SECTION 09 51 13.19 – DECORATIVE INTERIOR METAL CEILING PANELS

PART 1 - GENERAL

1.1 SUMMARY

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

B. Section Includes:

1. Metal ceiling tile system **AC-10.**
2. Metal ceiling panel system **AC-11.**
3. Perforated metal panel system **AC-16**
4. Attachments, fasteners, and panel accessories.
5. Backlighting fixtures.
6. Transformers and dimming controls.

C. Related Requirements:

1. Division 26 Electrical for LED Backlighting connection to power supply.

1.2 ACTION SUBMITTALS

A. Product Data: Technical data including material description, impact strength, panel dimensions and profiles, and finishes.

B. Sustainable Design Submittals:

1. Building Product Disclosure and Optimization - Sourcing of Raw Materials:
    a. Extended Producer Responsibility (EPR): Submit documentation indicating that manufacturers have a take back or recycling program for the product purchased.
    b. 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.
    c. Regional Materials: For products that are required to comply with requirements for regional materials, indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material.
        1) Include statement indicating distance to Project, cost for each regional material and the fraction by weight that is considered regional.
2. Indoor Environmental Quality, Low Emitting Materials: Building Products must be tested and compliant with the California Department of Public-Health (CDPH) Standard Method v1.2 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.
    b. For flooring products, submit documentation of VOC emissions testing compliance for hard surface flooring products, containing any material in addition to composite wood, in the form of FloorScore certification or CDPH Standard Method v1.2 compliance verification.

c. For Ceiling/ products, submit documentation of VOC emissions testing compliance in the form of Greenguard Gold certification, SCS Indoor Advantage Gold certification or CDPH Standard Method v1.2 compliance verification.

C. Shop Drawings: Submit plans, elevations, sections, and attachment details.

1. Plan for entire surface of custom graphic perforation patterns.

D. Samples: Submit samples for each type of exposed finish required, prepared on 8 inch by 11-inch samples of metal of same thickness and material indicated, for each type.

1. Color sample: 8-inch by 11-inch, in pattern specified, for each type.
2. Full-size standard pattern for review and mockup inclusion.
3. Full-size custom pattern for review and mockup inclusion.

E. Mockup: Full-size panel, of each type, anchored to surfaces with back lighting system.

1. Mockup shall function to demonstrate light temperature and light dimming capabilities to achieve optimum color temperature and lighting levels, prior to final installation.

a. Provide fully function lighting control source equivalent to that intended for final installation.
b. Mockup shall demonstrate proposed location of LED Driver; LED Driver location shall be hidden from view.

2. Build room corner mockups of the Gate and Boarding area to be constructed in the field include the following:

a. Back lit metal panel ceiling system.
b. Transitions to other types of ceilings as specified in other sections.
c. Include mechanical and electrical devices, diffusers, and the like specified in Divisions 21, 22, 23, 26, 27, and 28.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to Architect approval, mockup components maybe reused in final installation.

F. Fabrication Engineering and Design Data Submittal: Submit for interior metal ceiling panels to verify compliance with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.3 INFORMATIONAL SUBMITTALS

A. 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.

1.4 CLOSEOUT SUBMITTALS

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

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain panels from single source from single manufacturer.

1.6 COORDINATION

A. Coordinate installation of panels with installation of light gauge metal studs, and integral fire-treated blocking.

B. Coordinate installation of panels with adjacent construction to ensure that assemblies, trim, and joint sealants, are protected against damage and deterioration.

C. Coordinate power supply locations with Division 26.

1. Coordinate LED Driver size and location to minimize number of drivers and accommodate locating drivers remotely, out of view.

1.7 DELIVERY, STORAGE AND HANDLING

A. Store panels in original undamaged packages and containers inside well ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.

1. Maintain room temperature within storage area at not less than 70 degrees F (21 degrees C) during the period plastic materials are stored.

1.8 FIELD CONDITIONS

A. Field Measurements: Verify locations of partitions and construction contiguous with panels by field measurements before fabrication and indicate measurements on Shop Drawings.

1.9 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Suspension System Components: Quantity of each grid, exposed molding, and trim equal to 2 percent of quantity installed.
2. One full-size back light replacement panel.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fabrication Engineering and Design Data: Engage a qualified professional engineer, as defined in Section 01 33 16, “Fabrication Engineering Design Data,” to design interior metal ceiling panels complying with requirements.

B. Surface Burning Characteristics: Comply with ASTM E 84 or UL 723; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame Spread Index: 25 or less.
2. Smoke Developed Index: 450 or less.

