SECTION 09 51 00
SUSPENDED ACOUSTICAL CEILINGS

PART 1 GENERAL 1.01 SECTION INCLUDES

1.01 REFERENCE STANDARDS

A. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2023.

B. ASTM C635/C635M - Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2022.

C. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2019 (Reapproved 2025).

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.

E. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.

F. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2022.

G. ASTM E413 - Classification for Rating Sound Insulation; 2022.

H. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2023.

I. ASTM E1477 - Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers; 1998a (Reapproved 2022).

J. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2024.

K. UL (FRD) - Fire Resistance Directory; Current Edition.

1.02 REQUIREMENTS TO PROVIDE ACOUSTICAL CEILING WORK AS INDICATED ON DRAWINGS AND AS SPECIFIED HEREIN, INCLUDING THE FOLLOWING:

A. Acoustical Mineral Fiber Panel and Tile Ceilings
   1. Lay-in panel installation - exposed grid
   2. Direct (adhesive) installation
   3. Concealed spline installation

B. Acoustical Fiberglass-Mineral Fiber Composite Panel.
   1. Lay-in panel installation - exposed grid

C. Metal Panel Ceilings, non-perforated
   1. Lay-in panel installation - exposed grid with flush tegular panels.

D. Acoustical Wood Fiber Panel Ceilings
   1. Lay-in panel installation - exposed grid

1.03 SUSTAINABILITY REQUIREMENTS

A. Sustainability requirements included in the Section are as follows:
   1. Meet established minimum post and pre-consumer percent content for specified mineral based acoustical panels and tiles and documentation of Recycled materials.

B. The Contractor shall implement practices and procedures to meet the Project’s sustainable requirements. The Contractor shall ensure that the requirements related to these goals, as defined in Specification Section S01352, Sustainability Requirements, and as specified in this Section, are implemented to the fullest extent. Substitutions or other changes to the work shall not be proposed by the Contractor or their sub-contractors if such changes compromise the stated Sustainable Design Performance Criteria.

1.04 REFERENCE STANDARDS

A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.

1. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2009a.
2. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2013a.
3. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2013.
4. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2015.
5. ASTM E1414 - Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum; 2011.
6. ASTM E1477 - Standard Test Method for Luminance Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers; 1998a (Reapproved 2013). H. ASTM E413 - Classification for Rating Sound Insulation; 2010.
7. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2014.
8. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.
9. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009.
10. AMA-1-II Ceiling Sound Transmission Test By Two-Room Method
11. Acoustical and Insulaton Materials Association, "Job Conditions."
12. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2015.
13. UL (FRD)- Fire Resistance Directory; current edition.

1.05 DEFINITIONS

A. Direct Suspension System

B. Directly fastened to floor or roof construction above, installed as part of the Work of Section 05170.

C. Indirect Suspension System

D. Installed as part of the Work of this Section, as furnished by ceiling system manufacturer to be attached to direct suspension system.

1.06 SUBMITTALS

A. Product Data

B. Submit manufacturer's product specifications and installation instructions for ceiling materials, indicating compliance with applicable requirements. Include information pertaining to fire performance, flame spread, and smoke development. B. Shop Drawings

C. Submit shop drawing details for each space indicating the relationship to mechanical and electrical Work and other items penetrating or connected to the ceiling. Indicate framing and support details for the ceiling Work.

D. Metal panel ceilings

1. Submit large scale details indicating how ceiling mounted items such as lighting fixtures and HVAC diffusers are installed.
2. Submit ceiling plans for coordination with mechanical trades. Indicate which panels are to be installed without retainer clips, to enable service and maintenance access.

1.07 SAMPLES

A. Submit samples of the following materials, prior to installation;
   1. Acoustical panels: 6"x6" samples of each type, pattern and color.
   2. Lay-in mineral fiber acoustical panel with field cut tegular edge on one edge, painted to match factory tegular edges. The other three edges shall have manufactured tegular profile: 12” x 24” sample.
   3. Metal Panel Ceiling units: Full size sample of each type and finish.
   4. Exposed runners and moldings: 8" long samples of each color and system type required.
   5. Concealed suspension members: 1 set of each assembly specified.

B. Forward each approved sample type to Mechanical Installer for purpose of matching diffusers.

1.08 QUALITY ASSURANCE SUBMITTALS

A. Affidavit certifying experience of the installation company.

B. Certification and listing by an Approved Agency in accordance with NYC Dept. of Buildings rules, indicating that the materials and assemblies regulated by the NYC Building Code are acceptable for the intended use. When test methods are stipulated in the NYC Building Code, the tests utilized shall be stated in the Certification. Prior MEA and BSA approvals are acceptable for materials conforming to current Code requirements.

