1. Section 095400
Specialty Ceilings - USG
	1. PART 1  GENERAL
		1. SECTION INCLUDES
			1. Specialty ceiling panels and systems.
			2. Metal suspension system.
		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 Forming and Accessories:  Placement of special anchors or inserts for suspension system.
4. *The paragraph below is optional text*
	* + 1. Section 033000 - Cast-in-Place Concrete:  Placement of special anchors or inserts for suspension system.
5. *The paragraph below is optional text*
	* + 1. Section 053100 - Steel Decking:  Placement of special anchors or inserts for suspension system.
6. *The paragraph below is optional text*
	* + 1. Section 072100 - Thermal Insulation.
			2. Section 095100 - Acoustical Ceilings - USG:  Metal suspension systems.
		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 B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
			6. ASTM C635/C635M - Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2022.
			7. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2019.
			8. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023.
			9. 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.
			10. 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.
			3. Sequence work to ensure ceilings are not installed until building is enclosed, dust generating activities have terminated, and overhead work is completed.
		3. SUBMITTALS
			1. See Section 013000 - Administrative Requirements for submittal procedures.
			2. Shop Drawings:  Indicate grid layout and related dimensioning, attachment of specialty ceiling panels to grid, accessory attachments, junctions with other ceiling finishes, and mechanical and electrical items installed in the ceiling.
			3. Product Data:  Provide data on specialty ceiling components and suspension system components.
			4. Samples:  Two full size samples illustrating material and finish of specialty ceiling components.
			5. Samples:  Two samples each, [\_\_\_\_] inches ([\_\_\_\_] mm) long, of suspension system main runner, cross runner, and perimeter molding.
			6. Test Reports:  Certified test data from an independent test agency verifying that panels meet specified requirements for fire, acoustical, and seismic performance.
			7. Manufacturer's Installation Instructions:  Indicate special procedures and perimeter conditions requiring special attention.
			8. Designer's qualification statement.
			9. Manufacturer's qualification statement.
			10. Installer's qualification statement.
			11. Maintenance Materials:  Furnish the following for Owner's use in maintenance of project.
				1. See Section 016000 - Product Requirements for additional provisions.
				2. Specialty Ceiling System Components:  Provide a quantity equal to 2 percent of total product installed.
		4. QUALITY ASSURANCE
			1. Designer Qualifications for Seismic Design:  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 ceiling manufacturer.
		5. MOCK-UP
			1. Provide [\_\_\_\_] feet ([\_\_\_\_] m) by [\_\_\_\_] feet ([\_\_\_\_] m) mock-up including ceiling panels, suspension members, trim, and installation accessories.
			2. See Section 014000 - Quality Requirements for additional requirements.
			3. Locate where directed.
			4. Mock-up may remain as part of the work.
		6. DELIVERY, STORAGE, AND HANDLING
			1. Deliver specialty ceiling components to project site in original, unopened packages.
			2. Store in fully enclosed space, flat, level and off the floor.
		7. FIELD CONDITIONS
			1. Do not install specialty ceiling system until wet construction work is complete and permanent heat and air conditioning is installed and operating.
	1. PART 2  PRODUCTS
		1. Specialty CEILING ASSEMBLIES
			1. Refer to [Reflected Ceiling Plans] [Room Finish Schedule] and [Reflected Ceiling Plans] [Room Finish Schedule] on drawings for additional ceiling assemblies information.
			2. Specialty Ceiling Assembly Type SC-1:
				1. Panels:  [Curvatura 3-Dimensional Ceiling System] [Translucents Infill Panels (], Item No. [\_\_\_\_\_].

Color:  [As indicated on drawings] [White] .

Translucent Flat Panel Sizes:  24 by 24 inches (2 by 2) (600 mm by 600 mm).

Flat Panel Sizes:  [24 by 24 inches (2 by 2) (600 mm by 600 mm)] [24 by 72 inches (2 by 6) (600 mm by 1829 mm)].

Stock Curved Panel Sizes and Radii:

4-Foot Arc Lengths:  [61-inch radius] [As indicated on drawings] [92-inch radius] [31-inch radius] [To be selected from manufacturer's standards] [46-inch radius].

