SECTION 085653 - SECURITY WINDOWS

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

MasterSpec includes provisions for LEED 2009, LEED v4, IgCC, and Green Globes. Sustainable design requirements may be inserted in the Section Text using the hypertext links.

1. GENERAL
	* + 1. SUMMARY
				1. Section Includes:

Vision security windows.

Fixed, transaction security windows.

Sliding, transaction security windows.

* + - * 1. Related Requirements:

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

Refer to sections listed below for cross-reference requirements Contractor might expect to find in this Section but are specified in other Sections. Sections listed below are for spec editor’s and design team coordination and are to remain as Editor’s Notes. Remove referenced specification sections within the body of the specification if not applicable to the project.

Section 119821 "Detention Windows" for windows where persons are forcibly detained.

Section 0991143 "Exterior Painting" for field painting exterior security windows.

Section 099123 "Interior Painting" for field painting interior security windows.

* + - 1. COORDINATION
				1. Coordinate installation of anchorages for security windows. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in adjacent construction.
			2. PREINSTALLATION MEETINGS

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

* + - * 1. Preinstallation Conference: Conduct conference at [Project site] <**Insert location**>.

If needed, insert list of conference participants not mentioned in Section 013100 "Project Management and Coordination."

* + - 1. ACTION 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, except as noted below, and tabbed (for combined submittals).

Submit Qualification Data and Product Test Reports as specified in Quality Control Submittals first.

* + - * 1. Product Data: For each type of product.

Include construction details, material descriptions, dimensions of individual components and profiles, weights and finishes for window units.

Include manufacturer’s installation instructions.

* + - * 1. Sustainable Design Submittals:
				2. Shop Drawings: For security windows.

Include plans, elevations, sections, and attachment details.

Full-size section details of framing members, including internal armoring, reinforcement, and stiffeners.

Location of weep holes.

Hardware for sliding window units.

Glazing details.

Details of [**deal tray**] [**transaction drawer**] [**transaction counter**] [**and**] [**speaking aperture**].

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

* + - * 1. Samples for Initial Selection: For frame members with factory-applied color finishes.
				2. Samples for Verification: For each type of exposed finish required, prepared on Samples of sizes indicated below:

Framing: 12-inch- (305-mm-) long sections of frame members.

Transaction Drawer: 6 inches (150 mm) square.

* + - * 1. Cutaway Sample: Corner of security window, made from 12-inch (305-mm) lengths of full-size components, and showing details of the following:

Delete "Flashing and drainage" Subparagraphsubparagraph below if security windows are interior only.

Joinery.

Anchorage.

Glazing.

Flashing and drainage.

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

* + - * 1. Delegated Design Submittal: For security windows indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
			1. INFORMATIONAL SUBMITTALS
				1. Quality Control Submittals

Coordinate “Qualification Data” Paragraph below with qualification requirements in Section 014000 “Quality Requirements" and as may be supplemented in "Quality Assurance" Article.

Qualification Data: For [**Installer**] [**and**] [**testing agency**].

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

Welding certificates.

Product Test Reports: For each type of security window and accessory indicated as [**ballistics**] [**or**] [**forced-entry**] resistant, for tests performed by a qualified testing agency.

"Configuration Disclosure Drawing" Paragraphparagraph below is required by ASTM F1233 to indicate configuration of security windows when tested.

Configuration Disclosure Drawing: For each type of forced-entry-resistant security window, complying with ASTM F1233.

Examination reports documenting inspections of substrates, areas, and conditions.

Anchor inspection reports documenting inspections of built-in and cast-in anchors.

Field quality-control reports documenting inspections of installed products.

Field quality-control certification signed by Contractor.

Sample Warranty: For special warranty.

* + - 1. QUALITY ASSURANCE

Retain option in "Installer Qualifications" Paragraphparagraph below for operable transaction drawers.

* + - * 1. Installer Qualifications: An authorized representative who is trained and approved by manufacturer for installation[**and maintenance**] of units required for this Project.

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

* + - * 1. Welding Qualifications: Qualify procedures and personnel in accordance with the following:

Retain applicable subparagraphs below.

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

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

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

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

* + - 1. DELIVERY, STORAGE, AND HANDLING
				1. Pack security windows in wood crates for shipment. Crate glazing separate from frames unless factory glazed.
				2. Label security window packaging with drawing designation.
				3. Store crated security windows on raised blocks to prevent moisture damage.
			2. FIELD CONDITIONS
				1. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.
			3. SEQUENCING

Retain this article if security windows are field finished.

* + - * 1. Field Painting: Except where security windows have been preglazed before installation, complete field painting of security windows before glazing installation.
			1. WARRANTY

When warranties are required, verify with Owner's the Director’s counsel Representative that warranties stated in this article are not less than remedies available to Owner the Facility under prevailing local laws.

* + - * 1. Special Warranty: Manufacturer agrees to repair or replace security windows that fail in materials or workmanship within specified warranty period.

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

Structural failures including deflections exceeding 1/4 inch (6 mm).

