SECTION 095753 - SECURITY CEILING ASSEMBLIES

Revise this Section by deleting and inserting text to meet Project-specific requirements.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

1. GENERAL
	* + 1. RELATED DOCUMENTS
				1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
			2. SUMMARY
				1. Section Includes:

Downward-locking-panel security ceiling assemblies.

Security-plank security ceiling assemblies.

* + - 1. COORDINATION

Retain "Detention Specialist" paragraph below if Detention Specialist is retained for Project. If retaining a Detention Specialist, some requirements in this Section are the responsibility of Detention Specialist rather than Contractor.

* + - * 1. Detention Specialist: Coordinate with requirements of this Section that are to be performed by Detention Specialist or other entity.
				2. Coordinate layout and installation of security ceiling assemblies with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.
			1. PREINSTALLATION MEETINGS

Retain "Preinstallation Conference" paragraph below if Work of this Section is extensive or complex enough to justify a conference. A preinstallation conference is recommended for security ceiling assemblies.

* + - * 1. Preinstallation Conference: Conduct conference at [**Project site**] <**Insert location**>.
			1. SUBMITTALS
				1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				2. Manufacturer’s installation instructions shall be provided along with product data.
				3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				4. Product Data: For each type of product.
				5. Sustainable Design Submittals:

Samples for initial color selection are typically not required because white is only color available from manufacturers. Retain "Samples for Verification" paragraph below if required.

* + - * 1. Samples for Verification: For the following products, of sizes indicated below:

Security Ceiling Panel Units: Full cross section by 12 inches long for each type of panel.

Perimeter Supports, Closures, and Exposed Molding: 12 inches long for each type.

Suspension System: 12 inches long.

Retain "Coordination Drawings" paragraph below for situations where limited space necessitates maximum utilization for efficient installation of different components or if coordination is required for installation of products and materials by separate installers. Coordinate paragraph with other Sections specifying products listed below. Preparation of coordination drawings requires the participation of each trade involved in installations within the limited space.

* + - * 1. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

Revise subparagraphs below to suit Project.

Layout of panels, joint pattern, and transitions.

Suspension system members.

Method of attaching hangers to building structure.

Size and location of access panels.

Ceiling-mounted items including light fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.

Retain "Welding certificates" paragraph below if retaining "Welding Qualifications" paragraph in "Quality Assurance" Article.

* + - * 1. Welding certificates.
				2. Product Test Reports: For each security ceiling assembly, for tests performed by a qualified testing agency.
				3. Attachment Device Test Reports: Indicating capability to sustain, without failure, load indicated without pulling out from substrate.
				4. Evaluation Reports: For security ceiling assembly, from <**Insert applicable model code organization**>.

Retain "Field quality-control reports" paragraph below if Contractor is responsible for field quality-control testing and inspecting.

* + - * 1. Field quality-control reports.
				2. Examination reports documenting inspection of substrates, areas, and conditions.
				3. Anchor inspection reports documenting inspections of built-in and cast-in anchors.
			1. MAINTENANCE MATERIAL SUBMITTALS
				1. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

Security Ceiling Panels: Full-size units equal to [**2**] <**Insert number**> percent of amount installed.

Suspension System Components: Quantity of each grid and exposed component equal to [**2**] <**Insert number**> percent of amount installed.

Security Fasteners: Furnish not less than 1 box for each 50 boxes or fraction thereof, of each type and size of security fastener installed.

Tools: Provide [**two**] <**Insert number**> sets of tools for installing and removing security fasteners, packaged for easy handling and storage.

* + - 1. QUALITY ASSURANCE
				1. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

Retain "Welding Qualifications" paragraph below if shop or field welding is required. If retaining, also retain "Welding certificates" paragraph in "Informational Submittals" Article.

* + - * 1. Welding Qualifications: Qualify procedures and personnel according to the following:

Retain applicable subparagraphs below.

AWS D1.1, "Structural Welding Code - Steel."

AWS D1.2, "Structural Welding Code - Aluminum."

AWS D1.3, "Structural Welding Code - Sheet Steel."

AWS D1.6, "Structural Welding Code - Stainless Steel."

* + - * 1. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate security performance and aesthetic effects, and to set quality standards for materials and execution.

Build mockup [**48 by 48 inches square**] [**of size equal to one cell**] <**Insert size**> of each type of security ceiling assembly. Include ceiling panels, suspension system, perimeter support, [**lighting unit,**] [**duct penetration,**] [**access panel,**] and accessories.

* + - 1. DELIVERY, STORAGE, AND HANDLING
				1. Deliver security ceiling panels, suspension system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
				2. Handle security ceiling panels, suspension system components, and accessories carefully to avoid damaging units and finishes in any way.
1. PRODUCTS
	* + 1. PERFORMANCE REQUIREMENTS
				1. General Performance: Security ceiling assemblies shall withstand normal thermal movement and structural loads without failure, including permanent deformation of security ceiling assembly components including pans and suspension system; noise or metal fatigue caused by vibration, deflection, and displacement of security ceiling units; and permanent damage to fasteners and anchors.
				2. Acoustical Performance: Provide security ceiling assemblies with acoustical ratings indicated, as determined according to ASTM E1264 and the following:

Noise Reduction Coefficient (NRC): ASTM C423 and ASTM E795 in Type E-400 mounting.

