

SECTION 08 92 00

LOUVERED EQUIPMENT SCREENS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fixed, extruded-aluminum louvered roof top equipment screens.
2. Assembly framing, sub-framing and accessories for direct attachment and support of roof top equipment screens to structural supports, and anchorages noted on the Drawings.

B. Related Sections:

1. Division 3 Section for Cast in Place Concrete for related miscellaneous supports.
2. Division 5 Section "Structural Steel" for primary supports of roof top equipment screens.
3. Division 23 Section HVAC Equipment

1.2 ACTION SUBMITTALS

- A. Product Data: Technical data including construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of louver component, supports and accessories. Submit manufacturer's catalog data, detail sheets, specification and other data sufficient to indicate compliance with these specifications.
- B. Shop Drawings: For equipment screens and accessories. Include plans, elevations, sections, details, and attachments to other work. Show frame profiles and blade profiles, angles, and spacing. Indicate layouts heights, component connection details, and details of interface with adjacent construction.
- C. Samples for Selection: For each exposed product and for each color and texture specified.
- D. Samples for Confirmation: Provide samples of each exposed product to verify selections made.
- E. Delegated Design Submittal: Submit for formed metal wall panels indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for preparation.

1.3 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Provide plans, elevations and other details, drawn to scale, and coordinated with each other, using input from equipment installers of the items involved.
- B. Seismic Qualification Certificates: For Insert equipment, accessories, and components, from manufacturer to satisfy local Code, Ordinances and requirements of the Local Authority.
- C. Welding certificates.
- D. Material Product certificates.
- E. Material test reports.
- F. Product test reports.
- G. Certification: Manufacturer's Certificate of Compliance certifying that louvers comply with structural performance requirements and other performance requirements criteria indicated.
- H. Field quality-control reports.
- I. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data. Submit data for louvered equipment screen systems to include in maintenance manuals.
- B. Warranty in the name of the owner beginning on the date of Substantial Completion.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum five (5) years documented experience producing systems specified in this section.
- B. Installer Qualifications: An entity having minimum 5 years documented experience that employs installers and supervisors trained and approved or certified by the manufacturer.
- C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code – Steel D1.2/D1.2M, "Structural Welding Code – Aluminum."
- D. Regulatory Requirements: Comply with requirements of building Authorities Having Jurisdiction in Project location.
- E. Pre-Installation Meeting:

1. Convene at job site seven (7) calendar days prior to scheduled beginning of Work of this Section and following approval of all submittals. Meeting shall be to review all Work and related requirements for roof protection, other ongoing Work, schedule and interfacing materials and systems.
 2. Require attendance by representatives of the installing subcontractor, (who will represent the system manufacturer), and other entities directly affecting, or affected by, construction activities of this Section, protection or preinstalled systems and all related activities and installations.
 3. Notify Architect seven (7) calendar days in advance of scheduled meeting date.
- F. Mockups: Build mockups to verify selections and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
1. Build mockup of typical louvered equipment screen assembly as shown on Drawings, including corner conditions, supports, attachments, and all accessories. Mockup minimum size shall be no less than 400 square feet unless exceeded on the Drawings.
 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves deviations in writing.
 3. Subject to compliance with requirements, approved mockups may become part of the completed work if undisturbed at time of Substantial Completion.
- G. Coordination:
1. Coordinate all design and installation Work for equipment screen supports for all applications. Confirm all intended structural support is adequate to meet or exceed the Performance Requirements included herein.

