

**SECTION 09 5421  
METAL PAN CEILINGS - USG**

**<<<< UPDATE NOTES****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Metal pan <<ceilings; and soffits>>.
- B. Suspended metal support system and perimeter trim.
- C. Supplementary <<acoustical; and thermal>> insulation over system units.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 03 1000 - Concrete Forms and Accessories: Execution requirements for placement of <<attachment anchors; hanger clips; or \_\_\_\_\_>> to <<structure above; ceiling system; or \_\_\_\_\_>>.
- C. Section 03 3000 - Cast-in-Place Concrete: Execution requirements for placement of <<attachment anchors; hanger clips; or \_\_\_\_\_>> to <<structure above; ceiling system; or \_\_\_\_\_>>.
- D. Section 05 3100 - Steel Decking: Execution requirements for placement of <<attachment anchors; hanger clips; or \_\_\_\_\_>> to <<structure above; ceiling system; or \_\_\_\_\_>>.
- E. Section 07 2100 - Thermal Insulation.
- F. Section 08 3100 - Access Doors and Panels: Access panels.
- G. Section 09 2116 - Gypsum Board Assemblies - USG: Gypsum board and metal framing products.
- H. Section 09 5100 - Acoustical Ceilings - USG: Metal suspension system.
- I. Section 09 5423 - Linear Metal Ceilings - USG: Linear metal baffles.
- J. Section 21 1300 - Fire-Suppression Sprinkler Systems: Sprinkler heads.
- K. Section 23 3700 - Air Outlets and Inlets: Air <<diffusers; grilles; and \_\_\_\_\_>>.
- L. Section 26 5100 - Interior Lighting: Luminaires.
- M. Section 26 5600 - Exterior Lighting: Luminaires.
- N. Section 27 5116 - Public Address Systems: Audio speakers.
- O. Section 28 4600 - Fire Detection and Alarm: Fire detection and alarm components in ceiling.

**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 A580/A580M - Standard Specification for Stainless Steel Wire; 2018.
- C. ASTM A492 - Standard Specification for Stainless Steel Rope Wire; 1995 (Reapproved 2013).
- D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2020.
- E. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
- F. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021.
- G. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2017.

- H. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2017.
- I. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2013.
- J. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2017.
- K. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2020.
- L. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009 (Reapproved 2016).
- M. ASTM E413 - Classification for Rating Sound Insulation; 2016.
- N. 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.
- O. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2019.

#### 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.
- B. Preinstallation Meeting: Convene **<<one; or \_\_\_\_>>** week before starting work of this section.
- C. Sequencing: Supply hanger clips during steel deck erection. Supply additional hangers and inserts as required.

#### 1.05 SUBMITTALS

- A. See Section ***01 3000 - Administrative Requirements***, for submittal procedures.
- B. Product Data: Furnish for **<<component profiles; materials; perimeter and integral trim; space closures; and \_\_\_\_>>**.
- C. Shop Drawings: Indicate **<<reflected ceiling plan; location of mechanical and electrical components; details of junction with dissimilar materials; points of suspension; and \_\_\_\_>>**.
  - 1. Seismic Design: Include seal and signature of design professional on each drawing.
- D. Samples: Submit **<<two; or \_\_\_\_>>** samples ***by inch ( by mm)*** in size illustrating color and finish of exposed to view components.
- E. Designer's Qualification Statement.
- F. Manufacturer's Qualification Statement.
- G. Installer's Qualification Statement.
- H. 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 Metal Pan Panels: **<<One; Ten; or \_\_\_\_>>**, standard length.

#### 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 at ***the State in which the Project is located***.
- B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum **<<three; or \_\_\_\_>>** years **<<documented; or None - N/A>>** experience.
- C. Installer Qualifications: Company specializing in performing the work of this section.
  - 1. Minimum **\_\_\_\_\_** years **<<documented; or None - N/A>>** experience.
  - 2. Approved by metal ceiling manufacturer.

### 1.07 MOCK-UP

- A. Construct \_\_\_\_\_ mock-up, \_\_\_\_\_ **feet ( \_\_\_\_\_ m)** long by \_\_\_\_\_ **feet ( \_\_\_\_\_ m)** wide; include suspension system, panels, <<**closures; light fixtures; integral mechanical and electrical components; and \_\_\_\_\_**>> in mock-up.
- B. See Section **01 4000 - Quality Requirements** for additional requirements.
- C. Locate mock-up <<**where directed; or \_\_\_\_\_**>>.
- D. Mock-up <<**may; or may not**>> remain as part of the Work.

### 1.08 DELIVERY, STORAGE, AND HANDLING

- A. Accept factory-finished products on site in manufacturer's unopened factory packaging only; reject opened packages.
- B. Protect factory-finished products from damage to appearance by storing products in manufacturer's unopened factory packaging in dry storage area.

### 1.09 WARRANTY

- A. See Section **01 7800 - Closeout Submittals**, for additional warranty requirements.
- B. Provide <<**five; or \_\_\_\_\_**>> year manufacturer warranty; include coverage for corrosion resistance and discoloration of surface finish.