Ceiling Attenuation Class (CAC): ASTM E1414.

Structural Performance: Security ceiling assemblies shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

Insert loading requirements as determined by Projects structural engineer under each set of performance criteria below to suit Project. Verify requirements of authorities having jurisdiction. Vertical loads include impact loads.

Vertical Load for Security Ceiling Assemblies: <**Insert load**>, acting upward or downward.

Live Load for Security Ceiling Assemblies: Panel dead weight plus a uniform load of <**Insert load**>, acting upward or downward, with a deflection not more than L/360.

Retain subparagraph below for exterior security ceiling assemblies.

Wind Loads: As indicated on Drawings.

Retain "Seismic Standard" paragraph below for projects in areas that require seismic restraint. Verify requirements with authorities having jurisdiction.

* + - * 1. Seismic Standard: Provide ceilings designed and installed to withstand the effects of earthquake motions according to [**ASCE/SEI 7**] <**Insert requirement of authorities having jurisdiction**>.
			1. DOWNWARD-LOCKING-PANEL SECURITY CEILING ASSEMBLY
				1. Provide a complete, integrated assembly, including security ceiling panels, exposed suspension system, perimeter supports, and accessories.
				2. Panels: Fabricated from a single sheet of metal, with formed upturned edges on all four sides designed to continuously engage with and lock under rectangular bulb of suspension system.

Retain one or more of "Steel Panels," "Aluminum Panels," and "Stainless-Steel Panels" subparagraphs below. Coordinate with products specified; not all thicknesses are available from all manufacturers. Metal thicknesses indicated in "Steel Panels" subparagraph correspond to 18-, 20-, and 24-gage designations.

Steel Panels: Metallic-coated steel with minimum uncoated sheet thickness of [**0.043 inch**] [**0.033 inch**] [**0.021 inch**].

Aluminum Panels: Nominal sheet thickness of [**0.040 inch**] [**0.063 inch**].

Metal thicknesses indicated in "Stainless-Steel Panels" subparagraph below correspond to 18- and 24-gage designations.

Stainless-Steel Panels: Nominal sheet thickness of [**0.050 inch**] [**0.025 inch**].

Panel Size: [**12 by 24 inches**] [**12 by 48 inches**] [**24 by 24 inches**] [**24 by 48 inches**].

Insert perforation pattern in "Perforation Pattern" subparagraph below if critical to appearance.

Perforation Pattern: [**Manufacturer's standard**] [**Unperforated**] <**Insert pattern**>.

Noise Reduction Coefficient (NRC): [**0.70**] [**0.80**] [**0.85**] [**0.90**] [**0.95**] [**1.00**].

* + - * 1. Sound-Absorptive Pads: Provide sound-absorptive pads for placement over ceiling panels.

Retain "Spacer Grids" or "Support Clips" subparagraph below for improved acoustical absorption with sound-absorptive pads.

Spacer Grids: [**Metallic-coated-steel**] [**Aluminum**] grid units that provide an air cushion between security ceiling panels and sound-absorptive pads and that act to improve sound absorption.

Support Clips: Metal clips designed to hold sound-absorptive pads above bottom face sheet.

Retain "Backer Plates" paragraph below for improved acoustical privacy.

* + - * 1. Backer Plates: Unperforated units formed from [**metallic-coated steel**] [**aluminum**] sheet that reduces travel of sound through panel and that makes panel assembly comply with the following performance:

Ceiling Attenuation Class (CAC): [**40**] [**45**] <**Insert CAC rating**>.

Retain or revise "Sound-Absorptive Pads" subparagraph below if secondary pad differs from primary pad; delete if not required.

Sound-Absorptive Pads: Provide secondary sound-absorptive pads, same as specified for primary pads, for placement over backer plates to reduce plenum sound.

Locations of panels in "Access Panels" paragraph below are carefully determined in detention areas and are typically indicated on Drawings or specified by inserting location below.

* + - * 1. Access Panels: Material, perforation pattern, and finish same as security ceiling panels; designed for installation by [**continuously welding access panel frame to security ceiling panel**] [**security fasteners screwed through suspension system**]. Provide panels at [**locations indicated on Drawings**] <**Insert location**>.

Size: [**24 by 24 inches**] [**24 by 48 inches**] [**As indicated on Drawings**].

Delete "Lock Preparation" subparagraph below if panels are removed by security fasteners.

Lock Preparation: Prepare door panel to accept cylinder specified in [**Section 087100 "Door Hardware."**] [**Section 087163 "Detention Door Hardware."**]

* + - * 1. Suspension System: ASTM C635, heavy-duty exposed system consisting of snap-in main runners supported by hangers attached to building structure.

