SECTION 115213.19 - REAR PROJECTION SCREENS

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. SUMMARY
				1. Section Includes:

Rigid rear-projection screens.

Electrically operated, flexible rear-projection screens.

* + - * 1. 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 metal support framing for rear-projection screens.

**[Section 061000 "Rough Carpentry"] [Section 061053 "Miscellaneous Rough Carpentry"]** for wood backing for screen installation.

Retain one of or both subparagraphs below for wood or metal frames for rigid rear-projection screens.

Section 064023 "Interior Architectural Woodwork" for **[wood trim] [wood trim and wood ceiling closure panel] [wood frames]** for recessed screen installation.

**[Section 081113 "Hollow Metal Doors and Frames"]** for metal frames for field-installed, rear-projection screens.

* + - 1. DEFINITIONS

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

* + - * 1. Gain: Ratio of light refracted from viewing-surface material to that reflected perpendicularly from a magnesium carbonate surface as determined in accordance with SMPTE RP 94, except that, for measuring luminance of test viewing-surface material, projection lamp shall be placed behind viewing surface at same distance as it was placed in front of magnesium carbonate surface for measuring luminance of reference standard.
				2. Half-Gain Angle: The angle, measured from the axis of the viewing surface to the most central position on a perpendicular plane through the horizontal centerline of the viewing surface, where the gain is half of the peak gain.
			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. Submittals Package: Provide all submittals, except samples and closeout submittals, as a single submittal package.
				5. Product Data: For each type of product.
				6. Shop Drawings: Show layouts and types of rear-projection screens. Include the following:

For rigid rear-projection screens:

Frame details.

Anchorage details.

Details of juncture of exposed projection-screen surfaces with adjacent finishes.

Accessories.

For electrically operated, flexible rear-projection screens:

Drop heights.

Anchorage details, including connection to supporting structure for suspended units.

Details of juncture of screen case or trim with adjacent finishes.

Location of wiring connections.

Wiring diagrams.

Accessories.

Retain "Samples" paragraph below for single-stage Samples, with a subordinate list if applicable. Retain "Samples for Initial Selection" and "Samples for Verification" paragraphs for two-stage Samples.

* + - * 1. Samples for Initial Selection: For each type of exposed finish.
				2. Samples for Verification: For each type of exposed finish, in manufacturer's standard sizes.

Retain "Product Schedule" paragraph below if Project requires various types and sizes of screens.

* + - * 1. Product Schedule: For rear-projection screens. Use same designations indicated on Drawings.
			1. CLOSEOUT SUBMITTALS
				1. Maintenance Data: For rear-projection screens to include in maintenance manuals.
			2. DELIVERY, STORAGE, AND HANDLING
				1. Environmental Limitations: Do not deliver rear-projection screens until spaces are enclosed and weathertight, wet-work in installation spaces is complete and dry, and temporary or permanent HVAC system is operating and maintaining ambient temperature and humidity conditions planned for building occupants during the remainder of the construction period.
				2. Store rear-projection screens in manufacturer's protective packaging and according to manufacturer's written instructions.
			3. COORDINATION
				1. Coordinate layout and installation of rear-projection screens with adjacent construction, including ceiling suspension systems, light fixtures, HVAC system components,[ fire-suppression system,] and partitions.
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. MANUFACTURERS
				1. Source Limitations for Rear-Projection Screens: Obtain rear-projection screens from single manufacturer. Obtain viewing surfaces and accessories, including mounting hardware, from screen manufacturer.

Retain subparagraph below if front-projections screens are included in Project and if limiting products to a single manufacturer is required.

Obtain rear-projection screens from same manufacturer as front-projection screens.

* + - 1. RIGID REAR-PROJECTION SCREENS

Copy first paragraph below and re-edit for each product required. Insert drawing designation. Use these designations on Drawings to identify each product.

* + - * 1. Rigid Rear-Projection Screen **<Insert drawing designation>**: Transparent substrate with permanently bonded optical coating; provide with gaskets, setting blocks, fasteners, and other components necessary for complete installation.

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

Draper Inc.

Legrand AV; Legrand North America, LLC.

Stewart Filmscreen Corporation.

Approved equivalent.

Optical Coating: Minimum peak gain of **[0.5 and 43-degree] [0.70 and 48-degree] [0.70 and 180-degree] [0.75 and 78-degree] [0.90 and 71-degree] [1.0 and 35-degree] [1.0 and 50-degree] [1.0 and 63-degree] [1.3 and 33-degree] [1.5 and 31-degree]** minimum half-gain angle applied to transparent substrate indicated below.