Failure of welds.

Excessive air leakage.

Faulty operation of sliding window hardware.

Faulty operation of transaction drawers.

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

<**Insert failure modes**>.

Verify available warranties and warranty periods for units and components.

Warranty Period: [**Three**] <**Insert number**> years from date of Substantial Completion.

1. PRODUCTS

Manufacturers and products listed in this Section are neither recommended nor endorsed by the AIA or Deltek. Before selecting manufacturers and products, verify availability, suitability for intended applications, and compliance with minimum performance requirements. For definitions of terms and requirements for Contractor's product selection, see Section 016000 "Product Requirements."

Product options commonly available from manufacturers are included in square brackets throughout the Section Text. Not every manufacturer listed can provide every option offered; verify availability with manufacturers. For definitions of terms and requirements for Contractor's product selection, see Section 016000 "Product Requirements."

* + - 1. PERFORMANCE REQUIREMENTS
				1. Attack Resistance: Provide units identical to those tested for compliance with requirements indicated, and as follows:

Retain "Ballistics Resistance, UL 752," "Ballistics Resistance, ASTM F1233," "Ballistics Resistance, HPW-TP-0500.03," "Ballistics Resistance, SD-STD-01.01," or "Ballistics Resistance, NIJ STD-0108.01" Subparagraphsubparagraph below.

Retaining first option in "Ballistics Resistance, UL 752" Subparagraphsubparagraph below, in addition to one of Level options, requires that products be UL listed with ongoing performance verification by UL.

Ballistics Resistance, UL 752: [**Listed and labeled as**] [**Level 1**] [**Level 2**] [**Level 3**] [**Level 4**] [**Level 5**] [**Level 6**] [**Level 7**] [**Level 8**] [**Level 9**] [**Level 10**] [**Level 1-SG**] [**Level 2-SG**] [**Level 3-SG**] [**Level 4-SG**] [**Level 5-SG**] [**Level 6-SG**] [**Level 7-SG**] [**Level 8-SG**] [**Level 9-SG**] [**Level 10-SG**] in accordance with UL 752.

Ballistics Resistance, ASTM F1233: [**Class HG1**] [**Class HG2**] [**Class HG3**] [**Class HG4**] [**Class SMG**] [**Class R1**] [**Class R2**] [**Class R3**] [**Class R4-AP**] [**Class R5**] [**Class SH1**] [**Class SH2**] in accordance with ASTM F1233.

H.P. White Testing Laboratory is no longer in operation; however, at the time of this update, manufacturers still cite testing to HPW-TP-0500.03. If retaining "Ballistics Resistance, HPW-TP-05300.03" Subparagraphsubparagraph below, verify with manufacturer that testing is still applicable. See the Evaluations for further information.

Ballistics Resistance, HPW-TP-0500.03: [**A**] [**B**] [**C**] [**D**] [**E**]in accordance with HPW-TP-0500.03.

Ballistics Resistance, SD-STD-01.01: [**R**] [**SH**] in accordance with SD-STD-01.01.

Ballistics Resistance, NIJ STD-0108.01: [**Level I**] [**Level IIA**] [**Level II**] [**Level IIIA**] [**Level III**] [**Level IV**] in accordance with NIJ STD-0108.01.

Retain "Forced-Entry Resistance, HPW-TP-0500.03," "Forced-Entry Resistance, ASTM F1233," or "Forced-Entry Resistance, SD-STD-01.01" Subparagraphsubparagraph below. H.P. White Testing Laboratory is no longer in operation; however, at the time of this update, manufacturers still cite testing in accordance with HPW-TP-0500.03. If retaining "Forced-Entry Resistance, HPW-TP-05300.03" Subparagraphsubparagraph, verify with manufacturer that testing is still applicable. See the Evaluations for further information.

Forced-Entry Resistance, HPW-TP-0500.03: [**Level I**] [**Level II**] [**Level III**] [**Level IV**] [**Level V**] in accordance with HPW-TP-0500.03.

ASTM F1233 has changed its rating system to add classes in between the previous classes of one through five. New products may be required to be tested to the new class ratings; existing products may remain as tested to the previous ASTM F1233 classes. Revise "Forced-Entry Resistance, ASTM F1233" Subparagraphsubparagraph below to suit Project.

Forced-Entry Resistance, ASTM F1233: [**Class 1.0**] [**Class 1.1**] [**Class 1.2**] [**Class 1.3**] [**Class 1.4**] [**Class 1.5**] [**Class 2.0**] [**Class 2.1**] [**Class 2.2**] [**Class 2.3**] [**Class 2.4**] [**Class 2.5**] [**Class 2.6**] [**Class 2.7**] [**Class 2.8**] [**Class 3.0**] [**Class 3.1**] [**Class 3.2**] [**Class 3.3**] [**Class 3.4**] [**Class 3.5**] [**Class 3.6**] [**Class 3.7**] [**Class 3.8**] [**Class 3.9**] [**Class 3.10**] [**Class 4.0**] [**Class 4.1**] [**Class 4.2**] [**Class 4.3**] [**Class 4.4**] [**Class 4.5**] [**Class 4.6**] [**Class 4.7**] [**Class 4.8**] [**Class 4.9**] [**Class 4.10**] [**Class 4.11**] [**Class 4.12**] [**Class 4.13**] [**Class 5.0**] in accordance with ASTM F1233.

