

SECTION 108213
EXTERIOR GRILLES, DIVIDERS AND SCREENS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Exterior grilles, dividers and screens attached to structure.
- B. Exterior equipment screens.
- C. Framed exterior polycarbonate mesh screens to be mounted on structure provided by others.

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.

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 per current standard.
- D. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels per current standard.
- E. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes 2017.
- F. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process 2010 (Reapproved 2015).
- G. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2014.
- H. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric) 2014.
- I. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2014.
- J. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric) 2013.
- K. ASTM D1187/D1187M - Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal 1997 (Reapproved 2018).
- L. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2020.
- M. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs 2017.

1.04 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 samples of powder coat] **OR** [2 inch by 2 inch Kynar color chips 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. Samples: Submit assembled sample 24 inches by 24 inches (610 mm by 610 mm) minimum size to illustrate design, fabrication techniques, workmanship, and finish color.
- G. Test Reports: If required, submit test reports from an independent testing agency showing compliance with specified design and performance requirements.
- H. Manufacturer's Installation Instructions.
- I. Manufacturers storage and handling instructions.
- J. 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.
- K. Maintenance Data: Manufacturer's instructions for care and cleaning.
- L. Designer's Qualification Statement.
- M. Manufacturer's Qualification Statement.
- N. Installer's Qualification Statement.
- O. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 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 exterior grilles, dividers and screen 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.

1.06 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.

1.07 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: Manufacturer's standard ten year warranty on finish. Twenty year warranty optional. Not all colors are available with extended warranties.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Exterior Aluminum Grilles, Dividers and 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 GRILLES, DIVIDERS AND SCREENS

- A. Grilles: Provide shop fabricated, shop finished grilles assembled into panels.
 - 1. Grill Type: [_____]
 - a. Bar Angle: [_____] degrees from horizontal.
 - b. Horizontal Bar Spacing: [_____] inch ([_____] mm) on center.
 - c. Vertical Bar Spacing: [_____] inch ([_____] mm) on center.
 - d. Panel Depth: [_____] inch ([_____] mm) deep.
 - 2. Grille Type: Tubular shape.
 - a. Pattern: [_____].
 - b. Panel Depth: [_____] inch ([_____] mm).
 - 3. Panel Size and Configuration: As indicated on drawings.
 - 4. Frame/Support: Extruded aluminum tube or flat aluminum bar.
 - 5. Wind Load Resistance: Design to resist positive and negative wind load, [_____] psf ([_____] kPa), without damage or permanent deformation.

2.03 DIVIDERS AND SCREENS

- A. Screens: Provide shop fabricated, shop finished screens assembled into panels.
 - 1. Screen Type: [_____]

- a. Hole Size and Spacing: [] inch ([] mm) diameter, [] inch ([] mm) apart.
- b. Hole Shape: [].
- c. Panel Depth: [] inch ([] mm) deep.
2. Screen Type: Laser-cut metal sheet.
 - a. Pattern: [].
 - b. Panel Depth: [] inch ([] mm).
3. Panel Size and Configuration: As indicated on drawings.
4. Frame/Support: Extruded aluminum tube or flat aluminum bar.
5. Wind Load Resistance: Design to resist positive and negative wind load, [] psf ([] kPa), without damage or permanent deformation.

2.04 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.

2.05 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. Disassemble as necessary for shipping and handling, clearly mark units for proper reassembly.
- H. Provide supports, anchorages, and accessories as required for complete assembled system.

