



SECTION 10 71 13

EXTERIOR SUN CONTROL DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions, Division 01 - General Requirements, and other applicable specification sections in the Project Manual apply to the work specified in this Section.

1.2 SUMMARY

- A. Scope: Provide design and engineering, labor, material, equipment, related services, and supervision required, including, but not limited to, manufacturing, fabrication, erection, and installation for exterior sun control devices as required for the complete performance of the work, and as shown on the Drawings and as herein specified.
- B. Section Includes: The work specified in this Section includes, but shall not be limited to, the following:

Edit below to suit the Project.

- 1. Modular, shop-fabricated, metal sun shades to mount on exterior wall surfaces, including, but not limited to, concrete or steel framing, metal wall panels, window framing, and curtain wall framing.

- C. Related Sections: Related sections include, but shall not be limited to, the following:

- 1. Section 03 30 00 - Cast-In-Place Concrete.
- 2. Section 04 20 00 - Unit Masonry.
- 3. Section 05 12 00 - Structural Steel Framing.
- 4. Section 06 10 00 - Rough Carpentry.
- 5. Section 07 60 00 - Flashing and Sheet Metal.
- 6. Section 07 90 00 - Joint Protection.

1.3 REFERENCES

- A. General: The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only. The edition/revision of the referenced publications shall be the latest date as of the date of the Contract Documents, unless otherwise specified.

- B. American Architectural Manufacturers Association (AAMA):
 1. AAMA 611, "Voluntary Specifications for Anodized Architectural Aluminum (Revised)."
 2. AAMA 2604, "Voluntary Specification, Performance Requirements, and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels."
- C. American Society of Civil Engineers (ASCE):
 1. ASCE 7, "Minimum Design Loads for Buildings and Other Structures" (copyrighted by ASCE, ANSI approved).
- D. American Welding Society (AWS):
 1. AWS D1.1, "Structural Welding Code - Steel" (copyrighted by AWS, ANSI approved).
 2. AWS D1.2, "Structural Welding Code - Aluminum" (copyrighted by AWS, ANSI approved).
 3. AWS D1.3, "Structural Welding Code - Sheet Steel" (copyrighted by AWS, ANSI approved).
- E. ASTM (ASTM):
 1. ASTM A 36/A 36M, "Standard Specification for Structural Steel."
 2. ASTM A 500, "Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes."
 3. ASTM A 653/A 653M, "Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process."
 4. ASTM A 792/A 792M, "Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process."
 5. ASTM B 26/B 26M, "Standard Specification for Aluminum-Alloy Sand Castings."
 6. ASTM B 209/B 209M, "Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate."
 7. ASTM B 221/B 221M, "Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes."
- F. National Association of Architectural Metal Manufacturers (NAAMM):
 1. NAAMM MFM, "Metal Finishes Manual."
- G. South Coast Air Quality Management District (SCAQMD):
 1. SCAQMD Rule #1168, "Adhesive and Sealant Applications," including most recent amendments.
- H. SSPC: The Society for Protective Coatings (SSPC):
 1. SSPC Paint 12, "Paint Specification No. 12 Cold-Applied Asphalt Mastic (Extra Thick Film)."

1.4 SYSTEM DESCRIPTION

- A. General: Work shall be designed to perform under conditions specified herein or required by site conditions with no permanent damage to or deforming of the louver blades or assembly, noise or metal fatigue caused by louver blade rattle or flutter, or permanent damage to fasteners and anchors.
- B. Performance Requirements:
 1. Exterior sun control devices shall be factory-engineered to withstand all applicable design loads, including, but not limited to, dead loads, live loads, and snow loads. Minimum design loads shall be calculated to comply with ASCE 7, or with requirements of authorities having jurisdiction.
 2. Exterior sun control devices shall be factory-engineered to withstand wind loads, acting inwards and outwards. Minimum design loads shall be calculated to comply with ASCE 7, or with requirements of authorities having jurisdiction.

Retain subparagraphs above and/or below if applicable to the Project.

3. Exterior sun control devices shall be factory-engineered to withstand seismic loads. Minimum design loads shall be calculated to comply with ASCE 7, or with requirements of authorities having jurisdiction.
- C. Thermal Movements: Allow for thermal movement resulting from the following maximum change (range) in ambient and surface temperatures in engineering, fabricating, and installing exterior sun control devices to prevent buckling, opening of joints, overstressing of components and connections, and other detrimental effects. Base engineering calculation on actual surface temperatures of materials due to both solar heat gain and nighttime sky heat loss.

Differential values below (for aluminum in particular) are suitable for most of the U.S. Revise to suit local conditions.