Retain "Acrylic Substrate," "Semi-Rigid Acrylic Substrate," or "Glass Substrate," paragraph below.

Acrylic Substrate: Colorless, transparent, cast-acrylic sheet with a luminous transmittance of 92 percent in accordance with ASTM D1003 and complying with ASTM D4802, Category A-1 (cell cast), Finish 1 (smooth or polished), **[1/4 inch] [3/8 inch] [1/2 inch]** thick.

Semi-Rigid Acrylic Substrate: Colorless, transparent acrylic sheet that can be rolled for shipping; minimum **[1/8 inch] [3/16 inch]** thick.

The IBC does not generally require safety glazing if bottom edge of glass screen is more than 18 inches above the floor and the screen is more than 24 inches from a door.

Glass Substrate: Clear float glass complying with ASTM C1036 for Type I (transparent glass, flat), Class 1 (clear), and Quality q3 (glazing select), **[6.0 mm] [10.0 mm] [12.0 mm]** thick.

Optical Tint: **[High-contrast dark gray] [Medium neutral gray] [Neutral white] [Manufacturer's standard]**.

Coordinate size of viewing surface with viewing-surface material and media format.

Size of Viewing Surface: **[As indicated in schedule on Drawings] [50 by 80 inches] [57-1/2 by 92 inches] [87-1/2 by 140 inches] [45 by 80 inches] [52 by 92 inches] [79 by 140 inches]**, one piece.

Retain "Factory Frames" paragraph below if required. Screens can also be field installed in frames specified in other Sections. Manufacturers offer several frame profiles and sizes; show details on Drawings, or insert description.

* + - * 1. Factory Frames: Screen manufacturer's standard frames **[of profile indicated on Drawings] <Insert description>**, fabricated to sizes required to fit screens from aluminum extrusions complying with ASTM B221 for 6063-T5 alloy and temper.

Class II, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: Nonspecular as fabricated; Chemical Finish: Etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.010 mm or thicker) complying with AAMA 611.

Class II, Color Anodic Finish: AA-M12C22A42/A44 (Mechanical Finish: Nonspecular as fabricated; Chemical Finish: Etched, medium matte; Anodic Coating: Architectural Class II, integrally colored or electrolytically deposited color coating 0.010 mm or thicker) complying with AAMA 611.

Manufacturers standard colors vary.

Color: **[Black] [Dark bronze] [Either black or dark bronze, as standard with manufacturer]**.

* + - 1. ELECTRICALLY OPERATED, FLEXIBLE REAR-PROJECTION SCREENS

Retain "General Requirements" paragraph below for control, motor, and screen requirements. Not all electrically operated screens are UL listed as an assembly, although they all use UL-listed electrical components. Manual-crank-operated units are available; insert requirements for crank operation if necessary.

* + - * 1. General Requirements: Manufacturer's standard units, consisting of case, screen, motor, controls, mounting accessories, and other components necessary for a complete installation.

Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

Screen Mounting: Top edge securely anchored to rigid metal roller and bottom edge formed into a pocket holding a metal rod, with ends of rod protected by plastic caps.

Viewing-Surface and Masking Materials:

Most screen materials are mildew resistant. Before retaining "Mildew-Resistance Rating" paragraph below, verify that products comply with requirements.

Mildew-Resistance Rating: Zero or 1 when tested in accordance with ASTM G21.

Retain "Flame Resistance" or "Flame-Spread Index" subparagraph below if required by authorities having jurisdiction for occupancy classification of space where screens are installed. Screen manufacturers usually test products in accordance with NFPA 701 rather than ASTM E84. Before retaining either paragraph, verify that products comply with requirements.

Flame Resistance: Passes NFPA 701.

Flame-Spread Index: Not greater than 75 when tested in accordance with ASTM E84.

Seamless Construction: Provide viewing surfaces, in sizes indicated, without seams.

Copy first paragraph below and re-edit for each product required. Insert drawing designation. Use these designations on Drawings to identify each product.

* + - * 1. Surface-Mounted, Metal-Encased, Electrically Operated Screen **<Insert drawing designation>**: Motor-in-roller unit with tab-tensioned screen and screen case fabricated from formed-steel sheet or from aluminum extrusions with manufacturer's standard finish and matching end caps.

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

Draper Inc.

Legrand AV; Legrand North America, LLC.

Stewart Filmscreen Corporation.

Approved equivalent.

