SECTION 07 4113

FORMED METAL ROOF PANELS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metal roof panels mounted above membrane roof.

B. Related Documents and Sections: Examine Contract Documents for requirements that directly affect or are affected by Work of this Section. Other Documents and Sections that directly relate to work of this Section include, but are not limited to:

1. General provisions of the Contract, including General and Supplementary Conditions, and Division 01 General Requirements Specification Sections.
2. Section 07 4213 - FORMED METAL WALL PANELS
3. Section 07 4213.16 - METAL PLATE WALL PANELS
4. Section 07 4243 - COMPOSITE METAL WALL PANELS
5. Section 07 4247 - HIGH PERFORMANCE GFRC WALL PANELS
6. Section 07 5556 - FLUID-APPLIED MEMBRANE ROOFING.
7. Section 07 6200 - SHEET METAL FLASHING AND TRIM.

1.2 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 1592:

1. Snow Loads: As indicated on the Drawings.
2. Wind Loads: As indicated on Drawings.
3. Deflection Limits: For wind loads, no greater than 1/240 of the span.

B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, metal panel Installer, metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal panels, including installers of roof accessories and roof-mounted equipment.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review methods and procedures related to metal panel installation, including manufacturer's written instructions.
4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.

5. Review flashings, special details, drainage, penetrations, equipment curbs, and condition of other construction that affect metal panels.
6. Review temporary protection requirements for metal panel systems during and after installation.
7. Review procedures for repair of metal panels damaged after installation.
8. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.4 SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

B. Shop Drawings:

1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches (1:10).

C. Samples for Initial Selection: For each type of metal panel indicated with factory-applied color finishes.

1. Include similar Samples of trim and accessories involving color selection.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:

1. Metal Panels: 12 inches long by actual panel width. Include fasteners, closures, and other metal panel accessories.

E. Quality Assurance Submittals:

1. Qualification Data: For Installer.
2. Product Test Reports: For each product, for tests performed by a qualified testing agency.
3. Field quality-control reports.
4. Sample Warranties: For special warranties.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with SMACNA standard details and requirements.

B. Field formed panels are not allowed.

C. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.

1. Exterior Fire-Test Exposure: UL 790 Class A.

D. Fabricator and Installer Qualifications: Company specializing in metal roof panel installations with minimum five years documented experience and approved by manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Retain strippable protective covering on metal panels during installation.

1.7 COORDINATION

A. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.

B. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
    a. Structural failures including rupturing, cracking, or puncturing.
    b. Deterioration of metals and other materials beyond normal weathering.
2. Warranty Period: Two years from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
    a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
    b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
    c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
2. Finish Warranty Period: 10 years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 ROOF PANELS

A. Basis-of-Design Product: The design for the metal roof panels is based on the following:

1. Manufacturer: AEP Span.
2. Subject to compliance with requirements, other acceptable manufacturers with comparable products are the following:
    a. Metal Sales Manufacturing Corporation.
    b. Centria Architectural Systems.
    c. Firestone Metal Products, LLC.

3. Product: As selected by the Architect.

2.2 PANEL MATERIALS

A. Steel sheet 24 Gauge, 50 KSI yield point, 52 KSI tensile strength, with Galvalume finish per ASTM A-792-83, AZ50, topcoat shall be manufacturer's standard clear acrylic coating.

1. Colors: As selected by the Architect from manufacturer's full range of standard and premium colors.

B. Profile and Panel Coverage: As indicated on the Drawings, mechanically seamed.

2.3 ACCESSORIES

A. Slip Sheet: ASTM D 226, Type II, No. 30 asphalt saturated roofing felt.

B. Self-Adhering, High Temperature, Polyethylene-Faced Sheet Underlayment: ASTM D 1970, 0.030 inch thick composite waterproofing sheet with polyolefin film laminated to rubberized asphalt.

1. Product: Subject to compliance with requirements, provide one of the following or approved:
   a. Carlisle Coatings & Waterproofing Inc., Div. of Carlisle Companies Inc.; CCW WIP 300HT.
   b. GCP Applied Technologies; Grace Ultra.
   c. Henry Company; Blueskin PE200 HT.

C. Flashing and Trim: Formed from metal matching panels. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent painted metal panels.

2.4 SHOP FABRICATION

A. General: Coordinate roofing work with the work of Section 076200 - FLASHING AND SHEET METAL.

B. Form sections true to shape, accurate in size, square, and free from distortion or defects.

C. Form panels in full length where possible.

D. Adjust individual panel widths to equalize areas rather than finishing with one odd sized panel.

E. Sheet Metal Accessories: Fabricate flashing and trim to comply with recommendation in SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of item indicated.

1. Fabricate each metal flashing section in 10 foot runs.

PART 3 EXECUTION

3.1 EXAMINATION

A. Inspect roof deck substrate to verify substrates are dry, free of snow or ice, clean and smooth, free of depressions, waves, or projections, and roof deck is properly sloped.

B. Verify field dimensions are as indicated in shop drawings prior to fabrication.

3.2 PREPARATION

A. Install flashings and other sheet metal to comply with requirements of Section 076000 - FLASHING AND SHEET METAL.

3.3 INSTALLATION - GENERAL

A. Apply roof underlayment in single layer from eave to ridge, laid perpendicular to slope; weather lap edges 4 inches and nail in place. Minimize nail quantity.

B. Insulate dissimilar metal and incompatible surfaces with No. 30 felt, or by painting each surface of contact with bituminous coating.

C. Seal metal joints watertight.

3.4 ROOF PANEL INSTALLATION

A. Lay sheets with long dimension perpendicular to eaves. Apply pans beginning at eaves.

B. Fully engage interlocking seams.

C. Lap joints minimum 6 inches in direction of drainage.

3.5 CLEANING AND REPAIRING

A. Replace damaged and defective panels and trim.

B. Touch-up damaged paint.

C. Fill exposed openings with closure gaskets or elastomeric sealants.

1. Remove excess sealant materials from panel joints.

D. Sweep clean panels, flashing and gutters.

END OF SECTION

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