1. Temperature Change (Range): 120 °F or 67 °C, ambient; 180 °F or 100 °C, material surfaces.
- D. Corrosion Resistance: Separate incompatible materials to prevent galvanic corrosion.
- 1.5 SUBMITTALS
- A. General: See Section 01 33 00 - Submittal Procedures.
- B. Product Data: Submit product data showing material proposed. Submit sufficient information to determine compliance with the Drawings and Specifications. Product data shall include, but shall not be limited to, device components and finishes.
- C. Shop Drawings: Submit shop drawings for each product and accessory required. Include information not fully detailed in manufacturer's standard product data, including, but not limited to, layout, dimensions, spacing of components, and anchorage and installation details.
1. Submit shop drawings which have been signed and sealed by a professional engineer licensed to practice in the State in which the Project is located.
- D. Samples:
1. Submit samples for initial color selection. Submit samples of each specified finish. Submit samples in form of manufacturer's color charts showing full range of colors and finishes available. Where finishes involve normal color variations, include samples showing the full, range of variations expected.

Delete above if colors preselected and specified or scheduled. Retain below with or without above.

2. Submit samples for verification purposes. Submit 10 inch (254 mm) by 10 inch (254 mm) minimum size sample of sun control panel illustrating design, fabrication workmanship, and selected color coating. Additional samples may be required to show fabrication techniques and workmanship.
- E. Quality Control Submittals:
1. Design Data: For installed products indicated to comply with certain design loadings, include structural analysis data signed and sealed by the professional engineer who was responsible for their preparation.
 2. Qualification Data: Submit documentation demonstrating capability and experience in performing installations of the same type and scope as specified by this Section. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

Retain below if required for the Project.

3. Certificates: Submit certification by the manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOC's).

Retain below for Project requiring LEED certification.

- F. LEED Submittals: Submittals that are required to comply with requirements for LEED certification include, but shall not be limited to, the following:
 1. Recycled Content Materials: Provide product data and certification letter indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content. Include statement indicating costs for each product having recycled content.

Above applies to Credit MR 4. Below applies to Credit MR 5.1 and MR 5.2.

2. Regional Materials: Provide product data for regional materials indicating location and distance from the Project of material manufacturer and point of extraction, harvest, or recovery for each raw material. Distance shall be within 500 miles (805 Km) of the Project Site. Include statement indicating cost for each regional material and, if applicable, the fraction by weight that is considered regional.

Below applies to Credits EQ 4.1 (adhesives and sealants) and EQ 4.2 (paints and coatings).

3. Low-Emitting Materials: Submit certification by the manufacturer confirming that products (i.e., adhesives, sealants, paints, coatings, etc.) meet or exceed the volatile organic compound (VOC) limits set by specific agencies or other requirements as outlined in LEED Green Building Rating System. VOC limits shall be clearly stated in the submittal.
- G. Maintenance Data: Submit maintenance data for exterior sun control devices to include in operation and maintenance manuals specified in Division 01 - General Requirements.

1.6 QUALITY ASSURANCE

- A. Qualifications:
 1. Manufacturer Qualifications: Manufacturer shall be a firm engaged in the manufacture of exterior sun control devices of types and sizes required, and whose products have been in satisfactory use in similar service for a minimum of five years.
 2. Installer Qualifications: Installer shall be a firm that shall have a minimum of five years of successful installation experience with projects utilizing exterior sun control devices similar in type and scope to that required for this Project, and shall be approved by the manufacturer.
 3. Engineer Qualifications: The engineer shall be a professional engineer legally authorized to practice in the jurisdiction where the Project is located and experienced in providing engineering services of the kind indicated that have resulted in the installation of products similar to this Project in material, design, and extent, and that have a record of successful in-service performance.
 4. Welder Qualifications: Qualify welding processes and welding operators in accordance with AWS standard qualification procedures. Operators shall carry proof of qualification on their persons.

- B. Regulatory Requirements: Comply with applicable requirements of the laws, codes, ordinances, and regulations of Federal, State, and local authorities having jurisdiction. Obtain necessary approvals from such authorities.

Edit below to suit the Project. Retain AWS D1.1 and AWS D1.3 for steel, and AWS D1.2 for aluminum.

- C. Welding Standards: Comply with applicable provisions of AWS D1.1, AWS D1.2, and AWS D1.3.
- D. Mock-Ups: Prior to installation of the work, fabricate and erect mock-ups for each type of finish and application required to verify selections made under sample submittals and to demonstrate aesthetic effects as well as qualities of materials and execution. Build mock-ups to comply with the following requirements, using materials indicated for final unit of work. Locate mock-ups on site in location and of size indicated or, if not indicated, as directed by the Architect. Demonstrate the proposed range of aesthetic effects and workmanship to be expected in the completed work. Obtain the Architect's acceptance of mock-ups before start of final unit of work. Retain and maintain mock-ups during construction in undisturbed condition as a standard for judging completed unit of work.
1. When directed, demolish and remove mock-ups from the Project site.

Select above or below.

