SECTION 102239.13 - FOLDING GLASS-PANEL PARTITIONS

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 manually operated, glass-panel partitions.
				2. Related Requirements:

Retain Subparagraphs below to cross-reference requirements Contractor might expect to find in this Section but are specified in other Sections.

Section 055000 "Metal Fabrications" for supports that attach supporting tracks to overhead structural system.

* + - 1. DEFINITIONS

Retain terms that remain after this Section has been edited for a project.

* + - * 1. STC: Sound Transmission Class.
			1. PREINSTALLATION MEETINGS

Retain "Preinstallation Conference" Paragraph below if Work of this Section is extensive or complex enough to justify a conference.

* + - * 1. Preinstallation Conference: Conduct conference at Project site.

If needed, insert list of conference participants.

* + - 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:
				6. Shop Drawings: For operable glass-panel partitions.

Include plans, elevations, sections, details,[**numbered panel installation sequence,**] and attachments to other work.

Indicate stacking and operating clearances. Indicate location and installation requirements for hardware and track, blocking, and direction of travel.

Retain "Samples for Initial Selection" and "Samples for Verification" Paragraphs below for two-stage Samples.

* + - * 1. Samples for Initial Selection: For each type of exposed material, finish, covering, or facing.

Include Samples of accessories involving color selection.

* + - * 1. Samples for Verification: For each type of exposed material, finish, covering, or facing, prepared on Samples of size indicated below:

Panel Edge Material: Not less than 3 inches long.

Glass: Units 12 inches square.

Hardware: One of each exposed door-operating device.

Retain "Delegated-Design Submittal" Paragraph below if design services have been delegated to Contractor.

* + - * 1. Delegated-Design Submittal: For operable glass-panel partitions.

Include design calculations for seismic restraints that brace tracks to structure above.

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:

Partition track, track supports and bracing, switches, turning space, and storage layout.

Suspended ceiling components.

Structural members to which suspension systems are attached.

Size and location of initial access modules for acoustical tile.

Items penetrating finished ceiling, including the following:

Lighting fixtures.

HVAC ductwork, outlets, and inlets.

Speakers.

Sprinklers.

Smoke detectors.

Access panels.

Plenum acoustical barriers.

Revise "Setting Drawings" Paragraph below to suit Project.

* + - * 1. Setting Drawings: For embedded items and cutouts required in other work[**, including support-beam, mounting-hole template**].

Coordinate "Qualification Data" Paragraph below with qualification requirements in "Quality Assurance" Article.

* + - * 1. Qualification Data: For qualified Installer.

Retain "Seismic Qualification Certificates" Paragraph below if required by seismic criteria applicable to Project. See ASCE/SEI 7 for certification requirements for equipment and components.

* + - * 1. Seismic Qualification Certificates: For operable glass-panel partitions, tracks, accessories, and components, from manufacturer. Include seismic capacity of partition assemblies to remain in vertical position during a seismic event and the following:

Basis for Certification: Indicate whether certification is based on analysis, testing, or experience data, according to ASCE/SEI 7.

Detailed description of partition anchorage devices on which the certification is based and their installation requirements.

Retain "Product Certificates" Paragraph below to require submittal of product certificates from manufacturers.

* + - * 1. Product Certificates: For each type of operable glass-panel partition.
				2. Product Test Reports: For each operable glass-panel partition, for tests performed by a qualified testing agency.
				3. Sample Warranty: For manufacturer's special warranty.
			1. CLOSEOUT SUBMITTALS
				1. Operation and Maintenance Data: For operable glass-panel partitions to include in maintenance manuals.

Operation and maintenance documentation directory manuals.

Emergency manuals.

Systems and equipment operation manuals.

Systems and equipment maintenance manuals.

Product maintenance manuals.

In addition to items specified above include the following:

Panel finish and finishes for exposed trim and accessories. Include precautions for cleaning materials and methods that could be detrimental to finishes and performance.

Seals, hardware, track, track switches, carriers, and other operating components.

* + - 1. QUALITY ASSURANCE
				1. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
			2. DELIVERY, STORAGE, AND HANDLING

Retain this article if sequencing of panel facing materials is required (for example, for matching pattern or grain).

* + - * 1. Protectively package and sequence panels in order for installation. Clearly mark packages and panels with numbering system used on Shop Drawings. Do not use permanent markings on panels.
			1. WARRANTY
				1. Special Warranty: Manufacturer agrees to repair or replace components of operable glass-panel partitions that fail in materials or workmanship within specified warranty period.

