

# *Snap-Lock*

## *Standing Seam Metal Roofing*

### *Guide Specifications*

*Conforming to C.S.I. Standards*



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# ***Snap-Lock Standing Seam Guide Specifications***

This Guide Specification is intended to be used as a basis for the development of an office master specification or in the preparation of specifications for a particular project. In either case, this Guide Specification must be edited to fit the conditions of use. Particular attention should be given to the deletion of inapplicable provisions. Include necessary items related to a particular project. Include appropriate requirements when blank spaces have been provided.

## **Section 07410 - Preformed Roofing Panels**

### **PART I-GENERAL**

#### **1.01 SECTION INCLUDES:**

The work includes, but is not necessarily limited to providing all labor, materials, tools, equipment and services to furnish and install metal roofing, wall panels/siding, including soffit, flashing, trim and such other accessories to make the system complete and weathertight, as indicated on the drawings and specified herein.

**1.02 RELATED SECTIONS** (to be coordinated with other trades by the successful contractor under this section).

Edit for project conditions. Section Numbers indicated are those recommended by CSI Masterformat; revise if Numbers differ from those used in Project Manual.

#### A. FOR APPLICATIONS OVER **PLYWOOD DECKING** (edit as required)

1. Section 06100: Rough Carpentry
2. Section 06100: Structural Lumber Supports
3. Section 06181: Structural Glue Laminated Lumber Supports
4. Section 06200: Finish Carpentry
5. Section 07200: Thermal Insulation
6. Section 07250: Fireproofing
7. Section 07500: Membrane Roofing
8. Section 07620: Sheet Metal Flashing and Trim
9. Section 07700: Roof Specialties and Accessories
10. Section 07800: Skylights
11. Section 07900: Joint Sealants not specified herein
12. Section 09900: Finish Painting not specified herein

#### B. FOR APPLICATIONS OVER **METAL DECKING WITH RIGID INSULATION** (edit as required).

1. Section 05100: Structural Steel
2. Section 05200: Steel Joists
3. Section 05300: Structural Metal Roof and Metal Decking
4. Section 05500: Miscellaneous Fabricated Steel
5. Section 05580: Sheet Metal Fabrication
6. Section 07200: Insulation
7. Section 07200: Fireproofing
8. Section 07500: Membrane Roofing
9. Section 07600: Sheetmetal Gutters and Downspouts
10. Section 07620: Sheet Metal Flashing and Trim
11. Section 07900: Joint Sealants not specified herein
12. Section 09900: Finish Painting not specified herein
13. Section 07700: Roof Specialties and Accessories
14. Section 07800: Skylights
15. Section 07900: Joint Sealers TRI/OSP-2000:01/01/96

### 1.03 PERFORMANCE REQUIREMENTS

#### A. TESTING AND CERTIFICATION

##### 1. Wind Uplift: UL 580 Test:

24 gauge panels rated **UL Class 90** (Construction #359 and 359-A) when installed over minimum 16 gauge steel purlins, with roof fastener clips spaced 4'0" on center maximum using UL clips. The roof panel manufacturer must also subscribe to Underwriter's Laboratories' "Follow Up Service" assuring continuing product compliance with UL requirements.

UL certification does not indicate panel suitability for actual project conditions. *Snap-Lock* is tested in a structural condition for maximum uplift exposure. However, Summit Pacific Metal Sales promotes the application *Snap-Lock* over a solid substrate.

NOTE: UL 580 rating is for 12", 16", and 18" width panels only.

##### 2. Air Infiltration ASTM E283-73:

a. No greater than 0.014 CFM/Ft<sup>2</sup> at a test pressure of 1.57 PSF and 0.009 CFM/Ft<sup>2</sup> at a test pressure of 6.24 PSF, with optional sealant.

##### 3. Water Resistance: Panel to meet the following standard when tested in accordance with ASTM E331-70:

a. When tested for 5 gallons per minute spray for 15 minutes duration at each test pressure of 1.57 PSF, 6.24 PSF, 12.5 PSF, and 15.1 PSF, there shall be no evidence of water penetration.