1.09 PROJECT CLOSEOUT SUBMITTALS

A. Guarantee

B. Extra Materials (Attic Stock)

1.10 LOW EMITTING MATERIALS COMPLIANCE SUBMITTALS

A. Provide documentation for each sealant and adhesive to be used indicating that the sealants and adhesives comply with V.O.C. requirements as stated in Specification Section G01600.

1.11 SUSTAINABILITY SUBMITTALS

A. Recycled Content
   1. Submit documentation of recycled content consisting of product data or manufacturer’s statement as applicable for the following:
      a. Mineral fiber based panels
      b. Fiberglass-mineral fiber composite panels
      c. Metal panel ceilings
      d. Mineral fiber based tiles
   2. Submit Contractor’s Sustainable Materials Form with complete information on recycled content for ceiling unit materials provided under the work of this section in accordance with Section S01352, Sustainability Requirements. Include cost of materials and percentage, by weight, of materials that have post-consumer or pre-consumer recycled content.

1.06 QUALITY ASSURANCE

A. QUALIFICATIONS

1. INSTALLER IS TO BE A FIRM WITH NOT LESS THAN FIVE YEARS OF SUCCESSFUL EXPERIENCE IN THE INSTALLATION OF SPECIFIED MATERIALS. B. REGULATORY REQUIREMENTS

A. Building Code: Work of this Section shall conform to all requirements of the N.Y.C. Building Code and all applicable regulations of other governmental authorities.

B. Certification and listing by an Approved Agency in accordance with NYC Dept. of Buildings rules. Prior MEA and BSA approvals are acceptable for materials conforming to current Code requirements.

4.02 FIRE PERFORMANCE CHARACTERISTICS

A. Provide ceiling components that are identical to those tested for the following fire performance characteristics, according to ASTM test method, by UL or other testing and inspecting agency acceptable to authorities having jurisdiction. Identify ceiling components with appropriate marking of applicable testing and inspecting agency. a. Acoustical Mineral Fiber Panel and Tile Ceilings and Metal Panel Ceilings
    a. Surface Burning Characteristics: Tested per ASTM E84. Tested surfaces shall be the surfaces facing the occupied space.
        1) Flame Spread: 25 or less.
        2) Smoke Developed: 25 or less.
    2. b. All materials exposed to the airflow in ceiling cavity plenums used for supply, return, or exhaust air shall be non-combustible or have a maximum smoke developed index/rating of 50, as defined by and in accordance with NYC Construction Code Sections BC 719 and MC 602. Flame spread index shall not exceed 25. Tested surfaces shall be the surfaces facing the plenum.

B. Acoustical Fiberglass-Mineral Fiber Composite Panels
    1. Surface Burning Characteristics: Tested per ASTM E84. Tested surfaces shall be the surfaces facing the occupied space.
        a. Flame Spread: 25 or less.
        b. Smoke Developed: 50 or less.

C. Acoustical Wood Fiber Panel Ceilings
    1. Surface Burning Characteristics: Tested per ASTM E84. Tested surfaces shall be the surfaces facing the occupied space.
        a. Flame Spread: 25 or less.
        b. Smoke Developed: 25 or less.

4.03 FIRE RESISTANCE RATINGS

A. When the drawings indicate that the acoustical ceiling construction is part of a fire-rated floor/ceiling or roof/ceiling assembly, provide certification by an Approved Agency, in accordance with NYC Dept. of Buildings rules, indicating approval of the ceiling for use in the assembly described. E. Coordination of Work

1. COORDINATE LAYOUT AND INSTALLATION OF CEILING UNITS AND SUSPENSION SYSTEM COMPONENTS WITH OTHER WORK ABOVE, SUPPORTED BY, OR PENETRATING THROUGH CEILINGS, INCLUDING LIGHT FIXTURES, HVAC EQUIPMENT, FIRE-SUPPRESSION SYSTEMS AND PARTITIONS. RESOLVE ALL DISCREPANCIES AND CONFLICTS PRIOR TO START OF WORK. F. PRE-INSTALLATION MEETING

A. Prior to start of Work, installer of ceiling system and representatives of trades involved are to have a conference at the job site, in the presence of the Authority representative, to discuss coordination of ceiling system installation and resolve all discrepancies.
    1. DELIVERY, STORAGE AND HANDLING A. Delivery

B. Deliver all acoustical units in manufacturer's original, unopened packages fully identified with type, finish, performance data and compliance labeling.

