

SECTION 12 24 13 - WINDOW ROLLER SHADES

GENERAL

1.1 SECTION INCLUDES

- A. Roller shades for manual operation and accessories.
- B. Shade fabric.

1.2 RELATED SECTIONS

- A. Section 06 10 00 - Rough Carpentry: Wood blocking and grounds for mounting roller shades and accessories.
- B. Section 09 21 16 - Gypsum Board Assemblies: Coordination with gypsum board assemblies for installation of shade pockets, closures and related accessories.
- C. Section 09 51 00 - Acoustical Ceilings: Coordination with acoustical ceiling systems for installation of shade pockets, closures and related accessories.

1.3 REFERENCES

- A. ASTM International (ASTM):
 - 1. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
- B. National Fire Protection Association (NFPA):
 - 1. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
 - 2. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films.
- C. Underwriters Laboratories (UL):
 - 1. UL (GGG) - GREENGUARD Gold Certified Products; Current Edition.
- D. Window Covering Manufacturers Association (WCMA):
 - 1. WCMA A100.1 - Safety of Window Covering Products; 2018.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the work with other trades to provide rough-in of electrical wiring as required for installation of hardwired motorized shades.
- B. Preinstallation Meeting: One week prior to commencing work related to this section. Require attendance of all affected installers.
- C. Sequencing:
 - 1. Do not fabricate shades until field dimensions for each opening have been taken with finished conditions in place. "Hold to" dimensions are not acceptable.
 - 2. Do not install shades until final surface finishes and painting are complete.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's catalog pages and data sheets for products specified including materials, finishes, dimensions, profiles, mountings, and accessories.
 - 1. Preparation instructions and recommendations.
 - 2. Styles, material descriptions, dimensions of individual components, profiles, features, finishes, accessories, and operating instructions.
 - 3. Storage and handling requirements and recommendations.
 - 4. Mounting details and installation methods.
 - 5. Manufacturer's Instructions: Include storage, handling, protection, examination, preparation, and installation.
 - 6. Project Record Documents: Record actual locations of control system components and show interconnecting wiring.
 - 7. Operation and Maintenance Data: Component list with part numbers, and operation and maintenance instructions.
- C. Shop Drawings: Plans, elevations, sections, product details, installation details, operational clearances, wiring diagrams and relationship to adjacent work.
 - 1. Prepare shop drawings on AutoCad or MicroStation format using base sheets provided electronically by the Architect.
- D. Window Treatment Schedule: For all roller shades. Use same room designations as indicated on the Drawings and include opening sizes and key to typical mounting details.
- E. Verification Samples: For each finish product specified, one complete set of shade components, unassembled, demonstrating compliance with specified requirements.
 - 1. Shadecloth Sample: Mark face of material to indicate interior faces.
 - a. Test reports indicating compliance with specified fabric properties.
 - b. Verification Samples: 6 inches (150 mm) square, representing actual materials, color and pattern.
- F. Maintenance Data: Bill of materials for all components with part numbers. Methods for maintaining roller shades, precautions regarding cleaning materials and methods, instructions for operating hardware and controls.
- G. Warranty: Provide manufacturer's warranty documents as specified in this Section.
- H. Warranty: Manufacturer's warranty documents as specified in this Section.

1.6 QUALITY ASSURANCE

- A. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.
- B. Manufacturer Qualifications: Obtain roller shades system through one source from a single manufacturer with a minimum of ten years experience and minimum of five projects of similar scope and size in manufacturing products comparable to those specified in this section.
- C. Installer for Roller Shade System - Qualifications: Installer trained and certified by the manufacturer with a minimum of ten years experience in installing products comparable to those specified in this section.

- D. Product Listing Organization Qualifications: Organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.
- E. Fire-Test-Response Characteristics: Passes NFPA 701 small and large-scale vertical burn. Materials tested shall be identical to products proposed for use.
- F. Shadecloth Anti-Microbial Characteristics: 'No Growth' per ASTM G 21 results for fungi ATCC9642, ATCC9644, ATCC9645.
- G. Environmental Certification: Submit written certification from the manufacturer, including third party evaluation, recycling characteristics, and perpetual use certification as specified. Initial submittals, which do not include the Environmental Certification will be rejected. Materials that are simply 'PVC free' without identifying their inputs shall not qualify as meeting the intent of this specification and shall be rejected.
- H. Third Party Evaluation: Provide documentation stating the shade cloth has undergone third party evaluation for all chemical inputs, down to a scale of 100 parts per million, that have been evaluated for human and environmental safety. Identify any and all inputs, which are known to be carcinogenic, mutagenic, teratogenic, reproductively toxic, or endocrine disrupting. Also identify items that are toxic to aquatic systems, contain heavy metals, or organohalogens. The material shall contain no inputs that are known problems to human or environmental health per the above major criteria, except for an input that is required to meet local fire codes.
- I. Recycling Characteristics: Provide documentation that the shade cloth can, and is part of a closed loop of perpetual use and not be required to be down cycled, incinerated or otherwise thrown away. Scrap material can be sent back to the mill for reprocessing and recycling into the same quality yarn and woven into new material, without down cycling. Certify that this process is currently underway and will be utilized for this project.
- J. Perpetual Use Certification: Certify that at the end of the useful life of the shade cloth, that the material can be sent back to the manufacturer for recapture as part of a closed loop of perpetual use and that the material can and will be reconstituted into new yarn, for weaving into new shade cloth. Provide information on each shade band indicating that the shade band can be sent back to the manufacturer for this purpose.