Failures include, but are not limited to, the following:

Faulty operation of operable glass-panel partitions.

Deterioration of metals, metal finishes, and other materials beyond normal use.

Verify available warranties and warranty periods. Longer warranties than two years may not be available for glass panel partitions.

Warranty Period: Two years from date of Substantial Completion.

1. PRODUCTS

Manufacturers and products listed in SpecAgent and Masterworks Paragraph Builder are neither recommended nor endorsed by the AIA or Deltek. Before inserting names, verify that manufacturers and products listed there comply with requirements retained or revised in descriptions and are both available and suitable for the intended applications.

* + - 1. PERFORMANCE REQUIREMENTS

Retain "Delegated Design" Paragraph below if Contractor is required to assume responsibility for design.

* + - * 1. Delegated Design: Engage a qualified Professional Engineer, licensed and registered to practice in the State of New York, to design seismic bracing of tracks to structure above.

Retain "Seismic Performance" Paragraph below with "Seismic Qualification Certificates" Paragraph in "Informational Submittals" Article for projects requiring seismic design. Delete Paragraph if performance requirements are indicated on Drawings. Model building codes and ASCE/SEI 7 establish criteria for buildings subject to earthquake motions. Coordinate requirements with Structural Engineer.

* + - * 1. Seismic Performance: Operable glass-panel partitions shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

Retain Subparagraph below to define the term "withstand" as it applies to this Project. Definition varies with type of building and occupancy and is critical to valid certification.

The term "withstand" means "the partition panels will remain in place without separation of any parts when subjected to the seismic forces specified."

Retain "Acoustical Performance" Paragraph below only if required for Project. This may significantly limit available products.

* + - * 1. Acoustical Performance: Provide operable glass-panel partitions tested by a qualified testing agency for the following acoustical properties according to test methods indicated:

If retaining "Sound-Transmission Requirements" Subparagraph below, indicate ratings in Part 2 or on Drawings. Verify, with manufacturer, that values for STC are possible and practical for required products.

Sound-Transmission Requirements: Operable glass-panel partition assembly tested for laboratory sound-transmission loss performance according to ASTM E90, determined by ASTM E413, and rated for not less than the STC indicated.

Retain "Fire-Test-Response Characteristics" Paragraph below for wood-framed panels if the amount of exposed wood on the wall surface is significant (usually greater than 10 percent of the wall area). Revise as required by governing code for partition location, occupancy classification, and whether facility is sprinklered or not. Verify and insert requirements of authorities having jurisdiction.

* + - * 1. Fire-Test-Response Characteristics: Provide wood-framed panels complying with one of the following as determined by testing identical products by a testing and inspecting agency acceptable to authorities having jurisdiction:

Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

Flame-Spread Index: [**25**] [**75**] or less.

Smoke-Developed Index: 450 or less.

* + - 1. OPERABLE GLASS PANELS <**Insert drawing designation**>

Copy this article and re-edit for each product.

Insert drawing designation. Use these designations on Drawings to identify each product.

In order to have a good STC rating only aluminum-framed manufacturers products with seals have been listed. For frameless aluminum, or wood framed glass wall systems without an STC rating change manufacturer and product names as necessary to meet design requirements.

* + - * 1. Operable Glass Panels: Aluminum-framed glass-panel partition system, including panels, seals, suspension system, operators, and accessories.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Avanti Systems, Inc.;[**Movare Movable Double Glazed Partition System**][**Movare Movable Single Glazed Partition System**].

Hufcor, Inc; [**Series GA1**][**Series GA2**][**Series GF1**][**Series GF2**].

Modernfold, Inc; [**Acousti-Clear Automatic Seal Single**]**[Acousti-Clear Automatic Seal Paired]**.

Approved equivalent.

* + - * 1. Panel Operation: Manually operated, [**individual**] [**paired**] [**continuously hinged**] panels.
				2. Panel Construction: As required to support panel from suspension components and with reinforcement for hardware attachment. Fabricate panels with tight hairline joints and concealed fasteners. Fabricate panels so finished in-place partition is rigid; level; plumb; aligned, with tight joints and uniform appearance; and free of bow, warp, twist, deformation, and surface and finish irregularities.

Factory-Glazed Fabrication: Glaze operable glass panels in the factory where practical and possible for applications indicated. Comply with manufacturer's written instructions.

* + - * 1. Glass and Glazing: As follows:

Retain "Safety Glass Standard for Partition Panels" and "Safety Glass Standard for Pass Doors" Subparagraphs below to suit Project. The IBC generally requires safety glass to be used in operable partitions and communicating pass doors. Verify the safety glass requirements of authorities having jurisdiction.

