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## SECTION 122413 - ROLLER WINDOW SHADES

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

This Section uses the term "Architect." Change this term to match that used to identify the design professional as defined in the General and Supplementary Conditions.

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

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

Retain or delete this article in all Sections of Project Manual.

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Manually operated roller shades [**with single rollers**] [**with double rollers**].
  - 2. Motor-operated roller shades [**with single rollers**] [**with double rollers**].
  - 3. Fixed roller shades for skylights.

## B. Related Requirements:

1. Section 061053 "Miscellaneous Rough Carpentry" for wood blocking and grounds for mounting roller shades and accessories.
2. Section 079200 "Joint Sealants" for sealing the perimeters of installation accessories for light-blocking shades with a sealant.

## 1.3 ALLOWANCES

Retain products and work included in this Section that are covered by cash or quantity allowance. Do not include amounts. Insert descriptions of items in Part 2 or 3 to provide information affecting the cost of the Work that is not included under the allowance.

- A. Roller shades are part of [**Window-Covering Allowance**] <Insert name of allowance>.

## 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1. Include styles, material descriptions, construction details, dimensions of individual components and profiles, features, finishes, and operating instructions for roller shades.

- B. Shop Drawings: Show fabrication and installation details for roller shades, including fabric panel materials, their orientation to rollers, and their seam and batten locations.

1. Motor-Operated Shades: Include details of installation and diagrams for power, signal, and control wiring.

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.

- C. Samples: For each exposed product and for each color and texture specified, **10 inches (250 mm)** long.

- D. Samples for Initial Selection: For each type and color of fabric panel material.

1. Include Samples of accessories involving color selection.

- E. Samples for Verification: For each type of roller shade.

1. Fabric Panel Material: Not less than [**10 inches (250 mm)**] [**3 inches (76 mm)**] square. Mark inside face of material if applicable.
2. 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.
3. Installation Accessories: Full-size unit, not less than **10 inches (250 mm)** long.

- F. Roller-Shade Schedule: Use same designations indicated on Drawings.

## 1.5 INFORMATIONAL SUBMITTALS

Coordinate "Qualification Data" Paragraph below with qualification requirements in and as may be supplemented in "Quality Assurance" Article.

- A. Qualification Data: For Installer.

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

- B. Product Certificates: For each type of fabric panel material, signed by product manufacturer.

Retain "Product Test Reports" Paragraph below to require submittal of product test reports with or without product certificates from manufacturers.

- C. Product Test Reports: For each type of fabric panel material, for tests performed by **[manufacturer and witnessed by a qualified testing agency] [a qualified testing agency]**.

## 1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roller shades to include in maintenance manuals.

## 1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Roller Shades: Full-size units equal to 5 percent of quantity installed for each size, color, and fabric panel material indicated, but no fewer than **[two] <Insert number>** units.

## 1.8 QUALITY ASSURANCE

- A. Manufacturer Qualifications:

1. A firm with at least 20 years of demonstrated experience in United States-based manufacture of the products required in this Section.
2. A firm with the capability to use both knife cutting and ultrasonic cutting in the manufacture of the products required in this Section.
3. A firm with the capability to digitally print on shade panels.

- B. Installer Qualifications: Fabricator of products.

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

1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

Retain subparagraph below if the intention is to make an exception to the default requirement in for demolishing and removing mockups.

2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

#### 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roller shades in factory packages, marked with manufacturer, product name, and location of installation using same designations indicated on Drawings.

#### 1.10 FIELD CONDITIONS

- A. Environmental Limitations: Do not install roller shades until construction and finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Field Measurements: Where 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 for operating hardware of operable glazed units through entire operating range. Notify Architect of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

### PART 2 - PRODUCTS

#### 2.1 Section 016000 "Product Requirements."MANUFACTURERS

Retain "Manufacturers" Paragraph and list of manufacturers below to require products from manufacturers listed or a comparable product from other manufacturers.

- A. Manufacturers: Subject to compliance with requirements, **[provide products by the following]** **[provide products by one of the following]** **[available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:**

Retain "Basis-of-Design Product" Paragraph and list of manufacturers below to identify a specific product or a comparable product from manufacturers listed. Retain option and delete insert note if manufacturer's name and model number are indicated on Drawings.

- B. Basis-of-Design Product: Subject to compliance with requirements, provide **[product indicated on Drawings]** Insolroll, Inc.; Insolroll Window Shading Systems **[Solar Screen]** **[Audio-Visual Shades]** or comparable product by one of the following:
  1. Insolroll, Inc.
  2. **<Insert manufacturer's name>**.

- C. Source Limitations: Obtain roller shades from single source from single manufacturer.

## 2.2 MANUALLY OPERATED SHADES WITH SINGLE ROLLERS

Retain "Chain-and-Clutch Operating Mechanisms," "Crank-and-Gear Operating Mechanisms," or "Spring Operating Mechanisms" Paragraph below or, if more than one type of manual operating mechanism is required, show locations of each on Drawings or in a window-treatment schedule.

- A. Chain-and-Clutch Operating Mechanisms: With continuous-loop bead chain and clutch comprised of multi-banded steel springs that stops shade movement when bead chain is released; permanently adjusted and lubricated.

1. Bead Chains: [Manufacturer's standard] [Antique brass] [Nickel-plated metal] [Polyester] <Insert description>.
  - a. Polyester Bead Chain Color: [Black] [Brown] [White] [Nickel] [Antique brass].
  - b. Metal Chain Guide Color: [Black] [Brown] [White] [Nickel] [Antique brass].
  - c. Clutch Color: [Vanilla] [Black].
  - d. Clutch Holding Capacity: [8 pounds (3.6 kg)] [16 pounds (7.3 kg)] [24 pounds (10.9 kg)] [30 pounds (13.6 kg)].
  - e. Loop Length: [Full length of roller shade] [As indicated on Drawings] <Insert length>.
  - f. Limit Stops: Provide upper and lower ball stops.
  
- g. Chain-Retainer Type: [Child-safety metal chain guide] [Child-safety locking chain guide] <Insert description>.

Retain "Spring Lift-Assist Mechanisms" Subparagraph below for heavy roller shades; verify availability with manufacturers and manufacturers' weight-limit recommendations.

