



PRODUCT SPECIFICATIONS

B & B Sheet Metal, 25-40 50th Avenue,
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EMAIL: info@bbsheetmetal.com
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SECTION 07 41 13 - METAL ROOF PANELS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes: [[Custom fabricated] [Manufactured]] [[standing seam, snap lock] [standing seam and batten] [mechanically seamed standing seam] [flat seamed]] metal panel system installed with concealed cleats including fasteners, cleats, metal trim, [snow guards,] [____], and other accessories.
- B. Related sections:
1. Section 06 10 00 - Rough Carpentry: Wood curbs, nailers, blocking, [plywood panel substrate] for metal roof panel system.
 2. Section 05 31 00 - Steel Decking: Structural steel roof deck substrate for metal panel roof system.
 3. Section 07 13 26 - Self-Adhering Sheet Waterproofing: Self-adhering sheet membrane applied as part of this Section to [plywood] [____] substrate as waterproofing for metal panel roof system.
 4. Section 07 21 13 - Board Insulation: Rigid board thermal insulation installed as part of this Section beneath metal panel roof system.
 5. Section 07 62 00 - Sheet Metal Flashings and Trim: General requirements for sheet metal flashings and trim for metal panel roof system provided and installed as part of this Section.
 6. Section 07 63 13 - Roof Drainage Sheet Metal: [Gutters,] [downspouts,] [leader and conductor heads,] [snow guards,] [____] installed to collect and convey water from metal panel roof system.
 7. Section [07 72 00 - Roof Accessories] [____]: Roof mounted [equipment curbs] [roof hatches] [smoke vents] [____] installed in metal roof panel system.
 8. Section 07 92 00 - Joint Sealants: Sealants and backing material used for installation of metal panel roof system.
 9. Section 07 63 16 - Ornamental Sheet Metal Roofing Specialties: Sheet metal [finials] [cupolas] [cornices] [____] installed in metal roof panel system.



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10. Section 08 62 20 - Sheet Metal Unit Skylights: Skylights installed in metal roof panel system.
11. Section 08 91 10 - Decorative Sheet Metal Louvers and Dormers: Louvered and glazed sheet metal dormers installed in metal roof panel system.

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 1. ASTM A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 2. Section A308 - Steel Sheet, Terne (Lead-Tin Alloy) Coated by Hot-Dip Process.
 3. ASTM A653 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by Hot-Dip Process.
 4. ASTM A792 - Sheet Steel, Aluminum-Zinc Alloy-Coated (Galvannealed) by the Hot Dip Process.
 5. ASTM B32 - Solder Metal.
 6. ASTM B101 - Lead-Coated Copper Sheet and Strip for Building Construction
 7. ASTM B209 - Aluminum and Aluminum-Alloy Sheet and Plate.
 8. ASTM B370 - Copper Sheet and Strip for Building Construction.
 9. ASTM D226 - Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
 10. ASTM E283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across Specimen.
 11. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
 12. ASTM E1592: Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.
- B. National Roofing Contractors Association (NRCA): NRCA Roofing Manual.



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- C. Sheet Metal and Air Conditioning Contractors National Association (SMACNA) – SMACNA Architectural Sheet Metal Manual.

1.3 PERFORMANCE REQUIREMENTS

- A. System to consist of fabricated sheet metal roof panels attached to a structural substrate to form a weathertight roof envelope.
- B. System to accommodate [[both] [curved] [and] [sloped] roof profiles] [and] [circular roof areas] [and] [rounded roof corners] as indicated on Drawings.
- C. Air infiltration: System to provide permanent resistance to air leakage of 0.09 CFM/SF of roof area when tested in accordance with ASTM E283 at static air pressure difference of 4 PSF.
- D. System shall have no measurable water penetration when tested in accordance with ASTM E331 at differential pressure of 20 percent minimum of inward acting windload and windload design pressure of 6.24 PSF minimum and 12.0 PSF maximum.
- E. Roof system, edge metal, and accessories and method of attachment shall be designed in accordance with ASTM E1592 and other applicable codes to adequately resist wind and uplift forces for roof configuration and Project location.
- F. System to accommodate movement of components without buckling, failure of joint seals, undue stress on fasteners, and other detrimental effects, when subjected to seasonal temperature ranges.
- G. System to accommodate tolerances of structure.

1.4 SUBMITTALS

- A. Submit in accordance with Section 01 33 00 - Submittal Procedures:
 - 1. Product data for roofing system, cleats, fasteners, trim, and other required accessories.
 - 2. Manufacturer's certification that roof system meets performance requirements specified in Paragraph 1.3.
 - 3. Manufacturer's certification of installer required by Paragraph 1.5.B.



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4. Shop drawings indicating dimensions, panel layout, method of anchorage, and details of eaves, [flashings,] [fascia,] [snow guard,] [_____] and joints with adjacent construction.
5. System samples:
 - a. 8 inches minimum length of panel with specified finish.
 - b. 8 inches minimum lengths of trim.
 - c. Hold-down cleat.