Provide system complete with main runners, splice plates, connector and alignment clips, hangers, trim, seismic- and wind-load clips and struts, and other suspension components required to support security ceiling units and other security ceiling-supported construction.

Main Runners and Cross Tees: Formed from metal sheet, 1-1/2 inches high, with 15/16-inch flange width and with oversized rectangular bulb for engaging panels.

Material: [**Galvanized steel, G90 zinc coating**] [**Electrolytic zinc-coated steel, 40Z zinc coating**] [**Aluminum**] [**Stainless steel**].

Revise "Wire Hangers, Braces, and Ties" subparagraph below if rigid steel channel hangers are required instead of wire hangers.

Wire Hangers, Braces, and Ties: Zinc-coated, carbon-steel wire, ASTM A641, Class 1 zinc coating, soft temper.

Revise "Size" subparagraph below to 0.135 inch if required by authorities having jurisdiction or if needed for extra security and quality (including corrosion allowance). Because larger sizes are difficult to work with, their use could result in poor leveling tolerance.

Size: Select wire diameter so its stress at [**3**] <**Insert safety factor**> times the hanger design load (ASTM C635, Table 1, Direct Hung) will be less than yield stress of wire, but provide not less than 0.106-inch diameter wire.

Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.

Flat Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.

Angle Hangers: Angles with legs not less than 7/8 inch wide, formed with 0.04-inch thick, galvanized-steel sheet, G90 zinc coating, with bolted connections and 5/16-inch diameter bolts.

Compression Struts: Fabricated from 3/4-inch diameter steel tubing, designed to fit over rectangular bulb of suspension system.

Clips in "Security Clips" subparagraph below are required for some security ceiling assemblies; delete if not required or allowed.

Security Clips: Steel wire, designed to slip over suspension system and through holes in flanges of panel to prevent panel removal.

* + - * 1. Perimeter Supports: Wall-mounted channel moldings and wall angles; fabricated from [**0.042-inch thick galvanized steel**] [**0.016-inch thick galvanized steel**] [**0.040-inch thick aluminum**] [**0.050-inch thick stainless steel**]; finished to match suspension system.
				2. Exposed Edge Moldings and Trim: Provide exposed members as indicated or required for edges of security ceiling, fixture trim, beams, fasciae at changes in security ceiling height, and other conditions; of metal and finish matching security ceiling panels.
				3. Materials:

Cold-Rolled Steel Sheet: ASTM A1008, CS (Commercial Steel), Type B; [**uncoated**] [**or**] [**electrolytic zinc coated**] suitable for exposed applications.

Metallic-Coated Steel Sheet: ASTM A653, CS (Commercial Steel), Type B; with G60 zinc (galvanized) or A60 zinc-iron-alloy (galvannealed) coating designation.

Steel Tubing: ASTM A513, Type B.

Type 304 stainless steel in "Stainless-Steel Sheet, Strip, Plate, and Flat Bars" subparagraph below is most commonly used stainless-steel alloy; Type 316 provides greater corrosion resistance. Other alloys are available for specialty applications; verify with manufacturer. If using more than one type on job, indicate locations on Drawings.

Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A666 or ASTM A240, austenitic stainless steel, [**Type 304**] [**Type 316**] [**Type 304 or 316 as indicated**] <**Insert type**>.

Aluminum Extrusions: ASTM B221. Provide alloy and temper recommended by manufacturer for strength, corrosion resistance, and application of required finish, but not less than 22,000-psi ultimate tensile strength.

Aluminum Sheet and Plate: ASTM B209.

* + - 1. SECURITY-PLANK SECURITY CEILING ASSEMBLY

Retain "Single-Configuration Panels" paragraph below for security-plank ceilings fabricated from a single sheet of metal.

* + - * 1. Single-Configuration Panels: Fabricated from a single sheet of metal, with a self-locking male/female lap joint for joining panels.

Retain one or more of "Steel Panels," "Aluminum Panels," and "Stainless-Steel Panels" subparagraphs below. Coordinate with products specified; not all thicknesses are available from all manufacturers. Metal thicknesses indicated in "Steel Panels" subparagraph correspond to 12-, 14-, 16-, 18-, and 20-gage designations.

Steel Panels: [Electrolytic zinc] [Metallic]-coated steel with minimum uncoated sheet thickness of [**0.097 inch**] [**0.068 inch**] [**0.053 inch**] [**0.043 inch**] [**0.033 inch**].

Aluminum Panels: Nominal sheet thickness of [**0.125 inch**] [**0.100 inch**] [**0.080 inch**] [**0.063 inch**] [**0.050 inch**] [**0.040 inch**].

Metal thicknesses indicated in "Stainless-Steel Panels" subparagraph below correspond to 12-, 14-, 16-, and 18-gage designations.

Stainless-Steel Panels: Nominal sheet thickness of [**0.109 inch**] [**0.078 inch**] [**0.062 inch**] [**0.050 inch**].

Panel Width: [**12 inches**] [**18 inches**] [**24 inches**].

