

**SECTION 07 41 13  
METAL ROOF PANELS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Architectural roofing system of preformed steel panels.
- B. Fastening system.
- C. Factory finishing.
- D. Accessories and miscellaneous components.

**1.02 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Storage and handling requirements and recommendations.
  - 2. Installation methods.
  - 3. Specimen warranty.
- C. Shop Drawings: Include layouts of roof panels, details of edge and penetration conditions, spacing and type of connections, flashings, underlayments, and special conditions.
  - 1. Show work to be field-fabricated or field-assembled.
- D. Selection Samples: For each roofing system specified, submit color chips representing manufacturer's full range of available colors and patterns.
- E. Warranty: Submit specified manufacturer's warranty and ensure that forms have been completed in Owner's name and are registered with manufacturer.

**1.03 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in the manufacture of roofing systems similar to those required for this project, with not less than 5 years of documented experience.
- B. Installer Qualifications: Company trained and authorized by roofing system manufacturer.

**1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Store roofing panels on project site as recommended by manufacturer to minimize damage to panels prior to installation.

**1.05 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Finish Warranty: Provide manufacturer's special warranty covering failure of factory-applied exterior finish on metal roof panels and agreeing to repair or replace panels that show evidence of finish degradation, including significant fading, chalking, cracking, or peeling within specified warranty period of 5 year period from date of Substantial Completion.
- C. Waterproofing Warranty: Provide manufacturer's warranty for weathertightness of roofing system, including agreement to repair or replace roofing that fails to keep out water within specified warranty period of 5 years from date of Substantial Completion.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Design is based on S-Deck, manufactured by Berridge Manufacturing Co.; [www.berridge.com](http://www.berridge.com).
- B. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 ARCHITECTURAL ROOF PANELS**

- A. Performance Requirements: Provide complete engineered system complying with specified requirements and capable of remaining weathertight while withstanding anticipated movement of substrate and thermally induced movement of roofing system.

- B. Metal Roofing: Factory-formed panels with factory-applied finish.
  - 1. Steel Panels:
    - a. Zinc-coated steel conforming to ASTM A653/A653M; minimum G60 galvanizing.
    - b. Steel Thickness: Minimum 24 gauge
  - 2. Texture: Smooth.
  - 3. Width: Maximum panel coverage of 32 inches.

### **2.03 ATTACHMENT SYSTEM**

- A. Exposed System: Provide manufacturer's recommended hot-dipped galvanized steel fasteners engineered to meet performance requirements and equipped with appropriate sealant separators to provide weathertight connections that will accommodate anticipated thermal movement.

### **2.04 PANEL FINISH**

- A. Fluoropolymer Coating System: Manufacturer's standard multi-coat thermocured coating system, including minimum 70 percent fluoropolymer color topcoat with minimum total dry film thickness of 0.9 mil; color and gloss as selected by Architect from manufacturer's standard color range.

### **2.05 ACCESSORIES AND MISCELLANEOUS ITEMS**

- A. Miscellaneous Sheet Metal Items: Provide flashings, gutters, downspouts, trim, moldings, and closure strips of the same material, thickness, and finish as used for the roofing panels. Items completely concealed after installation may optionally be made of stainless steel.
- B. Rib and Ridge Closures: Provide prefabricated, close-fitting components of steel with corrosion resistant finish or combination steel and closed-cell foam.
- C. Snow Guards: Alpine Snowguards: Product #30CL; [www.alpinesnowguards.com](http://www.alpinesnowguards.com)
  - 1. Substitutions: See Section 016000 - Product Requirements
- D. Sealants: As specified in Section 07 90 05.
  - 1. Exposed sealant must cure to rubber-like consistency.
  - 2. Concealed sealant must be non-hardening type.

### **2.06 FABRICATION**

- A. Panels: Fabricate panels and accessory items at factory, using manufacturer's standard processes as required to achieve specified appearance and performance requirements.

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

- A. Coordinate roofing work with provisions for roof drainage, flashing, trim, penetrations, and other adjoining work to assure that the completed roof will be free of leaks.
- B. Separate dissimilar metals by applying a bituminous coating, self-adhering rubberized asphalt sheet, or other permanent method approved by roof panel manufacturer.
- C. Where metal will be in contact with wood or other absorbent material subject to wetting, seal joints with sealing compound and apply one coat of heavy-bodied bituminous paint.