B. Copy of warranties required by Paragraph 1.8 for review by Architect.

1.5 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in standard and custom fabrication of sheet metal roofing systems with 5 years minimum successful, documented experience.
- B. Installer qualifications: Approved by manufacturer for installation of their roof systems and successfully installed 5 roof systems of similar scope which reflect high quality and weathertight installation.
- C. All roof system components shall be manufactured or provided by a single manufacturer.
- D. Roof system shall be designed, fabricated, and installed in accordance with:
 1. Applicable details and requirements published in NRCA Roofing Manual and SMACNA Architectural Sheet Metal Manual.
 2. Underwriters Laboratories, Inc. (UL): Class [A] [_____] Fire Hazard Classification.
 3. Factory Mutual Engineering Corporation (FM): Class [1] [_____] System with wind uplift for [I-60] [I-90] [_____] FM territory.
 4. [[ICC-International Building Code] [Florida Building Code] [Florida Dade County Code] [Code of authorities having jurisdiction for Project location] [_____].
- E. If roll forming on site is required to achieve continuous panel lengths and curved panels, operation of roll forming equipment shall be conducted by employee of manufacturer to ensure quality.



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1.6 PRE-INSTALLATION CONFERENCE

- A. In accordance with Section 01 31 00 - Project Management and Coordination convene pre-installation conference prior to commencing work of this Section.
- B. Review:
 - 1. Installation procedures
 - 2. Coordination with installation of flashings and other work.
 - 3. Availability of roofing materials.
 - 4. Preparation of substrate and penetrations through roof.
 - 5. Roof structure loading limitations.
 - 6. Weather conditions forecast.

1.7 STORAGE AND HANDLING

- A. Deliver panels and other components free of deformation and other damage. Package panels to protect against damage during transportation and handling.
- B. Store materials on platforms or pallets with weathertight covering. Provide ventilation. Ensure dryness. Avoid contact with material that might cause staining or other surface damage.
- C. Do not store on site for prolonged period.
- D. Handling: Avoid bending, gouging, scratching, and denting. Use cotton gloves when handling and installing unprotected panels in order to avoid soiling surface of panels.

1.8 WARRANTY

- A. Provide under provisions of Section 01 78 00 - Closeout Submittals:
 - 1. Manufacturer's [10] [_____] years materials and workmanship warranty for metal panel roof system.

B & B Sheet Metal provides different warranties for each of their factory applied finish coating systems. In some instances warranty length depends on color selected.



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Galvalume Plus - Steel sheet with a galvalume coating and an acrylic colored paint coating: 25 years warranty.

PermaColor 2000 - Galvanized steel, galvalume steel, or aluminum sheet with Kynar 500/Hylar 5000 fluorocarbon colored paint coating: 30 years warranty.

PermaMetalic 2000 - Galvanized steel, galvalume steel or aluminum sheet with Kynar 500/Hylar 5000 fluorocarbon colored paint coating: 20 years warranty.

Galvanized steel, galvalume steel, or aluminum with siliconized modified polyester colored coating: 15 years warranty.

2. Manufacturer's [15] [20] [25] [30] years warranty for factory applied metal finish against peeling, blistering, chalking, and fading.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. B & B Sheet Metal, Inc.
25-40 50th Avenue
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www.bbsheetmetal.com.
- B. Requests to use equivalent products of other manufacturers shall be submitted in accordance with Section 01 25 13 - Product Substitution Procedures.

2.2 MATERIALS

- A. Galvanized sheet steel: [24] [22] gauge thick zinc-coated steel sheet complying with ASTM A653.
- B. Galvanized sheet steel with fluoropolymer paint coating: [24] [22] gauge thick zinc-



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- coated steel sheet complying with ASTM A653 and pre-finished with fluoropolymer paint coating in [[metallic] [non-metallic] color selected by Architect from manufacturer's full range] [custom non-metallic color designated by Architect].
- C. Galvanized sheet steel with polyester paint coating: [24] [22] gauge thick zinc-coated steel sheet complying with ASTM A653 and pre-finished with polyester paint coating in [color selected by Architect from manufacturer's full range] [custom color designated by Architect].
 - D. Mill finished galvalume steel sheet: [24] [22] gauge thick sheet steel coated with an aluminum-zinc alloy in accordance with ASTM A792.
 - E. Acrylic coated galvalume steel sheet: [24] [22] gauge thick sheet steel coated with an aluminum-zinc alloy in accordance with ASTM A792 and an acrylic colored paint coating with [color selected by Architect from manufacturer's full range] [custom color designated by Architect]; Galvalume Plus as provided by B & B Sheet Metal.
 - F. Galvalume steel sheet with fluoropolymer paint coating: [24] [22] gauge thick steel sheet coated with an aluminum-zinc alloy in accordance with ASTM A792 and pre-finished with fluoropolymer paint coating in [[metallic] [non-metallic] color selected by Architect from manufacturer's full range] [custom non-metallic color designated by Architect].
 - G. Galvalume sheet steel with polyester paint coating: [24] [22] gauge thick zinc-coated steel sheet coated with an aluminum-zinc alloy in accordance with ASTM A792 and pre-finished with polyester paint coating in [color selected by Architect from manufacturer's full range] [custom color designated by Architect].
 - H. Copper sheet: Plain copper sheet complying with ASTM B370 and weighing [16] [20] ounces per square foot.
 - I. Pre-patinaed copper sheet: Copper sheet weighing [16] [20] ounces per square foot and complying with ASTM B370 with greenish-brown patina oxidation film; Evergreen Copper as provided by B & B Sheet Metal.
 - J. Lead-coated copper: Copper sheet with a thin lead coating complying with ASTM B101 and weighing [16] [20] ounces per square foot.
 - K. Zinc-coated copper: Copper sheet with a thin zinc coating complying with ASTM [_____] and weighing [16] [20] ounces per square foot; Freedom Gray Copper as provided by B & B Sheet Metal.
 - L. Stainless steel: [26] [24] gauge corrosion resistant chromium, tin, and steel alloy



