SYSTEMS, INC.---"R" or "PBR"
- ACI BUILDING SYSTEMS INC - "R" or "PBR Panel"
- ALLIANCE STEEL CO - "R Panel"
- BERRIDGE MFG CO - "R Panel"
- BUILDING CONCEPTS LTD - "B Panel"
- CARLISLE ENGINEERED METALS INC - "R Panel"
- FLORIDA PRE-FAB INC - "Florida Rib Panel"
- HIRSCHFELD METAL BUILDINGS - "R"
- KIRBY BUILDING SYSTEMS INC - "Kirby Rib"
- MBCI- "R" or "PBR"
- MESCO METAL BUILDINGS-"R" or "PBR"
- MIDLAND METALS, INC. — "PBR"
- NCI BUILDING SYSTEMS L P - "R" or "PBR"

- UNITED STEEL DECK INC - "Uniline R"
- WHIRLWIND STEEL BUILDINGS INC - "Super-Span (X)"

2. **Panel Fasteners** For panel to purlin and panel connections to be No. 14 self-tapping, hex-head, plated steel or stainless steel screws with a separate 5/8 in. O.D. steel or aluminum washer and a separate neoprene sealing washer. Length: For panel to panel fasteners to be 3/4 in. for insulation up to 3 in. thick and 1-1/4 in. for insulation over 3 in. thick

For panel to panel fasteners to be 3/4 in

For Class 90: Spacing for panel to purlin connections to be in a 4-8-4-8 in. pattern located 2 in. from the center line on both sides of each major rib. Spacing at end laps to be the same. Spacing for panel to panel connections to be 20 in. O.C. max with a fastener located over each purlin.

For Class 30: For panel to purlin connections to be 12 in. O.C. located 2 in. from the center line of each major rib. Spacing at end laps to be the same. Spacing for panel to panel connections to be 20 in. O.C. with a fastener located over each purlin.

Pilot holes: For panel to purlin fasteners to be 13/64 in. diam.

For panel to panel fasteners to be 1/8 in. diam.

As an alternate fastener: No. 12-14 self-drilling, self-tapping, 1/2 in hex-washer head Type B, steel or stainless steel screws with a neoprene sealing washer may be used. Length: For panel to purlin fasteners to be 1 in. for insulation up to 3 in. and 1-1/2 in. for insulation over 3 in. for panel to panel connections to be 1 in. Spacing to be the same.

3. **Insulation** (Optional) - Any compressible blanket insulation, 4 in. max thickness before compression.

4. Purlins -

For Class 90: No. 14 MSG min gauge steel.

For Class 30: No. 16 MSG min gauge steel.

(50,000 psi min yield strength).

5. **Lateral Bracing** (Not illustrated) As required.

Refer to General Information, Roof Deck Construction, (Roofing Materials and Systems Directory) for Items not evaluated.

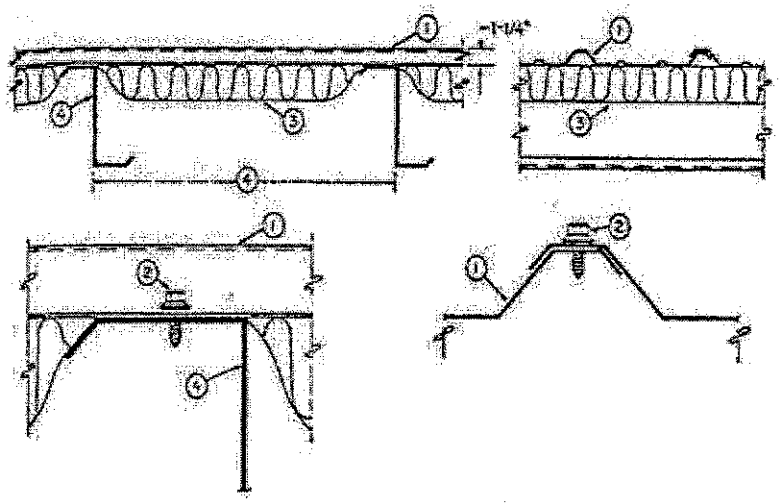
*Bearing the UL Classification Marking

Metal Roof and Wall Systems
w w w . m b c i . c o m

Construction No. 54

Uplift - Class 90 or 60 (See Items 2 and 4)

Fire - Not Investigated



1. Metal Roof Deck Panels* No. 26 MSG min gauge coated steel panels continuous over two or more spans. End laps to occur over purlins with panels overlapped 6 in. with lap beginning 3 in. from purlin web and extending across purlin upper flange. A bead of sealant may be used at panel end and side laps.

- A&S BUILDING SYSTEMS, INC.---"R" or "PBR"
- MBCI-"R" or "PBR"
- MESCO METAL BUILDINGS- "R" or "PBR"
- NCI BUILDING SYSTEMS LP--"R" or "PBR"
- MIDLAND METALS, INC. — "PBR"

2. Panel Fasteners For panel to purlin connections to be No. 12-14 self-drilling, self-tapping, hex-head, plated steel screws with a separate 1/2 in. OD formed steel washer and a separate neoprene sealing washer. The heads may have a nylon cover. Length to be 1 in. for up to 3 in. max thick insulation and 1 1/4 in. for insulation greater than 3 in.

Spacing: For Class 90 to be 6 in. OC located 3 in. from center line on both sides of each major rib. Spacing at end laps to be the same.

For Class 60 to be 12 in. OC beginning 2 1/2 in. from the center line on one side of each major rib. Spacing at end laps to be 6 in. OC beginning 3 in. from center line on both sides of each major rib.

For panel to panel connections - for Class 90 or 60 - to be same type 1 in. long. Spacing to be 18 in. OC with a fastener located over the purlins.

As an Alternate Fastener: For panel to purlin connections No. 14 by 3/4 in. Type A, self-tapping, plated steel screws with a separate 5/8 in. OD domed steel washer and a bonded neoprene sealing washer may be used. Length to be 3/4 in. for up to 3 in. max thickness insulation and 1 in. for insulation greater than 3 in. For Panel to panel connections to be same type 3/4 in. long.

Pilot holes: For panel to purlin to be a No. 8 bit. For panel to panel to be 1/8 in. diam.

3. Insulation (Optional) - Any compressible blanket insulation 4 in. max thickness before compression.

4. Purlin No. 16 MSG min gauge coated steel.

Spacing - For Class 90 to be 60-3/16 in. OC.

For Class 60 to be 63 1/4 in. OC.

No. 13 MSG min gauge coated steel.

Spacing - For Class 90 to be 63 1/4 in. OC.

(Min yield strength to be 55000 psi.)

Refer to General Information, Roof Deck Construction, (Roofing Materials and Systems Directory) for Items not evaluated.

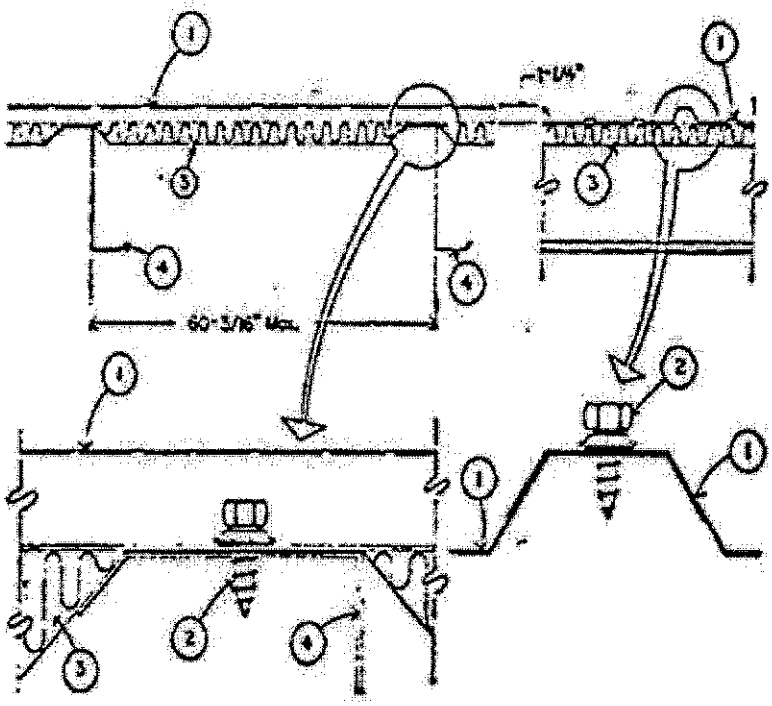
*Bearing the UL Classification Marking

Metal Roof and Wall Systems
w w w . m b c i . c o m

Construction No. 79

Uplift - Class 90

Fire Not Investigated



1. Metal Roof Deck Panels* No. 26 MSG min gauge coated steel. Panels continuous over two or more spans. End laps to occur over purlins with panels overlapped 3 in. min with lap centered over purlin web. A line of tape sealant may be used at panel side and end laps.