1.7 MOCK-UP

- A. Provide a mock-up of one roller shade assembly for evaluation of mounting, appearance and accessories.
 1. Locate mock-up in window designated by Architect.
 2. Mockup Size: Full size.
 3. Mockup Size (WxH): 3 x 3 feet (0.94 x 0.94 m) minimum.
 4. Intent of mock-up is to demonstrate quality of workmanship and visual appearance.
 5. If mock-up is not acceptable, rebuild mock-up until satisfactory results are achieved.
 6. Do not proceed with remaining work until, mock-up is accepted by Architect.
 7. Retain mock-up during construction as a standard for comparison with completed work.
 8. Do not alter or remove mock-up until work is completed or removal is authorized.
 9. Full-sized mock-up may become part of the final installation.
 10. Full-sized mock-up will become the property of the Owner to be used for spare parts.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver in factory-labeled packages, marked with manufacturer and product name, fire-test-response characteristics, and location of installation using same room designations indicated on Drawings and in Window Treatment Schedule.
- B. Store and handle products per manufacturer's recommendations.

1.9 PROJECT CONDITIONS

- A. Environmental Limitations: Install roller shades after finish work including painting is complete and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.10 WARRANTY

- A. Roller Shade Hardware and Chain Warranty: Manufacturer's standard non-depreciating warranty for interior shading.
 - 1. Shade Hardware: 10 years unless otherwise indicated.
 - a. Mecho/5 and Mecho/5X with ThermoVeil, EuroVeil, EuroTwill, Soho, Equinox, Midnite, Chelsea, or Classic Blackout shade fabric: 25 years.
 - b. Mecho/7 including bead chain with ThermoVeil, EuroVeil, EuroTwill, Soho, Equinox, Midnite, Chelsea, or Classic Blackout shade fabric: 25 years.
 - 2. Standard Shadecloth: Manufacturer's standard twenty-five year warranty.
 - 3. Ecoveil Shadecloth: Manufacturer's standard ten year warranty.
 - 4. Roller Shade Installation: One year from date of Substantial Completion, not including scaffolding, lifts or other means to reach inaccessible areas, which are deemed owner's responsibility.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Mecho, which is located at: 42-03 35th St.; Long Island City, NY 11101; ASD Tel: 718-729-2020; Fax: 718-729-2941; Email: marketing@mechoshade.com; Web: www.mechoshade.com.
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00.

2.2 ROLLER SHADES, MANUAL OPERATION AND ACCESSORIES

- A. Shade System; General:
 - 1. Components capable of being removed or adjusted without removing mounted shade brackets, or cassette support channel.
 - 2. Smooth operation raising or lowering shades.
 - 3. Cradle-to-Cradle certified for the complete shade system including operating hardware and shadecloth. Listed in C2C (DIR).
- B. Basis of Design: Mecho/7 System as manufactured by Mecho.
 - 1. Description: Manually operated fabric window shades.
 - a. Shade Type: Single Roller.
 - b. Shade Type: Double Roller.
 - c. Universal drive capability to offset drive chain for reverse or regular roll shades.

- d. Drop Position: Regular roll.
 - e. Drop Position: Reverse roll.
 - f. Mounting: Ceiling mounted.
 - g. Mounting: Recessed in ceiling pocket.
 - h. Mounting: Wall Mounted.
 - i. Mounting: Window Jamb Mounting.
 - j. Mounting: _____.
 - k. Size (WxH): _____.
 - l. Size: As indicated on drawings.
 - m. Fabric: As indicated under Shade Fabric article.
2. Brackets and Mounting Hardware: As recommended by manufacturer for mounting indicated and to accommodate shade fabric roll-up size and weight.
- a. Material: Steel, 1/8 inch (3 mm) thick.
 - b. Double Roller Brackets: Configured for light-filtering and room-darkening shades in one opening.
 - 1) Light-Filtering Fabric: Room-side of opening.
 - 2) Light-Filtering Fabric: Glass-side of opening.
 - 3) Room-Darkening Fabric: Room-side of opening.
 - 4) Room-Darkening Fabric: Glass-side of opening.
 - 5) Operating chain pulls for both fabrics configured for the same side of the window.
 - 6) Operating chain pulls for each fabric configured for opposite sides of the window.
 - c. Single Shade Operation Width: Up to 180 inches (4572 mm) dependent on fabric.
 - d. Multiple Shade Band Operation: Provide hardware as necessary to operate a maximum of six shade bands, totaling up to 50lbs hanging weight or 360 inches (9144 mm) wide; depending on fabric weight whichever is greater, using a single clutch operator.
 - e. Radiused Center Support Brackets: Provide brackets and connectors for radiused window applications.
 - 1) Maximum Offset: Eight degrees on each side for a 16 degree total offset.
3. Roller Tubes:
- a. Material: Extruded aluminum.
 - b. Size: As recommended by manufacturer; selected for suitability for installation conditions, span, and weight of shades.
 - c. Fabric Attachment: Utilize extruded channel in tube to accept vinyl spline welded to fabric edge. Shade band to be removable and replaceable without removing roller tube from brackets or inserting spline from the side of the roller tube.
 - d. Roller tubes to be capable of being removed and reinstalled without affecting roller shade limit adjustments.
4. Hembars: Designed to maintain bottom of shade straight and flat.
- a. Style: Full wrap fabric-covered bottom bar, flat profile with heat sealed closed ends.
 - b. Style: Exposed aluminum bottom bar with matching finials.
 - 1) Profile: Rectangular.
 - 2) Profile: _____.
 - 3) Color: Manufacturer's standard color coordinated with shade fabric selected.

