1. Section 095423
Linear Metal Ceilings - USG
	1. PART 1  GENERAL
		1. SECTION INCLUDES
			1. Linear metal ceilings.
			2. Suspended metal support system and perimeter trim.
2. *The paragraph below is optional text*
	* + 1. Supplementary acoustical insulation over system units.
		1. RELATED REQUIREMENTS
3. *The paragraph below is optional text*
	* + 1. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions.
4. *The paragraph below is optional text*
	* + 1. Section 031000 - Concrete Forms and Accessories:  Execution requirements for placement of attachment anchors to structure above.
5. *The paragraph below is optional text*
	* + 1. Section 033000 - Cast-in-Place Concrete:  Execution requirements for placement of attachment anchors to structure above.
6. *The paragraph below is optional text*
	* + 1. Section 053100 - Steel Decking:  Execution requirements for placement of attachment anchors to structure above.
7. *The paragraph below is optional text*
	* + 1. Section 072100 - Thermal Insulation.
8. *The paragraph below is optional text*
	* + 1. Section 083100 - Access Doors and Panels:  Access panels.
9. *The paragraph below is optional text*
	* + 1. Section 092116 - Gypsum Board Assemblies - USG:  Gypsum board and metal framing products
10. *The paragraph below is optional text*
	* + 1. Section 095100 - Acoustical Ceilings - USG:  Metal suspension system.
11. *The paragraph below is optional text*
	* + 1. Section 211300 - Fire-Suppression Sprinkler Systems:  Sprinkler heads.
12. *The paragraph below is optional text*
	* + 1. Section 233700 - Air Outlets and Inlets:  Air diffusers.
13. *The paragraph below is optional text*
	* + 1. Section 265100 - Interior Lighting:  Luminaires.
14. *The paragraph below is optional text*
	* + 1. Section 265600 - Exterior Lighting:  Luminaires.
15. *The paragraph below is optional text*
	* + 1. Section 275116 - Public Address Systems:  Audio speakers.
16. *The paragraph below is optional text*
	* + 1. 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 A492 - Standard Specification for Stainless Steel Rope Wire; 1995 (Reapproved 2019).
			3. ASTM A580/A580M - Standard Specification for Stainless Steel Wire; 2018.
			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; 2023.
			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; 2023.
			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.
		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. Sequencing:  Supply hanger clips during steel deck erection.  Supply additional hangers and inserts as required.
		3. SUBMITTALS
			1. Product Data:  Furnish for component profiles.
			2. Shop Drawings:  Indicate reflected ceiling plan.
				1. Seismic Design:  Include seal and signature of design professional on each drawing.
			3. Samples:  Two samples [\_\_\_] by [\_\_\_] inch ([\_\_\_] by [\_\_\_] mm) in size showing color and finish of exposed to view components.
17. *The paragraph below is optional text*
	* + 1. Designer's qualification statement.
18. *The paragraph below is optional text*
	* + 1. Manufacturer's qualification statement.
			2. Installer's qualification statement.
			3. Maintenance Materials:  Furnish the following for Owner's use in maintenance of project.
				1. See Section 016000 - Product Requirements for additional provisions.
				2. Extra Linear Panels:  One, standard length.
		1. QUALITY ASSURANCE
19. *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.
20. *The paragraph below is optional text*
	* + 1. Products Requiring Electrical Connection:  Listed and classified by Underwriters Laboratories Inc.
		1. MOCK-UP
21. *The paragraph below is optional text*
	* + 1. Construct [\_\_\_\_\_\_\_\_] mock-up, [\_\_\_\_] feet ([\_\_\_\_] m) long by [\_\_\_\_] feet ([\_\_\_\_] m) wide; include suspension system, panels, closures in mock-up.
22. *The paragraph below is optional text*
	* + 1. See Section 014000 - Quality Requirements for additional requirements.
23. *The paragraph below is optional text*
	* + 1. Locate mock-up where directed.
24. *The paragraph below is optional text*
	* + 1. Mock-up may remain as part of the Work.
		1. 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.
		2. 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. Linear Metal Ceiling Assemblies
			1. Linear Metal Baffles Type LMB-1, Item No. [\_\_\_\_\_]:
				1. Baffles:  Paraline Baffles.
25. *The paragraph below is optional text*
	* + - 1. Baffle Size:  [4" x 1.5" x 24" - 144"] [6" x 1.5" x 24" - 144"] [4" x 2.0" x 24" - 144"] [6" x 2.0" x 24" - 144"] [4" x 3.0" x 24" - 144"] [6" x 3.0" x 24" - 144"] [4" x 4.0" x 24" - 144"] [4" x 4.0" x 24" - 144" 6" x 4.0" x 24" - 144"].
				2. Layout:  As indicated on drawings.
				3. Finish Type:
26. *The paragraph below is optional text*

Anodized - On Metal Colors:  [058 Brushed Aluminum],[086 Polished Chrome],[As indicated on drawings].