2. Spring Lift-Assist Mechanisms: Manufacturer's standard for balancing roller-shade weight and lifting heavy roller shades.
    - a. Provide for fabric panels that weigh more than [24 lb (10.9 kg)] <Insert value> or for shades as recommended by manufacturer, whichever criteria are more stringent.
- B. Crank-and-Gear Operating Mechanisms: Sealed gearbox drive system controlled by crank handle.
1. Crank-Handle Type: Detachable.
  2. Crank-Handle Length: [4 feet (1.2 m)] [5 feet (1.5 m)] [6 feet (1.8 m)] [Manufacturer's standard] [As indicated on Drawings].

- C. Spring Operating Mechanisms: Roller contains spring sized to accommodate shade size indicated. Provide with positive locking mechanism that can stop shade movement at each half-turn of roller and with manufacturer's standard pull.
- D. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of fabric panels indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of fabric panels for service.
  - 1. Roller Drive-End Location: [**Right side of inside face of shade**] [**Left side of inside face of shade**] [**As indicated on Drawings**] <Insert requirements>.

Coordinate direction of roll with fascia, headbox, or shade-pocket design.

- 2. Direction of Fabric Panel Roll: [**Regular, from back of roller**] [**Reverse, from front of roller**].
- 3. Fabric Panel-to-Roller Attachment: [**Manufacturer's standard method**] [**Adhesive strip**].
  - a. Provide fabric panels not less than **12 inches (300 mm)** longer than desired shade height to assure solid attachment to roller tube and ability to adjust panels in field without removing mounting brackets.

Types and sizes of mounting hardware vary among manufacturers. Revise "Mounting Hardware" Paragraph below if specific types of hardware (e.g., extended brackets or slim-profile brackets) are required. Where hardware dimensions are critical, indicate installation conditions and size constraints on Drawings.

- E. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions indicated.

If retaining "Roller-Coupling Assemblies" Paragraph below, indicate locations and quantities of rollers joined with coupling assemblies on Drawings or in a window-treatment schedule.

- F. Roller-Coupling Assemblies: Coordinated with operating mechanism and designed to join up to three inline rollers into a multiband shade that is operated by one roller drive-end assembly.
- G. Fabric Panels:

Coordinate option retained in "Fabric Panel Material" Subparagraph below with requirements specified in "Fabric Panel Materials" Article.

- 1. Fabric Panel Material: [**Light-filtering fabric**] [**Light-blocking fabric**].
  - a. Exit door area shades shall be provided with "Emergency Exit Only" notification printed on fabric panel.

Revise "Fabric Panel Bottom (Hem) Bar" Subparagraph below if wood bar is acceptable for roller shades with spring operating systems.

2. Fabric Panel Bottom (Hem) Bar: Enclosed in hem pocket of fabric panel material, thermally sealed, not sewn.

Bottom bars vary among manufacturers; insert requirements for specific type and shape in "Bottom (Sill) Channel" Subparagraph below.

Methods of sealing light gaps at bottoms of shades vary among manufacturers.

- a. Bottom (Sill) Channel: With light seals and designed to eliminate light gaps at bottoms of shades when shades are closed.

Retain "Color and Finish" Subparagraph below for exposed bottom bars.

- b. Color and Finish: [As selected by Architect from manufacturer's full range] <Insert color and finish>.

#### H. Installation Accessories:

Retain "Front Fascia" or "Exposed Headbox" Subparagraph below for exposed roller enclosures. Retain "Exposed Headbox" Subparagraph for light-blocking shades.

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

Shapes and heights of fasciae vary among manufacturers.

- a. Shape: [L-shaped] [Curved] [Cassette] <Insert requirements>.
  - b. Height: Manufacturer's standard height required to conceal roller and fabric panel when shade is fully open, but not less than [4 inches (102 mm)] [3 inches (76 mm)] <Insert dimension>.
  - c. Color: [Bronze] [Black] [White] [Clear anodized] [Vanilla].
  - d. Color: [Fabric-wrapped] [Black] [White].
2. Reverse Roll Fascia: Aluminum extrusion that conceals front and top side of roller and operating mechanism and attaches to roller endcaps.
    - a. Shape: [L-shaped] <Insert requirements>.
    - b. Height: Manufacturer's standard height required to conceal roller and fabric panel when shade is fully open, but not less than [4 inches (102 mm)] <Insert dimension>.
    - c. Color: [Bronze] [White] [Clear anodized].
  3. Exposed Headbox: Rectangular, extruded-aluminum enclosure including front fascia, top and back covers and endcaps.

- a. Height: Manufacturer's standard height required to enclose roller and fabric panel when shade is fully open, but not less than **[4 inches (102 mm)] [height indicated on Drawings] <Insert dimension>**.

If retaining "Endcap Covers" Subparagraph below, verify availability with manufacturers. Depending on manufacturer and manual operating system, endcaps might be required for mounting shades or attaching fasciae or headboxes.

4. Endcap Covers: To cover exposed endcaps.

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

5. 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.
  - a. Height: Manufacturer's standard height required to enclose roller and fabric panel when shade is fully open, but not less than **[5-5/8 inches (143 mm)] [5 inches (127 mm)] [height indicated on Drawings] <Insert dimension>**.
  - b. Provide pocket with lip at lower edge to support acoustical ceiling panel.
6. Access Flap and Hanger: Removable aluminum panel designed for installation at bottom of site-constructed ceiling recess or pocket.

Widths of closure panels vary among manufacturers.

- a. Closure-Panel Width: **[As indicated on Drawings] [3 inches (76 mm)] <Insert dimension>**.

Retain "Side Channels" and "Bottom (Sill) Channel or Angle" subparagraphs below for light-blocking shades.

7. Side Channels: Designed to eliminate light gaps at sides of shades as shades are drawn down.

Methods of sealing light gaps at bottoms of shades vary among manufacturers. Fabric panel bottom bars fit into bottom channels to seal light leaks.

8. Bottom (Sill) Channel: With light seals and designed to eliminate light gaps at bottoms of shades when shades are closed.
9. Installation Accessories Color and Finish: **[As selected from manufacturer's full range] [White] [Bronze] [Clear anodized]**.

### 2.3 MANUALLY OPERATED SHADES WITH DOUBLE ROLLERS

Retain "Chain-and-Clutch Operating Mechanisms," "Crank-and-Gear Operating Mechanisms," or "Spring Operating Mechanisms" Paragraph below or, if more than one type of manual operating mechanism is required, show locations of each on Drawings or in a window-treatment schedule.



