SECTION 12 24 13 - ROLLER WINDOW SHADES

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

[Interior] [and] [Exterior] solar screen window shades.

Manually-operated roller mechanisms.

Motor-operated roller mechanisms [and control systems].

* + - 1. RELATED INFORMATION

Specifier: If retaining this optional Related Information article, edit list below to include only those information sources that apply to Project.

* + - * 1. Section 05 57 00 "Decorative Formed Metal" for pockets for window treatment.
				2. Section 06 10 00 "Rough Carpentry" for wood blocking for securing roller shades.
				3. Section 07 92 00 "Joint Sealants" for sealing the perimeters of channels for light-blocking shades.
				4. Section 09 51 13 "Acoustical Panel Ceilings" for pockets for window treatment.
				5. Division 26 sections for electrical power conductors, cables, and conduits for electrical service to motor-operated roller shades, conduit for low-voltage power and control wiring, and control devices and systems related to work of this Section.
			1. ALLOWANCES
				1. Roller shades are part of allowance; refer to Section 01 21 00 "Allowances."
			2. REFERENCE STANDARDS

Specifier: If retaining this optional References article, edit the list below to include only those references utilized in the edited section.

* + - * 1. National Electrical Manufacturers Association (NEMA): [www.nema.org](http://www.nema.org):

NEMA ICS 6 Industrial Control and Systems Enclosures

* + - * 1. National Fire Protection Association (NFPA): [www.nfpa.org](http://www.nfpa.org):

NFPA 70 National Electrical Code

NFPA 701 Standard Methods of Fire Tests for Flame Propagation of Textiles and Films

* + - * 1. Window Covering Manufacturers Association: [www.access-board.gov](http://www.access-board.gov):

WCMA A 100.1 Safety of Corded Window Covering Products (ANSI)

* + - 1. ADMINISTRATIVE REQUIREMENTS
				1. Pre-installation Conference: Conduct conference at Project site. Include representatives of Contractor, Owner, Architect, roller shade Installer, Installers of electrical connections, and others affecting or affected by the Work. Review the following:

Requirements of Contract Documents.

Requirements of shop drawings.

Delivery, storage, and handling.

Power and control wiring requirements for motor-operated roller shades.

* + - * 1. Coordination:

Coordinate installation of roller shades with installation of wall construction and connections to building services.

Coordinate installation of anchors and blocking indicated on roller shade shop drawings.

* + - 1. ACTION SUBMITTALS
				1. Product Data: For each type of (roller shades) product indicated. Include styles, material descriptions, construction details, dimensions of individual components and profiles, features, finishes, and operating instructions.
				2. Sustainable Design Submittals:

Laboratory Test Reports: For roller window shade fabric, indicating compliance with requirements for low-emitting materials.

* + - * 1. Shop Drawings: For roller shades.

Include keyed plans, and head, jamb, and sill details.

Locations and requirements for recesses and attachments to other work, including general construction, anchorage methods and locations, and service connections and locations.

Include diagrams for power, signal, and control wiring including dimensioned connection locations.

Indicate locations for fabric selections when more than one type is required.

* + - * 1. Samples for Initial Selection: For each type and color of Shade material.

Include Samples of exposed accessories involving color selection.

* + - * 1. Samples for Verification: For each type of roller shade.

Shade Material: Not less than 8 inches by 10 inches. Label roomside face of material, if the fabric is dual sided.

Roller Shade: Full-size operating unit, not less than 16 inches (400 mm) wide by 36 inches (900 mm) long for each type of roller shade indicated.

Installation Accessories: Full-size unit, not less than 10 inches (250 mm) long.

* + - * 1. Window Treatment Schedule: For roller shades. Use same designations indicated on Drawings.
			1. INFORMATIONAL SUBMITTALS
				1. Qualification Data: For qualified roller shade fabricator and Installer.
				2. Product Certificates: For each type of shade material.
				3. Product Test Reports: For each type of shade material, certifying compliance with requirements.
				4. Low-Emitting Product Certificate: For roller window shade fabric products specified to meet volatile organic emissions standards, submit GREENGUARD certification or comparable certification acceptable to Architect.
				5. Lead-Free Certification: For roller window shade fabric products specified to meet lead free standards, submit RoHS certification or comparable certification acceptable to Architect.