- A&S BUILDING SYSTEMS, INC.--- "R" or "PBR"
- ACI BUILDING SYSTEMS INC - "R" or "PBR Panel"
- ALLIANCE STEEL CO - "R Panel"
- BERRIDGE MFG CO - "R Panel"
- BUILDING CONCEPTS LTD - "B Panel"
- CORRUGATED INDUSTRIES INC - "R Panel"
- FLORIDA PRE-FAB INC - "Florida Rib Panel"
- HIRSCHFELD METAL BUILDINGS - "R"
- KIRBY BUILDING SYSTEMS INC - "Kirby-Rib Panel"
- MBCI- "R or PBR Panel"
- MESCO METAL BUILDINGS-"R" or "PBR"

- MIDLAND METALS, INC. — "PBR"
- NCI BUILDING SYSTEMS L P -"R" or "PBR Panel"
- STANDARD STRUCTURES INC - "PBR Panel" or "R Panel"
- UNITED STEEL DECK INC - "Uniline R Panel"
- WHIRLWIND STEEL BUILDINGS INC - "Super-Span (X)"

2. Panel Fasteners For panel to purlin and panel to panel connections to be No. 14 self-tapping, hex-head, plated steel or stainless steel screws with a separate 5/8 in. OD steel or aluminum washer and a separate neoprene sealing washer. Length for panel to purlin fasteners to be 3/4 in. for insulation up to 3 in. and 1-1/4 in. for insulation over 3 in. For panel to panel fasteners to be 3/4 in. Spacing for panel to purlin fasteners to be 6 in. OC with fasteners located 3 in. from the center line on both sides of each major rib. Or; in a 5-7-5-7 in. pattern with fasteners located 2-1/2 in. from the center line on both sides of each major rib. Spacing at end laps to follow same spacing as that used for continuous panels. At end laps spacing to be 6 in. OC with fasteners located adjacent to major ribs.

Spacing for panel to panel fasteners to be 20 in. OC.

Pilot holes: For panel to purlin fasteners to be 13/64 in. diam. For panel to panel fasteners to be 1/8 in. diam.

As An Alternate Fastener - No. 12-14 self-drilling, self-tapping, 1/2 in. hex-washer head, Type B steel or stainless steel screws with a neoprene sealing washer may be used. Length: For panel to purlin fasteners to be 1 in. for insulation up to 3 in. and 1-1/2 in. for insulation over 3 in. For panel to panel fasteners to be 1 in. Spacing to be the same.

3. Insulation (Optional) - Any compressible blanket insulation 4 in. max thickness before compression.

4. Purlin No. 16 MSG min gauge steel (50,000 psi min yield). Or: Min H series open web steel joists.

5. Lateral Bracing (Not Shown) - As required.

Refer to General Information, Roof Deck Constructions (Roofing Materials and Systems Directory) for Items not evaluated.

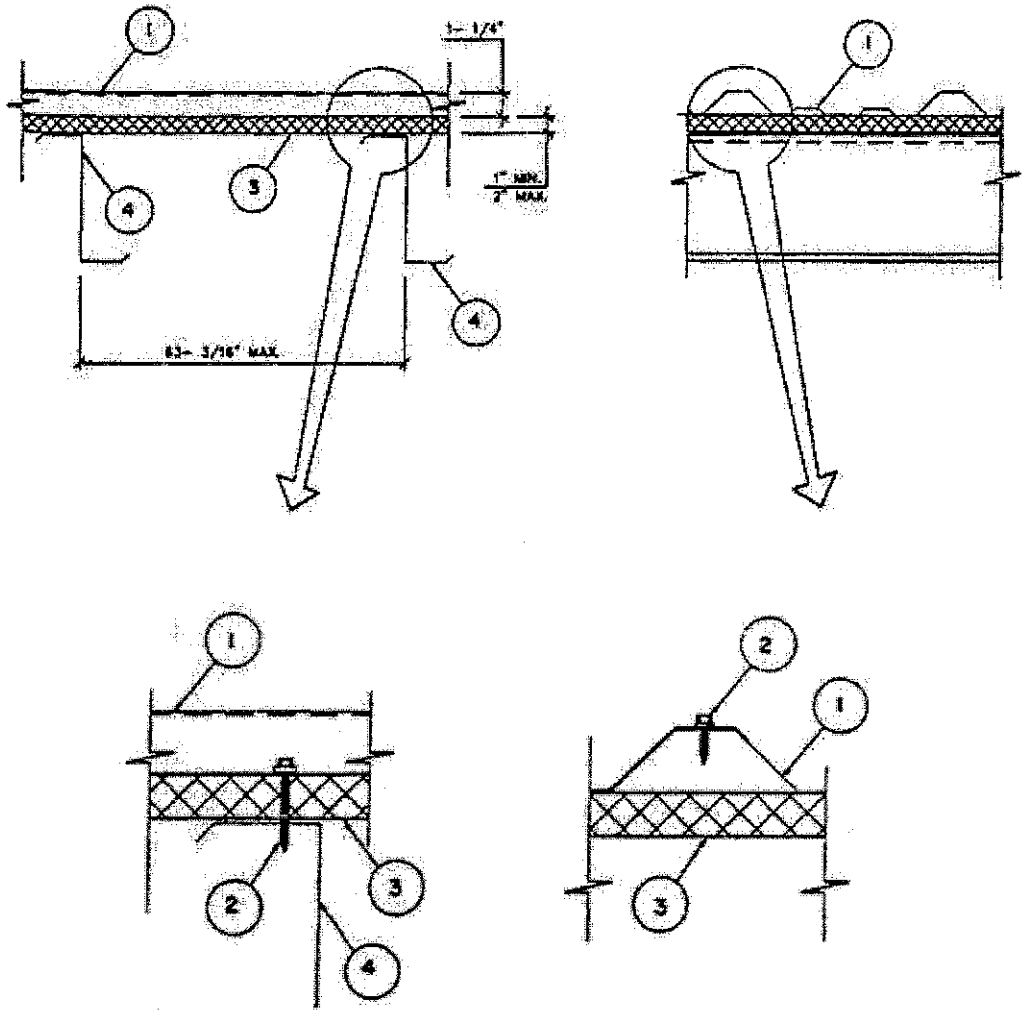
*Bearing the UL Classification Marking

Metal Roof and Wall Systems
w w w . m b c i . c o m

Construction No. 104

Uplift - Class 90

Fire Not Investigated



1. Metal Roof Deck Panels* No. 26 MSG min coated steel. Panels continuous over two or more spans. End laps to occur over purlins with panels overlapped 6 in. with lap beginning even with

purlin web and continuing across purlin upper flange. A line of sealant may be used at panel end and side laps.

- NCI BUILDING SYSTEMS L.P."R" or "PBR"
- MBCI-"R" or "PBR"
- A&S BUILDING SYSTEMS, INC.-"R" or "PBR"
- MESCO METAL BUILDINGS-"R" or "PBR"
- MIDLAND METALS, INC — "PBR"

2. Panel Fasteners For panel to purlin connections when using 16 MSG steel purlins to be No. 12-14 self-drilling, self-tapping, hex-head plated steel standoff screws with a separate 5/8 in. OD formed steel washer and a separate neoprene sealing washer. Min fastener length shall be 3/4 in. longer than the nom thickness of the insulation so as to insure full thread engagement.

Spacing to be 12 in. O.C. located between major ribs. Spacing at end laps to be in a 4-1/2, 7-1/2, 4-1/2, 7-1/2 in. pattern beginning 2-1/2 in. from the center line on both sides of each major ribs.

As an alternate fastener when using No. 16 MSG steel purlins, No. 14 self-tapping hex-head plated steel screws with a separate 5/8 in. OD formed steel washer and a neoprene sealing washer may be used. Min length shall be 3/4 in. longer than the nom thickness of the rigid insulation so as to insure full thread engagement. Pilot holes, 3/16 in. diam, to be used with alternate fastener only.

Fasteners for use with Type H open web steel joists to be No. 12-24 by 7/8 in. long self-drilling, self-tapping hex-head plated steel screws with a separate 5/8 in. OD formed steel washer and a separate neoprene sealing washer.

For Panel-to-Panel Connections - To be No. 14 by 7/8 in. lap tek self-drilling, self-tapping hex-head, plated steel screws with a separate 1/2 in. OD formed steel washer and a neoprene sealing washer. Spacing to be min 20 in. O.C.

As an alternate fastener: No. 14 by 3/4 in. self-tapping, hex-head plated steel screws with a separate formed steel washer and a separate neoprene sealing washer may be used. For alternate fasteners only, a 7/32 in. diam pilot hole shall be used in the top sheet and a 1/8 in. diam pilot hole shall be used in the bottom sheet.

3. **Insulation*** Rigid type. Supplied in 4 ft wide sheets, min density 2 pcf. Min thickness 1 in. Max thickness 2-1/4 in. Butt joints to occur over purlins. Top surface of all joints to be continuously sealed with a 2 in. wide vapor barrier tape, pressure sensitive on one side.

4. Purlins No. 16 MSG min gauge steel (min yield strength 50,000 psi) or H Series open web steel joists.

Refer to General Information, Roof Deck Construction (Roofing Materials and Systems Directory) for items not evaluated.

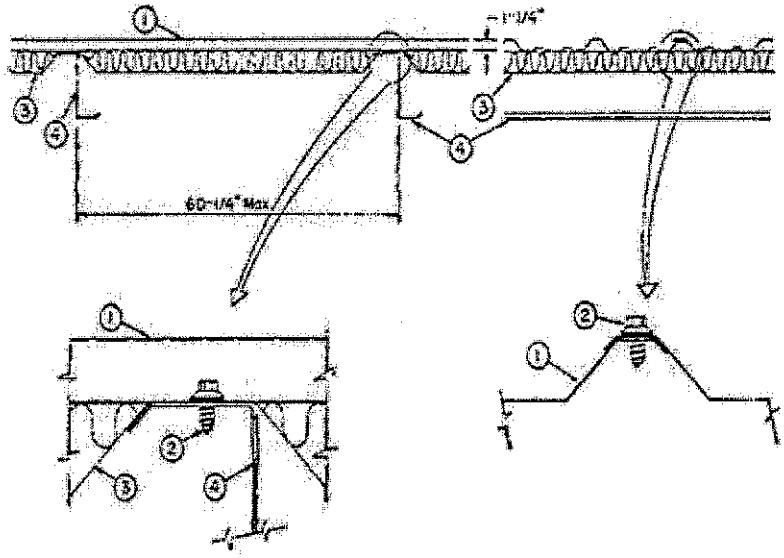
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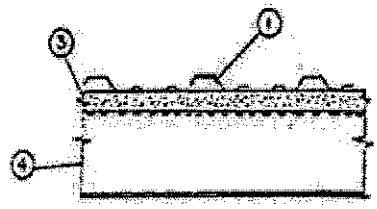
Metal Roof and Wall Systems
w w w . m b c i . c o m

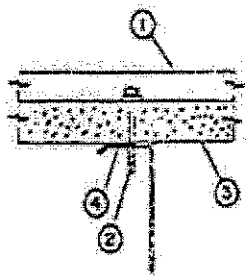
Construction No. 112

Wind Uplift - Steel Panels - Class 90

Fire Not Investigated







1. **Metal Roof Deck Panels*** No. 26 MSG min gauge coated steel. Panels continuous over two or more spans. End laps to occur over purlins with panels overlapped 3 in. min with laps beginning even with purlin web and extending across purlin flange. A bead of sealant may be used at panel side and end laps.