### **3.02 INSTALLATION**

- A. Overall: Install roofing system in accordance with approved shop drawings and panel manufacturer's instructions and recommendations, as applicable to specific project conditions. Anchor all components of roofing system securely in place while allowing for thermal and structural movement.
  - 1. Install roofing system with exposed fasteners prefinished to match panels.
  - 2. Minimize field cutting of panels. Where field cutting is absolutely required, use methods that will not distort panel profiles. Use of torches for field cutting is absolutely prohibited.
- B. Accessories: Install all components required for a complete roofing assembly, including flashings, gutters, downspouts, trim, moldings, closure strips, preformed crickets, caps, equipment curbs, rib closures, ridge closures, and similar roof accessory items.

- C. Roof Panels: Install panels in strict accordance with manufacturer's instructions, minimizing transverse joints except at junction with penetrations.
  - 1. Provide sealant tape or other approved joint sealer at lapped panel joints.

**3.03 CLEANING**

- A. Clean exposed sheet metal work at completion of installation. Remove grease and oil films, excess joint sealer, handling marks, and debris from installation, leaving the work clean and unmarked, free from dents, creases, waves, scratch marks, or other damage to the finish.

**3.04 PROTECTION**

- A. Do not permit storage of materials or roof traffic on installed roof panels. Provide temporary walkways or planks as necessary to avoid damage to completed work. Protect roofing until completion of project.
- B. Touch-up, repair, or replace damaged roof panels or accessories before date of Substantial Completion.

**END OF SECTION**

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**SECTION 07 62 00**  
**SHEET METAL FLASHING AND TRIM**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Fabricated sheet metal items, including flashings, counterflashings, gutters, and downspouts.
- B. Reglets and accessories.

**1.02 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Meeting: Convene one week before starting work of this section.
- B. Require attendance of all parties directly affecting work of this section. Notify the Architect one week prior to the scheduled meeting.
- C. Review conditions of installation, installation procedures, and coordination with related work.

**1.03 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
- C. Samples: Submit two sample sets 2x2 inch in size illustrating Manufacturer's full range of metal finish colors available.
- D. Sample Warranty: Submit sample of Manufacturer's standard 20 year finish warranty.

**1.04 QUALITY ASSURANCE**

- A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual requirements and standard details, except as otherwise indicated.
- B. Fabricator and Installer Qualifications: Company specializing in sheet metal work with 5 years of documented experience.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- B. Prevent contact with materials that could cause discoloration or staining.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Pre- Finished Sheet Metal
  1. Berridge Manufacturing Company; [www.berridge.com](http://www.berridge.com) (Basis of Design)
  2. Petersen Aluminum; [www.pac-clad.com](http://www.pac-clad.com)
  3. Englert, Inc.; [www.englertinc.com](http://www.englertinc.com)
  4. Substitutions: See Section 01 6000 - Product Requirements.

**2.02 SHEET MATERIALS**

- A. Pre-Finished Steel: ASTM 792-08, Grade 40 Steel with ASTM A792, AZ-55 aluminum-zinc alloy coating (Galvalume); 24 GA. minimum 0.02 inch (24 GA) thick base metal, shop pre-coated with PVDF coating.
  1. PVDF (Polyvinylidene Fluoride) Coating: Kynar 500, with a top side dry film thickness of 0.75 +/- 0.05 mil over 0.20 +/- .05 mil prime coat, with a total top side dry film thickness of 0.95 +/- 0.10 mil. Bottom side coated with primer and urethane coating for a total dry film thickness of 0.35 +/- 0.05 mil.
  2. Color: As selected by Architect from manufacturer's full range of standard colors.

**2.03 ACCESSORIES**

- A. Fasteners: Same material and finish as flashing metal.
- B. Underlayment: ASTM D226, organic roofing felt, Type II ("No. 30").

- C. Primer: manufacturers recommended type.
- D. Protective Backing Paint: manufacturers recommended type.
- E. Sealant: Specified in Section 079005.
- F. Plastic Cement: ASTM D4586, Type I.
- G. Reglets: Surface mounted type, galvanized steel; face and ends covered with plastic tape.

#### **2.04 FABRICATION**

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Fabricate cleats of same material as sheet, minimum 4 inches wide, interlocking with sheet.
- C. Form pieces in longest possible lengths with a minimum of 5'-0" and a maximum of 10'-0".
- D. Hem exposed edges on underside 1/2 inch; miter and seam corners.
- E. Joints and seams: Use locks and seams recommended by appropriate SMACNA standard for item being joined. Set in compatible sealant as specified in Section 079005. Allow joint to move.
- F. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
- G. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.

