

SECTION 07410
STANDING SEAM ROOF SYSTEM

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Standing seam roofing system.

1.2 RELATED SECTIONS

- A. Section 05120 - Structural Steel: Tolerances for primary and secondary building structure supporting framework.
- B. Section 06100 - Rough Carpentry: Blocking and miscellaneous framing.
- C. Section 06125 - Wood Decking: Wood deck material and installation.
- D. Section 07210 - Building Insulation: Insulation at walls and roof decks.
- E. Section 07620 - Sheet Metal Flashing and Trim: Installation requirements.
- F. Section 07710 - Gutters and Downspouts: Roof edge coordination and attachment provisions.
- G. Section 07900 - Joint Sealants: Installation requirements.

1.3 REFERENCES

- A. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - Architectural Sheet Metal.
- B. ASTM A1011 - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength low-Alloy with Improved Formability.
- C. ASTM E1592 - Tests for Uplift Resistance of Roof Assemblies.
- D. Underwriters Laboratories (UL) - Roofing Materials and Systems Directory.
- E. Underwriters Laboratories (UL) 580 - Tests for Uplift Resistance of Roof Assemblies.

1.4 DESIGN / PERFORMANCE REQUIREMENTS

- A. Uplift Requirements:
 - 1. Design wind uplift load capacity of roofing system capable of resisting the negative uplift pressure as follows:
 - a. Provide Uplift Class 90 rated roofing system that has been tested in accordance with ASTM E1592 test procedure.
 - 2. Design wind uplift load capacity of roofing system capable of resisting the negative and positive uplift pressure as calculated for the Project.
- B. Thermal Movements: Provide sheet metal roofing that allows for thermal movements resulting from 120 degrees F (49 degrees C) ambient change; 180 degrees F (82 degrees C) material surfaces range without permanent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other

detrimental effects.

1. Provide clips that resist rotation and avoid shear stress as a result of sheet metal roofing thermal movements.
 2. Provide slip critical details that prevent tension build-up causing buckling, oil canning and "popping" of system components.
- C. Because of residual stresses in the coil steel stock metals used to roll form architectural panels and because of the uneven substrates over which these panels are applied, manufacturer can not assure total elimination of waviness, or oil canning in the flats of the panels. This shall not be construed as a product defect and shall not be cause for rejection.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Data substantiating materials comply with requirements.
 2. Detailed specification of construction and fabrication.
 3. Manufacturer's installation instructions.
 4. Certified test reports indicating compliance with performance requirements.
 5. Clip fastener pull-out tests.
 6. Preparation instructions and recommendations.
 7. Storage and handling requirements and recommendations.
- C. Shop Drawings: Indicate dimensions, description of materials and finishes, general construction, specific modifications, component connections, anchorage methods, hardware, and installation procedures, plus the following specific requirements:
1. Indicate material profile, jointing pattern, jointing details, fastening methods, and installation details.
- D. Structural Calculations: Submit structural calculations prepared by manufacturer for approval. Submittal shall be sealed by a professional engineer registered in the state of the project.
1. Description of design criteria.
 2. Engineering analysis depicting stress and deflection (stiffness) requirements for each framing application.
 3. Selection of framing components, accessories and connection requirements.
 4. Verification of attachments to structure and adjacent framing components.
- E. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- F. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.
- G. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer shall have a minimum of 10 years experience supplying metal roofing to the region where the work is to be done.
- B. Installer Qualifications:
1. Acceptable to, licensed or certified by manufacturer.
 2. Not less than 5 years experience with the system.
 3. Successfully completed not less than 5 comparable scale projects using this system.
- C. Regulatory Requirements: Comply with local Building Code requirements if more restrictive

than those specified.

