SECTION 08 91 19 - FIXED LOUVERS

PART 1 - GENERAL

1.1 CONTROLLING DOCUMENTS

A. This specification is controlled by Section 08 40 00 “Exterior Enclosure System Requirements”. In addition to the requirements of this document, all requirements of Controlling Documents must also be met. The more onerous conditions of this document or the Controlling Document must be met.

B. Related Requirements:

1. Division 04, Section 04 20 00 “Unit Masonry” for architectural block.
2. Division 07, Section 07 92 00 “Joint Sealants” for sealant.

1.2 SUMMARY

A. Provide the work of this Section in accordance with requirements of the Contract Documents.

B. This Section includes, but is not limited to:

1. Fixed extruded-aluminum louvers **LVR-01** at architectural CMU.
2. Fixed extruded-aluminum louvers **LVR-02** at metal panels.
3. Blank-off panels for louvers

C. Related Work:

1. Division 08, Section 08 11 13 "Hollow Metal Doors and Frames" for louvers in hollow-metal doors.
2. Division 08, Section 08 40 00 "Exterior Enclosure System Requirements" for performance requirements.
3. Division 08, Section 08 41 13 "Aluminum Framed Entrances and Storefronts" for installation of louvers in storefront.
4. Refer to Division 23 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 axis 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.

D. Wind-Driven-Rain-Resistant Louver: Louver that provides specified wind-driven-rain performance, as determined by testing in accordance with AMCA 500-L.

1.4 ACTION SUBMITTALS

A. 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.

B. Sustainable Design Submittals:

1. Building Product Disclosure and Optimization - Sourcing of Raw Materials:

a. Recycled Content: For products having recycled content, indicate percentages by weight of post-consumer and pre-consumer recycled content.

1) Include statement indicating costs for each product having recycled content.

2. Indoor Environmental Quality, Low Emitting Materials: Building Products must be tested and compliant with the California Department of Public-Health (CDPH) Standard Method V1.1-2010 or v1.2 2017, using the applicable exposure scenario.

a. Adhesives and Sealants: For wet applied on-site products, submit printed statement showing compliance with the applicable chemical content requirements of SCAQMD Rule 1168, effective July 1, 2005, and rule amendment date of January 7, 2005.

3. Product Data: For recycled content, indicating postconsumer and preconsumer recycled content and cost.
4. Environmental Product Declaration (EPD): For each product.
5. Environmental Product Declaration: For each product.
6. Health Product Declaration: For each product.
7. Sourcing of Raw Materials: Corporate sustainability report for each manufacturer.

C. 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, flashings, sealants, and other means of preventing water intrusion.
2. Show mullion profiles and locations.

D. Samples: For each type of metal finish required on 12-inch-long section of actual louver blade.

E. Fabrication Engineering and Design Submittal: For louvers indicated to comply with structural performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

A. Product Test Reports: Based on evaluation of comprehensive tests performed in accordance with 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. Product test data standard is based on louver criteria from wind and water infiltration requirements as specified.

B. Sustainable Design Submittals:

1. Building Product Disclosure and Optimization - Environmental Product Declarations

a. Submit product specific type III EPDs or Industry wide (generic) EPDs, USGBC approved program declaration or products with a publicly available, critically reviewed life-cycle assessment conforming to ISO 14044 that have at least a cradle to gate scope.

2. Building Product Disclosure and Optimization - Material Ingredients

a. Material Ingredient Reporting: Submit documentation confirming chemical inventory of products to at least 0.1 % (1000pm) with at least one of the following:

1) Submit published manufacturer inventory of ingredients identified by name and Chemical Abstract Service Registration Number (CASRN)
2) Submit documentation that product has been certified as Cradle-to-Cradle v3 at the Bronze Level or better
3) Submit Declare product label indicating that all ingredients have been disclosed down to 1000 ppm or designated as Red List Free or Declared
4) Living Product Challenge
5) Product Lens Certification
6) USGBC approved program.

b. Material Ingredient Optimization: Submit documentation confirming chemical inventory of products to at least 0.01 % (100pm) and/or that has a compliant material ingredient optimization report with at least one of the following:

1) Submit GreenScreen V1.2 Benchmark: Third party report prepared by a licensed GreenScreen List Translator, or a full GreenScreen Assessment.
2) Submit third-party verified documentation that product has been certified as Cradle-to-Cradle v3 at the Bronze Level or better
3) Submit third-party verified Cradle to Cradle v3 Material Health certificate at the Bronze Level or better
4) Submit third-party verified Declare product label indicating that all ingredients have been disclosed down to 100 ppm
5) Submit third-party verified documentation that product is Living Product Challenge certified with a Red List Free or LBC Red List Free Declare label.
6) Submit documentation that product has a manufacturer prepared action plan with material inventory to at least 1000 ppm.

C. Sample Warranties: For manufacturer's special warranties.

1.6 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel in accordance with the following:

1. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."