- A&S BUILDING SYSTEMS, INC. -"R" or "PBR"
- KIRBY BUILDING SYSTEMS INC--"Kirby-Rib"
- STRAN BUILDINGS--"SR" Panel
- NCI BUILDING SYSTEMS L.P.-"R" or "PBR"
- MBCI-"R" or "PBR"
- MESCO METAL BUILDINGS-"R" or "PBR"
- MIDLAND METALS, INC. — "PBR"

2. Panel Fasteners When using compressible blanket insulation - for panel to purlin connections to be No. 14 self-tapping hex-head plated steel or stainless steel screws with a separate steel washer 5/8 in. diam. and a neoprene sealing washer. Length to be 3/4 in. for 3 in. max thickness insulation and 11/4 in. for over 3 in. thickness. Fasteners for panel to panel connections to be same type 3/4 in. long. Pilot holes to be 13/64 in. diam. Spacing for panel to purlin fasteners to be in a 5-7-5-7 in. pattern located 2 1/2 in. from the center line on both sides of each major rib. Spacing at end lap to be the same. For panel to panel connections, fasteners to be 20 in. O.C. with a fastener located approximately in line with the purlin fasteners.

As An Alternate Fastener - For panel to purlin connections to be No. 12-14 self-drilling, self-tapping, hex-head plated or stainless steel screws with a separate 1/2 in. O.D. steel washer and a neoprene sealing washer. Length to be 1 in. for up to 3 in. max thickness insulation and 1-1/2 in. for over 3 in. thickness. For panel to panel connections to be No. 14 by 7/8 in. lap tek . Spacing to be the same as above.

Panel Fasteners When Using Rigid Insulation For panel to purlin connections to be No. 12-14 self-drilling, self-tapping, hex-head, plated steel stand-off screws with a separate 5/8 O.C. formed steel washer and a separate neoprene sealing washer. Min fastener length to be 7/8 in. longer

than nom thickness of rigid insulation. Fasteners for panel to panel connections to be same as for compressible insulation. Spacing to be same as above.

3. **Insulation** (Optional) - Any compressible blanket insulation 4 in. max thickness before compression or rigid type - 2-1/4 in. max thickness; 4 ft wide. Butt joints (rigid insulation) to occur over purlins. Top surface of all joints to be continuously sealed with a 2 in. wide vapor barrier tape pressure sensitive on one side.

- CELOTEX CORP--Types TF600(B), TF604(B), TF610(B) or Thermax Plus (Blackore).

4. **Purlins** No. 16 MSG min gauge steel (55,000 psi min yield strength.)

5. **Lateral Bracing** (Not shown) - As required.

Refer to General Information, Roof Deck Constructions (Roofing Materials and Systems Directory) for items not evaluated.

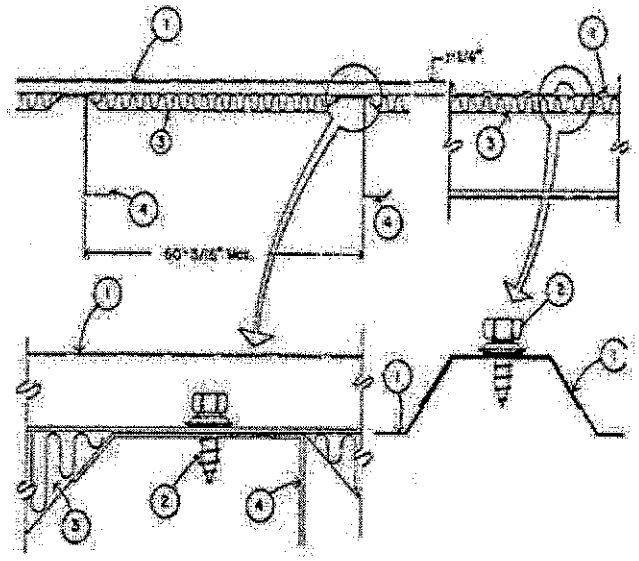
*Bearing the UL Classification Marking

Metal Roof and Wall Systems
w w w . m b c i . c o m

Construction No. 161

Uplift - Class 90

Fire Not Investigated



1. Metal Roof Deck Panels* No. 26 MSG min gauge coated steel. Panels continuous over two or more spans. End laps to occur over purlins with panels overlapped a min of 4 in. with lap centered over purlin web. A line of tape sealant may be used at panel side and end laps.

- A&S BUILDING SYSTEMS, INC.-"R" or "PBR" Panel
- ACI BUILDING SYSTEMS INC - "R" or "PBR Panel"
- ALLIANCE STEEL CO - "R Panel"
- BERRIDGE MFG CO - "R Panel"
- BUILDING CONCEPTS LTD - "B" Panel
- CENTRAL STATES MFG INC - "R Loc"
- COMMERCIAL BUILDING COMPONENTS INC - "R-Panel"
- FLORIDA PRE-FAB INC - "Florida Rib Panel"
- HIRSCHFELD METAL BUILDINGS - "R"
- KIRBY BUILDING SYSTEMS INC - "Kirby-Rib"
- MCELROY METAL MILL INC - "R Panel"
- MESCO METAL BUILDINGS - "R" or "PBR" Panel
- MBCI- "R" or "PBR" Panel
- METAL BUILDING PRODUCTS INC - "R"

- METAL SALES MFG CORP - "R Panel" , "PBR Panel" .
- MIDLAND METALS, INC. — "PBR"
- NCI BUILDING SYSTEMS LP - "R" or "PBR" Panel
- NUCOR BUILDING SYSTEMS, DIV OF - "Classic"
- SOUTHERN STRUCTURES INC - "SR Panel"
- STANDARD STRUCTURES INC - "PBR Panel" or "R Panel"
- STEEL SERVICE BUILDING CO - "R" or "R Panel PBL"
- UNITED STRUCTURES OF AMERICA INC - "U. S. A. R"
- WHIRLWIND STEEL BUILDINGS INC - "Super Span (X)"

2. **Panel Fasteners** For panel to panel and panel to purlin connections to be No. 12-14 by 1 in. self-drilling, self-tapping, hex head, plated steel screws with a 5/8 in. OD formed steel washer and a neoprene sealing washer.

As alternate Fasteners - For panel to purlin connections, 1/4 - 14 HHAB self-tapping, plating steel screws, with a separate 5/8 in. OD dome shaped steel washer and a neoprene sealing washer may be used.

Or: No. 14-10HHA, self-tapping, plating steel screws, with a separate, 5/8 in. OD dome shaped steel washer and a neoprene sealing washer may be used.

Spacing, for panel - to - purlin connections to be 12 in. on center beginning 2 - 1/2 in. from center line on one side of each major rib. Spacing at end lap to be in a 5 - 7 - 5 - 7 in. pattern beginning 2 - 1/2 in. from the center line on both sides of each major rib.

Fastener for panel to purlin connection to be 1-1/4 in. long when insulation (Item 3) is greater that 4-1/2 in.

Spacing for panel - to - panel connections to be 20 in. on center with a fastener located in line with the purlin fasteners.

3. **Insulation** (Optional) - Any compressible blanket insulation 6 in. max thickness before compression.

4. **Purlin** No. 16 MSG min gauge steel (50,000 psi min yield).

5. Lateral Bracing (Not shown) - As required.

Refer to General Information, Roof Deck Construction, (Roofing Materials and Systems Directory) for items not evaluated.

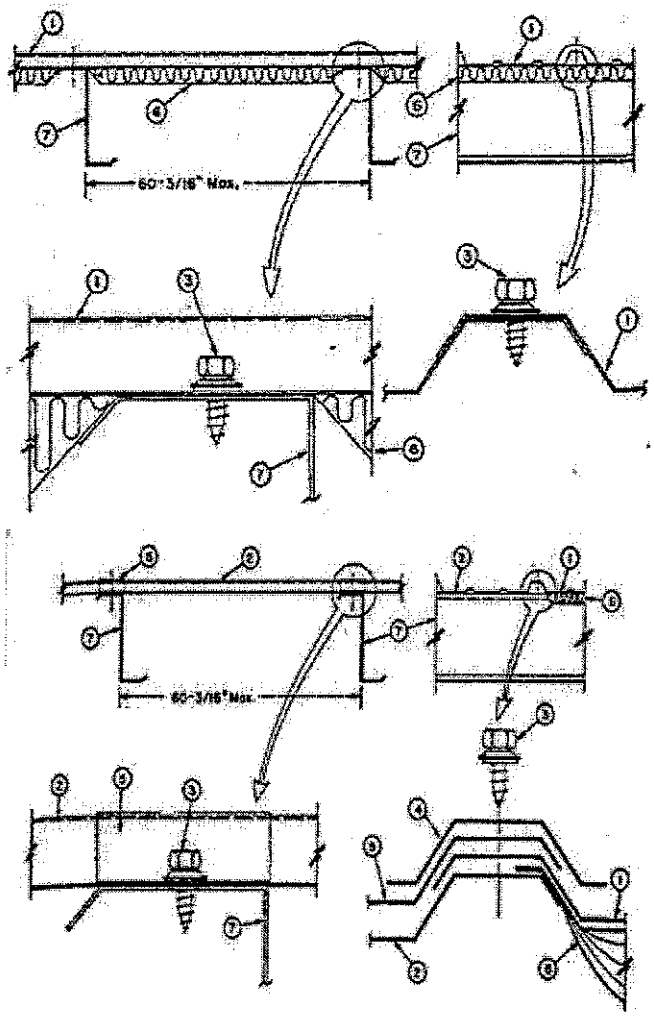
*Bearing the UL Classification Marking

Metal Roof and Wall Systems
w w w . m b c i . c o m

Construction No. 167

Uplift - Class 90

Fire Not Investigated



1. Metal Roof Deck Panels* No. 26 MSG min gauge coated steel. Panels continuous over two or more spans. End laps to occur over purlins with panels overlapped 6 in. with laps beginning even with purlin web and extending across purlin flange. A bead of sealant may be used at panel side and end laps.

