PART ONE: GENERAL

1.1 Description

1.1.1 Work of this Section, as shown or specified, shall be provided by the Interior Contractor and shall be in accordance with the requirements of the Contract Documents.

1.1.2 Work of this Section includes all labor, materials, equipment, and services necessary to complete the Window Shades as shown on the drawings and specified herein, included, but not limited to the following:

   a. Manually operated, roll-up fabric interior window shades including mounting and operating hardware
   b. Motorized, roll-up fabric interior window shades including motor operator, controls, and mounting hardware.
   c. Opaque window shade system: Manually operated, roll-up fabric opaque window shade system for complete blackout of window opening including side and bottom channels, headbox, manual operator, and mounting hardware.
   d. Opaque window shade system: Motorized, roll-up fabric opaque window shade system for complete blackout of window opening including side and bottom channels, headbox, motorized operator, controls, and mounting hardware.

1.2 Related Documents

1.2.1 Construction Documents and general provisions of the Agreement between Owner and Construction Manager and the Guaranteed Maximum Price (GMP) Amendment, including Division 00 General Conditions of the Contract for Construction and Supplementary Conditions and other Division 01 Specification Sections, applicable to this Section. All methods herein are to follow all applicable state and local code as well as installation standards.

1.2.2 Comply with the requirements of the various specifications and standards referred to in the contract Plans and Specifications, except where they conflict with the specific requirements of these contract Plans and Specifications. Such reference specifications and standards.

1.2.3 Related Work in Other Sections:

   a. Section 06 10 00 - Rough Carpentry.
   b. Section 07 90 00 - Joint Protection.
   c. Section 09 21 16 - Gypsum Board Shaft Wall Assemblies.
   d. Section 09 51 23 - Acoustical Tile Ceilings.
   e. Section 11 52 13 - Projection Screens.
   f. Section 11 52 16 - Projectors.
Division 16 - Electrical: Electrical supply, conduit, and wiring for motorized window shades.

1.3 References

1.3.1 NFPA 70 – National Electrical Code.
1.3.2 NFPA 701-99 – Fire Tests for Flame-Resistant Textiles and Films.
1.3.3 GreenGuard Environmental Institute Gold.
1.3.4 US Green Building Council

1.4 Submittals

1.4.1 All submittals shall be made according to Section 01 33 23, Shop Drawings, Product Data, and Samples and as specified herein.
1.4.2 Submit the following to the Consultant for approval prior to construction and fabrication:

a. Shop Drawings, indicating fabrication and installation methods, to include plans at not less than 1/2" = 1'-0" (or 1:20) scale, elevations at 1/4" = 1'-0" (1:50) scale and details at not less than 3" = 1'0" (1:5) scale. Indicate required field dimensions, materials, finishes, substructure, all fastening devices and accessory items. Include coordination details for related and adjoining work, operational clearances, installation details, and wiring diagrams. Show dimensions of section and method of assembly.

b. Product Data:
   1. Preparation instructions and recommendations.
   2. Installation and maintenance instructions.
   3. Styles, material descriptions, dimensions of individual components, profiles, features, finishes and operating instructions.
   4. Storage and handling requirements and recommendations.
   5. Mounting details and installation methods.
   6. Typical wiring diagrams including integration of motor controllers with building management system, audiovisual and lighting control systems as applicable.

c. Window Treatment Schedule: For all roller shades. Use same room designations as indicated on the Drawings, field verified window dimensions, quantities, type of shade, controls, fabric, and color, and include opening sizes and key to typical mounting details.

d. Selection Samples: For each finish product specified, two complete sets of shade cloth options and aluminum finish color samples representing manufacturer’s full range of available colors and patterns.

e. Verification Samples: For each finish product specified, two complete sets of shade components, unassembled, demonstrating compliance
with specified requirements. Shade fabric sample and aluminum finish sample as selected, representing actual product, color, and patterns. Mark face of material to indicate interior faces.

f. Maintenance Data: Methods for maintaining roller shades, precautions regarding cleaning materials and methods, instructions for operating hardware and controls.

g. Manufacturer’s Certificates: Certify products meet or exceed specified requirements.

