SECTION 07 72 16

ACOUSTICAL ROOF EQUIPMENT SCREENS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Manufactured Acoustical Roof Equipment Screens.
   2. Acoustical infill
   3. Lap seam metal wall panels.
   4. Perforated metal liner panels.
   5. Metal trim and accessories.

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 panel and accessory.

B. Shop Drawings: Submit details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details, including fabrication and installation layouts of metal panels;
   1. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches (1:10).

C. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

D. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

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. Qualification Data: Submit data for Installer.

B. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

C. Acoustical Test Reports: Manufacturer’s published acoustical test reports.

D. Product Test Reports: Submit reports for tests performed by a qualified testing agency.

E. Field quality control reports.

F. Warranties: 3 signed hard copies.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: Submit data for metal panels to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An entity having minimum 5 years documented experience that employs installers and supervisors trained and approved or certified by the manufacturer.

B. Provide acoustical panels by a firm having undivided responsibility for the entire panel system design, fabrication and installation, except as otherwise specified herein.

C. Provide acoustical panels in strict accordance with state and local building codes and ordinances and conforming to applicable wind load factors relative to framing and anchorage.

D. Acoustical Performance: Provide acoustical panels tested by a qualified testing agency for the following acoustical properties according to test methods indicated:

1. Sound Transmission Requirements: Acoustical panel assembly tested in a full-scale opening, 14 feet by 9 feet (4.27 m by 2.74 m):
   a. Laboratory sound transmission class (STC) rating of 32 according to ASTM E 90, determined by ASTM E 413.
   b. Noise reduction coefficient (NRC) of 1.10 according to ASTM C 423.
   c. Decay rates for use in sound insulation test methods according to ASTM E 2235.

E. Roll Forming Equipment: UL certified, portable roll forming equipment capable of producing metal panels warranted by manufacturer to be the same as factory formed products. Maintain UL certification of portable roll forming equipment for duration of work.

F. Source Limitations for Acoustical Panels: Obtain acoustical panels from one source with resources to provide products of consistent quality in appearance and physical properties.

G. Comply with all laws, ordinances, rules and regulations and orders of any public authority having jurisdiction over this part of the work.

H. Mockups: Build mockups to verify selections and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Build mockup of typical metal panel assembly, including corner, soffits, supports, attachments, and accessories.
2. Water Spray Test: Conduct water-spray test of metal panel assembly mockup, testing for water penetration according to AAMA 501.2.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed work if undisturbed at time of Substantial Completion.

I. Preinstallation Conference: Conduct conference at site.

1.6 COORDINATION

A. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal panels, and manufactured items to prevent damaged or deformation. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels to prevent bending, warping, twisting, and surface damage.

C. Store products under cover, in manufacturer's unopened packaging until ready for installation.

D. Protect materials from exposure to moisture.

E. Store materials in a dry, warm, ventilated weathertight location.

F. Protect metal fabrications from damage by exposure to weather.

G. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with materials that might cause staining, denting, or surface damage.

H. Retain strippable protective covering on metal panels during installation.

I. Copper Panels: Wear gloves when handling to prevent fingerprints and soiling of surface.

1.8 FIELD CONDITIONS

A. Field Measurements: Verify substrate dimensions 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, establish dimensions and proceed with fabricating acoustical panel system without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions.

B. Weather Limitations: Proceed with installation when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.9 WARRANTY

A. Provide manufacturer's written warranty stating that the panel system is to be free of faults and defects, except the warranty period is to be for twenty (20) years from Substantial Completion.
   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.

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: Engage a qualified professional engineer to design metal wall panels complying with performance requirements.

B. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads:
   1. Wind Loads: Indicated on Drawings.
   2. Wind Loads:
      a. Ultimate Design Wind Speed (V_{ult}): 120 mph.
      b. Nominal Design Wind Speed (V_{asd}): 95 mph.
      c. Occupancy Category: IV.
      d. Exposure Category: C.
      e. Internal Pressure Coefficient (GCPI): ±0.18.
   3. Other Design Loads: Indicated on Drawings.
   4. Deflection Limits: For wind loads, no greater than 1/240 of the span.

C. 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.

D. Anchors and Connections:

1. Anchors, connections and assemblies connecting the acoustical panels and associated fabrications to the supporting construction are shown on the Drawings as suggested locations for the acoustical panel manufacturer/installer's information. The acoustical panel manufacturer/installer is responsible for the structural design and placement of the connections and anchors, including all connecting hardware, accessories and reinforcing necessary for fabrication, and installation of the acoustical panels and associated fabrications.

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.

2.2 ACOUSTICAL ROOF EQUIPMENT SCREENS

A. Basis of Design: Soundguard Acoustical Panel System by RoofScreen. Provide a complete manufactured system with Face Panels, Acoustical Insulation, Perforated Back Panels with all required support framing members, metal trim, sealant, accessories and fasteners for a complete system.

1. Subject to compliance with requirements, provide basis of design or comparable equivalent system by one of the following:
    1) Architectural Metal Systems.
    2) Berridge Manufacturing Company.
    3) Butler Manufacturing Company; a division of BlueScope Buildings North America, Inc.
    4) MBCI; a division of NCI Group, Inc.
    5) McElroy Metal, Inc.
    6) Metal Sales Manufacturing Corporation.
    7) PAC-CLAD; Petersen Aluminum Corporation.