Panel Length: [**Minimum 8 feet**] [**Minimum 10 feet**] [**Minimum 12 feet**] [**Custom lengths to fit areas indicated**].

Retain one of two options or insert pattern in "Perforation Pattern" subparagraph below if critical to appearance.

Perforation Pattern: [**Manufacturer's standard**] [**Unperforated**] <**Insert pattern**>.

Noise Reduction Coefficient (NRC): [**0.70**] [**0.80**] [**0.85**] [**0.90**] [**0.95**] [**1.00**].

Retain "Double-Configuration Panels" paragraph below for security-plank ceilings made from separate top and bottom sheets factory fabricated into single units.

* + - * 1. Double-Configuration Panels: Factory-assembled units with cold-rolled steel top face sheet and metallic-coated steel bottom face sheet, welded to a truss core. Fabricate panels with a self-locking male/female lap joint for joining panels.

Coordinate remaining subparagraphs with products selected. See the Evaluations.

Panel Width: [**12 inches**] [**18 inches**] [**24 inches**] wide by length indicated.

Panel Length: [**Custom lengths to fit areas indicated**] <**Insert length**>.

Overall Panel Thickness: As [**required by indicated spans**] [**indicated on Drawings**].

Metal thicknesses indicated in "Minimum Uncoated Top Face Sheet Thickness" and "Minimum Uncoated Bottom Face Sheet Thickness" subparagraphs below correspond to 14-, 16-, 18-, and 20-gage designations.

Minimum Uncoated Top Face Sheet Thickness: [**0.068 inch**] [**0.053 inch**] [**0.043 inch**] [**0.033 inch**].

Minimum Uncoated Bottom Face Sheet Thickness: [**0.068 inch**] [**0.053 inch**] [**0.043 inch**] [**0.033 inch**].

Truss Core: Fabricated from 0.015-inch thick, cold-rolled steel sheet bent into corrugated shape; welded to top and bottom face sheets at even spacings across and along length of panel.

Retain one of two options or insert pattern in "Perforation Pattern for Bottom Face Sheet" subparagraph below if critical to appearance.

Perforation Pattern for Bottom Face Sheet: [**Manufacturer's standard**] [**Unperforated**] <**Insert pattern**>.

Noise Reduction Coefficient (NRC): [**0.65**] [**0.90**] [**1.00**].

* + - * 1. Sound-Absorptive Pads: Provide sound-absorptive pads for placement over ceiling planks.

Retain "Spacer Grids" or "Support Clips" subparagraph below for improved acoustical absorption with sound-absorptive pads.

Spacer Grids: [**Metallic-coated-steel**] [**Aluminum**] grid units that provide an air cushion between security ceiling panels and sound-absorptive pads and that act to improve sound absorption.

Support Clips: Metal clips designed to hold sound-absorptive pads above bottom face sheet.

Retain "Backer Plates" paragraph below for improved acoustical privacy, such as where partitions do not extend to structure above.

* + - * 1. Backer Plates: Unperforated units formed from [**metallic-coated steel**] [**aluminum**] sheet that reduces travel of sound through panel and that makes panel assembly comply with the following performance:

Ceiling Attenuation Class (CAC): [**40**] [**45**] <**Insert CAC rating**>.

Retain or revise "Sound-Absorptive Pads" subparagraph below if secondary pad differs from primary pad; delete if not required.

Sound-Absorptive Pads: Provide secondary sound-absorptive pads, same as specified for primary pads, for placement over backer plates to reduce plenum sound.

Locations of panels in "Access Panels" paragraph below are carefully determined in detention areas and are typically indicated on Drawings.

* + - * 1. Access Panels: Material, perforation pattern, and finish same as security ceiling panels; designed for installation by [**continuously welding access panel frame to security ceiling panel**] [**security fasteners screwed through suspension system**]. Provide at [**locations indicated on Drawings**] <**Insert location**>.

Size: [**24 by 24 inches**] [**24 by 48 inches**] [**As indicated**].

Delete "Lock Preparation" subparagraph below if panels are removed by security fasteners.

Lock Preparation: Prepare door panel to accept cylinder specified in [**Section 087100 "Door Hardware."**] [**Section 087163 "Detention Door Hardware."**]

* + - * 1. Closures: Fabricated from minimum 0.053-inch thick steel sheet, finished to match security ceiling panels. Fasten with security fasteners or by welding.

Retain "Suspension System" paragraph below for applications where span required exceeds available length of panels; otherwise, retain "Perimeter Supports" paragraph.

* + - * 1. Suspension System: Heavy-duty exposed system consisting of intermediate carriers supported by secondary support system attached to building structure.

Intermediate Carriers: Formed from tees with a nominal 4-inch wide exposed face or built up from back-to-back angles or channels each with a nominal 2-inch wide exposed face.

Retain one or more intermediate carriers subparagraphs below. Coordinate with products specified; not all thicknesses are available from all manufacturers.

Steel Intermediate Carriers: [**Electrolytic zinc**] [**Metallic**]-coated steel with minimum uncoated sheet thickness of [**0.097 inch**] [**0.068 inch**] [**0.053 inch**] [**0.043 inch**], finished to match security ceiling panels.

