

SECTION 107316.13 METAL CANOPIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Freestanding shop fabricated metal canopies.

1.02 RELATED REQUIREMENTS

- A. Section 033000 - Cast-in-Place Concrete: Concrete footings.
- B. Section 077123 - Manufactured Gutters and Downspouts.
- C. Section 099113 - Exterior Painting: Finish coating.
- D. Section 099600 - High-Performance Coatings: Finish coating.

1.03 REFERENCE STANDARDS

- A. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels, current standard.
- B. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels, current standard.
- C. AISC 303 - Code of Standard Practice for Steel Buildings and Bridges 2016.
- D. AISC 360 - Specification for Structural Steel Buildings 2016.
- E. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures Most Recent Edition Cited by Referring Code or Reference Standard.
- F. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2014.
- G. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength 2014, with Editorial Revision (2017).
- H. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes 2020.
- I. ASTM A529/A529M - Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality 2014.
- J. ASTM A572/A572M - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel 2018.
- K. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2020.
- L. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process 2010 (Reapproved 2015).
- M. ASTM A924/A924M - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process 2019.
- N. ASTM A992/A992M - Standard Specification for Structural Steel Shapes 2020.
- O. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink) 2017.
- P. ASTM E2950 - Standard Specification for Metal Canopy Systems 2014.
- Q. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs 2017.
- R. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength 2019.
- S. AWS D1.1/D1.1M - Structural Welding Code - Steel 2015, with Errata (2016).

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. Product Data: Submit product data sheets, including material descriptions and finishes, and preparation instructions and recommendations.
- C. Shop Drawings: Prior to commencement of fabrication, submit detailed shop drawings, showing profiles, sections of components, finishes, and fastening details.
- D. Design Data: Submit comprehensive structural analysis of design for the specified loads. Stamp and sign calculations by professional engineer.
- E. Samples: Submit two (2) of each item below for each type and condition shown.
 1. If requested, provide up to six different powder coat samples for submittal review.
 2. [3 inch by 6 inch samples of powder coat] **OR** [2 inch by 2 inch Kynar color chis or anodized aluminum samples].
 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 Documentation: 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. Perform work in accordance with AISC 303.
 1. Maintain one copy on site.
- D. Installer Qualifications: Company specializing in installation of metal canopy systems with a minimum of five years of documented experience and certified or approved by manufacturer.
- E. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with not less than ten years of documented experience.
- F. 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. Metal Canopies:
 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] OR [Not permitted].**

2.02 METAL CANOPIES

- A. Shop Fabricated Metal Canopy Type: .
 1. Pre-engineered system complying with ASTM E2950.
 2. Design and fabricate metal canopy system to resist wind, snow, live, and seismic loads without failure, damage, or permanent deflection in accordance with ASCE 7:
 - a. Loads: As indicated on drawings.
 - b. Wind: psf (kPa) positive, psf (kPa) negative; minimum.
 - c. Snow: psf (kPa); minimum.
 - d. Live: psf (kPa); minimum.
 3. Thermal Movement: Design canopy system to accommodate thermal movement caused by ambient temperature range of 120 degrees F (49 degrees C) and surface temperature range of 180 degrees F (82 degrees C) without buckling, failure of joint seals, undue stress on fasteners or other detrimental effects on assembly components.

- B. Configuration: Column layout, canopy clearance, fascia profile, and roof covering design as indicated on drawings.

2.03 COMPONENTS

- A. Structural Steel Framing:
 - 1. Columns: ASTM A500/A500M, Grade B, round or rectangular tubing, sized to suit project design load requirements.
 - 2. Base and Top Plates: ASTM A36/A36M, with pre-drilled bolt holes.
 - 3. Beams: Wide flange, ASTM A572/A572M Grade 50.
 - 4. Other Structural Steel Members: ASTM A36/A36M.
- B. Fascia: Manufacturer's standard [] profile.
- C. Anchor Bolts: ASTM A307 or ASTM A572/A572M, formed with bent shank, assembled with template for casting into concrete.
 - 1. Minimum exposed thread of 7 inches (178 mm) above footing and 23 inch (584 mm) minimum embedment.
 - 2. Provide nuts and washers as required for column leveling and plumbing.
- D. Concrete Footings: Refer to Section 033000 for additional requirements.
- E. Exposed Gutters and Downspouts: Galvanized steel with baked enamel finish, color to match canopy covering, manufacturer's recommended size for canopy specified.
 - 1. Refer to Section [] for additional requirements.

