SECTION 07 41 13

METAL ROOF PANELS

PART 1 – GENERAL

1.1 PURPOSE

A. This guideline is intended to provide useful information to the Professional Service Provider (PSP) to establish a basis of design. PSP is to apply the principles of this section such that the University of Texas at Arlington (UTA) may achieve a level of quality and consistency in the design and construction of their facilities. Deviations from these guidelines must be approved by UTA and may require justification through Life Cycle Cost (LCC) analysis and submitted to UTA for approval.

1.2 LESSONS LEARNED AND DESIGN CONSIDERATIONS

A. Materials under 24 gauge will oil can and is unacceptable.

1.3 SECTION INCLUDES

A. Metal Roof Panels
B. Metal Roof Accessories

1.4 RELATED WORK

A. Section 06 10 00 – Rough Carpentry
B. Section 07 22 16 – Roof and Deck Insulation
C. Section 07 62 00 – Sheet Metal Flashing and Trim
D. Section 07 92 00 – Sealants

1.5 REFERENCE STANDARDS

A. SMACNA - Architectural Sheet Metal Manual; current edition.
B. Metal Building Manufacturers Association (MBMA) - Metal Roofing Systems Design Manual; current edition.
C. ASTM A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate; current edition.
D. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; current edition.
E. ASTM A792 - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process; current edition.
F. ASTM B209 - Aluminum and Aluminum-Alloy Sheet and Plate; current edition.
G. ASTM B370 - Copper Sheet and Strip for Building Construction; current edition.
H. Underwriters Laboratories – wind uplift classifications; current edition.

1.6 SUBMITTALS

A. Submit under provisions of SPECIAL CONDITIONS requirements and Division 01.
B. Prior to pre-roofing meeting, submit the following:
   1. Manufacturer's Certification: document that certifies metal roof panels and accessories meet requirements.
   2. Product Literature: Submit product literature on sheet metal and accessory components.
   3. Wind Uplift Resistance: design and certify that roof panels meet wind uplift loads as shown on Structural Drawings. Verify wind uplift, uplift design and attachment.
   4. Sample installer and manufacturer watertightness and finish warranties.
C. Shop drawings: Submit shop drawings for approval prior to Pre-roofing Conference and start of Work. Include the following Drawings:
   1. Indicate on Shop Drawings material profiles, jointing patterns, jointing details, fastening methods, and installation instructions.
   2. Indicate location of sealants, tapes and gaskets.
   3. Indicate material type, finish and gage.
   4. Submit roof plan showing panel layout.
   5. Provide details of rake, ridge, valley, sidewall, and headwall flashings and other applicable flashings. Indicate locations of field applied sealant.
D. Product data:
   1. Submit manufacturer’s data sheets for each material. Coordinate with roof Specification Section(s).
   2. Material Safety Data Sheets: Provide manufacturer’s MSDS information for all materials proposed for use.
   3. ASTM Compliance Sheet: Submit product material list with corresponding ASTM standard(s) each product complies with. Include Specification paragraph reference number that relates to each product.

E. Samples:
   1. Submit color samples on metal of roof panel manufacturer's standard color options, for Architect's selection. Verify Project's roof panel finish requirements. This statement requires standard color chart. Roof panel manufacturers typically offer "standard" and "premium" colors
   2. Submit two samples, 12" long, full width panel, showing metal gage, seam and finish.

1.7 QUALITY ASSURANCE
A. Installer: Company specializing in performing the work of this Section and approved by roof manufacturer for installation of specified roof system.
B. Minimum 5 years documented successful experience with asphalt shingle roofing.

1.8 REGULATORY REQUIREMENTS
A. Fire Resistance:
   1. UL Class A Fire Hazard Classification

1.9 TOLERANCES
A. Comply with tolerances listed in this Section.
B. Where tolerances are not expressly stated in these Specifications, or by the manufacturer, perform Work within tolerances specified in the SMACNA Architectural Sheet Metal Manual.

1.10 PRE-ROOFING CONFERENCE
A. Schedule meeting to discuss roof Work before start of work onsite.
B. Comply with requirements of roof Specification Section(s).