5.02 STORAGE

A. Store materials where they will be protected against damage from moisture, direct sunlight, surface contamination or other causes.

B. Store ceiling unit containers in space where they will be installed for at least 24 hours prior to installation to stabilize moisture content and temperature.

5.03 HANDLING

A. Handle ceiling units carefully to avoid chipping edges or damaging units in any way.
    1. 1.08 FIELD CONDITIONS A. Space Enclosure

B. Do not install interior acoustical ceilings until space is enclosed and weatherproof, wet work in space is completed and dry, work above ceilings is completed, and until air temperature and humidity are maintained at values of final occupancy.

C. Pressurized plenums: Operate HVAC system for not less than 48 hours before beginning acoustical panel or ceiling installation.

1.09 GUARANTEE

6.01 A. WORK SHOWING DEFECTS IN WORKMANSHIP OR MATERIALS WITHIN THE ONE YEAR GUARANTEE PERIOD SPECIFIED IN THE CONTRACT SHALL BE CORRECTED AS DIRECTED BY THE AUTHORITY. DEFECTS INCLUDE BUT ARE NOT LIMITED TO:

A. Panels/tiles or suspension system loose or improperly secured.

B. Panels/tiles or suspension members showing discoloration or cracking.

C. Panels/tiles or suspension members warping, sagging, or deforming.

1.10 EXTRA MATERIALS

7.01 A. DELIVER EXTRA MATERIALS TO THE AUTHORITY'S REPRESENTATIVE (TO BE TRANSFERRED TO THE CUSTODIAN). FURNISH EXTRA MATERIALS, DESCRIBED BELOW, MATCHING PRODUCTS INSTALLED, PACKAGED WITH PROTECTIVE COVERING FOR STORAGE AND IDENTIFIED WITH APPROPRIATE LABELS.

A. Mineral fiber ceiling units: Furnish_____square feet of full-size units.

B. Fiberglass-mineral fiber compostie ceiling units: Furnish _____ square feet of full-size units.

C. Metal panel ceiling units: Furnish_____square feet of full size units.

D. Acoustic wood fiber composite ceiling units: Furnish_____feet fo full-size units.

PART 2 PRODUCTS 2.01 MANUFACTURERS

8.01 ACOUSTICAL PANELS

a. Mineral Fiber Composition Panels (24" x 48")

2. USG Interiors Inc.
   a. Product name: “Mars”
   b. Product number: 88785 Environmental
   c. performance type: “ClimaPlus”
   d. Armstrong World Industries
3. Product name: "Ultima"
   a. Product number: 1914 Environmental
   b. performance type: “HumiGuard Plus”
   c. CertainTeed Corporation
4. Product name: “Symphony-m”
   a. Product number: 1220BB-IOF-1 Environmental performance type: “104/90”

8.02 FIBERGLASS-MINERAL FIBER COMPOSITE PANELS (24" X 48")

a. Armstrong World Industries

2. Product name: LYRA
   a. Product number: 8373
   b. CertainTeed Corporation
3. Product name: Adagio
   a. Product number: 1660-OVT-1

8.03 FIBERGLASS-MINERAL FIBER COMPOSITE PANELS-HIGH CAC (24” X 24”)

a. Armstrong World Industries

2. Product name: LYRA High CAC Product number: 8732
   a. CertainTeed Corporation
3. Product name: Adagio High CAC
   a. Product number: HCAC1672-OVT-1

8.04 WOOD FIBER COMPOSITION PANELS

a. Tectum, Inc., Newark, Ohio, 888-977-9691 - "Tectum Acousti-Tough Ceiling System"
b. Conwed Designscape, Ladysmith,WI, 800-291-7010 -“FiberSorb” E. Metal Panel Ceiling Units (24” x 24”)

1. ARMSTRONG WORLD INDUSTRIES INC., LANCASTER, PA, 877-276-7876

1. Product: “MetalWorks Flush Tegular”, unperforated, model #6461M1.

B. Flush tegular lay-in products of the following manufacturers may be used subject to compliance with specified requirements. Exposed surface of panels shall be flush with exposed surface of suspension grid.
1. Simplex Ceilings, Montreal, Quebec, Canada, 514-744-3323
2. Hunter-Douglas Architectural Products Inc., Norcross, GA, 800-291-7010, 732-780-9159.
3. Steel Ceilings, Coshocton, Ohio, 800-848-0496, 740-622-4655.
4. Chicago Metallic Corp., Baltimore, MD, 800-323-7164.
5. USG Interiors Inc., Chicago, IL, 800-950-3839.
   a. Acoustical Tile
6. Mineral Fiber Composition Tile (12” x 12”)
   a. Armstrong World Industries
   b. CertainTeed Corporation 3) USG Interiors Inc.
   c. Indirect Metal Suspension Systems
7. Chicago Metallic Corporation
8. Donn Corporation/USG Interiors, Inc.
9. Armstrong World Industries, Inc.
10. Suspension members for metal panel ceilings shall be by the manufacturer of the ceiling panels or by a company recommended by the panel manufacturer.
11. MATERIALS - ACOULSTICAL PANLES AND TILES A. Mineral Fiber Panels and Tiles

