1. Section 095421
Metal Pan Ceilings - USG
	1. PART 1  GENERAL
		1. SECTION INCLUDES
			1. Metal pan ceilings.
			2. Suspended metal support system and perimeter trim.
			3. Supplementary acoustical insulation over system units.
		2. RELATED REQUIREMENTS
2. *The paragraph below is optional text*
	* + 1. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions.
3. *The paragraph below is optional text*
	* + 1. Section 031000 - Concrete Forms and Accessories:  Execution requirements for placement of attachment anchors to structure above.
4. *The paragraph below is optional text*
	* + 1. Section 033000 - Cast-in-Place Concrete:  Execution requirements for placement of attachment anchors to structure above.
5. *The paragraph below is optional text*
	* + 1. Section 053100 - Steel Decking:  Execution requirements for placement of attachment anchors to structure above.
			2. Section 072100 - Thermal Insulation.
			3. Section 092116 - Gypsum Board Assemblies - USG:  Gypsum board and metal framing products.
			4. Section 095100 - Acoustical Ceilings - USG:  Metal suspension system.
			5. Section 095423 - Linear Metal Ceilings - USG.  Linear metal baffles and baffle assemblies.
			6. Section 211300 - Fire-Suppression Sprinkler Systems:  Sprinkler heads.
			7. Section 233700 - Air Outlets and Inlets:  Air diffusers.
			8. Section 265100 - Interior Lighting:  Luminaires.
			9. Section 265600 - Exterior Lighting:  Luminaires.
			10. Section 275116 - Public Address Systems:  Audio speakers.
			11. Section 284600 - Fire Detection and Alarm:   Fire detection and alarm components in ceiling.
		1. REFERENCE STANDARDS
			1. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
			2. ASTM A580/A580M - Standard Specification for Stainless Steel Wire; 2018.
			3. ASTM A492 - Standard Specification for Stainless Steel Rope Wire; 1995 (Reapproved 2019).
			4. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2022.
			5. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
			6. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
			7. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2022.
			8. ASTM C635/C635M - Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2022.
			9. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2019.
			10. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2017.
			11. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2022.
			12. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009 (Reapproved 2016).
			13. ASTM E413 - Classification for Rating Sound Insulation; 2022.
			14. 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; 2022.
			15. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2022.
		2. ADMINISTRATIVE REQUIREMENTS
			1. Coordination:  Coordinate work of this section with installation of mechanical and electrical components and with other construction activities affected by work of this section.
			2. Preinstallation Meeting:  Convene one week before starting work of this section.
6. *The paragraph below is optional text*
	* + 1. Sequencing:  Supply hanger clips during steel deck erection.  Supply additional hangers and inserts as required.
		1. SUBMITTALS
			1. See Section 013000 - Administrative Requirements for submittal procedures.
			2. Product Data:  Furnish for component profiles.
			3. Shop Drawings:  Indicate reflected ceiling plan.
				1. Seismic Design:  Include seal and signature of design professional on each drawing.
			4. Samples:  Two samples [\_\_\_] by [\_\_\_] inch ([\_\_\_] by [\_\_\_] mm) in size illustrating color and finish of exposed to view components.
			5. Designer's qualification statement.
			6. Manufacturer's qualification statement.
			7. Installer's qualification statement.
			8. Maintenance Materials:  Furnish the following for Owner's use in maintenance of project.
				1. See Section 016000 - Product Requirements for additional provisions.
				2. Extra Metal Pan Panels:  One, standard length.
		2. QUALITY ASSURANCE
7. *The paragraph below is optional text*
	* + 1. 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.
			2. Manufacturer Qualifications:  Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
			3. Installer Qualifications:  Company specializing in performing the work of this section.
				1. Minimum [\_\_\_\_\_\_\_\_\_\_] years documented experience.
				2. Approved by metal ceiling manufacturer.
		1. MOCK-UP
			1. Construct [\_\_\_\_\_\_\_\_] mock-up, [\_\_\_\_] feet ([\_\_\_\_] m) long by [\_\_\_\_] feet ([\_\_\_\_] m) wide; include suspension system, panels, closures in mock-up.
			2. See Section 014000 - Quality Requirements for additional requirements.
			3. Locate mock-up where directed.
			4. Mock-up may remain as part of the Work.
		2. DELIVERY, STORAGE, AND HANDLING
			1. Accept factory-finished products on site in manufacturer's unopened factory packaging only; reject opened packages.
			2. Protect factory-finished products from damage to appearance by storing products in manufacturer's unopened factory packaging in dry storage area.
		3. WARRANTY
			1. See Section 017800 - Closeout Submittals, for additional warranty requirements.
			2. Provide five year manufacturer warranty; include coverage for corrosion resistance and discoloration of surface finish.
	1. PART 2  PRODUCTS
		1. Metal Pan CEILING ASSEMBLIES
			1. Refer to [Room Finish Schedule] [Reflected Ceiling Plans] and [Room Finish Schedule] [Reflected Ceiling Plans] on drawings for additional ceiling assemblies information.
			2. Metal Pan [Ceiling] [Soffit] System:  Panels, suspension members, trim, and accessories as required to provide a complete system.
			3. Metal Pan Ceiling Assembly Type [MPC-1] :
				1. Panels:  [Expanse - Torsion Spring] [Expanse - Lay-In].