B. Mockups: Prior to installing exterior wall systems, construct mockup indicated on Drawings. Incorporate each type of exterior wall construction and finish to verify selections made under sample submittals and to demonstrate aesthetic effects as well as qualities of materials and execution.

1. Mockup louver panels in the exterior wall mockup; extent as shown.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
4. Demolish and remove mockups when directed, unless otherwise indicated.

1.7 FIELD CONDITIONS

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

1.8 WARRANTY

A. Warranty for Louvers located in the Exterior Wall: Submit a 5-year written warranty, beginning from date of final completion, agreeing to repair or replace any component of the louver work that develops defects in materials or workmanship within the specified warranty period. Defects include structural failure, sealant failure, uncontrolled water leakage, deterioration of metal finishes beyond normal weathering, failure of operating parts to function properly, and any other evidence of failure or deterioration of the louver work to meet performance requirements.

B. Special Finish Warranty, Factory-Applied Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of baked enamel, powder coat, or organic finishes within specified warranty period.

1. Deterioration includes, but is not limited to, the following:

   a. Color fading more than 5 Delta E units (Hunter) when tested in accordance with ASTM D2244 on exposed surfaces cleaned with clean water and soft cloth.
   b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214 on exposed unwashed surfaces.
   c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain fixed louvers from single source from a single manufacturer where indicated to be of same type, design, or factory-applied color finish.

2.2 PERFORMANCE REQUIREMENTS

A. Fabrication Engineering and Design: Design louvers, including comprehensive engineering analysis by a qualified professional engineer, using structural performance requirements and design criteria indicated.

B. Removability: Select louvers shall be engineered to be installed with mechanisms and connections to allow panels to be removable to accommodate equipment replacement.

C. Structural Performance: Louvers 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 are considered to act normal to the face of the building.

1. Wind Loads:

a. Determine loads based on pressures as indicated on Drawings.

D. 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 in accordance with AMCA 500-L.

E. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

F. SMACNA Standard: Comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for fabrication, construction details, and installation procedures.

G. Low-Emitting Materials:

1. Adhesives and Sealants wet-applied inside the weather-proofing system must meet the VOC general emissions testing criteria of CDPH Standard Method v1.2.
2. All adhesives and sealants wet-applied inside the weather-proofing system must have VOC content in compliance with the applicable VOC limits (g/L) found in tables in Division 01, Section 01 81 13.14 “Sustainable Design Requirements – LEED v4 BD+C.”

2.3 FIXED EXTRUDED-ALUMINUM LOUVERS

A. Horizontal, Wind-Driven-Rain-Resistant Louver, Extruded Aluminum **LVR-01**:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Airline Louvers; Mestek, Inc.
b. Airolite Company, LLC (The).
c. Architectural Louvers Co.; Harray, LLC.
d. Arrow United Industries; Mestek, Inc.
e. Construction Specialties, Inc.
f. Ruskin; Air Distribution Technologies, Inc.; Johnson Controls, Inc.

2. Basis of Design: Construction Specialities Inc RSH-5700.
3. Louver Depth 5 inches.
4. Head, Sill, Jamb, Mullions Nominal Thickness: Not less than 0.80 inch.

a. Sill flashings shall have welded side panels.

5. Blade Nominal Thickness: Not less than 0.60 inch.

6. Flashing: Minimum 4 inch high by full depth sill flashings nominal thickness of 0.050 inch.
7. Louver Performance Ratings:

    a. Free Area: Not less than 7.32 ft2 or 45% for 48-inch-wide by 48-inch-high louver.
    b. Air Performance:

        1) Intake Pressure drop at 900 fpm free area velocity (4.57 m/s) 0.134 in. H2O (33.38 Pa)
        2) Exhaust pressure drop at 900 fpm free area velocity (4.57 m/s) 0.166 in. H2O (41.35 Pa)

    c. Wind-Driven Rain Performance: Not less than **99** percent effectiveness when subjected to a rainfall rate of 3 inches per hour and a wind speed of 29 mph at a core-area intake velocity of 763 fpm.

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

B. Horizontal, Wind-Driven-Rain-Resistant Louver, Extruded Aluminum **LVR-02**:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Airline Louvers; Mestek, Inc.
    b. Airolite Company, LLC (The).
    c. Architectural Louvers Co.; Harray, LLC.
    d. Arrow United Industries; Mestek, Inc.
    e. Construction Specialties, Inc.
    f. Ruskin; Air Distribution Technologies, Inc.; Johnson Controls, Inc.

2. Basis of Design: Construction Specialities Inc RSH-5700.
3. Louver Depth 5 inches.
4. Head, Sill, Jamb, Mullions Nominal Thickness: Not less than 0.80 inch.

    a. Sill flashings shall have welded side panels.