2. Accepted mock-ups in undisturbed condition at time of Substantial Completion may become part of completed unit of work.

- E. Single Source Responsibility: Obtain exterior sun control devices from a single source with resources to produce products of consistent quality in appearance and physical properties without delaying the work.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the Project site in supplier's or manufacturer's original wrappings and containers, labeled with supplier's or manufacturer's name, material or product brand name, and lot number, if any.
- B. Store materials in their original, undamaged packages and containers, inside a well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.

1.8 PROJECT CONDITIONS

- A. Field Measurements: Take field measurements prior to fabrication of the work and preparation of shop drawings, to ensure proper fitting of the work. Show recorded measurements on final shop drawings. Notify the Owner and the Architect, in writing, of any dimensions found which are not within specified dimensions and tolerances in the Contract Documents, prior to proceeding with the fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the work.

1.9 WARRANTY

- A. General: See Section 01 77 00 - Closeout Procedures.
- B. Special Warranty: Provide manufacturer's standard form outlining the terms and conditions of their standard limited warranty:
1. Surface Finish Warranty: One year limited warranty.
 2. Material Integrity Warranty: One year.

- C. Additional Owner Rights: The warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Items specified are to establish a standard of quality for design, function, materials, and appearance. Equivalent products by other manufacturers are acceptable. The Architect will be the sole judge of the basis of what is equivalent.

2.2 MATERIALS

Retain below for Project requiring LEED Certification.

- A. LEED Requirements:
1. Recycled Content Materials: Provide building materials with recycled content such that post-consumer recycled content plus one-half of pre-consumer recycled content constitutes a minimum of [10 percent] [20 percent] of the cost of materials used for the Project. See LEED Green Building Rating System.

Below applies to Credit MR 4. Select applicable percentages (10 percent applies to Credit MR 4.1, 20 percent applies to Credit MR 4.1 and MR 4.2). Below applies to Credit MR 5.1 and MR 5.2. Retain first indicated option below for Credit MR 5.1, retain both options for Credit MR 5.2.

2. Regional Materials: Provide a minimum of [10 percent (based on cost)] [and an additional 10 percent beyond Credit MR 5.1 (total of 20 percent, based on cost)], of building materials that are regionally extracted, processed, and manufactured.

Below applies to Credits EQ 4.1 (adhesives and sealants) and EQ 4.2 (paints and coatings).

3. Low-Emitting Materials: Use adhesives, sealants, paints, coatings, etc., that comply with the specified limits for VOC content when calculated according to SCAQMD Rule #1168. See LEED Green Building Rating System for VOC content limits.

B. Steel:

1. Bar Stock: ASTM A 36/A 36M.
2. Tubing: ASTM A 500, Grade B.
3. Sheet: ASTM A 653/A 653M galvanized or ASTM A 792/A 792M galvalume.

C. Aluminum:

1. Extruded Shapes: ASTM B 221/B 221M, Alloy 6063, Temper T6.
2. Sheet: ASTM B 209/B 209M, Alloy 6063, Temper T6.
3. Castings: ASTM B 26/B 26M, Alloy 319.

- D. Anchors and Inserts: Provide type, size, and material required for loading and installation indicated. Use non-ferrous metal or hot-dip galvanized anchors and inserts for exterior installations and elsewhere as needed for corrosion resistance. Use toothed steel or expansion bolt devices for drilled-in-place anchors. Provide types of size and spacing as recommended by manufacturer for specific condition and as detailed on final shop drawings.

- E. Bituminous Paint: Provide cold-applied asphalt mastic complying with SSPC Paint 12, except containing no asbestos fibers.

2.3 MANUFACTURED UNITS

- A. Exterior Sun Control Device:
 - 1. Type: Provide exterior sun control device consisting of modular framed panels with indicated infill and outriggers for mounting on window framing or exterior wall surfaces, as indicated on the Drawings.
 - a. Material: Aluminum.

Select infill below.

- b. Infill: Louver.
 - c. Infill: Bar.
 - d. Infill: Perforated sheet.
 - e. Infill: [_____].
 - 2. Panel: Modular panel with perimeter frame.
 - a. Panel Size: As indicated on the Drawings.
 - b. Panel Size: [_____] inches ([_____] mm) by [_____] inches ([_____] mm).

Select panel size above and panel infill below.

- c. Panel Infill: Inclined, flanged louvers welded to cross bars.
 - d. Panel Infill: Bar grill type consisting of flat, vertical bars connected with cross bars.
 - e. Panel Infill: Flat perforated panel.
 - f. Panel Infill: [_____].
 - 3. Support System: Provide means for support of exterior sun control devices. System shall be designed to resist applicable dead, live, wind, and seismic loads. Provide type as indicated on the Drawings. Provide welded fabrication as detailed and dimensioned on the Drawings and final shop drawings. Provide size as required to provide sufficient structural support.
 - B. Basis of Design: Hansen Architectural Systems, Inc.; 5500 SE Alexander Street, Hillsboro, OR 97123; Toll Free Tel: 800-599-2965, Fax: 503-356-8478; Web: www.aluminumrailing.com.