Safety Glass Standard for Partition Panels: Glass products complying with testing requirements in 16 CFR 1201, Category II, or ANSI Z97.1, Class A.

Safety Glass Standard for Pass Doors: Glass products complying with testing requirements in 16 CFR 1201, Category II.

Retain one or more of "Tempered Glass," "Tempered Patterned Glass," and "Laminated Glass," Subparagraphs below; revise to suit Project. Verify availability of required options with manufacturer.

Tempered Glass: ASTM C1048, Kind FT (fully tempered), Type I (transparent flat glass), [**Class 1 (clear)**] [**Class 2 (tinted)**], Quality-Q3.

Tempered Patterned Glass: ASTM C1048, Kind FT (fully tempered), Type II (patterned flat glass), Class 1 (clear), Form 3 (patterned); and of quality, finish, and pattern specified.

Laminated Glass: ASTM C1172, with [**clear**] [**colored**] [**patterned**] [**graphic**] interlayer.

Annealed Float Glass: ASTM C1036, Type I (transparent flat glass), [**Class 1 (clear)**] [**Class 2 (tinted)**], Quality-Q3.

Patterned Glass: ASTM C1036, Type II (patterned and wired flat glass), Class 1 (clear), Form 3 (patterned); and of quality, finish, and pattern specified.

Retain "Glass Vertical Edge" Subparagraph below for frameless glass.

Glass Vertical Edge: [Polished] [Manufacturer's standard, permanently adhered edge trim].

Glazing System: [**Manufacturer's standard factory-glazing system**] [**Manufacturer's standard factory-glazing system that produces acoustical seal**] [**Manufacturer's standard factory-glazing system as indicated**].

* + - * 1. Dimensions: Fabricate operable glass-panel partitions to form an assembled system of dimensions indicated and verified by field measurements.

In "Panel Width" Subparagraph below, second and third options are a custom-sized product. Before retaining either option, verify cost and availability with manufacturer.

Panel Width: [**Standard widths**] [**Equal widths**] [**As indicated**].

Retain "STC" Paragraph below for glass partitions with acoustical properties.

* + - * 1. STC: Not less than 36.

In "Panel Weight" Paragraph below, use weight to be accommodated in structural calculations and suitable for required panel assembly and glass.

* + - * 1. Panel Weight: 11 lb/sq. ft. maximum.

Dimension in "Panel Frame Thickness" Paragraph below will affect panel strength and required storage space.

* + - * 1. Panel Frame Thickness: Nominal dimension of 1-7/8 inches.

Consider deleting "Panel Frame Materials" Paragraph below if products are adequately specified by performance requirements.

* + - * 1. Panel Frame Materials:

Retain "Aluminum" Subparagraph below for aluminum-framed panels or frameless (only top and bottom rail) panels.

Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use, corrosion resistance, and finish indicated; ASTM B221 for extrusions; manufacturer's standard strengths and thicknesses for type of use.

Frame Reinforcement: Manufacturer's standard steel or aluminum.

Retain "Wood Frame" Subparagraph below if required. Insert requirements describing fire-retardant-treated wood, if necessary, to suit Project and to comply with requirements of authorities having jurisdiction. Verify availability with manufacturer before retaining specific species.

Wood Frame: Clear, vertical-grain, straight, kiln-dried[**, fire-retardant-treated**] wood as follows:

Species: [**Match Director’s Representative's sample**] [**As selected by Director’s Representative from manufacturer's full range**] [**Cherry**] [**Hemlock**] [**Maple**] [**Meranti**] [**Poplar**] [**Red oak**] <**Insert species**>.

* + - * 1. Panel Closure: [**Manufacturer's standard unless otherwise indicated**].

Retain "Hardware" Paragraph below to suit Project; revise to specify another hardware finish.

* + - * 1. Hardware: Manufacturer's standard as required to operate operable glass-panel partition and accessories; with decorative, protective finish.

In "Hinges" Subparagraph below, verify availability of concealed hinges with manufacturer. These hinges are invisible when panels are aligned.

Hinges: Manufacturer's standard.

Floor Lock: [**Thumb-turn**] [**Key**] actuated.

Revise "Panel Frame Finishes" Paragraph below for each finish required. Verify, with manufacturer, the availability of each finish.