## PART 2 PRODUCTS

### 2.01 METAL PAN CEILING ASSEMBLIES

- A. Refer to <<**Room Finish Schedule; Reflected Ceiling Plans; and \_\_\_\_\_**>> on drawings for additional ceiling assemblies information.
- B. Metal Pan <<**Ceiling; Soffit; and \_\_\_\_\_**>> System: Panels<<**and baffles; and \_\_\_\_\_; or None - N/A**>>, suspension members, trim, and accessories as required to provide a complete system.
- C. Metal Pan Ceiling Assembly Type <<**MPC-1; or \_\_\_\_\_**>>:
  1. Panels: <<**Celebration Snap-In Metal Panels; Celebration Torsion-Spring Metal Panels; Geometrix Lay-In Metal Panels; Illusions Modular Metal Panels; Panz Lay-In Metal Panels; or \_\_\_\_\_**>><<**Item No. \_\_\_\_\_; or None - N/A**>>.
    - a. Lay-In Panel Edge: <<**Square; Shadowline; Fineline; Flush mount; or \_\_\_\_\_**>>.
    - b. Standard Perforations Pattern: <<**CS03002; CS04002; CS04003; CD04004; CS05003; CS05006; CS06302; CS06303; CD06305; CD06310; CS06310; CD06319; CE07814; CS07814; CE07906; CS09405; CD09410; CS09420; CE09420; CS11708; CD11717; CS12505; CD12510; CE12510; CE12520; CS12520; CS18801; CD18803; CS18806; CE18820; CS18820; CE18833; CD18839; CE19735; CS20105; CS20123; CS25012; CS25020; CE25030; CD25039; CE25058; CE31246; CS37507; CS37509; CD37515; CS37520; CE37533; CD37539; CS50009; CS50020; CE50020; CD50039; CD50055; CE50063; CS62520; CD62540; CS75028; CS125031; CE125031; SS18814; SS25011; SS25025; SS37511; SS39415; SS39460; SS43134; SS50011; SS50025; SS50070; SS75036; OS06317; OS06333; OS09420; OS12523; OS12537; OS18827; OD18827; RS12518; RS12527; RS15657; RS25021; or RS25041**>>.
    - c. Parti Custom Multi-Panel Perforations: On portions of metal pan ceilings indicated on drawings.
    - d. Pixels Perforated Imagery: On portions of metal pan ceilings indicated on drawings.
  2. Flat Panel Size: <<**As indicated on drawings; 24 inches by 24 inches (2 by 2) panel (600 mm by 600 mm); 24 inches by 48 inches (2 by 4) panel (600 mm by 1200 mm); 24 inches by 72 inches (2 by 6) plank (600 mm by 1800 mm); 24 inches by 96 inches (2 by 8) plank (600 mm by 2400 mm); 48 inches by 48 inches (4 by 4) panel (1219 mm by 1219 mm); \_\_\_\_\_ inches by \_\_\_\_\_ inches (\_\_\_\_\_ mm by \_\_\_\_\_ mm)**>>.
  3. Layout: As indicated on drawings.
  4. Standard Suspension Grid: Specified in Section <<**09 5100; or \_\_\_\_\_**>>.

5. Interior Suspension Grid: <<**Donn DX 15/16-inch Suspension System; Donn Centricitee DXT 9/16-inch Suspension System; Donn Finline DXF Suspension System; Donn Finline 1/8 DXFF Suspension System; Donn Identitee DXI Suspension System; Donn DX 15/16-inch Concealed Suspension System; Illusions Engineered Grid; Gridware Open Cell Decorative System; or \_\_\_\_\_**>>.
6. Exterior Suspension Grid: Donn Finline DXFEV 9/16-inch Suspension System.

## 2.02 PERFORMANCE REQUIREMENTS

- A. Design for maximum deflection of <<**1/360; or \_\_\_\_\_**>> of span.
- B. Design to support imposed loads of indicated elements without eccentric loading of supports. Where supported elements may induce rotation of ceiling system components, provide stabilizing reinforcement.
- 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. \_\_\_\_\_.
- D. Surface Burning Characteristics: Flame spread index of \_\_\_\_\_, smoke developed index of \_\_\_\_\_, when tested in accordance with ASTM E84.

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Coordinate acoustic requirements with acoustical backer and other components specified below. Verify manufacturers' ability to meet specified acoustic performance.

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- E. Acoustic Attenuation: STC of \_\_\_\_\_ calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90, with insulation installed.
- F. Sound Absorption Average (SAA): \_\_\_\_\_, measured in accordance with ASTM C423 with insulation installed.
- G. Noise Reduction Coefficient (NRC): \_\_\_\_\_, measured in accordance with ASTM C423 with insulation installed.
- H. Systems Located Outside Building Envelope:
  1. Accommodate wind and suction loads and wind uplift without damage <<**in accordance with applicable code; or \_\_\_\_\_**>>.
  2. Accommodate wind and suction loads and wind uplift to resist \_\_\_\_\_ **psf ( \_\_\_\_\_ kPa)** without damage.
  3. Thermal Resistance Value: Total **R-value of \_\_\_\_\_ (RSI-value of \_\_\_\_\_)** with insulation installed.

## 2.03 COMPONENT PRODUCTS

- A. Metal Pan Panels:
  1. 2-Dimensional Lay-In Panels: Metal-faced <<**unperforated; perforated; or \_\_\_\_\_**>> prefinished acoustical panels.
    - a. Construction: <<**Galvanized steel; Stainless steel; Aluminum; or \_\_\_\_\_**>> flat-face formed sheet, with <<**glass fiber; mineral fiber; or \_\_\_\_\_**>> acoustical media backing.
    - b. Application(s): \_\_\_\_\_.
    - c. Classification: ASTM E1264 Type <<**V; VI; VII; or \_\_\_\_\_**>>.
    - d. Panel Size: <<**24 by 24 inch (610 by 610 mm); \_\_\_\_\_ by \_\_\_\_\_ inches ( \_\_\_\_\_ by \_\_\_\_\_ mm)**>>.
    - e. Installation: Lay-in, into suspension grid specified.
    - f. NRC Range: \_\_\_\_\_ to \_\_\_\_\_, determined in accordance with ASTM E1264.
    - g. Perforations Pattern: <<**Standard perforation pattern; Parti perforations; Pixels perforations.; and \_\_\_\_\_**>>.

