
PART 1 GENERAL**1.1 RELATED DOCUMENTS**

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

1.2 SUMMARY

- A. This Section includes:
 - 1. Fixed, extruded-aluminum louvers.
- B. Related Requirements:
 - 1. Division 8 Section 08 90 10/Performance Requirements for Exterior Façade Systems.
 - 2. Division 23 Sections for louvers that are a part of mechanical equipment.

1.3 DEFINITIONS

- A. Louver Terminology: Definitions of terms for metal louvers contained in AMCA 501 apply to this Section unless otherwise defined in this Section or in referenced standards.
- B. Horizontal Louver: Louver with horizontal blades (i.e., the axes of the blades are horizontal).
- C. Drainable-Blade Louver: Louver with blades having gutters that collect water and drain it to channels in jambs and mullions, which carry it to bottom of unit and away from opening.

1.4 QUALITY ASSURANCE

- A. The work of this section shall be performed by a company which specializes in the type of fixed louvers work required for this Project, with a minimum of 5 years of documented successful experience and shall be performed by skilled workmen thoroughly experienced in the necessary crafts.
 - 1. Work shall be performed in compliance with Owner's insurance underwriters' requirements and UL approvals and testing for materials, assemblies and procedures.
- B. Manufacturer shall specialize in manufacturing the type of fixed louvers specified in this section, with a minimum of 5 years of documented successful experience, and have the facilities capable of meeting all requirements of Contract Documents as a single-source responsibility and warranty.
- C. Source Limitations: Obtain louvers and vents from single source from a single manufacturer where indicated to be of same type, design, or factory-applied color finish.
- D. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
- E. SMACNA Standard: Comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for fabrication, construction details, and installation procedures.
- F. Manufacturer's identification tags or marks are not acceptable on surfaces which will remain exposed to view after installation.
 - 1. Evidence of "patching" after removal of tags or marks is not acceptable.

1.5 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Louvers shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated without permanent deformation of louver components, noise or metal fatigue caused by louver-blade rattle or flutter, or permanent damage to fasteners and anchors. Wind pressures shall be considered to act normal to the face of the building.
 - 1. Wind Loads: Determine based on pressures as indicated in Wind Tunnel Test Report.
- B. Louver Performance Ratings: Provide louvers complying with requirements specified, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width according to AMCA 500-L.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
 - 1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

1.6 SUBMITTALS

- A. Submit the following according to Conditions of the Construction Contract and Division 1 Specification Sections.
- B. Product Data: For each type of product.
 - 1. For louvers specified to bear AMCA seal, include printed catalog pages showing specified models with appropriate AMCA Certified Ratings Seals.
- C. LEED Submittal: MRc4 – List all materials with recycled content indicating material cost broken out by post-industrial (pre-consumer) and post-consumer content. Only include data for materials permanently installed on the project site.
- D. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other work. Show frame profiles and blade profiles, angles, and spacing.
 - 1. Show weep paths, gaskets, flashing, sealant, and other means of preventing water intrusion.
 - 2. Show mullion profiles and locations.
- E. Samples: For each type of metal finish required.
- F. Hazardous Materials Notification: In the event no product or material is available that does not contain asbestos, PCB or other hazardous materials as determined by the Owner, a "Material Safety Data Sheet" (MSDS) equivalent to OSHA Form 20 shall be submitted for that proposed product or material prior to installation.
- G. Asbestos and PCB Certification: After completion of installation, but prior to Substantial Completion, Contractor shall certify in writing that products and materials installed, and processes used, do not contain asbestos or polychlorinated biphenyls (PCB), using format in Article 3 of General Conditions.

1.7 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Based on evaluation of comprehensive tests performed according to AMCA 500-L by a qualified testing agency or by manufacturer and witnessed by a qualified testing agency, for each type of louver and showing compliance with performance requirements specified.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Comply with General Conditions and Division 1 Section "Product Requirements".

1.9 FIELD CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.10 WARRANTY

- A. Comply with General Conditions and Division 1 Section "Product Requirements".

PART 2 PRODUCTS**2.1 UNAUTHORIZED MATERIALS**

- A. Materials and products required for work of this section shall not contain asbestos, polychlorinated biphenyls (PCB) or other hazardous materials identified by the Owner.

2.2 ACCEPTABLE MANUFACTURERS

- A. Products of the manufacturers specified in this section establish the minimum functional, aesthetic and quality standards required for work of this section.
- B. Source Limitations: Obtain louvers from single source from a single manufacturer where indicated to be of same type, design, or factory-applied color finish.
- C. Substitutions: Comply with General Conditions using form in Division 1 Section "Substitution Request Form".