Forced-Entry Resistance, SD-STD-01.01: [**Five**] [**15**] [**60**]-minute protection level in accordance with SD-STD-01.01.

* + - * 1. Structural Loads: Security windows withstand the effects of wind loads, with no permanent deformation or breakage of components within window assembly when tested in accordance with ASTM E330/E330M.

Indicate structural loads, as determined by Project's structural engineer, on Drawings or revise "Wind Loads" Subparagraphsubparagraph below. Structural loads are typically required to be indicated on Drawings; verify with authorities having jurisdiction. To avoid conflicts, do not indicate structural design data both on Drawings and in the Specifications.

Wind Loads: As indicated on Drawings**.**

Usually retain "Air Leakage, Fixed Glazing and Framing" Paragraphparagraph below. ASTM E283 requires using a static-air-pressure difference of 1.57 lbf/sq. ft. (75 Pa) unless otherwise indicated, which is equivalent to a 25-mph (40-km/h) wind. Static-air-pressure difference of 6.24 lbf/sq. ft. (300 Pa) is equivalent to a 50-mph (80-km/h) wind.

* + - * 1. Air Leakage, Fixed Glazing and Framing: Provide windows with maximum air leakage through fixed glazing and framing areas of [**0.06 cfm/sq. ft. (0.03 L/s per sq. m)**] <**Insert value**> of fixed wall area when tested in accordance with ASTM E283 at a minimum static-air-pressure difference of [**1.57 lbf/sq. ft. (75 Pa)**] [**6.24 lbf/sq. ft. (300 Pa)**] <**Insert value**>.

"Air Leakage, Operable Window" Paragraphparagraph below is for operable sliding security windows. Before retaining paragraph, verify with manufacturers because few sliding security windows are tested to ASTM E283.

* + - * 1. Air Leakage, Operable Window: Not more than [**0.37 cfm/ft. (0.18 L/s per m)**] <**Insert value**> of sash crack length at an inward test pressure of [**6.24 lbf/sq. ft. (298 Pa)**] <**Insert value**> when tested in accordance with ASTM E283.

Usually retain "Water Penetration under Static Pressure, Fixed Glazing and Framing" Paragraphparagraph below. For water penetration under static pressure tests, air-pressure difference of 20 percent of wind-load design pressure provides satisfactory performance in most parts of the United States. Locations where high winds and heavy rains frequently occur simultaneously require higher test-pressure differences. Lower test-pressure differences are acceptable for some locations. Revise below to suit Project.

* + - * 1. Water Penetration under Static Pressure, Fixed Glazing and Framing: Provide windows that do not evidence water penetration through fixed glazing and framing areas when tested in accordance with ASTM E331 at a minimum static-air-pressure difference of 20 percent of positive wind-load design pressure, but not less than [**6.24 lbf/sq. ft. (300 Pa)**] <**Insert value**>.

"Water Penetration under Static Pressure, Operable Window" Paragraphparagraph below is for operable sliding security windows. Before retaining paragraph, verify with manufacturers because few sliding security windows are tested to ASTM E331.

* + - * 1. Water Penetration under Static Pressure, Operable Windows: Provide windows that do not evidence water leakage through operable units for 15 minutes when window is subjected to a rate of flow of 5 gal./h per sq. ft. (0.05 L/s per sq. m) with a differential pressure across the window of [**2.86 lbf/sq. ft. (137 Pa)**] [**6.24 lbf/sq. ft. (298 Pa)**] when tested in accordance with ASTM E331.

Retain "Energy Performance" Paragraphparagraph below if required and insert U-factor and solar heat-gain coefficient needed for Project; options are examples only. Verify availability with manufacturers.

* + - * 1. Energy Performance: Provide windows with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below[**and certified and labeled in accordance with NFRC**]:

Thermal Transmittance (U-Factor): Glazing and framing areas as a whole have U-factor of not more than [**0.80 Btu/sq. ft. x h x deg F (4.54 W/sq. m x K)**] [**0.65 Btu/sq. ft. x h x deg F (3.69 W/sq. m x K)**] <**Insert value**> as determined in accordance with NFRC 100.

Solar Heat-Gain Coefficient (SHGC): Glazing and framing areas as a whole have SHGC of no greater than [**0.6**] [**0.7**] <**Insert value**> as determined in accordance with NFRC 200.

Retain "Windborne-Debris Impact Resistance" Paragraphparagraph below to suit Project. The IBC BCNYS establishes criteria for buildings in hurricane-prone locations. In paragraph, "enhanced" option applies to essential facilities and has additional requirements. Verify requirements of authorities having jurisdiction. Verify which manufacturers have tested products and can demonstrate compliance.

