

SECTION 107113.43
SUN SHADES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Modular, shop fabricated sun shades to be mounted on structure.

1.02 RELATED REQUIREMENTS

- A. Section 033000 - Cast-in-Place Concrete: Mounting substrates.
- B. Section 042000 - Unit Masonry: Mounting substrates.
- C. Section 051200 - Structural Steel Framing: Mounting substrates.
- D. Section 074213.13 - Formed Metal Wall Panels: Mounting substrates.
- E. Section 084313 - Aluminum-Framed Storefronts: Mounting substrates.
- F. Section 084413 - Glazed Aluminum Curtain Walls: Mounting substrates.
- G. Section 085113 - Aluminum Windows: Mounting substrates.
- H. Section 107113 - Exterior Sun Control Devices: Operable sun control devices.

1.03 REFERENCE STANDARDS

- A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum 2014 (2015 Errata).
- B. AAMA 612 - Voluntary Specification, Performance Requirements, and Test Procedures for Combined Coatings of Anodic Oxide and Transparent Organic Coatings on Architectural Aluminum 2017a.
- C. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels, current standard.
- D. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels, current standard.
- E. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes 2017.
- F. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength 2014, with Editorial Revision (2017).
- G. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process 2010 (Reapproved 2015).
- H. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2014.
- I. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric) 2014.
- J. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2014.
- K. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric) 2013.
- L. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position 2018.
- M. ASTM D1929 - Standard Test Method for Determining Ignition Temperature of Plastics 2020.
- N. ASTM D2843 - Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics 2019.
- O. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2020.
- P. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs 2017.

- Q. NFPA 268 - Standard Test Method for Determining Ignitibility of Exterior Wall Assemblies Using a Radiant Heat Energy Source 2017.
- R. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components 2019.
- S. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films 2019.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Installation Meeting: Schedule and conduct a pre-installation meeting one week before starting work of this section. Attendees shall include, but are not limited to:
 - 1. Contractor.
 - 2. Manufacturer's representative.
 - 3. Architect.
 - 4. Owner's representative.
 - 5. Other subcontractors of adjacent work.

1.05 SUBMITTALS

- A. [See Section 013000 - Administrative Requirements for submittal procedures.] **OR** [See Division 01, Administrative Requirements for submittal procedures.]
- B. Shop Drawings: Prior to commencement of fabrication, submit detailed shop drawings, showing all profiles, sections of all components, finishes, fastening details, and manufacturer's technical and descriptive data. Include field dimensions of openings and elevations on shop drawings.
- C. Product Data: Submit manufacturer's product data, including description of materials, components, finishes, fabrication details, anchors and accessories.
- D. Design Data: Submit comprehensive structural analysis of design for the specified loads and structural attachments. Stamp and sign calculations by professional engineer.
- E. Samples: Submit two (2) of each item below:
 - 1. If requested, provide up to six different powder coat samples for submittal review.
 - 2. 3 inch by 6 inch minimum size sample of finish color.
 - 3. Pattern Sample: [Submit 12 inch by 12 inch flat panel, without finish] **OR** [Submit **[Insert number of panels]** full size panel samples]. Pattern scaling may vary depending on selection.
- F. Test Reports: If required, submit test reports from an independent testing agency showing compliance with specified design and performance requirements.
- G. Manufacturer's Installation Instructions.
- H. Manufacturers storage and handling instructions.
- I. Sustainable Design Submittals:
 - 1. In accordance with Division 01 sustainable design requirements.
 - OR**
 - 2. Submit Product Data for Credits **[Insert Sustainable Design program credits here]**
 - 3. For products having recycled content, documentation indicating percentages by weight of post consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.
- J. Maintenance Data: Manufacturer's instructions for care and cleaning.
- K. Designer's Qualification Statement.
- L. Manufacturer's Qualification Statement.
- M. Installer's Qualification Statement.
- N. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

- A. Verification and Coordination:

1. Verify actual locations of walls and other construction contiguous with the work of this Section using field measurements before fabrication. Indicate measurements on Shop Drawings.
 2. Embedded Anchor Plates and Structural Connections: Coordinate support sizes and locations.
- B. Engineering:
1. System to be engineered by manufacturer for standard loading criteria and geometry layout.
 2. Custom Systems: Structural design to be performed by the manufacturer or a Registered Structural Engineer licensed in the State in which the Project is located.
 3. Engineering for assembly will be provided by manufacturer.
 4. Structural attachment or connections to be engineered by the Engineer of Record for the Project.
- C. Installer Qualifications: Company specializing in installation of fixed sun shade systems with a minimum of five years of documented experience and certified or approved by manufacturer.
- D. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with not less than ten years of documented experience.
- E. Fabricator Qualifications: Company specializing in fabrication of products of the type specified in this Section with a minimum of 8 years of documented experience and sufficient production capacity to produce the required units within the Project schedule.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's original protective coverings and packaging with corresponding labels and identifying information.
- B. Protect materials against damage during transit, delivery, storage, and installation at site. Protect against bending, warping, twisting or surface damage. Store in accordance with manufacturers written instructions and in a dry location.
- C. Inspect materials upon delivery for damage. Repair damage to be indistinguishable from undamaged areas; if damage cannot be repaired to be indistinguishable from undamaged parts and finishes, replace damaged items.
- D. Deliver materials to project site ready for erection.

1.08 WARRANTY

- A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective work within a one year period after Date of Substantial Completion.
- C. Warranty: Manufacturer's standard one year warranty against defects in materials, fabrication, finishes, and installation commencing on Date of Substantial Completion.
- D. Warranty on FEVE and PVDF Finishes: Provide **[manufacturer's standard 10 year warranty]** OR **[manufacturer's extended 20 year warranty]** on finish. Not all colors are available with extended warranties. If extended warranty is required, confirm color selection with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Sun Screens:
 1. BOK Modern, Inc.; **[Insert product style name here]**; www.bokmodern.com
 2. [Substitutions: See Section 016000 - Product Requirements.] OR [See Division 01, Administrative Requirements for substitution procedures]

2.02 SUN SCREENS

- A. Sun Screens: Shop fabricated, shop finished, extruded aluminum outriggers, louvers, and fascia, free of defects impairing strength, durability or appearance.
 1. Configuration: As indicated on drawings.
 2. Outrigger Shape: [_____].

3. Design Criteria: Design and fabricate to resist the following loads without failure, damage, or permanent deflection:
 - a. Wind: [] psf ([] kPa) positive, [] psf ([] kPa) negative; minimum
 - b. Snow: [] psf ([] kPa); minimum.
 - c. Live: [] psf ([] kPa); minimum.
 - d. Thermal Movement: Plus/minus 1/8 inch (3.175 mm), maximum.
4. Sizes: As indicated on drawings.
5. Provide a complete system ready for erection at project site.
6. Shop fabricate to the greatest extent possible; disassemble if necessary for shipping.

2.03 MATERIALS

- A. Metal Surfaces: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations or blemishes; unless allowed for specific metal types and finishes.
- B. Perforated Aluminum Sheet: AA5052-H32, **[0.125-inch (3.17 mm)] [0.1875-inch (4.76 mm)] [Insert custom thickness]** thick.
- C. Perforated Stainless Steel Sheet: ASTM A240/A240M, **[Type 304] [Type 316L], [0.062-inch (1.57 mm)] [Insert custom thickness]** thick.
- D. Perforated Cold-Rolled Steel Sheet: ASTM A1008/A1008M, commercial steel Type B, **[0.074-inch (1.88 mm)] [Insert custom thickness]** thick.
- E. Perforated Corten Steel Sheet: ASTM A242/A242M, **[0.074-inch (1.88 mm)] [Insert custom thickness]** thick.
- F. Laser Cut Proprietary Pattern: **[As selected by the Architect from manufacturer's full library] OR [Insert name of custom design and pattern scale here]**.
- G. Concealed Structural Supports: Aluminum, or steel coated for corrosion resistance and dissimilar metal isolation.
- H. Fasteners: ASTM F593 stainless steel or ASTM A307 carbon steel.
- I. Stainless Steel Tensioning Tubes: ASTM A276/A276M.