- A&S BUILDING SYSTEMS, INC.- "R" or "PBR" Panel
- ACI BUILDING SYSTEMS INC - "R" or "PBR Panel"
- ALLIANCE STEEL CO - "Type R"
- AMERICAN STEEL BUILDING CO INC - "Amerib 90" Panel
- BUILDING CONCEPTS LTD - "B" Panel
- CORRUGATED INDUSTRIES INC - "R" Panel
- FLEXOSPAN STEEL BUILDINGS INC - "R" Panel
- HIRSCHFELD METAL BUILDINGS - "R"
- KENROD STEEL CO INC - "R" Panel
- KIRBY BUILDING SYSTEMS INC - "Kirby-Rib"
- MCELROY METAL MILL INC - "R" Panel
- MESCO METAL BUILDINGS - "R" or "PBR" Panel
- MBCI- "R" or "PBR" Panel
- MIDLAND METALS, INC — "PBR"
- NCI BUILDING SYSTEMS LP - "R" or "PBR" Panel
- NUCOR BUILDING SYSTEMS, DIV OF - "Classic" Panel
- SOUTHERN STRUCTURES INC - "SR" Panel
- STANDARD STRUCTURES INC - "PBR Panel" or "R Panel"
- UNITED STRUCTURES OF AMERICA INC - "U.S.A. R"
- WHIRLWIND STEEL BUILDINGS INC - "Superspan"

2. Building Units* Translucent, reinforced plastic panels. Thickness 1/16 in. formed to the same configuration as the metal roof deck panels. Panels continuous over two spans.

- ACI BUILDING SYSTEMS INC - "R Skylight"
- ALLIANCE STEEL CO - "Type Skylight"
- AMERICAN STEEL BUILDING CO INC - "Amerib 90 Skylight" Panel
- BUILDING CONCEPTS LTD - "B Panel Skylight"
- CORRUGATED INDUSTRIES INC - "R Skylight"
- KENROD STEEL CO INC - "R Panel Skylight"
- KIRBY BUILDING SYSTEMS INC - "Kirby-Rib Skylite Panels"
- MCELROY METAL MILL INC - "R Skylight"
- NCI BUILDING SYSTEMS LP - "R" Light Transmitting Panel
- NUCOR BUILDING SYSTEMS, DIV OF - "Classic"
- OMEGA INDUSTRIES - "R Skylight Panel"
- SOUTHERN STRUCTURES INC - "SR" Skylight
- SUNTUF INC - "Sunsky" or "Dynaglas" or "Suntuf" or "Suntop"
- UNITED STRUCTURES OF AMERICA INC - "U.S.A. R Skylight"
- WHIRLWIND STEEL BUILDINGS INC - "Superspan Skylight"

3. Panel Fasteners For steel panel to purlin and for translucent panel to purlin connections to be No. 12-14 by 1 in. self-drilling, self-tapping, hex head, plated steel screws with a separate 5/8 in. O.D. formed steel washer and a neoprene sealing washer. Fasteners for panel to panel connections to be same type and length.

Fastener for panel to purlin connection to be 1-1/4 in. long when insulation (Item 6) is greater than 4-1/2 in.

Spacing For steel panel to purlin fasteners, spacing to be 12 in. on center beginning 2-1/2 in. from the center line on one side of each major rib.

Spacing at end lap to be in a 5-7-5-7 in. pattern beginning 2 1/2 in. from the center line on both sides of each major rib.

For translucent panel - to - purlin fasteners, spacing to be in a 5, 3 1/2, 3 1/2, 5 in. pattern beginning 2 1/2 in. from the center line on both sides of each major rib.

For steel panel - to - panel fasteners, spacing to be 20 in. on center. For translucent panel - to - steel panel fasteners, spacing to be 12 in. on center driven into rib reinforcement (Item 4).

4. **Translucent Panel Rib Reinforcement** For side support - hat - shaped section fabricated from No. 26 MSG steel to the configuration of the steel panel major rib.

5. **Translucent Panel Purlin Reinforcement** For translucent panel reinforcement over purlins, 3 in. wide by No. 26 MSG thick steel strips fabricated in the shape of the metal panel.

6. **Insulation** (Optional) - Any compressible blanket insulation 6 in. max thickness before compression.

7. **Purlins** No. 16 MSG min gauge steel (50,000 psi min yield strength).

8. **Lateral Bracing** Not shown. As required.

Refer to general information, Roof Deck Constructions, (Roofing Materials and Systems Directory) for items not evaluated.

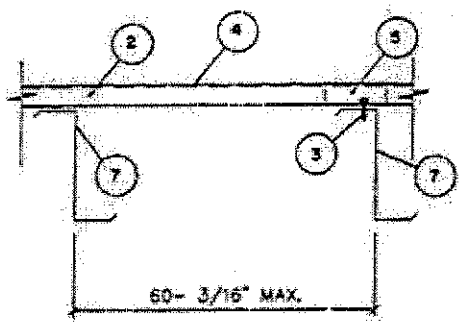
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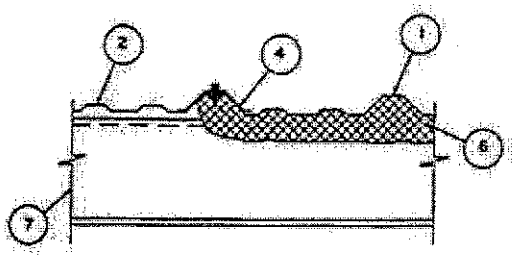
Metal Roof and Wall Systems
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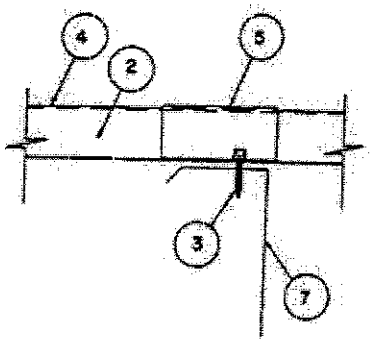
Construction No. 184

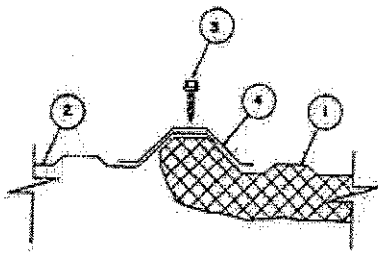
Uplift - Class 90

Fire Not investigated









1. **Metal Roof Deck Panels*** No. 26 MSG min coated steel. Panels continuous over two or more spans. End laps to occur over purlins with panels overlapped 6 in. Lap to begin even with purlin web and extend across purlin upper flange. Sealant may be used at panel end and side laps.

- A&S BUILDING SYSTEMS, INC.---"R" or "PBR" Panel
- MBCI-"R" or "PBR" Panel
- MESCO METAL BUILDINGS-"R" or "PBR" Panel
- NCI BUILDING SYSTEMS LP--"R" or "PBR" Panel.
- MIDLAND METALS, INC. — "PBR"

2. **Building Units*** (Translucent reinforced plastic panels) - Formed to the same profile as the metal roof deck panels (Item 2). Nom thickness 0.060 in. Panels continuous over two or more spans. End laps min of 6 in. long to occur over purlins. Metal panel to be over plastic panel at upslope location and under at downslope location.

- NCI BUILDING SYSTEMS LP--"R Light Transmitting Panel"

3. Fasteners used for metal and plastic panel to purlin connections to be No. 12-14 by 1-1/4 in long self-drilling, self-tapping, hex-head plated steel screws with a separate 1/2 in. OD formed steel washer and a neoprene sealing washer.

Spacing for metal panel to purlin connections to be 12 in. OC beginning 2-1/4 in. from the center line on one side of each major rib. Spacing for plastic panel to purlin connections to be in a 2-1/4, 3, 1-1/2, 3, 2-1/4 in. pattern beginning 2-1/4 in. from the center line on both sides of each major rib with the two outer most fasteners driven into the rib reinforcement. An additional fastener is to be driven into the rib reinforcement on the outside of the rib and located 2-1/4 in. from the rib center line. Spacing at the end laps for metal panels to be in a 4-1/2, 7-1/2, 4-1/2 in. pattern beginning 2-1/4 in. from the center line on both sides of each major rib.

Fasteners for metal and plastic panel to panel connections to be same as panel to purlin screws but 1 in. long. Spacing for metal panel to metal panel connections to be 20 in. OC. Spacing for plastic panel to metal panel connections to be 12 in. OC.

4. **Light Transmitting Panel Side Reinforcement** The reinforcement for use at side laps of building units (Item 2) to be hat-shaped, 6 in. wide at the base, and formed to the profile of the panel major ribs. Fabricated from No. 26 MSG steel having a yield strength of 80,000 psi.