- 4) Color: To be selected by Architect from manufacturer's standard color selection.
- 5) Color: _____.
- 6) Color: As indicated on the Drawings.
- c. Style: _____.
- d. Room-Darkening Shades: Provide a slot in bottom bar with wool-pile light seal.
- 5. Clutch Operator: Manufacturer's standard material and design integrated with bracket/brake assembly.
 - a. Heavy-duty, 1/8" steel mounting bracket and integrated steel brake, clutch and sprocket assembly rigidly affix the shade support and user control to the building structure fully independent of the roller tube components.
 - b. Permanently lubricated maintenance-free brake assembly employs an oil-impregnated steel hub with wrapped spring clutch.
 - c. Brake must withstand minimum pull force of 50 pounds (22.7 kg) in the stopped position.
 - d. Direct drive clutch requires no interstitial gear stages or plastic parts between the building structure and clutch ensuring reliable operation across the full range of shade sizes.
 - e. Urethane dampened clutch protects bead chain and clutch from failure due to high shock loads during shade operation minimizing down time.
 - f. Maximum shade hanging weight of 50 pounds (22.7 kg).
 - g. Clutch shall be upgradable to motorized drive on compatible tubes without requiring change in mounting attachment method/location, roller tube or fabric band.
 - h. Motorized drive options available require no additional wiring to be added for power or communication capability for switch or automated operation.
- 6. Drive Chain: Continuous loop T304 stainless steel beaded ball chain, 100 pound (45 kg) minimum breaking strength warranted from breaking for the life of the shade system hardware under prescribed operation. Provide upper and lower limit stops.
 - a. Chain Retainer: Chain tensioning device complying with WCMA A100.1.
 - b. Limit stops: Bead stops affixed to the chain maintain consistent shadeband alignment at the top and bottom of shade travel across multiple shades, and help prevent shade damage resulting from unmanaged user control.
- 7. Mecho/7, Managed Lift Force, Hardware: Lifts single band or multiband shade assemblies:
 - a. Lifting Force: 3 to 8.5 pounds (1.4 to 3.9 kg) max pull force to lift shade assemblies with a shade band hanging weight, not including mounting hardware, of up to 50 pounds (22.7 kg).
 - b. Direct drive clutch with Managed Lift Force provides the best user experience by managing the user pull force while using the fewest number of chain pulls to position a shade.
 - c. Backward compatible to Mecho/5 components including fascia, regular and reverse roll, pockets, and wall-mounting accessories.
 - d. Includes offset drive capability, left/right, front, or back to allow for utilization of blackout channels.
 - e. Allows for ease of operation when obstructions do not allow for direct drive chain access.
 - f. Offset chain drive shall not cause an increase of friction or pull force when operated up to a 26 degree angle from vertical.
- 8. Accessories:
 - a. Fascia: Removable extruded aluminum fascia, size as required to conceal shade mounting, attachable to brackets without exposed fasteners.

- 1) Finish: Baked enamel.
 - a) Color: Black.
 - b) Color: White.
 - c) Color: Bronze.
 - d) Color: Gray.
 - e) Color: _____.
- 2) Finish: Clear anodized.
- 3) Finish: Fabric wrapped to match shade.
- 4) Finish: _____.
- 5) Can be installed across two or more shade bands in one piece.
- 6) Single Fascia: Accommodate regular roll shades.
- 7) Single Fascia: Accommodate reverse roll shades.
- 8) Profile: Square.
- 9) Profile: Radiused.
- 10) Profile: _____.
- 11) Configuration: Captured, fascia stops at captured bracket end.
- 12) Configuration: Continuous, fascia extends past continuous bracket.
- 13) Configuration: Captured and continuous, as indicated on drawings.
- b. Ceiling Pockets: Premanufactured metal shade pocket for recess mounting in acoustical tile or drywall ceilings; size and configuration as indicated on drawings.
 - 1) Removable closure panel.
 - 2) Ceiling tile support.
 - 3) _____.
- c. Room-Darkening Channels: Extruded aluminum side and center channels with brush pile edge seals, SnapLoc mounting base, and concealed fasteners. Channels to accept one-piece exposed blackout hembar to assure side light control and sill light control.
- d. Adjustable Multi-band Coupler: Field-adjustable coupler positioned between adjacent shadebands driven by the same clutch facilitates hembar alignment between the bands while maintaining the light gap between the shade bands to no more than 1.25 inch (32mm).

C. Basis of Design: Mecho/5x System as manufactured by Mecho.

1. Description: Manually operated fabric window shades.
 - a. Shade Type: Single Roller.
 - b. Shade Type: Double Roller.
 - c. Universal drive capability to offset drive chain for reverse or regular roll shades.
 - d. Drop Position: Regular roll.
 - e. Drop Position: Reverse roll.
 - f. Mounting: Ceiling mounted.
 - g. Mounting: Recessed in ceiling pocket.
 - h. Mounting: Wall Mounted.
 - i. Mounting: Window Jamb Mounting.
 - j. Mounting: _____.
 - k. Size (WxH): _____.
 - l. Size: As indicated on drawings.
 - m. Fabric: As indicated under Shade Fabric article.
2. Brackets and Mounting Hardware: As recommended by manufacturer for mounting indicated and to accommodate shade fabric roll-up size and weight.
 - a. Material: Steel, 1/8 inch (3 mm) thick.

