

SECTION 09 5100
ACOUSTICAL CEILINGS - USG

<<<< UPDATE NOTES

OPTIONAL CHECKLIST BELOW CONTAINS MUCH INFORMATION THAT MAY AID SELECTION OF APPROPRIATE PRODUCTS. IT IS NOT A SUBSTITUTE FOR MORE COMPLETE INFORMATION AVAILABLE FROM USG.

IT ALSO INCLUDES A CONFIGURATION TOOL FOR USG CEILING ASSEMBLIES. USING IT IS HIGHLY RECOMMENDED.

OPTIONAL CHECKLIST**INSTRUCTIONS**

Use the preselection tools below to find ceiling solutions that meet the desired performance criteria. The built-in linking scheme in the CONFIGURATION TOOL suggests compatible components and characteristics; it also shows which ceiling assemblies are impossible due to a combination of incompatible or unavailable components.

Use the CONFIGURATION TOOL from top to bottom each time a different ceiling assembly needs to be defined.

Another alternative is to build the section using a partial or entirely manual approach. In either case, define acoustical ceiling assemblies in Part 2.

CONFIGURATION TOOL PROCEDURE

Step 1. Select the ceiling grid configuration. This determines the look of the finished ceiling, whether exposed grid, concealed grid, or gridless monolithic system.

Note 1: Selecting a "1 by 1 tile" is likely to call for a concealed grid, and - obviously - using tiles, not panels.

Note 2: It is also possible to choose a gridless, monolithic appearance (using the "Ensemble" system).

Step 2. Select required acoustics performance criteria for: NRC (do this FIRST). Then make the Panel Pattern (surface appearance) selections. There are also additional, but optional performance criteria: CAC, Light Reflection, and any number of less-critical optional criteria: face-cut pattern (for "Illusion" series panels); recycled content percentage; product ingredients transparency (EcoBlueprint); and low-emissions (Greenguard).

Pro Tip 1: Ceilings play an important role in controlling noise (unwanted sound) within and between spaces. Some ceilings perform better than others in this regard. Follow the expert advice of an acoustician, or recommendations of the ceiling product manufacturer to set appropriate performance criteria.

Pro Tip 2: At the outset (by default), performance criteria are set by SpecLink at their lowest minimum values. This allows for selections at each step to be made from the largest pool of initial candidate products.

Pro Tip 3: Products are grouped by their NRC performance. That is the key distinguishing characteristic. Note that some products have a high NRC but low CAC performance. Others, have a low NRC but high CAC performance. And a few products have high performance for both NRC and CAC. Select carefully based on the essential acoustical requirements of the space.

Pro Tip 4. As each criterion is applied, the list of viable panels is likely to decrease. If none remain, some criterion will have to be adjusted.

Step 3. Review candidate products that meet the initial performance criteria. If no products remain available, adjust the criteria rather than override the linking logic.

Pro Tip 1: If a sequence has NOT been linked to (it's blank), it means that it does not meet any of the primary criteria (grid or panel pattern). Do not activate it.

Pro Tip 2: Remaining viable candidate products are in "Yellow" sequences that follow a "Green" heading sequence. That is a visual clue that the choice meets other criteria in addition to having an NRC performance up to the specified level (but not greater).

Products in "Yellow" sequences that follow "Red" sequences may meet other criteria, but not the NRC performance. Scroll past these products to get to the ones with the required NRC performance (Hint: paragraph heading for these products will be "Green").

Pro Tip 3: Configuration Tool is set up to allow the subsequent selections category to be triggered only by permitted (viable) choices. Therefore, selection of "Yellow" sequences in "Red" NRC heading category will not allow the selection process to proceed. This is intentional, but can be overridden.

Step 4. Select (with a checkmark) each type or characteristic of component products (panels, grids, etc.) in the suggested sequence. Note that some selected options may narrow down (partially or completely) the previously-made or subsequently-available choices. This is mostly due to incompatibility of some panel edge shapes with certain types of narrow face grids.

Step 5. If the component products selected are compatible with each other (there are no conflicts that would prevent them for being properly integrated into an assembly), scroll down to Part 2 of this Section and record the decisions in the Ceiling Assembly sequences' choices for ceiling panels, their edges, and suspension/support grids or framing required. This single-place description allows the contractor to properly bid and procure the major components of the acoustical ceiling.

Pro Tip 1: Ceiling Assembly sequences include as a default the suggested designation (e.g. "APC-1"). This designation MUST match the designation indicated on drawings. It is this designation that ties the drawings and specification together. The choice has an option for user-generated designation.

Pro Tip 2: When choices in Step 5 have been made, appropriate selections will be automatically activated in the component product lists in Part 2 of the Section. Only those items "in the project" will thereby be included.

Step 6. Change the View of the section from "Normal" to "Selected" to review content that will be included in the section. Go back to "Normal" view if items seem to be missing from lists of components.

SUSPENDED "CLOUD" SYSTEMS PROCEDURE

Step 1. These systems have very specific designs, integrating panels, suspension systems, and accessories. They can be specified directly, without a need to use the CONFIGURATION TOOL.

Select this paragraph to specify these systems.

ACCESSORY PERIMETER, TRANSITION, AND WALL TRIMS PROCEDURE

Step 1. These elements have very specific design uses, Perimeter trims are designed for "Cloud" type systems. Transitions trims can be used in a variety of ways at ceiling height transitions. Wall trims are available in various shapes. Many are designed to complement the shape and look of a specific suspension system. Other types may be required in seismic design applications. Accessory trims can be specified directly, without a need to use the CONFIGURATION TOOL.

Select this paragraph to activate or suggest for inclusion sequences covering these items.

CEILING ASSEMBLIES REQUIRED IN PROJECT:

Select to configure and include the first ceiling assembly.

Select to configure and include the second ceiling assembly.

Select to configure and include the third ceiling assembly.

<<<< CONFIGURATION TOOL >>>>

Fire-Resistance-Rated Floor-Ceiling Assemblies: <<**No**; or **Yes**>>.

Fire-Resistance-Rated Roof-Ceiling Assemblies: <<**No**; or **Yes**>>.

A. Ceiling Grid Configuration Selection:

Conventional Sizes:

12 inches by 12 inches (1 by 1) tile.
 20 inches by 60 inches (1-2/3 by 5) panel.
 24 inches by 24 inches (2 by 2) panel.
 24 inches by 48 inches (2 by 4) panel.
 24 inches by 60 inches (2 by 5) plank.
 24 inches by 72 inches (2 by 6) plank.
 24 inches by 96 inches (2 by 8) plank.
 30 inches by 30 inches (2-1/2 by 2-1/2) panel.
 30 inches by 60 inches (2-1/2 by 5) panel.
 48 inches by 48 inches (4 by 4) panel.
 48 inches by 48 inches (4 by 4) panel.
 Gridless, monolithic.

Metric Sizes:

600 by 600 mm panel.
 600 by 1200 mm panel.
 500 by 1500 mm panel.

Panel Type Selection:

NRC Performance: <<**None; 0.50; 0.55; 0.60; 0.65; 0.70; 0.75; 0.80; 0.85; 0.90; 0.95; or 1.00**>>, minimum.

CAC Performance: <<**No Rating; 20; 25; 30; 33; 35; 40; or 44**>>, minimum.

Panel Pattern(s): <<**A - Perforated, regularly spaced large holes; B - Perforated, randomly spaced large holes; C - Perforated, small holes; D - Fissured; E - Lightly textured; F - Heavily Textured; G - Smooth; H - Printed; I - Embossed; J - Embossed-in-register; K - Surface scored; L - Random swirl; and Z - Other pattern**>>.

Face-Cut Pattern: <<**Two/24; Four/48; Eight/12; or 32/6**>>.

Light Reflectance Performance: <<**0.70; 0.80; 0.84; 0.85; 0.86; 0.87; 0.89; or 0.90**>>, minimum.

Recycled Content (RC) is listed for each acoustical unit. If several products meet other essential criteria, consider selecting the one with highest recycled content percentage.

Material Ingredients Transparency: Included in the USG EcoBlueprint Program.

Low Emissions (VOC): Greenguard-certified product.

Caution: Direct selection of Panel Type below may affect performance values previously selected above.

Acoustical Units: Panels, tiles, planks, or large-size panels.

Products with no rating or NRC below 0.45:

Clean Room (Unperforated) 5/8" Class 100 (GI), RC=55 percent.
 Halcyon Canopies - directly suspended without a grid (EG).
 Heradesign micro <<**1"; 1-3/8"; or ___**>> (L), RC<50 percent.
 Heradesign plano 1" (L), RC<50 percent.
 Kitchen 5/8" Panels (G), RC=24 percent.
 Olympia Micro 5/8" Unperforated (CE), RC=44 percent.
 Radar Tile, adhered or stapled (CE), RC=34 to 44 percent.
 Sheetrock FIRECODE 1/2" (G), RC=80 percent.
 Sheetrock Clean Room FIRECODE 1/2" (G), RC=80 percent.

Products with NRC Rating up to 0.50:

Astro FIRECODE 3/4" (G), RC=68 percent.
 Danoline 1/2" (C), Perforation pattern CV, RC=80 percent.
 Olympia Micro 50 NRC 5/8" (CE), RC=44 percent.
 Olympia Micro 50 NRC HRC 5/8" (CE), RC=53 percent.

Olympia Micro Illusion Two/24 3/4" (CE), RC=61 percent.
 Premier Hi-Lite Twill (Unperforated) 5/8" (E), RC=64 percent.
 Premier Hi-Lite (Unperforated) Kapok 5/8" (E), RC=64 percent.
 Radar Basic Tile 3/4" (CE), RC=44 percent.
 Radar Ceramic Perforated 5/8" (CE), RC=44 percent.
 Radar Illusion Four/48 3/4" (CEK), RC=25 percent.
 Radar Illusion 32/6 3/4" (CEK), RC=25 percent.

Products with NRC Rating up to 0.55:

Aspen Basic 3/4" (CDFI), RC=42 percent.
 Aspen Basic 3/4" Illusion Two/24 (CDFIK), RC=42 percent.
 Astro 5/8" (G), RC=68 percent.
 Astro Illusion Two/24 3/4" (GK), RC=69 percent.
 Clean Room (Perforated) 5/8" Class 10m-100m (CGI), RC=55 percent.
 Fissured Basic 5/8" (CD) RC=25 percent.
 Fissured Basic FIRECODE 5/8" (CD), RC=48 to 51 percent.
 Frost Basic Paperback FIRECODE 3/4" (E), RC=72 percent.
 Heradesign 1, <<5/8"; 1"; 1-3/8"; or ___>> (L), RC<50 percent.
 Heradesign 2, <<5/8"; 1"; 1-3/8"; or ___>> (L), RC<50 percent.
 Heradesign 3, 1" (L), RC<50 percent.
 Pebbled 5/8" (CE), RC=44 percent.
 Radar Basic 5/8" (CE), RC=25 percent.
 Radar Basic FIRECODE 5/8" (CE), RC=48 to 51 percent.
 Radar Basic Illusion Two/24 3/4" (CEK), RC=25 to 26 percent.
 Radar 5/8" (CE), RC=25 to 34 percent.
 Radar FIRECODE 5/8" (CE), 48 to 51 percent.
 Radar High Durability 5/8" (CE), RC=26 percent.
 Radar High-CAC FIRECODE 5/8" (CE), RC=48 percent.
 Radar Illusion Two/24 3/4" (CEK), RC=25 to 26 percent.
 Radar Illusion FIRECODE Two/24 3/4" (CEK), RC=57 percent.
 Radar Illusion Eight/12 3/4" (CEK), RC=25 percent.
 Radar Education High Durability 5/8" (CE), RC=26 percent.
 Rock Face FIRECODE 5/8" (CE), RC=50 percent.
 Rock Face FIRECODE 3/4" (CE), RC=50 percent.
 Sandrift Basic FIRECODE 3/4" (Z), RC=73 percent.
 Touchstone FIRECODE 5/8" (CEI), RC=51 percent.

Products with NRC Rating up to 0.60:

Eclipse FIRECODE 3/4" (EI), RC=64 percent.
 Eclipse Tile 3/4" (EI), RC=76 percent.
 Mars Healthcare High-CAC 60/40 3/4" (EG).
 Mars High-CAC 60/40 3/4" (EG), RC=79 percent.
 Millennia Tile (EG), RC=79 percent.
 Olympia Micro 60 NRC 3/4" (CE), RC=61 percent.
 Orion 60 1/2" (EG), RC=67 percent.

Products with NRC Rating up to 0.65:

Danoline 1/2" (C), Perforation pattern C6, RC=80 percent.
 Eclipse Illusion Pedestals I 3/4" (EI), RC=79 percent.
 Eclipse Illusion Pedestals IV 3/4" (EI), RC=79 percent.
 Glacier Basic 3/4" (F), RC=72 percent.
 Glacier Basic FIRECODE 3/4" (F), RC=73 percent.
 Glacier Basic Tile 3/4" (F), RC=72 percent.

Products with NRC Rating up to 0.70:

Acoustic SF 1" (E), RC=Varies.
 Danoline 1/2" (C), Perforation pattern C4, RC=80 percent.
 Eclipse 3/4" (EI), RC=79 percent.

Eclipse 3/4" HRC (EI), RC=83 percent.
 Eclipse Illusion Two/24 3/4" (EIK), RC=79 percent.
 Eclipse Illusion Four/48 3/4" (EIK), RC=79 percent.
 "F" Fissured Basic Panel 3/4" (D), RC=69 percent.
 "F" Fissured Basic Tile 3/4" (D), RC=69 percent.
 Frost Basic Paperback 3/4" (E), RC=72 percent.
 Frost Basic Foil Backed 7/8" (E), RC=72 percent.
 Frost 3/4" (E), RC=72 percent.
 Mars 3/4" HRC (EG), RC=81 percent.
 Mars Planks 3/4" HRC Planks (EG), RC=81 percent.
 Millennia 3/4" (EG), RC=79 percent.
 Millennia Illusion Two/24 3/4" (EGK), RC=79 percent.
 Premier Hi-Lite Twill (Perforated) 5/8" (CE), RC=64 percent.
 Premier Hi-Lite (Perforated) Kapok 5/8" (CE), RC=64 percent.
 Radar High-NRC 7/8" (CE), RC=40 percent.
 Radar High-NRC FIRECODE 3/4" (CE), RC=57 percent.
 Radar High-NRC/High-CAC 7/8" (CE), RC=37 percent.
 Radar High-NRC/High-CAC FIRECODE 3/4" (CE), RC=57 percent.
 Radar Education High-NRC 3/4" (CE), RC=40 percent.
 Radar Education FIRECODE High-NRC 3/4" (CE), RC=57 percent.
 Radar Education High -NRC 7/8" (CE), RC=37 percent.
 Radar Education FIRECODE High-NRC/High-CAC 3/4" (CE), RC=57 percent.
 Radar Education High-NRC/High-CAC 7/8" (CE), RC=37 percent.
 Renditions Animations Eclipse 2 by 2, 3/4" (EI), RC=79 percent.
 Renditions Animations Frost 2 by 2, 3/4" (E), RC=72 percent.
 Renditions Animations Millennia 2 by 2, 3/4" (EG), RC=79 percent.
 Renditions Boundaries Eclipse 2 by 2, 3/4" (EI), RC=79 percent.
 Renditions Boundaries Frost 2 by 2, 3/4" (E), RC=72 percent.
 Renditions Boundaries Millennia 2 by 2, 3/4" (EG), RC=79 percent.
 Renditions Custom Eclipse 2 by 2, 3/4" (EI), RC=79 percent.
 Renditions Custom Frost 2 by 2, 3/4" (E), RC=72 percent.
 Renditions Custom Millennia 2 by 2, 3/4" (EG), RC=79 percent.
 Sandrift 3/4" (Z), RC=72 percent.

Products with NRC Rating up to 0.75:

Danoline 1/2" (C), Perforation pattern S3, RC=80 percent.
 Danoline 1/2" (C), Perforation pattern S9, RC=80 percent.
 Eclipse High-NRC 7/8" (EI), RC=81 percent.
 Frost High-LR 3/4" (E), RC=72 percent.
 Mars 3/4" (EG), RC=69 percent.
 Mars Clean Room ISO 5 (Class 100) 3/4" (EG), RC=69 percent.
 Mars Healthcare 75/35 3/4" (EG), RC=68 percent.
 Mars Healthcare with Aircare Coating 3/4" 75/35 (EG), RC=68 percent.
 Mars Healthcare Clean Room 75/35 3/4" (EG), RC=68 percent.
 Mars Planks 3/4" (EG), RC=69 percent.
 Millennia High-NRC 3/4" (EG), RC=80 percent.
 Orion 75 5/8" (EG), RC=65 percent.
 Radar Open Plan 7/8" (CE), RC=38 percent.