1.11 DELIVERY, STORAGE AND HANDLING
A. Deliver, store, and handle products according to manufacturer's recommendations.
B. Deliver products in original containers, dry, undamaged, with seals and labels intact.
C. Storage:
   1. Roof-top storage of weather-sensitive material is not permitted. Material stored overnight on roof-top will be considered defective.
   2. Store weather-sensitive products in enclosed storage trailers. Or if site conditions do not allow storage trailers,
      a) Store weather-sensitive products on pallets, clear of ground, and cover with secure breathable canvas tarps. Or if site conditions do not allow site storage,
      b) Store weather-sensitive products in an enclosed warehouse, or in storage trailers off-site. Deliver products in quantity that can be used each day, without roof-top storage. Products must be returned to warehouse, or storage trailer, each day.
D. Store related materials, within temperature ranges, recommended by the manufacturer(s) of each product.
E. Stack sheet metal to prevent twisting, bending, or abrasion, and to provide ventilation.
F. Do not stack products on roof surfaces without properly securing to prevent blow-off and sliding-off roof.
G. Deliver panels to jobsite properly packaged to provide protection against transportation damage.
H. Exercise care in unloading, storing and erecting panels to prevent bending, warping, twisting, and surface damage.
I. Store all material and accessories above ground on well skidded platforms. Store under waterproof covering. Provide proper ventilation to panels to prevent condensation build-up between each panel.
J. Remove from site panels which are damaged, or become water-stained during storage and handling. Remove, and replace materials, which are installed damage, or stained.

1.12 ENVIRONMENTAL REQUIREMENTS
A. Comply with manufacturer's environmental requirements for storage and application of products.
B. Verify existing and forecasted weather conditions and determine when conditions are acceptable for roof Work within manufacturer's recommended guidelines.
C. Do not expose materials sensitive to water, or sunlight, damage in quantities greater than can be weatherproofed during each day.

1.13 COORDINATION
A. Coordinate Work with installation of other associated Work, to ensure quality application.
B. Coordinate Work with installation of associated metal flashings, manufactured fascia panels, soffit, and

building walls.

C. Coordinate Work to minimize foot traffic and construction activity on installed finished surfaces.
D. Coordinate location of pipe penetrations to allow centering of pipe in panel.
E. Coordinate location of roof curbs, to allow proper integration with roof panel seams.

1.14 INSPECTION BY MANUFACTURER

A. Comply with requirements of roof membrane Specification Section(s).
B. Provide manufacturer's field inspection reports within five days of each site visit.

1.15 SUBSTITUTIONS

A. Where specific products are listed in this Specification, the referenced manufacturer's systems are to establish a level of quality.
B. Requests for substitutions to listed products shall be submitted during the bidding phase per requirements of Division 01.
C. Consideration of requests for substitution is at the sole discretion of the A/E and Owner, and approvals shall be issued in writing by the A/E with Owner concurrence.

1.16 QUALITY ASSURANCE

A. Installer Qualifications: Installer ("roofer") to perform the Work of this Section, which firm has no fewer than 5 years of successful experience with installation metal roof systems similar to those required for this Project, and is certified, or licensed, by the roof panel manufacturer, for installation of manufacturer-warranted systems.
B. Field Measurements: Prior to fabrication of panels, take field measurements of structure or substrates to receive panel system. Allow for trimming panel units, where final dimensions cannot be established prior to fabrication.
C. Install a 20 foot wide, quality control area of metal roofing on Project's roof, for review by the Architect, to establish the quality of installation for the roof, and have reviewed prior to installing additional area.

1.17 WARRANTY

A. Roof Installer Warranty: provide two (2) year installer warranty under provisions of Division 01.
B. Panel Finish Warranty: Furnish manufacturer's 20-year coating warranty:
C. Metal Roof System Warranty: Provide manufacturer's watertightness warranty. Warranty must include the following:
    1. 20 year term. Term starts at completion of roof. Years, 1 through 20, are fully covered by Warranty, including years under Contractor's Warranty.
    2. Coverage to include metal roof panels, and metal roof accessories provided by metal roof panel manufacturer.
D. Installer Warranty: Provide 2 year Installer Workmanship Warranty covering sheet metal roof workmanship.