- b. Double Roller Brackets: Configured for light-filtering and room-darkening shades in one opening.
 - 1) Light-Filtering Fabric: Room-side of opening.
 - 2) Light-Filtering Fabric: Glass-side of opening.
 - 3) Room-Darkening Fabric: Room-side of opening.
 - 4) Room-Darkening Fabric: Glass-side of opening.
 - 5) Operating chain pulls for both fabrics configured for the same side of the window.
 - 6) Operating chain pulls for each fabric configured for opposite sides of the window.
 - c. Single Shade Operation Width: Up to 180 inches (4572) dependent on fabric.
 - d. Multiple Shade Band Operation: Provide hardware as necessary to operate more five shade bands, up to 360 inches (9144 mm) wide; depending on fabric weight, using a single clutch operator.
 - e. Radiused Center Support Brackets: Provide brackets and connectors for radiused window applications.
 - 1) Maximum Offset: Eight degrees on each side for a 16 degree total offset.
3. Roller Tubes:
- a. Material: Extruded aluminum.
 - b. Size: As recommended by manufacturer; selected for suitability for installation conditions, span, and weight of shades.
 - c. Fabric Attachment: Utilize extruded channel in tube to accept vinyl spline welded to fabric edge. Shade band to be removable and replaceable without removing roller tube from brackets or inserting spline from the side of the roller tube.
 - d. Roller tubes to be capable of being removed and reinstalled without affecting roller shade limit adjustments.
4. Hembars: Designed to maintain bottom of shade straight and flat.
- a. Style: Full wrap fabric covered bottom bar, flat profile with heat sealed closed ends.
 - b. Style: Exposed aluminum bottom bar with matching finials.
 - 1) Profile: Rectangular.
 - 2) Profile: _____.
 - 3) Color: Manufacturer's standard color coordinated with shade fabric selected.
 - 4) Color: To be selected by Architect from manufacturer's standard color selection.
 - 5) Color: _____.
 - 6) Color: As indicated on the Drawings.
 - c. Style: _____.
 - d. Room-Darkening Shades: Provide a slot in bottom bar with wool-pile light seal.
5. Clutch Operator: Manufacturer's standard material and design integrated with bracket/brake assembly.
- a. Heavy-duty, 1/8" steel mounting bracket and integrated steel brake, clutch and sprocket assembly rigidly affix the shade support and user control to the building structure fully independent of the roller tube components.
 - b. Permanently lubricated maintenance-free brake assembly employs an oil-impregnated steel hub with wrapped spring clutch.
 - c. Brake must withstand minimum pull force of 50 pounds (22.7 kg) in the stopped position.

- d. Direct drive clutch requires no interstitial gear stages or plastic parts between the building structure and clutch ensuring reliable operation across the full range of shade sizes.
- e. Maximum shade hanging weight of 30 pounds (13.6 kg).
- 6. Drive Chain: Continuous loop stainless steel beaded ball chain, 100 pound (45 kg) minimum breaking strength. Provide upper and lower limit stops.
 - a. Chain Retainer: Chain tensioning device complying with WCMA A100.1.
 - b. Limit stops: Bead stops affixed to the chain maintain consistent shadeband alignment at the top and bottom of shade travel across multiple shades, and help prevent shade damage resulting from unmanaged user control.
- 7. Mecho/5x, Managed Lift Force, Hardware: Lifts single band or multiband shade assemblies:
 - a. Lifting Force: 3 to 8.5 pounds (1.4 to 3.9 kg) max pull force to lift shade assemblies with a shade band hanging weight, not including mounting hardware, of 30 pounds (13.6 kg).
 - b. Direct drive clutch with Managed Lift Force provides the best user experience by managing the user pull force while using the fewest number of chain pulls to position a shade.
 - c. Backward compatible to Mecho/5 components including fascia, regular and reverse roll, pockets, and wall-mounting accessories.
 - d. Includes offset drive capability, left/right, front, or back to allow for utilization of blackout channels.
 - e. Allows for ease of operation when obstructions do not allow for direct drive chain access.
 - f. Offset chain drive shall not cause an increase of friction or pull force when operated up to a 26 degree angle from vertical.
- 8. Accessories:
 - a. Fascia: Removable extruded aluminum fascia, size as required to conceal shade mounting, attachable to brackets without exposed fasteners.
 - 1) Finish: Baked enamel.
 - a) Color: Black.
 - b) Color: White.
 - c) Color: Bronze.
 - d) Color: Gray.
 - e) Color: _____.
 - 2) Finish: Clear anodized.
 - 3) Finish: Fabric wrapped to match shade.
 - 4) Finish: _____.
 - 5) Can be installed across two or more shade bands in one piece.
 - 6) Single Fascia: Accommodate regular roll shades.
 - 7) Single Fascia: Accommodate reverse roll shades.
 - 8) Profile: Square.
 - 9) Profile: Radiused.
 - 10) Profile: _____.
 - 11) Configuration: Captured, fascia stops at captured bracket end.
 - 12) Configuration: Continuous, fascia extends past continuous bracket.
 - 13) Configuration: Captured and continuous, as indicated on drawings.
 - b. Ceiling Pockets: Premanufactured metal shade pocket for recess mounting in acoustical tile or drywall ceilings; size and configuration as indicated on drawings.
 - 1) Removable closure panel.
 - 2) Ceiling tile support.