##### 4. Flame Spread: Panel to meet the following standard when tested in accordance with ASTM E-84-87:

a. Panel shall display a flame-spread classification of Class 1, "0" fuel contribution.

##### 5. Static Differential Test: Panel to meet the following standard when tested in accordance with ASTM E-330:

a. Panel shall be tested to conform to the requirements of the modified ASTM E-330 static pressure differential test.

### 1.04 REFERENCES

#### A. The following references shall be used:

1. SMACNA (Sheet Metal and Air Conditioning Contractors National Association, Inc.) Architectural Sheet Metal Manual.
1. NRCA (The National Roofing Contractors Association) Roofing and Waterproofing Manual (including Construction Details), Handbook of Accepted Roofing Knowledge, and Metal Roofing Details Guide.
2. Manufacturer's Installation and Details Guide.
3. AISC Steel Construction Manual.
4. AISI Cold Formed Steel Design Manual.

### 1.05 SUBMITTALS

#### A. PRODUCT DATA

1. Submit manufacturer's technical product data, installation instructions and recommendations for the roofing. Include data substantiating that materials comply with requirements.

#### B. SAMPLES

1. Before ordering products, submit manufacturer's standard color samples for Architect's/Engineer's selection.
2. Before starting work, submit [quantity] 12" long panel samples showing shape and a representative color chip for Architect's/Engineer's acceptance.

#### C. SHOP DRAWINGS

1. Shop drawings are to be a small-scale layout of roof plan and elevation, indicating the extent of work to be performed. Include sections of roof, fascia, walls, siding and soffits, for each condition, detailing flashing and trim for different conditions, such as eaves, outside/inside corners, ridge, valleys, gutters, end wall terminations, closures, etc., showing a full and complete installation that comply with manufacturer's standard recommendations.
2. Describe all proposed details that deviate from what is shown on the plans.
3. Details to allow for expansion and contraction.
4. Show securement of panels and clips, spacing, type and number of fasteners, as recommended by the Manufacturer.

D. SITE CONDITIONS

1. Provide completed site condition form for the specified finish to suit actual project conditions.
  
1. Wind Uplift: The roof system manufacturer shall provide an attachment schedule signed by a professional Engineer licensed in the area where the work will be performed and supporting calculations to resist the following uplift loads:
  - a. Uplift loads as calculated using the 199[\_\_\_] Edition of the UBC with a [\_\_\_\_\_] mph basic wind speed, Exposure Factor [\_\_\_\_\_] , and importance Factor [\_\_\_\_\_].

On more complex roofs, a roof plan showing the areas of discontinuity (perimeter & corner zones) should be provided by the Engineer of Record.

Item 2 is for snow load applications only.

2. Drag Loading: The roof panel manufacturer shall provide an attachment schedule signed by a licensed Professional Engineer and supporting calculations to resist drag loads induced by a snow load of [\_\_\_\_\_] psf.

**1.05 QUALITY ASSURANCE**

A. INSTALLER'S QUALIFICATIONS

1. Installer must be approved by the panel manufacturer in writing before work commencing.
2. Installer shall meet the following:
  - a. Successfully applied five metal roofs of comparable size and complexity that reflect a quality and weather tight installation.
  - b. Have been in business for a minimum period of 5 years in the region where the work will be performed.

B. MANUFACTURER'S QUALIFICATIONS

1. Manufacturer shall have a minimum of 6 years experience supplying metal roofing to the region where the work is to be done.
2. Comply with current independent testing and certification as specified.
3. Manufacturer shall provide proof of liability insurance for their metal roof system.

C. REGULATORY AGENCY REQUIREMENTS

1. Comply with UBC and local Building Code requirements if stricter than those specified herein.
2. Compliance with certification must be submitted with bid.

**1.06 PRODUCT DELIVERY, STORAGE AND HANDLING**

- A. Unload and store materials at job site to protect them from any damage and discoloration. Follow Manufacturer's material handling information, especially regarding long panel lengths.
- B. Inspect delivered materials immediately. Prevent any interference with other trades or other adverse work conditions.
- C. Handle panels with non-marring slings.
- D. Do not bend panels.
- E. Store panels on skids above ground, with one end elevated for drainage.
- F. Protect material with waterproof covering and allow for sufficient ventilation to prevent condensation build up or moisture entrapment in the materials.
- G. If panels become wet, immediately separate sheets, wipe dry with clean cloth, and allow to air dry.

