

SECTION 10200 - LOUVERS AND VENTS

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. Fixed, extruded-aluminum louvers.
- 2. Adjustable louvers.

- B. Related Sections include the following:

- 1. Division 7 Section "Joint Sealants" for sealants installed in perimeter joints between louver frames and adjoining construction.
- 2. Division 8 Section "Steel Doors and Frames" for louvers in hollow-metal doors and frames.
- 3. Division 8 Section "Flush Wood Doors" for louvers in wood doors.
- 4. Division 9 Section "Painting (Professional Line Products)" for field painting louvers.
- 5. Division 15 Sections for louvers that are a part of mechanical equipment.
- 6. Division 16 Sections for electrical power connections for motor-operated adjustable metal louvers.

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. 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 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide louvers capable of withstanding 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 on vertical projection of louvers.
 - 1. Wind Loads: Determine loads based on pressures as indicated on Drawings.

2. Wind Loads: Determine loads based on a uniform pressure of **20 lbf/sq. ft. (957 Pa)**, acting inward or outward.
- B. Seismic Performance: Provide louvers capable of withstanding the effects of earthquake motions determined according to ASCE 7, "Minimum Design Loads for Buildings and Other Structures": Section 9, "Earthquake Loads."
- C. Thermal Movements: Provide louvers 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, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 1. Temperature Change (Range): **120 deg F (67 deg C)**, ambient; **180 deg F (100 deg C)**, material surfaces.
- D. Air-Performance, Water-Penetration, Air-Leakage, and Wind-Driven Rain Ratings: Provide louvers complying with performance requirements indicated, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width according to AMCA 500-L.
- E. Airborne Sound Transmission Loss: Provide acoustical louvers complying with airborne sound transmission loss ratings indicated, as demonstrated by testing manufacturer's stock units identical to those specified, except for length and width according to ASTM E 90.

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other Work. Show blade profiles, angles, and spacing.
 1. For installed louvers and vents indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 2. Wiring Diagrams: Power, signal, and control wiring for motorized adjustable louvers.
- C. Samples for Initial Selection: For units with factory-applied color finishes.
- D. Samples for Verification: For each type of metal finish required.
- E. Qualification Data: For professional engineer.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency or by manufacturer and witnessed by a qualified testing agency, for each type of louver.

1.6 QUALITY ASSURANCE

- A. Source Limitations: Obtain louvers and vents through one source from a single manufacturer where indicated to be of same type, design, or factory-applied color finish.
- B. Welding: Qualify procedures and personnel according to the following:
 - 1. AWS D1.2, "Structural Welding Code--Aluminum."
 - 2. AWS D1.3, "Structural Welding Code--Sheet Steel."
- C. SMACNA Standard: Comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for fabrication, construction details, and installation procedures.
- D. UL and NEMA Compliance: Provide motors and related components for motor-operated adjustable louvers that are listed and labeled by UL and comply with applicable NEMA standards.

1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify louver openings by field measurements before fabrication and indicate measurements on Shop Drawings.
 - 1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish opening dimensions and proceed with fabricating louvers without field measurements. Coordinate construction to ensure that actual opening dimensions correspond to established dimensions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Louvers:
 - a. Airline Products Co.
 - b. Airolite Company (The).
 - c. American Warming and Ventilating, Inc.
 - d. Arrow United Industries.
 - e. Carnes Company, Inc.
 - f. Cesco Products.
 - g. Construction Specialties, Inc.
 - h. Dowco Products Group; Safe-Air of Illinois, Inc.
 - i. Greenheck.
 - j. Industrial Louvers, Inc.
 - k. Louvers & Dampers, Inc.
 - l. Metal Form Manufacturing Company, Inc.
 - m. NCA Manufacturing, Inc.
 - n. Nystrom Building Products.

- o. Reliable Products; Hart & Cooley, Inc.
- p. Ruskin Company; Tomkins PLC.
- q. Vent Products Company, Inc.

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.
- E. Stainless-Steel Sheet: ASTM A 666, Type 304, with No. **[4] [6]** finish.
- F. 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 hex-head or Phillips pan-head screws for exposed fasteners, unless otherwise indicated.
- G. Postinstalled 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 per ASTM E 488, conducted by a qualified independent testing agency.
- H. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.3 FABRICATION, GENERAL

- A. Assemble louvers 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.
- 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. Maintain equal louver blade spacing, including separation between blades and frames at head and sill, to produce uniform appearance.
- D. Maintain equal louver blade spacing to produce uniform appearance.