* + - * 1. Windborne-Debris Impact Resistance: Passes ASTM E1886 missile-impact and cyclic-pressure tests in accordance with ASTM E1996 for Wind Zone [**1**] [**2**] [**3**] [**4**] for [**basic**] [**enhanced**] protection.

Insert increased heights if different from those in "Large-Missile Test" and "Small-Missile Test" subparagraphs below. For enhanced protection, delete "Small-Missile Test" Subparagraphsubparagraph.

Large-Missile Test: For glazing located within [**30 feet (9.1 m)**] <**Insert dimension**> of grade.

Small-Missile Test: For glazing located between 30 feet (9.1 m) and [**60 feet (18.3 m)**] <**Insert dimension**> above grade.

* + - 1. VISION SECURITY WINDOWS
				1. Provide vision security windows with framing on four sides and no operable sash or ventilator.
				2. Framing: Fabricate perimeter framing, mullions, and glazing stops from [**steel**] [**metallic-coated steel sheet**] [**stainless steel**] [**aluminum**] as follows:

Profile: [**Manufacturer's standard**] [**Narrow**], with minimum face dimension indicated.

Minimum Face Dimension: [**2 inches (50 mm)**] [**1-1/4 inches (32 mm)**] [**As indicated on Drawings**] <**Insert dimension**>.

Depth: [**Manufacturer's standard**] [**Adjustable, two-piece clamp**] [**As indicated on Drawings**] <**Insert depth**>.

Retain subparagraph below if required.

Provide [**thermally broken**] [**thermally improved**] construction for aluminum framing.

* + - * 1. Glazing and Glazing Materials: Comply with requirements in Section 088853 "Security Glazing."
				2. Materials:

Mild Steel Plates, Shapes, and Bars: ASTM A36/A36M.

Cold-Rolled Steel Sheet: ASTM A1008/A1008M, CS (Commercial Steel), Type B; suitable for exposed applications.

Metallic-Coated Steel Sheet: ASTM A653/A653M, CS (Commercial Steel), Type B; with G60 (Z180) zinc (galvanized) or A60 (ZF180) zinc-iron-alloy (galvannealed) coating designation.

Hot-Rolled Steel Sheet: ASTM A1011/A1011M, CS (Commercial Steel), Type B; free of scale, pitting, or surface defects; pickled and oiled.

Type 304 stainless steel in "Stainless Steel Sheet, Strip, Plate, and Flat Bars" Paragraphparagraph 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/A240M, austenitic stainless steel, [**Type 304**] [**Type 316**] [**Type 304 or 316 as indicated**] <**Insert type**>.

Aluminum Extrusions: ASTM B221 (ASTM B221M). Provide alloy and temper recommended by manufacturer for strength, corrosion resistance, and application of required finish, but not less than 22,000-psi (150-MPa) ultimate tensile strength.

Aluminum Sheet and Plate: ASTM B209 (ASTM B209M).

* + - 1. FIXED, TRANSACTION SECURITY WINDOWS
				1. Provide fixed, transaction security windows with operable sash or ventilator capable of allowing transfer of currency and documents.
				2. Configuration: [**One fixed-glazed panel**] [**Multiple fixed-glazed panels**] [**As indicated on Drawings**].
				3. Framing: Fabricate perimeter framing, mullions, and glazing stops from [**steel**] [**metallic-coated steel sheet**] [**stainless steel**] [**aluminum**] as follows:

Profile: [**Manufacturer's standard**] [**Narrow**], with minimum face dimension indicated.

Minimum Face Dimension: [**2 inches (50 mm)**] [**1-1/4 inches (32 mm)**] [**As indicated on Drawings**] <**Insert dimension**>.

Depth: [**Manufacturer's standard**] [**Adjustable, two-piece clamp**] [**As indicated on Drawings**] <**Insert depth**>.

Retain subparagraph below if required.

Provide [**thermally broken**] [**thermally improved**] construction for aluminum framing.

* + - * 1. Head and Jamb Framing: Designed for [**sealant glazing**] [**gasket glazing**] [**voice communication by speech at normal volume**].

Retain "Channel-Frame Sill" or "Voice-Communication-Type Sill" Paragraphparagraph below for type of sill.

* + - * 1. Channel-Frame Sill: Formed from stainless steel and designed for sealant glazing.

Retain one of two "Transaction Counter" subparagraphs below; delete both if sill rests on countertop with built-in deal tray.

Transaction Counter: Stainless steel, [**12 inches (305 mm)**] [**18 inches (457 mm)**] deep by width of security window, with integral deal tray [**centered in opening**] [**as indicated on Drawings**].

Transaction Counter: Stainless steel, 21 inches (533 mm) deep by width of security window, with operable deal tray [**centered in opening**] [**as indicated on Drawings**].

* + - * 1. Voice-Communication-Type Sill: Formed from stainless steel and designed to allow passage of speech at normal speaking volume without distortion.