Products with NRC Rating up to 0.80:

Danoline 1/2" (C), Perforation pattern O1, RC=80 percent.
 Ensemble Acoustical Drywall Ceiling - Direct Mount System, with **<<1 inch (25.4 mm)>>** Z-furring channels.
 Ensemble Acoustical Drywall Ceiling - Suspended System, with **<<1 inch (25.4 mm)>>** backer panel.
 Frost High-NRC/High-CAC 7/8" (E), RC=73 percent.

Mars Healthcare High-NRC/High-CAC 80/40 1" (EG), RC=69 percent.
 Mars Healthcare High-NRC 80/35 7/8" (EG), RC=69 percent.
 Mars High-NRC/High-CAC 80/40 1" (EG), RC=69 percent.
 Mars High-NRC 80/35 7/8" (EG), RC=69 percent.
 Mars High-NRC Planks 7/8" 80/35 with plant-based binder (EG), RC=65 percent.

Products with NRC Rating up to 0.85:

Ensemble Acoustical Drywall Ceiling - Direct Mount System, with **<<2 inch (50.8 mm)>>** Z-furring channels.

Mars Healthcare High-NRC 85/35 7/8" (EG), RC=68 percent.
 Mars High-NRC 85/35 7/8" (EG), RC=68 percent.
 Mars High-NRC Planks 7/8" 85/35 with plant-based binder (EG), RC=65 percent.
 Orion 85 5/8" (EG), RC=67 percent.
 Premier Nubby 2 By 2 3/4" (E), RC=30 percent.

Products with NRC Rating up to 0.90:

Halcyon 3/4" (EG), RC=38 percent.
 Halcyon (Foil Backed) 1" (EG), RC=40 percent.
 Halcyon 3/4" Planks (EG), RC=38 percent.
 Halcyon 1" Planks, 2 by 5 (EG), RC=40 percent.
 Halcyon (Foil Backed) 1" Planks (EG), RC=40 percent.
 Halcyon (Foil Backed) Large Size Panels (EG), RC=40 percent.
 Mars High-NRC 90/30 1" (EG), RC=67 percent.
 Mars High-NRC 90/30 1" Planks (EG), RC=66 percent.
 Premier Nubby 1" (E), RC=33 percent.
 Premier Nubby (Foil Backed) 1" (E), RC=33 percent.

Products with NRC Rating up to 0.95:

Halcyon 1" (EG), RC=40 percent.
 Halcyon Eco 1" with plant-based binder (EG), RC=34 percent.
 Halcyon 1-1/2", Foil Backed (EG), RC=42 percent.
 Halcyon Healthcare 1" (EG), RC=40 percent.
 Halcyon 1" Planks (EG), RC=40 percent.
 Halcyon Large Size Panels (EG), RC=40 percent.

Products with NRC Rating up to 1.00:

Halcyon 1-1/2" (EG), RC=42 percent.
 Halcyon Healthcare 1-1/2" (EG), RC=42 percent.

Direct-Mount System Selection:

Ensemble Ceiling Large Panels.
 Ensemble Wall Large Panels.
 Danoline Ceiling Large Panels.
 Danoline Wall Large Panels.
 Heradesign Ceiling Large Panels.
 Heradesign Wall Large Panels.

 Selection of the panel type above narrows down the choice of compatible suspension systems.

Suspension System (Face Profile) Selection:

Donn **<<DX; or DXL>>** 15/16-inch Suspension System **<<None - N/A; or, semi-concealed>>**.
 Donn DXLA/DXCE 15/16-inch Suspension System
 Donn DXSS 15/16-inch Suspension System.
 Donn ZXLA 15/16-inch Suspension System

Donn AX/AXCE 15/16-inch Suspension System
 Donn <<DX; or DXL>> 15/16-inch Concealed Suspension System.
 Donn CE 1-1/2-inch Suspension System
 Donn DXW 1-1/2-inch Suspension System
 Donn Centricitee <<DXT; or DXLT>> 9/16-inch Suspension System<<*None - N/A; or 1*,
except for square edge panels larger than 24 by 24 inches>>.
 Donn Fineline <<DXF; or DXLF>> Suspension System.
 Donn Fineline 1/8 DXFF Suspension System.
 Donn Fineline DXFEV Suspension System.
 Donn Identitee DXI Suspension System.
 Compositions Decorative Cloud System.
 Ensemble - Planar Suspended System.
 Ensemble - Curved Suspended System.
 Ensemble - Direct Mount with <<1 inch (25.4 mm); 2 inch (50.8 mm)>> Z-furring
 channels.
 Ensemble - Direct Mount Wall.
 Danoline - Direct Mount Ceiling.
 Danoline - Direct Mount Wall with Z-furring channels.
 Heradesign - Direct Mount Ceiling.
 Heradesign - Direct Mount Wall with Z-furring channels..

Selection of the panel type above narrows down the choice of available edge details.
 Selection of available edge details below may narrow down the choice of available panels
 above.

Panel Edge Selection

SQ (Square).
 SL (Reveal [Shadowline]).
 SLT (Reveal tapered [Shadowline Tapered]).
 SLB (Reveal beveled [Shadowline Bevel]).
 FL (Flush reveal [Fineline]).
 FLB (Flush reveal beveled [Fineline Bevel]).
 FN (Flush narrow).
 FW.(Flush wide).
 PE/ILT Pedestals.
 PE/SLT Pedestals.
 ILT Interline Tapered.
 BESK Tile.
 SESK Tile.
 SFAR, at long side.

After making and confirming selections (this task is made easier by using the
 CONFIGURATION TOOL) for each Ceiling Assembly type in the project, record them by
 making selections in Part 2 CEILING ASSEMBLY TYPES Article below. As a consequence of
 doing this, additional appropriate Part 2 component sequences will be activated.

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Suspended metal grid ceiling systems.
- B. Acoustical<<*None - N/A; or and nonacoustical*>> units.

- C. Supplementary acoustical insulation above ceiling.
- D. Wall angles and shadow moldings.
- E. Special trims and accessories.

1.02 RELATED REQUIREMENTS

- A. Section **01 6116 - Volatile Organic Compound (VOC) Content Restrictions.**
- B. Section **03 1000 - Concrete Forming and Accessories:** Placement of special anchors or inserts for suspension system.
- C. Section **03 3000 - Cast-in-Place Concrete:** Placement of special anchors or inserts for suspension system.
- D. Section **05 3100 - Steel Decking:** Placement of special anchors or inserts for suspension system.
- E. Section **07 2100 - Thermal Insulation.**
- F. Section **08 3100 - Access Doors and Panels.**
- G. Section **09 2116 - Gypsum Board Assemblies:** Gypsum board and metal framing products.
- H. Section **09 2116 - Gypsum Board Assemblies:** Acoustical insulation.
- I. Section **09 5153 - Direct-Applied Acoustical Ceilings.**
- J. Section **21 1300 - Fire-Suppression Sprinkler Systems:** Sprinkler heads.
- K. Section **23 3700 - Air Outlets and Inlets:** Air diffusion devices.
- L. Section **26 5100 - Interior Lighting:** Light fixtures.
- M. Section **27 5116 - Public Address Systems:** Speakers.
- N. Section **28 4600 - Fire Detection and Alarm:** Fire alarm components.

1.03 REFERENCE STANDARDS

- A. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- B. ASTM A492 - Standard Specification for Stainless Steel Rope Wire; 1995 (Reapproved 2013).
- C. ASTM A580/A580M - Standard Specification for Stainless Steel Wire; 2018.
- D. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2019.
- E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2020.
- F. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
- G. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021.
- H. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2017.
- I. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2017.
- J. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2017.
- K. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels; 2013.
- L. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2017.

- M. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2020.
- N. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2020.
- O. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2020.
- P. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2020.
- Q. ASTM E413 - Classification for Rating Sound Insulation; 2016.
- R. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2020.
- S. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2019.
- T. ASTM E1414/E1414M - Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum; 2021a.
- U. CHPS (HPPD) - High Performance Products Database; Current Edition at www.chps.net/.
- V. FBC TAS 202 - Criteria for Testing Impact and Non-Impact Resistant Building Envelope Components Using Uniform Static Air Pressure; Testing Application Standard; 1994.
- W. FBC TAS 203 - Criteria for Testing Products Subject To Cyclic Wind Pressure Loading; Testing Application Standard; 1994.
- X. FM (AG) - FM Approval Guide; current edition.
- Y. GA-216 - Application and Finishing of Gypsum Panel Products; 2016.
- Z. ISO 14644-1 - Cleanrooms and associated controlled environments - Part 1: Classification of air cleanliness by particle concentration; 2015.
- AA. ITS (DIR) - Directory of Listed Products; current edition.
- AB. UL (FRD) - Fire Resistance Directory; Current Edition.
- AC. UL (GGG) - GREENGUARD Gold Certified Products; Current Edition.
- AD. UL 580 - Standard for Tests for Uplift Resistance of Roof Assemblies; Current Edition, Including All Revisions.
- AE. UL 1897 - Uplift Tests for Roof-Covering Systems; Underwriters Laboratories Inc; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate work of this section with installation of mechanical and electrical components and with other construction activities affected by work of this section.
 - 1. Review with affected installers those locations of facility services lines and equipment within ceiling plenum that prevent installation of hangers at spacings compliant with limitations established in referenced standards. Arrange for each affected mechanical or electrical installer to provide necessary number of additional structural support points for ceiling installer.
- B. Preinstallation Meeting: Convene **<<one; or _____>>** week before starting work of this section.
- C. Sequencing: Schedule work of affected trades to minimize or eliminate installation conflicts and rework.
 - 1. Supply hanger clips during steel deck erection. Supply additional hangers and inserts as required.
 - 2. Ensure that acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved. Do not install acoustical units until after interior wet work is dry.

1.05 SUBMITTALS

- A. See Section **01 3000 - Administrative Requirements** for submittal procedures.

- B. Shop Drawings: Indicate <<***grid layout and related dimensioning; junctions with other ceiling finishes; mechanical and electrical items installed in the ceiling; and _____***>>.
- C. Product Data: Provide data on <<***suspension system components; acoustical units; and _____***>>.
- D. Evaluation Service Reports: Show compliance with specified requirements.
- E. Samples: <<***Two; or _____***>> samples _____ by _____ inches (_____ by _____ mm) in size indicating material and finish of acoustical units.
- F. Samples: <<***Two; or _____***>> full size samples indicating material and finish of acoustical units.
- G. Samples: <<***Two; or _____***>> samples each, _____ inches (_____ mm) long of suspension system <<***main runner; cross runner; perimeter molding; and _____***>>.
- H. Manufacturer's Installation Instructions: Indicate <<***special procedures; perimeter conditions requiring special attention; and _____***>>.
- I. Designer's qualification statement.
- J. Manufacturer's qualification statement.
- K. Installer's qualification statement.
- L. Maintenance Materials: Furnish the following for **Owner's** use in maintenance of project.
 1. See Section **01 6000 - Product Requirements** for additional provisions.
 2. Extra Acoustical Units: _____ sq ft (_____ sq m) of each type and size.
 3. Extra Acoustical Units: <<***Quantity equal to 5 percent of total installed; Quantity equal to _____ percent of total installed; or _____***>>.

1.06 QUALITY ASSURANCE

- A. Designer Qualifications for Seismic Design: Perform under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in **the State in which the Project is located.**
- B. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum <<***three; or _____***>> years<< ***documented; or None - N/A***>> experience.
- C. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum <<***three; or _____***>> years<< ***documented; or None - N/A***>> experience.
- D. Installer Qualifications: Company specializing in performing work of the type specified and with at least <<***three; or _____***>> years of<< ***documented; _____; or None - N/A***>> experience<< ***and approved by manufacturer; or None - N/A***>>.

1.07 FIELD CONDITIONS

- A. Maintain uniform temperature of minimum <<***60 degrees F (16 degrees C); _____ degrees F (_____ degrees C)***>>, and maximum humidity of <<***40; or _____***>> percent before, during, and after acoustical unit installation.

PART 2 PRODUCTS

2.01 CEILING ASSEMBLIES

- A. Refer to <<***Room Finish Schedule; Reflected Ceiling Plans; and _____***>> on drawings for additional ceiling assembly information.
- B. Acoustical Ceiling Assembly Type <<***APC-1; or _____***>>:
 1. Acoustical Units: <<***Acoustic SF 1"; Aspen Basic 3/4"; Aspen Basic 3/4" Illusion Two/24; Astro 5/8"; Astro FIRECODE 3/4"; Astro Illusion Two/24 3/4"; Clean Room (Perforated) 5/8" Class 10m-100m; Clean Room (Unperforated) 5/8" Class 100; Danoline Perforated Gypsum 1/2" Lay-In; Danoline Perforated Gypsum 1/2" Direct-Mount; Eclipse 3/4"; Eclipse FIRECODE 3/4"; Eclipse High-NRC 7/8"; Eclipse HRC 3/4"; Eclipse Illusion Four/48 3/4"; Eclipse Illusion Pedestals I 3/4"; Eclipse Illusion***>>

Pedestals IV 3/4"; Eclipse Illusion Two/24 3/4"; Eclipse Tile 3/4"; "F" Fissured Basic Panel 3/4"; "F" Fissured Basic Tile 3/4"; Fissured Basic 5/8"; Fissured Basic FIRECODE 5/8"; Frost Basic Foil Backed 7/8"; Frost Basic Paperback 3/4"; Frost Basic Paperback FIRECODE 3/4"; Frost 3/4"; Frost High-LR 3/4"; Frost High-NRC/High-CAC 7/8"; Glacier Basic 3/4"; Glacier Basic FIRECODE 3/4"; Glacier Basic Tile 3/4"; Halcyon (Foil Backed) 1"; Halcyon (Foil Backed) 1" Planks; Halcyon (Foil Backed) 1-1/2"; Halcyon (Foil Backed) Large Size Panels; Halcyon 1"; Halcyon Eco 1"; Halcyon 1" Planks; Halcyon 1-1/2"; Halcyon 3/4"; Halcyon 3/4" Planks; Halcyon Canopies; Halcyon Healthcare 1"; Halcyon Healthcare 1-1/2"; Halcyon Large Size Panels; Heradesign 1 Lay-In; Heradesign 1 Direct-Mount; Heradesign 2 Lay-In; Heradesign 2 Direct-Mount; Heradesign 3 Lay-In; Heradesign 3 Direct-Mount; Heradesign micro Lay-In; Heradesign micro Direct-Mount; Heradesign plano Lay-In; Heradesign plano Direct-Mount; Kitchen 5/8"; Mars 3/4"; Mars 3/4" HRC; Mars Clean Room ISO 5 (Class 100) 3/4"; Mars Healthcare 75/35 3/4"; Mars Healthcare Clean Room 3/4"; Mars Healthcare High-CAC 60/40 3/4"; Mars Healthcare High-NRC 80/35 7/8"; Mars Healthcare High-NRC 85/35 7/8"; Mars Healthcare High-NRC/High-CAC 80/40 1"; Mars Healthcare with Aircare 3/4"; Mars High-CAC 60/40 3/4"; Mars High-NRC 80/35 7/8"; Mars High-NRC 85/35 7/8"; Mars High-NRC 90/30 1"; Mars Planks; Mars High-NRC Planks 1"; Mars High-NRC Planks 7/8"; Mars High-NRC/High-CAC 80/40 1"; Millennia 3/4"; Millennia High-NRC 3/4"; Millennia Illusion Two/24 3/4"; Millennia Tile; Olympia Micro 5/8" Unperforated; Olympia Micro 50 NRC 5/8"; Olympia Micro 50 NRC HRC 5/8"; Olympia Micro 60 NRC 3/4"; Olympia Micro Illusion Two/24 3/4"; Orion 60 1/2"; Orion 75 5/8"; Orion 85 5/8"; Panz Metal Panels; Pebbled 5/8"; Premier Hi-Lite (Perforated) Kapok 5/8"; Premier Hi-Lite (Unperforated) Kapok 5/8"; Premier Hi-Lite Twill (Perforated) 5/8"; Premier Hi-Lite Twill (Unperforated) 5/8"; Premier Nubby (Foil Backed) 1"; Premier Nubby 1"; Premier Nubby 2 By 2 3/4"; Radar 5/8"; Radar Basic 5/8"; Radar Basic Ceramic Perforated 5/8"; Radar Basic FIRECODE 5/8"; Radar Basic Illusion Two/24 3/4"; Radar Basic Tile 3/4"; Radar Education FIRECODE High -NRC 3/4"; Radar Education FIRECODE High-NRC/High-CAC 3/4"; Radar Education High Durability 5/8"; Radar Education High -NRC 3/4"; Radar Education High -NRC 7/8"; Radar Education High-NRC/High-CAC 7/8"; Radar FIRECODE 5/8"; Radar High Durability 5/8"; Radar High-CAC FIRECODE 5/8"; Radar High-NRC 7/8"; Radar High-NRC FIRECODE 3/4"; Radar High-NRC/High-CAC 7/8"; Radar High-NRC/High-CAC FIRECODE 3/4"; Radar Illusion 32/6 3/4"; Radar Illusion Eight/12 3/4"; Radar Illusion FIRECODE Two/24 3/4"; Radar Illusion Four/48 3/4"; Radar Illusion Two/24 3/4"; Radar Open Plan 7/8"; Radar Tile; Renditions Animations Eclipse; Renditions Animations Frost; Renditions Animations Millennia; Renditions Boundaries Eclipse; Renditions Boundaries Frost; Renditions Boundaries Millennia; Renditions Custom Eclipse; Renditions Custom Frost; Renditions Custom Millennia; Rock Face 3/4"; Rock Face 5/8"; Sandrift 3/4"; Sandrift Basic FIRECODE 3/4"; Sheetrock 1/2"; Sheetrock Clean Room 1/2"; Touchstone 5/8"; True Wood 3/4"; -----; Celebration Metal Canopies; or None - N/A>><<, Item No. _____; or None - N/A>>.

