

SECTION 09 51 13 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes acoustical panels and exposed suspension systems for ceilings.
- B. Refer to Division 01 Sections for requirements regarding:
 - 1. LEED credit achievement goals as summarized by the LEED Scorecard attached to Section 01 81 13 "Sustainable Design Requirements."
 - 2. Requirements for documentation of LEED credits.
 - 3. Payment application requirements as they relate to LEED documentation requirements.

1.2 SUBMITTALS

- A. Product Data: Submit product data for each type of product indicated.
- B. Sustainable Design Submittals:
 - 1. Completed "LEED Criteria Worksheet," for each component material of the product or assembly used in the installation of Work of this Section. Refer to Section 01 81 13 "Sustainable Design Requirements."
 - 2. Product Data: For sealants, indicating VOC content.
 - 3. Laboratory Test Reports: For sealants, indicating compliance with requirements for low-emitting materials.
 - 4. Laboratory Test Reports: For ceiling products, indicating compliance with requirements for low-emitting materials.
 - 5. Environmental Product Declaration: For each product.
 - 6. Health Product Declaration: For each product.
- C. Shop Drawings: Submit shop drawings of reflected ceiling plans drawn accurately to large scale and coordinating penetrations and ceiling-mounted items. Show the following:
 - 1. Patterns of ceiling suspension assembly members with setting out/work points.
 - 2. Method of attaching hangers to building structure.
 - 3. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings at walls, column penetrations, and other junctures of acoustical ceilings with adjoining construction.

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- D. Samples: Submit samples for each acoustical panel, for each exposed suspension system member, for each exposed molding and trim, and for each color and texture required, prepared on Samples of size indicated below. Samples shall show the full range of color and texture variations to be expected in the final installation.
1. Acoustical Panel: Set of 6-inch square Samples of each type, color, pattern, and texture.
 2. Exposed Suspension System Members, Moldings, and Trim: Set of 12-inch- long Samples of each type, finish, and color.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an Installer, with not less than 5 years experience in the installation of materials specified, and who has completed acoustical panel ceilings similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance.
- B. Ceiling products shall comply with the requirements of the California Department of Public Health's (CDPH) "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers", Standard Method v1.2-2017."
- C. Fire-Test-Response Characteristics: Provide acoustical panel ceilings that comply with the following requirements:
1. Fire-Resistance Characteristics: Where indicated, provide acoustical panel ceilings identical to those of assemblies tested for fire resistance according to one of the following standards, or another testing and inspecting agency acceptable to authorities having jurisdiction:
 - a. ASTM E 119 "Test Methods for Fire Tests of Building Construction and Materials."
 - b. Underwriters Laboratory (UL) "Fire Resistance Directory."
 - 1) Fire Rated Acoustical Ceiling Panel Assemblies: Comply with UL Design Number D215 for the fire rating indicated on the drawings.
 2. Identify materials with appropriate markings of applicable testing and inspecting agency.
 3. Surface-Burning Characteristics: Provide acoustical panels with the following surface-burning characteristics complying with one of the following:
 - a. ASTM E 1264 "Standard Classification for Acoustical Ceiling Products" for Class A materials as determined by testing identical products per ASTM E 84 "Standard Test Method for Surface Burning Characteristics of Building Materials":
 - 1) Smoke-Developed Index: 450 or less.

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- D. Sound Transmission Characteristics: For acoustical panel ceilings with STC ratings, provide materials and construction identical to those tested in assembly indicated according to the following standards:
1. ASTM E 90 "Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements."
 - a. Classified according to ASTM E 413 "Classification for Rating Sound Insulation" by a qualified independent testing agency.
- E. Seismic Performance: Acoustical ceiling shall withstand the effects of earthquake motions determined according to ASCE/SEI 7 for the geographic location of the site.
- F. Sample Installations: Before installing acoustical panel ceilings, install sample installations, for each type of acoustical panel ceiling installation required to demonstrate aesthetic effects and qualities of materials and execution. The sample installation shall be complete in every way and include all attachments to structure, hangers, grids, ceiling panels, moldings and column trims, light fixtures, air outlets and inlets; speakers, sprinklers heads, heat and smoke detectors. Install sample installations to comply with the following requirements, using materials indicated for the completed Work:
1. Size and Location: Provide 250 square foot sample installations in locations as directed by Architect.
 2. Demonstrate the proposed range of aesthetic effects and workmanship.
 3. Obtain Architect's approval of sample installations before starting work.
 4. Maintain sample installations during construction in an undisturbed condition as a standard for judging the completed Work.
 5. Approved sample installations may become part of the completed Work if undamaged at time of Final Acceptance.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical panels, suspension system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