PART 2 – PRODUCTS

2.1 SHEET MATERIALS

A. Roof Panels: BattenLok panel manufactured by MBCI, JSM 200 as manufactured by American Building Components, Inc., SDP 200 by Centria, or acceptable substitute, meeting the following requirements:
    1. Galvalume ASTM 792 or Galvanized G90, 24 gage sheet steel, with full-strength Kynar 500 coating, in color chosen by A/E from standard color selections.
    2. Factory-formed panel width of 16 inches, with continuous 2 inch high, interlocking standing seam. Field-formed panels are not acceptable, unless performed by panel manufacturer's trained full-time employees on approved equipment.
    3. Panels fabricated in full length from ridge to eave. Include costs to ship over-sized panels under special permit, or provide factory roll formed panels. Field panel endlaps are not permitted.
    4. Factory-applied continuous sealant at standing seam.
B. Roof Accessories
    1. Underlayment: high-temperature-resistant, modified bituminous sheet membrane, with adhesive backing, non-slip walking surface, Vycor by W.R. Grace, or MiraDRi 300HT, or approved substitute.
    2. Panel Clip Screw – corrosion-resistant, provided by roof panel manufacturer, as required in wind uplift rating, and meeting warranty requirements.
    3. Roof Panels Clip: Floating clip bearing the UL classification marking meeting wind uplift requirements

of this Section. Verify Project's roof panel attachment requirements. Short roof panels may not require floating clip.

4. Roof Panel Clip Bearing Plate: heavy gage steel, corrosion-resistant coating, in size, profile, and gage to meet wind uplift requirements and prevent deformation of roof insulation. Verify Project's roof panel bearing plate requirements – typically used when placing roof clips directly over insulation board.
5. Metal Trim and Metal Closures: meeting requirements of Section 07 62 00.
6. Concealed supports, angles, plates, accessories and brackets: As recommended, and furnished by manufacturer.
7. Accessory Screw: Size and screw type as provided by panel manufacturer for each use, with prefinished hex washer head in color to match panels where exposed to view.
8. Rivets: non-magnetic stainless steel, including mandrel, in size to match application.
9. Field Sealant: Color coordinated primerless silicone or high grade, non-drying butyl as supplied by panel manufacturer.
10. Sealant Tape: non-drying, 100 percent solids, high grade butyl tape, as supplied by panel manufacturer, in sizes to match application.
11. Pipe Penetration Flashings: flexible boot type, with stainless steel compression ring, and stainless steel pipe strap, Dektite by Buildex, or approved substitute. Use silicone type at hot pipes.
12. Metal Roof Curbs: welded aluminum, or stainless steel, factory-insulated, with integral cricket, and designed to fit roof panel module, sized to meet application, by L.M. Curbs, or approved substitute.
13. Insulation: according to provisions of Section 07 22 16.

PART 3 – EXECUTION

3.1 GENERAL

A. The roof manufacturer's technical specifications shall be considered a part of this Section and shall be used as a minimum standard in conjunction with this Section.
B. If this Section conflicts with, or exceeds manufacturer's minimum requirements the more rigid standard shall apply and be enforced.

3.2 EXAMINATION

A. Ensure metal roof deck is ready to receive metal roofing.
B. Ensure surface of deck is free from objectionable warp, wave, and buckle.

3.3 UNDERLAYMENT INSTALLATION

A. Install insulation board according to provisions of Section 07 22 16.
B. Install one layer underlayment, shingle fashion, over insulation.
C. Extend up vertical surfaces 2 inches at sidewalls, and headwalls, and down over roof edges 1 inch.
D. Apply one layer with metal roof with 6 inch endlaps and 3 inch sidelaps.
E. Ensure underlayment is bonded to substrate to prevent blow-off, prior to roof panel installation.
F. Install underlayment to provide watertight installation prior to roof panel installation.
G. Cover underlayment, within maximum 30 days, with new sheet metal roof system at insulated areas. Remove and replace underlayment exposed longer than 30 days.
H. Repair torn, cut, buckled, or weathered underlayment prior to roof panel application.