- a. Face-Cut: <<Two/24; Four/48; Eight/12; or 32/6>>.
- b. Panel Size: <<As indicated on drawings; 12 inches by 12 inches (1 by 1) tile (305 mm by 305 mm); 24 inches by 24 inches (2 by 2) panel (610 mm by 610 mm); 24 inches by 48 inches (2 by 4) panel (610 mm by 1219 mm); 24 inches by 60 inches (2 by 5) plank (610 mm by 1524 mm); 24 inches by 72 inches (2 by 6) plank (610 mm by 1829 mm); 24 inches by 96 inches (2 by 8) plank (610 mm by 2438 mm); 30 inches by 30 inches (2-1/2 by 2-1/2) panel (762 mm by 762 mm); 30 inches by 60 inches (2-1/2 by 5) large size panel (762 mm by 1524 mm large size panel); 600 by 600 mm panel; 600 by 1200 mm panel; 500 by 1500 mm panel; Gridless, monolithic; ___ inches by ___ inches (___ mm by ___ mm)>>.
- c. Panel Edge: <<SQ; SL; SLT; SLB; FL; FLB; PE/ILT; PE/SLT; ILT; BESK; SESK; _____; or As indicated on drawings>> edge.

- d. Color: <<**Flat White; As indicated on drawings; To be selected from manufacturer's Standard color range; To be selected from manufacturer's Advantage color range; To be selected from manufacturer's Premium color range; or _____**>>.
 - e. Characteristics: Noise Reduction Coefficient = ____, Ceiling Attenuation Class = ____, Light Reflectance = ____, Recycled Content = ____, Environmental Product Declaration: ____, Health Product Declaration: ____, GreenGuard Gold: ____, EC3 Score: ____, ClimaPlus Warranty: ____.
2. Suspension Grid: <<**Donn DX 15/16-inch Suspension System; Donn DXL 15/16-inch Suspension System; Donn DXSS 15/16-inch Suspension System; Donn ZXLA 15/16-inch Suspension System; Donn Centricitee DXT 9/16-inch Suspension System; Donn Centricitee DXLT 9/16-inch Suspension System; Donn Fineline DXF Suspension System; Donn Fineline DXLF Suspension System; Donn Fineline 1/8 DXFF Suspension System; Donn Fineline DXFEV 9/16-inch Suspension System; Donn Identitee DXI Suspension System; Donn CE 1-1/2-inch Suspension System; Donn DXW 1-1/2-inch Suspension System; Donn DXLA/DXCE 15/16-inch Suspension System; Donn AX/AXCE 15/16-inch Suspension System; Donn DX 15/16-inch Concealed Suspension System; Donn DXL 15/16-inch Concealed Suspension System; or _____**>>.
 - a. Color: <<**Flat White; Matching panels; As indicated on drawings; To be selected from manufacturer's Standard color range; To be selected from manufacturer's Advantage color range; To be selected from manufacturer's Premium color range; or _____**>>.
 3. Ensemble Acoustical Drywall Ceiling.
 - a. Color: <<**White; _____; As indicated on drawings; or To be selected from manufacturer's standards**>>.
 - b. Support Assembly: <<**Flat suspension system; Curved suspension system; Direct-mount system; or _____**>>.

 To configure additional Acoustical Ceiling Assemblies, copy and edit one of the paragraphs above.

2.02 CEILING PERFORMANCE REQUIREMENTS

- A. Design for maximum deflection of <<**1/360; or _____**>> of span.
- B. Fire-Resistance Rating: Determined in accordance with test procedures in ASTM E119 and complying with the following:
 1. <<**UL (FRD); FM (AG); ITS (DIR); or _____**>> Assembly Design No. ____.
 2. ICC-ES Evaluation Report No. _____.
- C. Seismic Performance: Ceiling systems designed to withstand the effects of earthquake motions determined according to ASCE 7 for Seismic Design Category <<**C; D, E, or F; or _____**>> and complying with the following:
 1. Local authorities having jurisdiction.
 2. ICC-ES Evaluation Report No. _____.

2.03 ACOUSTICAL WALL ASSEMBLIES

- A. Acoustical Wall Assembly Type <<**AW-1; or _____**>>:
 1. Danoline Acoustical Perforated Gypsum Wall Panels.
 2. Ensemble Direct Mount Wall System.
 3. Heradesign Wood Wool Direct Mount Wall Panels.

2.04 CEILING COMPONENT PRODUCTS

- A. Acoustical Units:
 1. Acoustical Units - General: ASTM E1264, Fire Class A.

- a. VOC Content: As specified in Section **01 6116**.
- b. VOC Content: Certified as Low Emission by one of the following:
 - 1) Product listing in UL (GGG).
 - 2) Product listing in CHPS (HPPD).
- c. Noise Reduction Coefficient (NRC) rating, Ceiling Attenuation Class (CAC) rating, and Light Reflectance Coefficient (LR) performance for each type of unit specified below, as determined in accordance with ASTM E1264.
- d. Fire Class / Surface Burning Characteristics: Determined in accordance with test method ASTM E84.
 - 1) Surface Burning Characteristics: Unless otherwise indicated, flame spread index of **<<25 or less; or _____>>**, smoke developed index of **<<50 or less; or _____>>**.

Products listed below have already been selected above in the "Ceiling Assemblies" article. They are described below based on configuration of each ceiling assembly. Review the section in "Selected View" mode to confirm that only the products required for the project have been included.

ASTM E1264 Type III - The first Acoustical Panels paragraph includes "standard" acoustical units; the second Acoustical Panels paragraph includes acoustical units that can be used in fire-resistance-rated assemblies.

2. Acoustical **<<Panels; Tiles; or _____>>**: Painted mineral fiber, with the following characteristics:
 - a. Application(s): _____.
 - b. Classification: ASTM E1264 Type III.
 - 1) Form(s): Includes the following, as applicable to each product specified.
 - (a) Form 1 - Nodular.
 - (b) Form 2 - Water felted.
 - (c) Form 3 - Dry felted.
 - (d) Form 4 - Cast or molded.
 - (e) Form 5 - Other.
 - 2) Pattern(s): Includes the following, as applicable to each product specified.
 - (a) A - Perforated, regularly spaced large holes.
 - (b) B - Perforated, randomly spaced large holes.
 - (c) C - Perforated, small holes.
 - (d) D - Fissured.
 - (e) E - Lightly textured.
 - (f) F - Heavily textured.
 - (g) G - Smooth.
 - (h) H - Printed.
 - (i) I - Embossed.
 - (j) J - Embossed-in-register.
 - (k) K - Surface scored.
 - (l) L - Random swirl.
 - (m) Z - Other patterns.
 - c. Thickness: As applicable to each product specified.
 - d. Recycled Content: As applicable to selected products.
 - e. Material Ingredients Transparency: Products included in the USG EcoBlueprint Program.
 - f. Low Emissions (VOC): Greenguard-certified products.
 - g. Products:
 - 1) USG Corporation; Aspen Basic Acoustical Panels: www.usg.com/ceilings/#sle.

- 2) USG Corporation; Aspen Basic Illusion Acoustical Panels:
www.usg.com/ceilings/#sle.
(a) Face-Cut Pattern: As selected for each ceiling assembly above.
- 3) USG Corporation; Astro Panels: www.usg.com/ceilings/#sle.
- 4) USG Corporation; Astro Illusion Two/24 Panels: www.usg.com/ceilings/#sle.
(a) Face-Cut Pattern: As selected for each ceiling assembly above.
- 5) USG Corporation; Eclipse Panels: www.usg.com/ceilings/#sle.
- 6) USG Corporation; Eclipse High-NRC Panels: www.usg.com/ceilings/#sle.
- 7) USG Corporation; Eclipse Tile: www.usg.com/ceilings/#sle.
- 8) USG Corporation; Eclipse Illusion Two/24 Panels: www.usg.com/ceilings/#sle.
(a) Face-Cut Pattern: As selected for each ceiling assembly above.
- 9) USG Corporation; Eclipse Illusion Four/48 Panels: www.usg.com/ceilings/#sle.
(a) Face-Cut Pattern: As selected for each ceiling assembly above.
- 10) USG Corporation; Eclipse Pedestals I Panels: www.usg.com/ceilings/#sle.
- 11) USG Corporation; Eclipse Pedestals IV Panels: www.usg.com/ceilings/#sle.
- 12) USG Corporation; "F" Fissured Basic 3/4" Panels: www.usg.com/ceilings/#sle.
- 13) USG Corporation; "F" Fissured Basic FIRECODE 5/8" Panels:
www.usg.com/ceilings/#sle.
- 14) USG Corporation; Fissured Basic 5/8" Panels: www.usg.com/ceilings/#sle.
- 15) USG Corporation; Frost Basic Paperback 3/4" Panels:
www.usg.com/ceilings/#sle.
- 16) USG Corporation; Frost Basic Foil Backed 3/4" Panels:
www.usg.com/ceilings/#sle.
- 17) USG Corporation; Frost 3/4" Panels: www.usg.com/ceilings/#sle.
- 18) USG Corporation; Frost High-NRC/High-CAC 7/8" Panels:
www.usg.com/ceilings/#sle.
- 19) USG Corporation; Frost High-LR 3/4" Panels: www.usg.com/ceilings/#sle.
- 20) USG Corporation; Glacier Basic Panels 3/4": www.usg.com/ceilings/#sle.
- 21) USG Corporation; Glacier Basic Tile 3/4": www.usg.com/ceilings/#sle.
- 22) USG Corporation; Millennia 3/4" Panels: www.usg.com/ceilings/#sle.
- 23) USG Corporation; Millennia High-NRC 3/4" Panels: www.usg.com/ceilings/#sle.
- 24) USG Corporation; Millennia Tile: www.usg.com/ceilings/#sle.
- 25) USG Corporation; Millennia Illusion Two/24 3/4" Panels:
www.usg.com/ceilings/#sle.
(a) Face-Cut Pattern: As selected for each ceiling assembly above.
- 26) USG Corporation; Olympia Micro 5/8" Unperforated Panels:
www.usg.com/ceilings/#sle.
- 27) USG Corporation; Olympia Micro 50 NRC 5/8" Panels:
www.usg.com/ceilings/#sle.
- 28) USG Corporation; Olympia Micro 50 NRC HRC 5/8" Panels:
www.usg.com/ceilings/#sle.
- 29) USG Corporation; Olympia Micro 60 NRC 3/4" Panels:
www.usg.com/ceilings/#sle.
- 30) USG Corporation; Olympia Micro Illusion Two/24 3/4" Panels:
www.usg.com/ceilings/#sle.
(a) Face-Cut Pattern: Two/24.
- 31) USG Corporation; Orion 60 1/2" Panels: www.usg.com/ceilings/#sle.
- 32) USG Corporation; Orion 75 5/8" Panels: www.usg.com/ceilings/#sle.
- 33) USG Corporation; Orion 85 5/8" Panels: www.usg.com/ceilings/#sle.
- 34) USG Corporation; Pebbled 5/8" Panels: www.usg.com/ceilings/#sle.
- 35) USG Corporation; Radar Basic Acoustical Panels: www.usg.com/ceilings/#sle.
- 36) USG Corporation; Radar Basic Tile: www.usg.com/ceilings/#sle.
- 37) USG Corporation; Radar Basic Illusion Two/24 Panels:
www.usg.com/ceilings/#sle.

- (a) Face-Cut Pattern: As selected for each ceiling assembly above.
- 38) USG Corporation; Radar Panels: www.usg.com/ceilings/#sle.
- 39) USG Corporation; Radar High-Durability Panels: www.usg.com/ceilings/#sle.
- 40) USG Corporation; Radar Tile: www.usg.com/ceilings/#sle.
- 41) USG Corporation; Radar High-CAC Panels: www.usg.com/ceilings/#sle.
- 42) USG Corporation; Radar High-NRC Panels: www.usg.com/ceilings/#sle.
- 43) USG Corporation; Radar High-NRC/High-CAC Panels:
www.usg.com/ceilings/#sle.
- 44) USG Corporation; Radar Illusion Two/24 Panels: www.usg.com/ceilings/#sle.
- (a) Face-Cut Pattern: As selected for each ceiling assembly above.
- 45) USG Corporation; Radar Illusion Four/48 Panels: www.usg.com/ceilings/#sle.
- (a) Face-Cut Pattern: As selected for each ceiling assembly above.
- 46) USG Corporation; Radar Illusion Eight/12 Panels: www.usg.com/ceilings/#sle.
- (a) Face-Cut Pattern: As selected for each ceiling assembly above.
- 47) USG Corporation; Radar Illusion 32/6 Panels: www.usg.com/ceilings/#sle.
- (a) Face-Cut Pattern: As selected for each ceiling assembly above.
- 48) USG Corporation; Radar Education High-Durability Panels:
www.usg.com/ceilings/#sle.
- 49) USG Corporation; Radar Education High-NRC Panels:
www.usg.com/ceilings/#sle.
- 50) USG Corporation; Radar Education High-NRC/High-CAC Panels:
www.usg.com/ceilings/#sle.
- 51) USG Corporation; Radar Open Plan Panels: www.usg.com/ceilings/#sle.
- 52) USG Corporation; Renditions Animations Eclipse Face-Routed Panels:
www.usg.com/ceilings/#sle.
- 53) USG Corporation; Renditions Animations Frost Face-Routed Panels:
www.usg.com/ceilings/#sle.
- 54) USG Corporation; Renditions Animations Millennia Face-Routed Panels:
www.usg.com/ceilings/#sle.
- 55) USG Corporation; Renditions Boundaries Eclipse Face-Routed Panels:
www.usg.com/ceilings/#sle.
- 56) USG Corporation; Renditions Boundaries Frost Face-Routed Panels:
www.usg.com/ceilings/#sle.
- 57) USG Corporation; Renditions Boundaries Millennia Face-Routed Panels:
www.usg.com/ceilings/#sle.
- 58) USG Corporation; Renditions Custom Eclipse Face-Routed Panels:
www.usg.com/ceilings/#sle.
- 59) USG Corporation; Renditions Custom Frost Face-Routed Panels:
www.usg.com/ceilings/#sle.
- 60) USG Corporation; Renditions Custom Millennia Face-Routed Panels:
www.usg.com/ceilings/#sle.
- 61) USG Corporation; Rock Face 5/8" Panels: www.usg.com/ceilings/#sle.
- 62) USG Corporation; Rock Face 3/4" Panels: www.usg.com/ceilings/#sle.
- 63) USG Corporation; Sandrift 3/4" Panels: www.usg.com/ceilings/#sle.
- 64) USG Corporation; Touchstone 5/8" Panels: www.usg.com/ceilings/#sle.
- 65) _____.
- 66) Substitutions: <<See Section 01 6000 - Product Requirements; or **Not permitted**>>.
3. Acoustical Panels: Painted mineral fiber, with the following characteristics:
- a. Application(s): Fire-resistance-rated assemblies.
 - b. Classification: ASTM E1264 Type III.
 - 1) Form(s): Includes the following, as applicable to each product specified.
 - (a) Form 1 - Nodular.
 - (b) Form 2 - Water felted.