C. Provide units per ASTM E1264; of designation, style, finish, color, acoustical range, edge detail and size as indicated below:
1. Suspended (Exposed grid, lay-in) Installation

STYLE: FINE TEXTURE

a. Size: 24" x 48" x 3/4", or as indicated Edge Profile: Reveal beveled tegular, or as indicated.

WEIGHT: 0.95-1.05 LBS./SQ.FT.

NRC: MIN. 0.70

CAC: MIN. 35

LIGHT REFLECTANCE: MIN. 0.9 AVERAGE

a. Color: White Finish: Factory finish
2. Direct (Adhesive) Installation on Gypsum Drywall, Plaster, or Concrete (Cast-in-Place):

STYLE: FISSURED OR TEXTURED AS DETERMINED BY PROJECT

a. Architect
b. Size: 12" x 12" x 3/4” Edge Profile: Beveled, spline Weight: 1.05 lbs./sq.ft. min.

NRC: 0.60-0.70

a. Color: White Finish: Vinyl Latex Paint
2. Suspended (Concealed Spline) Installation

STYLE: FISSURED OR TEXTURED AS DETERMINED BY PROJECT

a. Architect

SIZE: 12" X 12" X 3/4"

a. Edge Profile: Square - K4C4 Weight: 1.05 lbs./sq.ft. min.

NRC: 0.60-0.70

CAC: MIN. 35

COLOR: WHITE

FINISH: VINYL LATEX PAINT

A. Panels shall be sag resistant to at least 104ºF, 90% RH.

B. Mineral fiber products shall be manufactured with a minimum of 60% of post and pre-consumer content materials.

B. FIBERGLASS-MINERAL FIBER COMPOSITE PANELS

a. Suspended (Exposed grid, lay-in) Installation

STYLE: FINE TEXTURE

1. Size: 24" x 48" x 1”-11/2” TH Edge Profile: Square.

WEIGHT: 0.44-0.98 LBS./SQ.FT.

NRC: MIN. 0.90

CAC: NA

LIGHT REFLECTANCE MIN. 0.85 AVERAGE

COLOR: WHITE

FINISH: FACTORY FINISH

a. Panels shall be sag resistant to at least 104ºF, 90% RH.

b. Fiberglass-mineral fiber composite products shall be manufactured with a minimum of 35% of post and pre-consumer content materials. C. Fiberglass/Mineral Fiber Composite Panels-High CAC 1. Suspended (Exposed grid, lay-in) Installation

STYLE: FINE TEXTURE

1. Size: 24" x 24" x 11/2”-13/4” TH Edge Profile: Square.

WEIGHT: 1.45-1.77 LBS./SQ.FT.

NRC: MIN. 0.90

CAC: MIN. 40

LIGHT REFLECTANCE MIN. 0.85 AVERAGE

COLOR: WHITE

FINISH: FACTORY FINISH

a. Panels shall be sag resistant to at least 104ºF, 90% RH.

b. Fiberglass-mineral fiber high CAC composite products shall be manufactured with a minimum of 60% of post and pre-consumer content materials. D. Metal Panel Ceiling Units

1. PROVIDE UNITS AS DESCRIBED BELOW:

A. SUSPENDED (EXPOSED GRID) INSTALLATION

STYLE: UNPERFORATED, METAL-PANEL, FLUSH TEGULAR TYPE.

SIZE: 24”X24” UNLESS INDICATED OTHERWISE.

a. Edge Profile: Flush tegular (exposed surface of panel shall be flush with exposed surface of grid runners).

MATERIAL/THICKNESS: ALUMINUM .032" THICKNESS, OR STEEL .021” THICKNESS.

COLOR/FINISH: ALUMINUM PANELS: BAKED WHITE ENAMEL, OR LACQUERED

1) mill finish for aluminum color, as selected by Architect, or

2) Steel panels: Powder coat white or silver grey on galvanized steel, as selected by Architect. Apply coating after panels are formed.