5. **Light Transmitting Purlin Reinforcement** Used over building unit (Item 2) at purlin locations. 3 in. wide No. 26 MSG steel, formed to the profile of the panel. Yield strength of steel to be 80,000 psi.

6. **Insulation** Compressible blanket type insulation. 4 in. nom thickness before compression.

7. **Purlins** No. 16 MSG min gauge steel (50,000 psi min yield strength).

8. **Lateral Bracing** (Not Shown) - As required.

Refer to General Information, Roof Deck Construction (Roofing Materials and Systems Directory) for items not evaluated.

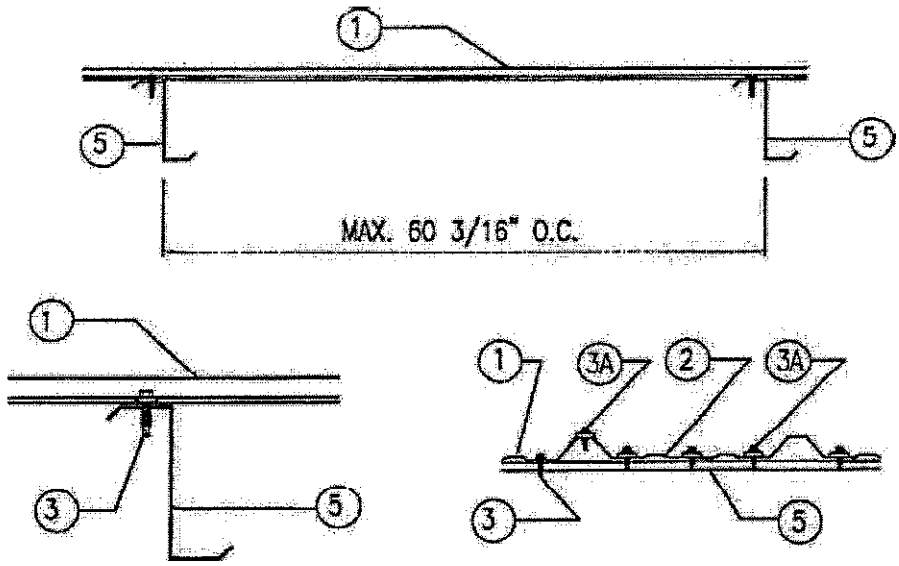
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Metal Roof and Wall Systems
w w w . m b c i . c o m

Construction No. 542

Uplift - Class 90

Fire Not Investigated



1. **Metal Roof Deck Panels*** - No. 26 MSG min. coated steel. Panels continuous over two or more spans. End laps to occur over purlins with panels overlapped 6 in. with lap beginning 2 in. from purlin and extending across purlin flange. A bead of sealant may be used at panel sidelaps.

- A&S BUILDING SYSTEMS, INC.-"R or PBR Panel"
- MBCI-"R or PBR Panel"
- MESCO METAL BUILDINGS-"R or PBR Panel"
- NCI BUILDING SYSTEMS LP-"R or PBR Panel"
- MIDLAND METALS, INC. — "PBR"

2. Building Units* - Translucent, reinforced plastic panels. Thickness 1/16 in. formed to the same configuration as the metal roof deck panels. Panels continuous over two spans.

- NCI BUILDING SYSTEMS LP-"R Panel Light Transmitting Panel"

3. **Fasteners - (Screws)** For steel panel to purlin, connections to be No. 12-14 by 1 in. self-drilling, self-tapping, hex head, plated steel screws with a separate 5/8 in. O.D. steel washer and a neoprene sealing washer. Spacing at intermediate purlins to be 12 in. on center beginning 2-1/2 in. from centerline on one side of each major rib. Spacing at panel end lap purlins to be in a 5-7-5-7 in. pattern beginning at centerline on both sides of each major rib.

For steel panel to panel, connections to be 1/4 in. -14 by 7/8 in. self-drilling, self-tapping, hex head, plated steel lap tak with 5/8 in. O.D. steel washer and a neoprene sealing washer. Spacing to be 20 in. on center.

3A. Fasteners - (Screws) - For Building Units (Item 2) to purlin, connections to be No. 12-14 by 1 in. self-drilling, self-tapping, hex head, plated steel screws with a separate 7/8 in. O.D. steel washer and a neoprene sealing washer. Spacing to be 3-1/2 in. on center beginning 2-1/2 in. from centerline on both sides of each major rib.

For Building Unit to steel panel, connections to be 1/4 in. -14 by 7/8 in self-drilling, self-tapping, hex head, plated steel lap tak with 7/8 in. O.D. steel washer and a neoprene sealing washer. Spacing to be 10 in. on center with a fastener located at the endlaps.

4. Insulation - (Optional) (Not Shown) - Any compressible blanket insulation, 6 in. max thickness before compression.

5. Purlin-No. 16 MSG minimum steel (50,000 psi min. yield strength).

6. Lateral Bracing - (Not Shown) - As Required.

Refer to General Information, Roof Deck Construction, (Roofing Materials and Systems Directory) for Items Not Evaluated.

*Bearing the UL Classification Marking

SPEC-DATA®

This Spec-Data sheet conforms to editorial style prescribed by The Construction Specifications Institute. The manufacturer is responsible for technical accuracy.

1. PRODUCT NAME

Galvalume® Sheet Steel

2. MANUFACTURER

Bethlehem Steel Corporation
Sparrows Point Division
Sparrows Point, MD 21219
Phone: (800) 521-4789

3. PRODUCT DESCRIPTION

Coating: "Galvalume" is the registered trade name for a patented sheet steel product having a coating of corrosion-resistant aluminum-zinc alloy applied by a continuous hot dipping process. The alloy coating of aluminum and zinc provides an optimum balance between (a) the long-term general corrosion resistance, high temperature oxidation resistance and heat reflectivity of aluminum, and (b) the galvanic protection of zinc at scratches and cut edges

Basic Use: Galvalume sheet, both bare and painted, is intended for applications where superior corrosion resistance is required, as in roofing, siding, pre-engineered buildings, appliances, air conditioner housings and other uses. Galvalume sheet is also used for applications where resistance to oxidation at elevated temperatures is important, such as fireplaces, toasters and automotive exhaust systems.

Limitations: Based on experience to date, Bethlehem advises against contact of Galvalume sheet with lead, copper, graphite, unprotected steel, uncured concrete, or wet, green or pressure-treated wood; exposure of Galvalume sheet to water run-down from copper and use of Galvalume sheet in harsh chemical or intensive animal confinement environs.

4. TECHNICAL DATA

Coating: The composition of the Galvalume sheet coating is typically 55% aluminum, 1.6% silicon and the balance zinc, nominal percentages by weight. The product is described in ASTM Specification A 792 and is available in three coating classes:

ASTM Designation	AZ50	AZ55	AZ60
Triple Spot Average Minimum Oz/Sq Ft	.50	.55	.60
Single Spot Minimum Oz/Sq Ft	.43	.50	.52

A nominal coating weight of .50 Oz/Sq Ft (total both sides) is equivalent to .8 mil thickness on each side.

The coating is available as regular spangle or extra smooth surface, with or without chemical treatment. An oil coating may also be specified.

Atmospheric Corrosion Resistance: Based on 13-year atmospheric test results (Figure 1), it is estimated that Galvalume (AZ50) sheet will outlast G90 galvanized by two to four times in marine, industrial and rural atmospheres. When compared to aluminum coated sheet steel, Galvalume sheet has superior corrosion resistance at sheared edges.

Salt Spray Corrosion Resistance: With cut edges protected, the coating on Galvalume Sheet Steel (AZ50) lasts five to ten times longer than the coating on G90 galvanized. In salt spray tests conducted with bare cut edges exposed, the corrosion resistance is typically three to four times that of G90 galvanized (see Figure 2).

High Temperature Behavior: Galvalume sheet can be used at temperatures up to 600°F without discoloration and up to 1250°F without heavy oxidation and scaling.

Prolonged exposure to temperatures above 600°F can result in changes to the base metal characteristics of conventional Galvalume sheet. A new product, Galvalume H.T. Sheet (UL listed) will resist base metal

Figure 1

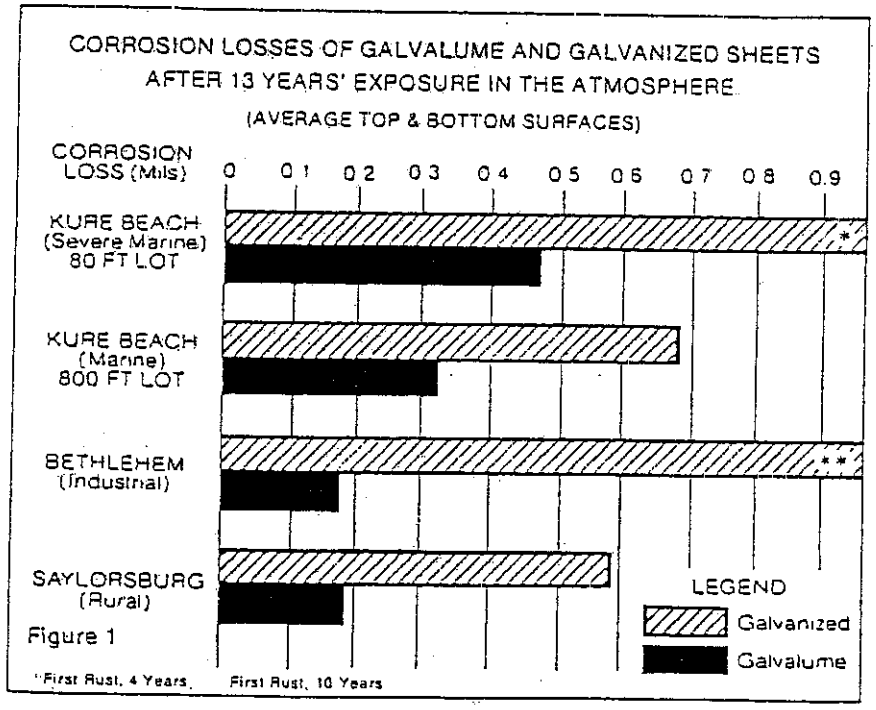


Figure 1

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Galvalume is a registered trade name of BIEC International, Inc