Motor in Roller: Instant-reversing motor of size and capacity recommended in writing by screen manufacturer; with permanently lubricated ball bearings, automatic thermal-overload protection, preset limit switches to automatically stop screen in up and down positions, and positive-stop action to prevent coasting. Mount motor inside roller with vibration isolators to reduce noise transmission.

Show locations of control switches on Drawings.

Controls: Remote,**[ key-operated,]** three-position control switch installed in recessed device box with flush cover plate**[ matching other electrical device cover plates in room where switch is installed]**.

Retain one option in first subparagraph below or revise to suit Project. Manufacturers normally provide one switch unless otherwise indicated. Indicate switch locations on Drawings.

Provide with **[one control switch] [two control switches] [number of control switches indicated on Drawings]**.

Provide power supply for low-voltage systems if required.

Provisions in first two subparagraphs below help control tampering; item in second subparagraph inactivates remote control and switches.

Provide locking cover plates for switches.

Provide key-operated, power-supply switch.

Provide **[infrared] [radio-frequency]** remote control, consisting of battery-powered transmitter and receiver.

Provide video interface control for connecting to projector. Projector provides signal to raise or lower screen.

Surface-Mounting Configuration: **[Mounted using manufacturer's standard projecting wall brackets] [Mounted directly to wall or ceiling, as indicated on Drawings, with concealed mounting] [Recessed in ceiling trough indicated on Drawings with concealed mounting]**.

Screen-Case Color: **[As selected by Director’s Representative from manufacturer's standard options] [White] [Black]**.

Tab Tensioning: Durable low-stretch cord, such as braided polyester, on each side of screen that is connected to edge of entire height of screen by tabs, to pull viewing surface flat horizontally.

Retain "Off-White Viewing Surface" or "Gray Viewing Surface" subparagraph below. Gray surfaces generally provide better contrast and color rendition than off-white surfaces and perform better in higher ambient-light conditions.

Off-White Viewing Surface: Minimum peak gain of **[0.65 and 78-degree] [0.9 and 65-degree] [1.0 and 63-degree] [1.3 and 42-degree]** minimum half-gain angle.

Gray Viewing Surface: Minimum peak gain of **[1.0 and 39-degree] [1.2 and 30-degree] [1.5 and 31-degree]** minimum half-gain angle.

Coordinate size of viewing surface with viewing-surface material and media format.

Size of Viewing Surface: **[As indicated in schedule on Drawings] [50 by 80 inches] [57-1/2 by 92 inches] [87-1/2 by 140 inches] [45 by 80 inches] [52 by 92 inches] [79 by 140 inches]**.

Extra Drop Height: **[As indicated in schedule on Drawings] [As needed at top of screen for bottom of screen to be 36 inches above floor] [36 inches at bottom of screen]**.

Color: **[Same as viewing surface] [Black]**.

Screen in first paragraph below can be suspended over stages, where no ceiling is provided, or can be recess mounted in ceiling. Surface-mounted, electrically operated screens can also be used for recessed applications by installing screen case in a trough built into ceiling. Copy and re-edit for each product required. Insert drawing designation. Use these designations on Drawings to identify each product.

* + - * 1. Suspended, Electrically Operated Screen **<Insert drawing designation>**: Motor-in-roller unit designed and fabricated for suspended mounting with tab-tensioned screen.

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

Draper Inc.

Legrand AV; Legrand North America, LLC.

Stewart Filmscreen Corporation.

Approved equivalent.

Wiring Compartment: Metal or metal lined.

Motor in Roller: Instant-reversing motor of size and capacity recommended in writing by screen manufacturer; with permanently lubricated ball bearings, automatic thermal-overload protection, preset limit switches to automatically stop screen in up and down positions, and positive-stop action to prevent coasting. Mount motor inside roller with vibration isolators to reduce noise transmission.

Show locations of control switches on Drawings.

Controls: Remote,**[ key-operated,]** three-position control switch installed in recessed device box with flush cover plate**[ matching other electrical device cover plates in room where switch is installed]**.

Retain one option in first subparagraph below or revise to suit Project. Manufacturers normally provide one switch unless otherwise indicated. Indicate switch locations on Drawings.

Provide with **[one control switch] [two control switches] [number of control switches indicated on Drawings]**.

Provide power supply for low-voltage systems if required.

Provisions in first two subparagraphs below help control tampering; item in second subparagraph inactivates remote control and switches.

Provide locking cover plates for switches.

Provide key-operated, power-supply switch.

Provide **[infrared] [radio-frequency]** remote control, consisting of battery-powered transmitter and receiver.