- 3) _____.
 - c. Room-Darkening Channels: Extruded aluminum side and center channels with brush pile edge seals, SnapLoc mounting base, and concealed fasteners. Channels to accept one-piece exposed blackout hembar to assure side light control and sill light control.
 - d. Adjustable Multi-band Coupler: Field-adjustable coupler positioned between adjacent shadebands driven by the same clutch facilitates hembar alignment between the bands while maintaining the light gap between the shade bands to no more than 1.25 inch (32mm).
- D. Basis of Design: Mecho/5 System as manufactured by Mecho.
1. Description: Manually operated fabric window shades.
 - a. Shade Type: Single Roller.
 - b. Shade Type: Double Roller.
 - c. Universal drive capability to offset drive chain for reverse or regular roll shades.
 - d. Drop Position: Regular roll.
 - e. Drop Position: Reverse roll.
 - f. Mounting: Ceiling mounted.
 - g. Mounting: Recessed in ceiling pocket.
 - h. Mounting: Wall Mounted.
 - i. Mounting: Window Jamb Mounting.
 - j. Mounting: _____.
 - k. Size (WxH): _____.
 - l. Size: As indicated on drawings.
 - m. Fabric: As indicated under Shade Fabric article.
 2. Brackets and Mounting Hardware: As recommended by manufacturer for mounting indicated and to accommodate shade fabric roll-up size and weight.
 - a. Material: Steel, 1/8 inch (3 mm) thick.
 - b. Double Roller Brackets: Configured for light-filtering and room-darkening shades in one opening.
 - 1) Light-Filtering Fabric: Room-side of opening.
 - 2) Light-Filtering Fabric: Glass-side of opening.
 - 3) Room-Darkening Fabric: Room-side of opening.
 - 4) Room-Darkening Fabric: Glass-side of opening.
 - 5) Operating chain pulls for both fabrics configured for the same side of the window.
 - 6) Operating chain pulls for each fabric configured for opposite sides of the window.
 - c. Multiple Shade Band Operation: Provide hardware as necessary to operate more than one shade band using a single clutch operator.
 - d. Radiused Center Support Brackets: Provide brackets and connectors for radiused window applications.
 - 1) Maximum Offset: Eight degrees on each side for a 16 degree total offset.
 3. Roller Tubes:
 - a. Material: Extruded aluminum.
 - b. Size: As recommended by manufacturer; selected for suitability for installation conditions, span, and weight of shades.
 - c. Fabric Attachment: Utilize extruded channel in tube to accept vinyl spline welded to fabric edge. Shade band to be removable and replaceable without removing roller tube from brackets or inserting spline from the side of the roller tube.

- d. Roller tubes to be capable of being removed and reinstalled without affecting roller shade limit adjustments.
- 4. Hembars: Designed to maintain bottom of shade straight and flat.
 - a. Style: Full wrap fabric covered bottom bar, flat profile with heat sealed closed ends.
 - b. Style: Exposed aluminum bottom bar with matching finials.
 - 1) Profile: Rectangular.
 - 2) Profile: _____.
 - 3) Color: Manufacturer's standard color coordinated with shade fabric selected.
 - 4) Color: To be selected by Architect from manufacturer's standard color selection.
 - 5) Color: _____.
 - 6) Color: As indicated on the Drawings.
 - c. Style: _____.
 - d. Room-Darkening Shades: Provide a slot in bottom bar with wool-pile light seal.
- 5. Clutch Operator: Manufacturer's standard material and design integrated with bracket/brake assembly.
 - a. Heavy-duty, 1/8" steel mounting bracket and integrated steel brake, clutch and sprocket assembly rigidly affix the shade support and user control to the building structure fully independent of the roller tube components.
 - b. Permanently lubricated maintenance-free brake assembly employs an oil-impregnated steel hub with wrapped spring clutch.
 - c. Brake must withstand minimum pull force of 50 pounds (22.7 kg) in the stopped position.
 - d. Direct drive clutch requires no interstitial gear stages or plastic parts between the building structure and clutch ensuring reliable operation across the full range of shade sizes.
 - e. Maximum shade hanging weight of 18 pounds (8.2 kg).
- 6. Drive Chain: Continuous loop stainless steel beaded ball chain, 100 pound (45 kg) minimum breaking strength. Provide upper and lower limit stops.
 - a. Chain Retainer: Chain tensioning device complying with WCMA A100.1.
 - b. Limit stops: Bead stops affixed to the chain maintain consistent shadeband alignment at the top and bottom of shade travel across multiple shades, and help prevent shade damage resulting from unmanaged user control.
- 7. Accessories:
 - a. Fascia: Removable extruded aluminum fascia, size as required to conceal shade mounting, attachable to brackets without exposed fasteners.
 - 1) Finish: Baked enamel.
 - a) Color: Black.
 - b) Color: White.
 - c) Color: Bronze.
 - d) Color: Gray.
 - e) Color: _____.
 - 2) Finish: Clear anodized.
 - 3) Finish: Fabric wrapped to match shade.
 - 4) Finish: _____.
 - 5) Can be installed across two or more shade bands in one piece.
 - 6) Single Fascia: Accommodate regular roll shades.
 - 7) Single Fascia: Accommodate reverse roll shades.
 - 8) Two-Piece Double Fascia: Front and rear double fascia.
 - 9) Profile: Square.