Sill Depth: [**12 inches (305 mm) deep**] [**18 inches (457 mm) deep with 6-inch (152-mm) deep projection on attack side**] [**21 inches (533 mm) deep with 6-inch (152-mm) deep projection on both sides**].

Transaction Counter: Stainless steel, [**12 inches (305 mm)**] [**18 inches (457 mm)**] deep by width of security window, with integral deal tray [**centered in opening**] [**as indicated on Drawings**].

Integral Transaction-Drawer Sill: Formed from [**stainless steel**] [**framing to match head and jamb framing**]; with transaction drawer integrated into framing and contained in a stainless steel housing that forms a transaction counter on [**secure side**] [**attack side**] [**both sides**] of opening. Drawer front is flush with housing when drawer is closed.

* + - * 1. Glazing and Glazing Materials: Comply with requirements in Section 088853 "Security Glazing."
				2. Glazing Meeting Edges: Polished glazing.
				3. Materials:

Mild Steel Plates, Shapes, and Bars: ASTM A36/A36M.

Cold-Rolled Steel Sheet: ASTM A1008/A1008M, CS (Commercial Steel), Type B; suitable for exposed applications.

Metallic-Coated Steel Sheet: ASTM A653/A653M, CS (Commercial Steel), Type B; with G60 (Z180) zinc (galvanized) or A60 (ZF180) zinc-iron-alloy (galvannealed) coating designation.

Hot-Rolled Steel Sheet: ASTM A1011/A1011M, CS (Commercial Steel), Type B; free of scale, pitting, or surface defects; pickled and oiled.

Type 304 stainless steel in "Stainless Steel Sheet" Paragraphparagraph 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/A240M, austenitic stainless steel, [**Type 304**] [**Type 316**] [**Type 304 or 316 as indicated**] <**Insert type**>.

Aluminum Extrusions: ASTM B221 (ASTM B221M). Provide alloy and temper recommended by manufacturer for strength, corrosion resistance, and application of required finish, but not less than 22,000-psi (150-MPa) ultimate tensile strength.

Aluminum Sheet and Plate: ASTM B209 (ASTM B209M).

* + - 1. SLIDING, TRANSACTION SECURITY WINDOWS
				1. Provide sliding, transaction security windows.
				2. Configuration: [**One fixed-glazed panel and one horizontal-sliding glazed panel**] [**Two glazed panels that slide horizontally and meet at center of security window**] [**As indicated on Drawings**].
				3. Operation: [**Manual open/manual closing**] [**Manual open/self-closing**].
				4. Framing: Fabricate perimeter framing, mullions, and glazing stops from [**steel**] [**metallic-coated steel sheet**] [**stainless steel**] [**aluminum**] as follows:

Profile: [**Manufacturer's standard**] [**Narrow**], with minimum face dimension indicated.

Minimum Face Dimension: [**2 inches (50 mm)**] [**1-1/4 inches (32 mm)**] [**As indicated on Drawings**] <**Insert dimension**>.

Depth: [**Manufacturer's standard**] [**Adjustable, two-piece clamp**] [**As indicated on Drawings**] <**Insert depth**>.

Retain subparagraph below if required.

Provide [**thermally broken**] [**thermally improved**] construction for aluminum framing.

* + - * 1. Head and Jamb Framing: Designed for [**sealant**] [**gasket**] glazing. Removable header access panel on secure side.
				2. Sill: Stainless steel channel frame designed for [**sealant**] [**gasket**] glazing.

Delete "Shelf" Subparagraphsubparagraph below if sill rests on countertop with built-in deal tray.

Shelf: Stainless steel, [**12 inches (305 mm)**] [**18 inches (457 mm)**] deep by width of security window, with integral deal tray.

Retain first option in "Sliding Window Hardware" Paragraphparagraph below if retaining "Manual open/self-closing" option in "Operation" Paragraphparagraph. Not all manufacturers offer self-closing, self-latching, or self-locking. Verify hardware options with manufacturers.

* + - * 1. Sliding Window Hardware: Provide roller track designed for overhead support of [**two- or four-wheel carriage**] [**heavy-duty, antilift ball-bearing carrier**] [**manufacturer's standard carrier**] supporting horizontal-sliding glazed panel[**with manufacturer's standard self-closing mechanism mounted in header**]. Provide [**self-latching**] [**and**] [**self-locking**] [**manufacturer's standard**] pull and lock with two keys for each horizontal-sliding glazed panel.

Provide weather stripping for exterior horizontal-sliding, transaction security windows.

* + - * 1. Glazing and Glazing Materials: Comply with requirements in Section 088853 "Security Glazing."

Glazing Meeting Edges: Polished glazing.

* + - * 1. Materials:

Mild Steel Plates, Shapes, and Bars: ASTM A36/A36M.

Cold-Rolled Steel Sheet: ASTM A1008/A1008M, CS (Commercial Steel), Type B; suitable for exposed applications.