1.6 WARRANTY

- A. Written warranty signed by manufacturer in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, the following:
 - a. Structural failures including rupturing, cracking, or puncturing.
 - b. Deterioration of metals and materials beyond normal weathering.
 2. Warranty Period: Two years from date of Substantial Completion.
- B. Panel Finishes: Written warranty signed by manufacturer in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory applied finishes within specified warranty period.
1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design louvered equipment screen assemblies, including comprehensive engineering analysis by a qualified professional engineer, using structural and seismic performance requirements and design criteria indicated.
1. Design Requirements: Design and size components of louver system to withstand dead and live loads, and loads caused by positive and negative wind pressure acting normal to plane of wall as calculated in accordance with SEI/ASCE 7 to establish wind pressure based on the following criteria:
- B. Structural Performance: Louvered equipment screen assemblies 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 loads based on pressures as indicated on Drawings.
 2. Deflection Limits: For wind loads, no greater than 1/180 of the span.
- C. Seismic Performance: Louvers, including attachments to other construction, shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
1. Design earthquake spectral response acceleration, short period (Sds) for Project is as indicated on the Drawings.
 2. Provide a complete system meeting Seismic Performance as indicated on drawings.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): 120 degrees F (67 degrees C), ambient; 180 degrees F (100 degrees C), material surfaces.
- E. Fire Test Response Characteristics: Provide metal wall panels and system components with fire test response characteristics, determined by testing identical panels and system components per test method indicated by UL. Identify products with appropriate markings of applicable testing agency.
1. Fire Resistance Characteristics: Provide materials and construction tested for fire resistance per ASTM E119.
 2. Intermediate Scale Multistory Fire Test: Tested mockup, representative of completed multistory wall assembly of which wall panel is a part, complies with NFPA 285 for test method and required fire-test-response characteristics of exterior nonload bearing wall panel assemblies.
 3. Radiant Heat Exposure: No ignition when tested according to NFPA 268.
 4. Potential Heat: Acceptable level when tested according to NFPA 259.

5. Surface Burning Characteristics: Provide wall panels with a flame spread index of 25 or less and a smoke-developed index of 450 or less, per ASTM E84.
- F. SMACNA Standard: Comply with recommendations in SMACNA Architectural Sheet Metal Manual for fabrication, construction details, and installation procedures.

2.2 MANUFACTURERS

- A. Basis-of-Design Product: Construction Specialties Inc System Vert-A-Cade 304. Subject to compliance with requirements, provide the specified product or comparable product by one of the following:
 1. Manufacturers of equivalent products submitted and approved in accordance with Section 01 25 00.

2.3 EXTRUDED-ALUMINUM ROOF TOP EQUIPMENT SCREEN

- A. Horizontal Blade Louvered Roof Top Equipment Screen
 1. Louver Blade Depth: 6 inches.
 2. Blade Spacing: 4.75 inch centers
 3. Blade Profile: Narrow profile plain blade without center baffle.
 4. Blade Nominal Thickness: As required to meet the Performance Requirements but not less than .012 inch (3.2mm).
 5. Framing Support Nominal Thickness: Not less than 0.125 inch (3.2 mm)
 6. Louver Performance Requirements:
 - a. Free Area: Not less than 12.9 sq. ft. for 48-inch- (1220-mm-) wide by 48-inch- (1220-mm-) high louver assembly.

2.4 MATERIALS

- A. Aluminum Extrusions: ASTM B 221M, Alloy 6063-T5.
- B. Aluminum Sheet: ASTM B 209M, Alloy 3003 with temper as required for forming; alloy recommended by manufacturer, with temper as required to suit forming operations and structural performance required.
- C. Framing and sub-framing: Aluminum Plate, Shapes and Bar: ASTM B 221, alloy 6061-T5 or 6063-T5.
- D. Threaded Fasteners: All screws, bolts, nut and washers shall be 300 series stainless steel.
 1. Corner assembly fasteners shall be #10-16 x stainless steel TEK screws. Length as required to develop full holding capacity of screw when fastened to Mechanical Equipment.
 2. Provide lock washer or other locking device at all bolted connections.