- 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: Classified as containing greater than 50% total recycled content.
- j. Accessories: Provide manufacturer's standard **<<edge trim; and \_\_\_\_\_>>**.
- k. Products:
- 1) USG Corporation; Panz Metal Panels: [www.usg.com/ceilings/#sle](http://www.usg.com/ceilings/#sle).
  - 2) \_\_\_\_\_.
  - 3) \_\_\_\_\_.
  - 4) Substitutions: **<<See Section 01 6000 - Product Requirements; or Not permitted>>**.
2. 2-Dimensional Panels: Preformed aluminum, **<<unperforated; perforated; or \_\_\_\_\_>>**, prefinished metal panels with integral edge for concealed suspension without visible hardware.
- a. Construction: **<<Galvanized steel; Stainless steel; Aluminum; or \_\_\_\_\_>>** flat-face formed sheet, with **<<glass fiber; mineral fiber; or \_\_\_\_\_>>** acoustical media backing.
  - b. Application(s): \_\_\_\_\_.
  - c. Panel Color: **<<\_\_\_\_\_; or As indicated on drawings>>**.
  - d. NRC Range: \_\_\_\_\_ to \_\_\_\_\_, determined in accordance with ASTM E1264.
  - e. Perforations Pattern: **<<Standard perforation pattern; Parti perforations; Pixels perforations.; and \_\_\_\_\_>>**.
  - f. 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 dye-sublimation process on polyester powder coat substrate applied to panels.
      - (a) Color: **<<As indicated on drawings; To be selected from manufacturer's standards; Beech; Dark Bamboo; Light Bamboo; Dark Cherry; Light Cherry; Maple; Red Oak; Walnut; or \_\_\_\_\_>>**.
    - 3) Painted Finish: Manufacturer's **<<standard; custom; or \_\_\_\_\_>>** color.
      - (a) Color: **<<As indicated on drawings; To be selected from manufacturer's standards; Flat White; Silver Satin; Metallic Copper; Metallic Gold; Metallic Oyster; Matte White; or \_\_\_\_\_>>**.
  - g. Acoustical Fabric: **<<Manufacturer's standard non-woven fabric; or \_\_\_\_\_>>**.
  - h. Installation Method:
    - 1) Installation in Existing Grid: Snap-in, downward access, positive attachment into existing 15/16-inch suspension system.
      - (a) Panel Size: **<<12 by 48 inches (305 by 1219 mm); 12 by 60 inches (305 by 1524 mm); 24 by 24 inches (610 by 610 mm); 24 by 48 inches (610 by 1219 mm); 24 by 72 inches (610 by 1829 mm); 24 by 96 inches (610 by 2438 mm); 48 by 48 inches (1219 by 1219 mm); 20 by 60 inches (508**

- by 1524 mm); 30 by 30 inches (762 by 762 mm); 30 by 60 inches (762 by 1524 mm); \_\_\_ by \_\_\_ inches (\_\_\_ by \_\_\_ mm)>>.**
- (b) Renovation Clip: Manufacturer's standard accessory made from injection-molded flame-resistant, self-extinguishing resin and designed for attachment to existing grid.
- 2) Installation: Snap-in, downward access, positive attachment into **<<9/16 inch (14 mm); \_\_\_ inch (\_\_\_ mm)>>** Donn Fineline DXF suspension system.
- (a) Panel Size: **<<12 by 48 inches (305 by 1219 mm); 12 by 60 inches (305 by 1524 mm); 24 by 24 inches (610 by 610 mm); 24 by 48 inches (610 by 1219 mm); 24 by 72 inches (610 by 1829 mm); 24 by 96 inches (610 by 2438 mm); 48 by 48 inches (1219 by 1219 mm); 20 by 60 inches (508 by 1524 mm); 30 by 30 inches (762 by 762 mm); 30 by 60 inches (762 by 1524 mm); \_\_\_ by \_\_\_ inches (\_\_\_ by \_\_\_ mm)>>.**
- i. Accessories: Provide manufacturer's standard **<<edge trim; spacers; fixture frames; air diffusers; and \_\_\_>>.**
- j. Products: **<<As indicated on drawings.; or None - N/A>>**
- 1) USG Corporation; Celebration Snap-In Metal Panels; [www.usg.com/ceilings/#sle](http://www.usg.com/ceilings/#sle).
- 2) \_\_\_\_\_.
- 3) \_\_\_\_\_.
- 4) Substitutions: **<<See Section 01 6000 - Product Requirements; or Not permitted>>.**
3. 2-Dimensional Panels: Preformed aluminum, **<<unperforated; perforated; or \_\_\_>>**, prefinished metal panels with integral edge for concealed suspension without visible hardware.
- a. Construction: **<<Galvanized steel; Stainless steel; Aluminum; or \_\_\_>>** flat-face formed sheet, with **<<glass fiber; mineral fiber; or \_\_\_>>** acoustical media backing.
- b. Application(s): \_\_\_\_\_.
- c. Panel Color: **<<\_\_\_; or As indicated on drawings>>.**
- d. NRC Range: \_\_\_ to \_\_\_, determined in accordance with ASTM E1264.
- e. Perforations Pattern: **<<Standard perforation pattern; Parti perforations; Pixels perforations.; and \_\_\_>>.**
- f. 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; Beech; Dark Bamboo; Light Bamboo; Dark Cherry; Light Cherry; Maple; Red Oak; Walnut; or \_\_\_>>.**
- 3) Painted Finish: Manufacturer's **<<standard; custom; or \_\_\_>>** color.
- (a) Color: **<<As indicated on drawings; To be selected from manufacturer's standards; Flat White; Silver Satin; Metallic Copper; Metallic Gold; Metallic Oyster; Matte White; or \_\_\_>>.**
- g. Acoustical Fabric: **<<Manufacturer's standard non-woven fabric; or \_\_\_>>.**
- h. Installation Method:
- 1) Installation: Torsion spring, downward access, into **<<15/16 inch (24 mm); 9/16 inch (14 mm); \_\_\_ inch (\_\_\_ mm)>>** Donn DX suspension system slotted cross tees.
- (a) Panel Size: **<<24 by 24 inches (610 by 610 mm); 24 by 48 inches (610 by 1219 mm); 48 by 48 inches (1219 by 1219 mm); 24 by 72 inches (610 by 1829 mm); \_\_\_ by \_\_\_ inches (\_\_\_ by \_\_\_ mm)>>.**
- i. Accessories: Provide manufacturer's standard **<<edge trim; spacers; fixture frames; air diffusers; and \_\_\_>>.**