Provide video interface control for connecting to projector. Projector provides signal to raise or lower screen.

Retain one of two options in "Screen Case" subparagraph below.

Screen Case: Made from **[metal] [metal and fire-retardant materials]**.

Retain "Ceiling Aperture" and "Finish on Exposed Surfaced" subparagraphs below for units that are recess mounted in ceiling.

Ceiling Aperture: **[Open under screen compartment] [With closure, hinged to automatically open when screen is lowered and automatically close when screen is fully raised]**.

Provide screen case **[with trim flange to receive ceiling finish] [constructed to be installed with underside flush with ceiling] [constructed to be installed with ceiling finish applied to underside]**.

Finish on Exposed Surfaces: **[Manufacturer's standard] [Prime painted] [Vinyl covering or baked enamel]**.

Tab Tensioning: Durable low-stretch cord, such as braided polyester, on each side of screen that is connected to edge of entire height of screen by tabs, to pull viewing surface flat horizontally.

Retain "Off-White Viewing Surface" or "Gray Viewing Surface" subparagraph below. Gray surfaces generally provide better contrast and color rendition than off-white surfaces and perform better in higher ambient-light conditions.

Off-White Viewing Surface: Minimum peak gain of **[0.65 and 78-degree] [0.9 and 65-degree] [1.0 and 63-degree] [1.3 and 42-degree]** minimum half-gain angle.

Gray Viewing Surface: Minimum peak gain of **[1.0 and 39-degree] [1.2 and 30-degree] [1.5 and 31-degree]** minimum half-gain angle.

Coordinate size of viewing surface with viewing-surface material and media format.

Size of Viewing Surface: **[As indicated in schedule on Drawings] [50 by 80 inches] [57-1/2 by 92 inches] [87-1/2 by 140 inches] [45 by 80 inches] [52 by 92 inches] [79 by 140 inches]**.

Extra Drop Height: **[As indicated in schedule on Drawings] [As needed at top of screen for bottom of screen to be 36 inches above floor] [36 inches at bottom of screen]**.

Color: **[Same as viewing surface] [Black]**.

1. EXECUTION
	* + 1. INSTALLATION OF RIGID REAR-PROJECTION SCREENS
				1. Install rear-projection screens to comply with screen manufacturer's written instructions. Install screens using procedures and tools recommended in writing by screen manufacturer; do not abrade viewing surfaces and damage finishes.

Installing the optically coated side towards the projector typically reduces the risk of coating damage; however, the polished, uncoated side might subject the audience to distracting glare.

* + - * 1. Install rigid rear-projection screens with optical coating toward **[projector] [audience]**.
				2. Install factory-framed, rear-projection screens in prepared wall openings. Securely anchor frames to surrounding construction, so frames are level and plumb and screen surfaces are flat.
				3. Install viewing surfaces in frames specified in other Sections, to comply with screen manufacturer's written instructions. Set with viewing surfaces flat and with edges level and plumb.
			1. INSTALLATION OF ELECTRICALLY OPERATED, FLEXIBLE REAR-PROJECTION SCREENS
				1. Install rear-projection screens to comply with screen manufacturer's written instructions, and securely anchor them to supporting substrate in a manner that produces a smoothly operating screen that, when lowered, has flat viewing surface and plumb vertical edges.

Delete the sentence below if there is a separate electrical work contract

Install low-voltage controls in accordance with NFPA 70 and complying with manufacturer's written instructions.

Delete the sentence below if no electrical work contract

Power supply and connections to be provided by the Electrical Work Contract.

Wiring Method: Install wiring in raceway, except in accessible ceiling spaces and in gypsum board partitions, where unenclosed wiring method may be used. Use UL-listed plenum cable in environmental air spaces, including plenum ceilings. Conceal raceway and cables, except in unfinished spaces.

Test electrically operated units to verify that screen controls, limit switches, closures, and other operating components are in optimum functioning condition.

* + - 1. PROTECTING AND CLEANING RIGID REAR-PROJECTION SCREENS
				1. Provide temporary covering of rear-projection screens until time of Substantial Completion. Use type of covering approved in writing by screen manufacturer that effectively protects screen from abrasion, breakage, or other damage.
				2. Clean rear-projection screens on both faces immediately before date scheduled for inspection intended to establish date of Substantial Completion. Use methods and cleaning materials recommended in writing by screen manufacturer; do not scratch or damage optical coatings or viewing-surface substrates.

END OF SECTION 115213.19