6-Foot Arc Lengths:  [69-inch radius] [To be selected from manufacturer's standards] [As indicated on drawings] [92-inch radius] [138-inch radius] [46-inch radius].

8-Foot Arc Lengths:  [As indicated on drawings] [61-inch radius] [183-inch radius] [To be selected from manufacturer's standards] [92-inch radius] [122-inch radius].

10-Foot Arc Lengths:  [To be selected from manufacturer's standards] [153-inch radius] [229-inch radius] [77-inch radius] [As indicated on drawings] [115-inch radius] .

Standard Perforations Pattern: See Perforations selection guide IC425 for available perforations.

Pixels Perforated Imagery:  On portions of metal pan ceilings indicated on drawings.

* + - * 1. Specialty Suspension System:  Curvatura 3-Dimensional Ceiling 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.
			3. Seismic Performance:  Ceiling systems designed to withstand the effects of earthquake motions determined according to ASCE 7 for Seismic Design Category D, E, or F and complying with the following:
				1. Local authorities having jurisdiction.
				2. ICC-ES Evaluation Report No. [\_\_\_\_\_\_\_\_\_\_].
			4. Surface Burning Characteristics:  Flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.
		2. COMPONENT Products
			1. Panels:
				1. Curved Metal Panels:  Flexible lay-in perforated metal panels.

Panel Material:  Aluminum.

Panel Thickness:  0.032 inch (0.81 mm), minimum.

Panel Color/Finish:  [\_\_\_\_\_].

NRC Range:  [\_\_\_\_] to [\_\_\_\_], determined in accordance with ASTM E1264.

Finishes:

Exposed Metal Finish:  As indicated on drawings.

Simulated Wood Painted Finish:  Wood Tones.

Color: [Beech 3810] [Dark Bamboo 3808] [Light Bamboo 3809] [Dark Cherry 3811] [Light Cherry 3812] [Maple 3813] [Red Oak 3814] [Walnut 3815].

Monochrome Painted Finish:  Manufacturer's standard color.

Color:  [Flat White] [Silver Satin] [Metallic Copper] [Metallic Gold] [Metallic Oyster].

Stamped Diamondflex Finish:  [Sheer Bright White] [Louvered Bright Silver] [Louvered Bright White] [Sheer Bright Silver].

Acoustical Fabric:  Manufacturer's standard non-woven fabric.

Accessories:  Provide manufacturer's standard stabilizer bars, panel splices, and edge trim.

Products:

USG Corporation;  Curvatura 3-Dimensional Ceiling System: www.usg.com/ceilings/#sle.

Substitutions:  Not permitted.

* + - * 1. Curved Four-Sided Panel System with Concealed Grid:  Pre-engineered, curved unperforated metal modular  pan torsion-spring ceiling system with wood veneer finish; concealed suspension system.

Sound-Absorptive Backer:  Manufacturer's standard “Acoustibond” material factory-laminated to the backside of the perforated panels.

Material:  Nonwoven synthetic fabric, 0.011 inch (0.27 mm) thick.

* + - 1. Standard Perforations:  Regular patterns of factory-machined, various size [circular] [square] [obround] [custom] [rectangular] openings at 90, 45, or 60 degrees, with unperforated borders at edges of panels.
			2. Perforated Imagery Enhancements:  Images created by a pattern of factory-machined perforations in metal pan panels.
				1. Original Image Type:  [Digital art] [Digital logo] [Digital photograph] , positive image.
				2. Original Image Source:  To be provided by Owner.
				3. Executed Image Resolution:  [Low-Res] [Med-Res] [Hi-Res], as defined by manufacturer.
				4. Executed Size:  Image canvas size (panel layout and number of panels) is indicated on drawings.
				5. Panel Canvas:  Curvatura Metal Panels.
				6. Products:

USG Corporation; Pixels Perforated Imagery:  www.usg.com/ceilings/#sle.

Substitutions:  Not permitted.

