

SECTION 09 51 10 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes ceilings consisting of acoustical panels and suspension systems.

1.3 SUBMITTALS

- A. Product Data: For each type of product specified.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of actual acoustical panels or sections of acoustical panels, fiberglass reinforced plastic panels, suspension systems, and moldings showing the full range of colors, textures, and patterns available for each type of ceiling assembly indicated.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications and FRP Panel Ceilings: Engage an experienced installer who has completed acoustical panel ceilings similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
- B. Source Limitations for Ceiling Units: Obtain each acoustical ceiling panel and suspension system from one source with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.
- C. Source Limitations for FRP Panels: Obtain from one source with resources to provide products of consistent quality in appearance and physical properties without delaying the work.
- D. Source Limitations for Suspension System: Obtain each suspension system from one source with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.
 - 1. Obtain both ceiling panels and suspension system from the same manufacturer.
- E. Fire-Test-Response Characteristics: Provide FRP panel ceilings that comply with the following requirements:

1. Fire-response tests were performed by UL, ITS/Warnock Hersey, or another independent testing and inspecting agency that is acceptable to authorities having jurisdiction and that performs testing and follow-up services.
2. Surface-burning characteristics of acoustical panels and FRP comply with ASTM E 1264 for Class A materials as determined by testing identical products per ASTM E 84.

1.5 DELIVERY, STORAGE, AND HANDLING

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

1.6 PROJECT CONDITIONS

- A. Space Enclosure and Environmental Limitations: Do not install FRP panel ceilings until spaces are enclosed and weatherproof, 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.

1.7 COORDINATION

- A. Coordinate layout and installation of FRP 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.

1.8 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents.
 1. Acoustical Ceiling Units: Full-size units equal to 2.0 percent of amount installed, Full carton quantity only.
 2. Suspension System Components: Quantity of each exposed component equal to 2.0 percent of amount installed full carton quantity only.

1.9 WARRANTY

- A. Sag & Warp Warranty
 1. Manufacturer,
- B. Ceiling Suspension System Warranty

1. Manufacturer shall warrant ceiling suspension system components as manufactured to meet or exceed ASTM C 635 standards and conform to direct hung structural classification of light, intermediate, or heavy duty. These components should be warranted against the occurrence of 50% red rust as defined by ASTM B 117 test procedures during the first 10 years of this warranty. This warranty is subject to further conditioned outlines below.
 - a. All material shall be installed in accordance with manufacturer's specifications for grid system.
 - b. Damage, which may occur from chemical fumes, freezing temperature, vibration and abuse, is not covered by this warranty.
 - c. Installation may be carried out in temperature conditions up to 120 degrees F and in spaces where HVAC systems are cycled or not operating. These systems can not be used in exterior applications, where standing water is present or where moisture will come in direct contact with the ceiling.
 - d. Damage which may occur from direct moisture in the form of building leaks or condensation is not covered by this warranty.
 - e. Manufacturer must receive written notice within 30 days after first observation of defects covered by this warranty. Subject to inspection, manufacture shall furnish new material at its own expense of the same or similar type and grade in an amount equal to that which is determined to be defective.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, provide products by one of the following:
 1. NUDO – FiberLite
 2. Kal-Lite
 3. Armstrong World Industries, Inc.

4.1 FIBERGLASS REINFORCED PLASTIC PANELS, GENERAL

- A. Provide manufacturer's standard panels of configuration indicated.
 1. Size: 2' by 4'
 2. Finish: Textured
 3. Color: White

4.2 METAL SUSPENSION SYSTEMS, GENERAL

- A. Metal Suspension System Standard for Acoustical Panels: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable ASTM C 635 requirements. As based on USG Interiors or Armstrong World Industries equal to USG, refer to Section 2.5 NON-FIRE-RESISTANCE-RATED, DIRECT-HUNG SUSPENSION SYSTEMS for specifications.

- B. Metal Suspension System Standard for FRP Panels: Provide manufacturer's standard direct-hung aluminum suspension systems of types, structural classifications, and finishes indicated that comply with applicable ASTM C635 requirements.
- C. Metal Suspension System Characteristics: Comply with requirements indicated in the Acoustical Panel Ceiling Schedule at the end of Part 3.
- D. Finishes and Colors, General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Provide manufacturer's standard factory-applied finish for type of system indicated.
 - 1. High-Humidity Finish: Comply with ASTM C 635 requirements for "Coating Classification for Severe Environment Performance" where high-humidity finishes are indicated.
- E. Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung, unless otherwise indicated.
- F. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:
 - 1. Zinc-Coated Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
 - 2. Nickel-Copper-Alloy Wire: ASTM B 164, nickel-copper-alloy UNS No. N04400.
 - 3. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635, Table 1, Direct Hung) will be less than yield stress of wire, but provide not less than 0.106-inch diameter wire.
- G. Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.
- H. Flat Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.
- I. Angle Hangers: Angles with legs not less than 7/8 inch wide; formed with 0.04-inch-thick, galvanized steel sheet complying with ASTM A 653/A 653M, G90 coating designation; with bolted connections and 5/16-inch diameter bolts.
- J. Sheet-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 and finish as that used for exposed flanges of suspension system runners.
 - 1. For lay-in panels with reveal edge details, provide stepped edge molding that forms reveal of same depth and width as that formed between edge of panel and flange at exposed suspension member.
 - 2. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.
 - 3. For narrow-face suspension systems, provide suspension system and manufacturer's standard edge moldings that match width and configuration of exposed runners.
- K. 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 and moldings before they are installed.
2. Screw attach moldings to substrate at intervals not over 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
 - a. Color: As selected by Architect from manufacturer's standard colors.
3. Manufacturer: Subject to compliance with requirements, provide products by one of the following:
 - a. Armstrong World Industries, Inc.
 - b. USG Interiors, Inc.

4.3 NON-FIRE-RESISTANCE-RATED, DIRECT-HUNG SUSPENSION SYSTEMS

- A. Wide Face, Double Web, Steel Suspension System for use with Acoustical Panels, Provide the following:
 1. Prepainted 15/16 inch wide flanges
 2. Main Runners USG Donn DX 24 or Armstrong World Industries equal to USG.
 3. 4' Tees USG Donn DX 424 or Armstrong World Industries equal to USG.
 4. 2' Tees USG Donn DX 216 or Armstrong World Industries equal to USG.
 5. Wall Angle USG M7 or Armstrong World Industries equal to USG.
 6. System to be stab installed.
 6. Finish: Factory Finish White

4.4 FABRICATION

- A. Trim pans: Edges formed to snap onto attachment clips and provide positive mechanical lock with no visible fasteners. Factory finished to match approved samples.
- B. Splice plates: Formed to snap into and provide positive lock between abutting pans with no visible fasteners. Factory finished to match trim pans.
- C. Mounting clips: Formed to snap into trim pans and provide positive mechanical lock with no visible fasteners while providing a variable angle, screw-fastened connection to suspension members that intersect the trim.

PART 3 - EXECUTION

A. EXAMINATION

1. Examine substrates and 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 other conditions affecting performance of acoustical panel ceilings.

- a. Proceed with installation only after unsatisfactory conditions have been corrected.

B. PREPARATION

1. Coordination: Furnish layouts for cast-in-place anchors, clips, and other ceiling anchors whose installation is specified in other Sections.
2. 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, and comply with layout shown on reflected ceiling plans.

C. INSTALLATION

1. General: Install acoustical panel ceilings to comply with publications referenced below per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
2. Standard for Ceiling Suspension System Installations: Comply with ASTM C 636.
3. Suspend ceiling hangers from building's structural members and as follows:
 - a. 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.
 - b. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - c. Splay hangers only where required and, if permitted with fire-resistance-rated ceilings, to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - d. 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.
 - e. Secure wire hangers to ceiling suspension members 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; that are appropriate for substrate; and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
 - f. 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 structure to which

hangers are attached and 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.

- g. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, powder-actuated fasteners, or drilled-in anchors that extend through forms into concrete.
 - h. Do not attach hangers to steel deck tabs.
 - i. Do not attach hangers to steel roof deck. Attach hangers to structural members.
 - j. Space hangers not more than **48 inches** o.c. along each member supported directly from hangers, unless otherwise indicated; and provide hangers not more than **8 inches** from ends of each member.
- 4. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs.
 - 5. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
 - a. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
 - b. Screw attach moldings to substrate at intervals not more than **16 inches** o.c. and not more than **3 inches** from ends, leveling with ceiling suspension system to a tolerance of **1/8 inch in 12 feet**. Miter corners accurately and connect securely.
 - c. Do not use exposed fasteners, including pop rivets, on moldings and trim.
 - 6. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
 - 7. Install ceiling panels with undamaged edges and fitted accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
 - a. Arrange directionally patterned acoustical panels as follows:
 - 1) As indicated on reflected ceiling plans.
 - b. Install panels with edges fully hidden from view by flanges of suspension system runners and moldings.
 - c. Install hold-down clips.

D. CLEANING

- 1. Clean exposed surfaces of 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