* + - * 1. Panel Frame Finishes:

Exposed Metal: [**Match Director’s Representative's sample**] [**As selected by Director’s Representative from manufacturer's full range**] as follows:

Aluminum: [**Clear anodized**] [**Light bronze anodized**] [**Medium bronze anodized**] [**Dark bronze anodized**] [**Black anodized**] [**Baked powder coating, black color**].

Metal-Clad Aluminum: [**Satin stainless steel**] [**Polished stainless steel**] [**Satin brass**] [**Polished brass**] [**Satin bronze**] [**Polished bronze**].

Retain one of two "Wood Finish" Subparagraphs below; revise to suit Project. Retain second if requiring a specific wood finish matching other Project work. Replace optional section in second Subparagraph with section where wood finish is specified.

Wood Finish: [**Match Director’s Representative's sample**] [**As selected by Director’s Representative from manufacturer's full range**], as follows:

Type: [**Transparent finish**] [**Transparent finish over stain**] <**Insert finish**> over wood variety indicated.

Wood Finish: As specified in Section 099300 "Staining and Transparent Finishing."

* + - 1. SEALS

Retain this article for operable glass panels with acoustical properties.

* + - * 1. Description: Seals that produce operable glass-panel partitions complying with performance requirements and the following:

Manufacturer's standard seals unless otherwise indicated.

Seals made from materials and in profiles that minimize sound leakage.

Seals fitting tight at contact surfaces and sealing continuously between adjacent panels and between operable glass-panel partition perimeter and adjacent surfaces, when operable glass-panel partition is extended and closed.

* + - 1. SUSPENSION SYSTEMS

If more than one track type is required, copy and revise this article to suit Project.

* + - * 1. Tracks: Steel or aluminum [**mounted directly to overhead structural support,**] [**with adjustable steel hanger rods for overhead support,**] designed for operation, size, and weight of operable glass-panel partition indicated. Size track to support partition operation and storage without damage to suspension system, operable glass-panel partitions, or adjacent construction. Limit track deflection to no more than 0.10 inch between bracket supports. Provide a continuous system of track sections and accessories to accommodate configuration and layout indicated for partition operation and storage.

Retain "Panel Guide" Subparagraph below for continuously hinged panels and possibly for paired panels.

Panel Guide: Aluminum guide on both sides of the track to facilitate straightening of the panels; finished with factory-applied, decorative, protective finish.

Retain "Head Closure Trim" Subparagraph below if required for maximum sound control. Trim also protects overhead surfaces. Indicate trim on Drawings.

Head Closure Trim: As required for acoustical performance; [**with factory-applied, decorative, protective finish**] [**primed for field finish**].

* + - * 1. Carriers: Trolley system as required for configuration type, size, and weight of partition and for easy operation; with ball-bearing wheels.

Retain "Multidirectional Carriers" Subparagraph below only for operable glass-panel partitions configured from individual panels.

Multidirectional Carriers: Capable of negotiating intersections without track switches.

Revise "Track Intersections, Switches, and Accessories" Paragraph below to suit Project.

* + - * 1. Track Intersections, Switches, and Accessories: As required for operation, storage, track configuration, and layout indicated for operable glass-panel partitions, and compatible with partition assembly specified. Fabricate track intersections and switches from steel or aluminum.

Retain applicable track intersections and switch types in first five Subparagraphs below and indicate on Drawings; delete if not required.

Curve-and-Diverter Switches: Allow radius turns to divert panels to an auxiliary track.

L, T, and X Intersections can be tracks configured for traveling by multidirectional carriers or can be switches for traveling by standard carriers with vertical wheels.

L Intersections: Allow panels to change 90 degrees in direction of travel.

T Intersections: Allow panels to pass through or change 90 degrees to another direction of travel.

X Intersections: Allow panels to pass through or change travel direction full circle in 90-degree increments, and allow one partition to cross track of another.

Switches in "Multidirectional Switches" Subparagraph below are used only with standard carriers.

Multidirectional Switches: Adjustable switch configuring track into L, T, or X intersections and allowing panels to be moved in all pass-through, 90-degree change, and cross-over travel direction combinations.

Consider retaining Subparagraph below if a biparting opening is required. Consult manufacturer for recommendation.

Center carrier stop.

* + - * 1. Aluminum Finish: Mill finish or manufacturer's standard, factory-applied, decorative finish unless otherwise indicated.
				2. Steel Finish: Manufacturer's standard, factory-applied, corrosion-resistant, protective coating unless otherwise indicated.
			1. ACCESSORIES

Retain accessories in this article to suit Project; delete if not applicable.