2.3 FIXED, EXTRUDED-ALUMINUM LOUVERS

- A. Horizontal, Drainable-Blade Louver: Louver Type 1 and 2:
1. Basis-of-Design Product: Subject to compliance with requirements, provide Airolite, Model SCH401 or comparable product by one of the following:
 - a. Airolite Company, LLC (The).
 - b. Ruskin Company; Tomkins PLC.
 - c. Construction Specialties.
 2. Locations: Exterior walls.
- B. Horizontal, Non-drainable-Blade Louver: Louver Type 3:
1. Basis-of-Design Product: Subject to compliance with requirements, provide Airolite K609 or comparable product by one of the following:
 - a. Airolite Company, LLC (The).
 - b. Construction Specialties, Inc.
 - c. Ruskin Company; Tomkins PLC.
 2. Locations: Interior at garage.

2.4 FIXED, ACOUSTICAL LOUVERS

- A. Acoustic Performance: Provide acoustical louvers complying with ratings specified, as demonstrated by testing manufacturer's stock units identical to those specified, except for length and width for outdoor-indoor, sound-transmission loss according to ASTM E966.
- B. Fixed, Formed-Metal Acoustical Louver Type 4: Louver with formed-metal blades filled on interior with mineral-fiber, rigid-board, acoustical insulation retained by perforated metal sheet of same material and finish as blade.
1. Basis-of-Design Product: Subject to compliance with requirements, provide IAC Model R or comparable product by one of the following:
 - a. Airolite Company, LLC (The).
 - b. American Warming and Ventilating; a Mestek company.
 - c. Construction Specialties, Inc.
 - d. IAC Acoustics.
 - e. Ruskin Company; Tomkins PLC.
 2. Louver Depth: 12 inches (300 mm).
 3. Frame Material: Extruded aluminum or aluminum sheet, not less than 0.080-inch (2.03-mm) nominal thickness.
 4. Blade Material: Aluminum sheet, not less than 0.080-inch (2.03-mm) nominal thickness.
 5. Blade Shape: Airfoil.
 6. Blade Angle: 45 degrees unless otherwise indicated.
 7. Blade Spacing: 12 inches (300 mm) o.c. for 12-inch- (300-mm-) deep louvers.

*** 2.5 FIXED ARCHITECTURAL GRILLE**

- * A. Basis-of-Design Product: Subject to compliance with requirements, provide Airolite "Angular Bar" Grille or comparable product by one of the following:
- * 1. Airolite Company, LLC (The).
 - * 2. Construction Specialties, Inc.
 - * 3. Ruskin Company; Tomkins PLC.
- * B. Grille Depth: 6 inches (150 mm).
- * C. Blade Profile: Angular bar.
- * D. Frame and Blade Nominal Thickness: As required to comply with structural performance requirements.
- * E. Horizontal Bar Spacing: 12 inches (300 mm).
- * F. Vertical Bar Spacing: 12 inches (300 mm).
- * G. Horizontal Bar Angle: 45°.
- * H. Perimeter Frame: Bar.

- * I. Location: Penthouse at Cooling Tower.
- * J. Designation: Louver Type 5.

2.6 LOUVER SCREENS

- A. General: Provide screen at each exterior louver.
 - 1. Screen Location for Fixed Louvers: Interior face.
 - 2. Screening Type: Bird screening.
- B. Secure screen frames to louver frames with stainless-steel machine screws, spaced a maximum of 6 inches (150 mm) from each corner and at 12 inches (300 mm) o.c.
- C. Louver Screen Frames: Fabricate with mitered corners to louver sizes indicated.
 - 1. Metal: Same type and form of metal as indicated for louver to which screens are attached. Reinforce extruded-aluminum screen frames at corners with clips.
 - 2. Finish: Mill finish unless otherwise indicated.
 - 3. Type: Non-rewirable, U-shaped frames.
- D. Louver Screening for Aluminum Louvers:
 - 1. Bird Screening: Aluminum, 1/2-inch- (13-mm-) square mesh, 0.063-inch (1.60-mm) wire.