1. *The paragraph below is optional text*

Painted - On Metal Colors:  [002 Silver Satin],[050 Flat White],[3708 Matte White],[As indicated on drawings].

1. *The paragraph below is optional text*

Timbre Colors:  [As indicated on drawings],[Cherry 4013],[Mahogany 4015],[Maple 4010],[Red Birch 4012],[VG Fir 4011],[Walnut 4014]

1. *The paragraph below is optional text*
	* + - 1. Suspension Grid:  Curvatura tees.
2. *The paragraph below is optional text*
	* + - 1. Suspension Grid:  Exposed Donn DX.
3. *The paragraph below is optional text*
	* + - 1. Suspension Grid:  Gridware.
		1. DESIGN REQUIREMENTS
			1. Design components to ensure light fixtures will not induce eccentric loads.  Where components may induce rotation of ceiling system components, provide stabilizing reinforcement.
		2. 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.
4. *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 D, E, or F and complying with the following:
5. *The paragraph below is optional text*
	* + - 1. Local authorities having jurisdiction.
6. *The paragraph below is optional text*
	* + - 1. ICC-ES Evaluation Report No. [\_\_\_\_\_\_\_\_\_\_].
			1. Surface Burning Characteristics:  Flame spread index of  25, smoke developed index of  50, when tested in accordance with ASTM E84.
			2. Acoustic Attenuation:  STC of [\_\_\_\_\_\_\_\_] calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90, with insulation installed.
			3. Sound Absorption Average (SAA):  [\_\_\_\_\_\_], measured in accordance with ASTM C423 with insulation installed.
			4. Noise Reduction Coefficient (NRC):  [\_\_\_\_\_\_], measured in accordance with ASTM C423 with insulation installed.
7. *The paragraph below is optional text*
	* + 1. Systems Located Outside Building Envelope:
8. *The paragraph below is optional text*
	* + - 1. Accommodate wind and suction loads and wind uplift without damage in accordance with applicable code.
9. *The paragraph below is optional text*
	* + - 1. Accommodate wind and suction loads and wind uplift to resist [\_\_\_\_] psf ([\_\_\_\_] kPa) without damage.
10. *The paragraph below is optional text*
	* + - 1. Thermal Resistance Value:  Total R-value of [\_\_\_\_] (RSI-value of [\_\_\_\_]) with insulation installed.
		1. COMPONENT Products
			1. Individual Linear Metal Baffles:  Single baffle elements attached to underside of suspension members.
				1. Profile:  Beam-shaped.
				2. Spacing:  As indicated on drawings.
				3. Material:  Aluminum sheet, ASTM B209/B209M.
				4. Finishes:

Exposed Metal Finish:  Anodized Metals.

1. *The paragraph below is optional text*

Color:  PIA12 Brushed Aluminum.

Color:  PM61 Polished Chrome.

Monochrome Painted Finish:  Manufacturer's standard color.

1. *The paragraph below is optional text*

Color:  050 Flat White.

Color:  002 Silver Satin.

Color:  3708 Matte White.

Simulated Wood Painted Finish:  TIMBRE.

1. *The paragraph below is optional text*

Color:  4010 Maple.

Color:  4011 VG Fir.

Color:  4012 Red Birch.

Color:  4013 Cherry.

Color:  4014 Walnut

Color:  4015 Mahogany.

1. *The paragraph below is optional text*
	* + - 1. Attachment Accessories:  Manufacturer's standard attachment and jointing clips, splices, or end caps.
				2. Products:

USG Corporation; Paraline Baffles Linear Ceiling System:  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 [hold down clips],[perimeter moldings],[seismic clips],[splices],[stabilizer bars] as required.

Materials:

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

* + - * 1. Carrier Systems:  Dedicated concealed support systems for linear metal ceilings:

Products:

USG Corporation; Curvatura Vault and Valley Tees with Flat Channel Carriers:  www.usg.com/ceilings/#sle.

Substitutions:  Not permitted.

* + - * 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:  Black.

Products:

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

Substitutions:  Not permitted.

* + - * 1. Open-Cell Grid-Only System:  Hot-dipped galvanized steel main and cross tee ceiling system, powder coat finish.
1. *The paragraph below is optional text*

Application(s):  Seismic.

Sizes:  2 foot by 2 foot (610 by 610 mm) module, with 24 by 24 inches (610 by 610 mm) cells.

Grid Profile: 15/16 inch GWDX (24 mm GWDX) ceiling grid.

Finish:  100 percent, 360 degrees tee coverage.

Color:  White.

Accessories:  Provide manufacturer's standard perimeter trim.

Products:

USG Corporation;  Gridware Open Cell Decorative System: www.usg.com/ceilings/#sle.

Substitutions:  Not permitted.

1. *The paragraph below is optional text*
	* 1. Accessories
			1. Support Channels, Carriers, and Hangers:  Galvanized steel; size and type to suit application and ceiling system flatness requirement specified.
			2. Suspension Wire:  Size and type as required for application, seismic requirements, and ceiling system flatness requirement specified.
				1. Concealed Suspension:

Suspension Wire:  Steel, annealed, galvanized finish, 12 gage, 0.0808 (2.05 mm) diameter.