* + - 1. Specialty Suspension Systems:
				1. 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] [USG Curvatura valley tee] [USG Curvatura vault tee] as required.

Materials:

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

* + - * 1. Exposed Curved Suspension System:  Hot-dipped galvanized steel grid consisting of vault and valley main tees and straight cross tees, with integral hold-down tabs.
1. *The paragraph below is optional text*

Application(s):  Seismic.

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

Configuration:  [One-directional] [Two-directional].

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] [As indicated on drawings] [To be selected from manufacturer's standards].

Edge Trim:  Manufacturer's standard.

Products:

USG Corporation;  Curvatura 3-Dimensional Ceiling System:  www.usg.com/ceilings/#sle.

Substitutions:  Not permitted.

* + - * 1. Support Channels, Carriers, Stabilizer bars and Hangers:  [Galvanized] [Primed] steel; size and type to suit application [seismic requirements] [None - N/A] and ceiling system flatness requirement specified.
			1. Moldings and Trim:
				1. Edge Trim and Splices:  Manufacturer's standard edge trim.
				2. Perimeter (Wall) Moldings:   [Same metal and finish as grid] [Aluminum].

Size:  As required for installation conditions[and specified Seismic Design Category] [and [None - N/A].

Angle Moldings:  L-shaped, for mounting at same elevation as face of grid.

* + - * 1. Metal Perimeter Trim for "Cloud" Suspension Systems:  Steel; provide [fascia splice plates] [preformed corner clips] and [fascia splice plates] [preformed corner clips] for complete trim system.

Trim Height:  2-1/4 inch (57 mm).

Finish:   [Baked enamel] [Match panels].

Color:   [Match panels] [White].

* + 1. Accessories
			1. Suspension Wire[None - N/A] [and Rope]:  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, [galvanized] [plain] finish, [12 gage, 0.0808 (2.05 mm)] [9 gage, 0.1144 inch (2.91 mm)] [[\_\_\_] gage, [\_\_\_] inch ([\_\_\_] mm)] diameter.

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

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

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

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

* + - 1. Touch-Up Paint for Exposed Surfaces:  Type and color to match acoustical units and suspension system grid and trim elements.
			2. Touch-Up Paint For Concealed Galvanized Items:  [Zinc rich] [Zinc oxide] type, as recommended by ceiling system manufacturer.
		1. Fabrication
			1. Shop fabricate ceiling components to the greatest extent possible.
	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. Do not begin installation until after interior wet work is dry.
			5. Start of installation constitutes acceptance of project conditions.
		2. Preparation
			1. Coordinate the location of hangers with other work.
1. *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.
			3. Layout ceiling components in pattern according to reflected ceiling plan and as shown on shop drawings.
		1. INSTALLATION - Suspension System
			1. Install suspension system in accordance with ASTM C636/C636M and manufacturer's instructions and as supplemented in 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. Locate system on room axis according to reflected ceiling plan.
			5. 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.
2. *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.
3. *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. 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. Use longest practical lengths.
				2. Assemble corners according to manufacturer's instructions corners to backer angles according to manufacturer's instructions.
		1. INSTALLATION - SPECIALTY CEILING Units
			1. Install in accordance with manufacturer's instructions.
			2. Fit components in place, free from damaged edges or other defects detrimental to appearance and function.
			3. Cut to fit irregular grid and perimeter moldings.
				1. Shape and finish field-cut edges as recommended by manufacturer to match profile of factory edges and finish.
			4. Fit edge trim neatly against abutting surfaces.
			5. Install specialty units level, in uniform curvilinear plane, and free from twist, warp, and dents.
			6. Hang specialty units from suspension grid by engaging torsion springs into main tees.
			7. Where round obstructions occur, provide preformed closures to match perimeter molding.
			8. Bend hold-down tabs onto each panel to retain panels tight to grid system; comply with fire rating requirements, and where required by manufacturer.
		2. TOLERANCES
			1. Maximum Variation from Indicated Planes:  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. Cleaning
			1. Clean and touch up minor finish damage.  Remove and replace components that cannot be successfully cleaned and repaired.
4. END OF SECTION