2. Metal panel corners and edges shall be formed to eliminate any visible voids in the final ceiling installation. Vertical sides of panels shall be fabricated to avoid contact with the “bulb” portion of grid runners.

43.02 WOOD FIBER COMPOSITION PANELS

1. MATERIAL: WOOD FIBERS BONDED WITH INORGANIC HYDRAULIC CEMENT.

1. Provide units to meet ASTM E1264 and to meet specifications outlined below:
2. Suspended (Exposed-Grid) Installation

STYLE: STANDARD LAY-IN

SIZE: 24" X 48" X 1"

EDGE PROFILE: SQUARE

NRC: MIN. 0.45

COLOR: WHITE

FINISH: FACTORY PAINTED WHITE

50.01 PROVIDE FIRE-RATED CEILING SYSTEMS WHEN INDICATED ON THE DRAWINGS AS PART OF A FIRE-RATED ASSEMBLY, WITH RATINGS AS STIPULATED.

1. 2.03 MATERIALS - METAL SUSPENSION SYSTEMS - INDIRECT HUNG A. Exposed Grid Suspension System

B. Manufacturer's standard system, with design and finish as selected by the Project Architect.

C. Structural Classification: Heavy-duty system in accordance with ASTM C635.

D. Face width: 15/16".

E. Main runners: Connect to direct suspension system (refer to Specification Section 05170). Conform to ASTM C635 for heavy-duty classification.

F. Provide runners suitable for attachment of hold-down clips and impact clips as applicable.

G. Hold-Down Clips for Non-Fire-Rated Ceilings: For ceilings composed of lay-in panels, provide hold-down clips spaced 2'-0" o.c. on all cross tees.

H. For metal panel ceilings the exposed grid shall be furnished by the panel manufacturer, or by a company recommended by the panel manufacturer, and finish shall match panels. Main runners and cross runners shall be G60 hot-dipped galvanized steel in accordance with ASTM A653, with aluminum capping.

I. Impact Clips: Provide in high impact areas, including corridors, lobbies, and at other locations indicated. Provide manufacturer's impact clip ("keep clip") system designed to absorb impact forces against lay-in panels. Provide number of clips recommended by manufacturer; not less than 4 clips per panel. System shall meet requirements of Article titled “Impaction Ceiling System Installation”.

J. For metal panel ceilings provide Armstrong #414 “butterfly” style removable retention clips, or equal, to retain panels in place except at specific locations where maintenance access is required. Clips shall be easily removable by twisting the “wings” of the clip.

B. CONCEALED SPLINE SUSPENSION SYSTEM

A. Manufacturer's standard system; with face width, design and finish as selected by the Architect.

B. Structural Classification: Heavy-Duty System - ASTM C635.

C. Selected System: Non-Fire Rated, Single Web, Indirect Hung, "Concealed Z System" as manufactured by Chicago Metallic Corporation, or accepted equal, including but not limited to the following:

1. Main Runners: Conform to ASTM C635 - heavy-duty classification; install to direct suspension system.
2. Main runners, cross tees, spacer bars, variable placement tees, grid adapters, splines and access components shall be of cold rolled steel with a protective coating.

3. Wall angle moldings and channel moldings shall be of cold rolled steel with a protective coating and a standard (white) factory applied paint finish, unless otherwise indicated, scheduled or selected by Architect.
4. Accessories: Couplings, clips, splines and miscellaneous accessories required for complete installation.
5. Access: MFG standard downward access system with units in any location removable by inserting a special hooktool between tiles into slot at end of cross member and disengaging cross member from main member.

2.04 MISCELLANEOUS MATERIALS

A. EDGE MOLDINGS AND TRIM PIECES

1. PROVIDE MANUFACTURER'S STANDARD MOLDING FOR EDGES AND PENETRATIONS OF CEILING UNITS WHICH FIT WITH TYPE OF EDGE DETAIL AND SUSPENSION SYSTEM INDICATED. B. PANEL/TILE FASTENERS

1. CADMIUM PLATED, TYPE RECOMMENDED BY PANEL/TILE MANUFACTURER, BUT FOR NOT LESS THAN 1/2" PENETRATION OF SUBSTRATE. C. DROP CLIPS

A. 18 gage galvanized steel with key hole slot, or other configuration approved by New York City Dept. of Buildings for connection of ceiling suspension members to carrying channels.

B. Drop clips shall be of length required for indicated ceiling height, and to provide clearances for lighting fixtures, mechanical equipment, and other items above the ceiling.
   1. Where necessary because of limited clearance, provide clips that connect runners tight to the bottom of carrying channels. D. Tile Adhesive

C. Comply with ASTM D1779, factory made product recommended by manufacturer, bearing UL label for Class 0-25 flame spread.