- j. Products:
- 1) USG Corporation; Celebration Metal Panels; www.usg.com/ceilings/#sle.
  - 2) \_\_\_\_\_.
  - 3) \_\_\_\_\_.
  - 4) Substitutions: <<See Section 01 6000 - Product Requirements; or **Not permitted**>>.
4. 3-Dimensional Lay-In Panels: Preformed aluminum, multi-shaped, <<**unperforated; perforated; or** \_\_\_\_\_>> metal panels.
- a. Application(s): \_\_\_\_\_.
  - b. Panel Size: <<**24 by 24 inch (610 by 610 mm);** \_\_\_\_\_ by \_\_\_\_\_ inches (\_\_\_\_\_ by \_\_\_\_\_ mm)>>.
  - c. Panel Shapes: As indicated on drawings.
  - d. Panel Shapes: <<**Flat; Wedge; Outside Wedge Corner; Inside Wedge Corner; and** \_\_\_\_\_>>.
  - e. Panel Depths: As indicated on drawings.
  - f. Panel Depths: <<**1-1/4 inches (32 mm); 1-1/4 inches (32 mm); 1-1/4 inches (32 mm); 1-1/4 inches (32 mm); 2-1/4 inches (57 mm); 2-1/4 inches (57 mm); 2-1/4 inches (57 mm); 2-1/4 inches (57 mm); 3-1/4 inches (83 mm); 3-1/4 inches (83 mm); 3-1/4 inches (83 mm);** \_\_\_\_\_ inches; \_\_\_\_\_ mm; \_\_\_\_\_ inches (\_\_\_\_\_ mm); and \_\_\_\_\_ mm (\_\_\_\_\_ inches)>>.
  - g. Installation: Lay-in, <<**15/16 inch (24 mm); 9/16 inch (14 mm);** \_\_\_\_\_ inch (\_\_\_\_\_ mm)>> standard ceiling grid.
  - h. Panel Color: <<\_\_\_\_\_; or **As indicated on drawings**>>
  - i. NRC Range: \_\_\_\_\_ to \_\_\_\_\_, determined in accordance with ASTM E1264.
  - j. Perforations Pattern: <<**Standard perforation pattern; Parti perforations; Pixels perforations;** and \_\_\_\_\_>>.
  - k. Finishes: <<**As indicated on drawings;** or **None - N/A**>>
    - 1) Painted Finish: Manufacturer's <<**standard; custom; or** \_\_\_\_\_>> color.
      - (a) Color: <<**As indicated on drawings; To be selected from manufacturer's standards; Silver Satin; Flat White; or** \_\_\_\_\_>>.
  - l. Acoustical Fabric Backer: <<**Manufacturer's standard non-woven fabric;** or \_\_\_\_\_>>.
  - m. Accessories: Provide manufacturer's standard <<**edge trim; and** \_\_\_\_\_>>.
  - n. Products:
    - 1) USG Corporation; Geometrix 3-Dimensional Metal Panels; www.usg.com/#sle.
    - 2) \_\_\_\_\_.
    - 3) \_\_\_\_\_.
    - 4) Substitutions: <<See Section 01 6000 - Product Requirements; or **Not permitted**>>.
5. Four-Sided Panels: Metal <<**unperforated; perforated; or** \_\_\_\_\_>> panels with <<**wood veneer; applied PVC-free laminate; exposed metal; painted; or** \_\_\_\_\_>> finish.
- a. Application(s): \_\_\_\_\_.
  - b. Panel Forming: Die-form panels with a minimum **1-1/4 inch (31.75 mm)** return edge on each side. Attach aligning clips to return edges with countersunk chamfered machine rivets through countersunk holes so that rivet heads are flush with faces of panel returns. Exposed fasteners are not permitted.
  - c. Panel Material: Single sheet of aluminum, selected for surface flatness, smoothness and freedom from surface blemishes; complying with ASTM B209/B209M, Alloy 3105, with up to 90 percent recycled content.
  - d. Panel Size(s): <<**As indicated on drawings; or** \_\_\_\_\_>>.
  - e. Perforations Pattern: <<**Standard perforation pattern; Parti perforations; Pixels perforations;** and \_\_\_\_\_>>.
  - f. Panel Edge Profile: Square, for butt installation.