3.4 INSTALLATION OF ROOF PANELS

A. Comply generally with recommendations in the "Architectural Sheet Metal Manual", by SMACNA, except where otherwise specified.
B. Install field panels in continuous lengths, without endlaps.
C. Install clips, over bearing plates at roof insulation, in pattern to meet wind uplift rating requirements.
D. Allow for 1 inch panel clearance at penetrations.
E. Install concealed supports, angles and brackets as furnished by manufacturer to form complete assemblies.
F. Field-apply sealant at penetrations, transitions, and other locations necessary (not standing seams) for airtight, waterproof installation.
G. Ensure sealant beads and tape is applied prior to sheet metal installation to achieve a concealed bead. Neatly trim exposed portions of sealant without damaging painted finish.
H. Align pipe penetrations to occur at center of roof panel. Report and have corrected improperly-placed penetrations. Remove and replace roof panels which have improperly-placed penetration flashings.
I. Align roof curbs to fit roof panel module and overlap standing seam(s). Allow for proper drainage on both

sides of curb.

J. Install sheet metal flashings according to manufacturer's recommendations, and in accordance with provision of Section 07 62 00.

3.5 CLEANING & PROTECTION

A. Clean exposed surfaces of Work promptly after completion of installation.
B. Clean mud, dirt, and construction-related debris from panels before panels are scratched or marred.
C. Protect Work as required to ensure roofing will be without damage at time of final completion.
D. Do not allow excessive foot traffic over finished surfaces.
E. Do not track mud, dirt, or construction-related debris onto panel surfaces.
F. Clean metal roof surfaces using methods and materials approved by roof panel manufacturer.
G. Replace damaged Work before final completion.

PART 4 APPENDIX

4.1 PRODUCT DATA / CUT SHEETS

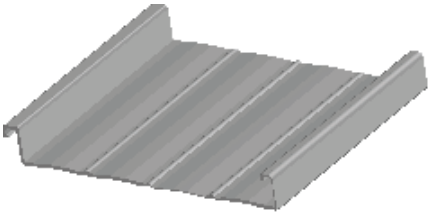
A. MBCI, BattenLok
B. Centria, SDP 200
C. Berridge, Standing Seam Systems

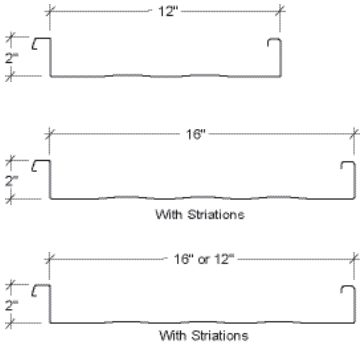
END OF SECTION

STANDING SEAM METAL ROOFING

BATTENLOK® HS

BattenLok® HS is a mechanically field seamed, high strength structural standing seam roof system. The BattenLok® HS panels have a 2" tall vertical seam and are available in both 12-inch and 16-inch widths. BattenLok® HS can be installed directly over purlins or bar joists and is capable of transitioning from roof to fascia. BattenLok® HS does not require a solid substructure for support.





Features and Benefits:

- Low and high clips are available to allow for various thicknesses of insulation to be installed between the panels and purlins.
- Heavier gauges, striations, embossing and installation over a solid deck minimize oil canning.
- Numerous UL 580 Construction rating are available, as well as UL 790, Class A for external fire, numerous roof assemblies for UL 263 for internal fire and the UL 2218 Class 4 impact rating.
- BattenLok® HS carries Florida approval rating.