2.5 FABRICATION

- A. Provide factory-formed systems with continuous interlocking connections and indicated or necessary components: Form all components true to shape, accurate in size, square and free from distortion or defects. Cut components to precise lengths indicated on approved shop drawings.
- B. Join concealed frame members to each other and to fixed louver blades with fillet welds concealed from view 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.
- C. Trim and Closures: Fabricated from 0.040 inch aluminum, and finished with the manufacturers coating system as indicated.
- D. Framing: Fabricate and assemble components in largest practical sizes, for delivery to the site.
 - 1. Construct corner assemblies to required shape with joints tightly fitted.
 - 2. Supply components required for anchorage of framing. Fabricate anchors and related components of material and finish as required, or as specifically noted.

2.6 FINISHES

- A. High-Performance Organic Finish: 2-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pre-treat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 1. Color and Gloss: Match Architect's sample.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with installer present, for compliance with requirements and other conditions affecting performance of the Work.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.
 - 2. Beginning Work constitutes installer's and Contractor's acceptance of conditions.
- B. Examine protection of installed roofing system components for compliance with protection indicated in Section 07 54 00 Polyvinyl Chloride (PVC) Roofing, and will provide ample protection and performance of all Work.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.
 - 2. Beginning Work constitutes installer's and Contractor's acceptance of conditions. Any damage to surrounding Work shall be repaired at the direction of the Architect without additional cost to the Project.

3.2 INSTALLATION

- A. Ensure and confirm all roofing systems and components installed are protected from damage as specified in Section 07 54 00 Polyvinyl Chloride (PVC) Roofing.
- B. Install louvered equipment screens and related components in accordance with the manufacturer's instructions and approved shop drawings. Keep perimeter lines and all components straight, plumb, and level. Provide brackets, anchors, and accessories necessary for a complete installation.
- C. Cut and trim component parts during erection only with the approval of the engineer and manufacturer or fabricator, and in accordance with all recommendations. Restore finishes completely should cutting be permitted. Remove and replace members where cutting and trimming has impaired the strength or appearance of the assembly to the satisfaction of the Architect.
- D. Do not install warped, bowed, deformed or otherwise damaged or defaced members. Remove and replace any members damaged in the erection process as directed.
- E. Fasten structural supports without damage to HVAC units, roof system or other equipment.
 - 1. Provide corner and mid-span assemblies as required by approved shop drawings so that the panels are supported uniformly.
 - 2. Fastening bottom rail using bolts to permit ease of access to HVAC units.
- F. Metal Separation: Where aluminum materials contact dissimilar metals and materials, insert rubber grommets at attachment points, thus eliminating where dissimilar metals would otherwise be in contact, leading to corrosion.
- G. Do not cut or abrade finishes which cannot be restored. Return items with such finishes to shop for required alterations.

3.3 ERECTION TOLERANCES

- A. Maximum variation from plane or location shown on the approved shop drawings: 1/8" per 12 feet of length, but not exceeding 3/8 inch in any total building length or portion thereof (non-cumulative).
- B. Maximum offset from true alignment between members abutting end to end, edge-to-edge in line or separated by less than 3 inch with maximum 1/16 inch joints.

3.4 FIELD QUALITY CONTROL

- A. Engage manufacturer's technical representative to provide on-site assistance during mock-up installation as well as initial stage of project installation. The manufacturer's technical representative shall provide a written report of all observations made, discussions held in regards to the system, installation and remediations and submit report to the Architect for review no more than 3 days following the onsite visit.

3.5 PROTECTION AND CLEANING

- A. Protect all installed materials and components to prevent damage including but not limited to other trades for the duration of construction. Utilize materials that may be easily removed without leaving residue or permanent stains.
- B. Immediately clean exposed surfaces of the louvers to remove fingerprints and dirt accumulation during the installation process. Do not let soiling remain until the final cleaning.
- C. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to the material finishes. Thoroughly rinse surfaces and dry.
- D. Restore grilles and screens and accessory components damaged during installation and construction so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by the Architect, remove damaged materials and replace with new materials.
 - 1. Touch up minor abrasions in finishes with a compatible air-dried coating that matches the color and gloss of the factory applied coating. All repairs shall be to the satisfaction of the Architect.
 - 2. Replace any damaged items beyond repair at no additional cost to the Project or Owner.

END OF SECTION