Lay-In Panel Edge:  Square.

* + - * 1. Flat Panel Size:  [Maximum length is 120” with max width of 24”] [Minimum width is 6” with max length of 96”] [Maximum width is 42” with max length of 48” (48” width available in select patterns. Consult factory for details] [Consult factory for custom panel size possibilities].
				2. Layout:  As indicated on drawings.
				3. Finish Type:

Painted - On Metal Colors:  [As indicated on drawings] [Steel] [Bronze] [ Copper] [White] [Black] [Mill].

* + - * 1. Standard Suspension Grid:  Specified in Section 095100.
				2. Interior Suspension Grid:  [Donn Fineline DXF Suspension System] .
		1. PERFORMANCE REQUIREMENTS
			1. Design for maximum deflection of [1/360] of span.
			2. 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.
1. *The paragraph below is optional text*
	* + 1. 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] and complying with the following:
2. *The paragraph below is optional text*
	* + - 1. Local authorities having jurisdiction.
3. *The paragraph below is optional text*
	* + - 1. ICC-ES Evaluation Report No. [\_\_\_\_\_\_\_\_\_\_].
		1. COMPONENT Products
			1. Open-Cell Panels:  Formed expanded-metal pans.
				1. Application(s):  [\_\_\_\_\_\_\_\_\_\_].
				2. Installation Method:
4. *The paragraph below is optional text*

Torsion-spring, downward access, into 15/16 inch Donn DX suspension system with slotted cross tees.

1. *The paragraph below is optional text*

Lay-in.

* + - * 1. Material:  Aluminum.
				2. Pattern:  [Raised EX-1, 45 percent open] [Raised EX-2, 55 percent open] [Raised EX-3, 48 percent open] [Raised EX-4, 62 percent open] [Raised EX-5, 70 percent open] [Raised EX-6, 72 percent open] [Raised EX-7, 76 percent open] [Raised EX-8, 63 percent open] [Raised EX-9, 12 percent open].
				3. Torsion-Spring Installation Nominal Panel Size: [Maximum length is 120” with max width of 24”] [Minimum width is 6” with max length of 96”] [Maximum width is 42” with max length of 48” (48” width available in select patterns. Consult factory for details] [Consult factory for custom panel size possibilities].
				4. [Maximum length is 120” with max width of 24”] [Minimum width is 6” with max length of 96”] [Maximum width is 42” with max length of 48” (48” width available in select patterns. Consult factory for details] [Consult factory for custom panel size possibilities]
1. *The paragraph below is optional text*
	* + - 1. Finish:  Mill finish.
2. *The paragraph below is optional text*
	* + - 1. Finish:  Powder coat.
3. *The paragraph below is optional text*

Color:  [Bronze] [Copper] [Black] [White] [Steel Blue].

* + - * 1. Products:

USG Corporation;  Expanse:  www.usg.com/ceilings/#sle.

Substitutions:  Not permitted.

* + - 1. Suspension Systems:
				1. Metal Suspension Systems:  See Section 095100 - Acoustical Ceilings - USG.
				2. Metal Suspension Systems - General:  Complying with ASTM C635/C635M; die cut and interlocking components, with [perimeter moldings] [seismic clips] [splices] , [perimeter moldings] [seismic clips] [splices] , [perimeter moldings] [seismic clips] [splices] , [perimeter moldings] [seismic clips] [splices] , and [perimeter moldings] [seismic clips] [splices] as required.