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complying with ASTM A167.

- M. Terne-coated stainless steel: 26 gauge stainless steel sheet with a hot dipped lead and tin terne coating complying with ASTM A167 and ASTM A308.
- N. Aluminum sheet: [0.032] [0.040] inch thick aluminum sheet complying with ASTM B209 and [mill finished.] [finished with fluoropolymer paint coating in [[metallic] [non-metallic] color selected by Architect from manufacturer's full range] [custom non-metallic color designated by Architect] [finished with polyester paint coating in [color selected by Architect from manufacturer's full range] [custom color designated by Architect]].
- O. Sealant: [Silicone] [Polyurethane] [Acrylic] [_____] type specified in Section 07
92 00 - Joint Sealants.
- P. Solder: ASTM B32.

2.3 FACTORY APPLIED FINISHES

- A. Metal surfaces to receive factory applied coatings shall be free of scratches and other serious blemishes.

PermaColor 2000 Fluoropolymer Finish:

- B. Fluoropolymer non-metallic colored paint coating: 0.8 to 0.9 mill Kynar 500/Hylar 5000 polyvinylidene fluoride, low-gloss coating over a 0.2 to 0.3 mil urethane primer on finish side and primer and washcoat on reverse side of metal sheet; PermaColor 2000 as provided by B & B Sheet Metal in non-metallic [color selected by Architect from manufacturer's full range] [custom color designated by Architect].

PermaMetallic 2000 Fluoropolymer Finish:

- C. Fluoropolymer metallic colored paint coating: 0.8 to 0.9 mill metallic fluorocarbon 70 percent Kynar 500/Hylar 5000 polyvinylidene fluoride coating over a 0.2 to 0.3 mil urethane primer on finish side and primer and washcoat on reverse side of metal sheet; PermaMetallic 2000 as provided by B & B Sheet Metal in metallic color selected by Architect from manufacturer's full range.
- D. Polyester paint coating: Siliconized modified polyester colored thermoset paint coating; Siliconized Modified Polyester as provided by B & B Sheet Metal in [color selected by



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Architect from manufacturer's full range] [custom color designated by Architect].

Galvalume Plus.

- E. Acrylic coating: Acrylic based colored paint coating with [color selected by Architect from manufacturer's full range.] [custom color designated by Architect.]

2.4 ROOF SHEATHING

- A. Type: [CDX exterior grade] [_____] plywood [as specified in Section [06 10 00 - Rough Carpentry] [_____]].
- B. Thickness:
 - 1. Curved roof areas: Two [3/8] [_____] inch thick layers.
 - 2. Straight sloped roof areas: One [1/2] [_____] inch layer.

2.5 RIGID BOARD THERMAL INSULATION

- A. Type: [Closed cell polyisocyanurate insulation rigid board thermal insulation] [_____] [as specified in Section [07 21 13 - Rigid Board Insulation]].
- B. Minimum compressive strength: [20] [_____] PSI.
- C. Board size: [48 by 96] [48 by 48] [_____] inches.
- D. Long term thermal resistance (LTTR), R value: [7.25] [_____] per inch at 75 degrees F.

2.6 UNDERLAYMENT

- A. Underlayment: [Cold applied, self-adhering waterproof membrane composed of polyethylene film coated one side with rubberized asphalt adhesive as specified in Section 07 13 26 - Self-Adhering Sheet Waterproofing.] [30 pounds unperforated asphalt saturated felt complying with ASTM D226.] [_____] .

2.7 STANDING SEAM, SNAP LOCK METAL PANEL SYSTEMS

Snap Seam Metal Roof Panels.

- A. Type: Factory roll formed, snap-lock panel system with 1-7/8 inches high male standing



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seam, and 1-5/8 inches high female standing seam installed with concealed hold-down cleats; Snap Seam Metal Roof Panels as manufactured by B & B Sheet Metal.