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

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] connection.

* + - * 1. Grouping Bar:

Grouping Bar for Suspension System: [2'] [4'] lengths, with [4"] [6"] [8"] or [12"] on-center baffles.

* + - * 1. Batten End Clip:

Insert batten end cap, where required with exposed batten edge condition.

1. *The paragraph below is optional text*
	* + 1. Hold-Down Clips:  Manufacturer's standard clips to suit application.
2. *The paragraph below is optional text*
	* + 1. Seismic Clips:  Manufacturer's standard clips for seismic conditions and to suit application.
3. *The paragraph below is optional text*
	* + 1. Miscellaneous Accessories:  Manufacturer's standard [filler strips],[perimeter trim],[splice plates] required for complete installation of system.
4. *The paragraph below is optional text*
	* + 1. Edge Molding, Expansion Joints, and Splices:  Same material, thickness, and finish as linear panels.
5. *The paragraph below is optional text*
	* + 1. End Caps:  Formed metal; same color and finish as sight-exposed surfaces of linear panels.
6. *The paragraph below is optional text*
	* + 1. Metal Baffle Grid Attachment Clips:  Manufacturer's standard for attachment to main tees.
7. *The paragraph below is optional text*
	* + 1. Celebration Compasso Elite clip.
			2. Acoustical Insulation:  ASTM C665 friction fit type, unfaced batts.
				1. Thickness:  2 inch (51 mm).
				2. Size:  To fit acoustical suspension system.
8. *The paragraph below is optional text*
	* + 1. Thermal Insulation:  Specified in Section 072100.
9. *The paragraph below is optional text*
	* + 1. Thermal Insulation:  ASTM C665,  preformed glass fiber batt; friction fit, complying with the following:
10. *The paragraph below is optional text*
	* + - 1. Thermal Resistance:  R-value (RSI-value) of [\_\_\_\_] ([\_\_\_\_]).
11. *The paragraph below is optional text*
	* + - 1. Batt Size:  [\_\_\_]  by [\_\_\_] inch ([\_\_\_]  by [\_\_\_] mm).
12. *The paragraph below is optional text*
	* + - 1. Facing:  Unfaced.
13. *The paragraph below is optional text*
	* + - 1. Facing:  Faced on one side with foil.
			1. Gypsum Board and Framing Materials:  See Section 092116.
			2. Touch-Up Paint for Exposed Surfaces:  Type and color to match linear panels and suspension system grid and trim elements.
			3. Touch-Up Paint For Concealed Galvanized Items:  Zinc rich type, as recommended by ceiling system manufacturer.
		1. FABRICATION
			1. Shop cut linear panels to accommodate mechanical and electrical items.
			2. Factory-form internal and external corners of same material, thickness, finish, and profile to match exposed linear panels ; back brace internal corners.
			3. Fabricate components to allow access to ceiling plenum as required.
	1. PART 3  EXECUTION
		1. EXAMINATION
14. *The paragraph below is optional text*
	* + 1. Verify existing conditions before starting work.
15. *The paragraph below is optional text*
	* + 1. Verify that layout of hangers will not interfere with other work.
16. *The paragraph below is optional text*
	* + 1. Verify that field measurements are as indicated on shop drawings.
17. *The paragraph below is optional text*
	* + 1. Start of installation constitutes acceptance of project conditions.
		1. Preparation
18. *The paragraph below is optional text*
	* + 1. Coordinate the location of hangers with other work.
19. *The paragraph below is optional text*
	* + 1. Provide hanger clips during steel deck erection.  Provide additional hangers and inserts as required.
20. *The paragraph below is optional text*
	* + 1. 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.
21. *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.
22. *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 - LINEAR METAL Components:
			1. Install linear panels, baffles, and other system components in accordance with manufacturer's instructions.
			2. Stagger end joints minimum 12 inches (300 mm).
			3. Align end joints.
			4. Butt interior end joints tight.
			5. Set exterior end joints with 1/16 inch (2 mm) gap for expansion and contraction.
			6. Provide expansion joints to accommodate plus or minus 1 inch (25 mm) movement and maintain visual closure.
			7. Field miter corners at changes in panel direction.
			8. Install filler strips between linear panels at interior locations.
			9. Install edge moldings at junctions with other finishes and at vertical surfaces; use maximum piece lengths.
			10. Where bullnose masonry units occur, install radiused closures to fit edge molding.
			11. Install end caps at sight-exposed ends of linear panels.
			12. Exercise care when site cutting sight-exposed finished components to ensure surface finish is not defaced.
			13. Insulation:  Install above panel members; fit tight between grid members ; place insulation with facing side down.
		2. 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).
		3. CLEANING
			1. Clean polished surfaces.
			2. Replace damaged or abraded components.
		4. SCHEDULES
23. *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.
24. *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.
25. END OF SECTION