- (c) Form 3 - Dry felted.
 - (d) Form 4 - Cast or molded.
 - (e) Form 5 - Other.
 - 2) Pattern(s): Includes the following, as applicable to each product specified.
 - (a) A - Perforated, regularly spaced large holes.
 - (b) B - Perforated, randomly spaced large holes.
 - (c) C - Perforated, small holes.
 - (d) D - Fissured.
 - (e) E - Lightly textured.
 - (f) F - Heavily textured.
 - (g) G - Smooth.
 - (h) H - Printed.
 - (i) I - Embossed.
 - (j) J - Embossed-in-register.
 - (k) K - Surface scored.
 - (l) L - Random swirl.
 - (m) Z - Other patterns.
 - c. Thickness: As applicable to each product specified.
 - d. Recycled Content: As applicable to selected products.
 - e. Material Ingredients Transparency: Products included in the USG EcoBlueprint Program.
 - f. Low Emissions (VOC): Greenguard-certified products.
 - g. Products:
 - 1) USG Corporation; Astro FIRECODE 3/4" Panels: www.usg.com/ceilings/#sle.
 - 2) USG Corporation; Eclipse FIRECODE 3/4" Panels: www.usg.com/ceilings/#sle.
 - 3) USG Corporation; Fissured Basic FIRECODE 3/4" Panels: www.usg.com/ceilings/#sle.
 - 4) USG Corporation; Frost Basic Paperback FIRECODE 3/4" Panels: www.usg.com/ceilings/#sle.
 - 5) USG Corporation; Glacier Basic FIRECODE 3/4" Panels: www.usg.com/ceilings/#sle.
 - 6) USG Corporation; Radar Basic FIRECODE 5/8" Panels: www.usg.com/ceilings/#sle.
 - 7) USG Corporation; Radar FIRECODE 5/8" Panels: www.usg.com/ceilings/#sle.
 - 8) USG Corporation; Radar High-CAC FIRECODE 5/8" Panels: www.usg.com/ceilings/#sle.
 - 9) USG Corporation; Radar High-NRC FIRECODE 3/4" Panels: www.usg.com/ceilings/#sle.
 - 10) USG Corporation; Radar High-NRC/High-CAC FIRECODE 3/4" Panels: www.usg.com/ceilings/#sle.
 - 11) USG Corporation; Radar Education High-NRC FIRECODE 3/4" Panels: www.usg.com/ceilings/#sle.
 - 12) USG Corporation; Radar Education High-NRC/High-CAC FIRECODE 3/4" Panels: www.usg.com/ceilings/#sle.
 - 13) USG Corporation; Radar Illusion FIRECODE 3/4" Panels: www.usg.com/ceilings/#sle.
 - (a) Face-Cut Pattern: Two/24.
 - 14) USG Corporation; Sandrift Basic FIRECODE 3/4" Panels: www.usg.com/ceilings/#sle.
 - 15) _____.
 - 16) Substitutions: <<See Section 01 6000 - Product Requirements; or Not permitted>>.
-

ASTM E1264 Type IV - The first paragraph includes "standard" acoustical units; the second paragraph includes cleanroom panels.

4. Acoustical <<**Panels; Tiles; or** _____>>: Mineral fiber with membrane-faced overlay, with the following characteristics:
- a. Application(s): _____.
 - b. Classification: ASTM E1264 Type IV.
 - 1) Form(s): Includes the following, as applicable to each product specified.
 - (a) Form 1 - Nodular.
 - (b) Form 2 - Water felted.
 - (c) Form 3 - Dry felted.
 - (d) Form 4 - Cast or molded.
 - (e) Form 5 - Other.
 - 2) Pattern(s): Includes the following, as applicable to each product specified.
 - (a) A - Perforated, regularly spaced large holes.
 - (b) B - Perforated, randomly spaced large holes.
 - (c) C - Perforated, small holes.
 - (d) D - Fissured.
 - (e) E - Lightly textured.
 - (f) F - Heavily textured.
 - (g) G - Smooth.
 - (h) H - Printed.
 - (i) I - Embossed.
 - (j) J - Embossed-in-register.
 - (k) K - Surface scored.
 - (l) L - Random swirl.
 - (m) Z - Other patterns.
 - c. Thickness: As applicable to each product specified.
 - d. Recycled Content: As applicable to selected products.
 - e. Material Ingredients Transparency: Products included in the USG EcoBlueprint Program.
 - f. Low Emissions (VOC): Greenguard-certified products.
 - g. Products:
 - 1) USG Corporation; Acoustic SF 1" Panels: www.usg.com/ceilings/#sle.
 - 2) USG Corporation; Mars 3/4" Panels: www.usg.com/ceilings/#sle.
 - 3) USG Corporation; Mars HRC 3/4" Panels: www.usg.com/ceilings/#sle.
 - 4) USG Corporation; Mars Healthcare High-NRC 85/35 7/8" Panels: www.usg.com/ceilings/#sle.
 - 5) USG Corporation; Mars Healthcare High-NRC/High CAC 80/40 1" Panels: www.usg.com/ceilings/#sle.
 - 6) USG Corporation; Mars Healthcare High-NRC 80/35 7/8" Panels: www.usg.com/ceilings/#sle.
 - 7) USG Corporation; Mars Healthcare 75/35 3/4" Panels: www.usg.com/ceilings/#sle.
 - 8) USG Corporation; Mars Healthcare High CAC 60/40 3/4" Panels: www.usg.com/ceilings/#sle.
 - 9) USG Corporation; Mars Healthcare High-NRC/High-CAC 80/40 1" Panels: www.usg.com/ceilings/#sle.
 - 10) USG Corporation; Mars Healthcare with Aircare Coating 3/4" Panels: www.usg.com/ceilings/#sle.
 - 11) USG Corporation; Mars High-NRC 90/30 1" Panels: www.usg.com/ceilings/#sle.
 - 12) USG Corporation; Mars High-NRC 85/35 7/8" Panels: www.usg.com/ceilings/#sle.

- 13) USG Corporation; Mars High-NRC/High-CAC 80/40 1" Panels:
www.usg.com/ceilings/#sle.
 - 14) USG Corporation; Mars High-NRC 80/35 7/8" Panels:
www.usg.com/ceilings/#sle.
 - 15) USG Corporation; Mars High CAC 60/40 3/4" Panels:
www.usg.com/ceilings/#sle.
 - 16) USG Corporation; Mars Planks: www.usg.com/ceilings/#sle.
 - 17) USG Corporation; Mars High-NRC 7/8" Planks: www.usg.com/ceilings/#sle.
 - 18) USG Corporation; Mars High-NRC 1" Planks: www.usg.com/ceilings/#sle.
 - 19) _____.
 - 20) Substitutions: <<See Section 01 6000 - Product Requirements; or **Not permitted**>>.
5. Acoustical Panels: Mineral fiber with membrane-faced overlay, with the following characteristics:
- a. Application(s): <<**Clean room**; or _____>>.
 - b. Classification: ASTM E1264 Type IV.
 - 1) Form(s): Includes the following, as applicable to each product specified.
 - (a) Form 1 - Nodular.
 - (b) Form 2 - Water felted.
 - (c) Form 3 - Dry felted.
 - (d) Form 4 - Cast or molded.
 - (e) Form 5 - Other.
 - 2) Pattern(s): Includes the following, as applicable to each product specified.
 - (a) A - Perforated, regularly spaced large holes.
 - (b) B - Perforated, randomly spaced large holes.
 - (c) C - Perforated, small holes.
 - (d) D - Fissured.
 - (e) E - Lightly textured.
 - (f) F - Heavily textured.
 - (g) G - Smooth.
 - (h) H - Printed.
 - (i) I - Embossed.
 - (j) J - Embossed-in-register.
 - (k) K - Surface scored.
 - (l) L - Random swirl.
 - (m) Z - Other patterns.
 - c. Clean Room Classification: ISO 14644-1, <<**Class 5**; **Class 7**; or **Class _____**>>.
 - d. Thickness: As applicable to each product specified.
 - e. Recycled Content: As applicable to selected products.
 - f. Material Ingredients Transparency: Products included in the USG EcoBlueprint Program.
 - g. Low Emissions (VOC): Greenguard-certified products.
 - h. Products:
 - 1) USG Corporation; Mars Clean Room ISO 5 (Class 100) 3/4" Panels:
www.usg.com/ceilings/#sle.
 - 2) USG Corporation; Mars Healthcare Clean Room 3/4" Panels:
www.usg.com/ceilings/#sle.
 - 3) _____.
 - 4) Substitutions: <<See Section 01 6000 - Product Requirements; or **Not permitted**>>.

[ASTM E1264 Type V, VI, or VII - Metal-faced acoustical panels.](#)

6. Metal-Faced Acoustical Panels: <<***Galvanized steel; Stainless steel; Aluminum; or _____***>> flat formed sheet, with <<***glass fiber; mineral fiber; or _____***>> acoustical media backing; with the following characteristics:
- a. Application(s): _____.
 - b. Classification: ASTM E1264 Type <<***V; VI; VII; or _____***>>.
 - c. Panel Size(s): As indicated on drawings.
 - d. Panel Size(s): <<***12 by 48 inches (305 by 1219 mm); 12 by 48 inches (305 by 1219 mm); 12 by 48 inches (305 by 1219 mm); 12 by 60 inches (305 by 1524 mm); 12 by 60 inches (305 by 1524 mm); 305 by 1524 mm (12 by 60 inches); 24 by 24 inches (610 by 610 mm); 24 by 24 inches (610 by 610 mm); 610 by 610 mm (24 by 24 inches); 24 by 48 inches (610 by 1219 mm); 24 by 48 inches (610 by 1219 mm); 610 by 1219 mm (24 by 48 inches); 24 by 72 inches (610 by 1829 mm); 24 by 72 inches (610 by 1829 mm); 610 by 1829 mm (24 by 72 inches); 24 by 96 inches (610 by 2438 mm); 24 by 96 inches (610 by 2438 mm); 610 by 2438 mm (24 by 96 inches); 20 by 60 inches (508 by 1524 mm); 20 by 60 inches (508 by 1524 mm); 508 by 1524 mm (20 by 60 inches); 30 by 30 inches (762 by 762 mm); 30 by 30 inches (762 by 762 mm); 762 by 762 mm (30 by 30 inches); 30 by 60 inches (762 by 1524 mm); 30 by 60 inches (762 by 1524 mm); 762 by 1524 mm (30 by 60 inches); _____ inches; _____ mm; _____ inches (_____ mm); and _____ mm (_____ inches)***>>.
 - e. Panel Appearance: <<***Smooth; Perforated; Perforated with Backer; or _____***>>.
 - 1) Perforation Pattern: <<***A062; A116; and _____***>>.
 - f. Edge Detail: <<***Square; Shadowline; Finline; or Flush Mount***>>.
 - g. Thickness: As applicable to each product specified.
 - h. Finishes: <<***As indicated on drawings; or None - N/A***>>
 - 1) Exposed Metal Finish: <<***As indicated on drawings; To be selected from manufacturer's standards; Brushed Aluminum anodized; Polished Chrome anodized; Polished Brass anodized; Satin Chrome anodized; or _____***>>.
 - 2) Simulated Wood Painted Finish: Wood Tones.
 - (a) Color: <<***As indicated on drawings; To be selected from manufacturer's standards; Maple; Red Birch; VG Fir; Cherry; Walnut; Mahogany; or _____***>>.
 - 3) Painted Finish: Manufacturer's <<***standard; custom; or _____***>> color.
 - (a) Color: <<***As indicated on drawings; To be selected from manufacturer's standards; Silver Standard; Lumin White; Blanco Mat; or _____***>>.
 - 4) Stamped Diamondflex Finish: <<***As indicated on drawings; To be selected from manufacturer's standards; Louvered Bright White; Louvered Bright Silver; Sheer Bright White; Sheer Bright Silver; or _____***>>.
 - i. Recycled Content: As applicable to selected products.
 - j. Material Ingredients Transparency: Products included in the USG EcoBlueprint Program.
 - k. Low Emissions (VOC): Greenguard-certified products.
 - l. Products:
 - 1) USG Corporation; Panz Metal Panels: www.usg.com/ceilings/#sle.
 - 2) _____.
 - 3) _____.
 - 4) Substitutions: <<***See Section 01 6000 - Product Requirements; or Not permitted***>>.

[ASTM E1264 Type IX - Mineral fiber with scrubbable finish, recommended for commercial kitchen/any food prep areas.](#)

7. Acoustical Panels: Mineral fiber with scrubbable finish, with the following characteristics:
- a. Application(s): _____.

- b. Classification: ASTM E1264 Type IX.
 - 1) Form(s): Includes the following, as applicable to each product specified.
 - (a) Form 1 - Nodular.
 - (b) Form 2 - Water felted.
 - (c) Form 3 - Dry felted.
 - (d) Form 4 - Cast or molded.
 - 2) Pattern(s): Includes the following, as applicable to each product specified.
 - (a) A - Perforated, regularly spaced large holes.
 - (b) B - Perforated, randomly spaced large holes.
 - (c) C - Perforated, small holes.
 - (d) D - Fissured.
 - (e) E - Lightly textured.
 - (f) F - Heavily textured.
 - (g) G - Smooth.
 - (h) H - Printed.
 - (i) I - Embossed.
 - (j) J - Embossed-in-register.
 - (k) K - Surface scored.
 - (l) L - Random swirl.
 - (m) Z - Other patterns.
- c. Thickness: As applicable to each product specified.
- d. Recycled Content: As applicable to selected products.
- e. Material Ingredients Transparency: Products included in the USG EcoBlueprint Program.
- f. Low Emissions (VOC): Greenguard-certified products.
- g. Products:
 - 1) USG Corporation; Kitchen Lay-in Panels: www.usg.com/ceilings/#sle.
 - 2) _____.
 - 3) _____.
 - 4) Substitutions: <<See Section 01 6000 - Product Requirements; or **Not permitted**>>.

ASTM E1264 Type X - Mineral fiber with plastic or metal overlay; clean room classified option.

- 8. Acoustical Panels: Mineral fiber with <<**plastic; aluminum; or** _____>> membrane-faced overlay, with the following characteristics:
 - a. Application(s): <<**Clean room; or** _____>>.
 - b. Classification: ASTM E1264 Type X.
 - 1) Pattern(s): Includes the following, as applicable to each product specified.
 - (a) A - Perforated, regularly spaced large holes.
 - (b) B - Perforated, randomly spaced large holes.
 - (c) C - Perforated, small holes.
 - (d) D - Fissured.
 - (e) E - Lightly textured.
 - (f) F - Heavily textured.
 - (g) G - Smooth.
 - (h) H - Printed.
 - (i) I - Embossed.
 - (j) J - Embossed-in-register.
 - (k) K - Surface scored.
 - (l) L - Random swirl.
 - (m) Z - Other patterns.
 - c. Clean Room Classification: ISO 14644-1, <<**Class 5; Class 7; or Class** _____>>.

- d. Thickness: As applicable to each product specified.
- e. Recycled Content: As applicable to selected products.
- f. Material Ingredients Transparency: Products included in the USG EcoBlueprint Program.
- g. Low Emissions (VOC): Greenguard-certified products.
- h. Products:
 - 1) USG Corporation; Clean Room (Unperforated) 5/8" Class 100 Panels: www.usg.com/ceilings/#sle.
 - 2) USG Corporation; Clean Room (Perforated) 5/8" Class 10m-100m Panels: www.usg.com/ceilings/#sle.
 - 3) _____.
 - 4) Substitutions: <<See Section 01 6000 - Product Requirements; or **Not permitted**>>.

ASTM E1264 Type XII - Glass fiber with overlay; panels, tiles, planks, or large-size panels.