- g. Installation: Design system to allow every panel to provide access to ceiling plenum. Panels designed for progressive access are not permitted.
  - h. Mounting Assemblies: Mount heavy-duty torsion springs to aligning clips to allow downward access without potential for damage to panel face or hinge assembly. Do not attach springs directly to return edges of panels.
  - i. Finishes: **<<As indicated on drawings; or None - N/A>>**
    - 1) Wood Veneer Finish: USG Ceilings Plus Arboreal veneers.
      - (a) Color: **<<As indicated on drawings; To be selected from manufacturer's standards; Maple; VG Fir; White Oak; Cherry; Mahogany; Walnut; or \_\_\_\_\_>>**.
    - 2) Applied PVC-Free Laminate Finish:
      - (a) Laminates: Faux-Wood USG Ceilings Plus Saranté laminate.
      - (b) Color: **<<As indicated on drawings; To be selected from manufacturer's standards; S-18 Sable Walnut; S-28N Dark Chestnut; S-26 Earth Rosewood; S-38 Natural Walnut; S-27 Forest Walnut; S-17 Dark Oak; S-37 Dark Jatoba; S-24N Grey Cedar; S-36N European Cherry; S-25 Cherry Birch; S-25 Natural Ovang; S-16N Tan Sawn Oak; S-15 Blond Pear; S-33 Bamboo; S-14N Cinnamon Cherry; S-34 Cherry Anigre; S-22 Oak Line; S-13 Red Birch; S-23N Golden Birch; S-12N Valley Maple; S-32 CP Maple; S-31 Golden Oak; S-21 Blond Teak; S-11 Creme Ovang; or \_\_\_\_\_>>**.
    - 3) Exposed Metal Finish: **<<As indicated on drawings; To be selected from manufacturer's standards; Kryolite; Grau; Sateen; or \_\_\_\_\_>>**.
    - 4) Painted Finish: Manufacturer's **<<standard; custom; or \_\_\_\_\_>>** color.
      - (a) Color: **<<As indicated on drawings; To be selected from manufacturer's standards; Standard Silver; Blanco Mat; Flat White; or \_\_\_\_\_>>**.
  - j. Sound-Absorptive Backer: Manufacturer's standard "Ultrasorb" recycled cotton fiber material, factory-laminated to backside of the perforated panels in sufficient thickness to achieve specified NRC rating for the panels.
    - 1) Thickness, Density, and Acoustical Performance: **<<1 inch thick with density of 1.5 pcf, for NRC 0.75 (25.4 mm thick with density of 24 kg/cu m, for NRC 0.75); 1 inch thick with density of 3.0 pcf, for NRC 0.80 (25.4 mm thick with density of 48 kg/cu m for NRC 0.80); 1 inch thick with density of 6.0 pcf, for NRC 0.85 (2.54 mm thick with density of 96 kg/cu m, for NRC 0.85); 1-1/2 inches thick with density of 1.5 pcf, for NRC 0.90 (38 mm thick with density of 24 kg/cu m, for NRC 0.90); 2 inches thick with density of 4.0 pcf, for NRC 1.15 (51 mm thick with density of 48 kg/cu m, for NRC 1.15); \_\_\_ inches thick with density of \_\_\_ pcf for NRC \_\_\_ (\_\_\_ mm thick with density of \_\_\_ kg/cu m, for NRC \_\_\_)>>**.
  - k. Sound-Absorptive Backer: Manufacturer's standard "SoundTex" recycled fiber fleece material factory-laminated to the backside of the perforated panels to achieve NRC 0.75 for the panels.
    - 1) Material: Nonwoven synthetic fabric, **0.011 inch (0.27 mm)** thick.
  - l. Products:
    - 1) USG Corporation; Illusions Modular Metal Panels: [www.usg.com/ceilings/#sle](http://www.usg.com/ceilings/#sle).
    - 2) \_\_\_\_\_.
    - 3) \_\_\_\_\_.
    - 4) Substitutions: **<<See Section 01 6000 - Product Requirements; or Not permitted>>**.
6. End Caps: **<<Formed metal; Molded plastic; or \_\_\_\_\_>>**; same color and finish as sight-exposed surfaces of metal pan panels.
- B. Standard Perforations: Regular patterns of factory-machined, various size **<<circular; square; obround; custom; rectangular; or \_\_\_\_\_>>** openings at 90, 45, or 60 degrees, with unperforated borders at edges of panels.