**1.07 PROJECT CONDITIONS**

- A. Examine the conditions and substrates in which metal roofing work is to be installed. Substrate shall be installed level, flat and true to avoid panel stresses. Slope must be a minimum 3/12.
- B. The contractor shall take field measurements of the structure and substrates indicated and specified to ensure that panel lengths and brakeformed flashings are dimensioned accurately to facilitate easy installation.
- C. Proceed with roofing installation only after satisfactory conditions are met and all field conditions have been verified.
- D. Allow for sufficient trimming of panel units at eaves, valleys, and gables before fabrication.

#### 1.08 WARRANTY

##### A. MANUFACTURER'S PRODUCT WARRANTY

- 1. Manufacturer's standard coating performance warranty, as available for specified installation and environmental conditions. (Contact a Summit Pacific Metal Sales' representative to determine actual warranty criteria.)

##### B. CONTRACTOR'S WARRANTY

- 1. Warrant panels, flashings, sealants, fasteners and accessories against defective materials and/or workmanship, to remain watertight and weatherproof with normal usage for two (2) years following project substantial completion date. Such repairs to be performed at no cost to the building owner.

### PART 2 - PRODUCTS

#### 2.01 ACCEPTABLE MANUFACTURER

- A. **Summit Pacific Metal Sales**, 2911 Lake Forest Road, P. O. Box 6928, Tahoe City, CA 96145. Phone: 530/583-8888, 800/338-6763 FAX: 530/583-7777
- B. Panel Designation: **Snap-Lock Standing Seam**; also known as the "ENGLERT Series 2000 1-3/4" Architectural Snap Lock Standing Seam." See Sweet's Catalog Section 7410 ENG.

Panel pan profile shall be: [Choose one:]

- 1. "P" Series: has two minor stiffener beads "pencil ribs" equidistant between the seams.
  - 2. "M" Series (Microline): has subtle striations along the panel.
  - 3. "S" Series (Smooth): smooth panel with no stiffener beads or striations.
- C. ALTERNATES: Approval of substitute systems is required before bid. The Architect will be the sole judge of what qualifies as an "equal" system. To be approved as an equal system, submit or respond to all items in "Quality Assurance," "Performance Requirements" and "Submittal" sections of this specification. All submittals must be received in the Architect's office a minimum of ten (10) working days before bid.

#### 2.02 MATERIALS

##### A. PANELS

- 1. Base Metal
  - a. Material: Steel conforming to ASTM A-792 Grade D, minimum yield 40 KSI, 52 KSI Tensile Strength, thickness 24 gauge.
  - b. Protective Coating: Zincalume® AZ50 conforming to ASTM A-792, Galvalume®, or G-90 Hot-dipped galvanized finish.

2. Finish:
  - a. Exterior finish includes a 0.2 mil thick corrosion-resistant primer and a 0.8 mil thick finish coat of Polyvinylidene Fluoride (PVF<sub>2</sub>), full strength 70% Kynar 500®/Hylar 5000® for a total of 1.0 mil dry film thickness. See Section 2.05 Paint Finish.
3. Color: [Choose one]
  - a. Provide Manufacturer's standard selection of not less than seven standard low gloss colors. Specular gloss to be 15 ±4 @ 85° per ASTM D-523.
  - b. Custom color as selected by Architect to be [\_\_\_\_\_].
4. Configuration:
  - a. Standing Seam: Roof panels shall consist of integral self-locking standing seams 1-3/4" high spaced 18" on center, (Note: 10", 12" and 16" available as non-standard widths).

Note: Because of the inconsistencies in the base steel tolerances, alloys and the galvanizing process of light gauge steel products, and uneven substrates over which they are applied, it is commonly accepted in the industry that a certain amount of waviness, or "oil canning," may be evident in the rollformed product. This is more evident with longer and wider panels, and is reduced when Low-Gloss paint finishes are used. Oil canning shall not be construed as a product defect and shall not be cause for product refusal.