- 9. Acoustical <<**Panels; Tiles; or** _____>>: Glass fiber with membrane-faced overlay, with the following characteristics:
 - a. Application(s): _____.
 - b. Classification: ASTM E1264 Type XII.
 - 1) Form(s): Includes the following, as applicable to each product specified.
 - (a) Form 1 - Plastic.
 - (b) Form 2 - Cloth.
 - (c) Form 3 - Other.
 - 2) Pattern(s): Includes the following, as applicable to each product specified.
 - (a) A - Perforated, regularly spaced large holes.
 - (b) B - Perforated, randomly spaced large holes.
 - (c) C - Perforated, small holes.
 - (d) D - Fissured.
 - (e) E - Lightly textured.
 - (f) F - Heavily textured.
 - (g) G - Smooth.
 - (h) H - Printed.
 - (i) I - Embossed.
 - (j) J - Embossed-in-register.
 - (k) K - Surface scored.
 - (l) L - Random swirl.
 - (m) Z - Other patterns.
 - c. Thickness: As applicable to each product specified.
 - d. Recycled Content: As applicable to selected products.
 - e. Material Ingredients Transparency: Products included in the USG EcoBlueprint Program.
 - f. Low Emissions (VOC): Greenguard-certified products.
 - g. Products:
 - 1) USG Corporation; Halcyon 3/4" Panels: www.usg.com/ceilings/#sle.
 - 2) USG Corporation; Halcyon 1" Panels: www.usg.com/ceilings/#sle.
 - 3) USG Corporation; Halcyon Eco 1" Panels: www.usg.com/ceilings/#sle.
 - 4) USG Corporation; Halcyon (Foil Backed) 1" Panels: www.usg.com/ceilings/#sle.
 - 5) USG Corporation; Halcyon 1-1/2" Panels: www.usg.com/ceilings/#sle.
 - 6) USG Corporation; Halcyon (Foil Backed) 1-1/2" Panels: www.usg.com/ceilings/#sle.
 - 7) USG Corporation; Halcyon Healthcare 1" Panels: www.usg.com/ceilings/#sle.

- 8) USG Corporation; Halcyon Healthcare 1-1/2" Panels:
www.usg.com/ceilings/#sle.
- 9) USG Corporation; Halcyon 3/4" Planks: www.usg.com/ceilings/#sle.
- 10) USG Corporation; Halcyon 1" Planks: www.usg.com/ceilings/#sle.
- 11) USG Corporation; Halcyon (Foil Backed) 1" Planks: www.usg.com/ceilings/#sle.
- 12) USG Corporation; Halcyon Large Size Panels: www.usg.com/ceilings/#sle.
- 13) USG Corporation; Halcyon Logix Channels: www.usg.com/ceilings/#sle.
- 14) USG Corporation; Halcyon (Foil Backed) Large Size Panels:
www.usg.com/ceilings/#sle.
- 15) USG Corporation; Premier Hi-Lite Twill (Perforated) 5/8" Panels:
www.usg.com/ceilings/#sle.
- 16) USG Corporation; Premier Hi-Lite Twill (Unperforated) 5/8" Panels:
www.usg.com/ceilings/#sle.
- 17) USG Corporation; Premier Hi-Lite Kapok (Perforated) 5/8" Panels:
www.usg.com/ceilings/#sle.
- 18) USG Corporation; Premier Hi-Lite Kapok (Unperforated) 5/8" Panels:
www.usg.com/ceilings/#sle.
- 19) USG Corporation; Premier Nubby 2 by 2 3/4" Panels:
www.usg.com/ceilings/#sle.
- 20) USG Corporation; Premier Nubby 1" Panels: www.usg.com/ceilings/#sle.
- 21) USG Corporation; Premier Nubby (Foil Backed) 1" Panels:
www.usg.com/ceilings/#sle.
- 22) _____.
- 23) Substitutions: <<See Section 01 6000 - Product Requirements; or **Not permitted**>>.

ASTM E1264 Type XIV (exelsior bonded with inorganic binders) - Form 1 panels have no backing and Form 2 panels have mineral or glass fiber base backing.

10. Acoustical Panels: Magnesite-bonded wood wool, with the following characteristics:
 - a. Application(s): _____.
 - b. Classification: ASTM E1264 Type XIV.
 - 1) Form(s): Includes the following, as applicable to each product specified.
 - (a) Form 1 - No backing.
 - (b) Form 2 - Mineral or glass fiber base backing.
 - 2) Pattern(s): Includes the following, as applicable to each product specified.
 - (a) A - Perforated, regularly spaced large holes.
 - (b) B - Perforated, randomly spaced large holes.
 - (c) C - Perforated, small holes.
 - (d) D - Fissured.
 - (e) E - Lightly textured.
 - (f) F - Heavily textured.
 - (g) G - Smooth.
 - (h) H - Printed.
 - (i) I - Embossed.
 - (j) J - Embossed-in-register.
 - (k) K - Surface scored.
 - (l) L - Random swirl.
 - (m) Z - Other patterns.
 - c. Panel Size: <<As indicated on drawings; 24 inches by 48 inches (2 by 4) panel (610 mm by 1219 mm); 24 inches by 96 inches (2 by 8) plank (610 mm by 2438 mm); ___ inches by ___ inches (___ mm by ___ mm)>>.
 - d. Panel Thickness: <<5/8 inch (16 mm); 1 inch (25 mm); 1-3/8 inches (35 mm); ___ inch (___ mm)>>.

- e. Edges Configuration: <<***BEV/BEV; BEV/SQ; or _____***>>.
 - 1) Ashlar Installation Clips: Manufacturer's standard for the application.
- f. Texture: <<***Heradesign 1 (Super Fine Texture); Heradesign 2 (Fine Texture); Heradesign 3 (Macro Texture); Heradesign micro; Heradesign plano; or _____***>>.
 - g. Recycled Content: As applicable to selected products.
 - h. Material Ingredients Transparency: Products included in the USG EcoBlueprint Program.
 - i. Low Emissions (VOC): Greenguard-certified products.
 - j. NRC: <<***0.50; 0.65; 0.70; 0.75; 0.80; or _____***>>.
 - k. Direct-Mounting: Drywall suspension system DWSS
 - l. Products:
 - 1) USG Corporation; Heradesign Wood Wool Lay-In Panels: www.usg.com/ceilings/#sle.
 - 2) USG Corporation; Heradesign Wood Wool Direct-Mount Ceiling Panels: www.usg.com/ceilings/#sle.
 - 3) _____.
 - 4) Substitutions: <<***See Section 01 6000 - Product Requirements; or Not permitted***>>.

ASTM E1264 Type XX (other types) - The first paragraph below includes "ceramic-bonded mineral fiber" panels. The second paragraph includes "gypsum board" panels.

- 11. Acoustical Panels: Ceramic-bonded mineral fiber, with the following characteristics:
 - a. Application(s): _____.
 - b. Classification: ASTM E1264 Type XX.
 - 1) Pattern(s): Includes the following, as applicable to each product specified.
 - (a) A - Perforated, regularly spaced large holes.
 - (b) B - Perforated, randomly spaced large holes.
 - (c) C - Perforated, small holes.
 - (d) D - Fissured.
 - (e) E - Lightly textured.
 - (f) F - Heavily textured.
 - (g) G - Smooth.
 - (h) H - Printed.
 - (i) I - Embossed.
 - (j) J - Embossed-in-register.
 - (k) K - Surface scored.
 - (l) L - Random swirl.
 - (m) Z - Other patterns.
 - c. Thickness: As applicable to each product specified.
 - d. Recycled Content: As applicable to selected products.
 - e. Material Ingredients Transparency: Products included in the USG EcoBlueprint Program.
 - f. Low Emissions (VOC): Greenguard-certified products.
 - g. Products:
 - 1) USG Corporation; Radar Ceramic Panels: www.usg.com/ceilings/#sle.
 - 2) _____.
 - 3) _____.
 - 4) Substitutions: <<***See Section 01 6000 - Product Requirements; or Not permitted***>>.
- 12. Acoustical Panels: Precision-perforated gypsum boards, with the following characteristics:
 - a. Application(s): _____.
 - b. Classification: ASTM E1264 Type XX.

- 1) Pattern(s): Includes the following, as applicable to each product specified.
 - (a) A - Perforated, regularly spaced large holes.
 - (b) B - Perforated, randomly spaced large holes.
 - (c) C - Perforated, small holes.
 - (d) D - Fissured.
 - (e) E - Lightly textured.
 - (f) F - Heavily textured.
 - (g) G - Smooth.
 - (h) H - Printed.
 - (i) I - Embossed.
 - (j) J - Embossed-in-register.
 - (k) K - Surface scored.
 - (l) L - Random swirl.
 - (m) Z - Other patterns.
 - c. Thickness: **1/2 inch (13 mm)**.
 - d. Recycled Content: As applicable to selected products.
 - e. Material Ingredients Transparency: Products included in the USG EcoBlueprint Program.
 - f. Low Emissions (VOC): Greenguard-certified products.
 - g. Panel Edge: <<**FN; FW; SL; FL; or ____**>>.
 - h. Perforation Pattern: <<**C4; C6; CV; S3; S9; O1; S12; or ____**>>.
 - i. Perforation Layout: <<**2L4; 2L2; or ____**>>.
 - j. Acoustical Backer Color: <<**White; Gray; or ____**>>.
 - k. NRC: <<**0.50; 0.65; 0.70; 0.75; 0.80; or ____**>>.
 - l. Products:
 - 1) USG Corporation; Danoline Acoustical Perforated Gypsum Lay-In Panels:
www.usg.com/ceilings/#sle.
 - 2) USG Corporation; Danoline Acoustical Perforated Gypsum Direct-Mount Panels:
www.usg.com/ceilings/#sle.
 - 3) _____.
 - 4) Substitutions: <<**See Section 01 6000 - Product Requirements; or Not permitted**>>.
13. Acoustical Panels: Gypsum, with the following characteristics:
- a. Application(s): _____.
 - b. Classification: ASTM E1264 Type XX.
 - 1) Pattern(s): Includes the following, as applicable to each product specified.
 - (a) A - Perforated, regularly spaced large holes.
 - (b) B - Perforated, randomly spaced large holes.
 - (c) C - Perforated, small holes.
 - (d) D - Fissured.
 - (e) E - Lightly textured.
 - (f) F - Heavily textured.
 - (g) G - Smooth.
 - (h) H - Printed.
 - (i) I - Embossed.
 - (j) J - Embossed-in-register.
 - (k) K - Surface scored.
 - (l) L - Random swirl.
 - (m) Z - Other patterns.
 - c. Thickness: As applicable to each product specified.
 - d. Recycled Content: As applicable to selected products.
 - e. Material Ingredients Transparency: Products included in the USG EcoBlueprint Program.
 - f. Low Emissions (VOC): Greenguard-certified products.

- g. Products:
- 1) USG Corporation; Sheetrock FIRECODE 1/2" Panels: www.usg.com/ceilings/#sle.
 - 2) USG Corporation; Sheetrock Clean Room 1/2" Panels: www.usg.com/ceilings/#sle.
 - 3) _____.
 - 4) Substitutions: <<See Section 01 6000 - Product Requirements; or **Not permitted**>>.
14. Acoustical Panel Canopies: Glass fiber panels suspended by hanger wire or rods attached to field-installed anchor hardware on panel backs.
- a. Classification: ASTM E1264 Type XII.
 - 1) Form: <<**1, plastic; 2, cloth; 3, (other)** _____; or _____>>.
 - 2) Pattern(s): Includes the following, as applicable to each product specified.
 - (a) A - Perforated, regularly spaced large holes.
 - (b) B - Perforated, randomly spaced large holes.
 - (c) C - Perforated, small holes.
 - (d) D - Fissured.
 - (e) E - Lightly textured.
 - (f) F - Heavily textured.
 - (g) G - Smooth.
 - (h) H - Printed.
 - (i) I - Embossed.
 - (j) J - Embossed-in-register.
 - (k) K - Surface scored.
 - (l) L - Random swirl.
 - (m) Z - Other patterns.
 - b. Size and Configuration: As indicated on drawings.
 - c. Shape: _____.
 - d. Color: <<**White; As indicated on drawings; or** _____>>.
 - e. Thickness: As applicable to each product specified.
 - f. Recycled Content: As applicable to selected products.
 - g. Material Ingredients Transparency: Products included in the USG EcoBlueprint Program.
 - h. Low Emissions (VOC): Greenguard-certified products.
 - i. Products:
 - 1) USG Corporation; Halcyon Canopies: www.usg.com/ceilings/#sle.
 - 2) _____.
 - 3) _____.
 - 4) Substitutions: <<See Section 01 6000 - Product Requirements; or **Not permitted**>>.
15. Acoustical Panel Canopies: Metal panels with <<**glass fiber; mineral fiber; or** _____>> acoustical media backing suspended by hanger wire attached to brackets on panel back.
- a. Classification: ASTM E1264 Type VII.
 - 1) Pattern: <<**"A" - perforated, regularly spaced large holes; "C" - perforated, small holes; or** _____>>.
 - b. Panel Material: Aluminum sheet, ASTM B209/B209M.
 - c. Panel Finish: <<**Enamel; Anodized; or** _____>>; _____ color <<**from manufacturer's standard range; as selected; or** _____>>.
 - d. Size and Configuration: As indicated on drawings.
 - e. Thickness: As applicable to each product specified.
 - f. Recycled Content: As applicable to selected products.
 - g. Material Ingredients Transparency: Products included in the USG EcoBlueprint Program.

- h. Low Emissions (VOC): Greenguard-certified products.
- i. Products:
 - 1) USG Corporation; Celebration Metal Canopies: www.usg.com/ceilings/#sle.
 - 2) _____.
 - 3) _____.
 - 4) Substitutions: **<<See Section 01 6000 - Product Requirements; or Not permitted>>**.

Other types of ceiling panels, not classified as ASTM E1264 types.

- 16. Sound-Absorbing Gypsum Board Ceiling System: Perforated gypsum board with acoustic backer panels and spray-applied finish.
 - a. System Noise Reduction Coefficient (NRC): Not less than 0.80 when measured and calculated in accordance with ASTM C423.
 - b. System Ceiling Attenuation Class (CAC): Not less than 40 when tested in accordance with ASTM E1414/E1414M and classified in accordance with ASTM E413.
 - c. Sound-Absorbing Gypsum Board: Manufacturer's proprietary four-sided taper perforated boards.
 - 1) Thickness: **<<5/8 inch (16 mm); _____ inch (_____ mm)>>**.
 - d. Installation Method: DGLW planar suspension system.
 - e. Installation Method: DGLW curved suspension system, with **8-foot (2438 mm)** minimum radius curved main tees.
 - f. Installation Method: **<<1-inch (25.4 mm); 2-inch (50.8 mm)>>** Z-furring direct-mount system.
 - g. Spray-Applied Finish: Manufacturer's proprietary acoustically transparent, acrylic-based finish coating.
 - h. Backer Panels: Ensemble High-NRC backer panels, **<<1 inch (25.4 mm); 2 inches (50.8 mm)>>** thick.
 - 1) Direct Mount Panel Fasteners: Impaling clips of **<<unfinished steel; galvanized steel; plastic; nylon; or _____>>**, designed to be **<<adhered; mechanically fastened; or _____>>** to surfaces to receive backer panels; length to suit panel thickness and substrate; capable of securely and rigidly holding panels in place.
 - i. Products:
 - 1) USG Corporation; Ensemble Acoustical Drywall Ceiling System: www.usg.com/#sle.
 - 2) _____.
 - 3) _____.
 - 4) Substitutions: **<<See Section 01 6000 - Product Requirements; or Not permitted>>**.
- 17. Wood Veneer Acoustic Panels: Manufacturer's standard core with wood veneer face and integrated acoustical backer.
 - a. Classification: ASTM E1264 Type XX composite wood panel.
 - 1) Provide MDF core with no added urea formaldehyde (NAUF).
 - b. Certification: FSC certified.
 - c. Panel Size(s): **<<24 by 24 inches; 610 by 610 mm; 24 by 24 inches (610 by 610 mm); 610 by 610 mm (24 by 24 inches); 24 by 48 inches (610 by 1220 mm); 24 by 48 inches (610 by 1220 mm); 24 by 48 inches (610 by 1220 mm); _____ inches; _____ mm; _____ inches (_____ mm); and _____ mm (_____ inches)>>**.
 - d. Plank Size(s): **<<12 by 48 inches (305 by 1219 mm); 12 by 48 inches (305 by 1219 mm); 12 by 48 inches (305 by 1219 mm); 12 by 60 inches; 305 by 1525 mm; 12 by 60 inches (305 by 1525 mm); 305 by 1525 mm (12 by 60 inches); 24 by 72 inches; 610 by 1828 mm; 24 by 72 inches (610 by 1828 mm); 610 by 1828 mm (24 by 72 inches); 24 by 96 inches; 610 by 2440**

mm; 24 by 96 inches (610 by 2440 mm); 610 by 2440 mm (24 by 96 inches); 20 by 60 inches; 508 by 1525 mm; 20 by 60 inches (508 by 1525 mm); 508 by 1525 mm (20 by 60 inches); 30 by 60 inches; 762 by 1524 mm; 30 by 60 inches (762 by 1524 mm); 762 by 1524 mm (30 by 60 inches); _____ inches; _____ mm; _____ inches (_____ mm); and _____ mm (_____ inches)>>.

