SECTION 09510

ACOUSTICAL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Acoustical ceiling and suspension systems.

B. Related Sections:

1. Section 07210 - Building Insulation.
2. Section 09250 - Gypsum Board Assemblies: Suspended gypsum board ceilings.
3. Division 15: Sprinkler heads, grilles, registers, and diffusers in acoustical ceilings.
4. Division 16: Fire alarm components, lighting fixtures, speakers in ceiling system and other systems components in acoustical ceilings.

1.2 DEFINITIONS

A. AC: Articulation Class.

B. CAC: Ceiling Attenuation Class.

C. LR: Light Reflectance coefficient.

D. NRC: Noise Reduction Coefficient

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's specifications and installation instructions for each type of product proposed for use.

1. Include test reports to confirm fire performance and acoustical properties of proposed acoustical units.

B. Coordination Drawings: Submit reflected ceiling plans drawn accurately to scale coordinating penetrations and ceiling-mounted items. Show the following:

1. Adjoining gypsum board construction.
2. Ceiling suspension members, including wall moldings.
3. Method of attaching hangers to building structure.
4. Ceiling-mounted items including light fixtures, speakers, alarm and detection devices, and other electrical systems components; air outlets and inlets, sprinkler heads, and other mechanical systems components; and special moldings at walls, column penetrations, and other junctures with adjoining construction.

C. Samples For Verification: Submit the following:

1. 12-inch long samples of suspension system members, including moldings, of color and system type proposed for use.
2. 12-inch square samples of acoustical unit type, pattern and color proposed for use.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced Installer who has successfully completed acoustical ceilings similar to those indicated for Project.

B. Fire-Performance: Provide acoustical panels with surface burning characteristics specified below, based on ASTM E 84 tests performed by UL or other independent agency acceptable to authorities having jurisdiction. Identify packaged products with approval markings of test agency.

1. Flame Spread: 25 or less.
2. Smoke Developed: 50 or less.

C. Source Limitations:

1. Acoustical Ceiling Panel: Obtain each type through one source from a single manufacturer.
2. Suspension System: Obtain each type through one source from a single manufacturer.

D. Preinstallation Conference: Conduct conference at Project site

E. Coordination: 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.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Storage: Deliver ceiling components to project site in original packages and protect during storage against damage.

1. Before installing acoustical ceiling units, permit them to reach stabilized temperature and humidity of space where they will be installed.

B. Handling: Handle ceiling components to avoid chipping or damaging them.

1.6 PROJECT CONDITIONS

A. Installation Conditions: Do not install acoustical ceilings until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete, and temperature and humidity will be continuously maintained near levels intended for final occupancy.

B. Fireproofing: All fireproofing which is removed shall be replaced. All penetrations of fireproofing shall be patched or sealed to restore the required fire resistance.

1.7 EXTRA MATERIALS

A. General: Furnish extra materials that match products installed, are packaged with protective covering for storage, and are identified with appropriate labels.

B. Acoustical Ceiling Units: Furnish quantity of full-size units equal to 2.0 percent of each type of ceiling unit installed.

C. Suspension System Components: Furnish quantity of main- and cross-tees and edge moldings equal to 2.0 percent of components installed.

1.8 WARRANTY

A. Sag Warranty: Ceiling panel products shall have a ten (10) year warranty to withstand temperature conditions up to 90 degrees F and relative humidity of 90 percent without visible sag.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Approved Products/Manufacturers: Refer to the CEILING SYSTEMS LEGEND on the Drawings.

B. Substitutions: Products of other manufacturers may be substituted upon Architect's approval. Final determination of match shall be by Architect. Refer to Sections 01630 and 01631.

2.2 ACOUSTICAL PANELS, GENERAL

A. Standard for Acoustical Ceiling Units: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances, unless otherwise indicated.

1. Mounting Method for Measuring NRC: Type E-400 (plenum mounting in which face of test specimen is 15-3/4 inches away from the test surface) per ASTM E 795.

B. Colors and Patterns: Provide products to match appearance characteristics indicated.

2.3 METAL SUSPENSION SYSTEMS, GENERAL

A. Standard for Metal Suspension Systems: Provide manufacturer's standard metal suspension systems that comply with ASTM C 635 requirements as specified.

B. 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.

C. Attachment Devices: Size for 5 times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.

D. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper.

1. Gage: Provide wire sized so that stress at 3 times hanger design load (ASTM C 635, Table 1, Direct-Hung) will be less than yield stress of wire, but not less than 0.106-inch diameter (12 gage).
2. Anchors in Concrete: Anchors of type and material indicated below, with holes or loops for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to five times that imposed by ceiling construction, as determined by testing per ASTM E 488 or ASTM E 1512 as applicable, conducted by a qualified testing and inspecting agency

E. Hold-Down Clips: Where indicated, provide manufacturer's standard hold-down clips spaced 24 inches o.c. on all cross tees.