Aluminum Intermediate Carriers: Nominal sheet thickness of [**0.125 inch**] [**0.100 inch**] [**0.080 inch**] [**0.063 inch**] [**0.050 inch**] [**0.040 inch**], finished to match security ceiling panels.

Stainless-Steel Intermediate Carriers: Nominal sheet thickness of [**0.141-inch**] [**0.109-inch**] [**0.078-inch**] [**0.063-inch**], finished to match security ceiling panels.

Secondary Support System:

Retain "Hanger Rods" or "Angle Hangers" subparagraph below. Secondary support varies between products; verify requirements with manufacturer.

Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.

Angle Hangers: 1-1/2-by-1-1/2-inch galvanized-steel angles, G90 zinc coating, bolted to intermediate carriers and building structure.

* + - * 1. Perimeter Supports: Wall-mounted angles, tees, and bearing plates.

Retain one or more perimeter supports subparagraphs below. Coordinate with products specified; not all thicknesses are available from all manufacturers.

Steel Perimeter Supports: [**Electrolytic zinc**] [**Metallic**]-coated steel with minimum uncoated sheet thickness of [**0.167 inch**] [**0.097 inch**] [**0.068 inch**] [**0.053 inch**] [**0.043 inch**], finished to match security ceiling panels.

Aluminum Perimeter Supports: Nominal sheet thickness of [**0.125 inch**] [**0.100 inc**] [**0.080 inch**] [**0.063 inch**] [**0.050 inch**] [**0.040 inch**], finished to match security ceiling panels.

Stainless-Steel Perimeter Supports: Nominal sheet thickness of [**0.141-inch**] [**0.109-inch**] [**0.078-inch**] [**0.063-inch**], finished to match security ceiling panels.

* + - * 1. Exposed Edge Moldings and Trim: Provide exposed members as indicated or required for edges of security ceiling, fixture trim, beams, fasciae at changes in security ceiling height, and other conditions, of metal and finish matching security ceiling panels.
				2. Materials:

Cold-Rolled Steel Sheet: ASTM A1008, CS (Commercial Steel), Type B; [**uncoated**] [**or**] [**electrolytic zinc coated**] suitable for exposed applications.

Metallic-Coated Steel Sheet: ASTM A653, CS (Commercial Steel), Type B; with G60 zinc (galvanized) or A60 zinc-iron-alloy (galvannealed) coating designation.

Steel Tubing: ASTM A513, Type B.

Type 304 stainless steel in "Stainless-Steel Sheet, Strip, Plate, and Flat Bars " subparagraph below is most commonly used stainless-steel alloy; Type 316 provides greater corrosion resistance. Other alloys are available for specialty applications; verify with manufacturer. If using more than one type on job, indicate locations on Drawings.

Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A666 or ASTM A240, austenitic stainless steel, [**Type 304**] [**Type 316**] [**Type 304 or 316 as indicated**] <**Insert type**>.

Aluminum Extrusions: ASTM B221. Provide alloy and temper recommended by manufacturer for strength, corrosion resistance, and application of required finish, but not less than 22,000-psi ultimate tensile strength.

Aluminum Sheet and Plate: ASTM B209.

* + - 1. SOUND-ABSORPTIVE PADS

Retain this article if sound-absorptive pads are required for security ceiling assemblies.

Verify availability of pad material, thickness, density, and wrap material with manufacturer and coordinate with acoustical performance specified elsewhere.

* + - * 1. Plastic-Sheet-Wrapped, Mineral-Fiber Insulation: Pads consisting of nonrigid, vinyl chloride plastic sheet encapsulating unfaced mineral-fiber insulation.

Plastic Sheet: Not less than 0.003 inch thick; flat black.

Mineral Fiber: Glass fiber or fiber made from slag (mineral wool), complying with ASTM C553, Type I, II, or III.

Thickness: [**1 inch**] [**1-1/2 inches**] [**2 inches**] [**4 inches**] [**As required to meet NRC rating**].

Mineral-Fiber Density: [**1.0 lb/cu. ft.**] [**1.5 lb/cu. ft.**] [**As required to meet NRC rating**].

Surface-Burning Characteristics: As determined by testing identical products according to ASTM E84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

Flame-Spread Index: [**25**] <**Insert value**> or less.

Smoke-Developed Index: [**50**] [**450**] <**Insert value**> or less.

* + - 1. FABRICATION
				1. Panels: Form metal panels from sheet metals selected for their surface flatness, smoothness, and freedom from surface blemishes where exposed to view in finished unit. Do not use materials whose exposed surfaces exhibit pitting, seam marks, roller marks, or variations in flatness exceeding those permitted by referenced standards for stretcher-leveled metal sheet.

Retain "Security Planks" subparagraph below for security planks.

Security Planks: Factory fabricate double-configuration security planks and join top and bottom face sheets by continuous weld over entire length of panel edge joints.