Specifier: Retain paragraphs below when Project requirements include compliance with Federal Buy American provisions.

* + - * 1. Buy American Act Certification: Submit documentation certifying that products comply with provisions of the Buy American Act 41 U.S.C 10a – 10d.
			1. CLOSEOUT SUBMITTALS
				1. Operation and Maintenance Data: For roller shades, to include in maintenance manuals.

Methods for maintaining roller shades and finishes.

Precautions about cleaning materials and methods that could be detrimental to fabrics, finishes, and performance.

* + - 1. QUALITY ASSURANCE
				1. Manufacturer Qualifications: A qualified shade material manufacturer listed in this Section be able to provide roller shade material meeting specified requirements.

Specifier: Retain "Approval of Manufacturers and Comparable Products" Paragraph below if Owner allows substitutions but desires strict control over qualifying of substituted manufacturers.

Approval of Manufacturers and Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:

Completed and signed Substitution Request form.

Product data, including certified independent data indicating compliance with requirements.

Samples of each finish component.

Sample submittal from similar project.

Project references: Minimum of five installations of similar equipment not less than two years old, with Owner contact information.

Sample warranty.

* + - * 1. Fabricator Qualifications: Experienced roller shade fabricator approved by roller shade material manufacturer. Contact the roller shade material manufacture rep for a list of qualified fabricators available in the project area.
				2. Installer Qualifications: Experienced Installer, trained and approved by fabricator, who has completed at least five installations similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance.

Retain "Standards for Manufacture and Installation" Paragraph below for Projects requiring motor-operated roller shades.

* + - * 1. Standards for Manufacture and Installation: In addition to requirements of authorities having jurisdiction, comply with the following:

National Electrical Manufacturer’s Association (NEMA).

* + - * 1. Mockups: Provide mockup consisting of a single complete roller window shade installation of type most typical for Project, in location as directed by Architect.

Proceed with work upon approval of mockup by Architect.

Approved mockup may remain as part of the Work.

* + - 1. COORDINATION
				1. Verify opening locations prior to fabrication of shade units.

Retain Subparagraph below for Projects requiring motor-operated roller shades.

* + - * 1. Coordinate pre-wiring for roller window shade power and control wiring at each shade drive location in accordance with shade manufacturer's written instructions.
			1. DELIVERY, STORAGE, AND HANDLING
				1. Protect components according to manufacturer's written instructions. Prevent damage from condensation, temperature changes, direct exposure to sun, or other causes.
			2. PROJECT CONDITIONS
				1. Environmental Limitations: Do not deliver, store or install roller shades until work in spaces, including painting, is complete and ambient temperature and humidity conditions are maintained at occupancy levels.
				2. Field Measurements: Where the roller shades are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances of operable glazed units’ operation hardware throughout the entire operating range. Notify Architect of discrepancies. Coordinate fabrication schedule with construction progress to avoid delaying the work.
			3. WARRANTY
				1. Manufacturer's Warranty: On Manufacturer's standard form, in which Manufacturer agrees to repair or replace roller window shade components that fail in materials or workmanship (includes wear and tear) within [five] years of date of installation.
1. PRODUCTS
	* + 1. ROLLER WINDOW SHADE MATERIAL MANUFACTURERS
				1. Approved Manufacturer: **Mermet** 5790 N. Main St. Cowpens, SC 29330 mermetusa.com 864-463-1200

Specifier: Retain one of two "Substitutions" Subparagraphs below, or delete both, based upon direction of Owner.

Substitutions: No substitutions per Owner's request.

Substitutions: Comparable products of other manufacturers subject to approval by [Architect] [Owner] in accordance with Instructions to Bidders and Division 01 General Requirements.

Source Limitations: Provide roller window shade materials through one source from a single manufacturer.

* + - 1. PERFORMANCE REQUIREMENTS
				1. Fire-Test-Response Characteristics: Provide fabric products that pass NFPA 701 as determined by testing of fabrics by a testing and inspecting agency acceptable to authorities having jurisdiction.
				2. Low-Emitting Materials: Provide fabric products that comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
			2. ROLLER WINDOW SHADE MATERIALS
				1. Light-Filtering Transparent Fabric: Woven clear view, light and glare controlling fabric, stain and fade resistant; NFPA 701; California US Title 19; CAN/ULC-S109-14 Small & Large Flame Test.

Product: Shade Type “A”.