#### **2.05 GUTTER AND DOWNSPOUT FABRICATION**

- A. Downspouts and Gutters: Size and profile indicated on drawings.
- B. Accessories: Profiled to suit downspouts and scuppers.
  - 1. Anchorage Devices: In accordance with SMACNA requirements.
  - 2. Gutter Supports: Brackets.
  - 3. Downspout Supports: Brackets.
- C. Downspout Shoes: Cast iron, Neenah 4929, with extension, basis of design. Size shown on drawings.
- D. Seal metal joints.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
- B. Verify roofing termination and base flashings are in place, sealed, and secure.

#### **3.02 PREPARATION**

- A. Install starter and edge strips, and cleats before starting installation.
- B. Install surface mounted reglets true to lines and levels. Seal top of reglets with sealant.
- C. Back paint concealed metal surfaces other than stainless steel with protective backing paint to a minimum dry film thickness of 15 mil. Manufacturers standard back paint on pre-finished sheet metal items are acceptable in lieu of field back painting.

#### **3.03 INSTALLATION**

- A. Conform to drawing details and/ or SMACNA standards, whichever is most stringent.
- B. Insert flashings into reglets to form tight fit. Secure in place with malleable wedges. Seal flashings into reglets with sealant specified in Section 07 90 05.
- C. Secure flashings in place using concealed cleats and fasteners, unless otherwise detailed.
- D. Apply plastic cement compound between metal flashings and felt flashings.
- E. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- F. Seal metal joints watertight with sealant specified in Section 079005.

- G. Secure gutters and downspouts in place using concealed fasteners where possible, unless detailed otherwise.
- H. Slope gutters 1/4 inch per 10 feet, minimum.
- I. Connect downspouts to downspout shoes. Seal connection watertight.

**3.04 FIELD QUALITY CONTROL**

- A. See Section 01 40 00 - Quality Requirements, for field inspection requirements.
- B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

**END OF SECTION**

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**SECTION 07 90 05**  
**JOINT SEALERS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Sealants and joint backing and bond breakers.

**1.02 ADMINISTRATIVE REQUIREMENTS**

- A. Coordinate the work with other sections referencing this section.

**1.03 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, and color availability.
- C. Samples: Submit two samples, 1/4 inch dia x 2 inch in size illustrating manufacturers full range of sealant colors for Architect selection.
- D. Sample Warranty: Submit sample of Manufacturer's and Installer warranty to be executed upon completion of work.
- E. Manufacturer's Installation Instructions: Indicate special procedures, surface preparation, and perimeter conditions requiring special attention.

**1.04 QUALITY ASSURANCE**

- A. Maintain one copy of each referenced document covering installation requirements on site.
- B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum ten years documented experience.
- C. Applicator Qualifications: Company specializing in performing the work of this section with minimum five years documented experience.

**1.05 MOCK-UP**

- A. Provide mock-up of sealant joints in conjunction with wall and weather barrier under provisions of Section 01 40 00. Coordinate with mock-up specified in Section 04 20 00.
- B. Construct mock-up with specified sealant types and with other components noted.
- C. Locate where directed.
- D. Mock-up may not remain as part of the Work.

**1.06 FIELD CONDITIONS**

- A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

**1.07 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective work within a two year period after Date of Substantial Completion.
- C. Manufacturer and Installer Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal and watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

**PART 2 PRODUCTS**

**2.01 SEALANTS**

- A. Type E-1 - General Purpose Exterior Sealant: Polyurethane; ASTM C920, Grade NS, Class 25, Uses M, G, and A; single or multi- component.
  - 1. Color: To be selected by Architect from manufacturer's standard range.
  - 2. Applications: Use for:
    - a. Control, expansion, and soft joints in masonry.