- A. Chain-and-Clutch Operating Mechanisms: With continuous-loop bead chain and clutch comprised of multi-banded steel springs that stops shade movement when bead chain is released; permanently adjusted and lubricated.
1. Bead Chains: [Manufacturer's standard] [Antique brass] [Nickel-plated metal] [Polyester] <Insert description>.
    - a. Polyester Bead Chain Color: [Black] [Brown] [White] [Nickel] [Antique brass].
    - b. Metal Chain Guide Color: [Black] [Brown] [White] [Nickel] [Antique brass].
    - c. Clutch Color: [Vanilla] [Black].
    - d. Clutch Holding Capacity: [8 pounds (3.6 kg)] [16 pounds (7.3 kg)] [24 pounds (10.9 kg)] [30 pounds (13.6 kg)].
    - e. Loop Length: [Full length of roller shade] [As indicated on Drawings] <Insert length>.
    - f. Limit Stops: Provide upper and lower ball stops.
  - g. Chain-Retainer Type: [Child-safety metal chain guide] [Child-safety locking chain guide] <Insert description>.

Retain "Spring Lift-Assist Mechanisms" Subparagraph below for heavy roller shades; verify availability with manufacturers and manufacturers' weight-limit recommendations.

2. Spring Lift-Assist Mechanisms: Manufacturer's standard for balancing roller-shade weight and lifting heavy roller shades.
    - a. Provide for fabric panels that weigh more than [24 lb (10.9 kg)] <Insert value> or for shades as recommended by manufacturer, whichever criteria are more stringent.
- B. Crank-and-Gear Operating Mechanisms: Sealed gearbox drive system controlled by crank handle.
1. Crank-Handle Type: Detachable.
  2. Crank-Handle Length: [4 feet (1.2 m)] [5 feet (1.5 m)] [6 feet (1.8 m)] [Manufacturer's standard] [As indicated on Drawings] <Insert length>.
- C. Spring Operating Mechanisms: Roller contains spring sized to accommodate shade size indicated. Provide with positive locking mechanism that can stop shade movement at each half-turn of roller and with manufacturer's standard pull.
- D. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of fabric panels indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of fabric panels for service.

Coordinate option retained in "Double-Roller Mounting Configuration" Subparagraph below with available space. Side-by-side mounting is wider than offset mounting; offset mounting is taller than side-by-side mounting.

1. Double-Roller Mounting Configuration: [**Side by side**] [**Offset, outside roller over and inside roller under**] <Insert requirements>.
2. Inside Roller:
  - a. Drive-End Location: [**Right side of inside face of shade**] [**Left side of inside face of shade**] [**As indicated on Drawings**] <Insert requirements>.

Coordinate direction of roll with mounting configuration, fascia, headbox, or shade-pocket design.

- b. Direction of Fabric Panel Roll: [**Regular, from back of roller**] [**Reverse, from front of roller**].
3. Outside Roller:
  - a. Drive-End Location: [**Right side of inside face of shade**] [**Left side of inside face of shade**] [**As indicated on Drawings**] <Insert requirements>.

Coordinate direction of roll with mounting configuration, fascia, headbox, or shade-pocket design.

- b. Direction of Fabric Panel Roll: [**Regular, from back of roller**] [**Reverse, from front of roller**].
4. Fabric Panel-to-Roller Attachment: [**Manufacturer's standard method**] [**Adhesive strip**] <Insert description>.
  - a. Provide fabric panels not less than **12 inches (300 mm)** longer than desired shade height to assure solid attachment to roller tube and ability to adjust panels in field without removing mounting brackets.

Types and sizes of mounting hardware vary among manufacturers. Revise "Mounting Hardware" Paragraph below if specific types of hardware (e.g., one-piece, double-roller brackets) are required. Where hardware dimensions are critical, indicate installation conditions and size constraints on Drawings.

- E. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller mounting configuration, roller assemblies, operating mechanisms, installation accessories, and installation locations and conditions indicated.

If retaining "Multiple Panel Shade Assemblies" Paragraph below, indicate locations and quantities of rollers joined with coupling assemblies on Drawings or in a window-treatment schedule.

- F. Multiple Panel Shade Assemblies: Coordinated with operating mechanism and designed to join up to three inline panels on a single roller tube and operated in unison by one operator.
- G. Inside Fabric Panels:

Typically, light-filtering fabric panels are installed on the inside rollers and light-blocking fabric panels are installed on the outside rollers in double-roller configurations. Coordinate option retained in "Fabric Panel Material" Subparagraph below with requirements specified in "Fabric Panel Materials" Article.

1. Fabric Panel Material: [**Light-filtering fabric**] [**Light-blocking fabric**] <Insert requirements>.

- a. Exit door area shades shall be provided with "Emergency Exit Only" notification printed on fabric panel.

Revise "Fabric Panel Bottom (Hem) Bar" Subparagraph below if wood bar is acceptable for roller shades with spring operating systems.

2. Fabric Panel Bottom (Hem) Bar: Enclosed in hem pocket of fabric panel material, thermally sealed, not sewn.

Bottom bars vary among manufacturers; insert requirements for specific type and shape in "Type" Subparagraph below.

- a. Type: [**Enclosed in sealed pocket of fabric panel material**] [**Exposed with endcaps**] <Insert description>.

Retain "Color and Finish" Subparagraph below for exposed bottom bars.

- b. Color and Finish: [**As selected by Architect from manufacturer's full range**] <Insert color and finish>.

#### H. Outside Fabric Panels:

Coordinate option retained in "Fabric Panel Material" Subparagraph below with requirements specified in "Fabric Panel Materials" Article.

1. Fabric Panel Material: [**Light-blocking fabric**] [**Light-filtering fabric**] <Insert requirements>.

Revise "Fabric Panel Bottom (Hem) Bar" Subparagraph below if wood bar is acceptable for roller shades with spring operating systems.

2. Fabric Panel Bottom (Hem) Bar: Enclosed in hem pocket of fabric panel material, thermally sealed, not sewn.

Bottom bars vary among manufacturers; insert requirements for specific type and shape in "Bottom (Sill) Channel" Subparagraph below.

Methods of sealing light gaps at bottoms of shades vary among manufacturers.

