

PRODUCT SPECIFICATION GUIDE

GRILLES AND SCREENS

FACILITY CONSTRUCTION SUBGROUP: DIVISION 10 SPECIALTIES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Linear Bar Grilles.
 - 2. Angular Bar Grilles.
 - 3. Solar-Line Bar Grilles.
 - 4. Continue-Line Bar Grilles.
 - 5. Matrix Grilles.
 - 6. Prism Grilles.
 - 7. Sansome Grilles.
 - 8. Monumental Grilles.
 - 9. Mia Grilles.
 - 10. Gemini Grilles.
 - 11. Architectural Screens.
- B. Related Sections include the following:
 - 1. Division 5 Section "Structural Steel" for supporting structure.

1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide exterior grilles capable of withstanding the effects of loads and stresses from wind and normal thermal movement without evidencing permanent deformation of grille components including blades, frames, and supports; noise or metal fatigue caused by grille or screen component rattle or flutter; or permanent damage to fasteners and anchors.
 - 1. Wind Load: Uniform pressure (velocity pressure) of 20 lbf/sq. ft. (960 Pa), acting inward or outward.
 - 2. Wind Load: Uniform pressure (velocity pressure) of 30 lbf/sq. ft. (1440 Pa), acting inward or outward.
 - 3. Wind Load: Uniform pressures (velocity pressures) indicated on Drawings, acting inward or outward.
 - 4. Thermal Movements: Provide grilles or screens that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, and other detrimental effects:
 - a. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

1.4 SUBMITTALS

- A. Product Data: For each type of product specified.
- B. Shop Drawings: For grille or screen units and accessories. Include plans; elevations; sections; and details showing profiles, angles, and spacing of elements. Show unit dimensions related to wall openings and adjacent construction; profiles of frames at jambs, heads, and sills; and anchorage details and locations.
 - 1. For installed grilles and screens indicated to comply with design loadings, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- B. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for units with factory-applied color finishes.
- C. Samples for Verification: Of each type of metal finish required, prepared on Samples of same thickness and material indicated for final Work. Where finishes involve normal color and texture variations, include Sample sets showing the full range of variations expected.
- D. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

1.5 QUALITY ASSURANCE

- A. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of kind indicated. Engineering services are defined as those performed for installations of grilles and screens that are similar to those indicated for this Project in material, design, and extent.
- B. Source Limitations: Obtain grilles and screens through one source from a single manufacturer where alike in one or more respects regarding type, design, or factory-applied color finish.
- C. Welding Standards: As follows:
 - 1. Comply with AWS D1.2, "Structural Welding Code--Aluminum."
 - 2. Select subparagraph above or below or both if required.
 - 3. Comply with AWS D1.3, "Structural Welding Code--Sheet Steel."
- D. SMACNA Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" recommendations for fabrication, construction details, and installation procedures.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify supports and adjoining construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Established Dimensions: Where field measurements cannot be made without delaying the Work, guarantee dimensions and proceed with fabricating grilles and screens without field measurements. Coordinate construction to ensure that actual opening dimensions correspond to established dimensions.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products manufactured by:

1. The AIROLITE Company, LLC, Marietta, OH; Phone 740 373 7676; Fax 740 373 6666; email info@airolite.com; and, web <http://www.airolite.com>

2.2 MATERIALS

- A. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), alloy 6063-T5 or T-52.
- B. Aluminum Sheet: ASTM B 209 (ASTM B 209M), alloy 3003 or 5005 with temper as required for forming, or as otherwise recommended by metal producer for required finish.
- C. Aluminum Castings: ASTM B 26/B 26M, alloy 319.
- D. Galvanized Steel Sheet: ASTM A 653/A 653M, G90 (Z275) zinc coating, mill phosphatized.
- D. Stainless-Steel Sheet: ASTM A 666, Type 302 or 304.
- E. Fasteners: Of same basic metal and alloy as fastened metal or 300 series stainless steel, unless otherwise indicated. Do not use metals that are incompatible with joined materials.
 1. Use types and sizes to suit unit installation conditions.
 2. Use Phillips flat-head screws for exposed fasteners, unless otherwise indicated.
- F. Anchors and Inserts: Of type, size, and material required for loading and installation indicated. Use nonferrous 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.
- G. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint 12 but containing no asbestos fibers, or cold-applied asphalt emulsion complying with ASTM D 1187.