- C. Perforated Imagery Enhancements: Images created by a pattern of factory-machined perforations in metal pan panels.
1. Original Image Type: <<**Digital photograph; Digital art; Digital logo; or \_\_\_\_\_**>>, <<**positive; negative; or \_\_\_\_\_**>> image.
  2. Original Image Source: To be provided by **Owner**.
  3. Executed Image Resolution: <<**Hi-Res; Med-Res; Low-Res; or \_\_\_\_\_**>>, as defined by manufacturer.
  4. Executed Size: Image canvas size (panel layout and number of panels) is indicated on drawings.
  5. Panel Canvas: <<**Celebration Snap-In Metal Panels; Celebration Torsion-Spring Metal Panels; Panz Lay-In Metal Panels; and \_\_\_\_\_**>>.
  6. Products:
    - a. USG Corporation; Parti Perforated Imagery: [www.usg.com/ceilings/#sle](http://www.usg.com/ceilings/#sle).
    - b. USG Corporation; Pixels Perforated Imagery: [www.usg.com/ceilings/#sle](http://www.usg.com/ceilings/#sle).
    - c. \_\_\_\_\_.
    - d. Substitutions: <<**See Section 01 6000 - Product Requirements; or Not permitted**>>.
- D. Suspension Systems:
1. Metal Suspension Systems: See Section **09 5100 - Acoustical Ceilings - USG**.
  2. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with <<**perimeter moldings; 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.
  3. Exposed Acoustical 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% 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 15/16 Inch Suspension System: [www.usg.com/ceilings/#sle](http://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; 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% 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 9/16 Inch Suspension System: [www.usg.com/ceilings/#sle](http://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**>> 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% 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 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 Suspension System: [www.usg.com/ceilings/#sle](http://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% total recycled content.
  - d. Profile: Slotted Reveal Tee; <<**9/16 inch (14 mm)**>> \_\_\_\_ inch (\_\_\_\_ mm)>> face width, with 1/8-inch 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](http://www.usg.com/ceilings/#sle).
    - 2) \_\_\_\_\_.
    - 3) \_\_\_\_\_.
    - 4) Substitutions: <<**See Section 01 6000 - Product Requirements**>>; or **Not permitted**>>.
7. 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% 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**>>.
8. Open-Cell Grid-Only System: Hot-dipped galvanized steel main and cross tee ceiling system, powder coat finish.
- a. Application(s): <<**Seismic**>> or \_\_\_\_\_>>.
  - b. Sizes: **2 foot by 2 foot (610 by 610 mm)** module, with <<**24 by 24 inches (610 by 610 mm); 24 by 24 inches (610 by 610 mm); 24 by 24 inches (610 by 610 mm); 24 by 48 inches (610 by 1219 mm); 24 by 48 inches (610 by 1219 mm); 610 by 1219 mm (24 by 48 inches); 48 by 48 inches; 1219 by 1219 mm; 48 by 48 inches (1219 by 1219 mm); 1219 by 1219 mm (48 by 48 inches); \_\_\_\_\_ inches; \_\_\_\_\_ mm; \_\_\_\_\_ inches (\_\_\_\_\_ mm); and \_\_\_\_\_ mm (\_\_\_\_\_ inches)**>> cells.
  - c. Grid Profile: <<**15/16 inch GWDX (24 mm GWDX)**>> \_\_\_\_\_ inch (\_\_\_\_\_ mm)>> ceiling grid.
  - d. Finish: 100 percent, 360 degrees tee coverage.
  - e. Color: <<**As indicated on drawings; White; To be selected from manufacturer's standards**>> or \_\_\_\_\_>>.
  - f. Accessories: Provide manufacturer's standard <<**perimeter trim**>> and \_\_\_\_\_>>.
  - g. Products:
    - 1) USG Corporation; Gridware Open Cell Decorative System:  
www.usg.com/ceilings/#sle.
    - 2) \_\_\_\_\_.
    - 3) \_\_\_\_\_.
    - 4) Substitutions: <<**See Section 01 6000 - Product Requirements; or Not permitted**>>.
9. Exterior 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. Galvanizing: ASTM A653/A653M <<**G90**>> or \_\_\_\_\_>> coating.
  - d. Recycled Materials Content: Classified as containing greater than 50% total recycled content. Available for specific sizes and lengths.
  - e. Profile: Slotted Reveal Tee; <<**9/16 inch (14 mm)**>> \_\_\_\_\_ inch (\_\_\_\_\_ mm)>> face width, with 1/4-inch wide center reveal.
  - f. Intersections: Mitered.
  - g. Finish: <<**Baked enamel**>> or \_\_\_\_\_>>.
  - h. Color: <<**As indicated on drawings; White; To be selected from manufacturer's standards**>> or \_\_\_\_\_>>.
  - i. Products:
    - 1) USG Corporation Fineline DXFEV Suspension System:  
www.usg.com/ceilings/#sle.
    - 2) \_\_\_\_\_.
    - 3) \_\_\_\_\_.