- a. Bottom (Sill) Channel: With light seals and designed to eliminate light gaps at bottoms of shades when shades are closed.

Retain "Color and Finish" Subparagraph below for exposed bottom bars.

- b. Color and Finish: [**As selected by Architect from manufacturer's full range**] <Insert color and finish>.

#### I. Installation Accessories:

Retain "Front Fascia" or "Exposed Headbox" Subparagraph below for exposed roller enclosures. Retain "Exposed Headbox" Subparagraph for light-blocking shades.

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

Shapes and heights of fasciae vary among manufacturers.

- a. Shape: [**L-shaped**] [**Curved**] [**Cassette**] <Insert requirements>.
  - b. Height: Manufacturer's standard height required to conceal roller and fabric panel when shade is fully open, but not less than [**4 inches (102 mm)**] [**3 inches (76 mm)**] <Insert dimension>.
  - a. Color: [**Bronze**] [**Black**] [**White**] [**Clear anodized**] [**Vanilla**].
  - b. Color: [**Fabric-wrapped**] [**Black**] [**White**].
2. Reverse Roll Fascia: Aluminum extrusion that conceals front and top side of roller and operating mechanism and attaches to roller endcaps.
    - a. Shape: [**L-shaped**] <Insert requirements>.
    - b. Height: Manufacturer's standard height required to conceal roller and fabric panel when shade is fully open, but not less than [**4 inches (102 mm)**] <Insert dimension>.
    - c. Color: [**Bronze**] [**White**] [**Clear anodized**].
  3. Exposed Headbox: Rectangular, extruded-aluminum enclosure including front fascia, top and back covers, endcaps, and removable bottom closure.
    - a. Height: Manufacturer's standard height required to enclose roller and fabric panel when shade is fully open, but not less than [**4 inches (102 mm)**] [**height indicated on Drawings**] <Insert dimension>.

If retaining "Endcap Covers" Subparagraph below, verify availability with manufacturers. Depending on manufacturer and manual operating system, endcaps might be required for mounting shades or attaching fasciae or headboxes.

4. Endcap Covers: To cover exposed endcaps.

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

5. 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.
  - a. Height: Manufacturer's standard height required to enclose roller and fabric panel when shade is fully open, but not less than [**5-5/8 inches (143 mm)**] [**5 inches (127 mm)**] [**height indicated on Drawings**] <Insert dimension>.
  - b. Provide pocket with lip at lower edge to support acoustical ceiling panel.
6. Access Flap and Hanger: Removable aluminum panel designed for installation at bottom of site-constructed ceiling recess or pocket.

Widths of closure panels vary among manufacturers.

- a. Closure-Panel Width: **[As indicated on Drawings] [3 inches (76 mm)] <Insert dimension>**.

Retain "Side Channels" and "Bottom (Sill) Channel or Angle" subparagraphs below for light-blocking shades.

7. Side Channels: Designed to eliminate light gaps at sides of shades as shades are drawn down.

Methods of sealing light gaps at bottoms of shades vary among manufacturers. Fabric panel bottom bars fit into bottom channels to seal light leaks.

8. Bottom (Sill) Channel: With light seals and designed to eliminate light gaps at bottoms of shades when shades are closed.
9. Installation Accessories Color and Finish: **[As selected from manufacturer's full range] [White] [Bronze] [Clear anodized]**.

#### 2.4 FIXED SHADES FOR SKYLIGHTS

- A. General: Manufacturer's complete inoperable fixed shade system and accessories suitable for conditions indicated at rectangular windows, trapezoidal, and triangular windows, and at skylights.
- B. Hem Bar: Shades shall have a thermally-sealed hem pocket at top and bottom. Provide **[1-inch by 3/16-inch (25mm by 4.8 mm) aluminum hem bar for direct mounting with fasteners] [spring rods for attachment without fasteners]**.
- C. Fabric Panels:
  1. Fabric Panel Material: **[Light-filtering fabric] [Light-blocking fabric] <Insert requirements>**.

#### 2.5 MOTOR-OPERATED, SINGLE-ROLLER SHADES

- A. Motorized Operating System: Provide factory-assembled, shade-operator system of size and capacity and with features, characteristics, and accessories suitable for conditions indicated, complete with electric motor and factory-rewired motor controls, power disconnect switch, enclosures protecting controls and operating parts, and accessories required for reliable operation without malfunction. Include wiring from motor controls to motors. Coordinate operator wiring requirements and electrical characteristics with building electrical system.
  1. Electrical Components: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

If required, insert manufacturers' description of alternative motor that is available (e.g., "quiet operation" motor, etc.) in "Electric Motor" Subparagraph below.

2. Electric Motor: [**Manufacturer's standard**] <Insert description> tubular, enclosed in roller.
  - a. Electrical Characteristics: Single phase, [**24**] [**110**] [**220**] <Insert value> V, 60 Hz.
3. Remote Control: Electric controls with NEMA ICS 6, Type 1 enclosure for [**surface**] [**recessed or flush**] <Insert type> mounting. Provide the following for remote-control activation of shades:

Retain one or more of "Wireless Control," "Keyed Control Station," "Individual Switch Control Station," "Group Control Station," "Individual/Group Control Station," "Sun Sensor Control," "Infrared Control," "Timer Control," and "Microprocessor Control" subparagraphs below or revise to suit Project.