- 10) Profile: Radiused.
 - 11) Profile: _____.
 - 12) Configuration: Captured, fascia stops at captured bracket end.
 - 13) Configuration: Continuous, fascia extends past continuous bracket.
 - 14) Configuration: Captured and continuous, as indicated on drawings.
 - b. Ceiling Pockets: Premanufactured metal shade pocket for recess mounting in acoustical tile or drywall ceilings; size and configuration as indicated on drawings.
 - 1) Removable closure panel.
 - 2) Ceiling tile support.
 - 3) _____.
 - c. Room-Darkening Channels: Extruded aluminum side and center channels with brush pile edge seals, SnapLoc mounting base, and concealed fasteners. Channels to accept one-piece exposed blackout hembar to assure side light control and sill light control.
- E. Basis of Design: UrbanShade, manual operation. As manufactured by Mecho. Fabric window shade system complete with mounting brackets, roller tubes, hembars, hardware, and accessories.
- 1. Shade Type: Single roller.
 - 2. Shade Type: Double roller.
 - 3. Drop Position: Regular. Fabric falls off roller tube, close to glass.
 - 4. Drop Position: Reverse. Fabric falls off the room-side of the roller tube.
 - 5. Mounting: Ceiling mounted.
 - 6. Mounting: Recess mounted in ceiling pocket.
 - 7. Mounting: Wall mounted.
 - 8. Mounting: Window jamb mounted.
 - 9. Size (WxH): _____.
 - 10. Size: As indicated on drawings.
 - 11. Fabric: As indicated under Shade Fabric article.
 - 12. Brackets and Mounting Hardware: Stamped steel. As recommended by manufacturer for mounting indicated accommodating shade fabric roll-up size and weight.
 - a. Double Roller Brackets: Configured for light-filtering and room-darkening shades in one opening.
 - 1) Light-Filtering Fabric: Room-side of opening.
 - 2) Light-Filtering Fabric: Glass-side of opening.
 - 3) Room-Darkening Fabric: Room-side of opening.
 - 4) Room-Darkening Fabric: Glass-side of opening.
 - 13. Roller Tubes: Extruded aluminum. Capable of being removed and reinstalled without affecting roller shade limit adjustments.
 - a. Size: As recommended by manufacturer; for installation conditions, span, and weight of shades.
 - b. Fabric Attachment: Extruded channel in tube accepts vinyl spline welded to fabric edge.
 - 1) Shade Band: Removable and replaceable without removing roller tube from brackets or inserting spline from the side of the roller tube.
 - 14. Hembars: Maintains bottom of shade straight and flat.
 - a. Style: Full wrap fabric covered bottom bar, flat profile with heat sealed closed ends.
 - b. Style: Exposed aluminum bottom bar with matching finials.
 - 1) Profile: Rectangular.
 - 2) Profile: _____.

- 3) Color: Manufacturer's standard coordinated with shade fabric selected.
- 4) Color: To be selected from manufacturer's standard color selection.
- 5) Color: _____.
- c. Room-Darkening Shades: Slotted bottom bar with wool-pile light seal.
- 15. Manual Operation:
 - a. Clutch Operator: Manufacturer's standard material and design integrated with bracket/brake assembly.
 - 1) Brake Assembly: Mounted on a low-friction plastic hub with wrapped spring clutch.
 - a) Brake must withstand minimum pull force of 25 lbs (12 kg) in stopped position.
 - 2) Clutch/Brake Mounting: On support brackets, independent of roller tube components.
 - b. Drive Chain: Continuous loop beaded ball chain. Upper and lower limit stops.
 - 1) Breaking Force: 45 lbf (200 N) minimum.
 - 2) Chain Retainer per WCMA A100.1: Tensioning device.
 - c. Lift Assist Mechanism: Contained in idler end of roller tube. When hanging weights exceed roller tube weight limits. Manufacturer's standard.
- 16. Accessories:
 - a. Fascia: Removable extruded aluminum. Size as required to conceal shade mounting. Attachable to brackets without exposed fasteners.
 - 1) Finish: Baked enamel.
 - a) Color: Black.
 - b) Color: White.
 - c) Color: Bronze.
 - d) Color: Gray.
 - e) Color: _____.
 - 2) Finish: Clear anodized.
 - 3) Finish: Fabric wrapped to match shade.
 - 4) Finish: _____.
 - 5) Can be installed across two or more shade bands in one piece.
 - 6) Profile: Square.
 - 7) Profile: Radiused.
 - 8) Profile: _____.
 - 9) Configuration: Captured, fascia stops at captured bracket end.
 - 10) Configuration: Continuous, fascia extends past continuous bracket.
 - 11) Configuration: Captured and continuous, as indicated on drawings.
 - b. Ceiling Pockets: Manual Premanufactured metal shade pocket with removable closure panel, for recess mounting in acoustical tile or drywall ceilings; size and configuration as indicated on drawings.
 - c. Room-Darkening Channels, Standard: Extruded aluminum side and center channels with brush pile edge seals, SnapLoc mounting base, and concealed fasteners. Channels to accept one-piece exposed blackout hembar to assure side light control and sill light control.

2.3 ROLLER SHADE FABRICATION

- A. Field measure finished openings prior to ordering or fabrication.
- B. Dimensional Tolerances: Fabricate shades to fit openings within specified tolerances.
 - 1. Vertical Dimensions: Fill Opening from Head to Sill: 1/2 inch (13 mm) space between bottom bar and window stool.