1. Material: [[16] [20] gauge, [copper] [pre-patinaed copper] [lead-coated copper] [zinc-coated copper]] [[0.25] [0.32] [0.40] inch thick mill finished aluminum]].

Snap Seam Metal Roof Panel.

Standard width for is 16 inches. The panels can be custom fabricated in any width between 12 and 18 inches.

2. Nominal size: [16] [_____] inches wide by length to provide continuous span.

A1101 Integral Snap-Lock Metal Roof Panels.

- B. Type: Factory roll formed, snap-lock panel system with V-shaped 1-1/4 inches high male standing seam, and rounded female standing seam with horizontal mounting flange for attachment directly to roof deck without use of hold-down cleats; A1101 Integral Snap Seam Metal Roof Panels as manufactured by B & B Sheet Metal.

1. Material: [[16] [20] gauge, [copper] [pre-patinaed copper] [lead-coated copper] [zinc-coated copper]] [[0.32] [0.40] inch thick fluoropolymer paint coated aluminum]] [[24] [22] gauge thick, fluoropolymer paint coated galvanized steel sheet].

A1101 Integral Snap-Lock Metal Roof Panel.

Standard width for is 16 inches. The panels can be custom fabricated in any width between 12 and 18 inches.

2. Nominal size: [16] [_____] inches wide by length to provide continuous span.

S2000 Integral Snap-Lock Metal Roof Panels.

- C. Type: Factory roll formed, snap-lock panel system with 1-3/4 inches high standing seams; S2000 Integral Snap-Lock Metal Roof Panels as manufactured by B & B Sheet Metal.

1. Material: [[16] [20] gauge, [copper] [pre-patinaed copper] [lead-coated copper] [zinc-coated copper]] [[0.32] [0.40] inch thick fluoropolymer pain coated aluminum]] [[24] [22] gauge thick, fluoropolymer paint coated galvanized steel sheet].

2. Type: Factory roll formed, snap-lock panel system with 1-3/4 inches high standing



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seams; S2000 Integral Snap-Lock Metal Roof Panels as manufactured by B & B Sheet Metal.

B & B Sheet Metal Roof Panels may be provided with or without optional intermediate ribs or striations.

3. Profile: Flat panel with standing edge seams [and two intermediate [half round ribs] [V groove striations] equally spaced.

S2000 integral Snap-Lock Metal Panels

Standard width is 16 inches. The panels can be custom fabricated in any width between 12 and 18 inches.

4. Nominal size: [16] [_____] inches wide by length to provide continuous span.

2.8 STANDING SEAM METAL PANEL AND BATTEN SYSTEM

S2000 Integral Snap-Lock Metal Roof Panel with Snap-on Batten.

A. Type: Factory roll formed, snap-lock panel system with 1-3/4 inches high standing seams and channel-shaped snap-on batten; S2000 Integral Snap-Lock Metal Roof Panel with Snap-on Batten as manufactured by B & B Sheet Metal.

1. Material: [[16] [20] gauge, [copper] [pre-patinaed copper] [lead-coated copper] [zinc-coated copper]] [[0.32] [0.40] inch thick Kynar 500/Hylar 5000 coated aluminum]] [[24] [22] gauge thick, fluoropolymer coated galvanized steel sheet].

B & B Sheet Metal Roof Panels may be provided with or without optional intermediate ribs or striations.

2. Profile: Flat panel with standing edge seams [and two intermediate [half round ribs] [V groove striations] equally spaced.

S2000 Integral Snap-Lock Metal Panel with Snap-on Batten

Standard width is 16 inches. The panels can be custom fabricated in any width between 12 and 18 inches.

3. Nominal size: [16] [_____] inches wide by length to provide continuous span.
4. Batten cap: Channel shape fabricated from same material and finish as metal roof panel and anchored to standing seam with butterfly-type clips.



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Batten Seam Metal Roof Panels.

B. Type: Factory roll formed, standing seam metal panel system with L-shaped flanges on both sides installed with concealed hold-down cleats and flat flanged batten strips which slide over and interlock with standing seams of two adjacent panels; Batten Seam Metal Roof Panel as manufactured by B & B Sheet Metal.

1. Material: [[16] [20] gauge, [copper] [lead-coated copper] [zinc-coated copper]] [28 gauge thick, terne-coated stainless steel sheet].

B & B Sheet Metal Roof Panels may be provided with or without optional intermediate ribs or striations.

2. Profile: Flat panel with [_____] inches high L-shaped standing seams each edge [and two intermediate [half round ribs] [V groove striations] equally spaced.

Batten Seam Metal Roof Panels

Standard width is 16 inches. The panels can be custom fabricated in any width between 12 and 18 inches.

3. Nominal size: [16] [_____] inches wide by length to provide continuous span.

The flat batten cap can be provided in various face widths.

4. Batten cap: [_____] inches wide flat strip with hemmed flanges designed to interlock flanges of two adjacent standing seam roof panels and fabricated from same material and finish as metal roof panels.