- a. Wireless Control: System consisting of a concealed wireless 433 MHz radio receiver built into motor with no external components. Provide [**wireless wall switches**] [**or**] [**handheld remote transmitters**] for individual shades or groups of shades, to open and close shades simultaneously, and to stop shade movement.
  - b. Keyed Control Station: Keyed, [**maintained**] [**momentary**]-contact, three-position, switch-operated control station with open, close, and off functions. Provide two keys per station.
  - c. Individual Switch Control Station: [**Maintained**] [**Momentary**]-contact, [**three**] [**five**]-position, [**toggle**] [**rocker**]-style, wall-switch-operated control station with open, close, and center off functions.
  - d. Group Control Station: [**Maintained**] [**Momentary**]-contact, three-position, rocker-style, wall-switch-operated control station with open, close, and center off functions for single-switch group control.
  - e. Individual/Group Control Station: [**Maintained**] [**Momentary**]-contact, three-position, rocker-style, wall-switch-operated control station with open, close, and center off functions for individual and group control.
  - f. Sun Sensor Control: Adjustable system consisting of digital displays detecting sun intensity and responding by automatically adjusting shades.
  - g. Infrared Control: System consisting of concealed receiver complete with external eye and connecting modular cable and [**two**] <Insert number> portable, multiple-channel transmitters with separate buttons to open and close up to [**12**] <Insert number> individual shades or groups of shades, to open and close shades simultaneously, and to stop shade movement.
  - h. Timer Control: Clock timer, [**24-hour**] [**seven-day**] <Insert period> programmable for regular events.
  - i. Microprocessor Control: Electronic programmable means for setting, changing, and adjusting control features; isolated from voltage spikes and surges.
  - j. Color: [**As selected by Architect from manufacturer's full range**] <Insert color>.
4. Limit Switches: Adjustable switches interlocked with motor controls and set to stop shades automatically at fully raised and fully lowered positions.
  5. Operating Features:
    - a. Group switching with integrated switch control; single faceplate for multiple switch cutouts.
    - b. Capable of interface with [**audiovisual**] [**multiroom**] <Insert description> control system.
    - c. Capable of accepting input from building automation control system.

Retain first subparagraph below only for sensor-, infrared-, or timer-controlled systems.

- d. Override switch.
6. Accessories:
  - a. Solar power unit.
  - b. <Insert accessory>.
- B. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of fabric panels indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of fabric panels for service.
  1. Roller Drive-End Location: [**Right side of inside face of shade**] [**Left side of inside face of shade**] [**As indicated on Drawings**] <Insert requirements>.

Coordinate direction of roll with fascia, headbox, or shade-pocket design.

2. Direction of Fabric Panel Roll: [**Regular, from back of roller**] [**Reverse, from front of roller**].
3. Fabric Panel-to-Roller Attachment: [**Manufacturer's standard method**] [**Adhesive strip**] <Insert description>.
  - a. Provide fabric panels not less than **12 inches (300 mm)** longer than desired shade height to assure solid attachment to roller tube and ability to adjust panels in field without removing mounting brackets.

Types and sizes of mounting hardware vary among manufacturers. Revise "Mounting Hardware" Paragraph below if specific types of hardware (e.g., extended brackets or slim-profile brackets) are required. Where hardware dimensions are critical, indicate installation conditions and size constraints on Drawings.

- C. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions indicated.

If retaining "Multiple Panel Shade Assemblies" Paragraph below, indicate locations and quantities of rollers joined with coupling assemblies on Drawings or in a window-treatment schedule.

- D. Multiple Panel Shade Assemblies: Coordinated with operating mechanism and designed to join up to three inline panels on a single roller tube and operated in unison by one operator.
- E. Fabric Panels:

Coordinate option retained in "Fabric Panel Material" Subparagraph below with requirements specified in "Fabric Panel Materials" Article.

1. Fabric Panel Material: [**Light-filtering fabric**] [**Light-blocking fabric**] <Insert requirements>.

2. Fabric Panel Bottom (Hem) Bar: Enclosed in hem pocket of fabric panel material, thermally sealed, not sewn.

Bottom bars vary among manufacturers; insert requirements for specific type and shape in "Bottom (Sill) Channel" Subparagraph below.

Methods of sealing light gaps at bottoms of shades vary among manufacturers.

- a. Bottom (Sill) Channel: With light seals and designed to eliminate light gaps at bottoms of shades when shades are closed.

Retain "Color and Finish" Subparagraph below for exposed bottom bars.

- b. Color and Finish: [As selected by Architect from manufacturer's full range] <Insert color and finish>.

F. Installation Accessories:

Retain "Front Fascia" or "Exposed Headbox" Subparagraph below for exposed roller enclosures. Retain "Reverse Roll Fascia" Subparagraph when required. Retain "Exposed Headbox" Subparagraph for light-blocking shades.

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

Shapes and heights of fasciae vary among manufacturers.

- a. Shape: [L-shaped] [Curved] [Cassette] <Insert requirements>.
  - b. Height: Manufacturer's standard height required to conceal roller and fabric panel when shade is fully open, but not less than [4 inches (102 mm)] [3 inches (76 mm)] <Insert dimension>.
  - c. Color: [Bronze] [Black] [White] [Clear anodized] [Vanilla].
  - d. Color: [Fabric-wrapped] [Black] [White].
2. Reverse Roll Fascia: Aluminum extrusion that conceals front and top side of roller and operating mechanism and attaches to roller endcaps.
    - a. Shape: [L-shaped] <Insert requirements>.
    - b. Height: Manufacturer's standard height required to conceal roller and fabric panel when shade is fully open, but not less than [4 inches (102 mm)] <Insert dimension>.
    - c. Color: [Bronze] [White] [Clear anodized].
  3. Exposed Headbox: Rectangular, extruded-aluminum enclosure including front fascia, top and back covers, endcaps, and removable bottom closure.
    - a. Height: Manufacturer's standard in height required to enclose roller and fabric panel when shade is fully open, but not less than [4 inches (102 mm)] [as indicated on Drawings] <Insert dimension>.

If retaining "Endcap Covers" Subparagraph below, verify availability with manufacturers.



4. Endcap Covers: To cover exposed endcaps.

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

5. 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.
  - a. Height: Manufacturer's standard height required to enclose roller and fabric panel when shade is fully open, but not less than **[5-5/8 inches (143 mm)] [5 inches (127 mm)] [height indicated on Drawings] <Insert dimension>**.
  - b. Provide pocket with lip at lower edge to support acoustical ceiling panel.
6. Access Flap and Hanger: Removable aluminum panel designed for installation at bottom of site-constructed ceiling recess or pocket.

Widths of closure panels vary among manufacturers.

- a. Closure-Panel Width: **[As indicated on Drawings] [3 inches (76 mm)] <Insert dimension>**.

Retain "Side Channels" and "Bottom (Sill) Channel" subparagraphs below for light-blocking shades.

7. Side Channels: Designed to eliminate light gaps at sides of shades as shades are drawn down.

Methods of sealing light gaps at bottoms of shades vary among manufacturers. Fabric panel bottom bars fit into bottom channels to seal light leaks.

8. Bottom (Sill) Channel: With light seals and designed to eliminate light gaps at bottoms of shades when shades are closed.
9. Installation Accessories Color and Finish: **[As selected from manufacturer's full range] [White] [Bronze] [Clear anodized] <Insert color and finish>**.