5. Blade Nominal Thickness: Not less than 0.60 inch.
6. Flashing: Minimum 4 inch high by full depth sill flashings nominal thickness of 0.050 inch.
7. Louver Performance Ratings:

    a. Free Area: Not less than 7.32 ft2 or 45% for 48-inch-wide by 48-inch-high louver.
    b. Air Performance:

        1) Intake Pressure drop at 900 fpm free area velocity (4.57 m/s) 0.134 in. H2O (33.38 Pa)
        2) Exhaust pressure drop at 900 fpm free area velocity (4.57 m/s) 0.166 in. H2O (41.35 Pa)

    c. Wind-Driven Rain Performance: Not less than **99** percent effectiveness when subjected to a rainfall rate of 3 inches per hour and a wind speed of 29 mph at a core-area intake velocity of 763 fpm.

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

2.4 LOUVER SCREENS

A. General: Provide screen at each exterior louver.

1. Screen Location for Fixed Louvers: Interior face.
2. Screening Type: Insect screening.

B. Secure screen frames to louver frames with machine screws with heads finished to match louver, spaced a maximum of 6 inches from each corner and at 12 inches 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: Same finish as louver frames to which louver screens are attached.
3. Type: Rewirable frames with a driven spline or insert.

D. Louver Screening for Aluminum Louvers:

1. Insect Screening, Aluminum: 18-by-16 mesh, 0.012-inch wire. .

2.5 BLANK-OFF PANELS

A. Uninsulated Blank-Off Panels: Metal sheet attached to back of louver.

1. Aluminum sheet for aluminum louvers, not less than 0.050-inch nominal thickness.
2. Panel Finish: Same finish applied to louvers.

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 or greater as shown.
2. Metal Facing Sheets, Aluminum: Not less than 0.032-inch nominal thickness.
3. Insulating Core: Rigid, glass-fiber-board insulation or 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 nominal thickness channel frames, 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.

2.6 MATERIALS

A. Recycled Content of Products:

1. Provide products with an average recycled content of aluminum products so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 12 percent.
2. Provide products with an average recycled content of steel products so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 50 percent.

B. Regional Materials: Provide a minimum of 20 percent of building materials (by cost) that are regionally extracted, processed and manufactured materials within a radius of 100 miles.

C. Aluminum Extrusions: ASTM B221, Alloy 6063-T5, T-52, or T6.

D. Aluminum Sheet: ASTM B209, Alloy 3003 or 5005, with temper as required for forming, or as otherwise recommended by metal producer for required finish.

E. Fasteners: Use types and sizes to suit unit installation conditions.

1. Use Phillips flat-head hex-head or Phillips pan-head screws for exposed fasteners unless otherwise indicated.
2. For fastening aluminum, use aluminum or 300 series stainless steel fasteners.
3. For color-finished louvers, use fasteners with heads that match color of louvers.

F. Postinstalled Fasteners for Concrete and Masonry: Torque-controlled expansion anchors, fabricated from stainless steel components, with allowable load or strength design capacities calculated in accordance with ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing in accordance with ASTM E488/E488M conducted by a qualified testing agency.

G. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

H. Recycled Content of Aluminum Components: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 50 percent.

I. Regional Materials: Manufacture products within 100 miles of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 100 miles of Project site.

2.7 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 unless continuous vertical assemblies are indicated.

C. Maintain equal louver blade spacing, including separation between blades and frames at head and sill, to produce uniform appearance.

D. 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.

E. Include supports, anchorages, and accessories required for complete assembly.

F. Provide vertical mullions of type and at spacings indicated, but not more than is recommended by manufacturer, or 72 inches o.c., whichever is less.

1. Semi-recessed 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.
2. 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.

G. Provide subsills made of same material as louvers for recessed louvers.

H. 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.

2.8 ALUMINUM FINISHES

A. Finish louvers after assembly.

B. High-Performance Finish:

1. Two-coat fluoropolymer finish system consisting of corrosion inhibitive primer and fluoropolymer color coat complying with AAMA 2605, with suspended mica flakes for mica colors, containing not less than 70 percent PVDF resin by weight in color coat in not less than 1.2 mils dry thickness. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
2. Color and Gloss:
    a. **LVR-01:** As selected by Architect from manufacturer's full range of solid and mica colors to match **CMU-01** specified in Section 04 20 00 "Unit Masonry".
    b. **LVR-02:** To match existing metal panel cladding.

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. Comply with manufacturer's written instructions and recommendations for installation of louvers.

B. Verify dimensions of supporting structure at the site by accurate field measurement so that work will be accurately designed, fabricated and fitted to the structure.

C. Anchor louvers to the building substructure

D. Locate and place louvers level, plumb, and at indicated alignment with adjacent work. Coordinate with the requirements of aluminum curtain walls for installation of panels in curtain walls.

E. 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.

F. Form closely fitted joints with exposed connections accurately located and secured.

G. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.

H. 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.

I. 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.

J. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply with Division 07, Section 07 92 00 "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