D. All adhesives used on site shall comply with V.O.C. requirements specified in Section G01600.

E. PRIMER

A. In accordance with manufacturer of acoustical tile adhesive, substrate shall be primed with one of the following products prior to application of adhesive to remove any residual which would prevent proper attachment of tile:
   1. Chemical Wash
   2. Sizing
   3. Adhesive base or primer
   4. All adhesive base and primers used on site shall comply with V.O.C. requirements specified in Section G01600.

PART 3 EXECUTION 3.01 EXAMINATION

57.01 EXAMINE THE BUILDING BEFORE BEGINNING WORK TO DETERMINE THAT IT IS PROPERLY ENCLOSED AND THE STRUCTURE IS IN PROPER CONDITION TO RECEIVE ACOUSTICAL MATERIALS AND SUSPENSION SYSTEM. AREA SHALL BE BROOM CLEANED AND UNINTERRUPTED FOR FREE MOVEMENT OF ROLLING SCAFFOLD. DO NOT PROCEED UNTIL SATISFACTORY CONDITIONS PREVAIL.

57.02 VERIFY THAT DIRECT SUSPENSION SYSTEM HAS BEEN INSTALLED PROPERLY, THAT MAIN RUNNERS ARE SPACED EVENLY AND HAVE BEEN LEVELED TO A TOLERANCE OF 1/8" IN 12' MEASURED BOTH LENGTHWISE ON EACH RUNNER AND TRANSVERSELY BETWEEN PARALLEL RUNNERS SO THAT INDIRECT SUSPENSION SYSTEM INSTALLATION MAY PROCEED ACCURATELY.

57.03 START OF WORK CONSTITUTES ACCEPTANCE OF EXISTING CONDITIONS, THEREFORE, CONTRACTOR IS ADVISED TO BRING ANY DISCREPANCIES TO THE ATTENTION OF THE AUTHORITY PRIOR TO START OF WORK. D.

3.02 PREPARATION

A. COORDINATION

A. Provide and coordinate the locations of inserts, clips, or other supports for support of acoustical ceilings.

B. Determine the length of drop clips required to maintain indicated ceiling height and to provide necessary clearance for electrical, mechanical and other equipment. Where necessary for clearance, clips that connect runners tight to the bottom of carrying channels shall be used.

C. 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 width units at borders and comply with reflected ceiling plans. B. Adhesive Tile Installations

D. Before installing adhesively-applied tile on wet-placed substrate such as cast in place concrete or plaster, test and verify that moisture level is below tile manufacturer's recommended limits.

E. Surface Preparation: Remove dirt, dust, oil, grease, and other foreign matter that may impair proper bonding of the tile adhesive. Clean and prepare substrate in accordance with the adhesive manufacturer's instructions and as specified.
   1. Existing Painted Surfaces: Remove loose, peeling, and blistered coatings. Sand glossy surfaces to a dull finish.
   2. Concrete Surfaces: Remove laitance, fins, and other defects that may impair bonding of the tile adhesive or may prevent alignment of tiles in a uniform plane.

3.03 INSTALLATION - GENERAL

60.01 INSTALL MATERIALS IN ACCORDANCE WITH MANUFACTURER'S PRINTED INSTRUCTIONS AND IN COMPLIANCE WITH ASTM C636, GOVERNING REGULATIONS, FIRE RESISTANCE RATING REQUIREMENTS, AS INDICATED.

A. Coordinate requirements for Work of other trades to be built into ceiling system. Provide supplementary framing as required.

60.02 ARRANGE DIRECTIONALLY-PATTERNED UNITS (IF ANY) IN MANNER SHOWN BY REFLECTED CEILING PLANS, OR AS APPROVED BY THE PROJECT ARCHITECT. INSTALL IN PATTERNS INDICATED, (BALANCED BORDERS ALL SIDED) SYMMETRICAL OR CENTERED ABOUT CENTER LINE OF CORRIDORS, PANELS, FIXTURES, BEAM HAUNCHES, ROOMS, SPACES.

60.03 CUT AS REQUIRED FOR INSTALLATION OF ELECTRIC FIXTURES, AIR DIFFUSERS, GRILLES, SPRINKLER HEADS, SECURITY DEVICES, ACCESS DOORS, ETC., PROVIDED UNDER OTHER CONTRACTS. VERIFY SIZES AND LOCATIONS WITH OTHER TRADES.