- 4) Substitutions: <<See Section 01 6000 - Product Requirements; or **Not permitted**>>.
10. Standard Concealed Ceiling Suspension System: Hot-dipped galvanized steel grid.
- Description: Engineered grid, with main tees, slotted-faces of cross tees, hangers, trim molding<< **seismic retention clips; or None - N/A**>>, load resisting struts and other suspension components required to support ceiling and other ceiling supported construction.
  - Application(s): <<**Seismic; or** \_\_\_\_\_>>.
  - Structural Classification: <<**Intermediate-duty; Heavy-duty; or** \_\_\_\_\_>>, when tested in accordance with ASTM C635/C635M.
  - Profile: Flat.
  - Finish: <<**Baked enamel; or** \_\_\_\_\_>>.
  - Color: <<**Matte Black; or** \_\_\_\_\_>>.
  - Panel Installation: Panels installed from below by inserting torsion springs into slots in faces of main tees of ceiling grid.
  - Products:
    - USG Corporation; DX 15/16 Inch Suspension System, with slotted cross tees: [www.usg.com/ceilings/#sle](http://www.usg.com/ceilings/#sle).
    - \_\_\_\_\_.
    - \_\_\_\_\_.
    - Substitutions: <<See Section 01 6000 - Product Requirements; or **Not permitted**>>.
11. Custom-Engineered Concealed Ceiling Suspension System: Hot-dipped galvanized steel grid.
- Description: Engineered grid, with slotted-faces of main tees, cross tees, hangers, trim molding<< **seismic retention clips; or None - N/A**>>, load resisting struts and other suspension components required to support ceiling and other ceiling supported construction.
  - Application(s): <<**Seismic; or** \_\_\_\_\_>>.
  - Structural Classification: Heavy Duty, when tested in accordance with ASTM C635/C635M.
  - Profile: Flat.
  - Finish: <<**Baked enamel; or** \_\_\_\_\_>>.
  - Color: <<**Matte Black; or** \_\_\_\_\_>>.
  - Panel Installation: Panels installed from below by inserting torsion springs into slots in faces of main tees of ceiling grid.
  - Products:
    - USG Corporation; Illusions Engineered Grid Suspension System: [www.usg.com/ceilings/#sle](http://www.usg.com/ceilings/#sle).
    - \_\_\_\_\_.
    - \_\_\_\_\_.
    - Substitutions: <<See Section 01 6000 - Product Requirements; or **Not permitted**>>.
12. Celebration Fixture Frames: Manufacturer's standard frames compatible with Torsion-Spring system.
- Type: <<**Lay-In; Semi-Flush; or** \_\_\_\_\_>>
  - Sizes: <<**As indicated on drawings; 2 by 2 feet; 610 by 610 mm; 2 by 2 feet (610 by 610 mm); 610 by 610 mm (2 by 2 feet); 2 by 4 feet; 610 by 1219 mm; 2 by 4 feet (610 by 1219 mm); 610 by 1219 mm (2 by 4 feet); \_\_\_\_\_ feet; \_\_\_\_\_ mm; \_\_\_\_\_ feet (\_\_\_\_\_ mm); and \_\_\_\_\_ mm (\_\_\_\_\_ feet)**>>
13. Celebration Air Diffusers: Manufacturer's standard air outlet accessory compatible with Snap-In system.
- Perforations percentage or as indicated on drawings.
  - Configuration: <<**As indicated on drawings; or** \_\_\_\_\_>>.

- c. Configuration: Provide **<<one-slot; two-slots; three-slots; four-slot; and \_\_\_\_\_>>** four-way diffusers.
14. Linear Metal Baffles: See Section **09 5423**.
15. Moldings and Trim:
- a. Edge Molding**<< Expansion Joints,; or None - N/A>>** and Splices: Same material, thickness, and finish as metal pan panels, unless otherwise indicated.
  - b. Perimeter (Wall) Moldings: **<<Same metal and finish as grid; Aluminum; or \_\_\_\_\_>>**.
    - 1) Size: As required for installation conditions**<< and specified Seismic Design Category; and \_\_\_\_\_; or None - N/A>>**.
    - 2) Angle Moldings: L-shaped, for mounting at same elevation as face of grid.
    - 3) Shadow Moldings: Shaped to create a perimeter reveal.
    - 4) Channel Moldings: U-shaped, for hold-down type installations.
    - 5) Gaskets For Perimeter Moldings: Closed-cell foam, factory-applied to molding.
    - 6) Acoustical Sealant For Perimeter Moldings: Non-hardening, non-skinning, for use in conjunction with suspended ceiling system.
  - c. Metal Transition Trim: Steel or extruded aluminum; provide attachment clips, splice plates and preformed corner pieces for complete trim system:
    - 1) 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)>>**.
    - 2) Finish: **<<Baked enamel; or \_\_\_\_\_>>**.
    - 3) Color: **<<White; or \_\_\_\_\_>>**.
    - 4) Products:
      - (a) USG Corporation; Compasso Elite Transitions - Acoustical to Acoustical: [www.usg.com/ceilings/#sle](http://www.usg.com/ceilings/#sle).
      - (b) USG Corporation; Compasso Elite Transitions - Acoustical to Drywall: [www.usg.com/ceilings/#sle](http://www.usg.com/ceilings/#sle).
      - (c) USG Corporation; Compasso Elite Drywall: [www.usg.com/ceilings/#sle](http://www.usg.com/ceilings/#sle).
      - (d) \_\_\_\_\_.
      - (e) Substitutions: **<<See Section 01 6000 - Product Requirements; or Not permitted>>**.
  - d. Metal Perimeter Trim for "Cloud" Suspension Systems: Steel or extruded aluminum; provide attachment clips, splice plates, and preformed corner pieces for complete trim system.
    - 1) 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)>>**.
    - 2) Finish: **<<Baked enamel; or \_\_\_\_\_>>**.
    - 3) Color: **<<White; or \_\_\_\_\_>>**.
    - 4) Products:
      - (a) USG Corporation; Compasso Suspension Trim - Standard: [www.usg.com/ceilings/#sle](http://www.usg.com/ceilings/#sle).
      - (b) USG Corporation; Compasso Suspension Trim - Slim: [www.usg.com/ceilings/#sle](http://www.usg.com/ceilings/#sle).
      - (c) USG Corporation; Compasso Suspension Trim - Elite: [www.usg.com/ceilings/#sle](http://www.usg.com/ceilings/#sle).
      - (d) USG Corporation; Compasso Suspension Trim - Elite with Island Accent Lighting: [www.usg.com/ceilings/#sle](http://www.usg.com/ceilings/#sle).
      - (e) \_\_\_\_\_.
      - (f) Substitutions: **<<See Section 01 6000 - Product Requirements; or Not permitted>>**.
  - e. Metal Curtain Pocket Trim: Steel or extruded aluminum; provide attachment clips, splice plates and preformed corner pieces for complete trim system:
    - 1) 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)>>**.