1.5 Quality Assurance

1.5.1 Manufacturer Qualifications: Obtain roller shades through one source from a single manufacturer with a minimum of twenty years experience in manufacturing products comparable to those specified in this section.

1.5.2 NFPA Flame-Test: Passes NFPA 701. Materials tested shall be identical to products proposed for use.

1.5.3 Mock-Up: Provide a mock-up of one of each type roller shade assembly specified for evaluation of mounting, appearance and accessories.
   a. Locate mock-up in window(s) designated by Architect.
   b. Do not proceed with remaining work until mock-up is accepted by Architect.

1.6 Delivery, Storage, and Handling

1.6.1 Do not deliver window shades until building is enclosed and construction within spaces where shades will be installed is substantially complete.

1.6.2 Deliver products in manufacturer's original, unopened, undamaged containers with labels intact.

1.6.3 Label containers and shades according to Window Shade Schedule.

1.6.4 Store products in manufacturer's unopened packaging until ready for installation.

1.7 Sequencing

1.7.1 Ensure that locating templates and other information required for installation of products of this section are furnished to affected trades in time to prevent interruption of construction progress.

1.7.2 Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.8 Project Conditions

1.8.1 Install roller shades after finish work and ambient temperature, humidity and ventilation conditions are maintained at levels recommended for project upon completion.

1.9 Warranty
1.9.1 Hardware and Shade Fabric: Draper's standard twenty-five year limited warranty.
1.9.2 Spring Roller Shades: Draper's standard ten year limited warranty.
1.9.3 Motors and Controls: Draper's standard five year limited warranty.

PART TWO: PRODUCTS

2.1. Manually Operated Window Shades

2.1.1 Manually Operated Window Shades with Independent Control: Manually operated, vertical roll-up, fabric window shade with components necessary for complete installation.

a. Operation: Bead chain and clutch operating mechanism allowing shade to stop when chain is released. Designed never to need adjustment or lubrication. Provide limit stops to prevent shade from being raised or lowered too far.
   1. Clutch mechanism: Fabricated from high carbon steel and molded fiberglass reinforced polyester or injected molded nylon. White or Black color as selected by Architect.
   2. Bead chain loop: Stainless steel bead chain hanging at side of window.
   3. Bead chain loop: Plastic bead chain hanging at side of window, Ivory, Grey, White, Bronze or Black color as selected by Architect.
   4. Idler Assembly: Provide roller idler assembly of molded nylon with adjustable or spring-loaded length idler pin to facilitate easy installation, and removal of shade for service.
   5. Bead Chain Hold Down: P-Clip (standard).

b. Operation: Crank and Gear Box:
   1. Single Shade
   2. Multiple Shades
   4. Crank Handle
      i. Detachable anodized aluminum and chrome plated steel handle.
      ii. Permanently mounted anodized aluminum and chrome plated steel handle.
      iii. Size: 4 feet (122 cm).
      iv. Size: 6 feet (183 cm).
      v. Size: 10 feet (305 cm).
5. **Idler Assembly:** Provide roller idler assembly of molded nylon with adjustable length idler pin to facilitate easy installation, and removal of shade for service.

c. **Roller Tube:** Fabricated from extruded aluminum, galvanized steel, or enameled steel. Diameter, wall thickness, and material selected by manufacturer to accommodate shade type and size. Fabric connected to the roller tube with LSE (low surface energy) double sided adhesive specifically developed to attach coated textiles to metal. Adhesive attachment to eliminate horizontal impressions in fabric.

d. **Coupling system:** Provide system to operate shades from single crank by coupling shade rollers together. System to consist of endcaps, plus couplings to connect rollers.
   1. 2 shades operated from single crank.
   2. 3 shades operated from single crank.
   3. 4 shades operated from single crank.

e. **Shade slat:** Slat encased in heat seamed hem.