Materials:

Steel Grid:  ASTM A653/A653M G30 coating, unless otherwise indicated.

* + - * 1. Exposed Acoustical Suspension System:  Hot-dipped galvanized steel grid and cap.

Application(s):  Seismic.

Structural Classification:  Intermediate-duty, when tested in accordance with ASTM C635/C635M.

1. *The paragraph below is optional text*

Recycled Materials Content:  Classified as containing greater than 50% total recycled content.  Available for specific sizes and lengths.

Profile:   Tee; 15/16 inch (24 mm) face width.

Finish:   Baked enamel.

Color:  White.

Products:

USG Corporation;  DX 15/16 Inch Suspension System:  www.usg.com/ceilings/#sle.

Substitutions:  Not permitted.

* + - * 1. Standard Concealed Ceiling Suspension System:  Hot-dipped galvanized steel grid.

Description:  Engineered grid, with main tees, hangers, trim molding, load resisting struts and other suspension components required to support ceiling and other ceiling supported construction.

Suspension Grid: TSCP-26 CP Main tee.

Application(s):  Seismic.

Structural Classification:   Intermediate-duty, when tested in accordance with ASTM C635/C635M.

Profile:  Flat.

Finish:   Baked enamel.

Color:  [Black] [Galvanized] [Custom].

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.

Substitutions:  Not permitted.

* + - * 1. Moldings and Trim:

Metal Perimeter Trim for "Cloud" Suspension Systems:  Steel or extruded aluminum; provide attachment clips, splice plates, and preformed corner pieces for complete trim system.

Trim Height:  [4-3/16 inch (96.8mm)] [5-1/2 inch (114.3mm)].

Finish:   Baked enamel.

Color:  Color to match panel.

Products: Manufacturers standard perimeter trim.

Metal Curtain Pocket Trim:  Steel or extruded aluminum; provide attachment clips, splice plates and preformed corner pieces for complete trim system:

Products:

[\_\_\_\_\_\_].

Substitutions:  Not permitted.

Color: [To match ceiling] [Custom]

* + 1. ACCESSORIES
			1. Support Channels, Carriers, and Hangers:  [Galvanized] [Primed] steel; size and type to suit application[, seismic requirements,] [None - N/A] and ceiling system flatness requirement specified.
			2. Suspension Wire[and Rope] [None - N/A]:  Size and type as required for application[, seismic requirements,] [None - N/A] and ceiling system flatness requirement specified.
				1. Concealed Suspension:

Suspension Wire:  Steel, annealed, [plain] [galvanized] finish, [9 gage, 0.1144 inch (2.91 mm)] [12 gage, 0.0808 (2.05 mm)] [[\_\_\_] gage, [\_\_\_] inch ([\_\_\_] mm)] diameter.

* + - * 1. Exposed (To View) Suspension:

Suspension Wire:  Stainless steel, [18 gage, 0.0403 (1.02 mm)] [[\_\_\_] gage, [\_\_\_] inch ([\_\_\_] mm)] diameter, complying with ASTM A580/A580M.

Suspension Rope:  1/32 inch (0.8 mm) stainless steel rope wire complying with ASTM A492, with [turnbuckle] [wire crimp] [loop and crimp-end] or [turnbuckle] [wire crimp] [loop and crimp-end] connection.