F. Edge Moldings and Trim: Manufacturer's standard moldings for edges and penetrations, of types and profiles indicated.

1. Material: Roll-formed, hemmed-edge, galvanized steel.
2. Finish: Provide manufacturer's standard factory-applied finish to match system components.

2.4 RELATED MATERIALS

A. Concealed Acoustical Sealant: Nondrying, nonhardening, nonskinning, nonstaining, nonbleeding, gunnable synthetic rubber sealant recommended for sealing interior concealed joints to reduce airborne sound transmission, Pecora “BA-98", Tremco “Acoustical Sealant”, or similar.

2.5 SOUND ATTENUATION MATERIAL

A. Sound Attenuation Blankets: Unfaced mineral-fiber blanket insulation produced by combining mineral fibers with thermosetting resins to comply with ASTM C 665 for Type I (blankets without membrane facing). Provide insulation with maximum flame spread of 25 and smoke development of 50 when tested in accordance with ASTM E 84.

1. Thickness: Minimum 3 1/2" thick or as required to achieve required sound rating.

PART 3 - EXECUTION

3.1 PREPARATION

A. Examination: Examine ambient conditions, substrates and construction to which ceiling system attaches or abuts, for compliance with requirements specified in this and other sections that affect installation and anchorage of ceiling system. Do not proceed with ceiling installation until unsatisfactory conditions have been corrected.

B. Layout: Generally, measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less-than-half-size units at borders, and comply with reflected ceiling plans.

1. If drawing dictates specific layout or work point, comply with Drawings.

C. Coordination: Furnish layouts for preset inserts, clips, and other devices for ceiling hangers, which are installed as work of other Sections. Supply devices for installation well in advance of time needed.

3.2 INSTALLATION

A. General: Comply with ASTM C 636 installation standard, manufacturer's instructions, and CISCA "Ceiling Systems Handbook."

B. Arrangement: Arrange acoustical units and orient ceiling suspension grid shown by reflected ceiling plans.

C. Suspension System: Suspend ceiling hangers from structural components only, not from conduits, pipes, ducts, and other non-structural items. Do not attach hangers to metal deck or permanent metal forms.

1. Install hangers plumb and free from contact with ducts, pipes, conduits or other objects within ceiling plenum that are not part of supporting structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other effective means.
2. Space hangers not more than 4'-0" o.c. along each supported member unless otherwise shown, and provide hangers not more than 8 inches from ends of each member.
3. Where ducts and other construction interfere with the location of hangers, install supplemental suspension members and hangers in form of trapezes or equivalent devices to support ceiling loads within performance limits established by referenced standards.
4. Secure wire hangers by looping and wire-tying, either directly to in-place construction or to inserts, eyescrews, or other secure, appropriate devices, and so that attachments will not fail due to age, corrosion, or elevated temperatures.
5. Install hold-down clips in areas required by Owner; space as recommended by panel manufacturer's written instructions, unless otherwise indicated.
6. Assemble and support suspension grid in accordance with grid manufacturer's instructions. Support grid independently of edge moldings; do not use edge moldings for support.
7. Level suspension system to tolerance of 1/8" in 12'-0".

D. Edge Moldings: Install edge moldings at perimeter of acoustical ceiling area and at penetrating items to support edges of acoustical units.

1. 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 tolerance of 1/8 inch in 12'-0". Miter corners accurately and connect securely.
2. Apply continuous ribbon of acoustical sealant, concealed on back of vertical leg, before installing moldings.
3. Caulk any voids between molding and substrate

E. Lay-In Ceilings: Install acoustical panels in coordination with suspension system, with edges concealed by support of suspension members. Scribe and cut panels to fit accurately at borders and at penetrations.

3.3 COMPLETION

A. Ceilings: Clean, touch-up and repair exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch-up of minor finish damage. Remove and replace

work that cannot be cleaned and repaired to permanently eliminate evidence of soiling, staining, and damage.

B. Other Work: Touch-up, repair or remove and replace as necessary other items damaged due to acoustical ceiling work.

C. Completed Work: Acoustical ceilings shall be clean, undamaged and complete. Suspension members and moldings shall be securely attached, with neat, aligned joints. Acoustical units shall be properly sized and supported by suspension system and wall moldings at all sides. Ceilings shall be level to tolerance of 1/8" in 12'-0".

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. Architect shall make final determination as to which panels are to be replaced or cleaned.

3.5 CEILING SYSTEM SCHEDULE

A. See "Ceiling Systems Legend" on Drawings

END OF SECTION