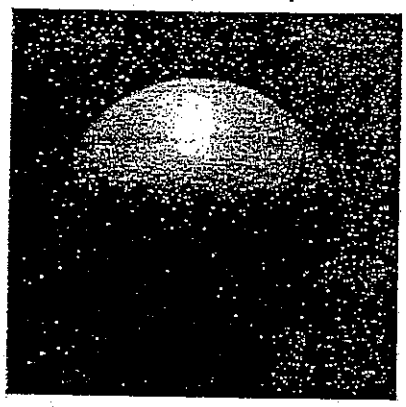
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Bethlehem Steel Corporation
May 1995
(Supersedes August 1992)
MANUFACTURED ROOFING AND SIDING
Coated Sheet Steel
7

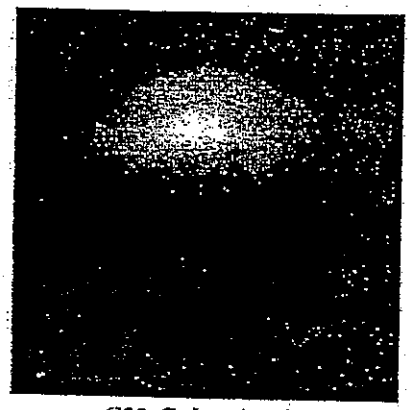
cause the aluminum-zinc coating is less susceptible to microfracturing during forming than is the zinc coating on G90 galvanized. Less paint crazing results in improved corrosion resistance.

Corrosion Resistance: Based on atmospheric test results, bare Galvalume sheet is at least two or four times more resistant to atmospheric corrosion than G90 galvanized and is comparable to aluminum-coated Type 2.

FIGURE 1: REVERSE IMPACT
Nine Joule (80 inch-pound)



Galvalume Sheet



G90 Galvanized

Prepainted Galvalume sheet has also exhibited excellent corrosion resistance in a variety of accelerated tests and atmospheric exposures. It has demonstrated equal or better performance than prepainted G90 galvanized in corrosion protection at flat areas, paint damaged areas, and formed areas where paint crazing has occurred. Prepainted Galvalume sheet exhibits less than 3mm of edge creep along sheared edges and no scribe creep after 750 hours salt-spray exposure (Specification ASTM B 117). Additionally, no blistering or loss of paint adhesion occurs after 1,000 hours waterfog exposure (100% relative humidity at 100°F).

Edge Creep: Edge creep is paint undercutting along sheared edges on prepainted metal sheets. Outdoor exposures of Bethlehem-approved paint systems applied to Galvalume sheet demonstrate the product's excellent resistance to edge creep.

In tests of siliconized polyester paint systems, widely used in the industry, prepainted Galvalume sheet exhibits consistently low edge creep that tends to level off to about 1mm after three years of exposure at Bethlehem's most corrosive test site at Kure Beach, NC. This low level of edge creep is maintained up through at least 10 years of exposure, the longest exposure time for which data are available.

5. INSTALLATION

Certain precautions should be taken when installing prepainted Galvalume sheet.

- Prepainted Galvalume should not come in direct contact with wet concrete. Concrete's high alkalinity attacks the aluminum, subsequently causing the coating to peel.
- Prepainted Galvalume sheet should not be placed in contact with copper, lead, or the water run-off from either. Electrochemical reaction between these elements and the aluminum-zinc alloy coating will lead to premature corrosion of the coating.
- Fasteners should have corrosion resistance at least equivalent to the expected life of the base material.

Otherwise, prepainted Galvalume sheet can be stored, handled, and installed using the same procedures as with prepainted galvanized or aluminum-coated sheet steels. Good installation practice includes removal of metal fines due to drilling, cutting, etc. from the sheet surface and avoiding exposure of insulation to the weather.

6. AVAILABILITY AND COST

Availability: Prepainted Galvalume sheet is available for shipment anywhere in the country. Galvalume sheet is manufactured at Bethlehem's plants at Sparrows Point, MD and Jackson, MS, and painted at approved coil coaters throughout the country. Prepainted Galvalume sheet can be obtained in thicknesses from 0.014" to 0.074" and in widths up to 48". Heavier and lighter thicknesses may be negotiated.

Cost: Prepainted Galvalume sheet is priced comparable to prepainted G90 galvanized on a price per square foot (or per part) basis. Specific price quotations will be furnished upon request.

7. WARRANTY

The Galvalume sheet *substrate* is conditionally warranted against rupture, structural failure or perforation due to corrosion for a period of 20 years and six months when used for building panel applications.

Paint finishes are warranted depending upon application, paint system and color. More specific information regarding warranties will be furnished upon request.

8. MAINTENANCE

Prepainted Galvalume sheet requires no special maintenance under normal use. Recommended touch-up paint systems are available upon request for repairing areas damaged during erection.

9. TECHNICAL SERVICES

For more information call one of Bethlehem's Product Application Engineers at (800) 521-4789 or write: Bethlehem Steel Corporation, Coated Sheet Marketing, 5111 North Point Boulevard, Sparrows Point, MD 21219. *http://www.bethsteel.com*

10. FILING SYSTEMS

- SPEC-DATA® II

Descriptive Sheet 3927
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Bethlehem

SPEC DATA®

This Spec-Data sheet conforms to editorial style prescribed by The Construction Specifications Institute. The manufacturer is responsible for technical accuracy.

Bethlehem Steel Corporation
May 1995
(Supersedes February 1992)

1. PRODUCT NAME

Prepainted Galvalume® Sheet

2. MANUFACTURER

Bethlehem Steel Corporation
Sparrows Point Division
Sparrows Point, MD 21219
Phone:(800) 521-4789

3. PRODUCT DESCRIPTION

Product and Application: Galvalume, the Bethlehem trade name for a patented sheet steel having a hot-dip coating of corrosion-resistant, aluminum zinc alloy, is available prepainted from the manufacturer. The use of prepainted Galvalume sheet offers the consumer many positive features in addition to the proven superior corrosion resistance of the substrate. These features include:

- More uniform paint coating.
- Reduction of in-plant rejections resulting from defective material treatments and coatings.
- Longer tool life because of prepainted Galvalume sheet's lubricity and non-abrasiveness.
- Shorter production schedules by eliminating handling, cleaning and postpainting.
- Elimination of capital equipment by the fabricator; thus, saving money and maintenance time.
- Reduction of fire hazard and pollution problems by eliminating storage of volatile solvents.
- No special tooling requirement because prepainted Galvalume sheet is generally formed on press brakes and roll forming equipment with the same dies and rolls used for bare steel.

Prepainted Galvalume sheet is an ideal product for many painted applications where superior atmospheric corrosion resistance is needed, such as in pre-engineered buildings, architectural panels, siding, roofing (conventional and standing seam) and other building components. It is also suitable for appliances and other end uses. A wide variety of colors and finishes is available to satisfy most applications.

4. TECHNICAL DATA

Typical Mechanical Properties (Commercial Quality):

- Yield Strength: 40-50 ksi
- Tensile Strength: 55-70 ksi
- Total Elongation: 20-36%
- Hardness: 50-65 HRB

(Structural quality grades, including 50 ksi and 80 ksi minimum yield strengths, are also available.)

Substrate: The Galvalume sheet coating consists of an alloy of nominally 55% aluminum, 1.6% silicon, and the balance zinc by weight, as listed in ASTM designation A 792. On a volume basis, the coating is approximately 80% aluminum. The high aluminum content of the coating results in Galvalume sheet having a lower density and less weight per unit area than G90 galvanized sheet of equivalent thickness.

This means that a ton of Galvalume sheet will yield more square feet of useable product than a ton of G90 galvanized of equivalent thickness. A Bethlehem sales representative can provide specific details for any particular application.

The metallic coating is applied by a continuous hot-dip process whereby properly cleaned low carbon, cold-rolled steel is dipped into a molten aluminum-zinc bath. The patented alloy coating of Galvalume sheet provides an optimum balance between (a) the long-term general corrosion resistance of aluminum, and (b) the galvanic protection of zinc at scratches and cut edges.

Process Specification: Bethlehem has instituted a process control program to insure that prepainted Galvalume sheet is produced to prescribed standards. The program specifies the methods and materials to be used in each phase of the painting process, as well as stringent product performance requirements. The Bethlehem Process Specification for prepainted Galvalume sheet is based on extensive laboratory evaluation and outdoor exposure tests in cooperation with pretreatment and paint suppliers.

Processing: Galvalume sheet is cleaned and pretreated in preparation for painting. Surface contaminants are removed using a suitable alkaline cleaner. The sheet is then pretreated with a chromate pretreatment. The pretreatment is a uniform, continuous deposit applied in a manner to provide excellent paint adhesion and corrosion resistance.

A minimum of two coats of paint are applied to both the face side and back side of the sheet: a corrosion inhibitive primer and a top coat. The primers are selected from a list of Bethlehem-approved paint systems. The primer is a uniform continuous film, compatible with the subsequently applied top coat. It is applied to each surface at a thickness specified by the paint manufacturer (typically 0.2-0.25 mil). Top coat thickness varies depending on paint type and end use. The face side top coat has excellent long-term outdoor weathering characteristics. Both face side and back side top coats must meet various quality assurance tests, such as adhesion, flexibility and hardness.

Paint Adhesion: Paint adhesion on Galvalume sheet is consistently better and less variable than on G90 galvanized sheet. Adhesion is determined by pick-off on a tape pull on a cross-hatch, wedge bend and nine joule (80 inch-pound) reverse impact dimple.