Product Specifications

- **Applications:** Roof
- **Coverage Widths:** 12", 16"
- **Minimum Slope:** ½:12
- **Panel Attachment:** Concealed Fastening System; Low, High (fixed or floating), Utility (no insulation clearance)
- **Gauges:** 24 (standard); 22 (optional)
- **Finishes:** Smooth or Embossed; with Striations or Striations and Pencil Ribs
- **Coatings:** Galvalume Plus®, Signature® 200, Signature® 300, Signature® 300 Metallic

www.mbci.com | shop.mbci.com

HOUSTON | 281.407.6915
ADEL, GA | 888.514.6062
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ROME, NY | 315.371.4330
SALT LAKE CITY | 385.715.2952
SAN ANTONIO | 210.888.9768

STANDING SEAM METAL ROOFING

BATTENLOK® HS

CATEGORY	CHARACTERISTIC	TEST METHOD	PURPOSE	RESULT
ENVIRONMENTAL	Air Leakage Through Roof Panel Joints	ASTM E1680	Determines the air leakage characteristics of metal roof panels under specified air pressure differences at ambient conditions	0.016 cfm/ft2 at 1.57 psf static pressure 0.025 cfm/ft2 at 6.24 psf static pressure
	Water Penetration Through Roof Panel Joints	ASTM E1646	Determines the resistance to water penetration of metal roof panels under uniform static air pressure difference	No uncontrolled water penetration through the panel joints at a static pressure of 20.00 psf
	Impact Resistance	UL 2218	Determines Impact Resistance of prepared Roof Covering Materials	Class 4 Rating
FIRE RESISTANCE	Room Fire Performance	UL 790	Standard for Standard Test Methods for Fire Tests of Roof Coverings	See Class A Fire Rating Data Sheet
	Room Fire Performance	UL 263	Standard for Fire Tests of Building Construction and Materials	For use in Design Nos. P225, P227, P230, P237, P265, P268, P508, P510, P512, P701, P711, P720, P722, P726, P731, P734, P801, P815, P819.
STRUCTURAL	Uplift Resistance	ASTM E 1592	Provides a standard procedure to evaluate or confirm structural performance under uniform static air pressure difference	See Load Chart Section
	Gravity Loads	AISI S100	North American Specification for the Design of Cold-Formed Steel Structural Members	See Section Properties and Allowable Load Table Section
ROOF LISTINGS	Roof Performance Underwriters Laboratories	UL 580	Determines the uplift resistance of roof assemblies consisting of the roof and roof coverings materials	Class 90 Rating - Construction Number 90, 176, 180, 238B, 437, 449, 451, 452 and 487.
	Roof Performance Florida Approval	ASTM E 1592 FM 4471 UL 790	Florida product approval is the approval of products and systems, which comprise the building envelope and structural frame, for compliance with the structural requirements of the Florida Building Code.	See FL# 11819.1
	Roof Performance - Texas Department of Insurance	UL 580	TWIA provides windstorm and hail insurance in areas exposed to hurricanes and currently provides windstorm and hail coverage in the following 14 "first tier" Texas coastal counties: Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Jefferson, Kenedy, Kleberg, Matagorda, Nueces, Refugio, San Patricio and Willacy.	See RC-24

CENTRIA

SDP 200 FEATURES

PRODUCT DATA

This structural standing seam panel offers superior resistance to wind uplift loads while providing the beauty and long life of a traditional standing seam roof.

This Structural Design Panel is a handed, asymmetrical, mechanically seamed panel.

The SDP 200 panel features a "hook and rotate" installation procedure while the SDP 200e design allows for a "vertical drop in" method of installation.

It may be installed directly over open purlins and blanket insulation, steel deck and rigid insulation or plywood substrates. Two-piece floating clips are standard.

The two-piece clips interlock in the standing seam to provide a thermal movement capability for panel runs up to 225'-0'.

Listed for UL 580 Class 90.

- 5'-0" over minimum 16 ga. purlins
- 4'-0" over minimum 22 ga. steel deck
- 3'-0" over nominal 5/8' plywood

Tested according to ASTM E 1592 to meet COE requirements.

Factory-applied sealant and tight side seam prevent water entry.