1. *The paragraph below is optional text*
	* + 1. Seismic Clips:  Manufacturer's standard clips designed to provide a rigid connection between suspension grid tees and wall moldings.
			2. 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.
			3. Touch-Up Paint for Exposed Surfaces:  Type and color to match pans and suspension system grid and trim elements.
			4. Touch-Up Paint For Concealed Items:  [Zinc oxide] [Zinc rich] type, as recommended by ceiling system manufacturer.
		1. FABRICATION
			1. Shop cut metal pan panels to accommodate mechanical and electrical items.
			2. Factory-form internal and external corners of same material, thickness, finish, and profile to match exposed metal pan panels; back brace internal corners.
	1. PART 3  EXECUTION
		1. EXAMINATION
			1. Verify existing conditions before starting work.
			2. Verify that layout of hangers will not interfere with other work.
			3. Verify that field measurements are as indicated on shop drawings.
			4. Start of installation constitutes acceptance of project conditions.
		2. Preparation
			1. Coordinate the location of hangers with other work.
2. *The paragraph below is optional text*
	* + 1. Provide hanger clips during steel deck erection.  Provide additional hangers and inserts as required.
			2. Install after major above-ceiling work is complete.
		1. INSTALLATION - SUSPENSION SYSTEM
			1. Install suspension system in accordance with ASTM C636/C636M and manufacturer's instructions and as supplemented by this section.
			2. Install hangers and inserts coordinated with overhead work.  Provide additional hangers and supports as required.
			3. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
			4. Lay out system to a balanced grid design with edge units no less than 50 percent of acoustical unit size.
			5. Locate system on room axis according to reflected ceiling plan.
			6. 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.
3. *The paragraph below is optional text*
	* + 1. 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.
4. *The paragraph below is optional text*
	* + 1. 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.
			2. Where ducts. facility services, or equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
			3. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
			4. Support fixture loads using supplementary hangers located within 6 inches (152 mm) of each corner, or support components independently.
			5. Do not eccentrically load system or induce rotation of runners.
			6. Form expansion joints as detailed.  Form to accommodate plus or minus 1 inch (25 mm) movement.  Maintain visual closure.
			7. Install unopposed tee attachment clips at appropriate locations to enable installation of acoustical units in an ashlar pattern.
			8. 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. Miter corners. Provide preformed edge closures to match bullnosed cornered partitions.
				1. Install in bed of acoustical sealant.
				2. Use longest practical lengths.
				3. Overlap and rivet corners.
		1. INSTALLATION - METAL PANS
			1. Install panels, baffles, and other system components in accordance with manufacturer's instructions.
5. *The paragraph below is optional text*
	* + 1. Stagger end joints minimum 12 inches (300 mm).
6. *The paragraph below is optional text*
	* + 1. Align end joints.
			2. Butt interior end joints tight.
			3. Set exterior end joints with 1/16 inch (2 mm) gap for expansion and contraction.
			4. Provide expansion joints to accommodate plus or minus 1 inch (25 mm) movement and maintain visual closure.
			5. Field miter corners at changes in panel direction.
			6. Install edge moldings at junctions with other finishes and at vertical surfaces; use maximum piece lengths.
			7. Where bullnose masonry units occur, install radiused closures to fit edge molding.
			8. Exercise care when site cutting sight-exposed finished components to ensure surface finish is not defaced.
			9. Insulation:  Install above panel members; fit tight between grid members ; place insulation with facing side down.
		1. INSTALLATION OF TRANSITION TRIM
			1. 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.
			2. At drywall suspension systems install gypsum panels after the transition trim is installed.
			3. 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.
			4. 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.
		2. INSTALLATION OF Perimeter "Cloud" TRIM
			1. 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.
			2. 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.
			3. 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. Installation of Curtain Pocket Trim
			1. Mounting:  Mount curtain pocket trim in accordance with manufacturer's instructions and as appropriate for project conditions:
				1. Wall Cleat Mounting:

Determine the mounting height of the pocket and cleat combination.  Mount wall cleats on the perimeter wall at that height.

Mount cleats at framing stud locations, on the center of the stud flange or face for the length of the pocket.

Secure cleat and pocket to wall using fasteners appropriate for attachment substrates.

Hook pocket on the mounting cleats.  Use a metal screw for locking pocket to cleat.

* + - * 1. Hanger Wire Mounting:

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.

* + - * 1. Metal Framing Mounting:

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.

* + - 1. 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.
			2. 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.
			3. 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.
			4. 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.
			5. Install extension plates in accordance with manufacturer's instructions.
			6. Connection to Suspension Grid:  Use clips recommended by manufacturer.
		1. TOLERANCES
			1. Maximum Variation from Flat and Level Surface:  1/8 inch in 10 feet (3 mm in 3 m).
			2. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads:  2 degrees.
			3. Maximum Variation From Dimensioned Position:  1/4 inch (6 mm).
		2. CLEANING
			1. Clean polished surfaces.
			2. Replace damaged or abraded components.
		3. SCHEDULES
1. *The paragraph below is optional text*
	* + 1. Main Foyer:  Box beam design, no space closures, polished chrome finish; 9 feet (2.75 m) above finished floor; refer to reflected ceiling plan.
2. *The paragraph below is optional text*
	* + 1. Sloped Ceilings in Stair Wells:  Flat panel shape, bullnosed edge, acoustic insulation above, recessed black filler, flat white surface finish.
3. END OF SECTION