* + - 1. GENERAL FINISH REQUIREMENTS
				1. Comply with NAAMM/NOMMA 500 for recommendations for applying and designating finishes.
				2. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
				3. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
			2. ALUMINUM FINISHES
				1. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

Color and Gloss: [**Manufacturer's standard white**] <**Insert color and gloss**>.

For exact finish, insert names of coating manufacturers and products.

* + - 1. METALLIC-COATED STEEL SHEET FINISHES

Retain "Surface Preparation" paragraph below for prime finish or prime plus baked-enamel or powder-coat finish.

* + - * 1. Surface Preparation: Clean surfaces of oil and other contaminants. Use cleaning methods that do not leave residue. After cleaning, apply a conversion coating compatible with the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas and apply galvanizing repair paint, complying with SSPC-Paint 20, to comply with ASTM A780.

Retain "Factory Prime Finish" paragraph below for field-painted, metallic-coated steel sheet fabrications.

* + - * 1. Factory Prime Finish: After cleaning and pretreating, apply an air-dried primer compatible with the coating to be applied over it.

Retain "Baked-Enamel or Powder-Coat Finish" paragraph below for factory-applied, baked-enamel or powder-coat finish for metallic-coated steel sheet fabrications.

* + - * 1. Baked-Enamel or Powder-Coat Finish: After cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils.

Color and Gloss: [**As indicated by manufacturer's designations**] [**Match Approved sample**] [**As selected by Director’s Representative from manufacturer's full range**] <**Insert color and gloss**>.

For exact finish, insert names of coating manufacturers and products.

* + - 1. STEEL FINISHES

Retain last option in "Surface Preparation" paragraph below if using baked-enamel or powder-coat finish.

* + - * 1. Surface Preparation: Remove mill scale and rust, if present, from uncoated steel, complying with [**SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning"**] [**or**] [**SSPC-SP 8, "Pickling"**] <**Insert surface preparation method**>.[**After cleaning, apply a conversion coating suited to the organic coating to be applied over it.**]

Retain "Factory Prime Finish" or "Baked-Enamel or Powder-Coat Finish" paragraph below. Downward-locking-panel security ceilings are typically factory finished with baked-enamel or powder-coat finishes; security-plank security ceilings are typically prime coated for field finish to allow for welding. If more than one type of finish is required, indicate locations on Drawings.

* + - * 1. Factory Prime Finish: After surface preparation and pretreatment, apply manufacturer's standard, fast-curing, lead- and chromate-free, universal primer.

Retain "Baked-Enamel or Powder-Coat Finish" paragraph below for factory-applied, baked-enamel or powder-coat finish for steel sheet.

* + - * 1. Baked-Enamel or Powder-Coat Finish: After cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 2 mils.

Color and Gloss: [**Manufacturer's standard white**] <**Insert color and gloss**>.

For exact finish, insert names of coating manufacturers and products.

* + - 1. STAINLESS-STEEL FINISHES
				1. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
				2. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.

Retain first subparagraph below for directional finishes.

Run grain of directional finishes with long dimension of each piece.

When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

Directional Satin Finish: No. 4.

Retain "Bright, Cold-Rolled, Unpolished Finish" paragraph below for nondirectional finish.

* + - * 1. Bright, Cold-Rolled, Unpolished Finish: No. 2B.
			1. SECURITY FASTENERS
				1. Operable only by tools produced by fastener manufacturer or other licensed fabricator for use on specific type of fastener. Drive-system type, head style, material, and protective coating as required for assembly, installation, and strength, and as follows:

Pinned Torx-Plus in "Drive-System Type" subparagraph below is most commonly used security-fastener drive system for detention work. Insert additional types of security fasteners with other drive systems and head styles if necessary for special applications. See the Evaluations.

Drive-System Type: [Pinned Torx-Plus] [Pinned Torx] <Insert system>.

Revise "Fastener Strength" subparagraph below if different fastener strength is required.

Fastener Strength: 120,000 psi.

Socket Button Head Fasteners:

Heat-treated alloy steel, ASTM F835.

Stainless steel, ASTM F879, Group 1 CW.

Socket Flat Countersunk Head Fasteners:

Heat-treated alloy steel, ASTM F835.

Stainless steel, ASTM F879, Group 1 CW.

Socket Head Cap Fasteners:

Heat-treated alloy steel, ASTM A574.

Stainless steel, ASTM F837, Group 1 CW.

Protective Coatings for Heat-Treated Alloy Steel:

Zinc and clear trivalent chromium where indicated.

Zinc phosphate with oil, ASTM F1137, Grade I, or black oxide unless otherwise indicated.

* + - 1. SECURITY SEALANTS
				1. Polyurethane Security Sealants: Manufacturer's standard, nonsag, tamper-resistant sealant for joints with low movement.
				2. Epoxy Security Sealants: Manufacturer's standard, nonsag, tamper-resistant sealant for joints with no movement.

Products in "Acoustical Sealant" paragraph below are not pick resistant or pick proof.