Basis of Design Product: **Insert Shade Fabric Name (Item #)**

Type: [PVC coated fiberglass] [100% Polyester] [100% Fiberglass] [PVC coated fiberglass with metalized back]

Specifier: Where basis of design specifying is not adequate to control procurement, retain detailed physical properties below and delete the above line A.1.a in this section.

Microbial Resistance, ASTM G21 and ASTM E2180: Pass.

Yarn Composition: “X” %

Thickness: “X” inches (“X” mm).

Weight: “X” oz. / sq. yd. (“X” g/sq. m).

Weave Pattern: [Basketweave] [Satin Weave] [Twill Weave] [Rib Weave] [Offset Twill Weave] [Warp Knit] [Mock Leno Weave] [Plain Weave] [Fancy Weave]

Color: “X” (“x.x”).

Specifier: Change in color or openness will affect the fenestration properties below.

Openness Factor: “X” percent.

Light Transmittance Tv: “X” percent.

Light Reflectance Rv: “X” percent.

Solar Reflectance Rs: “X” percent.

Solar Absorption As: “X” percent.

Solar Transmittance Ts: “X” percent.

Commercial SHGC % Improvement: “X” percent.

* + - * 1. PVC-Free Light-Filtering Transparent Fabric: Knitted or Woven clear view, light and glare controlling fabric, stain and fade resistant; NFPA 701; California US Title 19; CAN/ULC-S109-14 Small & Large Flame Test.

Product: Shade Type “A”.

Basis of Design Product: **Insert Shade Fabric Name (Item #)**

Type: [100% Polyester] [100% Fiberglass]

Specifier: Where basis of design specifying is not adequate to control procurement, retain detailed physical properties below and delete the above line A.1.a in this section.

Microbial Resistance, ASTM G21 and ASTM E2180: Pass.

Yarn Composition: “X” %

Thickness: “X” inches (“X” mm).

Weight: “X” oz. / sq. yd. (“X” g/sq. m).

Weave Pattern: [Warp Knit] [Mock Leno Weave] [Plain Weave]

Color: “X” (“product number”).

Specifier: Change in color or openness will affect the fenestration properties below.

Openness Factor: “X” percent.

Light Transmittance Tv: “X” percent.

Light Reflectance Rv: “X” percent.

Solar Reflectance Rs: “X” percent.

Solar Absorption As: “X” percent.

Solar Transmittance Ts: “X” percent.

Commercial SHGC % Improvement: “X” percent.

* + - * 1. Privacy Fabric: Woven, no or muted view fabric, stain and fade resistant; NFPA 701; California US Title 19; CAN/ULC-S109-14 Small & Large Flame Test.

Product: Shade Type “A”.

Basis of Design Product: **Insert Shade Fabric Name (Item #)**

Type: : [Polyester face cloth with Acrylic foam back] [100% Polyester] [100% Fiberglass] [ 100% Fiberglass face cloth with Cotton Flock back] [PVC coated fiberglass]

Specifier: Where basis of design specifying is not adequate to control procurement, retain detailed physical properties below and delete the above line A.1.a in this section.

Microbial Resistance, ASTM G21 and ASTM E2180: Pass.

Thickness: “X” inches (“X” mm).

Weight: “X” oz. / sq. yd. (“X” g/sq. m).

Room Side Color: “X” (“product number”).

Street Side Color: “X” .

Specifier: Change in color or openness will affect the fenestration properties below.

Openness Factor: “X” percent.

Light Transmittance Tv: “X” percent.

Light Reflectance Rv: “X” percent.

Solar Reflectance Rs: “X” percent.

Solar Absorption As: “X” percent.

Solar Transmittance Ts: “X” percent.

Commercial SHGC % Improvement: “X” percent.

* + - 1. ROLLER SHADE OPERATING UNITS
				1. Fabricators: Subject to compliance with requirements, provide roller window shade units fabricated by one of the following:

<**Insert approved fabricator**>

<**Insert approved fabricator**>

<**Insert approved fabricator**>

* + - * 1. Product Safety Standard: Provide roller window shade units fabricated per WCMA A 100.1 requirements for chain-loop devices, lead content, and warning labels.
				2. Rollers: Extruded aluminum or corrosion-resistant steel tubes sized to accommodate roller operating mechanisms and specified Shades without deflection. Equip with permanently-lubricated drive-end and idle-end assemblies configured to allow removal of Shades for servicing.