## 2.6 MOTOR-OPERATED, DOUBLE-ROLLER SHADES

- A. Motorized Operating Systems: Provide factory-assembled, shade-operator systems of size and capacity and with features, characteristics, and accessories suitable for conditions indicated, complete with electric motor and factory-prewired motor controls, power disconnect switch, enclosures protecting controls and operating parts, and accessories required for reliable operation without malfunction. Include wiring from motor controls to motors. Coordinate operator wiring requirements and electrical characteristics with building electrical system.
  1. Electrical Components: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

If required, insert manufacturers' description of alternative motor that is available (e.g., "quiet operation" motor, etc.) in "Electric Motor" Subparagraph below.

2. Electric Motor: [**Manufacturer's standard**] <Insert description> tubular, enclosed in rollers.
  - a. Electrical Characteristics: Single phase, [**24**] [**110**] [**220**] <Insert value> V, 60 Hz.
3. Remote Control: Electric controls with NEMA ICS 6, Type 1 enclosure for [**surface**] [**recessed or flush**] <Insert type> mounting. Provide the following for remote-control activation of shades:

Retain one or more of "Wireless Control," "Keyed Control Station," "Individual Switch Control Station," "Group Control Station," "Individual/Group Control Station," "Sun Sensor Control," "Infrared Control," "Timer Control," and "Microprocessor Control" subparagraphs below or revise to suit Project.

- a. Wireless Control: System consisting of a concealed wireless 433 MHz radio receiver built into motor with no external components. Provide [**wireless wall switches**] [or] [**handheld remote transmitters**] for individual shades or groups of shades, to open and close shades simultaneously, and to stop shade movement.
  - b. Keyed Control Station: Keyed, [**maintained**] [**momentary**]-contact, three-position, switch-operated control station with open, close, and off functions. Provide two keys per station.
  - c. Individual Switch Control Station: [**Maintained**] [**Momentary**]-contact, [**three**] [**five**]-position, [**toggle**] [**rocker**]-style, wall-switch-operated control station with open, close, and center off functions.
  - d. Group Control Station: [**Maintained**] [**Momentary**]-contact, three-position, rocker-style, wall-switch-operated control station with open, close, and center off functions for single-switch group control.
  - e. Individual/Group Control Station: [**Maintained**] [**Momentary**]-contact, three-position, rocker-style, wall-switch-operated control station with open, close, and center off functions for individual and group control.
  - f. Sun Sensor Control: Adjustable system consisting of digital displays detecting sun intensity and responding by automatically adjusting shades.
  - g. Infrared Control: System consisting of concealed receiver complete with external eye and connecting modular cable and [**two**] <Insert number> portable, multiple-channel transmitters with separate buttons to open and close up to [**12**] <Insert number> individual shades or groups of shades, to open and close shades simultaneously, and to stop shade movement.
  - h. Timer Control: Clock timer, [**24-hour**] [**seven-day**] <Insert period> programmable for regular events.
  - i. Microprocessor Control: Electronic programmable means for setting, changing, and adjusting control features; isolated from voltage spikes and surges.
  - j. Color: [**As selected by Architect from manufacturer's full range**] <Insert color>.
4. Limit Switches: Adjustable switches, interlocked with motor controls and set to stop shade movement automatically at fully raised and fully lowered positions.
  5. Operating Features:
    - a. Group switching with integrated switch control; single faceplate for multiple switch cutouts.

- b. Capable of interface with **[audiovisual] [multiroom]** **<Insert description>** control system.
- c. Capable of accepting input from building automation control system.

Retain first subparagraph below only for sensor-, infrared-, or timer-controlled systems.

- d. Override switch.
6. Accessories:
- a. Solar power unit.
  - b. **<Insert accessory>**.
- B. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of fabric panels indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shades for service.

Coordinate option retained in "Double-Roller Mounting Configuration" Subparagraph below with available space. Side-by-side mounting is wider than offset mounting; offset mounting is taller than side-by-side mounting.

1. Double-Roller Mounting Configuration: **[Side by side] [Offset, outside shade over and inside shade under]** **<Insert requirements>**.
2. Inside Roller:
  - a. Drive-End Location: **[Right side of inside face of shade] [Left side of inside face of shade] [As indicated on Drawings]** **<Insert requirements>**.

Coordinate direction of roll with mounting configuration, fascia, headbox, or shade-pocket design.

- b. Direction of Fabric Panel Roll: **[Regular, from back of roller] [Reverse, from front of roller]**.
3. Outside Roller:
- a. Drive-End Location: **[Right side of inside face of shade] [Left side of inside face of shade] [As indicated on Drawings]** **<Insert requirements>**.

Coordinate direction of roll with mounting configuration, fascia, headbox, or shade-pocket design.

- b. Direction of Fabric Panel Roll: **[Regular, from back of roller] [Reverse, from front of roller]**.
4. Fabric Panel-to-Roller Attachment: **[Manufacturer's standard method] [Adhesive strip]** **<Insert description>**.
- a. Provide fabric panels not less than **12 inches (300 mm)** longer than desired shade height to assure solid attachment to roller tube and ability to adjust panels in field without removing mounting brackets.

Types and sizes of mounting hardware vary among manufacturers. Revise "Mounting Hardware" Paragraph below if specific types of hardware (e.g., one-piece, double-roller brackets) are required. Where hardware dimensions are critical, indicate installation conditions and size constraints on Drawings.

- C. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller mounting configuration, roller assemblies, operating mechanisms, installation accessories, and installation locations and conditions indicated.

If retaining "Multiple Panel Shade Assemblies" Paragraph below, indicate locations and quantities of rollers joined with coupling assemblies on Drawings or in a window-treatment schedule.

- D. Multiple Panel Shade Assemblies: Coordinated with operating mechanism and designed to join up to three inline panels on a single roller tube and operated in unison by one operator.
- E. Inside Fabric Panels:

Typically, light-filtering fabric panels are installed on the inside rollers and light-blocking fabric panels are installed on the outside rollers in double-roller configurations. Coordinate option retained in "Fabric Panel Material" Subparagraph below with requirements specified in "Fabric Panel Materials" Article.

1. Fabric Panel Material: [**Light-filtering fabric**] <Insert requirements>.
2. Fabric Panel Bottom (Hem) Bar: Enclosed in hem pocket of fabric panel material, thermally sealed, not sewn.