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ACAA Project Number: TBD
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1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install acoustical panel ceilings until wet work (painting, drywall, interior tilework, and concrete leveling) in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.6 COORDINATION

- A. Coordinate layout and installation of acoustical panels and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

1.7 EXTRA MATERIALS

- A. Furnish and store at the site where directed, 2 percent of each type of acoustic panel installed in the Project, packaged in manufacturer's unopened cartons and identified as to contents.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Environmental Product Declaration of Product: Products shall have Product-specific Type III EPD.
- B. Manufacturers: Subject to compliance with requirements, provide acoustical panel ceiling systems indicated on Drawings, or comparable products, acceptable to the Architect, by one of the following:
 - 1. Armstrong Ceilings and Wall Solutions.
 - 2. USG.
 - 3. Rockfon North America.
 - 4. CertainTeed.

2.2 METAL SUSPENSION SYSTEMS

- A. Metal Suspension System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635/C 635M .

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1. Recycled Content: Provide products made from steel sheet with average recycled content such that postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25 percent.
 2. Edge Condition of Cross Runners: Unless otherwise indicated, provide mitered type cross runner to main tee runner intersections. Coordinate locations of notches in the main tees with adjacent ceiling, light, and diffuser modules to effect a notch free condition where cross tees are not indicated to intersect with the main tee.
- B. Overhead Deck Hanger Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.
1. Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with eyepins, clips or other accessory devices for attaching hangers of type indicated, and with capability to sustain, without failure, a load equal to 5 times that imposed by ceiling assembly as determined by testing according to ASTM E 488 or ASTM E 1512 as applicable, conducted by a qualified testing and inspecting agency.
 2. Refer to Section 01 45 00 "Structural Testing and Inspection", Article 3.3 "Concrete Reinforcement and Embedded Items" for testing of anchors.
- C. Hangers: As follows:
1. Wire Hangers, Braces, and Ties: Zinc-coated carbon-steel wire; ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
 - a. Size: Select wire diameter so its stress at three times hanger design load ASTM C 635/C 635M, Table 1, "Direct Hung" will be less than yield stress of wire, but provide not less than 12 ga. (0.106-inch)- diameter wire.
 2. Rod Hangers: ASTM A 510, mild carbon steel.
 - a. Diameter: 1/4-inch.
 - b. Protective Coating: ASTM A 153/A 153M, hot-dip galvanized.
 3. Flat Hangers: Commercial-sheet steel, ASTM A 653/A653M with G60, hot dip galvanized zinc coating.
 - a. Size: 1 by 3/16 inch by length indicated.
- D. Carrying Channels: ASTM C 754 with G60 coated cold rolled steel channels, 1-1/2-inch, 475 pounds per 1000 feet.
- E. Seismic Stabilizer Bars: Manufacturer's standard perimeter stabilizers designed to accommodate seismic forces.

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- F. Seismic Struts: Manufacturer's standard compression struts designed to accommodate seismic forces.
- G. Seismic Clips: Manufacturer's standard seismic clips designed and spaced to secure acoustical panels in place.
- H. Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that fit acoustical panel edge details and suspension systems indicated; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension system runners; provide in longest standard single piece lengths.
 - 1. Shadow (Stepped Moldings): Stepped edge molding that forms reveal of same depth and width as that formed between edge of panel and flange at exposed suspension member. Form from sheet metal of same material and finish as that used for exposed flanges of suspension system runners.
 - 2. F Moldings: Provide F moldings at ceiling breaks, soffits, bulkheads, and changes in elevation other than vertical walls and columns to the extent indicated. Form from sheet metal of same material and finish as that used for exposed flanges of suspension system runners.
 - 3. Metal Perimeter Channel Trim: Shapes and profiles to suit conditions indicated; fabricated from extruded aluminum; finished to match exposed flanges of suspension system runners. Provide manufacturer's recommended tee-bar connection clips, and hanging clips, which lock into specially designed bosses on the channel trim and are screw attached to the web of the intersecting suspension system members. Join sections of trim together with manufacturer's standard splice plates and alignment clips.
 - 4. Perimeter Wing Trim: Shapes and profiles to suit conditions indicated; fabricated from and finished to match exposed panel. Provide manufacturer's recommended connect wing cantilevers, connect splines, connect hooks, connect multi-connection, and installation screws suitable for installation indicated.
- I. Clips: Provide support clips, clamps, fasteners, splines, and other attachment devices as required to align components and to connect components and transfer imposed loads of suspension system.
 - 1. Provide partition attachment clips, and fasteners for areas where partition ceiling runners are secured to the ceiling suspension system.
 - 2. Provide attachment clips for runner to angle molding to avoid use of pop rivets.
 - 3. Provide grid converter accessories as required to change main tee direction 90 degrees from adjacent main tee.
 - 4. Provide light fixture clips.
 - 5. Provide hold down clips at entryways to reduce flutter as required.
 - 6. Provide miter closure clips.