Roller Drive-End Location: [Right side of interior face] [Left side of interior face] [As indicated on Drawings] [As scheduled].

Direction of Shade Roll: [Regular, from exterior face of roller] [Reverse, from interior face of roller].

Shade-to-Roller Attachment: Fabricator's standard method.

Specifier: Retain one of "Operating Mechanisms" Paragraphs below for either manual or motorized shade systems.

* + - * 1. Crank-and-Gear Operating Mechanisms: Sealed gearbox drive system controlled by crank handle.

Crank-Handle Type: [Detachable] [Permanently mounted].

Crank-Handle Length: [As required to mount at 48 inches above finished floor] [As indicated on Drawings].

* + - * 1. Chain-and-Clutch Operating Mechanisms: With continuous-loop bead chain and clutch that stops shade movement when bead chain is released; with upper and lower limit stops; permanently adjusted and lubricated.

Bead Chains: Fabricator's standard.

Loop Length: [Full length of roller shade] [As indicated on Drawings].

Chain-Retainer Type: [Clip, jamb mount] [Chain tensioner, jamb mounted] [Chain tensioner, sill mounted].

Spring Lift-Assist Mechanisms: Fabricator's standard for balancing roller shade weight and for lifting heavy roller shades.

Provide for Shades of size and weight as recommended by fabricator.

* + - * 1. Motorized Operating System:

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

Electric Motor: Fabricator's standard roller-enclosed tubular motor, sized as required to operate roller shades indicated.

Electrical Characteristics: [110-V ac] [220-V ac] [24-V dc] [12-V dc] [Solar-powered dc].

Remote Control: Electric controls with NEMA ICS 6, Type 1 enclosure for [surface] [flush] mounting.

Retain one or more of first eight subparagraphs below and edit to suit Project.

Keyed Control Station: Keyed, momentary-contact, three-position, switch-operated control station. Provide two keys per station.

Individual Switch Control Station: Momentary-contact, wall-switch-operated control station.

Group Control Station: Momentary-contact, three-position, rocker-style, wall-switch-operated control station for single-switch group control.

Individual/Group Control Station: Momentary-contact, three-position, rocker-style, wall-switch-operated control station for individual and group control.

Sun Sensor Control: Adjustable system consisting of digital displays detecting sun intensity and responding by automatically adjusting shades.

Timer Control: Clock timer, [24-hour] [seven-day] programmable.

Microprocessor Control: Electronic programmable means for setting, changing, and adjusting control features.

Color: As selected by Architect from manufacturer's full range.

* + - * 1. Roller-Coupling Assemblies: Designed to join up to three inline rollers operated by one roller drive-end assembly.
				2. Mounting Hardware: [Extended] [Slim profile] [Manufacturer's standard] brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions.
				3. Shade Bottom:

(Hem) Bar: Steel or extruded aluminum.

Color and Finish of [Exposed] Bottom Bar: As selected by Architect from fabricator's full range.

* + - * 1. Installation Accessories:

Retain "Front Fascia" or "Exposed Headbox" Subparagraph below for exposed roller enclosures.

Front Fascia: Aluminum extrusion that conceals front and underside of roller and operating mechanism and attaches to roller endcaps without exposed fasteners.

Shape: [Fabricator's Standard] [L-shaped] [Curved].

Height: Fabricator's standard height required to conceal roller and Shade assembly when shade is fully open, but not less than [3 inches (76 mm)] [height indicated on Drawings].

Retain "Exposed Headbox" Subparagraph for light-blocking shades.

Exposed Headbox: Rectangular, extruded-aluminum enclosure including front fascia, top and back covers, endcaps, and removable bottom closure.

Height: Fabricator's standard height required to enclose roller and Shade assembly when shade is fully open, but not less than [3 inches (76 mm)] [height indicated on Drawings].

Endcap Covers: To cover exposed endcaps.

Retain "Recessed Shade Pocket" Subparagraph below for roller enclosure installed above the ceiling.

Recessed Shade Pocket: Rectangular, extruded-aluminum enclosure designed for recessed ceiling installation; with front, top, and back formed as one piece, end plates, and removable bottom closure panel.

Height: Fabricator's standard height required to enclose roller and Shade assembly when shade is fully open, but not less than 4 inches (102 mm) [height indicated on Drawings].