* + - * 1. Acoustical Sealant: Manufacturer's standard, nonsag, paintable, nonstaining latex sealant complying with ASTM C834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E90.
			1. ACCESSORIES
				1. Concealed Bolts: ASTM A307, Grade A unless otherwise indicated.
				2. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welding.
				3. Attachment Devices: Size for [**five**] <**Insert safety factor**> times the design load indicated in ASTM C635, Table 1, Direct Hung, unless otherwise indicated.

Retain "Expansion Anchors" paragraph below if expansion anchors are acceptable. Verify safety factor with Project's structural engineer. Revise as required or insert specific load requirements and names of acceptable products.

* + - * 1. Expansion Anchors: Fabricated from corrosion-resistant materials, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing per ASTM E488 conducted by a qualified testing agency.

Design Consultant to review code references and verify that the referenced sections/tables are current. Note that code references shall be based on the current version of the Uniform Code.

1. EXECUTION
	* + 1. EXAMINATION
				1. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of security ceiling assemblies.
				2. Examine roughing-in for embedded and built-in anchors to verify actual locations of security ceiling assembly connections before security ceiling assembly installation.
				3. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of security ceiling assemblies.
				4. Inspect built-in and cast-in anchor installations before installing security ceiling assemblies to verify that anchor installations comply with requirements. Prepare inspection reports.

Repair, or remove and replace, anchors where inspections indicate noncompliance with specified requirements. Reinspect after repair or replacement.

Perform additional inspections to determine compliance of replaced or additional work. Prepare inspection reports.

* + - * 1. Verify locations and layouts of security ceiling assemblies with those indicated on reflected ceiling plans and coordination drawings.
				2. Proceed with installation only after unsatisfactory conditions have been corrected.
			1. PREPARATION

Revise "Coordination" paragraph below to suit Project.

* + - * 1. Coordination: Furnish layouts for cast-in-place anchors, clips, and other security ceiling anchors whose installation is specified in other Sections.

Retain subparagraph below if required.

Furnish cast-in-place anchors and similar devices to other trades for installation well in advance of time needed for coordinating other work.

* + - * 1. Measure each security ceiling area and establish layout of security ceiling panels to balance border widths at opposite edges of each security ceiling. Avoid using less-than-half-width panels at borders and comply with layout shown on reflected ceiling plans and coordination drawings.
			1. GENERAL INSTALLATION
				1. Comply with CISCA's "Ceiling Systems Handbook" for installation of security ceiling assemblies.
				2. Install perimeter supports around perimeter of security ceiling area.

Retain "Sealant" subparagraph below to eliminate air movement, light leaks, and sound leaks at edges of security ceiling. Acoustical sealant is not pick resistant or pick proof and may be used for nondetention applications or for high ceilings in dayrooms or where ceilings are inaccessible to inmates. Indicate locations if more than one type of sealant is used on Project.

Sealant: Apply [**polyurethane security**] [**epoxy security**] [**acoustical**] sealant in a continuous ribbon concealed on back of vertical legs of supports before they are installed.

Attach supports with anchor bolts or expansion anchors spaced not more than 12 inches o.c. and not more than 3 inches from ends. Miter corners accurately.

Level perimeter supports with suspension system to a tolerance of 1/8 inch in 12 feet.

Do not use exposed fasteners, including pop rivets, on moldings and trim. If exposed fasteners are unavoidable, obtain prior written approval from Director’s Representative for their use and use security fasteners.

* + - * 1. Install accessories where indicated and as required to comply with performance requirements.

Retain "Sound-Absorptive Pads" and "Backer Plates" subparagraphs below if required.

Sound-Absorptive Pads: For security ceiling panels indicated, provide sound-absorptive pads of width and length to completely fill inside of each security ceiling panel.

Install sound-absorptive pads [**over metal spacer grids**] [**with support clips**].

Backer Plates: Install plates in areas indicated on reflected ceiling plans or in room finish schedules. Lay backer plates directly on security ceiling assembly in manner indicated and close major openings to form complete coverage in required areas.[**Lay second sound-absorptive pad on backer plate.**]

Retain "Seismic Installation" paragraph below if required in seismic areas.

* + - * 1. Seismic Installation: Comply with seismic standard indicated, manufacturer's written instructions, and CISCA's "Ceiling Systems Handbook."
			1. DOWNWARD-LOCKING-PANEL SECURITY CEILING ASSEMBLY INSTALLATION
				1. Ceiling Hangers: Suspend from building's structural members and as follows:

Install hangers plumb and free from contact with insulation or other objects within security ceiling plenum that are not part of supporting structure or of security ceiling suspension system.

Splay hangers only where required to avoid obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.

Retain one of first two subparagraphs below unless both types of hangers are required and their locations are indicated on Drawings or by schedules.

Secure wire hangers to security ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.

Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both structure to which hangers are attached and type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.

Delete subparagraphs below that are not applicable.

Do not support security ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts or postinstalled mechanical or adhesive anchors.

When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.

Do not attach hangers to steel deck tabs.