f. **Mounting:**
   1. Mounting brackets.
   2. Endcaps only.
   3. Endcaps and fascia.
   4. Endcaps and headbox.
   5. Headbox.
   6. Ceiling Pocket.
   7. Dual roller endcaps only.
   8. Dual roller fascia.
   9. Dual roller with pocket headbox.

g. **Brackets:** Plated stamped steel. Provide size compatible with roller size.
   1. Mounted to ceiling.
   2. Mounted to wall.
   3. Mounted to jamb.

h. **Endcaps:** Stamped steel with universal design suitable for mounting to ceiling, wall, and jamb. Provide size compatible with roller size.
   1. Endcap covers: To match fascia or headbox color.

i. **Fascia:** L shaped aluminum extrusion to conceal shade roller and hardware.
   1. Attachment: Snaps onto endcaps without requiring exposed fasteners of any kind. Fascia can be mounted continuously across two or more shade bands. No notching is required.
   2. Shape: Square Fascia Panel.
   3. Shape: Dual Roller Fascia Panel.
   5. Finish: Black powder coat.
7. Finish: Ivory powder coat.
8. Finish: Bronze powder coat.
9. Finish: Custom powder coat as selected by the Architect.

j. Headbox Ceiling/Wall style: Aluminum fabrication with removable closure, endcaps, and back and top cover piece:
   1. Finish: Clear anodized.
   2. Finish: Black powder coat.
   3. Finish: White powder coat.
   5. Finish: Bronze powder coat.
   6. Finish: Custom powder coat as selected by the Architect.

k. Headbox, Pocket style: Aluminum fabrication with removable closure, endcaps, and U-shaped pocket:
   1. Finish: Clear anodized.
   2. Finish: Black powder coat.
   3. Finish: White powder coat.
   5. Finish: Bronze powder coat.
   6. Finish: Custom powder coat as selected by the Architect.

l. Dual Roller Ceiling Pocket. Pocket and endcaps designed for recessed ceiling installation of dual roller window shades.
   1. Material: 18 gauge steel with white finish on bottom and front.
   2. Small Size: 5-3/4 inches (146 mm) wide by 7-3/4 inches (197 mm) high.
   3. Closure Panel Aluminum, without exposed fasteners:
      i. Front Tile Flange
      ii. Left Tile Flange
      iii. Right Tile Flange
      iv. Pre-drilled Mounting Holes
      v. Pre-drilled Ventilation holes
   4. “L” Channel.
   5. “U” Channel.
   7. Channel Liners.

m. Type D Shade pocket: Rectangular pocket and endcaps designed for recessed ceiling installation of window shades.
   1. Material: Extruded aluminum alloy or steel with white finish.
   2. Size: 5 inches (127 mm) wide by 5-3/8 inches (137 mm) high.
   3. Closure Panel:
      i. 1-1/2 (38 mm) closure dimension, recommended for bead chain operation
ii. 3 inch (78 mm). If selected for CL or XD installer must notch the closure panel to allow the chain to pass through

4. Pocket End Cap Kit: Metal endcaps with 7/8 inch (22 mm) lip for support of acoustical ceiling panel.

5. Corners: Welded one-piece aluminum sections connecting to and matching pockets to allow continuous shade recess at ceiling corners.

n. Wall Clip with Closure Panel: For site constructed ceiling recesses, provide removable closure panel to minimize slot for shade passage but allowing access to shade for maintenance.
   1. Material: Aluminum alloy with white epoxy paint finish.
   2. Tile Lip: Provide wall clip with 7/8 inch tile lip (22 mm).
   3. Closure width: 1-1/2 inches (38 mm).
   4. Closure width: 3 inches (76 mm).
   5. Closure Width: 5 inches (127 mm).
   6. Provide continuous wall clip, 1-3/4 (44 mm) by 3/16 inch (5 mm), for snap-in attachment of closure panel without fasteners.

o. Light Gap Reduction Channels
   1. L Angle - 3/4 inch (19 mm) by 1 inch (25 mm).
   2. L Angle - 1 inch (25 mm) by 2-3/4 inches (70 mm).
   3. U Channel - 1 inch (25 mm) by 2-1/2 inches (64 mm).
   4. H Channel - 1 inch (25 mm) by 5 inches (127 mm).