Bottom bars vary among manufacturers; insert requirements for specific type and shape in "Bottom (Sill) Channel" Subparagraph below.

- a. Bottom (Sill) Channel: With light seals and designed to eliminate light gaps at bottoms of shades when shades are closed.

Retain "Color and Finish" Subparagraph below for exposed bottom bars.

- b. Color and Finish: [**As selected by Architect from manufacturer's full range**] <Insert color and finish>.

- F. Outside Fabric Panels:

Coordinate option retained in "Fabric Panel Material" Subparagraph below with requirements specified in "Fabric Panel Materials" Article.

1. Fabric Panel Material: [**Light-blocking fabric**] <Insert requirements>.
2. Fabric Panel Bottom (Hem) Bar: Enclosed in hem pocket of fabric panel material, thermally sealed, not sewn.

Bottom bars vary among manufacturers; insert requirements for specific type and shape in "Bottom (Sill) Channel" Subparagraph below.

Methods of sealing light gaps at bottoms of shades vary among manufacturers.

- a. Bottom (Sill) Channel: With light seals and designed to eliminate light gaps at bottoms of shades when shades are closed.

Retain "Color and Finish" Subparagraph below for exposed bottom bars.

- b. Color and Finish: [As selected by Architect from manufacturer's full range] <Insert color and finish>.

G. Installation Accessories:

Retain "Front Fascia" or "Exposed Headbox" Subparagraph below for exposed roller enclosures. Retain "Reverse Roll Fascia" Subparagraph when required. Retain "Exposed Headbox" Subparagraph for light-blocking shades.

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

Shapes and heights of fasciae vary among manufacturers.

- a. Shape: [L-shaped] [Curved] [Cassette] <Insert requirements>.
  - b. Height: Manufacturer's standard height required to conceal roller and fabric panel when shade is fully open, but not less than [4 inches (102 mm)] [3 inches (76 mm)] <Insert dimension>.
  - c. Color: [Bronze] [Black] [White] [Clear anodized] [Vanilla].
  - d. Color: [Fabric-wrapped] [Black] [White].
2. Reverse Roll Fascia: Aluminum extrusion that conceals front and top side of roller and operating mechanism and attaches to roller endcaps.
    - a. Shape: [L-shaped] <Insert requirements>.
    - b. Height: Manufacturer's standard height required to conceal roller and fabric panel when shade is fully open, but not less than [4 inches (102 mm)] <Insert dimension>.
    - c. Color: [Bronze] [White] [Clear anodized].
  3. Exposed Headbox: Rectangular, extruded-aluminum enclosure including front fascia, top and back covers, endcaps, and removable bottom closure.
    - a. Height: Manufacturer's standard height required to enclose roller and fabric panel when shade is fully open, but not less than [4 inches (102 mm)] [as indicated on Drawings] <Insert dimension>.

If retaining "Endcap Covers" Subparagraph below, verify availability with manufacturers.

4. Endcap Covers: To cover exposed endcaps.

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

5. 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.

- a. Height: Manufacturer's standard height required to enclose roller and fabric panel when shade is fully open, but not less than **[5-5/8 inches (143 mm)] [5 inches (127 mm)] [height indicated on Drawings] <Insert dimension>**.
  - b. Provide pocket with lip at lower edge to support acoustical ceiling panel.
1. Access Flap and Hanger: Removable aluminum panel designed for installation at bottom of site-constructed ceiling recess or pocket.

Widths of closure panels vary among manufacturers.

- a. Closure-Panel Width: **[As indicated on Drawings] [3 inches (76 mm)] <Insert dimension>**.

Retain "Side Channels" and "Bottom (Sill) Channel" subparagraphs below for light-blocking shades.

2. Side Channels: Designed to eliminate light gaps at sides of shades as shades are drawn down.

Methods of sealing light gaps at bottoms of shades vary among manufacturers. Fabric panel bottom bars fit into bottom channels to seal light leaks.

3. Bottom (Sill) Channel: With light seals and designed to eliminate light gaps at bottoms of shades when shades are closed.
4. Installation Accessories Color and Finish: **[As selected from manufacturer's full range] [White] [Bronze] [Clear anodized] <Insert color and finish>**.

## 2.7 FABRIC PANEL MATERIALS

- A. Fabric Panel Material Flame-Resistance Rating: Comply with **[NFPA 701] <Insert requirement>**. Testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

If more than one light-filtering or light-blocking fabric panel fabric is required, copy and re-edit applicable paragraph below and insert a unique designation for each fabric.

- B. Light-Filtering Fabric: Woven fabric, stain and fade resistant.
  1. Basis-of-Design Product: Insolroll EnviroScreen.
  2. Opacity: 2 percent openness.
  3. Composition: PVC-free consisting of one layer of aluminum vacuum formed to 100 percent Trevira CS fibers.
  4. Certifications:
    - a. Oko-Tek and Greenguard Indoor Air Quality Certified.
    - b. Greenguard Indoor Air Quality Certified for Children and Schools.

5. Performance Standard:
    - a. Maximum Visual Light Transmission: 4.8 percent regardless of color.
    - b. Shading Coefficient: 0.29 or lower regardless of color.
- C. Light-Filtering Fabric: Woven fabric, stain and fade resistant.
1. Basis-of-Design Product: Insolroll SilverScreen.
  2. Opacity: 5 percent openness.
  3. Composition: One layer of aluminum vacuum formed to PVC-coated fiberglass fabric.
  4. Certification:
    - a. Greenguard Indoor Air Quality Certified.
    - b. Greenguard Indoor Air Quality Certified for Children and Schools.
  5. Performance Standard:
    - a. Maximum Visible Light Transmission: 6 percent regardless of color.
    - b. Shading Coefficient: 0.16 or less regardless of color.
- D. Light Filtering Fabric: Woven fabric, stain and fade resistant.
1. Basis-of-Design Product: Insolroll Aurora.
  2. Opacity: 3.5 percent openness.
  3. Composition: Vinyl-coated polyester yarns woven in basket-weave configuration.
  4. Certification:
    - a. GreenGuard Indoor Air Quality Certified.
    - b. GreenGuard Indoor Air Quality Certified for Children and Schools.
- E. Light-Filtering Fabric: Woven fabric, stain and fade resistant.
1. Basis-of-Design Product: Insolroll SheerWeave [4000] [4100] [4400].
  2. Opacity: [3] [5] [10] percent openness.
  3. Composition: Vinyl-coated polyester yarns woven in basket-weave configuration.
  4. Certification:
    - a. GreenGuard Indoor Air Quality Certified.
    - b. GreenGuard Indoor Air Quality Certified for Children and Schools.
  5. Fire Classification: California U.S. Title 19 (small scale), NFPA101 (Class A Rating), NFPA701 TM #1.
- F. Light-Filtering Fabric: Woven fabric, stain and fade resistant.