- E. 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.
- F. Include supports, anchorages, and accessories required for complete assembly.
- G. Provide vertical mullions of type and at spacings indicated, but not more than recommended by manufacturer, or **72 inches (1830 mm)** o.c., whichever is less.
 - 1. Fully Recessed Mullions: Where indicated, provide mullions fully recessed behind louver blades. Where length of louver exceeds fabrication and handling limitations, fabricate with close-fitting blade splices designed to permit expansion and contraction.
 - 2. Semirecessed Mullions: Where indicated, provide mullions partly recessed behind louver blades so louver blades appear continuous. Where length of louver exceeds fabrication and handling limitations, fabricate with interlocking split mullions and close-fitting blade splices designed to permit expansion and contraction.
 - 3. 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.
 - 4. Exterior Corners: Prefabricated corner units with mitered and welded blades and with fully recessed mullions at corners.
- H. Where indicated, provide subsills made of same material as louvers for recessed louvers.
- I. Join frame members to each other and to fixed louver blades with fillet welds concealed from view, unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

2.4 FIXED, EXTRUDED-ALUMINUM LOUVERS

- A. Horizontal, Drainable -Blade Louver.
 - 1. Louver Depth: Coordinate with wall type but **4 inches** minimum.
 - 2. Frame and Blade Nominal Thickness: As required to comply with structural performance requirements, but not less than **0.060 inch (1.5 mm)** for blades and **0.080 inch (2.0 mm)** for frames.
 - 3. Mullion Type: Exposed.
 - 4. Performance Requirements:
 - a. Free Area: Not less than **7.0 sq. ft. (0.65 sq. m)** for **48-inch- (1.2-m-)** wide by **48-inch- (1.2-m-)** high louver.
 - b. Point of Beginning Water Penetration: Not less than **900 fpm (4.6 m/s)**.
 - c. Air Performance: Not more than **0.10-inch wg (25-Pa)** static pressure drop at **700-fpm (3.6-m/s)** free-area velocity.
 - d. Air Performance: Not more than **0.15-inch wg (37-Pa)** static pressure drop at **900-fpm (4.6-m/s)** free-area velocity.

5. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

2.5 ADJUSTABLE, EXTRUDED-ALUMINUM LOUVERS

- A. Louver Construction and Operation: Provide adjustable louvers with extruded-aluminum frames and blades of thickness required to comply with structural performance requirements, but not less than **0.080-inch (2.0-mm)** nominal thickness, and with operating mechanisms to suit louver sizes.
 1. Motor operation with 2position, spring-return application (with power on, motor opens louver; with power off, spring closes louver); 110-V, 60-Hz motor and limit switch; equipped as follows:
 - a. Terminals for controlling devices.
 2. Pneumatic piston operation for use with **80- to 100-psi (550- to 690-kPa)** compressed air.
 - a. Operation: Modulating; power open, power close with spring-return fail-safe.
- B. Dual-Blade, Drainable-Blade, Adjustable Louver Fixed drainable blades and adjustable plain blades combined in single frame.
 1. Louver Depth: Coordinate with wall type but **4 inches** minimum.
 2. Performance Requirements:
 - a. Free Area: Not less than **6.0 sq. ft. (0.56 sq. m)** for **48-inch- (1.2-m-)** wide by **48-inch- (1.2-m-)** high louver.
 - b. Point of Beginning Water Penetration: Not less than **750 fpm (3.8 m/s)**.
 - c. Air Performance: Not more than **0.10-inch wg (25-Pa)** static pressure drop at **750-fpm (3.8-m/s)** free-area velocity.
 - d. Air Leakage: Not more than **1.5 cfm per sq. ft. (7.6 L/s per sq. m)** of louver gross area at a differential static pressure of **0.15-inch wg (37 Pa)** with adjustable louver blades closed.
 3. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

2.6 LOUVER SCREENS

- A. General: Provide screen at each exterior louver unless noted otherwise.
 1. Screen Location for Fixed Louvers: Interior face.
 2. Screen Location for Adjustable Louvers: Interior face, unless otherwise indicated.
 3. Screening Type: Bird screening.
- B. Secure screens 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 kind and form of metal as indicated for louver to which screens are attached. Reinforce extruded-aluminum screen frames at corners with clips.
2. Finish: Same finish as louver frames to which louver screens are attached.
3. Type: Rewirable frames with a driven spline or insert for securing screen mesh.

D. Louver Screening for Aluminum Louvers:

1. Bird Screening: Aluminum, ~~1/2-inch~~ (12.7-mm-) square mesh, ~~0.063-inch~~ (1.6-mm) wire.

E. Louver Screening for Galvanized Steel Louvers:

1. Bird Screening: Galvanized steel, ~~1/2-inch~~ (12.7-mm-) square mesh, ~~0.041-inch~~ (1.04-mm) wire.

2.7 FINISHES, GENERAL

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

2.8 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 611.
- C. 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 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 2605.
 - a. Color and Gloss: As selected by Architect from manufacturer's full range.

2.9 GALVANIZED STEEL SHEET FINISHES

- A. Surface Preparation: Clean surfaces of dirt, grease, and other contaminants. Clean welds, mechanical connections, and abraded areas and repair galvanizing according to ASTM A 780. Apply a conversion coating suited to the organic coating to be applied over it.
- B. Factory Priming for Field-Painted Finish: Where field painting after installation is indicated, apply an air-dried primer immediately after cleaning and pretreating.

2.10 STAINLESS-STEEL SHEET FINISHES

- A. Repair sheet finish by grinding and polishing irregularities, weld spatter, scratches, and forming marks to match surrounding finish.

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.
 - 1. 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 and vents 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 louver installation progresses, where weathertight louver joints are required. Comply with Division 7 Section "Joint Sealants" for sealants applied during louver installation.

3.4 ADJUSTING AND CLEANING

- A. Test operation of adjustable louvers and adjust as needed to produce fully functioning units that comply with requirements.
- B. Clean exposed surfaces of louvers and vents that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate until final cleaning.
- C. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.
- D. Restore louvers and vents 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 10200