2.06 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; Anodized :
- 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 [_____].
- Finishes for Aluminum; Powder Coating to meet AAMA 2604:
- 3. Pretreat according to manufacturers instructions and AAMA 2604 to withstand a minimum of 2000 hours (ASTM B117) or 1500 hours (ASTM G85) salt spray testing.
 - 4. Apply Architectural Grade AAMA 2604 compliant topcoat at a minimum of 2.5 mils and process according to manufacturer's recommendations.
 - 5. Color and Gloss: [As selected by Architect from manufacturer's full range of choices]
- Finishes for Aluminum; Powder Coating to meet AAMA 2605:
- 6. Pretreat according to manufacturer's instructions and AAMA 2605 to withstand a minimum of 3000 hours (ASTM B117) or 2000 hours (ASTM G85) salt spray testing.
 - 7. Apply standard available colors, high volume RAL, or high volume custom color matches in single coat powder finish containing no less than 100% FEVE (fluorinated ethylene vinyl ether) at a minimum of 2.0 mils and process according to manufacturer's recommendations.
 - 8. Apply custom color matches for low volume as a 2-coat 70% min. PVDF (poly vinylidene fluoride) resin fluoropolymer powder or liquid system including specially formulated inhibitive primer where required by manufacturer and top color coat to total dry film thickness of 2-3 mils.
 - 9. Apply specifically available pallet colors only as a 3-coat system including clear fluorocarbon topcoat using 70% min. PVDF (poly vinylidene fluoride) resin fluoropolymer liquid to total dry film thickness of 2-3 mils.
- C. Finishes for Steel:
- 1. Mill finish.
 - 2. Powder Coating:
 - a. Pretreat according to AAMA 2604 to withstand a minimum of 2000 hours (ASTM B117) or 1500 hours (ASTM G85 Annex A2).
 - b. Apply 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 AAMA 2604 compliant topcoat at a minimum of 2.0 mils and process according to manufacturer's written recommendations.
 - d. Color and Gloss: As selected by Architect from manufacturers standard range.
- D. 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
- E. Pre-grained #4 finish on available gauge material.
- F. Cor-ten or weathering steel unfinished mill material with no significant scratches or gouges.

2.07 ACCESSORIES

- A. Non-Weld Mechanical Fittings: Slip-on, galvanized malleable iron castings, for Schedule 40 pipe, with flush setscrews for tightening by standard hex wrench, no bolts or screw fasteners.
- B. Non-Weld Mechanical Fittings: In-line aluminum fittings, with flush setscrews for tightening by standard hex wrench, no bolts or screw fasteners.
- C. Welding Fittings: Factory- or shop-welded from matching pipe or tube; joints and seams ground smooth.
- D. 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.
- E. 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.
- F. Carbon Steel Bolts and Nuts: ASTM A307.
- G. Hydraulic Expansion Cement: ASTM C1107/C1107M.
- H. 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.
- I. Sealant: Silicone; black.
- J. Finish Touch-Up Materials: As recommended by manufacturer for field application.
- K. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- L. 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 painting, roofing, masonry work, and other adjacent work that might damage grille, screen or divider finish have been completed prior to start of installation.
- D. Verify that anchorage devices have been properly installed and located.
- E. Do not install until after all adjacent painting, roofing and masonry have been completed.

- F. Do not proceed with installation until all conditions are satisfactory.
- G. Notify Architect immediately of conditions that would prevent satisfactory installation.
- H. Do not proceed with work until detrimental conditions have been corrected.
- I. 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 grilles level, plumb, with uniform joints, and in alignment with adjacent work as indicated.
- C. Mechanically secure grilles to supporting structure.
- D. Fit exposed connections together to form tight, hairline joints per manufacturers recommendation for seismic movement or thermal expansion and contraction
- E. Do not cut or trim members without approval of manufacturer; do not install damaged members
- F. Adjust before anchoring to ensure alignment at abutting joints.
- G. Use manufacturer's hardware for connections.
- H. Attach securely in place using anchorage devices and fasteners as approved by Engineer of Record.
- I. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.
- J. 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.
- K. Universal Bracket: Install per manufacturers printed instructions.
- L. 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.
- M. Isolate dissimilar materials with bituminous coating, bushings, grommets, or washers to prevent electrolytic corrosion.
- N. 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 True Position: 1/8 inch (3 mm).
- B. Maximum Offset From True Alignment: 1/8 inch (3 mm).

3.05 CLEANING

- A. Remove temporary protective covering as grilles are installed.
- 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.
- C. Touch-up damaged finish coating using material provided by manufacturer to match original coating.
- D. Replace grilles that have been damaged beyond touch-up repair.

3.06 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