60.04 ON COMPLETION, THE CEILINGS SHALL PRESENT A UNIFORM HORIZONTAL PLANE SURFACE, UNLESS OTHERWISE INDICATED, FREE FROM BLEMISHES AND IMPERFECTIONS. EXPOSED GRID CROSS RUNNERS SHALL FIT TIGHTLY AGAINST ADJACENT MAIN RUNNERS, WITH NO VISIBLE GAPS.

60.05 INSTALL EDGE MOLDINGS OF TYPE INDICATED AT PERIMETER OF ACOUSTICAL CEILING AREA AND AT LOCATIONS WHERE NECESSARY TO CONCEAL EDGES OF ACOUSTICAL UNITS.

A. Sealant Bed: Apply continuous ribbon of acoustical sealant, concealed on back of vertical leg before installing moldings.

B. Screw-attach moldings to substrate at intervals not over 16" o.c. and not more than 3" from ends, leveling with ceiling suspension system to tolerance of 1/8" in 12'-0". Miter corners accurately and connect securely.

60.06 INSTALL PANELS IN COORDINATION WITH SUSPENSION SYSTEM WITH SUSPENSION MEMBERS CONCEALED BY SUPPORT OF PANEL UNITS.

60.07 NEATLY SCRIBE AND CUT PANELS TO FIT ACCURATELY AT BORDERS, INTERRUPTIONS, AND PENETRATIONS. THE CUT EDGES OF REVEAL TEGULAR LAY-IN MINERAL FIBER PANELS SHALL BE FIELD CUT TO MATCH PROFILE OF FACTORY EDGES, IN ACCORDANCE WITH MANUFACTURER'S PRINTED INSTRUCTIONS. PAINT THE CUT EDGES TO MATCH FACTORY FINISH WHERE EXPOSED TO VIEW, USING PAINT SUPPLIED BY PANEL MANUFACTURER.

3.04 DIRECT ADHESIVE TILE INSTALLATION

61.01 APPLY PRIMER AS SPECIFIED HEREIN TO ALL CONCRETE SURFACES PRIOR TO CEMENTING TILES IN PLACE.

61.02 REMOVE LOOSE DUST FROM BACKS OF TILES BY BRUSHING AND THEN PRIMING THEM WITH THIN COAT OF ADHESIVE.

61.03 CEMENT ACOUSTIC TILE DIRECTLY TO CONCRETE CEILING SLAB, BETWEEN BEAM HAUNCHES AND TO PLASTER OR GYPSUM BOARD CEILING WITH (4) SPOTS OF ADHESIVE TO EACH SQUARE FOOT OF TILE. EACH SPOT OF ADHESIVE SHALL PRODUCE A SURFACE OF NOT LESS THAN (2) INCHES IN DIAMETER AFTER TILE HAS BEEN PRESSED IN PLACE.

61.04 FIT ADJOINING TILES TO FORM NEAT AND UNIFORM HAIRLINE JOINTS THAT ARE STRAIGHT AND PARALLEL TO THE ROOM AXIS IN BOTH DIRECTIONS. INSTALL DIRECTIONALLY PATTERNED OR TEXTURED TILES IN A CHECKERBOARD PATTERN UNLESS OTHERWISE INDICATED.

61.05 SCRIBE AND CUT TILE TO FIT ACCURATELY AT CEILING EDGES AND PENETRATIONS. INSTALL MOLDING AT CEILING PERIMETER, OPENINGS, CUT-OUTS AND WHERE OTHERWISE INDICATED.

3.05 METAL PAN CEILING INSTALLATION

62.01 PROVIDE COMPLETE INSTALLATION IN ACCORDANCE WITH CEILING MANUFACTURER'S RECOMMENDATIONS.

62.02 IN THE FINAL INSTALLATION THE EXPOSED PANEL SURFACE SHALL BE FLUSH, IN THE SAME HORIZONTAL PLANE, WITH THE EXPOSED SURFACE OF THE SUSPENSION GRID RUNNERS. REGRESSED PORTION OF PANELS SHALL BE COMPLETELY CONCEALED BY THE RUNNERS. REGRESSION EDGE ON FACE OF PANEL SHALL FIT TIGHTLY AGAINST RUNNER EDGES.

62.03 COORDINATE WITH OTHER TRADES FOR PROPER INSTALLATION OF LIGHTING FIXTURES, AIR DIFFUSERS, AND OTHER CEILING MOUNTED DEVICES.