C. 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."
3. All ceiling panel products must meet the VOC general emissions testing criteria of CDPH Standard Method v1.2.

2.2 METAL CEILING TILE SYSTEM AC-10

A. Manufacturer:

1. Product: Armstrong Metalworks Linear with Accessible Torsion Spring System.
2. Perforations: Pattern 3, 7% open, 0.0625” Ø, 0.297” OC, 45° staggered, 0.261” border.
3. Acoustical Backing Insulation: Black non-woven fabric backer PVC wrapped acoustical pad, 1 inch thick x 1.5 lb density, minimum NRC 0.70.
4. Size: 24 inch x 72 inch unless noted otherwise on drawings.
5. Color: White.
6. Performance Characteristics:

    a. Flame Spread: Class A per ASTM E1264.

7. Accessories: Service cove (white) metal trim (white)

2.3 METAL CEILING PANEL SYSTEM AC-11

A. Manufacturer:

1. Product: Arktura Vapor Frequency, custom scale (200%) with Torsion Spring System.
2. Size: 24 inch x 48 inch (610 mm x 1220 mm).
3. Color: Arktura White (Matte).

B. Panel Maintenance Numbering: Metal ceiling panels shall have numbering on each panel for installation and maintenance of panels. When maintenance removed panels, they can bring them the panels back on the right locations.

2.4 PERFORATED METAL PANEL SYSTEM AC-16

A. Manufacturer:

1. Product: Gordon Torsion Spring Ceiling System.
2. Panel Material: 0.040 inch (1 mm) thick perforated aluminum sheet
3. Perforations: R116-1364-DG07 perforation pattern, 7% open, 1/16-inch (1.6 mm) round holes on 13/64 inch (5.2 mm) diagonal center with 1/2” normal non-perforated border.
4. Acoustical Backing Insulation: Black non-woven fabric backer PVC wrapped acoustical pad, 1-inch-thick x 1.5 lb density, minimum NRC 0.70.
5. Size:
    a. Left Wedge: 24-inch x 84-inch x 1-1/2 inch.
    b. Right Wedge: 24-inch x 86-inch x 1-1/2 inch.
6. Edge: Square 1/2” reveals between panels unless noted otherwise on drawings.
7. Color: PDR 30128IFS Textured White Powder Coat for panels, light cove, and trim and White for exposed grid components.
8. Performance Characteristics:
    a. Flame Spread
        1) Class A per ASTM E 1264.
9. Translucent Backer: Manufacturer’s proprietary 1/16-inch Polycarbonate backer panel.
10. Arktura Backlighting Panels:
    a. 2x4 panel - two options: "Arktura Backlighting" and "Arktura Backlighting Eco"
        1) Total Lumens: 5940 Lm/2x4 panel
        2) Delivered Lumens: 5490lm/2x4 panel
        3) Power Consumption: 66 Watts 2x4 panel
        4) Color Temperature: 3500K
        5) UL Rating: Listed
        6) Voltage: 24 volts
        7) Dimming options: 0-10V option
        8) Plenum Rated wire: Standard
    b. Available Panel Types, (Type and location to be indicated on Drawings):
        1) Vapor Custom Frequency
        2) Vapor Custom Trail
        3) Vapor Custom Transition
        4) Solid
11. Suspension System for Custom Perforated Ceiling Panels:
    a. Armstrong (or equal)

1) 7301TS - Prelude XL 12' HD Main Beam slotted for torsion spring
2) XL7328 - Prelude XL 2' Cross Tee
3) 7147 WH - Torsion spring perimeter trim (extruded)
4) 7871 WH - (alternate trim) W Mold
5) 7131 WH - Torsion spring perimeter trim -2 part (must use when adjacent to Arktura wall channel mount system)
6) 7126 - Spreader hold down clip
7) Custom trims provided by Arktura for integration with mechanical systems

12. Accessories: Service cove (white) metal trim (white)

2.5 METAL SUSPENSION SYSTEMS AC-10, AC-16

A. Metal Suspension System Standard: Provide metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable ASTM C635/C635M requirements.

B. Color: Manufacturer's standard white powder coat or enamel finish for exposed to view components.

C. Suspension Systems: Provide systems complete with carriers, runners, splice sections, connector clips, alignment clips, leveling clips, hangers, molding, trim, retention clips, load resisting struts, and other suspension components required to support ceiling units and other ceiling supported construction.

D. Provide runners with factory-cut slots fabricated to accept torsion-spring attachment.

E. Attachment Devices: Size for 5 times the design load indicated in ASTM C635/C635M, Table 1, Direct Hung, unless otherwise indicated. Comply with seismic design requirements.

