SECTION 09 51 13 – acoustical panel ceilings

This Section has been edited to include Gensler's Product Sustainability Standards ("GPS Standards") criteria, providing language for only the "Gensler Standard" tier of performance - the required minimum level of performance for sustainable attributes of the product. To include "Market Differentiator" level of performance or for any other questions, please contact your regional specification leader, Tim Taylor, or Kaley Blackstock.

1. GENERAL
   1. summary
      1. Section includes supply and installation of the following, complete with all accessories and support framing to allow for a complete installation:

SPEC NOTE: Edit the following paragraphs to reflect the materials on the project and in the Finish Schedule.

* + - 1. Acoustical ceiling panels.
      2. Acoustical baffle shapes.
      3. Decorative wire mesh ceiling panels.
      4. Exposed suspension systems for interior ceilings.
  1. ADMINISTRATIVE REQUIREMENTS
     1. Coordination: Coordinate layout and installation of acoustic panel ceiling and suspension system with other construction that penetrates ceilings or is supported by them including but not limited to, light fixtures, HVAC equipment, fire suppression system, and partition assemblies, and as follows:
        1. Schedule and coordinate installation of ceiling to occur after completion of overhead mechanical and electrical work.
        2. Schedule and coordinate ceiling installation with mechanical and electrical trades building in components into ceiling finish panels.
     2. Pre-Installation Conference: Conduct conference at Project site in accordance with requirements of Section 01 31 19 – Project Meetings, to discuss coordination issues with Contractor, Subcontractor and Consultant present.
  2. action submittals
     1. Sustainable Design Submittals: Refer to Division 01 Section 01 81 33 – Sustainable Design Requirements.
     2. Product Data: For each type of product.
     3. Samples: For each exposed product and for each colour and texture specified, 150mm (6") in size.
     4. Samples for Initial Selection: For components with factory-applied finishes.
     5. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of sizes indicated below:
        1. Acoustical Panels: Set of 305mm (12") square samples of each type, colour, pattern, and texture.
        2. Exposed Suspension-System Members, Moldings, and Trim: Set of 150mm (6") long Samples of each type, finish, and colour.
        3. Clips: Full-size hold-down clips.
  3. Informational Submittals
     1. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
        1. Ceiling suspension-system members.
        2. Structural members to which suspension systems will be attached.
        3. Method of attaching hangers to building structure.
        4. Carrying channels or other supplemental support for hanger-wire attachment where conditions do not permit installation of hanger wires at required spacing.
        5. Size and location of initial access modules for acoustical panels.
        6. Items penetrating finished ceiling and ceiling-mounted items including the following:
           1. Lighting fixtures.
           2. Diffusers.
           3. Grilles.
           4. Speakers.
           5. Sprinklers.
           6. Perimeter moldings.
        7. Show operation of hinged and sliding components covered by or adjacent to acoustical panels.
     2. Qualification Data: For testing agency.
     3. Product Test Reports: For each acoustical panel ceiling, for tests performed by manufacturer and witnessed by a qualified testing agency.

The following requirement is a part of the GPS Standards and is required for all projects, relating to the Global Warming Potential (embodied carbon) limits established for select products. Contractors must submit a Type III EPD to verify that the product does not exceed the embodied carbon limits listed in Part II.

* + 1. Embodied Carbon Reporting: Type III Environmental Product Declarations, per ISO 14025 disclosing the Global Warming Potential of the product from Stages A1 through A3 in accordance with Section 01 81 33 "Sustainable Design Requirements - Embodied Carbon" for products listed under "Embodied Carbon Reporting" in Article "Quality Assurance."

The paragraph below aligns with edits made in January of 2023 to Gensler’s master specifications for our GC3 initiative. This requires that contractors complete an EPD Reporting Form, referenced in 018133 "Sustainable Design Requirements - Embodied Carbon" disclosing (checking a box) if an EPD exists for the product, and to provide the EPD.

* + 1. Environmental Product Declaration (EPD) Disclosure Submittals: Completed Environmental Product Declaration Reporting Form in accordance with Section 01 81 33 "Sustainable Design Requirements - Embodied Carbon" for the following product types in this Section:
       1. Carrying channels.

The following requirement is a part of the GPS standards and is required for all projects. This relates to TVOC emissions testing reports or certificates listed under 'Quality Assurance' for select product types.

* + 1. TVOC Emissions: Laboratory test reports or third-party certificates showing compliance with the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers" version 1.2-2017 for products listed under "TVOC Emissions" in Article "Quality Assurance."

The following requirement is a part of the GPS Standards and is required for all projects. This relates to material ingredient disclosure reports listed under 'Quality Assurance' for select product types.

* + 1. Material Ingredient Disclosure: Submit one of the following reports for products listed under "Material Ingredient Disclosure" in Article "Quality Assurance."
       1. Health Product Declaration.
       2. UL Product Lens.
       3. Living Building Challenge Declare Label or Living Product Challenge Label.
       4. EPEA Material Health Statement.
       5. Cradle-to-Cradle v4 Material Health Certificate or multi-attribute certificate.

The following requirement is a part of the GPS Standards and is required for all projects.

* + 1. Sustainability Reporting: Provide the following:
       1. Recycled content, including pre-consumer and post-consumer percentages.
       2. Biobased content for acoustical panels.
       3. Manufacturing location.
       4. End of Life:
          1. Acoustical Ceiling Panels: Manufacturer Take-Back Program.
          2. Suspension Systems and Trim: End-of-life recyclability percentage.
  1. closeout submittals
     1. Maintenance Data: For finishes to include in maintenance manuals.
  2. MAINTENANCE MATERIAL SUBMITTALS
     1. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
        1. Acoustical Ceiling Units: Full-size panels equal to two percent (2%) of quantity installed.
        2. Suspension-System Components and Accessories: Quantity of each exposed component equal to two percent (2%) of quantity installed.
  3. QUALITY ASSURANCE
     1. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
        1. Build mockup of typical ceiling area as shown on Drawings.
        2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Consultant specifically approves such 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.

The following requirement is part of the GPS Standards and is required for all projects. This corresponds to the GPS Standards requiring that select products have third-party verified Environmental Product Declarations (EPDs).

* + 1. Embodied Carbon Reporting: For the following product types, obtain products with Type III Environmental Product Declaration (EPD) in compliance with ISO 14025. Industry-wide EPDs must demonstrate that the manufacturer is a member of the publishing body responsible for the production of the EPD.
       1. Acoustical Ceiling Panels: Product-Specific EPDs.
       2. Metal Suspension Systems: Product-specific or industry-wide EPDs.
       3. Metal Edge Moldings and Trim: Product-specific or industry-wide EPDs. .

The following requirement is a part of the GPS Standards and is required for all projects. This corresponds to the GPS Standards requiring that select products have testing reports or certificates for the California Department of Public Health (CDPH) Standard Method v1.2-2017 emissions testing ("TVOC emissions").

* + 1. TVOC Emissions: Obtain the following products with publicly available reports or certificates verifying compliance with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers" version 1.2-2017, following the private office scenario:
       1. Acoustical ceiling panels.
       2. Suspension systems, edge, and trim.

The following requirement is a part of the GPS Standards and is required for all projects.

* + 1. Material Ingredient Disclosure: Obtain the following products with publicly available reports disclosing material ingredients to residuals no greater than 1000ppm:
       1. Acoustical ceiling panels.
       2. Suspension systems, edge, and trim.
  1. DELIVERY, STORAGE, and HANDLING
     1. Deliver acoustical panels, suspension-system components, and accessories to Project site 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.
     2. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.
  2. field CONDITIONS
     1. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weathertight, wet-work 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. products
   1. PERFORMANCE REQUIREMENTS
      1. Surface-Burning Characteristics: Comply with CAN/ULC S102; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
         1. Flame-Spread Rating: Class A.
         2. Flame Spread: 25 or less.
         3. Smoke Developed: 50 or less.
      2. Superimposed Loads: Determine superimposed loads applied to suspension systems by components of the building and verify that adequate hangers are installed to support additional loads in conjunction with normal loads of the ceiling system, and as follows:
         1. Maximum Deflection: Limit deflection to L/360 in accordance with ASTM C 635 deflection test.

The following requirement is a part of the GPS Standards and is required for all projects.

* + 1. Maximum Embodied Carbon Limit for Acoustical Panels excluding their Suspension Systems: Maximum Global Warming Potential for Production Stages A1 through A3 as defined in Section 01 81 33 "Sustainable Design Requirements - Embodied Carbon": 7.2 kg of CO2eq per m2.
  1. materials

SPEC NOTE: Edit the following CL#'s to reflect what is listed in the Finish Schedule. Delete paragraphs that are not required on the Project.

* + 1. Acoustic Panels (CL-#): Provide manufacturer's standard panels of configuration indicated in accordance with ASTM E 1264 classifications as designated by the nominal values for types, patterns, acoustic ratings, and light reflectance class listed in this Section; and as follows:
       1. Dimensions, Model and Manufacturer: As indicated in Section 09 06 05 – Product and Finish Schedule.
    2. Acoustical Baffle Shapes (CL-#): 100% polyester containing 50% recycled plastic bottles designer felt ceiling baffles, constructed of individual panels assembled to create a pattern:
       1. Class A fire rated with CAN/ULC S102.
       2. Panel Edge: Covered Edge.
       3. Suspended using standard tie wire.
       4. Colour, Pattern, Manufacturer and Model: As indicated in Section 09 06 05 – Product and Finish Schedule.
    3. Decorative Wire Mesh Ceiling Panels (CL-#):
       1. Pre-engineered architectural wire ceiling panels consisting of the following:
          1. Size: 610mm x 610mm x 6mm thick (24" x 24" x 1/4" thick).
          2. Openness Factor: 70% openness minimum.
          3. Colour, Model and Manufacturer: As indicated in Section 09 06 05 Product and Finish Schedule.
    4. Prefinished Ceiling Panels (CL-#):
       1. Acoustical, perforated ceiling panels, consisting of the following:
          1. Size: 610mm x 1220mm x 38mm thick (24" x 48" x 1-1/2" thick).
          2. Openness Factor: 40% openness minimum.
          3. Backing: manufacturers standard acoustical backer.
          4. Colour, Model and Manufacturer: As indicated in Section 09 06 05 Product and Finish Schedule.
    5. Metal Suspension System - Acoustical Panel Ceilings: Manufacturer's standard direct hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable ASTM C 635 requirements and as supplied by same materials supplier as acoustic panels for intermediate duty, exposed tee bar and as follows:

SPEC NOTE: Verify the suspension system sizing to make sure it follows the Finish Schedule and also that the ceiling tile works with this size of suspension system.

SPEC NOTE: 14mm (9/16") is the other common sizing.

* + - 1. Tee Bar Grid Face Width: 24mm (15/16").
      2. Module: Sized as appropriate to acoustic panel size.
      3. Hangers, Braces and Ties: Nominal 14 ga. diameter steel wire, galvanized.
      4. Exposed Finish: Manufacturer's standard satin, white finish.
      5. Corrosion Resistance: Hot-dip galvanized or stainless-steel components.
      6. Basis of Design Material: 15/16" Prelude XL by Armstrong World Industries, Inc.
    1. Tie Wire: Manufacturers standard 1.2mm (3/64") galvanized soft annealed steel wire.

SPEC NOTE: Keep the following paragraph if edge trim is required.

SPEC NOTE: Edge trim comes in all different stock depths. Edit the following paragraphs to reflect the depth of edge trim on the Project. Options are 2" increments, starting at 2", up to 16".

* + 1. Edge Trim:
       1. 150mm (6") exposed profile, attaching to metal suspension system; Finish: As selected from manufacturer's standard product line.
       2. Basis of Design material: Axiom Classic Trim, 150mm (6") Profile, by Armstrong Ceiling Systems.
    2. Accessories:
       1. Miscellaneous 'U' clips, splicers, screws, anchors, nails, wire, hold-down clips, and the like, for complete installation.
  1. ACOUSTICAL SEALANT
     1. Acoustical Sealant: As specified in Section 07 92 00 - Sealants.

1. execution
   1. examination
      1. 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 and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.
      2. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.
      3. Proceed with installation only after unsatisfactory conditions have been corrected.
   2. preparation
      1. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders unless otherwise indicated and comply with layout shown on reflected ceiling plans.
         1. Layout openings for penetrations centered on the penetrating items.
   3. installation
      1. Install acoustical panel ceilings according to ASTM C 636/C 636M, and manufacturer's written instructions.
      2. 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 and to supports above with a minimum of three tight turns. Connect hangers directly to structure or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
         5. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
         6. 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 that extend through forms into concrete.
         7. 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.
         8. Do not attach hangers to steel deck tabs.
         9. Do not attach hangers to steel roof deck. Attach hangers to structural members.
         10. Space hangers not more than 1200mm (48") o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 200mm (8") from ends of each member.
         11. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.
      3. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
         1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
         2. Screw attaches moldings to substrate at intervals not more than 400mm (16") o.c. and not more than 75mm (3") from ends. Miter corners accurately and connect securely.
         3. Do not use exposed fasteners, including pop rivets, on moldings and trim.
      4. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
      5. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide 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 colour of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.
         5. Install hold-down clips in areas indicated; space according to panel manufacturer's written instructions unless otherwise indicated.
            1. Hold-Down Clips: Space 610mm (24") o.c. on all cross runners.
         6. Protect lighting fixtures and air ducts according to requirements indicated for fire-resistance-rated assembly.
   4. ERECTION TOLERANCES
      1. Suspended Ceilings: Install main and cross runners’ level to a tolerance of 3 mm in 3.6 m (1/8" in 12'), non-cumulative.
      2. Moldings and Trim: Install moldings and trim to substrate and level with ceiling suspension system to a tolerance of 3 mm in 3.6 m (1/8" in 12'), non-cumulative.
   5. CLEANING
      1. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touch-up of minor finish damage.
      2. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

end of section