2.04 FABRICATION

- A. Fabricate assemblies to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish and anchorage, but not less than required to support structural loads.
- B. Fabricate in accordance with approved shop drawings and manufacturers written instructions. Form work true to line and level with accurate angles and surfaces.
- C. Assemble in the shop to greatest extent possible to minimize field splicing and assembly.
- D. Cut, drill and laser cut metals cleanly and accurately. Remove burrs and ease edges; unless allowed for specific metal types and finishes. Remove sharp or rough areas on exposed surfaces.
- E. Cut, reinforce, drill and tap as indicated to receive finish hardware, screws and similar items.
- F. Use grommets, bushings and washers or methods as recommended by the manufacturer for separation of dissimilar metals.

2.05 FINISHES

- A. Comply with NAAMM's MFM for recommendations for applying and designating finishes.
 1. Appearance of Finished Work:
 - a. Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved samples.
 - b. Noticeable variations in same piece are not acceptable except for steel and anodized aluminum.
 - c. Variations in appearance of other components are acceptable if they are within the range of approved samples and are assembled or installed to minimize contrast.
- B. Finishes for Aluminum:

1. Clear Anodic Finish: AAMA 611, AA-M10C22A41 CLASS I, Architectural Class 1, 0.7 to 1.2 mil coating thickness.
 2. Color Anodic Finish: AAMA 611, AA-M10C22A44 CLASS II, Architectural Class 1, 0.7 to 1.2 mil coating thickness.
 - a. Color: As selected by Architect from manufacturers full range
 - b. Color [_____].
- C. Powder Coating:
1. Apply architectural grade primer for compatible top coat system. Pretreat according to AAMA 2604 to withstand a minimum of 3000 hours (ASTM B117) or 700 hours (ASTM G85, Annex A2).
 2. Apply Architectural Grade outgassing forgiving primer for aluminum at minimum of 2.0 mils, 50 percent or less cure to ensure proper inter coat adhesion to topcoat.
 3. Apply Architectural Grade AAMA 2604 compliant topcoat at a minimum of 2.5 mils and process according to manufacturer's recommendations.
 4. Color and Gloss: [As selected by Architect from manufacturer's full range of choices] **OR [Insert Color].**
- D. Fluoropolymer PVDF and FEVE Coating Systems:
1. One Coat FEVE and Two Coat PVDF: Thermo cured system composed of specially formulated inhibitive primer and fluoropolymer color coat.
 2. For 3-coat System: Include clear fluorocarbon topcoat complying with AAMA 2605 using 70 percent minimum poly vinylidene fluoride resin by weight (either "Kynar 500" or "Hylar 5000" Fluorocarbon Resin by Atofina Chemical or Ausimont USA, Inc.).
 3. Apply to an average total dry film thickness of 1.6 mils.
 4. Color and Gloss: [As selected by Architect from Manufacturers full range] **OR [Insert Color].**
- E. Finishes for Steel:
1. Mill finish.
 2. Powder Coating:
 - a. Tiger Drylac 38 with primer, 2 coat system. Pretreat according to AAMA 2604 to withstand a minimum of 3000 hours (ASTM B117) or 700 hours (ASTM G85 Annex A2).
 - b. Apply TIGER 69/90500 zinc rich primer for steel at minimum of 2.0 mils 50 percent or less cure to ensure proper inter coat adhesion to topcoat.
 - c. Apply TIGER Series 38 AAMA 2604 compliant topcoat at a minimum of 2.5 mils and process according to manufacturer's written recommendations.
 - d. Color and Gloss: As selected by Architect from manufacturers standard range.
- F. Stainless Steel:
1. Polished Finishes:
 - a. Grind and polish surfaces to produce uniform finish free of cross scratches.
 2. Mill finish with no additional treatment to surfaces.
 3. Orbital sanding
- A. Pre-grained #4 finish on available gauge material.
- G. Cor-ten or weathering steel unfinished mill material with no significant scratches or gouges.