2.9 MECHANICALLY SEAMED METAL PANEL SYSTEM

S2500 2" Mechanically Seamed Metal Roof Panel.

A. Type: Factory roll formed, standing seam metal roof panel with 2 inches high J-shaped flanges on each side designed to interlock flange of adjacent panel, to be anchored to roof substrate with concealed hold-down cleats, and to be mechanically seamed with [90 degrees single lock] [180 degrees double lock]; S2500 2" Mechanically Seamed Metal Roof Panel System as manufactured by B & B Sheet Metal.



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1. Material: [[16] [20] gauge, [copper] [pre-patinaed copper] [lead-coated copper] [zinc-coated copper]] [[0.32] [0.40] inch thick Kynar 500/Hylar 5000 coated aluminum]] [[24] [22] gauge thick, fluoropolymer coated galvanized steel sheet] [[24] [22] gauge thick [mill finished galvalume steel sheet] [acrylic coated galvalume steel sheet] [fluoropolymer coated galvalume steel sheet]].

B & B Sheet Metal Roof Panels may be provided with or without optional intermediate ribs or striations.

2. Profile: Flat panel with 2 inches high L-shaped standing seams each edge [and two intermediate [ribs] [V groove striations] equally spaced.

S2500 2" Mechanically Seamed Metal Roof Panels.

Standard width is 16 inches. The panels can be custom fabricated in any width between 12 and 18 inches.

3. Nominal size: [16] [_____] inches wide by length to provide continuous span.

Standing Pre-Fold Seam Metal Roof Panels.

B. Type: Factory roll formed, standing seam metal roof panel with 1 inches high flanges on each side and hemmed flat flanges at top and bottom of panel. Flanges are designed to interlock flange of adjacent panel, to be anchored to roof substrate with concealed hold-down cleats, and to be mechanically seamed with [90 degrees single lock] [180 degrees double lock]; Standing Pre-Fold Seam Metal Roof Panel as manufactured by B & B Sheet Metal.

1. Material: [[16] [20] gauge, [copper] [pre-patinaed copper] [lead-coated copper] [zinc-coated copper]] [[0.32] [0.40] inch thick Kynar 500/Hylar 5000 coated aluminum]] [[24] [22] gauge thick, fluoropolymer coated galvanized steel sheet].
2. Profile: Flat panel with 1 inch high J-shaped flange on one side, 1 inch high L-shaped flange on other side, hemmed flange folding under panel at bottom edge of panel, and hemmed flange folding over top of panel.

Standing Pre-Fold Seam Metal Roof Panels

Standard width is 16 inches. The panels can be custom fabricated in any width between 12 and 18 inches.



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3. Nominal size: [16] [_____] inches wide by length to provide continuous span.

Standing Seam Metal Roof Panel.

- C. Type: Factory roll formed, standing seam metal roof panel with 1 inch high J-shaped flange on one side and L-shaped lunge on other side designed to interlock flange of adjacent panel, to be anchored to roof substrate with concealed hold-down cleats, and to be mechanically seamed with [90 degrees single lock] [180 degrees double lock]; Standing Seam Metal Roof Panel System as manufactured by B & B Sheet Metal.
1. Material: [[16] [20] gauge, [copper] [pre-patinaed copper] [lead-coated copper] [zinc-coated copper]] [[0.32] [0.40] inch thick Kynar 500/Hylar 5000 coated aluminum]] [[24] [22] gauge thick, fluoropolymer coated galvanized steel sheet].

Standing Seam Metal Roof Panels

Standard width is 16 inches. The panels can be custom fabricated in any width between 12 and 18 inches.

2. Nominal size: [16] [_____] inches wide by length to provide continuous span.

Standing Tapered Seam Metal Roof Panel System.

- D. Type: Factory roll formed, standing seam, trapezoidal, metal roof panel with 1 inch high J-shaped flange on one side and 1 inch high L-shaped flange on other side designed to interlock flange of adjacent panel, to be anchored to roof substrate with concealed hold-down cleats, and to be mechanically seamed with [90 degrees single lock] [180 degrees double lock]; Standing Tapered Seam Metal Roof Panel System as manufactured by B & B Sheet Metal.
1. Material: [[16] [20] gauge, [copper] [pre-patinaed copper] [lead-coated copper] [zinc-coated copper]] [[0.32] [0.40] inch thick Kynar 500/Hylar 5000 coated aluminum]] [[24] [22] gauge thick, fluoropolymer coated galvanized steel sheet].
2. Panel shape: Trapezoidal panels with varying width to accommodate circular roof areas or rounded roof corners. Provide left-tapered, right tapered, and double center tapered panels as indicated on Drawings and reviewed shop drawings and as required to accommodate roof configuration.

Standing Tapered Seam Metal Roof Panel

Each will have a top width and a larger bottom width not exceeding 18 inches. Required shapes and sizes should be shown and Drawings. Contact B & B Sheet Metal for assistance in determining sizes and panel layout for circular roof areas and rounded corners requiring



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tapered standing seam panels.