**B. ACCESSORIES**

- Fastener Clips: [Choose one] Spacing per Manufacturer's recommendation.
- a. 18 gauge galvanized steel, 40 ksi yield strength, 3-1/2" long double fastener type.
  - b. 18 gauge galvanized steel, 40 ksi yield strength, 2" long single fastener type.
1. Fasteners:
    - a. Per manufacturer recommendation.
  2. Sealants:
    - a. Gunnable Grade Caulking: Single component urethane caulk.
    - b. Tape Sealant: Butyl.
  3. Bearing Plate:
    - a. 22 gauge 4" x 6" galvanized steel bearing plate.

NOTE: Bearing plate is only required for applications over rigid insulation with attachment to deck.

4. Stiffeners
  - a. Provide 18 gauge steel stiffeners in areas subject to ice and snow build-up to reduce the likelihood of damage. Stiffeners to have provisions for not less than six fasteners and must have adjacent oval offset dimples to provide support and fastener relief.

**C. FLASHING**

1. Material, gauge and finish to match panels. Do not use lead or copper.
  - a. FABRICATION
    1. Unless otherwise shown on drawings or specified herein, fabricate panels in continuous one-piece lengths and fabricate flashings and accessories in longest practical lengths.
    2. Roofing panels shall be factory formed. Field formed panels when necessary for long length panels, special handling, etc.

**2.05 PAINT FINISH**

**A. FILM THICKNESS**

1. Topside Finish: Primer shall be .2-.3 mil. Full strength 70% Kynar 500 top coat shall be .8 - .9 mil. Reverse side finish shall be .2 - .3 mil primer with a wash coat. Total dry film thickness for the coating system shall be 1.00 mil nominal. All measurements per NCCA Technical Bulletin II-4 or ASTM D1005-84.

**B. SPECULAR GLOSS**

1. Standard Low Gloss colors to have a specular gloss of 15 ±4 @ 85° per ASTM D-523.

**C. ACCELERATED WEATHERING:**

1. (2000 Hours) Type D apparatus. No crack, peel, blister, or loss of adhesion per ASTM G-23.

**D. CHALKING**

1. No chalking greater than #8 rating (#10 = No Chalk) per ASTM D-659.

**E. COLOR CHANGE**

1. Less than 5 NBS units per ASTM D-2244.

- F. SALT SPRAY
  - 1. (750 Hours) Blister Rating = 10 (None), per ASTM B-117.
- G. HUMIDITY TEST
  - 1. (1000 Hours) No cracking or blistering per ASTM D-2247.
- H. FORMABILITY TEST
  - 1. 1/8" mandrel, no visible fracturing at 180° bend per ASTM D-522.
- I. IMPACT RESISTANCE
  - 1. Direct and reverse, 1.5 times metal thickness in mils expressed in inch lbs., with no loss of adhesion per ASTM D-2794.
- J. ABRASION RESISTANCE
  - 1. Exceeds 100 liters of falling sand with Oxythane primer, per ASTM D-968.
- K. FLAMMABILITY TEST
  - 1. "0" Fuel Contribution per ASTM E-84.
- L. MORTAR RESISTANCE
  - 1. No effect on finish per ASTM C-267.

## **PART 3-EXECUTION**

### **3.01 INSPECTION**

- A. Existing Conditions
  - 1. Verify substrate is uniform, even and symmetrical by running a string test. Inspect to assure that all purlins or sub-structure/ framing members are flat and insulation is embedded symmetrically so when the metal panels are applied, they will not appear wavy or distorted.
  - 2. Provide a written report of discrepancies or variations in the substrate to the Architect.
  - 3. Do not begin installation until unsatisfactory conditions are corrected.
  - 4. Do not proceed with installation until adjoining areas scheduled for stucco treatment have been stuccoed and washed down. Do not wash down acid residues from stucco directly over the metal panels.
  - 5. Commencement of installation shall signify acceptance of the substrate and adjacent conditions as being proper and acceptable for treatment of roofing.
  - 6. After beginning installation, submit approximately 500 square feet of product in place for Architect's approval, before proceeding with substantial work.