F. Expansion Anchors: Fabricated from corrosion resistant materials, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing per ASTM E488/E488M conducted by a qualified testing agency.

G. Power Actuated Fasteners in Concrete: Are not permitted, unless approved by Owner in writing, a minimum 48-hours prior to use.

H. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:

1. Stainless Steel Wire: ASTM A580/A580M, Type 304, nonmagnetic.
2. Size: Select wire diameter so its stress at 3 times the hanger design load indicated in ASTM C635/C635M, Table 1, Direct Hung, is less than yield stress of wire, but provide not less than 0.106-inch (2.69 mm) diameter wire.

I. Hanger Rods and Flat Hangers: Mild steel, zinc coated or protected with rust inhibitive paint.

J. Angle Hangers: Angles with legs not less than 7/8 inch (22 mm) wide; formed with 0.04 inch (1.0 mm) thick, galvanized steel sheet complying with ASTM A653/A653M, G90 (Z275) coating designation; with bolted connections and 5/16 inch (8 mm) diameter bolts.

K. Exposed Metal Edge Moldings and Trim: Provide exposed members indicated or as required to comply with seismic requirements of authorities having jurisdiction, to conceal edges of and penetrations through ceiling, to conceal edges of pans and runners, for fixture trim and adapters, for fasciae at changes in ceiling height, and for other conditions; of metal and finish matching acoustical metal pan ceiling units unless otherwise indicated.

1. For Circular Penetrations of Ceiling: Fabricate edge moldings to diameter required to fit penetration exactly.

2.6 METAL SUSPENSION SYSTEMS AC-11

A. Metal Suspension System Standard: Provide metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable ASTM C635/C635M requirements.

B. Color: Manufacturer's standard white powder coat or enamel finish for exposed to view components.

C. Suspension Systems: Provide systems complete with carriers, runners, splice sections, connector clips, alignment clips, leveling clips, hangers, molding, trim, retention clips, load resisting struts, and other suspension components required to support ceiling units and other ceiling supported construction.

D. Attachment Devices: Size for five (5) times the design load indicated in ASTM C635/C635M, Table 1, Direct Hung, unless otherwise indicated. Comply with seismic design requirements.

E. Expansion Anchors: Fabricated from corrosion resistant materials, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing per ASTM E488/E488M conducted by a qualified testing agency.

F. Power Actuated Fasteners in Concrete: Are not permitted, unless approved by Owner in writing, a minimum 48-hours prior to use.

G. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:

1. Stainless Steel Wire: ASTM A580/A580M, Type 304, nonmagnetic.
2. Size: Select wire diameter so its stress at 3 times the hanger design load indicated in ASTM C635/C635M, Table 1, Direct Hung, is less than yield stress of wire, but provide not less than 0.106-inch (2.69 mm) diameter wire.

H. Hanger Rods and Flat Hangers: Mild steel, zinc coated or protected with rust inhibitive paint.

I. Angle Hangers: Angles with legs not less than 7/8 inch (22 mm) wide; formed with 0.04 inch (1.0 mm) thick, galvanized steel sheet complying with ASTM A653/A653M, G90 (Z275) coating designation; with bolted connections and 5/16 inch (8 mm) diameter bolts.

J. Exposed Metal Edge Moldings and Trim: Provide exposed members indicated or as required to comply with seismic requirements of authorities having jurisdiction, to conceal edges of and penetrations through ceiling, to conceal edges of pans and runners, for fixture trim and adapters, for fasciae at changes in ceiling height, and for other conditions; of metal and finish matching acoustical metal pan ceiling units unless otherwise indicated.

1. For Circular Penetrations of Ceiling: Fabricate edge moldings to diameter required to fit penetration exactly.

2.7 FINISHES

A. Application of surface finish to be applied in compliance with the following standard operating procedure:

1. Inspect raw material for obvious defects. Finish to 180-grit.

2. 5-stage anti-corrosion pretreatment.
3. Electrostatically apply Triglycidyl Isocyanurate (TGIC) polyester powder (IGP Dura Xal or equivalent) to entire surface of part at approximately 2.0-3.0 mils. Exterior Architectural grade powder coating.
4. Cure part per manufacturer's specifications.

B. Surface finish, when complete, must meet the reference standards as listed below:

1. American Society for Testing and Materials (ASTM):

a. ASTM D3359 Standard Test Methods for Measuring Adhesion, Method B.
b. ASTM D3363 Standard Test Method for Film Hardness by Pencil Test.
c. ASTM D2794 [modified] Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
d. ASTM D522 [modified] Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings.
e. ASTM D4060 [modified] Standard Test Method for Abrasion Resistance.