3. Nominal size: Varying widths and lengths as indicated on Drawings and reviewed shop drawings and as required to accommodate roof configuration.

Standing Transverse Seam Metal Roof Panel.

E. Type: Factory roll formed, standing seam metal roof panel with 1 inch high J-shaped flange on one side and L-shaped flange on other side designed to interlock flange of adjacent panel, to be anchored to roof substrate with concealed hold-down cleats, and to be mechanically seamed with [90 degrees single lock] [180 degrees double lock] and provided with an attached upright flange extending across width of panel to slow flow of rainwater and to retain snow; Standing Transverse Seam Metal Roof Panel System as manufactured by B & B Sheet Metal.

1. Material: [[16] [20] gauge, [copper] [pre-patinaed copper] [lead-coated copper] [zinc-coated copper]] [[0.32] [0.40] inch thick Kynar 500/Hylar 5000 coated aluminum]] [[24] [22] gauge thick, fluoropolymer coated galvanized steel sheet].

Standing Transverse Seam Metal Roof Panels

Standard width is 16 inches. The panels can be custom fabricated in any width between 12 and 18 inches.

2. Nominal size: [16] [_____] inches wide by length to provide continuous span.

1-1/2 Inch Double Lock Curved Standing Seam Metal Roof Panel.

F. Type: Factory roll formed, curved, standing seam metal roof panel with 1-1/2 inches high J-shaped flange on one side and 1-1/2 inches high L-shaped flange on other side designed to interlock flange of adjacent panel, to be anchored to roof substrate with concealed hold-down cleats, and to be mechanically seamed with 180 degrees double lock; 1-1/2 Inch Double Lock Curved Standing Seam Metal Roof Panel System as manufactured by B & B Sheet Metal.

1. Material: [[16] [20] gauge, [copper] [pre-patinaed copper] [lead-coated copper] [zinc-coated copper]] [[0.32] [0.40] inch thick Kynar 500/Hylar 5000 coated aluminum]] [[24] [22] gauge thick, fluoropolymer coated galvanized steel sheet].

1-1/2 Inch Double Lock Standing Seam Metal Roof Panels

Standard width is 16 inches. The panels can be custom fabricated in any width between 12 and 18 inches.



PRODUCT SPECIFICATIONS

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2. Nominal size: [16] [_____] inches wide by length to provide continuous span.

1-1/2 Inch Double Lock Standing Seam Metal Roof Panels

Minimum radius for forming is 30 inches.

3. Panel curvature radius: [_____] inches.

1 Inch Double Lock Curved Standing Seam Metal Roof Panel.

- G. Type: Factory roll formed, curved, standing seam metal roof panel with 1 inch high J-shaped flange on one side and 1 inch high L-shaped lunge on other side designed to interlock flange of adjacent panel, to be anchored to roof substrate with concealed hold-down cleats, and to be mechanically seamed with 180 degrees double lock; 1 Inch

Double

Lock Curved Standing Seam Metal Roof Panel System as manufactured by B & B Sheet Metal.

1. Material: [[16] [20] gauge, [copper] [pre-patinaed copper] [lead-coated copper] [zinc-coated copper]] [[0.32] [0.40] inch thick Kynar 500/Hylar 5000 coated aluminum]] [[24] [22] gauge thick, fluoropolymer coated galvanized steel sheet].

1 Inch Double Lock Standing Seam Metal Roof Panels.

Standard width is 16 inches. The panels can be custom fabricated in any width between 12 and 18 inches.

2. Nominal size: [16] [_____] inches wide by length to provide continuous span.

1 Inch Double Lock Standing Seam Metal Roof Panels

Minimum radius for forming is 30 inches.

3. Panel curvature radius: [_____] inches.

2.10 FLAT SEAM METAL ROOF PANEL SYSTEM

Flat Seam Metal Roof Panels.

- A. Type: Factory formed flat seam, interlocking panels to be held in place by cleats, interlocked with adjacent panel seam flanges, and seam flattened with a mallet; Flat Seam Metal Roof Panel System as manufactured by B & B Sheet Metal.

1. Material: [[16] [20] gauge, [copper] [lead-coated copper] [zinc-coated copper]] [26] gauge thick, terne-coated stainless steel sheet].



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2. Shape: Rectangular.

Flat Seam Metal Roof Panels

Standard size is 22-1/2 by 16-1/2 inches. The panels can be custom fabricated in other sizes.

3. Nominal size: 22-1/2 by 16-1/2 inches.
4. Profile: Panels to have 3/4 inch wide hemmed flanges on all sides. One side and one end flange shall be folded on top surface of panel and other two flanges to be folded onto back surface as detailed on Drawings. Miter cut flange corners at 45 degrees.
5. Provide special sizes and profiles as indicated on Drawings and reviewed shop drawings to accommodate eaves, ridges, corners, penetrations, panel intersections, terminations with other materials, and other special conditions. Form with flat flanged hems similar to other flat seam panels.