- e. Panel Thickness: <<**3/4 inch (19 mm)**; _____ inch (_____ mm)>>.
 - f. Edge Profile: <<**FL; SL; AR; or _____**>>.
 - g. Surface Veneer Species: <<**As indicated on Drawings; To be selected from manufacturer's standards; Beech; Maple; Light Cherry; Dark Cherry; Walnut; Red Oak; Light Bamboo; Dark Bamboo; or _____**>>.
 - 1) Factory Finish: <<**Clear sealer; Wood stain as selected; Opaque paint as selected; Semi-transparent paint as selected; As scheduled; or _____**>>.
 - h. Panel Weight: Approximately **3.0 psf (14.65 kg/sq m)**.
 - i. Perforated Panel: Pattern <<**W100; W200; W300; W400; or _____**>>.
 - 1) NRC: <<**0.30; 0.40; 0.60; 0.70; or _____**>>, determined in accordance with ASTM E1264.
 - 2) Spacing: As indicated on drawings.
 - j. Channel Routed Panel: Pattern <<**W500; W500 (Border); W600; W600 (Border); or _____**>>.
 - 1) Spacing: As indicated on drawings.
 - k. Edge Trim
 - 1) True Wood Trim: <<**3-3/4 inches (95 mm); 5-1/4 inches (133 mm); As indicated on drawings; or _____**>> high.
 - l. Products:
 - 1) USG Corporation; True Wood Panels: www.usg.com/ceilings/#sle.
 - 2) _____.
 - 3) _____.
 - 4) Substitutions: <<**See Section 01 6000 - Product Requirements; or Not permitted**>>.
- B. Suspension Systems:
1. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with <<**wall angles and moldings; transition trim; perimeter trim; curtain pockets; hold down clips; stabilizer bars; seismic clips; splices; and _____**>> as required.
 - a. Stabilizer Bars: Manufacturer's <<**standard; locking; accessible; and _____**>> bars designed to provide system rigidity in large module applications.
 - 1) Lengths: As applicable to module dimensions, main tee spacing, and panel sizes of ceiling assemblies specified.
 - b. Materials:
 - 1) Steel Grid: ASTM A653/A653M <<**G30; G60; G90; or _____**>> coating, unless otherwise indicated.
 - 2) Aluminum Grid: Aluminum sheet, ASTM B209/B209M.
 - 3) Stainless Steel Grid: ASTM A666, Type 304.
 - Metal Grid Systems for Seismic Design Categories C, or D, E, F ----
 2. Exposed Acoustical Suspension System: Hot-dipped galvanized steel grid and cap.
 - a. Application(s): <<**Seismic; Fire-resistance-rated assemblies; Seismic and fire-resistance-rated assemblies; or _____**>>.
 - b. Structural Classification: <<**Intermediate-duty; Heavy-duty; or _____**>>, when tested in accordance with ASTM C635/C635M.
 - c. Recycled Materials Content: Classified as containing greater than 50 percent total recycled content. Available for specific sizes and lengths.
 - d. Profile: Tee; <<**15/16 inch (24 mm)**; _____ inch (_____ mm)>> face width.
 - e. Finish: <<**Baked enamel; or _____**>>.

- f. Color: **<<As indicated on drawings; White; To be selected from manufacturer's standards; or _____>>**.
- g. Products:
- 1) USG Corporation; **<<DX; or DXL>>** 15/16 Inch Suspension System: www.usg.com/ceilings/#sle.
 - 2) _____.
 - 3) _____.
 - 4) Substitutions: **<<See Section 01 6000 - Product Requirements; or Not permitted>>**.
3. Exposed Acoustical Suspension System: G90 Hot-dipped galvanized steel grid with aluminum cap.
- a. Application(s): **<<Seismic; Exterior soffit; Seismic and Exterior soffit; Fire-resistance-rated assemblies; Seismic and fire-resistance-rated assemblies; or _____>>**.
 - b. Structural Classification: **<<Intermediate-duty; Heavy-duty; or _____>>**, when tested in accordance with ASTM C635/C635M.
 - c. Recycled Materials Content: Classified as containing greater than 50 percent total recycled content.
 - d. Profile: Tee; **<<15/16 inch (24 mm); _____ inch (_____ mm)>>** face width.
 - e. Finish: **<<Baked-on polyester paint; or _____>>**.
 - f. Color: **<<As indicated on drawings; White; To be selected from manufacturer's standards; or _____>>**.
 - g. Panel Installation Requirements: System designed to accept panels field-cut to size and field-revealed to provide adequate lay-in edges.
 - h. Products:
 - 1) USG Corporation; ZXLA 15/16 Inch Suspension System: www.usg.com/ceilings/#sle.
 - 2) _____.
 - 3) _____.
 - 4) Substitutions: **<<See Section 01 6000 - Product Requirements; or Not permitted>>**.
4. Exposed Acoustical Suspension System: Hot-dipped galvanized steel grid and cap.
- a. Application(s): **<<Seismic; Fire-resistance-rated assemblies; Seismic and fire-resistance-rated assemblies; or _____>>**.
 - b. Structural Classification: **<<Intermediate-duty; Heavy-duty; or _____>>**, when tested in accordance with ASTM C635/C635M.
 - c. Recycled Materials Content: Classified as containing greater than 50 percent total recycled content. Available for specific sizes and lengths.
 - d. Profile: Tee; **<<9/16 inch (14 mm); _____ inch (_____ mm)>>** face width.
 - e. Finish: **<<Baked enamel; or _____>>**.
 - f. Color: **<<As indicated on drawings; White; To be selected from manufacturer's standards; or _____>>**.
 - g. Products:
 - 1) USG Corporation; Centricitee **<<DXT; or DXLT>>** 9/16 Inch Suspension System: www.usg.com/ceilings/#sle.
 - 2) _____.
 - 3) _____.
 - 4) Substitutions: **<<See Section 01 6000 - Product Requirements; or Not permitted>>**.
5. Exposed Acoustical Suspension System: Hot-dipped galvanized steel grid.
- a. Application(s): **<<Seismic; Fire-resistance-rated assemblies; Seismic and fire-resistance-rated assemblies; or _____>>**.
 - b. Structural Classification: **<<Intermediate-duty; Heavy-duty; or _____>>**, when tested in accordance with ASTM C635/C635M.

- c. Recycled Materials Content: Classified as containing greater than 50 percent total recycled content. Available for specific sizes and lengths.
 - d. Profile: Slotted Reveal Tee; <<**9/16 inch (14 mm)**>> _____ inch (_____ mm)>> face width, with **1/4 inch (6.35 mm)** wide center reveal.
 - e. Intersections: Mitered.
 - f. Finish: <<**Baked enamel**>> or _____>>.
 - g. Color: <<**As indicated on drawings; White; To be selected from manufacturer's standards**>> or _____>>.
 - h. Products:
 - 1) USG Corporation Finline <<**DXF**>> or **DXLF**>> Suspension System: www.usg.com/ceilings/#sle.
 - 2) _____.
 - 3) _____.
 - 4) Substitutions: <<**See Section 01 6000 - Product Requirements; or Not permitted**>>.
6. Exposed Acoustical Suspension System: Hot-dipped galvanized steel grid.
- a. Application(s): <<**Seismic**>> or _____>>.
 - b. Structural Classification: <<**Intermediate-duty; Heavy-duty**>> or _____>>, when tested in accordance with ASTM C635/C635M.
 - c. Recycled Materials Content: Classified as containing greater than 50 percent total recycled content.
 - d. Profile: Slotted Reveal Tee; <<**9/16 inch (14 mm)**>> _____ inch (_____ mm)>> face width, with **1/8 inch (3.2 mm)** wide center reveal.
 - e. Intersections: Mitered.
 - f. Finish: <<**Baked enamel**>> or _____>>.
 - g. Color: <<**As indicated on drawings; White; To be selected from manufacturer's standards**>> or _____>>.
 - h. Products:
 - 1) USG Corporation; Finline DXFF Suspension System: www.usg.com/ceilings/#sle.
 - 2) _____.
 - 3) _____.
 - 4) Substitutions: <<**See Section 01 6000 - Product Requirements; or Not permitted**>>.
7. Exposed Acoustical Suspension System: G90 Hot-dipped galvanized steel grid.
- a. Application(s): <<**Seismic; Interior; Exterior soffit; Seismic and interior; Seismic and exterior soffit**>> or _____>>.
 - b. Structural Classification: <<**Intermediate-duty; Heavy-duty**>> or _____>>, when tested in accordance with ASTM C635/C635M.
 - c. Recycled Materials Content: Less than 50 percent.
 - d. Wind Load Testing: Tested in accordance with UL 580 and UL 1897.
 - e. Florida Building Code: Tested in accordance with FBC TAS 202 and FBC TAS 203 protocols.
 - f. Profile: Slotted Reveal Tee; <<**9/16 inch (14 mm)**>> _____ inch (_____ mm)>> face width, with black color **1/4 inch (6.35 mm)** wide center reveal.
 - g. Compatibility: USG Celebration Snap-in Metal Panels.
 - h. Compatibility: USG Celebration Torsion-Spring Metal Panels.
 - i. Reveal Spacers: Manufacturer's standard spacers designed for installation adjacent to a cut perimeter panel or to air diffuser or light fixture.
 - j. Finish: <<**Baked-on polyester paint**>> or _____>>.
 - k. Color: <<**As indicated on drawings; White; To be selected from manufacturer's standards**>> or _____>>.
 - l. Products:

- 1) USG Corporation Finline DXFEV Suspension System:
www.usg.com/ceilings/#sle.
 - 2) _____.
 - 3) _____.
 - 4) Substitutions: <<See Section 01 6000 - Product Requirements; or **Not permitted**>>.
8. Exposed Suspension System: Hot-dipped galvanized steel grid and cap.
- a. Application(s): <<**Seismic**; or _____>>.
 - b. Structural Classification: <<**Intermediate-duty**; **Heavy-duty**; or _____>>, when tested in accordance with ASTM C635/C635M.
 - c. Recycled Materials Content: Classified as containing greater than 50 percent total recycled content.
 - d. Profile: Double reveal Tee; <<**9/16 inch (14 mm)**; _____ inch (_____ mm)>> face width.
 - e. Intersections: Seamless reveal.
 - f. Finish: <<**Baked enamel**; or _____>>.
 - g. Color: <<**As indicated on drawings**; **White**; To be selected from manufacturer's standards; or _____>>.
 - h. Products:
 - 1) USG Corporation; Identitee DXI Suspension System:
www.usg.com/ceilings/#sle.
 - 2) _____.
 - 3) _____.
 - 4) Substitutions: <<See Section 01 6000 - Product Requirements; or **Not permitted**>>.
9. Exposed Suspension System: Hot-dipped galvanized steel grid and cap<< **factory-applied closed-cell foam gaskets**; _____; or **None - N/A**>>.
- a. Application(s): <<**Seismic**; **Cleanroom**; **Seismic and cleanroom**; or _____>>.
 - b. Structural Classification: <<**Intermediate-duty**; **Heavy-duty**; or _____>>, when tested in accordance with ASTM C635/C635M.
 - c. Clean Room Classification: ISO 14644-1, <<**Class 5**; or **Class** _____>>.
 - d. Recycled Materials Content: Classified as containing greater than 50 percent total recycled content.
 - e. Profile: Tee; <<**1-1/2 inch (38 mm)**; _____ inch (_____ mm)>> face width.
 - f. Finish: <<**Baked enamel**; or _____>>.
 - g. Color: <<**As indicated on drawings**; **White**; To be selected from manufacturer's standards; or _____>>.
 - h. Products:
 - 1) USG Corporation; CE 1-1/2 Inch Suspension System:
www.usg.com/ceilings/#sle.
 - 2) _____.
 - 3) _____.
 - 4) Substitutions: <<See Section 01 6000 - Product Requirements; or **Not permitted**>>.
10. Exposed Suspension System: Hot-dipped galvanized steel grid and cap.
- a. Application(s): <<**Seismic**; or _____>>.
 - b. Structural Classification: <<**Intermediate-duty**; **Heavy-duty**; or _____>>, when tested in accordance with ASTM C635/C635M.
 - c. Recycled Materials Content: Classified as containing greater than 50 percent total recycled content.
 - d. Profile: Tee; <<**1-1/2 inch (38 mm)**; _____ inch (_____ mm)>> face width.
 - e. Finish: <<**Baked enamel**; or _____>>.
 - f. Color: <<**As indicated on drawings**; **White**; To be selected from manufacturer's standards; or _____>>.

- g. Products:
 - 1) USG Corporation; DXW 1-1/2 Inch Suspension System:
www.usg.com/ceilings/#sle.
 - 2) _____.
 - 3) _____.
 - 4) Substitutions: <<See Section 01 6000 - Product Requirements; or Not permitted>>.
- 11. Exposed Suspension System: Hot-dipped galvanized steel grid with aluminum cap<<
factory-applied white closed-cell foam gaskets;; _____; or None - N/A>>.
 - a. Application(s): <<**Seismic; Cleanroom; Fire-resistance-rated assemblies; Seismic and cleanroom; Cleanroom and fire-resistance-rated assemblies; Seismic and fire-resistance-rated assemblies; Seismic, cleanroom, and fire-resistance-rated assemblies; or _____**>>.
 - b. Structural Classification: <<**Intermediate-duty; Heavy-duty; or _____**>>, when tested in accordance with ASTM C635/C635M.
 - c. Recycled Materials Content: Classified as containing greater than 50 percent total recycled content.
 - d. Clean Room Classification: ISO 14644-1, <<**Class 5; or Class _____**>>.
 - e. Profile: Tee; <<**15/16 inch (24 mm); _____ inch (_____ mm)**>> face width.
 - f. Finish: <<**Baked enamel; or _____**>>.
 - g. Color: <<**As indicated on drawings; White; To be selected from manufacturer's standards; or _____**>>.
 - h. Products:
 - 1) USG Corporation; <<**DXLA; or DXACE**>> 15/16 Inch Suspension System:
www.usg.com/ceilings/#sle.
 - 2) _____.
 - 3) _____.
 - 4) Substitutions: <<See Section 01 6000 - Product Requirements; or Not permitted>>.
- 12. Seismic Clips: Manufacturer's standard clips designed to provide a rigid connection between suspension grid tees and wall moldings.
----- Nonseismic Grid Systems -----
- 13. Exposed Suspension System: Aluminum grid and cap<<
factory-applied closed-cell foam gaskets;; _____; or None - N/A>>.
 - a. Application(s): <<**Cleanroom; Nonmagnetic environment; or _____**>>.
 - b. Structural Classification: <<**Light-duty; Intermediate-duty; or _____**>>, when tested in accordance with ASTM C635/C635M.
 - c. Clean Room Classification: ISO 14644-1, <<**Class 5; or Class _____**>>.
 - d. Recycled Materials Content: Classified as containing greater than 50 percent total recycled content.
 - e. System meets USDA/FSIS requirements.
 - f. System meets FGI <<**Guidelines for Design and Construction of Hospitals; Guidelines for Design and Construction of Outpatient Facilities; Guidelines for Design and Construction of Residential Health, Care, and Support Facilities; or _____**>>.
 - g. System is capable of withstanding cleaning and disinfecting chemicals.
 - h. Profile: Tee; <<**15/16 inch (24 mm); 9/16 inch (14 mm); _____ inch (_____ mm)**>> face width.
 - i. Recycled Materials Content: Up to 90 percent.
 - j. Finish: <<**Baked enamel; or _____**>>.
 - k. Color: <<**As indicated on drawings; White; To be selected from manufacturer's standards; or _____**>>.
 - l. Accessories: Quick-release clips.
 - m. Products:

- 1) USG Corporation; <<**AX**; or **AXCE**>> 15/16 Inch Suspension System:
www.usg.com/ceilings/#sle.
 - 2) _____.
 - 3) _____.
 - 4) Substitutions: <<See Section 01 6000 - Product Requirements; or **Not permitted**>>.
14. Exposed Suspension System: Stainless steel grid and cap.
- a. Application(s): <<**High humidity conditions; Cleanroom; Nonmagnetic environment; or _____**>>.
 - b. Structural Classification: <<**Light-duty; Intermediate-duty; Heavy-duty; or _____**>>, when tested in accordance with ASTM C635/C635M.
 - c. Recycled Materials Content: Less than 50 percent.
 - d. Profile: Tee; <<**15/16 inch (24 mm); _____ inch (_____ mm)**>> face width.
 - e. Finish: <<**Manufacturer's standard polished finish; Manufacturer's standard brushed finish; or _____**>>.
 - f. Accessories: Quick-release clips.
 - g. Products:
 - 1) USG Corporation; DXSS 15/16 Inch Suspension System:
www.usg.com/ceilings/#sle.
 - 2) _____.
 - 3) _____.
 - 4) Substitutions: <<See Section 01 6000 - Product Requirements; or **Not permitted**>>.
15. Concealed Suspension System: Hot-dipped galvanized steel grid and cap.
- a. Application(s): <<**Fire-rated assemblies; or _____**>>.
 - b. Structural Classification: <<**Intermediate-duty; Heavy-duty; or _____**>>, when tested in accordance with ASTM C635/C635M.
 - c. Recycled Materials Content: Less than 50 percent.
 - d. Profile: Tee; <<**15/16 inch (24 mm); _____ inch (_____ mm)**>> face width.
 - e. Finish: <<**Baked enamel; or _____**>>.
 - f. Color: <<**White; or _____**>>.
 - g. Products:
 - 1) USG Corporation; <<**DX**; or **DXL**>> 15/16 Inch Concealed Suspension System:
www.usg.com/ceilings/#sle.
 - 2) _____.
 - 3) _____.
 - 4) Substitutions: <<See Section 01 6000 - Product Requirements; or **Not permitted**>>.
16. Panels and Exposed Suspension System for "Cloud" Applications: Lay-in panels and galvanized steel grid and cap; perimeter trim as specified under Accessories.
- a. Layout: <<**As indicated on drawings; Rectangles; Rectangles with rounded corners; or _____**>>.
 - b. Panels: Precut panels.
 - 1) Edges: <<**SQ; SL; SLT; or SLB**>>.
 - 2) Color: <<**White; or _____**>>.
 - c. Suspension System: DX <<**15/16 inch (24 mm); _____ inch (_____ mm)**>> face width.
 - 1) Structural Classification: <<**Intermediate-duty; Heavy-duty; or _____**>>, when tested in accordance with ASTM C635/C635M.
 - 2) Finish: <<**Baked enamel; or _____**>>.
 - d. Perimeter Trim: Compasso Elite.
 - e. Products:
 - 1) USG Corporation <<**Compositions Decorative Cloud System;; _____; or None - N/A**>>: www.usg.com/ceilings/#sle.
 - 2) _____.

- 3) _____.
 - 4) Substitutions: <<See Section 01 6000 - Product Requirements; or **Not permitted**>>.
17. Enclosure for Recessed Ceiling Fixtures: Mineral fiber insulation box enclosure with foil facing on exterior side for placement over recessed ceiling light fixture; flame spread index of 25 and smoke development index of 0 (zero) when tested in accordance with ASTM E84.
- a. Light Fixture Size: <<**24 by 24 inches (610 by 610 mm); 24 by 48 inches (610 by 1219 mm);** ___ by ___ inch (___ by ___ mm); or **As indicated on drawings**>>.
 - b. Insulation Thickness: <<**1-1/4 inch (31.8 mm);** ___ inch (___ mm)>>, nominal.
 - c. Thermal Resistance: **R-value (RSI-value)** of <<**4.2 degrees F hr sq ft/Btu (0.74 K sq m/W);** ___ degrees F hr sq ft/Btu (___ K sq m/W)>> per inch at <<**75 degrees F (24 degrees C);** ___ degrees F (___ degrees C)>>, minimum, when tested according to ASTM C518.
 - d. Provide enclosure with documented noise reduction coefficient (NRC) in accordance with ASTM C423 of at least <<**1.00; or** ___>> at **1 inch (25.4 mm)** thick.
 - e. Provide enclosure with documented ceiling attenuation class (CAC) in accordance with ASTM E1414/E1414M.
 - f. Manufacturers:
 - 1) _____.
 - 2) _____.
 - 3) _____.
 - 4) Substitutions: <<See Section 01 6000 - Product Requirements; or **Not permitted**>>.
- C. Moldings and Trim:
1. Edge Molding<<, **Expansion Joints;**, or **None - N/A**>> and Splices - General: Same material, thickness, and finish as metal pan panels, unless otherwise indicated.
 2. Perimeter Wall Moldings: <<**Same metal and finish as grid; Aluminum; or** _____>>.
 - a. Size: As required for installation conditions<< **and specified Seismic Design Category; and** _____; or **None - N/A**>>.
 - b. Angle Moldings: L-shaped, for mounting at same elevation as face of grid.
 - c. Shadow Moldings: Shaped to create a perimeter reveal.
 - d. Channel Moldings: U-shaped, for hold-down type installations.
 - e. Gaskets For Perimeter Moldings: Closed-cell foam, factory-applied to molding.
 - f. Acoustical Sealant For Perimeter Moldings: Nonhardening, nonskinning, for use in conjunction with suspended ceiling system.
 3. Metal Transition Trim: Steel or extruded aluminum; provide attachment clips, splice plates and preformed corner pieces for complete trim system.
 - a. Trim Height: <<**2-1/4 inch (57 mm); 4 inch (102 mm); 6 inch (152 mm); 8 inch (203 mm); 10 inch (254 mm);** _____ inch (_____ mm)>>.
 - b. Finish: <<**Baked enamel;** or _____>>.
 - c. Color: <<**White;** or _____>>.
 - d. Products:
 - 1) USG Corporation; Compasso Elite Transitions - Acoustical to Acoustical: www.usg.com/ceilings/#sle.
 - 2) USG Corporation; Compasso Elite Transitions - Acoustical to Drywall: www.usg.com/ceilings/#sle.
 - 3) USG Corporation; Compasso Elite Drywall: www.usg.com/ceilings/#sle.
 - 4) _____.
 - 5) Substitutions: <<See Section 01 6000 - Product Requirements; or **Not permitted**>>.
 4. Metal Perimeter Trim for "Cloud" Suspension Systems: Steel or extruded aluminum; provide attachment clips, splice plates, and preformed corner pieces for complete trim system.

- a. Trim Height: <<**2-1/4 inches (57 mm); 4 inches (102 mm); 6 inches (152 mm); 8 inches (203 mm); 10 inches (254 mm); _____ inches (_____ mm)**>>.
- b. Finish: <<**Baked enamel; or _____**>>.
- c. Color: <<**White; or _____**>>.
- d. Products:
 - 1) USG Corporation; Compasso Suspension Trim - Standard: www.usg.com/ceilings/#sle.
 - 2) USG Corporation; Compasso Suspension Trim - Slim: www.usg.com/ceilings/#sle.
 - 3) USG Corporation; Compasso Suspension Trim - Elite: www.usg.com/ceilings/#sle.
 - 4) USG Corporation; Compasso Suspension Trim - Elite with Island Accent Lighting: www.usg.com/ceilings/#sle.
 - 5) _____.
 - 6) Substitutions: <<**See Section 01 6000 - Product Requirements; or Not permitted**>>.
5. Metal Curtain Pocket Trim: Steel or extruded aluminum; provide attachment clips, splice plates, and preformed corner pieces for complete trim system.
 - a. Type: <<**Three-sided; Two-sided; One-sided; As indicated on drawings; or _____**>>.
 - b. Closure Plate Size: <<**2 inches (51 mm); 3 inches (76 mm); 4 inches (102 mm); _____ inches (_____ mm)**>>.
 - c. Extension Trim Height: <<**4 inches (102 mm); 6 inches (152 mm); 8 inches (203 mm); _____ inches (_____ mm)**>>.
 - d. Finish: <<**Baked enamel; or _____**>>.
 - e. Color: <<**White; or _____**>>.
 - f. Products:
 - 1) USG Corporation; Compasso Elite Curtain Pocket: www.usg.com/ceilings/#sle.
 - 2) _____.
 - 3) _____.
 - 4) Substitutions: <<**See Section 01 6000 - Product Requirements; or Not permitted**>>.
6. Wood Veneer Perimeter Trim: Field cut wood veneer panels to match acoustic ceiling panels.
 - a. Support: Aluminum L angle, **1/8 inch (3.2 mm)** thick.
7. Trim Accessories: Manufacturer's standard clips, cleats splice plates, extension plates, closure plates, corner pieces, and similar accessories required for a complete installation.

2.05 ACOUSTICAL WALL SYSTEMS

- A. Sound-Absorbing Gypsum Board Wall System: Perforated gypsum board with acoustic backer panels and spray-applied finish.
 1. Thickness, Perforated Gypsum Board: <<**5/8 inch (16 mm); _____ inch (_____ mm)**>>.
 2. Spray-Applied Finish: Acoustically transparent, acrylic based finish coating.
 3. Noise Reduction Coefficient (NRC): Not less than <<**0.80; 0.85; or _____**>> when measured and calculated in accordance with ASTM C423.
 4. Installation Method: <<**1-inch (25.4 mm); 2-inch (50.8 mm)**>> Z-furring direct-mount system.
 5. Backer Panels: Ensemble High-NRC backer panels, <<**1 inch (25.4 mm); 2 inches (50.8 mm)**>> thick.
 6. Installation Accessories: Manufacturer's standard.
 7. Products:
 - a. USG Corporation; Ensemble Acoustical Drywall Direct-Mount Wall System: www.usg.com/#sle.
 - b. _____.
 - c. _____.

- d. Substitutions: <<**See Section 01 6000 - Product Requirements; or Not permitted**>>.
- B. Sound-Absorbing Gypsum Board Wall System: Perforated gypsum board with acoustic backer panels.
1. Thickness, Perforated Gypsum Board: <<**1/2 inch (13 mm)**; _____ inch (_____ mm)>>.
 2. Noise Reduction Coefficient (NRC): Not less than <<**0.55; 0.60; 0.65; 0.70; or _____**>> when measured and calculated in accordance with ASTM C423.
 3. Installation Method: <<**1-inch (25.4 mm); 2-inch (50.8 mm)**>> Z-furring direct-mount system.
 4. Backer Panels: Ensemble High-NRC backer panels, <<**1 inch (25.4 mm); 2 inches (50.8 mm)**>> thick.
 5. Installation Accessories: Manufacturer's standard.
 6. Products:
 - a. USG Corporation; Danoline Acoustical Perforated Drywall Direct-Mount Wall System: www.usg.com/#sle.
 - b. _____.
 - c. _____.
 - d. Substitutions: <<**See Section 01 6000 - Product Requirements; or Not permitted**>>.
- C. Sound-Absorbing Wood Wool Wall System: Magnesite-bonded wood wool with acoustic backer panels.
1. Panel Size: <<**As indicated on drawings; 24 inches by 48 inches (2 by 4) panel (610 mm by 1219 mm); 24 inches by 96 inches (2 by 8) plank (610 mm by 2438 mm); _____ inches by _____ inches (_____ mm by _____ mm)**>>.
 2. Panel Thickness: <<**5/8 inch (16 mm); 1 inch (25 mm); 1-3/8 inches (35 mm); _____ inch (_____ mm)**>>.
 3. Edges Configuration: <<**BEV/BEV; BEV/SQ; or _____**>>.
 4. Texture: <<**Heradesign 1 (Super Fine Texture); Heradesign 2 (Fine Texture); Heradesign 3 (Macro Texture); Heradesign micro; Heradesign plano; or _____**>>.
 5. Test Mounting: <<**Type A; Type D-20; Type C-20; Type C-40; or Type _____**>>.
 6. Noise Reduction Coefficient (NRC): Not less than <<**0.50; 0.55; 0.75; 0.80; 0.85; 0.90; or _____**>> when measured and calculated in accordance with ASTM C423.
 7. Installation Method: <<**1-inch (25.4 mm); 2-inch (50.8 mm)**>> Z-furring direct-mount system.
 8. Installation Accessories: Manufacturer's standard.
 9. Products:
 - a. USG Corporation; Heradesign Wood Wool Direct-Mount Wall Panels: www.usg.com/ceilings/#sle.
 - b. _____.
 - c. _____.
 - d. Substitutions: <<**See Section 01 6000 - Product Requirements; or Not permitted**>>.

2.06 ACCESSORIES

- A. Support Channels, Carriers, and Hangers: <<**Galvanized; or Primed**>> steel; size and type to suit application<<, **seismic requirements;**, or **None - N/A**>> and ceiling system flatness requirement specified.
- B. Hat-Shaped Metal Channels: Steel, <<**22 gauge, 0.0299 inch (0.76 mm)**; _____ gauge, _____ inch (_____ mm)>>, minimum.
- C. Suspension Wire<< **and Rope; or None - N/A**>>: Size and type as required for application<<, **seismic requirements;**, or **None - N/A**>> and ceiling system flatness requirement specified.
1. Concealed Suspension:

- a. Suspension Wire: Steel, annealed, <<galvanized; or plain>> finish, <<12 gauge, 0.0808 (2.05 mm); 9 gauge, 0.1144 inch (2.91 mm); ___ gauge, ___ inch (___ mm)>> diameter, complying with ASTM A641/A641M.
2. Exposed (To View) Suspension:
 - a. Suspension Wire: Stainless steel, <<18 gauge, 0.0403 (1.02 mm); ___ gauge, ___ inch (___ mm)>> diameter, complying with ASTM A580/A580M.
 - b. Suspension Rope: 1/32 inch (0.8 mm) stainless steel rope wire complying with ASTM A492, with <<loop and crimp-end; turnbuckle; wire crimp; or _____>> connection.
- D. Compression Framing and Bracing: Metal stud sizes, gauges, and spacings as determined by qualified structural design professional and complying with applicable codes.
- E. Compression Posts: 3.4 inch (19 mm) nominal diameter EMT conduit, lengths as required by installation conditions.
 1. Adapters: Manufacturer's standard adapters designed to connect post to suspension carrier member.
- F. Hold-Down Clips: Manufacturer's standard clips to suit application.
- G. Seismic Clips: Manufacturer's standard clips for seismic conditions and to suit application.
- H. Drywall Ceiling Installation Accessories: Products recommended by gypsum board manufacturer.
 1. Close Mount Attachment Clips: Manufacturer's standard clips used in tight plenum applications to provide strong deck support connection without the use of hanger wires.
 2. Drywall Grid Locking Channels: Manufacturer's standard channels with an engineered locking pocket for connecting tees to the perimeter of ceiling, without using fasteners.
- I. Unopposed Tee Attachment Clip: Manufacturer's standard clip designed to create code-compliant cross tee connections when a cross tee is installed in a main tee without another cross tee directly opposite ("ashlar" installations).
- J. Wood Veneer Panel Safety Clips: Galvanized 1-9/16 by 5-1/2 inch (40 by 139 mm) bent sheet metal clips screw anchored to back of adjacent panels and spanning over top of suspended tee grid.
 1. Wire Ties: No.12 galvanized wire.
- K. Acoustical Insulation: <<Specified in Section 07 2100; or ASTM C665, friction fit type, unfaced batts>>.
 1. Thickness: <<2 inches (51 mm); 6 inches (152 mm); ___ inches (___ mm)>>.
 2. Size: To fit acoustical suspension system.
- L. Thermal Insulation: Specified in <<Section 07 2100; or _____>>.
- M. Thermal Insulation: ASTM C665, preformed <<glass; or mineral>> fiber <<batt; or roll>>;<<friction fit; or None - N/A>> complying with the following:
 1. Thermal Resistance: R-value (RSI-value) of ____ (____).
 2. <<Batt; or Roll>> Size: ___ by ___ inch (___ by ___ mm).
 3. Facing: Unfaced<< at _____; or None - N/A>>.
 4. Facing: Faced on one side with <<foil; asphalt treated Kraft paper; black plastic; mesh reinforced Kraft paper; or _____>><< at _____; or None - N/A>>.
- N. Gypsum Board and Framing Materials: See Section 09 2116.
- O. Touch-Up Paint for Exposed Surfaces: Type and color to match acoustical units and suspension system grid and trim elements.
- P. Touch-Up Paint For Concealed Items: <<Zinc rich; Zinc oxide; or _____>> type, as recommended by ceiling system manufacturer.