2.4 FABRICATION

- A. Assemble exterior sun control devices in factory to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
 - 1. Exterior sun control devices shall be assembled entirely by welding.
 - 2. Maintain equal blade spacing to produce uniform appearance.
 - 3. Include supports, anchorages, and accessories required for complete assembly.
 - 4. Join fixed blades, fascia, outriggers, mounting plates, etc., with fillet welds concealed from view, unless size of assembly makes concealed, bolted connections between frame members necessary.

2.5 FINISHES

- A. General: Comply with NAAMM MFM for recommendations for applying and designating finishes.
 - 1. Variations in appearance of abutting or adjacent units are acceptable if they are within one-half of the range of final samples. Noticeable variations in the same unit are not acceptable.

2. Variations in appearance of other components are acceptable if they are within the range of final samples and are assembled or installed to minimize contrast.
- B. Aluminum Finish: Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

Select finish below (clear anodized, color anodized, powder coating).

1. Class I Clear Anodized Finish: AA-M12-C22-A41 (Mechanical Finish: as fabricated, non-specular; Chemical Finish: etched, medium matte; Anodic Coating: Class I Architectural, clear film thicker than 0.7 mil [0.018 mm]) complying with AAMA 611.
2. Class I Color Anodized Finish: AA-M21-C22-A42/A44 (Mechanical Finish: as fabricated, non-specular; Chemical Finish: etched, medium matte; Anodic Coating: Class I Architectural, film thicker than 0.7 mil [0.018 mm] with integral color or electrolytically deposited color) complying with AAMA 611. Provide color to match the Architect's sample, or, if no sample, as selected by the Architect from within full range of industry colors and color density range.
3. High-Performance Organic Coating Finish: AA-C12C42R1X.
 - a. Chemical Finish: Cleaned with inhibited chemicals and acid chromate-fluoride-phosphate conversion coated.
 - b. Powder Coating: Prepare, pre-treat, and apply coating to exposed metal surfaces to comply with manufacturer's written instructions.
 - 1) Material: Polyester powder coating, 3.0 mil (0.076 mm). Average film thickness shall comply with AAMA 2604.
 - a) Basis of Design: "Series 38," TIGER Drylac U.S.A., Inc.

Select color and gloss below.

- 2) Color and Gloss: As Selected by the Architect from manufacturer's full range for color and gloss, including custom colors. Selections might include up to four different selections for color.
- 3) Color and Gloss: [_____].

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions: Examine areas and conditions under which the work is to be installed, and notify the Contractor in writing, with a copy to the Owner and the Architect, of any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.
1. Beginning of the work shall indicate acceptance of the areas and conditions as satisfactory by the Installer.

3.2 PREPARATION

- A. Coordinate installation of exterior sun control devices with provision of exterior wall system, window framing system, curtain wall system, etc., to ensure proper structural support is provided, attachment of exterior sun control devices is compatible with substrate, and weathertightness of exterior envelope is maintained.
- B. Coordinate setting drawings, diagrams, templates, instructions, and directions for installing anchors, such as sleeves, concrete inserts, anchor bolts, and miscellaneous items having integral anchors,

that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to the Project site.

3.3 INSTALLATION

- A. Install exterior sun control devices in accordance with reviewed product data, final shop drawings, the Drawings, and manufacturer's written installation instructions.
 - 1. Insulate dissimilar metals to prevent electrolysis with bituminous paint or non-absorptive gasket to prevent contact.
 - 2. Allow for thermal expansion and contraction of metal components.
 - 3. Install exterior sun control devices plumb, level, free from distortion, and aligned with building elements and adjacent construction.
 - 4. Do not install bent, bowed, or otherwise damaged devices. Remove damaged components from site and replace.
 - 5. Attach devices with appropriate fasteners for secure, permanent installation.

3.4 ADJUSTING AND CLEANING

- A. Touch-Up: Immediately after installation, touch-up scratched, nicked, abraded, chipped, or otherwise damaged areas of the finish so as to be unnoticeable. Performance of touch-up shall be in all ways equal to that of the factory finish.
- B. Cleaning: Wash to remove any deleterious material from finished surfaces immediately. Cleaning and protective methods shall be carefully selected, applied, and maintained so that finishes shall not become uneven or otherwise impaired as a result of unequal exposure to light and weathering conditions.

3.5 PROTECTION

- A. Provide final protection and maintain conditions in a manner acceptable to the Installer that shall ensure that the exterior sun control devices shall be without damage at time of Substantial Completion.

END OF SECTION