

**SECTION 07 61 16
COPPER STANDING SEAM ROOFING**

SPEC WRITER NOTES:

1. Use this section only for NCA projects.
2. Delete between //_____// if not applicable to project. Also delete any other item or paragraph as required and renumber the paragraphs.
3. Coordinate flashing conditions where galvanized trim or flashing comes in contact with copper elements; strong dielectric separation required.

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies the installation of standing seam copper roofing and all related flashing for complete installation.

1.2 RELATED WORK

- A. Sealant: Section 07 92 00, JOINT SEALANTS.

1.3 DESIGN REQUIREMENTS

- A. Provisions of Thermal Movement:

1. Fabricate and install metal roofing systems to provide for expansion and contraction of component materials without buckling, hole elongation, fastener failure or excess stress loading situations developing at any time during temperature cycle.
2. Set allowance for ambient temperature at time of installation.
3. Design and install clips to resist rotation and to avoid shear stress when roofing material expands and contracts.

- B. Uplift Resistance: Fabricate and install copper roofing system to resist design negative pressure of 90 lbs.; clips, fasteners and clip spacing corresponds to required design negative pressure with a minimum factor of safety of 3.

- C. Standing seams to be 25 mm (1 inch) high double lock seams // 300 mm (12 inches) // 410 mm (16 inches) // 460 mm (18 inches) // on centers.

1.4 SUSTAINABILITY REQUIREMENTS

- A. Materials in this section may contribute towards contract compliance with sustainability requirements. See Section 01 81 11, SUSTAINABLE DESIGN REQUIRMENTS, for project // local/regional materials, // low-emitting materials, // recycled content, // _____// requirements.

1.5 INSTALLATION REQUIREMENTS

- A. Install in accordance with SMACNA Architectural Sheet Metal Manual except as otherwise shown or specified.

1.6 SUBMITTALS

- A. Shop Drawings: Show details of construction and installation; thickness and kind of material, closures, flashing, fastenings and related components and accessories.
1. Shop drawings to reference design requirements and review of engineering.
- B. Material Certification: Provide documentation to demonstrate material compliance with requirements of the section.

1.7 PRE-INSTALLATION CONFERENCE

- A. Convene a meeting on site, after submittals are received and approved but before any work, to review drawings and specifications, submittals, schedule, manufacturer instructions, site logistics and pertinent matters of coordination, temporary protection, governing regulations, tests and inspections; participants to include RE/COR and all parties whose work is effected or related to the work of this section.

1.8 APPLICABLE PUBLICATIONS

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by the basic designation only. Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.

SPEC WRITER NOTES:

1. Remove reference citations that do not remain in Part 2 or Part 3 of edited specification.
2. Verify and make dates indicated for remaining citations the most current at date of submittal; determine changes from date indicated on the TIL download of the section and modify requirements impacted by the changes.

- B. American Society for Testing and Materials (ASTM):

B32-20	Solder Metal
B370-22	Copper Sheet and Strip for Building Construction
D226/D226M-17	Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing

C. Sheet Metal and Air Conditioning Contractors National Association
(SMACNA): Architectural Sheet Metal Manual - 2012

PART 2 - PRODUCTS

SPEC WRITER NOTES:

1. Make material requirements agree with applicable requirements specified in the referenced Applicable Publications. Update and specify only that which applies to the project.

2.1 SHEET COPPER

- A. ASTM B370 cold-rolled temper H00; 99.9 percent pure copper.
1. Roof Panels: //16//20//ounce.
 2. Flashings, Edge Strips and Cladding: //16//20//ounce.

2.2 FLASHING CEMENT

- A. ASTM D2822, Type I.

2.3 SOLDER

- A. ASTM B32: Flux type and alloy composition as required for use with metals to be soldered.

2.4 ROOFING FELT

- A. ASTM D226, Type II, No. 30.

2.5 SLIP SHEET

- A. Rosin sized building paper weighing minimum 4 pounds per 100 square feet.

2.6 FASTENINGS

- A. Concealed Cleats: 16 oz. copper or 0.018 stainless steel, fixed or expansion type, as required; design cleats to prevent hook unwind.
- B. Fasteners: All fasteners in contact with copper must be copper, brass or Series 300 stainless steel; fasteners for concealed cleats to be stainless steel screws (nails are not acceptable).

2.7 ACCESSORIES

- A. Provide components required for a complete roofing system, including // trim, // copings, // fascias, // corner units, // ridge closures, // clips, // gutters, // closure strips, // and similar items.
- B. Clips used with panel width greater than 305 mm (12 inches) must be made from multiple pieces with the allowance for the total thermal movement required to take place within the clip.
- C. Fabricate accessories of type and thickness of sheet copper complying with Copper Development Association (CDA) publication CDA A4050, Copper

in Architecture - Design Handbook; sealant in accordance with CDA A4050.

2.8 FABRICATION

- A. Fabricate panels to longest lengths practical.
- B. Fabricate panels to use concealed fasteners; exposed fasteners in roofing panels are prohibited.
- C. Form to shapes and dimensions shown, free from defects which impair strength or mar appearance.
- D. Form planes and lines to true alignment.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Follow SMACNA manual except as otherwise specified here.
- B. Roofing Surface:
 - 1. Clean and dry before application.
 - 2. Cover surface with roofing felt and a slip sheet of building paper with seams lapped 100 mm (4 inches); remove and replace wet slip sheet.
 - 3. Use copper nails driven through sheet copper washers not less than 25 mm (1-inch) square.
 - 4. Take care to insure that slip sheet completely isolates the underlayment from the copper.
- C. Install cleats over slip sheets at spacing determined by engineered design.
- D. Flash roof penetrations with material matching roof panels and make watertight by soldering.
- E. Set roofing components true to line and accurately fit together to form leak-proof joints.
- F. Form exposed surfaces flat and free of buckles, waves, and tool marks.
- G. Seams to be uniform and neat with minimum of solder, welds and sealant.
- H. Field cutting of panels by torch is not permitted.
- I. Seams:
 - 1. Mechanically seam to 5 ply double lock, finished 25 mm (1 inch) high.
 - 2. Transverse Seams:
 - a. Four-ply common lock with capillary breaks, two-inch width, minimum.
 - b. Low pitch (less than 6 in 12, but more than 3 in 12):

1) Fold top edge of lower panels over, solder 25 mm (1 inch) wide continuous locking strip parallel to and 100 mm (4 inches) below top edge.

2) Fold bottom edge of upper panel under and engage locking strip.

3. Ridge: Interlocked standing seams or ridge cap.

3.2 JOINING

A. Solder seams where required to produce watertight joints. Completely remove flux after soldering is completed.

B. Edges of copper required to be soldered must be tinned with solder for a width of 38 mm (1-1/2 inches).

C. Joints in copper up to 560 g (20 ounce) weight may be soldered.

D. Jointing of copper over 560 g (20 ounce) weight must be done by lapping, riveting and soldering. Space rivets 75 mm (3 inches) on center in two rows in a staggered position.

3.3 CLEANING

A. As work progresses, neutralize excess flux with 5 percent to 10 percent washing soda solution and thoroughly rinse.

B. Leave work clean, and free of stains, scrap and debris.

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