C. Durability of surface finish must meet the reference standards as listed below:

1. American Society for Testing and Materials (ASTM):

a. ASTM B117 Standard Practice for Operating Salt Spray (Fog) Apparatus.
b. AAMA 2604 – 5 Year South Florida Exposure (American Architectural Manufacturers Association, AAMA).

D. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

E. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

F. Comply with NAAMM Metal Finishes Manual for Architectural and Metal Products for recommendations for applying and designating finishes.

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

2.8 BACKLIGHTING SYSTEM

A. Manufacturer: Subject to compliance with requirements, provide aluminum framing system by the following:

1. Omnify Lighting.

a. Product: LumiCurtain.
b. Part number: 410100.
c. Wattage: Subject to mockup review and approval.

B. Backlighting System: A backlighting system designed to provide a backlighting system integral with the Vertika support framing, to provide an aesthetically pleasing back lighting for Arktura perforated metal paneling.

1. Constant Current LED Driver: As recommended by light fixture manufacturer.

a. Coordinate with Division 26.

C. Dimming Device: As recommended by the Light Fixture manufacturer, which minimizes the number of devices, and provides for dimming capabilities in a range of 1-to-10.

1. Coordinate with Division 26.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing to which acoustical metal pan ceilings attach or abut for compliance with requirements that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical metal pan ceilings.

B. Prepare written report listing conditions detrimental to performance of the work.

C. Proceed with installation after correcting unsatisfactory conditions.

3.2 PREPARATION

A. Measure each ceiling area and establish layout of acoustical metal pans to balance border widths at opposite edges of each ceiling. Avoid using less than half width pans at borders and comply with layout shown on reflected ceiling plans and coordination drawings.

3.3 INSTALLATION

A. Install metal pan ceiling assemblies to comply with ASTM C636/C636M and manufacturer's written instructions.

B. Suspend ceiling hangers from building's structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, counter splaying, or other equally effective means.
3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
4. Secure wire hangers to ceiling suspension members or carrying channels and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that do not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
5. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast in place hanger inserts, postinstalled mechanical or adhesive anchors, or power actuated fasteners (if permitted) that extend through forms into concrete.
6. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
7. Do not attach hangers to steel deck tabs.
8. Do not attach hangers to steel roof deck. Attach hangers to structural members.
9. Space hangers not more than 48 inches (1200 mm) o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches (200 mm) from ends of each member.

10. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

C. Trim, Base, and Corners: Provide manufacturers perimeter trim, base, and inside and outside corners necessary for a complete installation.

1. Apply sealant to joints to provide a light-proof enclosure.

D. Cut metal pan units for accurate fit at borders and at interruptions and penetrations by other work through ceilings. Stiffen edges of cut units as required to eliminate evidence of buckling or variations in flatness exceeding referenced standards for stretcher leveled metal sheet. Cut and treat edges to comply with manufacturer's written instructions.

E. Install acoustical metal pans in coordination with suspension system and exposed moldings and trim. Comply with manufacturer's installation tolerances.

1. For torsion spring hinged pans, position pans according to manufacturer's written instructions.
2. Align joints in adjacent courses to form uniform, straight joints parallel to room axis in both directions unless otherwise indicated.
3. Fit adjoining units to form flush, tight joints.
4. Install directionally patterned or textured metal pans in directions indicated.
5. Install back lighting system in accordance with the manufacturer’s instruction.

3.4 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Perform the following tests and inspections of completed installations of acoustical metal panel ceiling hangers, anchors, and fasteners in successive stages. Do not proceed with installations of acoustical metal panel ceiling hangers for the next area until test results for previously completed installations show compliance with requirements.

1. Extent of Each Test Area: When installation of ceiling suspension systems on each floor has reached 20 percent completion, but no panels have been installed.

a. Within each test area, testing agency selects one of every 10 power actuated fasteners and postinstalled anchors used to attach hangers to concrete and tests them for 200 lbf (890 N) of tension; it also selects one of every two postinstalled anchors used to attach bracing wires to concrete and tests them for 440 lbf (1957 N) of tension.
b. When tested fasteners and anchors do not comply with requirements, testing agency tests those fasteners and anchors not previously tested until 20 pass consecutively and then resumes initial testing frequency.

C. Metal panel ceiling hangers, anchors, and fasteners will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

3.5 CLEANING

A. Immediately after completion of installation, clean panels and accessories using a mild soap and water mixture. Wipe dry leaving no streaks or splotches.

B. Remove excess adhesive using methods and materials recommended in writing by manufacturer.

END OF SECTION