Metallic-Coated Steel Sheet: ASTM A653/A653M, CS (Commercial Steel), Type B; with G60 (Z180) zinc (galvanized) or A60 (ZF180) zinc-iron-alloy (galvannealed) coating designation.

Hot-Rolled Steel Sheet: ASTM A1011/A1011M, CS (Commercial Steel), Type B; free of scale, pitting, or surface defects; pickled and oiled.

Type 304 stainless steel in "Stainless Steel Sheet, Strip, Plate, and Flat Bars" Paragraphparagraph 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/A240M, austenitic stainless steel, [**Type 304**] [**Type 316**] [**Type 304 or 316 as indicated**] <**Insert type**>.

Aluminum Extrusions: ASTM B221 (ASTM B221M). Provide alloy and temper recommended by manufacturer for strength, corrosion resistance, and application of required finish, but not less than 22,000-psi (150-MPa) ultimate tensile strength.

Aluminum Sheet and Plate: ASTM B209 (ASTM B209M).

* + - 1. FABRICATION
				1. General: Fabricate security windows to provide a complete system for assembly of components and anchorage of window units.

Provide units that are reglazable from the secure side without dismantling the attack side of framing.

Prepare security windows for field glazing unless preglazing at the factory is indicated.

* + - * 1. Provide weep holes and internal water passages for exterior security windows to conduct infiltrating water to the exterior.
				2. Thermally Improved or Thermally Broken Construction: Fabricate framing with an integral, concealed, low-conductance thermal barrier, located between exterior materials and members exposed on interior in a manner that eliminates direct metal-to-metal contact.
				3. Framing: Miter or cope corners the full depth of framing; weld and dress smooth.

Fabricate framing with manufacturer's standard, internal opaque armoring in thicknesses required for security windows to comply with ballistics-resistance performance indicated.

* + - * 1. Glazing Stops: Finish glazing stops to match security window framing.

Attack-Side (Exterior) Glazing Stops: Welded or integral to framing.

Secure-Side (Interior) Glazing Stops: Removable, coordinated with glazing indicated.

* + - * 1. Welding: Weld components to comply with referenced AWS standard. To greatest extent possible, weld before finishing and in concealed locations to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
				2. Metal Protection: Separate dissimilar metals to protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
				3. Factory-cut openings in glazing for speaking apertures.

Retain "Preglazed Fabrication" Paragraphparagraph below if required. Verify size limitations with manufacturers.

* + - * 1. Preglazed Fabrication: Preglaze window units at factory, where required for applications indicated. Installation orientation of glazing to meet performance requirements. Comply with requirements in Section 088853 "Security Glazing."

Insert unique glazing requirements, if any, that are not included in Section 088853 "Security Glazing."

* + - * 1. Weather Stripping: Factory applied.
			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

Retain finishes in this article to suit Project. If retaining more than one, indicate location of each on Drawings or by inserts.

* + - * 1. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.
				2. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.

Options in "Color" Subparagraphsubparagraph below are examples only and may vary in color range and availability among manufacturers.

Color: [**Light bronze**] [**Medium bronze**] [**Dark bronze**] [**Black**] [**Match Architect Director’s Representative's sample**] [**As selected by Architect Director’s Representative from full range of industry colors and color densities**] <**Insert color**>.

"Baked-Enamel or Powder-Coat Finish" Paragraphparagraph below references AAMA standard for pigmented organic coating on extrusions and panels.

* + - * 1. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils (0.04 mm). Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

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

* + - 1. METALLIC-COATED STEEL SHEET FINISHES

Retain "Surface Preparation" Paragraphparagraph 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/A780M.

Retain "Factory Prime Finish" Paragraphparagraph 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" Paragraphparagraph 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 (0.05 mm).

Color and Gloss: [**As indicated by manufacturer's designations**] [**Match Architect Director’s Representative's sample**] [**As selected by Architect 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 "Galvanizing" Paragraphparagraph below for mild steel plates, shapes, and bars if required for Project.

* + - * 1. Galvanizing: After fabrication, galvanize window components by chemical cleaning complying with SSPC-SP 1, "Solvent Cleaning," and pickling treatment complying with SSPC-SP 8, "Pickling," followed by hot-dip galvanizing complying with ASTM A123/A123M.

Retain "Factory Prime Finish" Paragraphparagraph below for field-painted steel sheet fabrications.

* + - * 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" Paragraphparagraph below for factory-applied, baked-enamel or powder-coat finish for steel sheet fabrications.

* + - * 1. Baked-Enamel or Power-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 (0.05 mm).

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

* + - * 1. Stainless Steel Sheet and Plate Finishes:

No. 4 finish is 120- to 320-grit polished finish.

Directional Satin Finish: ASTM A480/A480M, No. 4.

* + - 1. ACCESSORIES
				1. Recessed Deal Trays: Formed from stainless steel[**with sliding stainless steel cover**]; fabricated in curved shape with exposed flanges for recessed installation into horizontal surface.