B. Exposed Fastener Lap Seam Metal Wall Face Panels

1. Provide factory formed metal panels designed to be field assembled by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps. Include accessories required for weathertight installation.
2. Tapered Rib Profile, Exposed Fastener Metal Wall Panels: Formed with raised, trapezoidal major ribs and a flat pan between major ribs.
   a. Basis of Design: 7.2 Rib Panel by RoofScreen; Subject to compliance with requirements, provide basis of design or comparable by one of the following
      a. Steel Sheet: Coil coated Galvalume steel sheet, AZ50, conforming to ASTM A 792 for painted and unpainted panels.
   b. Thickness: 24 gauge minimum as required to meet Performance Requirements.
      1) Surface: Smooth, flat Embossed finish.
      2) Exterior Finish: Three coat fluoropolymer.
         a) Exterior Surface:
         b) Color: As Selected by Architect from manufacturer's full range.
         c) Interior Surface:
         d) Color: As Selected by Architect from manufacturer's standard range.
   c. Major Rib Spacing: 7.2 inches o.c.
   d. Panel Coverage: 36 inches (914 mm).
   e. Panel Height: 1.5 inches (38 mm).

C. Perforated Back panels
   1. Back Panel: 0.028 inch thickness perforated sheet, ASTM A 666, Type 304 stainless-steel, with an ASTM A 480, Type 2B finish, unpainted.
   2. Perforations:
      a. Hole shape: round
      b. Hole size: 0.125 inch
      c. Hole centers: 0.187 inch
      d. Perforation pattern: Staggered.

D. Acoustical Insulation: Mineral-wool fiber conforming to ASTM E 136.
   1. Thickness: 4 inches.
   2. Density: 6 pcf.
   3. Absorption: Less than 1 percent water.
   4. Flame Spread: 15 or less.
   5. Smoke Developed: 0 or less.

2.3 MISCELLANEOUS MATERIALS

A. Miscellaneous Metal Subframing and Furring: ASTM C 645, cold formed, metallic coated steel sheet, ASTM A 653/A 653M, G90 (Z275 hot dip galvanized) coating designation or ASTM A 792/A 792M, Class AZ50 (Class AZM150) aluminum-zinc alloy coating

designation unless otherwise indicated. Provide standard sections as required for support and alignment of metal panel system.

1. Provide sufficient support for acoustical equipment screens to meet or exceed the Performance Requirements of this Section.

B. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required for a complete metal wall panel assembly with finished appearance incorporating, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, copings, parapet caps, soffits, reveals, trim, inside and outside corners, miscellaneous flashings and fillers. Finish flashing and trim with same finish system as adjacent metal panels.

C. Panel Fasteners: Self tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.

D. Panel Sealants: Provide sealant type recommended by manufacturer compatible with panel materials, are nonstaining, and do not damage panel finish.

1. Sealant Tape: Pressure sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
2. Joint Sealant: ASTM C 920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.
3. Butyl Rubber Based, Solvent Release Sealant: ASTM C 1311.

2.4 FABRICATION

A. Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. Onsite Fabrication: Subject to compliance with requirements, metal panels may be fabricated onsite using UL certified, portable roll forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.

C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

D. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA Architectural Sheet Metal Manual that apply to design, dimensions, metal, and other characteristics of item indicated.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.

2. Seams for Aluminum: Fabricate nonmoving seams with flat lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat lock seams. Tin edges to be seamed, form seams, and solder.
4. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.
    a. Size: As recommended by SMACNA Architectural Sheet Metal Manual or metal wall panel manufacturer for application but not less than thickness of metal being secured.

2.5 FINISHES

A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one/half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if within the range of approved Samples and are assembled or installed to minimize contrast.

C. Aluminum Panels and Accessories:
1. Three Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine metal frame members, substrates, areas, and conditions for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.
1. Examine framing to verify tube supports, angles, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.

B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.

C. Proceed with installation after correcting unsatisfactory conditions.

3.2 PREPARATION

A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal panel manufacturer's written recommendations.

3.3 INSTALLATION

A. Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the work securely in place, with provisions for thermal and structural movement.

1. Shim or plumb substrates receiving metal panels.
2. Flash and seal metal panels at perimeter of all openings. Fasten with self tapping screws. Do not begin installation until air or water resistive barriers and flashings concealed by metal panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal panel work proceeds.
6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four panel lap splice condition.
7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
8. Provide weathertight escutcheons for pipe and conduit penetrating panels.

B. Fasteners:

1. Aluminum Panels: Use stainless steel fasteners.

C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.

D. Lap Seam Metal Panels: Fasten metal panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.

1. Lap ribbed or fluted sheets one full rib. Apply panels and associated items true to line for neat and weathertight enclosure.
2. Provide metal backed washers under heads of exposed fasteners bearing on weather side of metal panels.
3. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
4. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.

5. Flash and seal panels with weather closures at perimeter of all openings.

E. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal wall panel manufacturer; or, if not indicated, provide types recommended by metal panel manufacturer.

F. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA Architectural Sheet Metal Manual. Provide concealed fasteners where possible and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.

1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof performance.

2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (610 mm) of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory authorized service representative to test and inspect completed metal wall panel installation, including accessories.

B. Remove and replace metal wall panels where tests and inspections indicate that the panels do not comply with specified requirements.

C. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.

D. Prepare test and inspection reports.

3.5 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

B. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

C. Replace metal panels that are damaged or deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

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