2. Vertical Dimensions: Fill Opening from Head to Sill: 1/2 inch (13 mm) space between bottom bar and finished floor.
 3. Vertical Dimensions: Fill Opening from Head to Sill: 1/2 inch (13 mm) space between bottom bar and _____.
 4. Vertical Dimensions: Fill Opening from Head to Sill (inch/mm): _____ space between bottom bar and window stool.
 5. Vertical Dimensions: Fill Opening from Head to Sill (inch/mm): _____ space between bottom bar and finished floor.
 6. Vertical Dimensions: Fill Opening from Head to Sill (inch/mm): _____ space between bottom bar and _____.
 7. Horizontal Dimensions: Inside Mounting.
 - a. Fill openings from jamb to jamb. No light gap.
 - b. Symmetrical Light Gaps on Both Sides of Shade: 3/4 inch (19.05 mm) total.
 - c. Symmetrical Light Gaps on Both Sides of Shade (inch/mm): _____ total.
 - d. Symmetrical Light Gaps on Both Sides of Shade (inch/mm): As detailed on the Drawings.
 8. Horizontal Dimensions: Outside mounting.
 - a. Cover window frames, trim, and casings completely.
 - b. Extend shades beyond jambs on each side: 2 inches (50 mm).
 - c. Extend shades beyond jambs on each side (inch/mm): _____.
 - d. Extend shades beyond jambs on each side (inch/mm): As detailed on the Drawings.
- C. Openings Requiring Continuous Multiple Shade Units with Separate Rollers: Locate roller joints at window mullion centers; butt rollers end-to-end.

2.4 SHADE FABRIC

- A. Basis of Design: Shade fabric as manufactured by Mecho.
1. Solar Shade cloths:
 - a. Fabric: Soho: 1100 series. 1 percent open. 2 x 2 basket-weave pattern of fine yarn PVC and polyester blend, same colors as in 1600 (3 percent open) and 1900 series, (5 percent open).
 - b. Fabric: Soho: 1600 series. 3 percent open. 2 x 2 basket-weave pattern of fine yarn PVC and polyester blend, same colors as in 1100 (1 percent open) and 1900 series, (5 percent open).
 - c. Fabric: Soho: 1900 series. 5 percent open. 2 x 2 basket-weave pattern of fine yarn, PVC and polyester blend, same colors as in 1100 (1 percent open) and 1600 series, (3 percent open).
 - d. Fabric: ThermoVeil: 0900 series. 0 to 1 percent visually translucent extra-dense linear weave pattern.
 - e. Fabric: ThermoVeil: 1000 series. 2 to 3 percent open, dense linear-weave pattern.
 - f. Fabric: ThermoVeil Basket Weave: 1700 series. 1 percent open 2 by 2 dense basket-weave pattern, colors match 1300 (5 percent open), also 126 inches (3200 mm) wide.
 - g. Fabric: ThermoVeil Basket Weave: 1500 series. 3 percent open 2 by 2 dense basket-weave pattern, colors match 1300 (5 percent open), also 126 inches (3200 mm) wide.
 - h. Fabric: ThermoVeil Basket Weave: 1300 series. 5 percent open, 2 by 2 dense basket-weave pattern, colors match 1500 (3 percent open), also 126 inches (3200 mm) wide.

- i. Fabric: ThermoVeil Basket Weave: 2100 series. 10 percent open 2 by 2 open basket-weave pattern, colors match 1300 (5 percent open) and 1500 (3 percent open).
 - j. Fabric: ThermoVeil Reversible Satin Twill Weave: 3000 series. 1 to 2 percent open, with an alternating predominant color in the warp and weft (fill). Reverse side can be used facing interior if specified.
 - k. Fabric: ThermoVeil Reversible Satin Twill Weave: 3200 series. 1 to 2 percent open, with an alternating predominant color in the warp and weft (fill). Reverse side can be used facing interior if specified.
 - l. Fabric: ThermoVeil Reversible Satin/Diamond Earthtone Twill Weave: 3300 series. 1 to 2 percent open, with an alternating predominant color in the warp and weft (fill). Reverse side can be used facing interior if specified.
 - m. Fabric: EcoVeil Screens: 0950 series. TPO Cradle to Cradle Certified, fabric, non-PVC, 1 X 1 basket-weave pattern at 1 percent open. Colors match 1350 (5 percent open) and 1550 (3 percent open).
 - n. Fabric: EcoVeil Screens: 1350 series. TPO Cradle to Cradle Certified, fabric, non-PVC, 1 X 1, basket-weave pattern at 5 percent open. Colors match 0950 (1 percent open) and 1550 (3 percent open).
 - o. Fabric: EcoVeil Screens: 1550 series. TPO fabric, Cradle to Cradle Certified, non-PVC, 1 X 1, basket-weave pattern at 3 percent open. Colors match 0950 (1 percent open) and 1350 (5 percent open).
 - p. Fabric: EcoVeil Sheer: 6750 series. Cradle to Cradle Certified, woven 100 percent polyester, PVC-free, reversible face, (3 percent open). The first shade cloth to pass NFPA 701 flame tests without added chemical flame retardants.
 - q. Fabric: EcoVeil Sheer: 6850 series. Cradle to Cradle Certified, woven 100 percent polyester, PVC-free, reversible face, (1 percent open). The first shade cloth to pass NFPA 701 flame tests without added chemical flame retardants.
 - r. Fabric: Acoustiveil Dimout: 0890 series. 0-1 percent open.
 - s. Fabric: EuroVeil Basket Weave Pattern: 5300. Thin, fine, screen cloth in broad range of colors. 5 percent open.
 - t. Fabric: EuroTwill Reversible Weave: 6000. Finely woven. 3 percent open. Reverse side can be used facing interior if specified.
 - u. Fabric: EuroTwill Reversible Weave: 6200. Distinctive, tightly woven twill design, comprised of fine polyester with PVC coating. 1 percent open. Reverse side can be used facing interior if specified.
 - v. Fabric: EuroTwill Reversible Weave: 6450. A broke twill-weave design comprised of fine polyester with PVC coating. 3 percent open. Reverse side can be used facing interior if specified.
 - w. Color: Selected from manufacturer's standard colors.
 - x. Color: Custom color.
2. Blackout Shade cloths:
- a. Fabric: Equinox Blackout: 0100 series. Opaque.
 - b. Fabric: Midnite Blackout: 0200 series. Opaque. Acrylic backing, PVC-free, white color reverse side (for exterior). Available 98 inch (24789 mm).
 - c. Fabric: Mirrofilm: 0600 series. Transparent.
 - d. Fabric: Distinctive Blackout: 0800 series. Opaque.
 - e. Fabric: Chelsea: 0250 series. Opaque.
 - f. Fabric: Classic Blackout: 0700 series. Opaque. Vinyl coated fabric blackout material same color reverse side (for exterior).
 - g. Color: Selected from manufacturer's standard colors.