Flat Pretinned Seam Metal Roof Panels.

B. Roof panels: Formed flat seam, interlocking panel with the seam edges pre-tinned with a lead-tin solder alloy to allow flat panel joints to be soldered only by heat application; Flat Pretinned Seam Metal Roof Panel System manufactured by B & B Sheet Metal.

1. Material: [[16] [20] gauge, [copper] [lead-coated copper] [zinc-coated copper]] [26] gauge thick, terne-coated stainless steel sheet].
2. Shape: Rectangular.

Flat Seam Metal Roof Panels.

Standard size is 22-1/2 by 16-1/2 inches. The panels can be custom fabricated in other **sizes**.

3. Nominal size: 22-1/2 by 16-1/2 inches.
4. Profile: Panels to have 3/4 inch wide hemmed flanges on all sides.
 - a. One side and one end flange shall be folded on top surface of panel and other two flanges to be folded onto back surface as detailed on Drawings.
 - b. Miter cut flange corners at 45 degrees.
 - c. Seam edges pre-tinned with a lead-tin solder alloy to allow flat panel joints to be



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soldered only by heat application.

- d. Panels designed to be held in place by cleats, interlocked with adjacent panel seam flanges, seams flattened with a mallet, and sealed by soldering
5. Provide special sizes and profiles as indicated on Drawings and reviewed shop drawings to accommodate eaves, ridges, corners, penetrations, panel intersections, terminations with other materials, and other special conditions. Form with flat flanged hems similar to other flat seam panels.

2.11 ACCESSORIES

- A. Hold-down cleats: [Copper] [Galvanized steel] concealed type attachment cleat that does not require any penetration of panels. Provide both one-piece fixed cleat and two-piece floating cleat assembly as required and shown on reviewed shop drawings to allow for thermal movement of installed metal roof panel system.
- B. Fasteners: Self tapping with cap plate of type, size, and spacing as recommended by roofing system manufacturer to meet requirements specified in Paragraph 1.3.
- C. [Gutters,] [closure pieces,] [valley flashing,] [ridge caps,] [_____] and other trim: Same material, thickness, and finish as panel. Break form to profiles shown on Drawings and reviewed shop drawings in accordance with requirements of Section 07 62 00 - Sheet Metal Flashings and Trim.
- D. Sealants: [As recommended by roof panel manufacturer for specific application.] [As specified in Section 07 92 00 - Joint Sealants.]
- E. Tape sealant: [Butyl type.] [As recommended by roof panel manufacturer for specific application.]

2.12 GENERAL FABRICATION

- A. Fabricate metal roof panels to profiles and dimensions indicated on Drawings and reviewed shop drawings.
- B. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- C. Linear components: Form in longest possible lengths with 8 foot as minimum.



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- D. Intersections: Cope to fit accurately and solder.
- E. Soldering: Clean and tin materials. Completely fill seams with solder. Soldering on exposed finished surfaces shall be neat, full flowing, and smooth. After soldering, remove flux and wipe and wash joints clean.
- F. Interlocking seams of metal roof panels shall have factory applied continuous bead of mastic on inside face to ensure weathertightness of panel joints.
- G. Make provisions for thermal expansion and contraction of metal roof panels to prevent distortion, damage, or failure to prevent water penetration.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Coordinate installation of metal roof panel system with installation of other components to ensure timely execution of work and sequencing to ensure weathertightness of roof system.
- B. Verify that roof framing and [steel] deck is complete, braced, and ready to receive standing seam roof system.
 - 1. Check squareness of roof deck by measuring diagonals from eave to ridge to confirm similar diagonals are identical.
 - 2. Verify maximum variation of roof plane is 1/4 inch.
 - 3. Verify roof deck is clean and dry.
- C. Report deficiencies to Architect and do not proceed until all deficiencies have been addressed.

3.2 RIGID INSULATION INSTALLATION

- A. Apply rigid board thermal insulation board to [steel] [_____] roof deck. Total thickness of rigid thermal insulation shall be [[_____] inches.] [as required to provide minimum R value of [30.00] [_____.] [as indicated on Drawings.]
- B. Lay insulation boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.



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- C. Apply no more insulation than can be covered by roofing in same day.

3.3 PLYWOOD SUBSTRATE

- A. Install plywood sheathing to receive metal roof panel system:
 - [1. Curved roof areas: Mechanically attach two 3/8 inch thick layers to structural [steel deck]. Stagger joints between layers.
 - [2. Straight sloped roof areas: Mechanically attach one 1/2 inch layer to structural [steel deck].]
- B. Mechanically fasten plywood [and rigid board insulation] to steel deck using manufacturer's recommended fastening pattern.
- C. Ensure plywood substrate is properly installed with all edges supported and secured.
 - 1. Substrate shall be clean, dry, smooth, and free of voids, sharp edges, loose splinters, oil, grease, and other materials.
 - 2. Fasteners shall be flush with surface of substrate.