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- J. Manufacturers and Products: Refer to Drawings and Schedules for extent and types of each metal suspension system required.

2.3 ACOUSTICAL PANELS (CL##)

- A. Manufacturers and Products: Refer to Drawings and Schedules for extent and types of each acoustical panel required.
 - 1. Recycled Content: Provide acoustical panels with recycled content such that postconsumer recycled content plus one-half of preconsumer recycled content constitutes a minimum of 23 percent by weight.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation, anchorage, with requirements for installation tolerances, and other conditions affecting performance of acoustical panel ceilings.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Layout the Work to center board pattern both directions around Work points shown in each major space or room as shown on the drawings or directed and, where possible, adjust pattern so that edge pieces will be not less than 1/2 unit in width.

3.3 INSTALLATION

- A. General: Install acoustical panel ceilings to comply with ASTM C 636 and seismic requirements indicated, per manufacturer's written instructions, and ASTM C636, and CISCA's "Ceiling Systems Handbook," and as required to match the accepted sample installation.
- B. Suspend ceiling hangers as follows:

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1. Fasten hangers to anchors that extend into decks. Space hangers not more than 48 inches along each member supported directly from hangers; and provide hangers not more than 6 inches from ends of each member. Provide additional hangers for support of fixtures and other items including but not limited to light fixtures and diffusers, as required to prevent overloading of deck attachment, eccentric deflection or rotation of supporting runners.
 2. Hangers:
 - a. Secure wire hangers to ceiling suspension members and to supports above with a minimum of 3 tight turns. Connect hangers directly to drilled in anchors (eye screws), or other devices that are secure, and are appropriate for substrate.
 - b. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to drilled in anchors, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved.
 3. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 4. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of the supporting structure or of the ceiling suspension system.
 5. 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. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
- C. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
1. Typical Edge Molding Attachment: Align moldings accurately and screw attach securely to substrate with concealed fasteners at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system. Miter corners accurately and connect securely.
 - a. Do not use exposed fasteners, including pop rivets, on moldings and trim.
 2. Window and Curtainwall Frame Head Attachment: Unless otherwise indicated, align moldings accurately and secure to window and curtainwall frame heads using manufacturers recommended double sided foam white tape, leveling with ceiling suspension system. Miter corners accurately and adhere securely.
 - a. Do not use exposed fasteners, including pop rivets, on moldings and trim.

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- D. Install suspension system runners so they are square and securely interlocked with one another. Clip runners to angle moldings do not use exposed fasteners. Finish to lines and levels shown, with maximum deflection not to exceed 1/360 of the span between supports. Laser level accurately in all directions, leveling to a tolerance of 1/8-inch noncumulative. Remove and replace dented, bent, or kinked members.
- E. Install acoustical panels with undamaged edges and fit accurately into suspension system runners and edge moldings. Run grain of units in one direction as accepted on shop drawings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
 - 1. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension-system runners and moldings.
 - 2. For reveal-edged panels on suspension-system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
 - 3. For reveal-edged panels on suspension system members with box-shaped flanges, install panels with reveal surfaces in firm contact with suspension system surfaces and panel faces flush with bottom face of runners.
 - 4. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using sealer and coating recommended in writing for this purpose by acoustical panel manufacturer.

3.4 CLEANING

- A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 09 51 13