2.1.2 Manually Operated Spring Roller Shade: Manually operated, vertical roll-up, fabric window shade with components necessary for complete installation.

a. Operation: Spring roller operating mechanism with metal roller containing heavy duty spring with positive locking mechanism permitting shade to be stopped at each half turn of roller. Provide cord clasp and braided cotton cord attached to bottom shade slat. Spring sized by manufacturer to accommodate shade size. Provide roller idler assembly of molded nylon and zinc-plated steel pin.
   1. Clutch mechanism: Fabricated from high carbon steel and molded fiberglass reinforced polyester or injected molded nylon. White or Black color as selected by Architect.
   2. Roller Tube: Fabricated from extruded aluminum, galvanized steel, or enameled steel. Diameter, wall thickness, and material selected by manufacturer to accommodate shade type and size. Fabric connected to the roller tube with LSE (low surface energy) double sided adhesive specifically developed to attach coated textiles to metal. Adhesive attachment to eliminate horizontal impressions in fabric.

4. Mounting:
   i. Mounting brackets.
   ii. Endcaps and fascia.
   iii. Endcaps and headbox.

   i. Mounted to ceiling.
   ii. Mounted to wall.
   iii. Mounted to jamb.

6. Endcaps: Stamped steel with universal design suitable for mounting to ceiling, wall, and jamb. Provide size compatible with roller size
   i. Endcap covers: To match fascia or headbox color.

7. Fascia: L shaped aluminum extrusion to conceal shade roller and hardware.
   i. Attachment: Snaps onto endcaps without requiring exposed fasteners of any kind. Fascia can be mounted continuously across two or more shade bands. No notching is required.
   ii. Shape: Square Fascia Panel.
   iii. Finish: Clear anodized.
   iv. Finish: Black powder coat.
   v. Finish: White powder coat.
   vi. Finish: Ivory powder coat.
   vii. Finish: Bronze powder coat.
   viii. Finish: Custom powder coat as selected by the Architect.
   ix. Finish: Fabric-Wrapped

8. Headbox: Aluminum fabrication with removable closure, endcaps, and back and top cover piece:
   i. Finish: Clear anodized.
   ii. Finish: Black powder coat.
   iii. Finish: White powder coat.
   iv. Finish: Ivory powder coat.
   v. Finish: Bronze powder coat.
   vi. Finish: Custom powder coat as selected by the Architect.

2.2. Motorized Window Shades

2.2.1 Type: Motorized vertical roll-up, fabric, window shade with motors, controls, mounting brackets, and other components necessary for complete installation.
   a. Mounting brackets.
b. Endcaps and fascia.
c. Endcaps and headbox.
d. Ceiling pocket.

2.2.2 Shade Motor and Control System

2.2.3 Roller: Fabricated from extruded aluminum or steel. Diameter, wall thickness, and material selected by manufacturer to accommodate shade size. Provide with roller idler assembly of molded nylon and zinc-plated steel pin. Sliding pin to allow easy installation and removal of roller. Fabric connected to the roller tube with LSE (low surface energy) double sided adhesive specifically developed to attach coated textiles to metal. Adhesive attachment to eliminate horizontal impressions in fabric.

2.2.4 Endcaps: Stamped steel with universal design suitable for mounting to ceiling, wall, and jamb. Provide size compatible with roller size.

2.2.5 Endcap covers to match fascia/headbox finish.

2.2.6 Brackets: 1/8 inch thick stamped steel, black powder coat, idler height adjuster, field adjustable to wall or ceiling mount.
   a. Mounted to ceiling.
   b. Mounted to wall.
   c. Mounted to jamb.