2.3 FABRICATION, GENERAL

- A. Assemble grilles and screens 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. Continuous Vertical Assemblies: Where height of grille and screen units exceeds fabrication and handling limitations, fabricate units to permit field-bolted assembly with close-fitting joints in jambs and mullions, reinforced with splice plates and without interrupting grille or screen pattern.
- B. Maintain equal blade or bar spacing, including separation between blades and frames at head, sill and jambs, to produce uniform appearance.
- C. Fabricate frames to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining materials' tolerances, and perimeter sealant joints.
- D. Include supports, anchorages, and accessories required for complete assembly.
- E. Provide vertical mullions of type and at spacings indicated, but not more than recommended by manufacturer. At horizontal joints between grille or screen units, provide horizontal mullions, unless continuous, uninterrupted vertical appearance are indicated.
- F. Join frame members to one another and blade or bar components with fillet welds concealed from view, unless otherwise indicated or size of grille or screen assembly makes concealed bolted connections between frame members necessary.

2.4 GRILLES AND SCREENS

- A. Grille and Screen Construction: Provide grilles or screens with extruded-aluminum frames and bars or blades.
- B. Linear Bar Grilles: As follows:
 1. Vertical Bar Spacing: Specify 2 inches (50 mm) to 12 inches (305 mm), unless otherwise indicated.
 1. Horizontal Bar Spacing: Specify 2 inches (50 mm) to 12 inches (305 mm), unless otherwise indicated.
 3. Grille Depth: 2 inches (52 mm) to 6 inches (152 mm), unless otherwise indicated.

4. Material Thickness: 0.081 inch (2.06 mm) to 0.250 inches (6 mm), unless otherwise indicated.
- B. Angular Bar Grilles: As follows:
1. Vertical Bar Spacing: Specify 2 inches (50 mm) to 12 inches (305 mm), unless otherwise indicated.
 2. Horizontal Bar Spacing: Specify 2 inches (50 mm) to 12 inches (305 mm), unless otherwise indicated.
 3. Horizontal Bar Angle: 0 to 60 degrees, unless otherwise indicated.
 4. Grille Depth: 2 inches (152 mm) to 6 inches (152 mm), unless otherwise indicated.
 5. Material Thickness: 0.081 inch (2.06 mm) to 0.250 inches (6 mm), unless otherwise indicated.
- C. Solar-Line Grilles: As follows:
1. Vertical Bar Spacing: Specify 2 inches (50 mm) to 12 inches (305 mm), unless otherwise indicated.
 2. Horizontal Bar Spacing: Specify 2 inches (50 mm) to 12 inches (305 mm), unless otherwise indicated.
 3. Horizontal Bar Angle: 0 to 60 degrees, unless otherwise indicated.
 4. Grille Depth: 2 inches (152 mm) to 6 inches (152 mm), unless otherwise indicated.
 5. Material Thickness: 0.081 inch (2.06 mm) to 0.250 inches (6 mm), unless otherwise indicated.
- D. Continue-Line Grilles: As follows:
1. Vertical Bar Spacing: Specify 2 inches (50 mm) to 12 inches (305 mm), unless otherwise indicated.
 2. Horizontal Bar Spacing: Specify 2 inches (50 mm) to 12 inches (305 mm), unless otherwise indicated.
 3. Horizontal Bar Angle: 0 to 60 degrees, unless otherwise indicated.
 4. Grille Depth: 2 inches (152 mm) to 6 inches (152 mm), unless otherwise indicated.
 5. Material Thickness: 0.081 inch (2.06 mm) to 0.250 inches (6 mm), unless otherwise indicated.
- E. Matrix Grilles: As follows:
1. Large Bar Spacing: Specify 2 inches (50 mm) to 12 inches (305 mm), unless otherwise indicated.
 2. Small Bar Spacing: Specify 1 inch (25 mm) to 12 inches (305 mm), unless otherwise indicated.
 3. Angle: 45 degrees, unless otherwise indicated.
 4. Grille Depth: 2 inches (152 mm) to 6 inches (152 mm), unless otherwise indicated.
 5. Material Thickness: 0.081 inch (2.06 mm) to 0.250 inches (6 mm), unless otherwise indicated.
- F. Prism Grilles: As follows:
1. Vertical Bar Spacing: Specify 1 inch (25 mm) to 12 inches (305 mm), unless otherwise indicated.
 2. Horizontal Bar Spacing: Specify 1 inch (25 mm) to 12 inches (305 mm), unless otherwise indicated.
 3. Horizontal Angle: 0 to 60 degrees, unless otherwise indicated.
 4. Grille Depth: 2 inches (152 mm) to 6 inches (152 mm), unless otherwise indicated.
 5. Material Thickness: 0.081 inch (2.06 mm) to 0.250 inches (6 mm), unless otherwise indicated.
- G. Sansome Grilles: As follows:
1. Geometric Pattern: As indicated.
 2. Material Thickness: 0.081 inch (2.06 mm) to 0.500 inches (12.7 mm), unless otherwise indicated.
- H. Monumental Grilles: As follows:
1. Geometric Pattern: As indicated.