- h. Color: Custom color.
- 3. Fabric Properties: Non-flammable, color-fast, impervious to heat and moisture, and able to retain its shape under normal operation.
 - a. Shade Type: Light filtering shades.
 - b. Shade Type: Room darkening shades.
 - c. Shade Type: _____.
 - d. Material Composition: PVC coated polyester yarns.
 - e. Material Composition: 100 percent polyester.
 - f. Material Composition: 100 percent TPO coated polyolefin yarn.
 - g. Material Composition: Polyester with acrylic backing.
 - h. Material Composition: Fiberglass with acrylic backing.
 - i. Material Composition: Vinyl coated fabric.
 - j. Material Composition: _____.
- 4. Material Certificates and Product Disclosures:
 - a. Low-Emitting Material Certification: Greenguard Gold certified and listed in UL (GGG).
 - b. Cradle to Cradle Material Health Certificate:
 - 1) Achievement Level: Silver.
 - 2) Achievement Level: Bronze.
 - c. Health Product Declaration (HPD): Published declaration with full disclosure of known hazards.
 - d. Declare label.
- 5. Performance Requirements:
 - a. Flammability per NFPA 701: Pass. Large or small scale test.
 - b. Fungal Resistance: No growth when tested per ASTM G21.
 - c. Solar Transmittance: _____, nominal.
 - d. Visible Light Transmittance: _____, nominal.
 - e. Solar Absorption: _____, nominal.
 - f. Solar Reflectance: _____, nominal.
- 6. Openness Factor: _____ percent, nominal.
- 7. Weight: _____ oz per sq yd (_____ grams per sq m).
- 8. Roll Width: 63 inches (1600 mm) maximum.
- 9. Roll Width: 72 inches (1829 mm) maximum.
- 10. Roll Width: 78 inches (1981 mm) maximum.
- 11. Roll Width: 84 inches (2134 mm) maximum.
- 12. Roll Width: 96 inches (2438 mm) maximum.
- 13. Roll Width: 98 inches (2489 mm) maximum.
- 14. Roll Width: 126 inches (3200 mm) maximum.
- 15. Roll Width (in/mm): _____.
- 16. Color: As selected by Architect from manufacturer's full range of colors.
- 17. Color: _____.
- 18. Fabrication:
 - a. Fabric Orientation: Railroaded, fabric is turned 90 degrees off the roll.
 - b. Battens: Manufacturer's standard material, full width of shade, and enclosed in welded shade fabric pocket; locate as indicated on drawings.
 - c. Seams for Railroaded Fabric: Manufacturer's standard sewn seam; locate as indicated on drawings.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Start of installation shall be considered acceptance of substrates.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using methods recommended by manufacturer for achieving best result for substrate under the project conditions.
- C. Coordinate with window installation and placement of concealed blocking to support shades.

3.3 INSTALLATION

- A. Install shades level, plumb, square, and true per manufacturer's instructions and approved shop drawings. Locate so shade band is at least 2 inches (51 mm) from interior face of glass. Allow proper clearances for window operation hardware. Use mounting devices as indicated.
- B. Replace shades exceeding specified tolerances at no extra cost to Owner.
- C. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range. Adjust level, projection, and shade centering from mounting bracket. Verify there is no telescoping of shade fabric.
- D. Clean roller shade surfaces after installation, per manufacturer's written instructions.
- E. Demonstrate operation and maintenance of window shade system to Owner's personnel.
- F. Manufacturer's authorized personnel are to train Owner's personnel on operation and maintenance of system.
 - 1. Use operation and maintenance manual as a reference, supplemented with additional training materials as required.

3.4 PROTECTION AND CLEANING

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.
 - 1. Clean soiled shades and exposed components as recommended by manufacturer.
 - 2. Replace shades that cannot be cleaned to "like new" condition.

END OF SECTION