- D. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Finish areas designated by Architect.
 - 2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
 - 3. Refinish mock-up area as required to produce acceptable work.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect materials against damage and discoloration.
- B. Handle panels with non-marring slings.
- C. Do not bend panels.
- D. Store panels above ground, with one end elevated to provide drainage.
- E. Protect panels against standing water and condensation between adjacent surfaces.
- F. If panels become wet, immediately separate sheets, wipe dry with clean cloth, and allow to air dry.
- G. Remove any strippable film coating prior to installation and do not allow it to remain on the panels in extreme cold, heat or in direct sunlight.
- H. Store and dispose of solvent-based materials, and solvent contaminated materials, in accordance with requirements of local authorities having jurisdiction.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.9 Warranty: Twenty year material and weather tightness warranties are available at additional costs. Warranty provides for repair or stoppage of any roof leaks caused by ordinary wear and tear under normal weather and atmospheric conditions.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: A-Lert Roof Systems, which is located at: 2065 FM 1102; New Braunfels, TX 78132; Toll Free Tel: 800-344-0609; Tel: 830-626-7755; Fax: 830-643-1912 ; Web: www.alertroofsystems.com
- B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 STANDING SEAM ROOFING SYSTEM

- A. Mechanically seamed concealed fastener UL 90 rated A-Lert Standing Seam Roofing System for new construction.
 - 1. General: Roof system consists of roof panels, anchor clips, sealants, fascia panels, gutters, downspouts, flashings and accessories.
 - 2. Panels: One side of panel is female in configuration suitable to accept the adjoining

male side and form a lapped seam which is mechanically rolled. All panels have a mechanically applied sealant in the female rib continuous from eave to ridge.

- a. A-Lert KR24-S, striated panel.
3. Wind Class: UL 90.
4. Seam Height: 2 inches (51 mm).
5. Panel Width: 16 inches (406 mm).
6. Metal:
 - a. 24 gauge zinc-aluminum alloy coated steel with 50,000 psi minimum yield strength.
7. Clips: Die-formed G90 galvanized steel, with factory applied sealant.
8. Fasteners:
 - a. Eave and Ridge: Number 18-9 by 1 inch (25 mm) self drilling screws with neoprene washer.
 - b. Clips: Number 12 by 1 inch (25 mm) self drilling screws.
 - c. Curbing: Number 12 by 1 inch (25 mm) self drilling screws with neoprene washer.
 - d. Ventilators, Pipe and Vent Flashing: Number 18-9 by 1 inch (25 mm) self drilling screws with neoprene washer.
9. Finish: Exterior to have a coat of 70 percent Kynar 500. Interior to have a white polyester top coat over an epoxy or water base primer. Color to be selected from manufacturer's standard colors.

2.3 ACCESSORIES

- A. General:
 1. Provide manufacturer's standard accessories and other items essential to completeness of roof installation including anchor clips, trim, ridge and hip caps, closures, flashing, and fascias.
- B. Concealed Clips:
 1. Clips as determined by manufacturer to suit performance requirements.
 2. Design clips for unlimited, unimpeded panel movement confirmed by testing, certified by an independent professional engineer.
 3. Testing: 100,000 cycles with 2 inch (51 mm) minimum panel movement in relation to anchored clip.
- C. Fasteners:
 1. Screws: As specified or as determined by manufacturer to suit specified performance requirements.
 2. Blind Rivets: Solid-treated, sealed stem type with EPDM washer under head.
 3. Wood Deck: Spoiler tip screws spaced 12 inches (305 mm) maximum on centers.
 4. Metal Deck or Purlins: Tek screws spaced 12 inches (305 mm) maximum on centers.
- D. Curbs: Custom fabricated from 1/8 inch (3.2 mm) aluminum with a 6 inch (152 mm) wide base and a 6 inch (152 mm) high vertical leg. Corners and other joints shall be welded.
- E. Fascia/Wall Panels: Job-site fabricated from roll-formed 24 gauge sheet metal with color and finish to match roof panels.
- F. Gutters: Fabricated from 24 gauge sheet metal. Minimum lengths, 20 feet (6096 mm) with expansion joints at 60 feet (18288 mm). Color and finish to match roof panels.
- G. Downspouts and Elbows: 24 gauge sheet metal pre-painted to match gutters. Space downspouts to accommodate 150 square feet (13.9 square meters) of roof area per square inch of downspout.
- H. Flashing at Rake and Eave: Fabricated from 24 gauge sheet metal to match color and finish

or roof panels. Install to allow for thermal expansion and contraction.