#### **3.01.1 PREPARATION**

- A. FIELD MEASUREMENTS
  - 1. Verify prior to fabrication.
  - 2. If field measurements differ from drawing dimensions, notify Architect/Engineer prior to fabrication.
- B. PROTECTION
  - 1. Treat, or isolate with protective material, any contacting surfaces of dissimilar materials to prevent electrolytic corrosion.
  - 2. Require workers who will be walking on roofing panels to wear clean, soft-soled work shoes that will not pick up stones or other abrasive material, which could cause damage and discoloration.
  - 3. Protect work of other trades against damage and discoloration.
- C. SURFACE PREPARATION
  - 1. Clean and dry surfaces prior to applying sealant.

### **3.02 INSTALLATION**

- A. PANELS
  - 1. Follow roof panel manufacturer's directions.
  - 2. Remove any strippable film coating before installation. Do not allow the strippable film coating to remain on the panels in extreme heat, cold, or in direct sunlight or other UV source.
  - 3. Certain geographic areas and jurisdictions may require special membrane underlayments for proper waterproofing performance. Consult the local building official for requirements, and follow the recommendations of the membrane manufacturer.
  - 4. The metal panel system shall be installed plumb, level, and straight over a layer of 30 lb. felt, (dry) with a minimum 6" for horizontal lap and 12" for end lap.
  - 5. Install panel seams vertically.

6. The seams shall be equidistant and shall align for corners, hips, valleys, mullions, and columns in accordance with architectural design parameters as shown on the drawings.
7. Lap panels away from prevailing wind direction.
8. Do not stretch or compress panel side-lap interlocks.
9. Secure panels without warp or deflection.
10. Fully engage interlocking seams, starting at one end and working to the other. Never snap both ends then work toward the middle.
11. Installation shall be made in accordance with Manufacturer's recommended procedures and layout drawings in Installations and Details Guide, SMACNA Architectural Sheet Metal manual, NRCA Roofing and Waterproofing Manual, Handbook of Roofing Knowledge, and NRCA Metal Roofing Details and shall be used as guides and details whenever applicable.
12. No face penetrations or perforation shall be made in metal panels by fasteners without architect's specific approval. All panels shall be continuous from ridge to eaves with no horizontal end laps.
13. Exercise proper care during installation to avoid damage or scratching of the panels. Avoid walking over the metal roof after installation is completed.

**B. ALLOWABLE ERECTION TOLERANCE**

1. Maximum Alignment Variation: 1/4 inch in 40 feet.

**C. FLASHING**

1. Follow manufacturer's directions and architect-approved shop drawings.
2. Overlap roof panels at least 6 inches.
3. End lap all flashing and trim at least 3". All gutters must be mitered, soldered and caulked with a lining of rubberized asphalt applied at the laps to make it watertight. All joints must be caulked. Soldered areas shall be counter-flashed or painted to match. All valleys shall be treated with a layer of rubberized asphalt and applied at least 24" each side from the center of the valley, on both sides, before applying valley flashing. End lap at least 6" at joints.
4. Install flashings to allow for thermal movement.
5. Remove any strippable protective film, if used, immediately preceding flashing installation.

**D. CUTTING AND FITTING**

1. Neat, square and true. Torch cutting is prohibited.
2. Openings 6 inches and larger in any direction: Shop fabricate and reinforce to maintain original load capacity.
3. Where necessary to saw cut panels, debur and treat with galvanic paint.

**3.04 CLEAN UP AND CLOSE**

**A. PANEL DAMAGE AND FINISH SCRATCHES**

1. Do not apply touch-up paint to damaged paint areas that involve minor scratches.
2. Panels or flashings that have severe paint and/or substrate damage shall be replaced as directed by the Architect's or Owner's representative.

NOTE: Summit Pacific Metal Sales does not recommend painting of damaged surfaces (minor scratches, etc.) due to fading and weathering differences of the touch-up paints in comparison to factory-applied system.

**B. CLEANING AND REPAIRING**

1. At completion of each day's work and at work completion, sweep panels, flashing and gutters clean. Do not allow fasteners, cuttings, filings or scraps to accumulate.
2. Complete all items on punch list.
3. Remove debris from project site upon work completion or sooner, if directed.

END OF SECTION