2.7 BLANK-OFF PANELS

- A. General: Fabricate blank-off panels from materials and to sizes indicated and comply with the following requirements:
 - 1. Finish: Same as finish applied to louvers.
 - 2. Attach blank-off panels to back of louver frames with clips.
 - 3. Where applicable, blank off panels shall be continuously sealed to louver frame around perimeter to prevent air and water leakage.
- B. Insulated, Blank-Off Panels: Laminated panels consisting of an insulating core surfaced on back and front with metal sheets and attached to back of louver.
 - 1. Thickness: 2 inches (50 mm).
 - 2. Metal Facing Sheets: Aluminum sheet, not less than 0.032-inch (0.81-mm) nominal thickness.
 - 3. Insulating Core: Extruded-polystyrene foam.
 - 4. Edge Treatment: Trim perimeter edges of blank-off panels with louver manufacturer's standard extruded-aluminum-channel frames, not less than 0.080-inch (2.03-mm) nominal thickness, with corners mitered and with same finish as panels.
 - 5. Seal perimeter joints between panel faces and louver frames with gaskets or sealant.
 - 6. Panel Finish: Same finish applied to louvers.
 - 7. Attach blank-off panels with clips.

2.8 MATERIALS

- A. Aluminum Extrusions: ASTM B221 (ASTM B221M), Alloy 6063-T5, T-52, or T6.
- B. Aluminum Sheet: ASTM B209 (ASTM B209M), Alloy 3003 or 5005 with temper as required for forming, or as otherwise recommended by metal producer for required finish.
- C. Fasteners: Use types and sizes to suit unit installation conditions.
 - 1. Use Phillips flat-head screws for exposed fasteners unless otherwise indicated.
 - 2. For fastening aluminum, use 300 series stainless-steel fasteners.
 - 3. For color-finished louvers, use fasteners with heads that match color of louvers.
- D. Post installed Fasteners for Concrete and Masonry: Torque-controlled expansion anchors, made from stainless-steel components, with capability to sustain, without failure, a load equal to 4 times the loads imposed, for concrete, or 6 times the load imposed for masonry, as determined by testing according to ASTM E488, conducted by a qualified independent testing agency.
- E. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187.

- F. Recycled Content: For materials containing post-industrial (pre-consumer) and/or post-consumer recycled content, contractor shall document the cost and percentage (by weight) of each material broken out by post-industrial (pre-consumer) and post-consumer content. LEED Submittal: MRc4 – List all materials with recycled content indicating material cost broken out by post-industrial (pre-consumer) and post-consumer content. Only include data for materials permanently installed on the project site.

2.9 FABRICATION

- A. Factory assemble louvers to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- B. Vertical Assemblies: Where height of louver 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.
1. Continuous Vertical Assemblies: Fabricate units without interrupting blade-spacing pattern unless horizontal mullions are indicated.
 2. Horizontal Mullions: Provide horizontal mullions at joints where indicated.
- C. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.
1. Frame Type: Channel unless otherwise indicated.
- D. Include supports, anchorages, and accessories required for complete assembly.
- E. Provide vertical mullions of type and at spacings indicated, but not more than is recommended by manufacturer, or 72 inches (1830 mm) o.c., whichever is less.
1. Exposed Mullions: Where indicated, provide units with exposed mullions of same width and depth as louver frame. Where length of louver exceeds fabrication and handling limitations, provide interlocking split mullions designed to permit expansion and contraction.
- F. Provide subsills made of same material as louvers or extended sills for recessed louvers.
- G. Join frame members to each other and to fixed louver blades with fillet welds threaded fasteners, or both, as standard with louver manufacturer unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

2.10 ALUMINUM FINISHES

- A. Finish louvers after assembly.
- B. Aluminum Louver Finish:
1. Fluoropolymer coating as specified in Division 9 Section "High-Performance Architectural Coatings".
 2. Color:
 - a. Louver Type 1, at Curtain Wall: Aluminum Color AL-3.
 - b. Louver Type 2, other than Curtain Wall: Aluminum Color AL-7.
 - c. Louver Type 3, Interior: Aluminum Color AL-7.
 - d. Louver Type 4, Acoustical: Aluminum Color AL-7.
 - e. Louver/Grille Type 5: Aluminum Color AL-7.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates and openings, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 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.

3.3 INSTALLATION

- A. Locate and place louvers 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 unpainted galvanized and nonferrous-metal surfaces that are in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint or by separating surfaces with waterproof gaskets or nonmetallic flashing.
- G. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply with Section 079200 "Joint Sealants" for sealants applied during louver installation.

3.4 ADJUSTING AND CLEANING

- A. Clean exposed louver surfaces that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate during construction period.
- 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. Restore louvers 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. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

END OF SECTION