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.
- G. Provide a complete system ready for erection at project site.
- H. Perform welding in accordance with AWS D1.1/D1.1M.

2.05 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.

2.06 FINISHES

- A. Structural Steel Framing:
 - 1. Shop Primer: Rust-inhibitive red oxide.
- B. 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.
- C. 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 [_____].
- D. 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].**
- E. 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].**
- F. 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.
- G. 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
 4. Pre-grained #4 finish on available gauge material.
- H. Cor-ten or weathering steel unfinished mill material with no significant scratches or gouges.

2.07 ACCESSORIES

- A. Rod and clevis assemblies, stainless steel.
- B. Welding Fittings: Factory- or shop-welded from matching pipe or tube; joints and seams ground smooth.
- C. Universal Bracket:
 1. Stainless steel 2-part bracket. System installed per manufacturer's instructions.
 2. Finish: Powder coat.
 3. Color: As selected by Architect from manufacturers standard range.
 4. Manufacturer: BOK Modern, Inc.; www.bokmodern.com.
- D. 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.
- E. Carbon Steel Bolts and Nuts: ASTM A307.
- F. Hydraulic Expansion Cement: ASTM C1107/C1107M.
- G. 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.
- H. Sealant: Silicone; black.
- I. Finish Touch-Up Materials: As recommended by manufacturer for field application.
- J. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- K. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.
- L. Trim, Closure Pieces, and Flashings: Same material, thickness and finish as decking; factory-fabricated to required profiles.
- M. Grout: ASTM C1107/C1107M; non-shrinking; premixed compound consisting of non-metallic aggregate, cement, water-reducing and plasticizing agents.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine substrates and site area for conditions that might prevent satisfactory installation.
- B. Verify that foundation, electrical utilities, and placed anchors are in correct position.
- C. Verify that bearing surfaces are ready to receive this work.
- D. Do not proceed with installation until all conditions are satisfactory.
- E. Verify that dimensions of supporting structure are within plus/minus 1/8 inch (3.175 mm) of dimensions indicated on shop drawings.

- F. Verify that all adjacent painting, roofing, masonry work, and other work that might canopy finish has been completed prior to installation.
- G. Do not install until after all adjacent painting, roofing and masonry have been completed.
- H. Notify Architect immediately of conditions that would prevent satisfactory installation.
- I. Do not proceed with work until detrimental conditions have been corrected.
- J. 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 - FRAMING

- A. Comply with Drawings and manufacturer's written instructions.
- B. Erect framing in accordance with AISC 303.
- C. Provide for erection and wind loads. Provide temporary bracing to maintain structure plumb and in alignment until completion of erection and installation.
- D. Set units level, plumb, with uniform joints, and aligned with building elements.
- E. Fit exposed connections together to form tight, hairline joints per manufacturers recommendation for seismic movement or thermal expansion and contraction
- F. Do not cut or trim structural members without approval of manufacturer; do not install damaged members
- G. Adjust before anchoring to ensure alignment at abutting joints.
- H. Use manufacturer's hardware for connections.
- I. Attach securely in place using anchorage devices and fasteners as approved by Engineer of Record.
- J. Fasten columns to anchor bolts.
- K. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.
- L. Coat concealed surfaces that will be in contact with grout, concrete, masonry, wood or dissimilar metals, with a heavy coat of bituminous paint.
- M. Universal Bracket: Install per manufacturers printed instructions.
- N. 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.
- O. Set column base plates with non-shrink grout to achieve full plate bearing.
- P. After erection, prime welds, abrasions, and surfaces not shop primed.
- Q. Isolate dissimilar materials with bituminous coating, bushings, grommets, or washers to prevent electrolytic corrosion.
- R. Touch-up damaged finish coating using material provided by manufacturer to match original coating.

3.03 INSTALLATION - CANOPY COVERING

- A. Install in accordance with manufacturer's instructions.
- B. Fasten metal decking to steel support members, aligned level and plumb.
- C. Install fascia panels, trim, and flashing.
- D. Separate dissimilar metals using concealed bituminous paint.
- E. Touch-up damaged finish coating using material provided by manufacturer to match original coating.

3.04 FIELD QUALITY CONTROL

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

3.05 TOLERANCES

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

3.06 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.

3.07 ADJUSTING AND PROTECTION

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

END OF SECTION