Provide pocket with lip at lower edge to support acoustical ceiling panel.

Closure Panel and Wall Clip: Removable aluminum panel designed for installation at bottom of site-constructed ceiling recess or pocket and for snap-in attachment to wall clip without fasteners.

Closure-Panel Width: As indicated on Drawings.

Light-Blocking Shade Side Channels: Designed to eliminate light gaps at sides of shades. Provide side channels with Shade guides or other means of aligning Shades with channels at tops.

Light-Blocking Shade Bottom (Sill) Channel or Angle: Designed to eliminate light gaps at bottoms of closed shades.

Installation Accessories Color and Finish: As selected from manufacturer's full range.

* + - 1. ROLLER WINDOW SHADE UNIT FABRICATION
				1. Roller Window Shade Unit Sizes: Fabricate units in sizes required to fill openings in configuration indicated:

Retain one or both "Inside of Jamb Installation" or "Outside of Jamb Installation" Subparagraph below as required for Project. Coordinate clearance requirements with distance between shades and glass, glass type, and placement of HVAC air supplies to avoid heat buildup and possible damage to glass. Consult with glass manufacturer's representative for recommendations.

Inside of Jamb Installation: Width and length equal to opening size less clearances recommended by manufacturer.

Outside of Jamb Installation: Width and length as indicated, with terminations between shades of end-to-end installations at centerlines of defined vertical separations between openings.

* + - * 1. Shade Fabrication: Fabricate Shades without battens or seams to extent possible, except for the following conditions:

Vertical Shades: Where width-to-length ratio of Shade exceeds fabric manufacturer's recommendations, provide battens and seams at uniform spacings along Shade length.

Railroaded Materials: Railroad material where material roll width is less than the required width of Shade and where indicated.

1. EXECUTION
	* + 1. EXAMINATION
				1. Examine roller window shade unit substrates with Installer for compliance with approved submittals and other conditions affecting performance of the Work.
				2. Verify locations of connections to building electrical system.
				3. Proceed with installation once unsatisfactory conditions have been corrected.
			2. PREPARATION
				1. Clean Surfaces thoroughly prior to installation.
				2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
			3. ROLLER WINDOW SHADE UNIT INSTALLATION
				1. Install roller window shade units level, plumb, square, and aligned with adjacent units according to fabricator's written instructions.

Allow clearances for window operation hardware.

Opaque Shades: Located so Shade is not closer than 2 inches (51 mm) to interior face of glass.

Retain "Electrical Connections" Paragraph below for motor-operated roller shades.

* + - * 1. Electrical Connections: Connect motor-operated roller window shade units to building electrical system.
				2. Roller Window Shade Unit Locations: [At exterior windows] [As indicated in window-covering schedule] [As indicated on Drawings].
			1. ADJUSTING
				1. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding, tracking or malfunction throughout entire operational range.
			2. CLEANING AND PROTECTION
				1. Clean roller window shade unit surfaces, after installation, according to manufacturer's written instructions.
				2. Provide final protection and maintain conditions that ensure that roller window shade units are without damage at time of Substantial Completion.
				3. Protect installed products until completion of project.
				4. Replace damaged roller window shade units that cannot be repaired, before time of Substantial Completion.
			3. DEMONSTRATION AND TRAINING

Retain this article for motorized roller shades.

* + - * 1. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain motor-operated roller window shade units.
			1. ROLLER WINDOW SHADE UNIT SCHEDULE

Specifier: For Projects requiring multiple types of installations and color/pattern selections, copy paragraph below and edit as required; use designations on Drawings or Window Schedule.

* + - * 1. Shade Unit [RWS#1]:

Fabric: [Light-filtering transparent] [PVC-free Light-filtering transparent] [Privacy].

Product: [Insert product and color/pattern selection].

Exposed hardware color: [Insert selection].

Installation: [Inside jamb] [Outside jamb].

Drive-end location, interior: [Right side] [Left side].

Operator: [Manual chain and clutch] [Manual crank and gear] [Motorized].

Control: [Individual control] [Group control] [Sun sensor] [Timer] [Microprocessor] [Room control] [BAS].

Installation accessories: [Front fascia] [Exposed Headbox] [Shade pocket] [Light-blocking channels and sill].

END OF SECTION