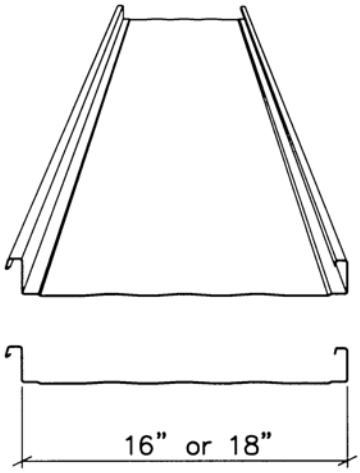
Pan of the panel is available striated or with optional planks or pencil beads.

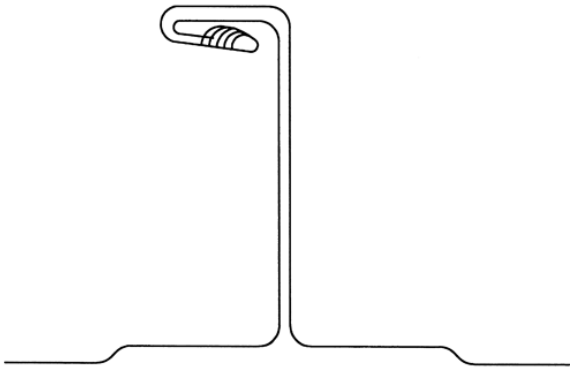
STANDARD PANEL DESCRIPTION

Panel height .....2" nom.
Panel width .....16", 18"
Panel length .....5'-48'*
Pan profile (standard) .....Striated
(optional).....Planked or pencil beads
Factory end lap.....Notched
Factory sealant.....Hot melt
Substrate (standard) .....Galvalume®, 50,000 psi
(optional) .....Galvanized**
Gage (standard) 24
(optional).....22†
Minimum roof slope .....1/2 : 12 w/o endlaps
.....1:12 w/endlaps

PANEL COATING & FINISH

Exposed exterior .....1 mil PVDF
Non-exposed interior.....0.5 mil primer/backer
Surface finish .....(STANDARD) Smooth††
.....(OPTIONAL) Embossed





* Consult CENTRIA for longer lengths.
**G90 galvanized steel not standard stock. Consult CENTRIA regarding delivery schedule.
† 22 ga. not stocked. Consult CENTRIA regarding delivery schedule.

††Oil canning within mil tolerances is not a cause for rejection.

COIL & FLAT SHEETS

Berridge owns and operates its own continuous coil-coating paint line to provide fast, responsive service for coil and flat sheets. A wide array of long-life Kynar 500® /Hylar 5000® Berridge colors are available pre-slit for portable roll forming or in flat sheet form for custom trim and flashing fabrication. Branch locations have a large inventory of 24 gauge painted flat sheets in all our standard colors and slit coil in popular widths and colors for immediate pick up.

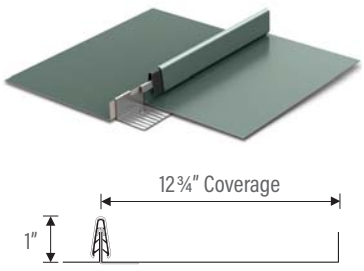
PORTABLE ROLL FORMERS

Berridge offers both factory-formed panels and a full-line of precision tolerance portable roll forming equipment to site-form standing seam roof panels. All Berridge portable roll formers are factory-set, dedicated profile machines that require no field adjustments. Site-formed panels require no end lap splices and are formed in continuous eave-to-ridge lengths. Roll formers are available for sale and for short-term or long-term lease.

STANDING SEAM ROOF SYSTEMS

TEE-PANEL

Straight, Curved and/or Tapered



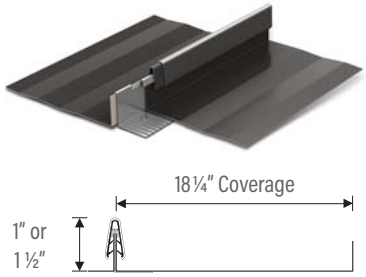
24 Gauge Steel
Limited Availability: 22 Gauge Steel, 0.032 Aluminum

Specifications
Uses: Roof, Fascia*
Coverage: 12¾"
Finishes: Smooth
Fasteners: Concealed
Applications: Solid sheathing
Seam: 1" snap-on with extruded vinyl weatherseal