3.4 UNDERLAYMENT INSTALLATION

- A. Install underlayment on complete [plywood] roof substrate in accordance with manufacturer's instructions.
- B. Prior to installation, remove dirt, loose fasteners and other protrusions from roof surface.
- C. Self adhered sheet waterproofing underlayment: Install over roof sheathing [for complete roof area.] [for roof valleys and as [24] [_____] inches wide strip at perimeter at edge of roof.]
 - 1. Apply underlayment membrane in fair weather at temperatures of 40 degrees F or higher in accordance with Section 07133 - Self Adhering Sheet Waterproofing.
 - 2. Start installation at lower edge of roof. Install underlayment perpendicular to or across roof slope with 4 inches minimum side laps and 6 inches minimum end laps.
 - 3. Supplement adhered application with nail and plastic cap mechanical fasteners of type, size and spacing as recommended by membrane manufacturer.
- D. Asphalt felt underlayment: Install one ply over complete roof area] [including over self-



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adhered sheet waterproofing installed at roof valleys and roof perimeter.]

- E. Do not leave underlayment membrane exposed for lengthy period of time. Exercise care not to puncture or tear underlayment barrier with subsequent roofing operations.

3.5 ROOF PANEL INSTALLATION

- A. Install panels and related components in accordance with manufacturer's instructions and standards of workmanship as published by SMACNA.
- B. Field cutting: If necessary to field cut roof panels or trim, use snips, nibblers, or electric-powered shears. Cut panels with bottom side up to prevent cutting contacting finished panel surface. After cutting, immediately brush panels to remove shavings.
- C. Install starter and edge flashings prior to panels.
- D. Do not allow panels or trim to come in contact with dissimilar materials.
- E. Select fasteners and space hold-down cleats to accommodate requirements of Paragraph 1.3.E. Locate first and last fastening cleats 3 inches minimum from panel ends. Align intermediate fastening clips at recommended spacing.

A1101 Integral Snap-Lock Metal Roof Panels.

- F. Anchor male standing seam of panel to substrate with hold-down cleat fastened to substrate. Place next panel so that female seam snap-locks onto male flange. Anchor other flange of second panel with hold-down cleats in preparation to receive subsequent panel.

A1101 Integral Snap-Lock Metal Roof Panel.

- G. Anchor horizontal flange extending from male standing seam of panel directly to substrate without hold-down cleats. Place next panel so that female seam snap-locks onto male flange. Anchor horizontal flange of second panel with fasteners preparation to receive subsequent panel.

S2000 Integral Snap-Lock Metal Roof Panels with Snap-On Batten.

- H. After snap-lock panels have been installed, place channel shaped battens over standing seams and secure with butterfly-type clips.

Batten Seam Metal Roof Panels.



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- I. Place roof panels with separation between panel flanges to accommodate width of flat batten. Anchor panels to substrate with hold-down cleats. After roof panels have been installed, slide flat batten over standing seams yo interlock panels.
- J. Anchor panel to substrate with cleat installed over male leg and attached to substrate. Place subsequent panel so that female flange interlocks with cleats and flange of adjacent panels.
- K. Permanently fasten roof panels by mechanically locking seams with an electric seamer. [Single lock seam with single pass of seamer.] [Double lock seam with two passes of seamer.]

Flat Seam Metal Roof Panel Systems.

- L. Sequence: Install panels from bottom of roof to top with staggered joints. Ensure panels are level, plumb, and accurately aligned with structure and adjacent components.
- M. Initial panel: Install panel to substrate over underlayment. Secure with hold-down cleats on one side and one end. Interlock cleats with flanged panel hems.
- N. Subsequent panels: Diagonally slide subsequent panel in place. Interlock two bottom flanged hems with two top flanged hems of previously installed panel. Secure remaining two edges with hold-down cleats.
- O. After panel is in place and flanges interlocked with flanges of adjacent panel, flat flanges with mallet to produce flat seam.
- P. Continue procedure to install additional panels in shingle fashion. Ensure seams are flat and joints are aligned in both directions.

Flat Pretinned Metal Roof Panels.

- Q. After seams have been flattened, solder seam by applying heat to flattened, pretinned joint.
- R. Do not install bent, dented, or scratched roof panels. Remove and replace panels damaged during installation.

3.6 TRIM INSTALLATION

- A. Install flashings, fascias, valley flashings, ridge caps, show guards and other trim as detailed on Drawings and reviewed shop drawings and as required to ensure



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weathertightness [and in accordance with Section 07 62 00 - Sheet Metal Flashings and Trim.]

3.7 CLEANING AND PROTECTION

- A. Remove site cuttings from finished surfaces and adjacent roof areas.
- B. Touch up minor scraped or damaged paint with factory supplied paint in matching color.
- C. Leave panels and trim free from excess sealant, grease, finger marks, and dirt.
- D. Do not allow traffic on completed roof. If necessary, provide cushioned walk boards.

END OF SECTION