2.2.7 Coupling system: Couplings to join motorized shade rollers to allow operation by single motor.

2.2.8 Shade slat: Slat encased in heat-seamed hem.

2.2.9 Fascia: L shaped aluminum extrusion to conceal shade roller and hardware.
   a. Attachment: Snaps onto end caps without requiring exposed fasteners of any kind. Fascia can be mounted continuously across two or more shade bands.

2.2.10 Headbox Ceiling/Wall Style: Aluminum fabrication with removable closure, endcaps, and back and top cover piece.

2.2.11 Headbox, Pocket Style: Aluminum fabrication with removable closure, endcaps, and U-shaped pocket.

2.2.12 Dual Roller Ceiling Pocket. Pocket and endcaps designed for recessed ceiling installation of dual roller window shades.

2.2.13 Type D Shade pocket: Rectangular pocket designed for recessed ceiling installation of window shades.

2.2.14 Light Gap Reduction Channels

2.3. Opaque Window Shade System

2.3.1 Operation Type: Motorized, vertical roll-up, fabric, opaque window shade system, complete with headbox, side and sill channels for total opacity.

2.3.2 Operation Type: Bead chain and clutch operated, vertical roll-up, fabric, opaque window shade system, complete with headbox, side and sill channels for total opacity.
2.3.3 Operation Type: Crank operated, vertical roll-up, fabric, opaque window shade system, complete with headbox, side and sill channels for total opacity.

2.3.4 Operation Type: Spring roller operated, vertical roll-up, fabric, opaque window shade system, complete with headbox, side and sill channels for total opacity.

2.3.5 Operation: Bead chain and clutch operating mechanism allowing shade to stop when chain is released. Designed never to need adjustment or lubrication. Provide limit stops to prevent shade from being raised or lowered too far.
   b. Bead chain loop: Stainless steel bead chain hanging at side of window.
   c. Bead chain loop: Plastic bead chain hanging at side of window, Ivory, Grey, or Black color as selected by Architect.
   d. Idler Assembly: Provide roller idler assembly of molded nylon with adjustable length idler pin to facilitate easy installation, and removal of shade for service.

2.3.6 Operation: Crank and gear box operated shades.
   b. Crank handle:
   c. Idler assembly: Provide roller idler assembly of molded nylon with adjustable length idler pin or spring-loaded idler to facilitate easy installation, and removal of shade for service.

2.3.7 Operation: Metal roller containing heavy-duty spring with positive locking mechanism permitting shade to be stopped at each half turn of the roller. Spring sized by manufacturer to accommodate shade size. Provide pull and latching chain attached to bottom shade slat and catch attached to sill channel. Chain inserted in catch to keep roller under constant tension. Provide roller idler assembly of molded nylon with zinc-plated steel pin.

2.3.8 Shade Motor and Control System:
   a. Standard Motor: 110 VAC, single phase, 60 Hz, instantly reversible, lifetime lubricated, and equipped with internal thermal overload protector, electric brake, and pre-set accessible limit switches. Tubular motor concealed inside each shade roller tube.
   b. Quiet Standard Motor - 110 VAC motor operates at 44 Db measured 3 feet from the motor. Makes no audible clicks when motor stops or starts. Tubular motor concealed inside each shade roller tube.
   e. Intelligent Technology Motor - 110 VAC motor with built-in low voltage controller with 3-wire pig tail and data cable. No external motor controls are required. Available with optional three-prong
plug. Tubular motor concealed inside each shade roller tube.


2.3.9 Roller Tube: Fabricated from extruded aluminum, galvanized steel, or enameled steel. Diameter, wall thickness, and material selected by manufacturer to accommodate shade type and size. Fabric connected to the roller tube with LSE (low surface energy) double sided adhesive specifically developed to attach coated textiles to metal. Adhesive attachment to eliminate horizontal impressions in fabric.

2.3.10 Headbox: Consists of extruded aluminum sections with endcaps and opacity plates.

2.3.11 Endcaps: Stamped steel with universal design suitable for mounting to ceiling, wall, and jamb. Provide size compatible with roller size.