- I. Companion Roof Jacks: Provide at all round roof penetrations complete with storm collars.
- J. Ventilators: Penn Ventilator stationary ventilators. Install ventilators at a ratio of one ventilator per 800 square feet (74.3 square meters) of roof area.
- K. Sealants: Provide products that do not contain oil, asbestos, or asphalt.
 - 1. Factory Applied Side lap Sealant: Non-drying, non-skinning, synthetic polymer-based, designed for metal to metal concealed joints.
 - 2. Field Applied Sealant: S-M 5522 Acryl-R acrylic sealant. Extruded polymeric butyl tape, non-skinning and not easily displaced under construction to be used at all curbs, roof jacks, ventilators and gutters.
 - 3. Exposed Sealant: Single component, skinning, polyurethane joint sealant, with color to match panel.
- L. Slip Sheeting: Red Rosin paper at areas where roofing system contacts weather treated wood blocking.

2.4 FABRICATION

- A. Steel to be stretcher leveled and handled to minimize stress and waviness of sheet steel.
- B. Fabricate exposed items of pre-finished sheet metal, color to match panels.
- C. Hem exposed edges on underside 1/2 inch (12 mm), miter and seam corners.
- D. Provide for thermal expansion and contraction.
- E. Panning of panel ends is required at ridge, hip, and headwall conditions when slope is less than 3:12.
- F. Fabricate vertical faces with bottom edge formed outward 1/2 inch (12 mm) and hemmed to form drip.
- G. Panels shall be factory formed to required length. Metal flashings and trim shall be factory formed from the same material, gauge and finish as the roofing panels.
- H. Roofing panels are available in unlimited lengths.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.

1. Follow roof panel manufacturer's directions.
 2. Lap panels away from prevailing wind direction.
 3. Do not stretch or compress panel side laps.
 4. Secure panels without warp or deflection.
 5. Clean and dry surfaces prior to applying sealants,
 6. Avoid exposed fasteners, except to fasten flashings, at fixed points, or as indicated on Drawings.
- B. Panels: Panels are joined at the side lap with an interlocking seam standing 2 inches (51 mm) above the flat. Panel side laps are seamed by a special mechanical seaming machine. Side lap sealer is machine applied.
- C. Cutting and Fitting:
1. Neat, square and true. Torch cutting is prohibited where cut is exposed to final view.
 2. Shop fabricate and reinforce openings 6 inches (153 mm) and larger in any direction to maintain load capacity.
 3. Where necessary to saw cut panels, deburr cut edges.
- D. Flashing:
1. Follow manufacturer's directions and approved shop drawings.
 2. End splices of panels are not allowed for eave to ridge distances less than 200 feet (60960 mm). Where necessary, overlap roof panels at least 6 inches (153 mm).
 3. Install flashings to allow for thermal movement.
 4. Remove strippable protection film, if used, immediately preceding flashing installation.
- E. Dissimilar Metals:
1. Where sheet metal is in contact with dissimilar metals, execute juncture to facilitate drainage and minimize possibility of galvanic action.
 2. At point of contact with dissimilar metal, coat metal with protective paint or tape placed between metals.
- F. Sealants:
1. Field apply sealant to penetrations, transitions, and other locations necessary for an airtight, waterproof installation.

3.4 PROTECTION

- A. Protect installed products until completion of project.
1. Require workmen 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 or discoloration to the panels.
 2. Protect work of other trades against damage and discoloration.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION