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SECTION 09 51 00

ACOUSTICAL CEILINGS

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**PART 1 - GENERAL**

1.1 SUMMARY

- A. Section Includes: Provide acoustical ceiling system with exposed suspended metal grid system, trim, and accessories as required for complete finished installation.
- B. Related Sections:
  - 1. Section 09 21 00: Gypsum board suspended ceiling systems.
  - 2. Divisions 21 through 28: Facilities services for ceiling penetrations.

1.2 REFERENCES

- A. ASTM C635: Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
- B. ASTM C636: Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
- C. ASTM E580: Application of Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels in Areas Requiring Seismic Restraint.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate installation of acoustical ceiling systems with items installed above ceilings to ensure work above ceilings is complete, space is sufficient for items in ceiling while allowing required ceiling heights, and building is enclosed.

1.4 SUBMITTALS

- A. Product Data: Furnish manufacturers' literature.
- B. Shop Drawings: Clearly indicate grid layout and related dimensioning, junctions with other work and ceiling finishes, and inter-relation of mechanical and electrical items related to system.
- C. Samples: Furnish samples of exposed grid finish and each type of ceiling unit.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Firm with minimum five years successful experience in projects of similar type and scope; acceptable to manufacturer of integrated acoustical ceiling system.

**1.6 SITE CONDITIONS**

- A. Do not install ceilings until building is enclosed, sufficient heat is provided, dust generating activities have terminated and overhead mechanical work is completed, tested and approved.
  - 1. Do not allow acoustical ceiling units to be exposed to moisture; immediately remove acoustical ceiling units with stains, units with signs of mold, and units with mildew.
- B. Allow wet work to dry prior to commencement of installation.
- C. Maintain uniform temperatures of minimum 60 degrees F and humidity of 20% to 40% prior to, during and after installation.

**PART 2 - PRODUCTS****2.1 SYSTEMS MANUFACTURERS**

- A. Armstrong World Industries, Inc.
- B. CertainTeed.
- C. Chicago Metallic Corp.
- D. USG Corporation.
- E. Substitutions: Refer to Section 01 25 00.

**2.2 MATERIALS**

- A. System Description: Provide acoustical ceiling systems with exposed suspended metal grid system, trim, and accessories as required for complete finished installation.
- B. Regulatory Requirements:
  - 1. Seismic Design Requirements: Comply with California Building Code requirements for seismic bracing of ceiling suspension system, and with ASTM E580.
    - a. Ceiling Struts: Provide struts as detailed on Drawings and as required by code, placed maximum 12'-0" on center in both directions and within 6'-0" of each wall.
    - b. Slack Wires: Provide safety slack wires, two per fluorescent fixture on diagonally opposite corners and a single wire for each recessed down light.
  - 2. Fire Performance Characteristics: Provide products listed by Underwriters Laboratories (UL) or other independent testing laboratory acceptable to applicable authorities.

- a. Flame Spread/Smoke Density: Provide products meeting code requirements for maximum 25 flame spread and maximum 25 smoke density.
- C. Suspension Systems: Comply with ASTM C635, as applicable to type of suspension system required for type of ceiling units indicated.
1. Exposed Grid System: Match Armstrong/Suprafine XL 7500 grid with shadow molding, 9/16" nominal face width, direct hung, aluminum or steel "T" exposed grid system.
  2. Attachment Devices: Size for 5 times design load indicated in ASTM C635, Table 1, Direct Hung.
  3. Hanger Wires: Galvanized carbon steel, ASTM A641, soft temper, pre-stretched, yield-stress load of at least three times design load, but not less than 12 gage.
  4. Straps, Tubes and Angles: Provide galvanized steel as required to meet state and local requirements for seismic design loads.
  5. Structural Class: Minimum intermediate-duty system.
  6. Edge Molding: Shadow molding for edges and penetrations of ceiling.
  7. Finish of Exposed Items: Manufacturer's standard white baked enamel.
  8. Maximum Allowable Deflection: L/360.
- D. 2x4 Acoustical Panels: ASTM E1264 type and form as indicated on Finish Schedule, as selected by Architect from manufacturer's full range of panels where not otherwise indicated.
1. Panels: Mineral composition lay-in ceiling panels with square edge designed to be compatible with specified suspension system.
  2. Texture: Light fissured panels unless otherwise indicated on Drawings.
  3. Size: 2'-0" by 4'-0", except where otherwise indicated on Drawings.
  4. Finish: Standard washable white painted finish.
- E. 2x2 Acoustical Panels: ASTM E1264 type and form as indicated on Finish Schedule, as selected by Architect from manufacturer's full range of panels where not otherwise indicated.
1. Panels: Mineral composition lay-in ceiling panels with reveal edge designed to be compatible with specified suspension system.
  2. Texture: Light fissured panels unless otherwise indicated on Drawings.
  3. Size: 2'-0" by 2'-0", except where otherwise indicated on Drawings.
  4. Finish: Standard washable white painted finish.

**PART 3 - EXECUTION**

**3.1 PREPARATION**

- A. Furnish layouts for inserts, clips and other supports required to be installed by other trades for support of acoustical ceilings.
  - 1. Install inserts, clips, and supports where not previously installed and where additional supports are required for complete installation.
- B. Measure ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling; do not use less than half width units at borders.
- C. Coordinate with other work supported by or penetrating through ceilings, including integral air handling systems, light fixtures, and other systems.

**3.2 INSTALLATION**

- A. Install acoustical ceiling systems in accordance with manufacturer's recommendations and ASTM C636.
  - 1. Coordinate installation of air handling systems and electrical systems integral with integrated acoustic ceiling systems.
  - 2. Finished Ceilings: True to lines and levels and free from warped, soiled or damaged grid or acoustical units.
- B. Install ceiling systems in a manner capable of supporting superimposed loads, with maximum permissible deflection of 1/8" in 10'-0".
- C. Install after major above-ceiling work is complete; coordinate location of hangers with other work.
  - 1. Ensure suspension system is located to accommodate fittings and units of equipment which is to be placed after installation of ceiling grid.
- D. Where ducts or other equipment prevent regular spacing of hangers, reinforce nearest adjacent hangers and related carrying channels as required to span required distance.
- E. Install ceiling suspension system to resist seismic loads as required by state and local codes, including extra hanger wires and compression supports for ceilings and light fixtures.
- F. Hang system independently of walls, columns, ducts, pipes and conduit. Where suspension system members are spliced, avoid visible displacement of the longitudinal axis or face plane of adjacent members.

- G. Do not support lighting fixtures from or on main runners or cross runners if weight of fixture causes total dead load to exceed deflection capability.
  - 1. Support fixture loads independently or provide supplementary hangers located within 6" of each corner.
- H. Do not install fixtures so main runners and cross runners are eccentrically loaded; where fixture installation would produce rotation of runners, provide stabilizer bars.
- I. Install edge moldings at intersection of ceiling and vertical surfaces, using maximum lengths, straight, true to line and level; miter corners.
  - 1. Provide edge moldings at junctions with other ceiling finishes.
- J. Where required form expansion joints to accommodate movement and maintain visual closure without distorting system.
- K. Fit acoustic units in place, free from damaged edges or defects detrimental to appearance and function.
  - 1. Lay directionally patterned units one way with pattern as directed.
  - 2. Fit border units neatly against abutting surfaces.
- L. Install system level, in uniform plane and free from twist, warp and dents.
- M. Install hold-down clips where required by applicable codes and where ceiling is within 20'-0" of an exterior door.

### **3.3 ADJUSTING**

- A. Adjustment: Adjust sags or twists which develop in ceiling system and replace any part which is damaged or faulty.

**END OF SECTION**