1. Basis-of-Design Product: Insolroll ShearWeave 4800.
  2. Opacity: 1 percent openness.
  3. Composition: Vinyl-coated polyester yarns woven to provide 99 percent UV blockage.
  4. Certification: GreenGuard Indoor Air Quality Certified.
  5. Fire Classification: California U.S. Title 19 (small scale), NFPA101 (Class A Rating), NFPA701 TM #1.
  6. Bacterial and Fungal Resistance:
- G. Light-Filtering Fabric: Woven fabric, stain and fade resistant.
1. Basis-of-Design Product: Insolroll M-Screen.
  2. Opacity: [3] [5] percent openness.
  3. Composition: Vinyl-coated fiberglass yarns woven in 1 x 2 weave configuration.
  4. Certification: GreenGuard Indoor Air Quality Certified.
  - 5.
  6. Bacterial and Fungal Resistance:
- H. Light-Filtering Fabric: Woven fabric, stain and fade resistant.
1. Basis-of-Design Product: Insolroll E-Screen.
  2. Opacity: [1] [3] [5] [10] percent openness.
  3. Composition: Vinyl-coated fiberglass yarns woven in 2 x 2 weave configuration.
  4. Certification: GreenGuard Indoor Air Quality Certified.
  - 5.
  6. Bacterial and Fungal Resistance:
- I. Light-Blocking Fabric: Opaque fabric, stain and fade resistant.
1. Basis-of-Design Product: Insolroll 14-ounce Fiberglass Blackout Fabric.
  2. Composition: Four-ply laminate with one ply fiberglass, 14 ounces per square yard.
  3. Fire Classification: NFPA 701 small scale.
- J. Light-Blocking Fabric: Opaque fabric, stain and fade resistant.
1. Basis-of-Design Product: Insolroll Twilight Blackout Fabric.
  2. Composition: 42 percent fiberglass, 51 percent acrylic, 7 percent cotton flocked backing.
  3. Fire Classification:
- K. Light-Blocking Fabric: Opaque fabric, stain and fade resistant.
1. Basis-of-Design Product: Insolroll ShearWeave 7000 Blackout Fabric.



2. Composition: 100 percent polyester with foamed acrylic backing.
3. Fire Classification: California U.S. Title 19 (small scale), NFPA101 (Class A Rating).

If required, insert requirements for dual-fabric fabric panels made of two layers of different, loosely layered material.

## 2.8 ROLLER-SHADE FABRICATION

- A. Product Safety Standard: Fabricate roller shades to comply with WCMA A 100.1, including requirements for flexible, chain-loop devices; lead content of components; and warning labels.
- B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at **74 deg F (23 deg C)**:

Retain "Between (Inside) Jamb Installation" or "Outside of Jamb Installation" Subparagraph below. Alternatively, retain both subparagraphs and show locations of each on Drawings or in a window-treatment schedule. Coordinate clearance requirements with distance between shades and glass, glass type, and placement of heating/cooling air supplies to avoid heat buildup and possible damage to glass.

If retaining "Between (Inside) Jamb Installation" Subparagraph, see "Product Characteristics" Article in the Evaluations for a discussion of GANA recommendations.

1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which shade is installed less **1/4 inch (6 mm)** per side or **1/2-inch (13-mm)** total, plus or minus **1/8 inch (3.1 mm)**. Length equal to head-to-sill or -floor dimension of opening in which shade is installed less **1/4 inch (6 mm)**, plus or minus **1/8 inch (3.1 mm)**.

If retaining "Outside of Jamb Installation" Subparagraph below, indicate locations of shades relative to openings and widths and lengths of shades on Drawings or in a window-treatment schedule.

2. Outside of Jamb Installation: Width and length as indicated, with terminations between shades of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.
- C. Fabric Panel Fabrication: Fabricate fabric panels without battens or seams to extent possible except as follows:
  1. Vertical Shades: Where width-to-length ratio of fabric panel is equal to or greater than **[1:4] <Insert ratio>**, provide battens and seams at uniform spacings along fabric panel length to ensure fabric panel tracking and alignment through its full range of movement without distortion of the material.
  2. Skylight Shades: Provide seams at uniform spacings along fabric panel as required to ensure fabric panel tracking and alignment through its full range of movement without distortion or sag of material.

Coordinate requirements in "Railroaded Materials" Subparagraph below with requirements in "Fabric Panel Materials" Article and with requirements indicated on Drawings or in a window-treatment schedule.

3. Railroaded Materials: Railroad material where material roll width is less than the required width of fabric panel and where indicated. Provide seams as required by railroaded material to produce fabric panels with full roll-width panel(s) plus, if required, one partial roll-width panel located at top of fabric panel.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

Retain option in first paragraph below for motorized operators.

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, [**accurate locations of connections to building electrical system,**] and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 ROLLER-SHADE INSTALLATION

- A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions.

Coordinate requirements for distance between roller shades and glass with glass type and placement of heating/cooling air supplies to avoid heat buildup and possible damage to glass. Generally, retain first option in "Opaque Fabric Panels" Subparagraph below. See "Product Characteristics" Article in the Evaluations.

1. Opaque Fabric Panels: Located so fabric panel is not closer than [**2 inches (51 mm)**] <Insert dimension> to interior face of glass. Allow clearances for window operation hardware.

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

- B. Electrical Connections: Connect motor-operated roller shades to building electrical system.

### 3.3 ADJUSTING

- A. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

### 3.4 CLEANING AND PROTECTION

- A. Clean roller-shade surfaces after installation, according to manufacturer's written instructions.

- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that roller shades are without damage or deterioration at time of Substantial Completion.
- C. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

### 3.5 DEMONSTRATION

[Retain this article for motorized roller shades.](#)

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain motor-operated roller shades.

END OF SECTION 122413