2.3.12 Side Channels: Double chamber fabricated from 0.06 inch (1.5 mm) thick extruded aluminum sections. One chamber accepts fabric and contains groove for fabric retainer. Other chamber accepts fabric guide and channel locator.

2.3.13 Sill channel: 0.06 inch (1.5 mm) thick extruded aluminum channel to receive slat bar and prevent light leakage.

2.3.14 Slat bar: Extruded aluminum bar attached to bottom of shade. Bar does not retract into headbox.

2.3.15 Channel locator: Injected molded nylon insert to align side and sill channels with headbox.

2.3.16 Fabric guide: Plated steel transition for fabric rolling into side channel.

2.3.17 Fabric retainer: System designed to prevent disengagement of fabric from side channels due to normal variations of air pressure caused by doors opening, HVAC systems, and temperature differences between room and window well. System consists of horizontal steel stays installed in shade, covered with fabric, and spaced at regular intervals. Grommets installed through stays are held within groove of side channel chamber.

2.4. Fabric

2.4.1 Color and pattern: As indicated in Color Schedule on Drawings.

2.4.2 Color and pattern: As selected by Architect from manufacturer's standard range.

PART THREE: EXECUTION

3.1 Examination

3.1.1 Do not begin installation until substrates have been properly prepared.

3.1.2 If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
3.2 Preparation

3.2.1 Coordinate requirements for blocking and structural supports to ensure adequate means for installation of window shades.

3.2.2 Coordinate requirements for blocking, construction of shade pockets, and structural supports to ensure adequate means for installation of window shades.

3.2.3 Coordinate installation of recessed shade pockets with construction of suspended acoustical panel ceilings specified in Section 09 51 23.

3.2.4 Coordinate installation of recessed shade pockets with construction of suspended gypsum board ceilings specified in Section 09 21 16.

3.2.5 Coordinate requirements for power supply conduit, and wiring required for window shade motors and controls.

3.3 Installation

3.3.1 Install in accordance with manufacturer's instructions.

3.3.2 Install roller shades level, plumb, square, and true. Allow proper clearances for window operation hardware.

3.3.3 Shade Pockets:
   a. Install shade pockets prior to installation of suspended ceiling system. Attach to supporting structure with screws through top of pocket at 24 inches (610 mm) minimum centers.
   b. Install shade pockets in conjunction with installation of suspended ceiling system. Attach to supporting structure with screws through top of pocket at 24 inches (610 mm) minimum centers.
   c. Install corner pieces securely and in alignment with pockets.
   d. Install pocket ends securely and in alignment with pockets.
   e. After interior construction is essentially complete, install shade and operating mechanism in pocket.

3.3.4 Install the following items to conceal roller and operating mechanism. Do not use exposed fasteners.
   a. Fascias.
   b. Closure panels.
   c. Endcaps.

3.3.5 Install headbox, side channels, and sill channel with sealant specified in Section 07 90 00 - Joint Protection.

3.3.6 Position shades level, plumb, and at proper height relative to adjacent construction. Secure with fasteners recommended by manufacturer.

3.4 Testing and Demonstration

3.4.1 Test motorized window shades to verify that controls, limit switches, interface to other building systems, and other operating components are functional. Correct deficiencies.

3.4.2 Test window shades to verify that operating mechanism, fabric retainer, and other operating components are functional. Correct deficiencies.
   a. Crank.
b. Chain and clutch.
c. Motorized operating mechanism.

3.4.3 During daylight hours, lower shades and turn off interior lights. Verify that there are no light leaks at perimeter or within shade assembly. Correct deficiencies.

3.4.4 Demonstrate operation of shades to Owner’s designated representatives.

3.5 Protection

3.5.1 Protect installed products until completion of project.

3.5.2 Touch-up, repair or replace damaged products before Substantial Completion.

3.6 Schedules

3.6.1 Refer to Drawings for shade types and locations.

END OF SECTION