2. Material Thickness: 0.081 inch (2.06 mm) to 0.125 inches (3 mm), unless otherwise indicated.
- I. Mia Grilles: As follows:
 1. Vertical Bar Spacing: Specify 2 inches (50 mm) to 36 inches (914 mm), unless otherwise indicated.
 2. Horizontal Blade Spacing: Specify 2 inches (50 mm) to 12 inches (305 mm), unless otherwise indicated.
 3. Horizontal Bar Angle: 0 to 60 degrees, unless otherwise indicated.
 4. Grille Depth: 2 inches (50.8 mm), unless otherwise indicated.
 5. Vertical Bar Thickness: 0.081 inch (2.06 mm) to 0.250 inches (6 mm), unless otherwise indicated.
 6. Horizontal Blade Thickness: 0.073 inches (1.8 mm), unless otherwise indicated.
- J. Gemini Grilles: As follows:
 1. Vertical Bar Spacing: Specify 9 inches (50 mm) to 48 inches (1219 mm), unless otherwise indicated.
 2. Horizontal Blade Spacing: Specify 5-1/2 inches (139 mm), unless otherwise indicated.
 3. Horizontal Bar Angle: 45 degrees, unless otherwise indicated.
 4. Grille Depth: 3 inches (76.2 mm), unless otherwise indicated.
 5. Material Thickness: 0.125 inches (3 mm), unless otherwise indicated.

2.5 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish grilles and screens after assembly.

2.6 ALUMINUM FINISHES

- A. Finish designations prefixed by AA comply with system established by the Aluminum Association for designating aluminum finishes.
- B. Class II, Clear Anodic Finish: AA-M12C22A31 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.010 mm or thicker) complying with AAMA 607.1.
- C. Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 607.1.
- D. Class I, Color Anodic Finish: AA-M12C22A42/A44 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, integrally colored or electrolytically deposited color coating 0.018 mm or thicker) complying with AAMA 606.1 or AAMA 608.1.
 1. Color: Light bronze.
 2. Color: Medium bronze.
 3. Color: Dark bronze.
 4. Color: Black.
 5. Color: Match Architect's sample.
 6. Color: As selected by Architect from the full range of industry colors and color densities.
- E. Conversion-Coated Finish: AA-C12C42 (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating).
- F. Conversion-Coated and Factory-Primed Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below).
 1. Organic Coating: Air-dried primer of not less than 2.0- mil (0.05-mm) dry film thickness.

- G. Baked-Enamel Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Apply baked enamel complying with paint manufacturer's specifications for cleaning, conversion coating, and painting.
 - 1. Organic Coating: Thermosetting, modified-acrylic enamel primer/topcoat system complying with AAMA 603.8, except with a minimum dry film thickness of 1.5 mils (0.04 mm), medium gloss.
 - 2. Color: As indicated by manufacturer's color designations.
 - 3. Color: Match Architect's sample.
 - 4. Color: As selected by Architect from manufacturer's full range of colors.
- H. High-Performance Organic Coating Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 1. Fluoropolymer Two-Coat Coating System: Manufacturer's standard two-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 605.2.
 - 2. Fluoropolymer Three-Coat Coating System: Manufacturer's standard three-coat, thermocured system consisting of specially formulated inhibitive primer, fluoropolymer color coat, and clear fluoropolymer topcoat, with both color coat and clear topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 605.2.
 - a. Color and Gloss: As indicated by manufacturer's color and gloss designations.
 - b. Color and Gloss: Match Architect's sample.
 - c. Color and Gloss: As selected by Architect from manufacturer's full range of colors and glosses.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Coordinate Setting Drawings, diagrams, templates, instructions, and directions for installation of anchorages that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

3.2 INSTALLATION

- A. Locate and place grille units level, plumb, and at indicated alignment with adjacent work.
- B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
- C. Form closely fitted joints with exposed connections accurately located and secured.
- D. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.
- E. Repair finishes damaged by cutting, welding, soldering, and grinding. Restore finishes so no evidence remains of corrective work. Return items that cannot be refinished in the field to the factory, make required alterations, and refinish entire unit or provide new units.
- F. Protect galvanized and nonferrous-metal surfaces from corrosion or galvanic action by applying a heavy coating of bituminous paint on surfaces that will be in contact with concrete, masonry, or dissimilar metals.
- G. Install concealed gaskets, flashings, joint fillers, and insulation, as grille installation progresses, where weathertight joints are required. Comply with Division 7 Section "Joint Sealants" for sealants applied during grille installation.

3.3 ADJUSTING, CLEANING, AND PROTECTING

- A. Periodically clean exposed surfaces of grilles that are not protected by temporary covering to remove fingerprints and soil during construction period. Do not let soil accumulate until final cleaning.
- B. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.
- C. Protect grilles from damage during construction. Use temporary protective coverings where needed and approved by grille manufacturer. Remove protective covering at the time of Substantial Completion.
- D. Restore grilles damaged during installation and construction so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.
 - 1. Clean and touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.