Clear Opening Size: [**12 inches wide by 8 inches deep by 1-1/2 inches high (305 mm wide by 203 mm deep by 38 mm high)**] [**12 inches wide by 11 inches deep by 1-1/2 inches high (305 mm wide by 279 mm deep by 38 mm high)**] [**16 inches wide by 11 inches deep by 1-1/2 inches high (406 mm wide by 279 mm deep by 38 mm high)**] <**Insert dimensions**>.

* + - * 1. Recessed, Nonricochet Deal Trays: Formed from stainless steel; fabricated with recessed bullet trap to ricochet bullets away from secure side, with exposed flanges for recessed installation into horizontal surface[**, and with sliding stainless steel cover**].

Clear Opening Size: [**10 inches wide by 7 inches deep by 1-1/2 inches high (254 mm wide by 178 mm deep by 38 mm high)**] [**12 inches wide by 8 inches deep by 1-1/2 inches high (305 mm wide by 203 mm deep by 38 mm high)**] [**12 inches wide by 11 inches deep by 1-1/2 inches high (305 mm wide by 279 mm deep by 38 mm high)**] [**16 inches wide by 11 inches deep by 1-1/2 inches high (406 mm wide by 279 mm deep by 38 mm high)**] <**Insert dimensions**>.

Bullet Trap Location: [**Secure side**] [**Both sides**].

Ballistics Resistance: [**UL Level 1**] [**UL Level 3**] [**Same as security window**] <**Insert level**>.

Retain subparagraph below if required.

Listed and labeled as bullet resisting in accordance with UL 752.

* + - * 1. Rotating Deal Trays: Formed from stainless steel, with rotating recessed deal tray on each side of secure opening and with handle that rotates deal trays 180 degrees.

Mounting: [**Drop in**] [**Countertop**].

Ballistics Resistance: [**UL Level 1**] [**UL Level 3**] [**Same as security window**] <**Insert level**>.

Retain subparagraph below if required.

Listed and labeled as bullet resisting in accordance with UL 752.

Revise "Transaction Drawers" Paragraphparagraph below to suit Project; a variety of models and features are available for transaction drawers. Verify features with manufacturers.

* + - * 1. Transaction Drawers: Formed from [**stainless steel**] [**steel**] [**bullet-resistant armoring**]; with ball-bearing, telescoping sliding mechanism; with cover on secure side of top of drawer that automatically closes when drawer is extended to attack side.

Inside Dimensions: [**15-3/8 inches wide by 8-1/2 inches deep by 4-3/8 inches high (390 mm wide by 216 mm deep by 111 mm high)**] [**13 inches wide by 22 inches deep by 6-1/2 inches high (330 mm wide by 559 mm deep by 165 mm high)**] <**Insert dimensions**>.

Operation: [**Manual**] [**Electric, with sliding handle for emergency manual operation during lack of power. Provide individual switches for power and drawer movement on secure side and call button on attack side**].

Ballistics Resistance: [**UL Level 1**] [**UL Level 3**] [**Same as security window**] <**Insert level**>.

Retain subparagraph below if required.

Listed and labeled as bullet resisting in accordance with UL 752.

* + - * 1. Speaking Apertures: Fabricate from [**stainless steel**] [**security glazing**], designed to allow passage of speech at normal speaking volume without distortion.

Shape: [**Circular**] [**Square**].

Ballistics Resistance: [**UL Level 1**] [**UL Level 3**] [**Same as security window**] <**Insert level**>.

Retain subparagraph below if required.

Listed and labeled as bullet resisting in accordance with UL 752.

* + - * 1. Concealed Bolts: ASTM A307, Grade A unless otherwise indicated.
				2. Cast-in-Place Anchors in Concrete: Fabricated from corrosion-resistant materials capable of sustaining, without failure, a load equal to [**four**] <**Insert number**> times the load imposed, as determined by testing in accordance with ASTM E488/E488M, conducted by a qualified testing agency; of type indicated below.

Threaded or wedge type; galvanized ferrous castings, either ASTM A27/A27M cast steel or ASTM A47/A47M malleable iron. Provide bolts, washers, and shims as required; hot-dip galvanized in accordance with ASTM A153/A153M or ASTM F2329/F2329M.

* + - * 1. Embedded Plate Anchors: Fabricated from mild steel shapes and plates, minimum 3/16 inch (4.8 mm) thick; with minimum 1/2-inch- (12.7-mm-) diameter, headed studs welded to back of plate.
				2. Welding Rods and Bare Electrodes: Select in accordance with AWS specifications for metal alloy welded.

Coordinate "Glazing Strips and Weather Stripping," "Miscellaneous Glazing Materials," and "Anchors, Clips, and Window Accessories" paragraphs below with materials specified in Section 088853 "Security Glazing."

* + - * 1. Glazing Strips and Weather Stripping: Manufacturer's standard replaceable components.

Compression Type: Molded EPDM or neoprene gaskets complying with ASTM D2000, Designations 2BC415 to 3BC620; molded PVC gaskets complying with ASTM D2287; or molded, expanded EPDM or neoprene gaskets complying with ASTM C509, Grade 4.