- b. Joints between concrete and other materials.
  - c. Joints between metal frames and other materials.
  - d. Other exterior joints for which no other sealant is indicated.
- B. Type I-1 - General Purpose Interior Sealant, Acrylic Emulsion Latex: ASTM C834, Type OP, Grade NF, single component, non-staining, non-bleeding, non-sagging, capable of being painted.
- 1. Color: To be selected by Architect from manufacturer's standard range.
  - 2. Applications: Use for:
    - a. Interior wall and ceiling control joints.
    - b. Interior joints between door and window frames and wall surfaces.
    - c. Other interior joints for which no other type of sealant is indicated.
- C. Type E2 - Butyl Sealant: ASTM C920, Grade NS, Class 12-1/2, Uses NT, M, A, G, O; single component, solvent release, non-skinning, non-sagging.
- 1. Color: To be selected by Architect from manufacturer's standard range.
  - 2. Applications: Use for:
    - a. Concealed sealant bead in sheet metal work.
- D. Type E-3 - Concrete Paving Joint, Self-Leveling Polyurethane Sealant: ASTM C920, Grade P, Class 25, Uses T, I, M, A, O; multi- component, chemical curing, non staining, non bleeding, self-leveling type.
- 1. Color: Color as selected.
  - 2. Applications: Use for:
    - a. Joints in sidewalks and vehicular paving.
- E. Type I-2 - Bathroom/Tile Sealant: Silicone; ASTM C920, Uses I, M and A; single component, mildew resistant.
- 1. Applications: Use for:
    - a. Joints between plumbing fixtures and floor and wall surfaces.
    - b. Joints between kitchen and bathroom countertops and wall surfaces.
- F. Type G-1 - Silicone Sealant: ASTM C920, Grade NS, Class 25, Uses NT, A, G, M, O; single component, solvent curing, non-sagging, non-staining, fungus resistant, non-bleeding.
- 1. Color: To be selected by Architect from manufacturer's standard range.
  - 2. Movement Capability: Plus and minus 25 percent.
  - 3. Service Temperature Range: -65 to 180 degrees F.
  - 4. Shore A Hardness Range: 15 to 35.
  - 5. Applications: Use for:
    - a. All glazing operations.

## 2.02 ACCESSORIES

- A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
- B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- C. Joint Backing: Round foam rod compatible with sealant; ASTM D 1667, closed cell PVC; oversized 30 to 50 percent larger than joint width; Standard backer rod manufactured by Sandell Manufacturing Company, Inc; [www.sandellmfg.com](http://www.sandellmfg.com).
- D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.
- B. Verify that joint backing and release tapes are compatible with sealant.

### **3.02 PREPARATION**

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean and prime joints in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Protect elements surrounding the work of this section from damage or disfigurement.

### **3.03 INSTALLATION**

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with ASTM C1193.
- C. Mask joints if necessary to keep adjacent surfaces not scheduled to receive sealant clean.
- D. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer.
- E. Install bond breaker where joint backing is not used.
- F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- G. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- H. Tool joints flush.

### **3.04 TESTING AND INSPECTION**

- A. Furnish an Independent testing agency to cut out and remove installed sealant joints in six (6) locations per side of building, each approximately one (1) linear foot. Locations will be randomly selected by the testing agency or Architect. The work will be checked by the testing agency for compliance with the contract documents in accordance with ASTM C1193. If defective work is found in any of the test locations, additional tests may be required of the contractor at no additional cost to the owner. If any test section removed reveals non-complying work, remove all adjacent sealant work to the point where work is found to be in compliance. Re-seal in accordance with the contract documents. If all tests fail to meet the contract document requirements, the Contractor shall be required to re-seal the entire section of the building at no additional cost to the Owner. Provide lifts or other acceptable means of access to the work.

### **3.05 CLEANING**

- A. Clean adjacent surfaces of excess sealant and smears as a result of this work, before the sealant cures.
- B. Repair joints that have shrunk, sagged, run, and that have thin spots or other defects.
- C. Leave adjacent surfaces in as good or better condition as they were before sealant operations.

### **3.06 PROTECTION**

- A. Protect sealants until cured.

### **3.07 SCHEDULE**

- A. See Drawings for designated sealant joints.
- B. Exterior Joints for Which No Other Sealant Type is Indicated: Type E-1.
- C. Control and Expansion Joints in Paving: Type E-3.
- D. Exterior Wall Expansion Joints: Type E-1.
- E. Joints Between Concrete Panels and Between Panels and Adjacent Work: Type E-1.
- F. Control, Expansion, and Soft Joints in Masonry, and Between Masonry and Adjacent Work: Type E-1.
- G. Lap Joints in Exterior Sheet Metal Work: Type E-2.
- H. Joints Between Exterior Metal Frames and Adjacent Work: Type E-1.

- I. Under Exterior Door Thresholds: Type E-1.
- J. Interior Joints for Which No Other Sealant is Indicated: Type I-1; .
- K. Control and Expansion Joints in Interior Concrete Slabs and Floors: Type E-3.
- L. Joints Between Plumbing Fixtures and Walls and Floors, and Between Countertops and Walls:  
Type I-2.
- M. All Glazing Joints: Type G-1.

**END OF SECTION**