Revise first subparagraph below if structural members are spaced too far apart for hangers and another method is required. For alternatives that may need to be detailed on Drawings, consult Structural Engineer, and see CISCA's guidelines. See SDI Publication No. 29 and the Evaluations in Section 053100 "Steel Decking."

Do not attach hangers to steel roof deck. Attach hangers to structural members.

Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.

Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

Struts described in subparagraph below prevent intrusion into space above panels.

Install compression struts extending from main runners to structure above and spaced at 48 inches o.c.

* + - * 1. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
				2. Panel Installation: Install panels to continuously engage with and lock under rectangular bulb of suspension system. Attach panels to perimeter supports with security fasteners not more than 3 inches from edges of panel. Fasten through exposed face of supports into panel.

Align joints in adjacent courses to form uniform, straight joints parallel to room axis in both directions unless otherwise indicated.

Fit adjoining units to form flush, tight joints. Scribe and cut units for accurate fit at borders and around construction penetrating security ceiling.

Install directionally patterned panels in directions indicated.

Scribe and cut security ceiling panels for accurate fit at borders and at interruptions and penetrations by other work through security ceilings. Stiffen edges of cut panels as required to eliminate evidence of buckling or variations in flatness.

* + - * 1. Access Panels: Install each access panel only where indicated and within one security ceiling panel.
			1. SECURITY-PLANK SECURITY CEILING ASSEMBLY INSTALLATION
				1. Install security planks with long edges continuously interlocked. Adjust security planks to final position before permanently fastening. Provide minimum 1-1/2-inch end bearing.

First subparagraph below provides additional security performance.

Attach adjacent security planks to each other with security fasteners spaced not more than 12 inches o.c. and not more than 6 inches from ends.

Retain one of first two subparagraphs below.

Continuously weld ends of security planks to perimeter supports. Remove exposed projecting burrs, edges, and rough spots resulting from welding operations by grinding smooth.

Attach ends of security planks to perimeter supports with security fasteners not more than 3 inches from edges of security plank. Fasten through exposed face of supports into security planks.

Provide intermediate carriers for ends of security planks that are not supported by perimeter supports. To attach security planks to intermediate carriers, use same method as that used for attaching security planks to perimeter supports.

Support intermediate carriers from structure above by secondary support system spaced at 48 inches o.c. and bolted to carriers.

* + - * 1. Access Panels: Install each access panel only where indicated and within one security plank.
				2. Provide steel angle reinforcement on each side of openings that exceed 12 inches in any direction.
			1. FIELD QUALITY CONTROL
				1. Inspect installed products to verify compliance with requirements. Prepare inspection reports and indicate compliance with and deviations from the Contract Documents.
				2. Remove and replace security ceiling assemblies where inspections indicate that work does not comply with specified requirements.
				3. Perform additional inspections to determine compliance of replaced or additional work. Prepare inspection reports.

Retain option in first paragraph below if field quality-control certifications are signed by Detention Specialist.

* + - * 1. Prepare field quality-control certification[**endorsed by Detention Specialist**] that states installed products and their installation comply with requirements in the Contract Documents.

Delete remainder of this article if not required. Testing requirements are examples only and apply only to security ceilings with hangers attached to concrete by postinstalled anchors. See "Field Quality-Control Testing" Article in the Evaluations before revising.

* + - * 1. Extent and Testing Frequency: Testing will take place in successive stages in areas described below. Proceed with installation of security ceiling assemblies only after test results for previously installed hangers comply with requirements.

Extent of Each Test Area: When installation of security ceiling suspension systems on each floor has reached 20 percent completion, but no security panel units have been installed.

Verify loads in first subparagraph below with structural engineer based on security ceiling loads and seismic zone where Project is located.

Within each test area, testing agency will select 1 of every 10 anchors used to attach hangers to concrete and will test them for 200 lbf of tension; it will also select one of every two postinstalled anchors used to attach bracing wires to concrete and will test them for 440 lbf of tension.

When testing discovers fasteners and anchors that do not comply with requirements, testing agency will test those fasteners and anchors not previously tested until 20 consecutively pass and then will resume initial testing frequency.

* + - * 1. Fasteners and anchors will be considered defective if they do not pass tests and inspections.
				2. Prepare test and inspection reports.
				3. Additional Testing: Where fasteners and anchors are removed and replaced, additional testing will be performed to determine compliance with specified requirements.
			1. CLEANING
				1. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage, including dented and bent units.

Retain first "Touchup Painting" paragraph below if touchup painting is included in this Section. Retain second "Touchup Painting" paragraph if it is included in Section 099114 "Exterior Painting" and Section 099123 "Interior Painting."

* + - * 1. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as that used for shop painting; comply with SSPC-PA 1 for touching up shop-painted surfaces.

Apply by brush or spray to provide a minimum dry film thickness of 2 mils.

* + - * 1. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 099114 "Exterior Painting" and Section 099123 "Interior Painting."
				2. Metallic-Coated Steel Surfaces: Clean field welds, bolted connections, and abraded areas and repair zinc or zinc-iron coating to comply with ASTM A780.

END OF SECTION 095753