- 2) Finish: <<**Baked enamel; or \_\_\_\_\_**>>.
- 3) Color: <<**White; or \_\_\_\_\_**>>.
- 4) Products:
  - (a) USG Corporation; Compasso Elite Curtain Pocket:  
www.usg.com/ceilings/#sle.
  - (b) \_\_\_\_\_.
  - (c) \_\_\_\_\_.
  - (d) Substitutions: <<**See Section 01 6000 - Product Requirements; or Not permitted**>>.

#### 2.04 ACCESSORIES:

- A. Subgirt Members: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with <<**G90/Z275; G60/Z180; or \_\_\_\_\_**>> coating; formed to resist imposed loads and to provide attachment for metal pan ceiling and accessories.
- B. 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.
- 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 gage, 0.0808 (2.05 mm); 9 gage, 0.1144 inch (2.91 mm); \_\_\_\_\_ gage, \_\_\_\_\_ inch (\_\_\_\_\_ mm)**>> diameter.
  2. Exposed (To View) Suspension:
    - a. Suspension Wire: Stainless steel, <<**18 gage, 0.0403 (1.02 mm); \_\_\_\_\_ gage, \_\_\_\_\_ 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 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.
- E. Seismic Clips: Manufacturer's standard clips designed to provide a rigid connection between suspension grid tees and wall moldings.
- F. 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.
- G. Acoustical Insulation: <<**Specified in Section 07 2100; or ASTM C665, friction fit type, unfaced batts**>>.
  1. Thickness: <<**2 inch (51 mm); 6 inch (152 mm); \_\_\_\_\_ inch (\_\_\_\_\_ mm)**>>.
  2. Size: To fit acoustical suspension system.
- H. Thermal Insulation: Specified in <<**Section 07 2100; or \_\_\_\_\_**>>.
- I. 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.
  4. Facing: Faced on one side with <<**foil; asphalt treated Kraft paper; black plastic; mesh reinforced Kraft paper; or \_\_\_\_\_**>>.
- J. Gypsum Board and Framing Materials: See Section **09 2116**.

- K. Touch-Up Paint for Exposed Surfaces: Type and color to match pans and suspension system grid and trim elements.
- L. Touch-Up Paint For Concealed Items: <<Zinc rich; Zinc oxide; or \_\_\_\_\_>> type, as recommended by ceiling system manufacturer.

## 2.05 FABRICATION

- A. Shop cut metal pan panels to accommodate mechanical and electrical items.
- B. Factory-form internal and external corners of same material, thickness, finish, and profile to match exposed metal pan panels<<back brace internal corners; or None - N/A>>.
- C. 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 additional hangers and inserts as required.
- C. Install after major above-ceiling work is complete.

### 3.03 INSTALLATION - SUSPENSION SYSTEM:

- A. Install suspension system in accordance with <<ASTM C636/C636M; ASTM E580/E580M; manufacturer's instructions; and \_\_\_\_\_>> and as supplemented by 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, Non-Seismic: 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.

#### 3.04 INSTALLATION - METAL PANS:

- A. Install panels **<<, baffles.; or None - N/A>>** and other system components in accordance with manufacturer's instructions.
- B. Stagger end joints minimum **12 inches (300 mm)**.
- C. Align end joints.
- D. Butt interior end joints tight.
- E. Set exterior end joints with **<<1/16 inch (2 mm); \_\_\_\_\_ inch (\_\_\_\_\_ mm)>>** gap for expansion and contraction.
- F. Provide **<<expansion; and control>>** joints to accommodate plus or minus **<<1 inch (25 mm); \_\_\_\_\_ inch (\_\_\_\_\_ mm)>>** movement and maintain visual closure.
- G. **<<Field miter corners; Install prefabricated corner sections; or \_\_\_\_\_>>** at changes in panel direction.
- H. Install filler strips between linear panels at **<<interior; and exterior>>** locations.
- I. Install edge moldings at junctions with other finishes and at vertical surfaces; use maximum piece lengths.
- J. Where bullnose masonry units occur, install radiused closures to fit edge molding.
- K. Install end caps at sight-exposed ends of panels.
- L. Exercise care when site cutting sight-exposed finished components to ensure surface finish is not defaced.
- M. Insulation: Install above panel members; fit tight between grid members **<<; place insulation with facing side down;; place insulation with facing side up; or None - N/A>>**.

#### 3.05 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.



### 3.06 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 premeasured pieces.

### 3.07 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.

### 3.08 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: <<***2; or \_\_\_\_\_***>> degrees.
- C. Maximum Variation From Dimensioned Position: <<***1/4 inch (6 mm); \_\_\_\_\_ inch (\_\_\_\_\_ mm)***>>.

### 3.09 CLEANING

- A. Clean <<***polished; reflective; or \_\_\_\_\_***>> surfaces.
- B. Replace damaged or abraded components.

### 3.10 SCHEDULES

- A. Main Foyer: Box beam design, no space closures, polished chrome finish; 9 feet (2.75 m) above finished floor; refer to reflected ceiling plan.
- B. Sloped Ceilings in Stair Wells: Flat panel shape, bullnosed edge, acoustic insulation above, recessed black filler, flat white surface finish.

### 3.11 END OF SECTION