Revise description in "Pass Doors" Paragraph below if pass doors with matching materials, construction, and acoustical qualities are unsuitable for Project. Some low- to medium-STC-rated partitions use hollow-core metal or wood pass doors that may be heavier, more durable, and more abuse resistant than doors constructed the same as partitions.

* + - * 1. Pass Doors: Swinging door built into and matching panel [**materials,**] [**construction,**] [**acoustical qualities,**] finish and thickness, complete with frames and operating hardware. Hinges finished to match other exposed hardware.

Generally, retain only one of first two options in "Accessibility Standard" Subparagraph below. Retain first option for facilities covered under the Americans with Disabilities Act (ADA) of 1990. Retain second for facilities covered under the Architectural Barriers Act (ABA). Retain last option for compliance with the IBC.

Accessibility Standard: Fabricate doors to comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1.

"Single Pass Door" and "Double Pass Door" Subparagraphs below have examples of door dimensions; revise to suit Project. Door sizes vary among manufacturers.

Single Pass Door: [**36 by 80 inches**] [**36 by 84 inches**].

Double Pass Door: [**72 by 80 inches**] [**72 by 84 inches**].

Pass-Door Hardware: Equip pass door with the following:

Features in six Subparagraphs below can be used with either a single or double pass door. Retain those required and revise to suit Project.

Door Seals: [**Mechanically operated floor seal on panels containing pass doors**] [**Sweep floor seals**].

Retain first Subparagraph below if required for exit doors from a high-occupancy space. Consult the IBC and authorities having jurisdiction for further information; revise to suit Project

Panic hardware.

Concealed door closer.

Retain "Latchset" Subparagraph or one of two "Lock" Subparagraphs below.

Latchset: Passage set.

Lock: Key-operated lock with cylinder[**, keyed to master key system,**] operable from both sides of door. Include two keys per lock.

Lock: Deadlock to receive cylinder, operable from both sides of door. See Section 087100 "Door Hardware" for lock cylinder and keying requirements.

* + - * 1. Storage Pocket Door: Full height at end of partition runs to conceal stacked partition; of same frame material, finish, thickness, and acoustical qualities as panels; complete with operating hardware[**and acoustical seals at soffit, floor, and jambs**]. Hinges in finish to match other exposed hardware.

Retain one of three Subparagraphs below.

Manufacturer's standard method to secure storage pocket door in closed position.

Rim Lock: Key-operated lock cylinder[**, keyed to master key system,**] to secure storage pocket door in closed position. Include two keys per lock.

Lock in "Rim Lock" Subparagraph below may be required for certain situations such as schools.

Rim Lock: Deadlock to receive cylinder, to secure storage pocket door in closed position. See Section 087100 "Door Hardware" for lock cylinder and keying requirements.

Retain "Vertical Edge Trim" Paragraph below for frameless glass panels with vertical edge trim.

* + - * 1. Vertical Edge Trim: Manufacturer's standard [**transparent**] [**thin aluminum astragal**] trim to protect vertical edges of glass in frameless panels.
1. EXECUTION
	* + 1. EXAMINATION
				1. Examine flooring, floor levelness, structural support, and opening, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of operable glass-panel partitions.
				2. Proceed with installation only after unsatisfactory conditions have been corrected.
			2. INSTALLATION
				1. Install operable glass-panel partitions and accessories after other finishing operations, including painting, have been completed in area of partition installation.
				2. Install panels in numbered sequence indicated on Shop Drawings.
				3. Broken, cracked, chipped, deformed, or unmatched panels are not acceptable.
				4. Broken, cracked, deformed, or unmatched gasketing or gasketing with gaps at butted ends is not acceptable.

Generally retain "Light-Leakage Test" Paragraph below.

* + - * 1. Light-Leakage Test: Temporarily opacify glass areas of panels. Illuminate one side of partition installation and observe vertical joints and top and bottom seals for voids. Adjust partitions for alignment and full closure of vertical joints and full closure along top and bottom seals.
			1. ADJUSTING
				1. Adjust operable glass-panel partitions, hardware, and other moving parts to function smoothly, and lubricate as recommended by manufacturer.
				2. Adjust [**pass doors**] [**and**] [**storage pocket doors**] to operate smoothly and easily, without binding or warping.
				3. Verify that safety devices are properly functioning.
			2. DEMONSTRATION
				1. Engage a Company Field Representative to train Facility’s maintenance personnel to adjust, operate, and maintain operable glass-panel partitions.

END OF SECTION 102239.13