Flexibility: Based on laboratory testing, the coating flexibility of Galvalume sheet is superior to that of G90 galvanized sheet. When subjected to the nine joule reverse impact dimple test, prepainted Galvalume sheet shows less evidence of paint crazing than does prepainted G90 galvanized (Figure 1). Less paint crazing occurs with prepainted Galvalume sheet be-

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7 MANUFACTURED ROOFING AND SIDING
Prepainted Corrosion-Resistant Sheet Steel
May 1995
(Supersedes February 1992)

Figure 2

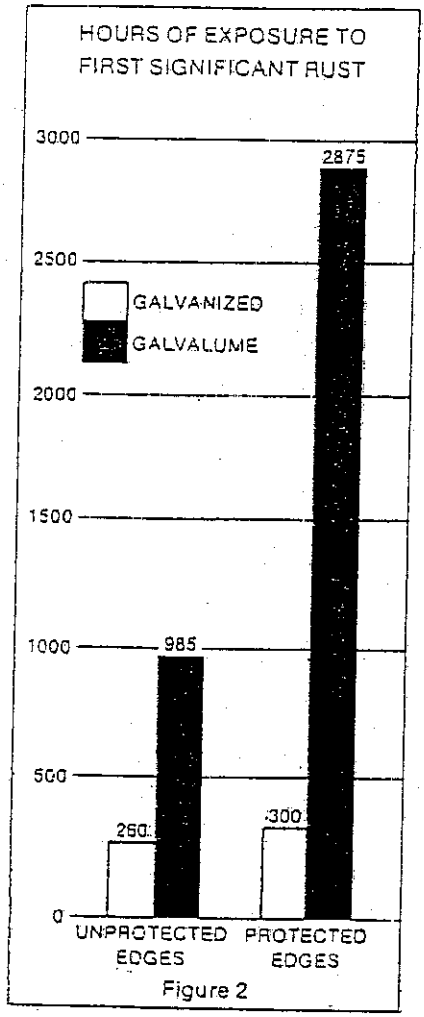


Figure 2

change. Galvalume sheet applications subjected to these temperatures should be reviewed with a local Bethlehem Sales Office.

Formability: Galvalume sheet can be formed about as readily as continuously annealed galvanized sheet. Lock forming and roll forming are readily accomplished.

Weldability: Galvalume sheet is readily weldable with conventional resistance and arc welding processes. Conditions for resistance welding are similar to those used on galvanized steel. Spot welding electrodes should be redressed as required to maintain nugget size. RWMA Class 2 or dispersion-strengthened copper alloy electrodes are suggested. Galvalume sheet can be arc welded with the shielded metal-arc and gas metal-arc processes. The lower zinc content of the coating of Galvalume sheet results in considerably less fuming during arc welding, providing reduced fume hazards to welders. For further information on welding, contact the nearest Bethlehem Sales Office.

Paintability: Properly pretreated Galvalume sheet has excellent paint adhesion. Bethlehem has approved specific pretreatment and primer systems which should be used to provide optimum long-term outdoor performance. The conditions of treatment, concentration, temperature, and time should be determined for each application to obtain the best paint-bonding properties and avoid excessive attack on the Galvalume coating. Bethlehem's *Specification for Prepainting Galvalume Sheet* which contains approved pre-treatment and primer systems is available upon request.

Galvalume sheet may be field-painted with most paints suitable for galvanized: zinc-dust primers, butyral wash primers and acrylic latex paints.

Typical Mechanical Properties (Commercial Quality)

Yield	38 - 53 ksi
Tensile	50 - 65 ksi
Total Elongation	20-36%
Hardness	50-65 HRB

(Higher strength levels are also available.)

5. INSTALLATION

To preserve the surface appearance of Galvalume sheet, only clean, dry gloves should be used during handling. Care should also be exercised to prevent the sheets from sliding over rough surfaces or each other. Fasteners and other component parts should have equivalent corrosion resistance. Galvalume sheet steel joints can be effectively closed using appropriate sealants such as neutral curing silicone rubber. If other types of sealants are considered, they should possess the long-term durability, adhesion and non-corrosive properties of neutral cure silicone rubber. Soldering is not recommended.

6. AVAILABILITY AND COST

Availability: Galvalume sheet is available for shipment anywhere in the country from our plants at Sparrows Point, MD and Jackson, MS. It can be obtained in thicknesses from 0.014" to 074" and in widths up to 48". Heavier thicknesses may be negotiated.

Cost: Galvalume sheet is generally priced comparable to G90 galvanized sheet. Specific price quotations for Bethlehem Galvalume sheet will be furnished upon request. Consult the telephone directory for the nearest Bethlehem Sales Office.

7. WARRANTY

Galvalume sheet conforms to the requirements of ASTM Specification A 792. Galvalume sheet is a component recognized by the American Gas Association and by Underwriters Laboratories, Inc. under File No. MH9372.

A warranty is available for bare and prepainted Galvalume sheet when used for building panel applications.

8. MAINTENANCE

Properly installed Galvalume sheet requires no special maintenance. Galvalume sheet, like galvanized, is subject to wet storage staining and turns gray to black if moisture is trapped between coil laps, cut length sheets, or roll formed parts during shipping and storage. The mill treats Galvalume sheet to retard wet storage staining (unless otherwise requested); however, the user should take precautions to keep Galvalume sheet dry in transit, in storage and at work sites.

9. TECHNICAL SERVICES

For more information call one of Bethlehem's Product Application Engineers at (800) 521-4789 or write: Bethlehem Steel Corporation, Coated Sheet Marketing, 5111 North Point Boulevard., Sparrows Point, MD 21219.

10. FILING SYSTEMS

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Bethlehem®

Online Certifications Directory

TGFU.R8116
Roofing Systems

Page Bottom Questions? Previous Page

Roofing Systems

Guide Information

MBCI
14031 W HARDY
HOUSTON, TX 77060 USA

R8116

OTHER SYSTEMS

Class A

Coated steel panels (surfacing) identified as "R" or "PBR", "Ultra-Dek", "Double-Lok", "BattonLok" or "SuperLok", "Vistasheen", "Craftsman Series SB", "Craftsman Series LB", "Craftsman Series HB", "MultiRib", "7 2 Panel", "LokSeam", "S-36", "5V-Crimp", "Estate Panel", "Slimeline", "Storm Proof" or "Imperial Rib", "Ameri-Drain" or "Rain Guard", "Regal Rib", "Monarch Rib", "Rugged Rib", "C" or "PBC", "3/4 High Rib" or "Heritage Panel", "Perma-Clad", "1/2 In. Corrugated", "1/4 In. Corrugated", "D" or "PBD", "7/8 Wide Rib" or "Weather Safe".

1. **Deck:** C-15/32 **Incline:** Unlimited **Impact:** Class 4

Barrier Board: 1/4 in. min. G-P Gypsum Dens-Deck® with all joints staggered a min of 6 in. from the plywood joints.
Ply Sheet (Optional): Any UL Classified Type G1, G2 or G3 base/ply sheet, Type 15, 20 or 30 felt or UL Classified prepared roofing accessory or WR Grace "Ice and Water Shield".
Surfacing: Coated Steel roofing panels, mechanically fastened or with steel screws when roof deck fasteners (panel clips) not required.

2. **Deck:** NC **Incline:** Unlimited **Impact:** Class 4

Barrier Board: 1/4 in. min. G-P Gypsum Dens-Deck®.
Ply Sheet (Optional): Any UL Classified Type G1, G2 or G3 base/ply sheet, Type 15, 20 or 30 felt or UL Classified prepared roofing accessory or WR Grace "Ice and Water Shield".
Surfacing: Coated Steel roofing panels, mechanically fastened or with steel screws when roof deck fasteners (panel clips) not required.

3. **Deck:** NC **Incline:** Unlimited **Impact:** Class 4

Barrier Board: 7/16 OBS or 5/8 in. plywood over polyisocyanurate insulation board or polyisocyanurate composite boad, any thickness
Ply Sheet (Optional): Any UL Classified Type G1, G2 or G3 base/ply sheet, Type 15, 20 or 30 felt or UL Classified prepared roofing accessory or WR Grace "Ice and Water Shield"
Surfacing: Coated Steel roofing panels, mechanically fastened or with steel screws when roof deck fasteners (panel clips) not required

4. **Deck:** NC **Incline:** Unlimited **Impact:** Class 4

Insulation: Polyisocyanurate, glass fiber, perlite or wood fiber, any thickness.
Ply Sheet (Optional): Any UL Classified Type G1, G2 or G3 base/ply sheet, Type 15, 20 or 30 felt or UL Classified prepared roofing accessory or WR Grace "Ice and Water Shield"
Surfacing: Coated Steel roofing panels, mechanically fastened or with steel screws when roof deck fasteners (panel clips) not required.

5. **Deck:** NC **Incline:** Unlimited **Impact:** Class 4

Insulation: None required, however any UL Classified insulations may be used over open purlin spans. Any combination and any total thickness of insulation may be used.
Surfacing: Coated Steel roofing panels, mechanically fastened or with steel screws when roof deck fasteners (panel clips) not required.

6. **Deck:** C-15/32 **Incline:** Unlimited **Impact:** Class 4

Barrier Board: 1/4 in. min. G-P Gypsum Dens-Deck® with all joints staggered a min of 6 in. from the plywood joints.
Ply Sheet (Optional): Any UL Classified Type G1, G2 or G3 base/ply sheet, Type 15, 20 or 30 felt or UL Classified prepared roofing accessory or WR Grace "Ice and Water Shield".
Surfacing: Coated Steel roofing panels, mechanically fastened or with steel screws when roof deck fasteners (panel clips) not required.