2.07 FABRICATION

- A. Shop fabricate ceiling<< and wall; or None - N/A>> components to the greatest extent possible.

- B. Fabricate components to allow access to ceiling plenum as required.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that layout of hangers will not interfere with other work.
- C. Verify that field measurements are as **<<indicated; indicated on shop drawings; instructed by the manufacturer; or _____>>**.
- D. Start of installation constitutes acceptance of project conditions.

3.02 PREPARATION

- A. Coordinate the location of hangers with other work.
- B. Provide hanger clips during steel deck erection. Provide for anticipated additional hangers and inserts as required.
- C. Install ceiling system after major above-ceiling work is complete.
- D. Acclimate wood ceiling materials by removing from packaging in installation area a minimum of **<<48 hours; 72 hours; or _____>>** prior to installation.

3.03 INSTALLATION - SUSPENSION SYSTEM

- A. Install suspension system in accordance with **<<ASTM C636/C636M; ASTM E580/E580M; and manufacturer's instructions>>** and as supplemented in this section.
- B. Install hangers and inserts coordinated with overhead work. Provide additional hangers and supports as required.
- C. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of **<<1:360; 1:240; or _____>>**.
- D. Lay out system to a balanced grid design with edge units no less than 50 percent of acoustical unit size.
- E. Locate system on room axis according to reflected ceiling plan.
- F. Suspension System, Nonseismic: Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- G. Seismic Suspension System, Seismic Design Category C: Hang suspension system independent of walls, columns, ducts, pipes and conduit. Maintain a **3/8 inch (9 mm)** clearance between grid ends and wall.
- H. Seismic Suspension System, Seismic Design Categories D, E, F: Hang suspension system with grid ends attached to the perimeter molding on two adjacent walls; on opposite walls, maintain a **3/4 inch (19 mm)** clearance between grid ends and wall.
- I. Where ducts, facility services, or equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers **<<and related carrying channels; or None - N/A>>** to span the extra distance.
- J. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- K. Support fixture loads using supplementary hangers located within **<<6 inches (152 mm); _____ inches (_____ mm)>>** of each corner, or support components independently.
- L. Do not eccentrically load system or induce rotation of runners.
- M. Form expansion joints **<<as detailed; or _____>>**. Form to accommodate plus or minus **<<1 inch (25 mm); _____ inch (_____ mm)>>** movement. Maintain visual closure.
- N. Install unopposed tee attachment clips at appropriate locations to enable installation of acoustical units in an ashlar pattern.

- O. Edge Moldings: Install at intersection of ceiling and vertical surfaces and penetrations, using components of maximum length; set level. << Provide edge moldings at junction with other ceiling finishes.; or None - N/A>><< Miter corners.; or None - N/A>><< Provide preformed edge closures to match bullnosed cornered partitions.; or None - N/A>>
1. Install <<in bed of acoustical sealant; or with continuous gasket>>.
 2. Use longest practical lengths.
 3. <<Miter; Overlap; or Overlap and rivet>> corners.
- P. Install light fixture boxes constructed of <<gypsum board; acoustical panel; or _____>> above light fixtures in accordance with fire rated assembly requirements and light fixture ventilation requirements.

3.04 INSTALLATION - ACOUSTICAL UNITS

- A. Install acoustical units in accordance with manufacturer's instructions.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Lay directional patterned units <<with pattern parallel to longest room axis; with pattern parallel to shortest room axis; in basket weave pattern; or _____>>.
- D. Fit edge trim neatly against abutting surfaces.
- E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- F. Cutting Acoustical Units:
1. Cut to fit irregular grid and perimeter edge trim.
 2. Make field cut edges of same profile as factory edges.
 3. Double cut and field paint exposed reveal edges.
- G. Where <<round obstructions; bullnose concrete block corners; and _____>> occur, provide preformed closures to match perimeter molding.
- H. Lay acoustical insulation for a distance of <<48 inches (1219 mm); _____ inches (_____ mm)>> either side of acoustical partitions << as indicated; or None - N/A>>.
- I. Install hold-down clips on each acoustical unit to retain it tight to grid system; comply with fire rating requirements.
- J. Install hold-down clips on acoustical units within <<20 ft (6 m); _____ ft (_____ m)>> of an exterior door.
- K. Install safety clips on wood veneer panels 2 inches (51 mm) from outside edge of panel and at 24 inches (610 mm) on center.
1. Use wire ties to attach safety clips.
- L. Install wood veneer trim using aluminum L-angle to attach to suspended grid system as required for application.

3.05 INSTALLATION - DIRECT-MOUNTED SOUND-ABSORBING GYPSUM BOARD CEILING FRAMING

- A. Install framing members in accordance with ASTM C754 and manufacturer's instruction.
- B. Install framing and accessories plumb, and true to line, with connections securely fastened.
- C. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.
- D. Determine the finished ceiling height. If the ceiling extends to the sidewalls, screw attach wall angles to the sidewalls at recommended distance above the finished ceiling height. Fasteners must be in the framing members.
- E. Confirm substrates are level within their installation tolerances. Shim as required. Attach Z-Furring channels maximum 24 inches (610 mm) on center.

- F. <<Screw attach; Adhere; or _____>> insulation impaling clips substrates, maximum **48 inches (1219 mm)** on center along the length of the Z-Furring channel. Butt-up impaling clips to the bottom leg of the Z-Furring.
- G. Backer Panel Installation: Place the bottom of the panels in the open leg of the Z-furring. While sliding it into the Z-Furring gap, also press the High-NRC Backer into the impaling clip to secure it in place.

3.06 INSTALLATION - SUSPENDED SOUND-ABSORBING GYPSUM BOARD CEILING FRAMING

- A. Install suspension system in accordance with <<ASTM C636/C636M; ASTM E580/E580M; and manufacturer's instructions>> and as supplemented in this section.
- B. Framing for Items by Other Installers: Install supplementary framing and blocking as required to support fixtures, equipment services, demountable partition supports, or similar construction.
- C. System Bracing: Install bracing at terminations in assemblies.
- D. Planar Suspended System:
 - 1. Determine the finished ceiling height. If the ceiling extends to the sidewalls, screw attach wall angles to the sidewalls at recommended distance above the finished ceiling height. Fasteners must be in the framing members. Attach hanger wires to structure above using method appropriate for material of structure. Space hanger wires maximum **48 inches (1219 mm)** on center in each direction.
 - 2. Secure the cross tees to the indexed support bars by snapping the clip into the cross tee holes on the main tee.
 - 3. Space the cross tees at **24 inches (610 mm)** on center. If the ceiling extends wall to wall, square up the main tees and screw attach to wall angle.
- E. Curved Suspended System:
 - 1. Determine the finished ceiling heights. If the ceiling extends to the sidewalls, screw attach wall angles to the sidewalls at recommended distance above the finished ceiling height. Fasteners must be in the framing members. Attach hanger wires to structure above using method appropriate for material of structure. For vaults, space hanger wires such that they are **48 inches (1219 mm)** on center along the arc of the curve. For valleys, space hanger wires **24 inches (610 mm)** on center.
 - 2. Secure the cross tees to the indexed support bars by snapping the clip into the cross tee holes on the main tee.
 - 3. Space the cross tees at **12 inches (305 mm)** on center. If the ceiling extends wall to wall, square up the main tees and screw attach to wall angle.
- F. Backer Panel Installation: Lay backer panels in the framing system from above on the back of the flanges of the main tees, similarly to installing standard lay-in ceiling panels. Do not screw attach backer panels to main tees.
- G. Perimeter Trim Installation: At perimeter of gypsum board ceilings that do not terminate at a wall, install specified trim. Attach trim pieces to grid members using manufacturer's standard accessories designed for that purpose.

3.07 INSTALLATION - SOUND-ABSORBING GYPSUM BOARD WALL SYSTEM FRAMING

- A. Install framing members in accordance with ASTM C754 and manufacturer's instruction.
- B. Install framing and accessories plumb, and true to line, with connections securely fastened.
- C. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.
- D. Determine the finished ceiling height. If the ceiling extends to the sidewalls, screw attach wall angles to the sidewalls at recommended distance above the finished ceiling height. Fasteners must be in the framing members.
- E. Confirm substrates are plumb within their installation tolerances. Shim as required. Attach Z-Furring channels maximum **24 inches (610 mm)** on center.

- F. <<Screw attach; Adhere; or _____>> insulation impaling clips substrates, maximum **48 inches (1219 mm)** on center along the length of the Z-Furring channel. Butt-up impaling clips to the bottom leg of the Z-Furring.
- G. Backer Panel Installation: Place the bottom of the panels in the open leg of the Z-furring. While sliding it into the Z-Furring gap, also press the High-NRC Backer into the impaling clip to secure it in place.

3.08 INSTALLATION - SOUND-ABSORBING GYPSUM BOARD AND ACOUSTICALLY-TRANSPARENT FINISH

- A. Gypsum Board Installation - General: Comply with <<ASTM C840; GA-216; manufacturer's instructions; and _____>>.
 - 1. Cut boards according to manufacturer's instructions.
 - 2. Do not make marks in the field of the panels without covering them with system's recommended compound prior to spraying.
 - 3. Fasten the perforated boards using bugle-head screws at spacing recommended by manufacturer. Fasten in the field of the board, not the perforations. Ensure that the fastener heads will be below the surface without tearing the fiberglass scrim.
- B. Curved Suspension System Installation: Use **8-foot (2438 mm)** long boards. Bend boards to the radius of suspension system. Wetting of boards is not required..
- C. Spray-Applied Finish:
 - 1. Use spray equipment recommended by system manufacturer to achieve specified acoustics and esthetics.
 - 2. Mask off surfaces that need protecting from overspray with plastic sheathing. Use a floor protector as required. Set up the spray machine and compressor using the proper hoses. Set the air and material pressure to achieve desired finish.
 - 3. Mix finish materials thoroughly prior to application. Blend the finish until it has a smooth, creamy consistency. Potable water up to amount recommended by manufacturer may be added to achieve the proper spray consistency.
 - 4. Check for proper consistency using a material thickness gauge provided by the spray equipment manufacturer (small steel ball). If the ball sinks completely, the fine finish is ready to spray. If the ball does not sink within 3 seconds, add more water (approximately **4 liquid ounces (120 mL)** at a time) and mix thoroughly until the ball sinks.
 - 5. Prime sprayer equipment with amount of clean potable water recommended by finish manufacturer. Prepare the spray gun for application as recommended to ensure finish is flowing smoothly through the machine.
 - 6. Apply finish in a minimum of four coats to achieve proper appearance and sound performance. Apply each coat very lightly with **36 inches (900 mm)** minimum gun clearance. Start in one corner and work progressively across the ceiling. Immediately cross hatch. Once the finish is dry to the touch (approx. 20 to 40 minutes), use a drywall squeegee to remove excess spray droplets, then recoat using the same technique. Apply successive coats until the desired appearance is achieved and the perforations are no longer visible through the finish.
 - 7. After the final coat, wait 24 hours and then remove any minor irregularities with a soft rubber-bladed squeegee trowel.
 - 8. At applications with perimeter trim, extend finish to coat visible portions of the trim.

3.09 INSTALLATION OF TRANSITION TRIM

- A. After the grids are installed, for each grid end that meets the transition trim, insert one tee attachment clip into the lower and upper bosses and secure the set screw. Leave enough tension for adjustment.
- B. At drywall suspension systems install gypsum panels after the transition trim is installed.
- C. Secure a tee attachment clip to each grid member that will connect to the transition trim. Install one framing screw into the center of the slotted screw hole. Leave enough tension so the

attachment clip can be adjusted if needed. Follow manufacturer's instructions when aligning the attachment clip.

- D. Install the splice plates by sliding them into the bosses at the end of each transition trim joint. Loosely tighten the set screws and align the system square and true.

3.10 INSTALLATION OF PERIMETER "CLOUD" TRIM

- A. General: Install in accordance with manufacturer's instructions.
1. Examine the reflected ceiling layout and carefully plan the layout of the trim on the ceiling grid.
 2. Lay trim segments on top of the grid in the desired pattern and temporarily secure them in place.
 3. Temporarily splice the segments together.
 4. Assemble trim system, arranging the trim into smooth curves.
 5. Mark and cut the suspension grid.
 6. Install an attachment clip to each cut end of the grid. Attach the clip to trim section segment.
 7. Join trim and permanently splice the segments together.
- B. 10-Inch and 12-Inch Trim:
1. Support segments by attaching diagonal braces to the installation clips using fasteners recommended by manufacturer. Attach one end of the brace to back of trim segment and the other to the tee. Ensure that the clip remains at 90 degrees to the ceiling plane. Repeat this procedure at **24 inches (610 mm)** increments along the entire perimeter of the grid.
 2. Attach trim segments to the grid.
- C. Corners:
1. Outside Corners: Slide a permanent splice plate into each side of the preformed outside corner. Attach one side of the outside corner to a trim segment. Connect a trim segment to the other side of the corner and secure with appropriate splice plate.
 2. Inside Corners: Follow manufacturer's instructions for installation of preformed and welded corners or for field-assembled corners from separate premitered pieces.

3.11 INSTALLATION OF CURTAIN POCKET TRIM

- A. Mounting: Mount curtain pocket trim in accordance with manufacturer's instructions and as appropriate for project conditions:
1. Wall Cleat Mounting:
 - a. Determine the mounting height of the pocket and cleat combination. Mount wall cleats on the perimeter wall at that height.
 - b. Mount cleats at framing stud locations, on the center of the stud flange or face for the length of the pocket.
 - c. Secure cleat and pocket to wall using fasteners appropriate for attachment substrates.
 - d. Hook pocket on the mounting cleats. Use a metal screw for locking pocket to cleat.
 2. Hanger Wire Mounting:
 - a. Mount using hanger wire located at **16 inches (406 mm)** on center by drilling a **1/4 inch (6 mm)** diameter hole into vertical mounting leg located on top of the extrusion, no more than **48 inches (1219 mm)** on center.
 3. Metal Framing Mounting:
 - a. Hang curtain pockets using standard **2-1/2-Inch (64 mm)** metal framing members **48 inches (1219 mm)** on center, maximum, hung from and braced with kickers attached to the underside of the structure.
- B. Continuous Lengths Installation: Use wall cleat, hanger wire, or metal framing mounting method specified above. Connect curtain pocket segments with standard system splice plates. Use three (3) splice plates for a tight, seamless connection; one located on the top of the pocket and two (2) along the vertical surface.

- C. Corners Installation: For 90-degree turns use manufacturer's pre-engineered inside and outside corners. Position corner segments in place using mounting method selected for the system. Use three (3) splice plates for a tight, seamless connection to the main curtain pocket; one located on the top of the pocket and two (2) along the vertical surface.
- D. End Cap Terminations: Use the appropriate end cap for the indicated ceiling integration. Install using self-tapping mini screws in two or three locations depending on the end cap selected.
- E. Partition Wall Termination: Use a single splice plate bent in half at 90-degrees. Mount one flange of the plate to the curtain pocket and mount the other to the partition wall above the ceiling grid wall molding.
- F. Install <<***extension plates; closure plates; and _____***>> in accordance with manufacturer's instructions.
- G. Connection to Suspension Grid: Use clips recommended by manufacturer.

3.12 TOLERANCES

- A. Maximum Variation from Flat and Level Surface: <<***1/8 inch in 10 feet (3 mm in 3 m); _____ inch in 10 feet (_____ mm in 3 m)***>>.
- B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: <<***Two; or _____***>> degrees.

3.13 CLEANING

- A. Clean and touch up minor finish damage. Remove and replace components that cannot be successfully cleaned and repaired.

3.14 SCHEDULE

- A. Kitchen Areas - Ceiling Assembly <<***APC-1; or _____***>>: ***24 by 24 inch (610 by 610 mm)*** metal pan acoustical units, plastic faced, interlocking suspension grid, insulation batts placed over units.
- B. Dining Areas Ceiling Assembly <<***APC-2; or _____***>>: ***24 by 48 inch (610 by 1219 mm)*** square edge mineral acoustical units, interlocking exposed T suspension grid.

END OF SECTION