Sliding Type: AAMA 701/702, made of wool, polypropylene, or nylon woven pile with nylon-fabric backing.

* + - * 1. Miscellaneous Glazing Materials: Provide material, size, and shape complying with requirements of glass manufacturers and with a proven record of compatibility with surfaces contacted in installation.

Cleaners, Primers, and Sealers: Type recommended by sealant or gasket manufacturer.

Setting Blocks: Elastomeric material with a Shore A durometer hardness of 85, plus or minus 5.

Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

* + - * 1. Anchors, Clips, and Window Accessories: Stainless steel; hot-dip, zinc-coated steel or iron, complying with ASTM B633; provide sufficient strength to withstand design pressures indicated.
				2. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.
				3. Sealants: For sealants required within fabricated security windows, provide type recommended by manufacturer for joint size and movement. Sealant remains permanently elastic, nonshrinking, and nonmigrating.
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 windows.
				2. Examine roughing-in for embedded and built-in anchors to verify actual locations of security window connections before security window installation.
				3. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of security windows.
				4. Inspect built-in and cast-in anchor installations, before installing security windows, to verify that anchor installations comply with requirements. Prepare inspection reports.

Remove and replace anchors where inspections indicate that they do not comply with specified requirements. Reinspect after repairs or replacements are made.

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

* + - * 1. For factory-installed glazing materials whose orientation (secure or attack side) is critical for performance, verify installation orientation.
				2. Proceed with installation only after unsatisfactory conditions have been corrected.
			1. PREPARATION

Revise this article to suit Project.

* + - * 1. Coordination: Furnish layouts for cast-in-place anchors, clips, and other security window 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. INSTALLATION
				1. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing security windows to in-place construction. Include threaded fasteners for inserts, security fasteners, and other connectors.

Retain subparagraph below if required. SD-STD-01.01 requires this as part of its certification process.

Install an attached or integral flange to secure side of security windows extending over rough-in opening gap so that gap has same [**forced-entry-resistance**] [**and**] [**ballistics-resistance**] performance as security window.

Retain "Voice-Communication-Type Framing" or "Glazed Framing" Paragraphparagraph below. First paragraph is for fixed, transaction security windows that provide speech transmission through the frame; second paragraph is for vision security windows and transaction security windows that provide speech transmission through means other than the frame, for example through a special sill or a speaking aperture or by microphone and speakers.

* + - * 1. Voice-Communication-Type Framing: Attach removable glass spacers to jambs and head of glazing, located not more than 6 inches (152 mm) from each corner and spaced not more than 12 inches (305 mm) o.c.

Retain "Glazed Framing" and "Removable Glazing Stops and Trim" paragraphs below for field-glazed units.

* + - * 1. Glazed Framing: Provide [**sealant**] [**gasket**]-glazed framing. Comply with installation requirements in Section 088853 "Security Glazing."
				2. Removable Glazing Stops and Trim: Fasten components with security fasteners.
				3. Fasteners: Install security windows using fasteners recommended by manufacturer with head style appropriate for installation requirements, strength, and finish of adjacent materials.[**Provide stainless steel fasteners in stainless steel materials.**]
				4. Sealants: Comply with requirements in Section 079200 "Joint Sealants" for installing sealants, fillers, and gaskets.

Set continuous sill members and flashing in a full sealant bed to provide weathertight construction unless otherwise indicated.

Seal frame perimeter with sealant to provide weathertight construction unless otherwise indicated.

* + - * 1. Metal Protection: Where dissimilar metals will contact each other, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended in writing by manufacturer for this purpose. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
			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. Perform additional inspections to determine compliance of replaced or additional work. Prepare inspection reports.
				3. Prepare field quality-control certification that states installed products and their installation comply with requirements in the Contract Documents.
			2. ADJUSTING
				1. Adjust horizontal-sliding, transaction security windows to provide a tight fit at contact points for smooth operation and a secure enclosure.
				2. Adjust transaction drawers to provide a tight fit at contact points[**and weather stripping**] for smooth operation and[**weathertight and**] secure enclosure.
				3. Remove and replace defective work, including security windows that are warped, bowed, or otherwise unacceptable.
			3. CLEANING AND PROTECTION
				1. Clean surfaces promptly after installation of security windows. Take care to avoid damaging the finish. Remove excess glazing and sealant compounds, dirt, and other substances.

Retain both subparagraphs below if retaining these products in Part 2.

Lubricate sliding security window hardware.

Lubricate transaction drawer hardware.

Retain first paragraph below if security windows are preglazed.

* + - * 1. Clean glass of preglazed security windows promptly after installation. Comply with requirements in Section 088853 "Security Glazing" for cleaning and maintenance.
				2. Provide temporary protection to ensure that security windows are without damage at time of Substantial Completion.
			1. DEMONSTRATION
				1. Train Owner's Facility’s maintenance personnel to adjust, operate, and maintain [**operable security windows**] [**and**] [**security windows with transaction drawers**].

END OF SECTION 085653