62.04 ALL PANELS SHALL BE REMOVABLE FOR ACCESS TO THE PLENUM. PROVIDE REMOVABLE LOCKING CLIPS TO PREVENT UNAUTHORIZED LIFTING OF PANELS, AND TO RETAIN PANELS IN PLACE WHILE CLEANING. PROVIDE AT LEAST 2 CLIPS PER PANEL. OMIT LOCKING CLIPS AT PANELS WHERE ACCESS IS REQUIRED TO MECHANICAL VALVES, DAMPERS OR OTHER EQUIPMENT, AND PROVIDE DECALS TO IDENTIFY THESE PANELS.

62.05 PROVIDE ALL CONNECTORS AND ACCESSORIES REQUIRED FOR A COMPLETE INSTALLATION, USING ONLY CORROSION RESISTANT MATERIALS.

62.06 PANEL EDGES SHALL NOT BE EXPOSED. PROVIDE MATCHING MOLDINGS AND ESCUTCHEONS WHERE REQUIRED TO CONCEAL EDGES AT CEILING PERIMETER AND CUT OPENINGS.

62.07 AFTER INSTALLATION, CLEAN METAL PANS OF ALL SOIL MARKS IN A MANNER AND WITH MATERIALS RECOMMENDED BY THE MANUFACTURER.

3.06 WOOD FIBER COMPOSITION PANEL INSTALLATION

63.01 INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURERS LATEST PRINTED SPECIFICATIONS AND INSTRUCTIONS.

63.02 WOOD FIBER PANELS SHALL BE INSTALLED WITH AN EXPOSED-TEE SUSPENSION SYSTEM CLASSIFIED

A. "Heavy-duty" complying with ASTM C635 - Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings. Tee's shall be suitable for attachment of "keep clips".

63.03 SUSPENSION SYSTEM SHALL BE SUFFICIENTLY RIGID TO SUPPORT CEILING MOUNTED LIGHTING FIXTURES; PROVIDE FOR NECESSARY CUT-OUTS OR SUPPORTS FOR MECHANICAL VENTILATION.

63.04 PROVIDE MANUFACTURER'S "KEEP CLIPS", MINIMUM 4 PER PANEL, FOLLOWING ALL REQUIREMENTS LISTED BELOW IN ARTICLE TITLED "IMPACTION CEILING SYSTEM INSTALLATION". PROVIDE MORE THAN 4 CLIPS PER PANEL WHERE NECESSARY TO WITHSTAND THE SPECIFIED FORCES, AND WHERE RECOMMENDED BY THE MANUFACTURER

1. IMPACTION CEILING SYSTEM INSTALLATION A. Must absorb 30 g's of energy.
    a. B. Must accept a force such as a basketball striking the ceiling plane with sufficient velocity to cause the panel to accelerate at a rate of 20" per second, without damage or dislocation of the panel or suspension system. The ceiling system must also be capable of accepting the decelerating force required to rebound the panel back into proper position on the grid, and without the panel breaking, cracking, or falling out as a result of this force or equivalent abuse. C. All acoustical material must be accessible and removable for access into the plenum at any location.

63.05 IMPACTION DECELERATION CLIP ("KEEP CLIP") SHALL BE FORMED OF SPRING STEEL TO ABSORB IMPACT, SNAPPING PANELS BACK IN PLACE.

63.06 THE EXPOSED SUSPENSION COMPONENTS SHALL ENSURE PROPER OPERATION AND REBOUND OF THE IMPACTION DECELERATION CLIP. THE SUSPENSION COMPONENTS SHALL BE UNDERWRITERS LABORATORIES LABELED FOR TWO HOUR FIRE RESISTANCE RATING.

63.07 INSTALLATION SHALL BE IN FULL ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS, RECOMMENDATIONS OUTLINED IN ASTM SPECIFICATION C636, AND THE CURRENT BULLETIN OF THE ACOUSTICAL AND INSULATION MATERIALS ASSOCIATION, CONSISTENT WITH U.L. REQUIREMENTS.

63.08 IMPACTION DECELERATION CLIP SHALL BE POSITIONED AND INSTALLED ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS. THESE CLIPS MUST PROVIDE ACCESS TO THE PLENUM AT ANY LOCATION.

3.08 ADJUSTING AND CLEANING

64.01 CLEAN EXPOSED SURFACES OF CEILINGS, INCLUDING TRIM, EDGE MOLDINGS, AND SUSPENSION MEMBERS; COMPLY WITH MANUFACTURER'S INSTRUCTIONS FOR CLEANING AND TOUCH-UP OF MINOR FINISH DAMAGE.

64.02 REMOVE AND REPLACE WORK WHICH CANNOT BE SUCCESSFULLY CLEANED AND REPAIRED TO PERMANENTLY ELIMINATE EVIDENCE OF DAMAGE.

C.

END OF SECTION 09 51 00