Class C

Coated steel panels (surfacing) identified as "R" or "PBR", "Ulta-Dek", "Double-Lok", "BattonLok" or "SuperLok", "Vistasheen", "Craftsman Series SB", "Craftsman Series LB", "Craftsman Series HB", "MultiRib", "7.2 Panel", "LokSeam", "S-36", "5V-Crimp", "Estate Panel", "Slimeline", "Storm Proof" or "Imperial Rib", "Ameri-Drain" or "Rain Guard", "Regal Rib", "Monarch Rib", "Rugged Rib", "C" or "PBC", "3/4 High Rib" or "Heritage Panel", "Perma-Clad", "1/2 In. Corrugated", "1/4 In. Corrugated", "D" or "PBD", "7/8 Wide Rib" or "Weather Safe".

1. **Deck:** C-15/32 **Incline:** Unlimited **Impact:** Class 4

Surfacing: Coated Steel roofing panels, mechanically fastened or with steel screws when roof deck fasteners (panel clips) not required.

UL Listed and Classified Products Components Canada

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Factory ID Code



Metal Roof Deck Panels

As To Uplift Resistance Only

- "R" Panel
- "PBR" Panel

Class 90

- As shown by Construction Nos. 30, 54, 79, 104, 112, 161, 167, 184 & 542
- **Panel for Roofing Systems as to an External Fire Exposure Only; Class A**

Also Classified as to Impact Resistance; Class 4

See UL Roofing Materials & Systems Directory

Fire Resistance Classification

- For use in Design Nos. P224, P225, P227, P230, P233, P237, P265, P268, P508, P510, P512, P701, P711, P715, P717, P720, P722, P724, P726, P731, P734, P736, P801, P803, P814, P815, P819, P821, and P823

See UL Fire Resistance Directory

10P3 R11609

"R" and "PBR" panels are recognized by ICBO ES ER-5409

10-00
CI1

Note: Underwriters Laboratories and ICBO are separate and unrelated entities.

Valspar

FLUROPON®

CERTIFIED LABORATORY TEST REPORT

UV Exposure

UV Exposure

TEST PROCEDURE:	**Accelerated Weathering 2016 hours Per ASTM G 154**
PRODUCT TESTED:	**Valspar Fluropon®**
TESTS RESULTS:	**Acceptable**
FILM INTEGRITY:	**No cracking, peeling, blistering, loss of adhesion of the protective coating, or corrosion of the base metal**
CHALKING:	**Chalk Rating of 8 or better per ASTM D 4214, Method A (ASTM D659)**
COLOR CHANGE:	**Less than 5 ΔE Hunter units per ASTM D 2244**
SAMPLE NUMBER:	**432A886**
LOCATION:	**THE VALSPAR CORPORATION, Kankakee, IL**

CERTIFIED BY:

A N Dunlop 7/29/03

A. N. Dunlop **Date**
Vice President Coil & Extrusions

ATTESTED BY:

Ann E. Landers 9/27/03

Ann E. Landers **Date**
Notary Public

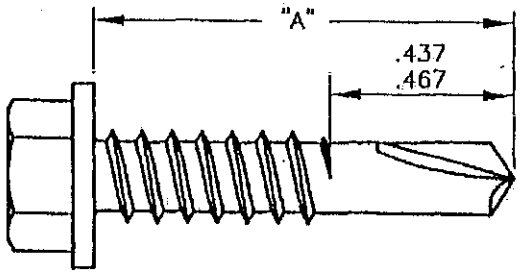
April 13, 2005
My Commission Expires on: Date

"OFFICIAL SEAL"
ANN E. LANDERS
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES 04/13/05

THE VALSPAR CORPORATION certifies these tests to be true and accurate and performed by our laboratory

FASTENER PERFORMANCE EVALUATION

REF: DWG. P-730A



CONSTRUCTION FASTENERS, INC.

#12-14 HWH PLATED STEEL SELF DRILLING FASTENER (#12 IMPAX) #2 PT.

PT. DIA.	.170/.165
MAJOR DIAMETER	.215/.209
MINOR DIAMETER	.164/.157
HEAD – ACROSS FLATS	.308/.305

LENGTH "A":	3/4"; 1"; 1 1/4"; 1 1/2"; 2"; 2 1/2"; 3"; 4"
NOM. TENSILE STRENGTH:	2900 LBS
MIN. TORSIONAL STRENGTH:	92 IN-LBS
NOM. SHEAR STRENGTH:	2050 LBS

PULL OUT STRENGTH TEST METHOD (T-750)

MAT'L	HRS 57 KSI MIN. YIELD STRENGTH			AZ55 GALVALUME					
THICKNESS (IN.)	.059	.074	.105	.015	.019	.023	.031	.035	.049
VALUE (LBS. ULT.)	841	1174	1965	143	155	202	301	317	484

SHEAR OF ASSEMBLY TEST METHOD (T-759)

MAT'L	HRS YIELD STRENGTH 57 KSI		AZ55 GALVALUME					
THICKNESS 1	.059	.074	.015	.019	.023	.031	.035	.049
THICKNESS 2	.059	.074	.015	.019	.023	.031	.035	.049
VALUE (LBS. ULT.)	804	1158	137	153	269	350	418	518

PULL OVER STRENGTH TEST METHOD (T-751)

WASHER	ALLOY DESIGNATION	AZ55 GALVALUME					
	THICKNESS	.015	.019	.023	.031	.035	.049
	YIELD STRENGTH (KSI)	80	40	40	40	40	40
ZAC	VALUE (LBS. ULT.)	665	932	1500	1883	1500*	1500*
BONDED WASHER 15mm O.D.	VALUE (LBS. ULT.)	542	654	1056	1247	1390	1842
NONE	VALUE (LBS. ULT.)	462	570	901	1148	1295	1866

CH 48 6-12-98

* ZAC FAILURE

TECHNICAL DATA PROVIDED HEREIN IS TO BE USED AS A GUIDE FOR TYPICAL STRENGTH CHARACTERISTICS ONLY.

ALL STRENGTH VALUES SHOWN ARE ULTIMATE VALUES, EXPRESSED IN POUNDS.

AN APPROPRIATE FACTOR OF SAFETY MUST BE APPLIED BY THE USER TO OBTAIN ALLOWABLE LIMITS FOR DESIGN.

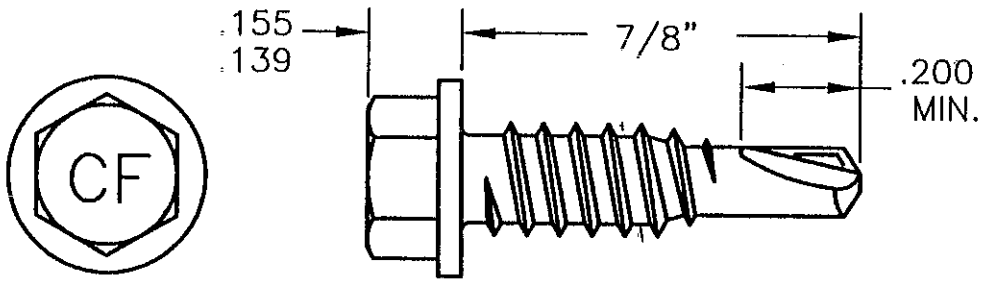
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PULLOVER DATA SHOWN HEREIN IS DOCUMENTED ON LAB TEST REPORT LTR 3035.97

SHEAR OF ASSEMBLY DATA SHOWN HEREIN IS DOCUMENTED ON LAB TEST REPORT LTR 3052.97

FASTENER PERFORMANCE EVALUATION

REF: DWG P-351A



CONSTRUCTION FASTENERS, INC.

1/4-14 HWH PLATED STEEL LAP SELF DRILL FASTENER

MAJOR DIAMETER	.246/.240
MINOR DIAMETER	.192/.185
HEAD - ACROSS FLATS	.308/.305
PT. DIA. (#1 PT.)	.150/.143

NOM. TENSILE STRENGTH	3800 LBS
MIN. TORSIONAL STRENGTH:	150 IN-LBS
NOM. SHEAR STRENGTH:	2850 LBS

PULL OUT STRENGTH

TEST METHOD (T-750)

ALLOY DESIGNATION	AZ55 GALVALUME						
THICKNESS	.015	.019	.023	.031	.035	.049	
YIELD STRENGTH (KSI)	80	40	40	40	40	40	
VALUE	198	204	304	379	440	690	

SHEAR OF ASSEMBLY

TEST METHOD (T-759)

ALLOY DESIGNATION	AZ55 GALVALUME						
THICKNESS 1	.015	.019	.023	.031	.035	.049	
THICKNESS 2	.015	.019	.023	.031	.035	.049	
VALUE	192	252	380	488	657	840	

PULL OVER STRENGTH

TEST METHOD (T-751)

WASHER	ALLOY DESIGNATION	AZ55 GALVALUME						
	THICKNESS	.015	.019	.023	.031	.035	.049	
	YIELD STRENGTH (KSI)	80	40	40	40	40	40	
14mm O.D. BONDED WASHER	VALUE	387	526	820	1037	1155	1801	

TECHNICAL DATA PROVIDED HEREIN IS TO BE USED AS A GUIDE FOR TYPICAL STRENGTH CHARACTERISTICS ONLY.

ALL STRENGTH VALUES SHOWN ARE ULTIMATE VALUES, EXPRESSED IN POUNDS.

AN APPROPRIATE FACTOR OF SAFETY MUST BE APPLIED BY THE USER TO OBTAIN ALLOWABLE LIMITS FOR DESIGN.

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PULL OVER DATA SHOWN HEREIN IS DOCUMENTED ON LAB TEST REPORT 3095.97

SHEAR OF ASSEMBLY DATA SHOWN HEREIN IS DOCUMENTED ON LAB TEST REPORT 3052.97

CH-60 6-12-98