* Fascia can not be curved or tapered

HIGH SEAM TEE-PANEL

Straight, Curved and/or Tapered



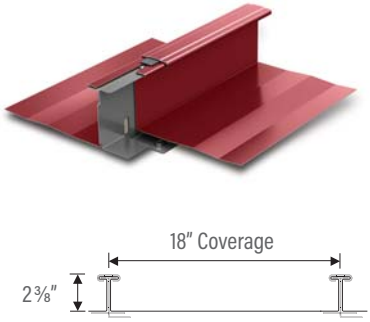
24 and 22 Gauge Steel
0.032 Aluminum

Specifications
Uses: Roof, Fascia*
Coverage: 18¼"
Finishes: Striated, optional smooth
Fasteners: Concealed
Applications: Solid sheathing
Seam: 1" or 1½" snap-on with extruded vinyl weatherseal

* Fascia can not be curved or tapered

TEE-LOCK PANEL

Straight



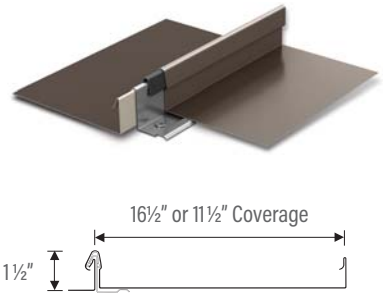
24 and 22 Gauge Steel
0.032 and 0.040 Aluminum

Specifications
Uses: Roofing, Fascia*
Coverage: 18"
Finishes: Striated, optional smooth
Fasteners: Concealed
Applications: Open framing, solid sheathing
Seam: 2⅜" standing mechanically seamed sidelap
Optional: Extruded vinyl weatherseal

* Requires flashing break from roof to fascia

CEE-LOCK PANEL

Straight



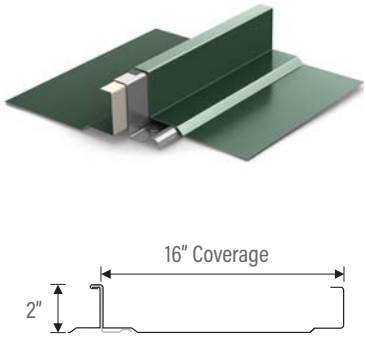
24 and 22 Gauge Steel
0.032 Aluminum

Specifications
Uses: Roof, Fascia
Coverage: 16½" or 11½"*
Finishes: Smooth, optional striations
Fasteners: Concealed
Applications: Solid sheathing
Seam: 1½" snap-lock seam
Optional: Extruded vinyl weatherseal

* Contact BMC for material availability. Not available with striations.

ZEE-LOCK PANEL

Straight, Curved or Tapered



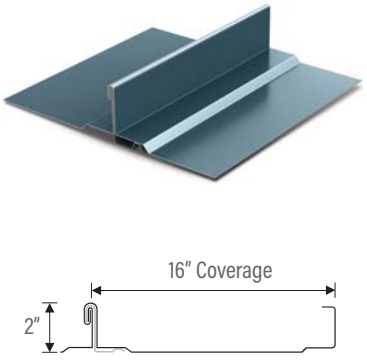
24 and 22 Gauge Steel
0.032 and 0.040 Aluminum**

Specifications
Uses: Roof, Fascia*
Coverage: 16"
Finishes: Smooth, optional striations
Fasteners: Concealed
Applications: Open framing, solid sheathing
Seam: 2" standing mechanically seamed sidelap
Optional: Extruded vinyl weatherseal on continuous rib, snap-on batten cap

* Fascia can not be curved or tapered
** Aluminum can not be curved or tapered

DOUBLE-LOCK ZEE-LOCK PANEL

Straight



24 Gauge Steel
0.032 and 0.040 Aluminum

Specifications
Uses: Roof, Fascia*
Coverage: 16"
Finishes: Smooth, optional striations
Fasteners: Concealed
Applications: Open framing, solid sheathing
Seam: 2" standing mechanically seamed sidelap

* Requires flashing break from roof to fascia