2.06 ACCESSORIES

- A. Welding Fittings: Factory- or shop-welded from matching pipe or tube; joints and seams ground smooth.
- B. Universal Bracket:
 1. Stainless steel 2-part bracket with flat mounting plate and recessed #12 screws provided by guardrail/railings manufacturer.
 2. Finish: Powder coat.
 3. Color: As selected by Architect from manufacturers standard range.
 4. Manufacturer: BOK Modern, Inc.; www.bokmodern.com.
- C. Anchors and Fasteners:

1. Select fasteners of type, grade and class required to product connections for anchoring metal panels to other types of construction indicated and capable of withstanding design loads.
 2. Provide anchors and other materials as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
 3. Do not use metals that are corrosive or non-compatible with materials joined. Avoid fastening dissimilar materials and separate with isolating hardware where necessary.
 - a. For anchorage to concrete, provide inserts to be cast into concrete for bolt anchors.
 - b. For anchorage to masonry, provide brackets to be embedded in masonry for bolt anchors.
 - c. For anchorage to stud walls, provide backing plates for bolt anchors.
 - d. Posts: Provide adjustable flanged brackets.
 4. Exposed Fasteners: No exposed bolts or screws.
- D. Carbon Steel Bolts and Nuts: ASTM A307.
- E. Hydraulic Expansion Cement: ASTM C1107/C1107M.
- F. Bituminous Coating: Cold-applied asphalt mastic, noncorrosive compound free of asbestos, sulfur, and other deleterious impurities; 0.015 inch (0.4 mm) dry film thickness per coat complying with ASTM D1187.
- G. Sealant: Silicone; black.
- H. Finish Touch-Up Materials: As recommended by manufacturer for field application.
- I. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- J. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine substrates and site area for conditions that might prevent satisfactory installation.
- B. Verify that dimensions of supporting structure are within plus/minus 1/8 inch (3.175 mm) of dimensions indicated on shop drawings.
- C. Verify that all adjacent painting, roofing, masonry work, and other work that might damage sun shade finish has been completed prior to installation of sun shades.
- D. Do not install until after all adjacent painting, roofing and masonry have been completed.
- E. Do not proceed with installation until all conditions are satisfactory.
- F. Notify Architect immediately of conditions that would prevent satisfactory installation.
- G. Do not proceed with work until detrimental conditions have been corrected.
- H. Furnish components to be installed in other work to installer of that other work, including but not limited to blocking, sleeves, inserts, anchor bolts, embedded plates, and supports for attachment of anchors.

3.02 INSTALLATION

- A. Comply with Drawings and manufacturer's written instructions.
- B. Set units level, plumb, with uniform joints, and aligned with building elements.
- C. Fit exposed connections together to form tight, hairline joints per manufacturers recommendation for seismic movement or thermal expansion and contraction
- D. Do not cut or trim aluminum members without approval of manufacturer; do not install damaged members
- E. Adjust before anchoring to ensure alignment at abutting joints.
- F. Use manufacturer's hardware for connections.

- G. Attach securely in place using anchorage devices and fasteners as approved by Engineer of Record.
- H. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.
- I. Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood or dissimilar metals, with a heavy coat of bituminous paint.
- J. Universal Bracket: Install per manufacturers printed instructions.
- K. Weld connections that cannot be shop welded due to size limitations.
 - 1. Weld in accordance with AWS D1.1/D1.1M.
 - 2. Match shop welding and bolting.
 - 3. Clean welds, bolted connections, and abraded areas.
 - 4. Touch up shop primer and factory-applied finishes.
 - 5. Repair galvanizing with galvanizing repair paint per ASTM A780/A780M.
- L. Isolate dissimilar materials with bituminous coating, bushings, grommets, or washers to prevent electrolytic corrosion.
- M. Touch-up damaged finish coating using material provided by manufacturer to match original coating.

3.03 FIELD QUALITY CONTROL

- A. Field Services: Provide the services of the manufacturer for field observation of installation.

3.04 TOLERANCES

- A. Maximum Variation from Level: Plus/Minus 1/8 inch (3.175 mm).

3.05 CLEANING

- A. Remove protective film from exposed metal surfaces.
- B. Metal: Clean exposed metal finishes with potable water and mild detergent, in accordance with manufacturer recommendations; do not use abrasive materials or chemicals, detergents, or other substances that may damage the material or finish.

3.06 ADJUSTING AND PROTECTION

- A. Touch-up and repair damage to exposed finishes to be indistinguishable from undamaged areas.
 - 1. If damage to finishes and components cannot be repaired to be indistinguishable from undamaged finishes and components, replace damaged items.
 - 2. Obtain approved coating for repainting surfaces from manufacturer.
- B. Return and replace items that cannot be repaired or refinished in field.
- C. Protect installed components and finishes from damage after installation.

END OF SECTION