



SECTION 12 24 13 - ROLLER SHADES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes roller shades with manual and electrical shade operators.

NOTE: Any window treatment is optional. Window treatment is used primarily to reduce heat gain into the building and to improve the readability of electronic signage during certain times of the day.

1.2 SUBMITTALS

- A. **Product Data:** For each type of product indicated. Include styles, material descriptions, construction details, dimensions of individual components and profiles, features, finishes, operating instructions, and typical wiring diagrams including integration of motor controllers with building management system, audiovisual and lighting control systems as applicable.
- B. **Shop Drawings:** Show location and extent of roller shades. Include elevations, sections, details, and dimensions not shown in Product Data. Show installation details, mountings, attachments to other work, operational clearances, and relationship to adjoining work.
- C. **Coordination Drawings:** Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:
1. Ceiling suspension system members and attachment to building structure.
 2. Ceiling-mounted or penetrating items including light fixtures, air outlets and inlets, speakers, sprinklers, recessed shades, and special moldings at walls, column penetrations, and other junctures of acoustical ceilings with adjoining construction.
 3. Shade mounting assembly and attachment.
 4. Size and location of access to shade operator, chain locations, motor, and adjustable components.
 5. Minimum Drawing Scale: 1/4 inch = 1 foot (1:48).
- D. **Samples for Initial Selection:** For each colored component of each type of shade indicated.
1. Include similar Samples of accessories involving color selection.
- E. **Samples for Verification:**
1. Complete, full-size operating unit not less than 16 inches (400 mm) wide for each type of roller shade indicated.
 2. For each finish product specified, one complete set of shade components, unassembled, demonstrating compliance with specified requirements. Shadecloth sample and aluminum finish sample as selected. Mark face of material to indicate interior faces.



3. For the following products:
 - a. Shade Material: Not less than 3 inches (76 mm) square, with specified treatments applied. Mark face of material.
 - b. Window Treatment Schedule: For roller shades. Use same designations indicated on Drawings.
- F. Product Certificates: For each type of roller shade, signed by product manufacturer.
- G. Qualification Data: Installer trained and certified by the manufacturer with a minimum of ten years experience in installing products comparable to those specified in this section.
- H. Maintenance Data: For roller shades to include in maintenance manuals. Include the following:
 1. Methods for maintaining roller shades and finishes.
 2. Precautions about cleaning materials and methods that could be detrimental to fabrics, finishes, and performance.
 3. Operating hardware.
 4. Motorized shade operator.

1.3 QUALITY ASSURANCE

- A. 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.
- B. Fire-Test-Response Characteristics: Provide roller shade band materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
- C. Flame-Resistance Ratings: Passes NFPA 701-99 small and large-scale vertical burn. Materials tested shall be identical to products proposed for use.
- D. Product Standard: Provide roller shades complying with WCMA A 100.1.
- E. Electrical Components: NFPA Article 100 listed and labeled by either UL or ETL or other testing agency acceptable to authorities having jurisdiction, marked for intended use, and tested as a system. Individual testing of components will not be acceptable in lieu of system testing.
- F. Shade cloth to “pass” indoor air quality / VOC testing as per ASTM D 5116-97 ASTM D 6670-01, USEPA-ETV (U.S. Environmental Protection Agency’s Environmental Technology Verification Protocol).
- G. Shade Cloth: Anti-Microbial Characteristics: 'No Growth' per ASTM G 21 results for fungi ATCC9642, ATCC9644, ATCC9645.



- H. Shade Cloth to be constructed of a woven screen material consisting of yarns comprised of extruded vinyl coated Polyester core yarn as a composite Thermoplastic shade cloth that shall be sealed at the edges, assuring binding the core yarn to the coating at the cut edge to assure a sealed edge to substantially minimize raveling. Screen cloths to have inert core yarns: i.e. Fiberglass yarns shall not be acceptable.
- I. Use only injection-molded Delrin engineered plastics by Dupont for all plastic components of shade hardware. Styrene based, PVC, or glass reinforced polyester thermo polymer plastics are not acceptable.
- J. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
 - 2. Locate mock-up in window designated by LAWA.
 - 3. Do not proceed with remaining work until mock-up is accepted by LAWA.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver shades in factory packages, marked with manufacturer and product name, fire-test-response characteristics, and location of installation using same room designations indicated on Drawings and in a window treatment schedule.

1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install roller shades until construction and wet and dirty finish work in spaces, including painting, is complete 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 operable glazed units' operation hardware throughout the entire operating range. Notify Architect of discrepancies. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.6 WARRANTY

- A. Roller Shade Hardware, Chain and Shade cloth; Manufacturer's standard fit-for-use, including normal wear & tear,, non-depreciating, Limited Lifetime twenty-five year warranty. Warranty to transfer to owner upon completion of installation.
- B. Roller Shade Motors and Motor Control Systems: Manufacturer's standard non-depreciating eight-year warranty.



PART 2 - PRODUCTS

2.1 ROLLER SHADES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide products indicated in Drawings or a comparable product by one of the following:
1. MechoShade Systems, Inc (MechoShade), as basis of design, performance and warranties, or equal.
- B. Shade Band Material: The selection of density and color of sunscreen shadecloth shall be based on the relationship with the specified glass, in accordance with the specific project requirements for reducing heat loads and glare.
1. Fabric Width: As per manufacturer's standard.
 2. Pattern: As per manufacturer's standard.
 3. Colors: As per manufacturer's standard.
 4. Material Openness Factor: As per manufacturer's recommendation for specified glass type and applicable conditions.
 5. Bottom Hem: Fabric wrapped and electronically sealed at ends. **Sewn hems and open hem pockets are not acceptable.**
- C. Rollers: Extruded-aluminum tube of diameter and wall thickness required to support and fit internal components of operating system and the weight and width of shade band material without sagging; designed to be easily removable from support brackets. Provide for positive mechanical attachment of shade band to roller tube; shade band shall be made removable / replaceable with a "snap-on" snap-off" spline mounting, without having to remove shade roller from shade brackets. Mounting spline shall not require use of adhesives, adhesive tapes, staples, and/or rivets.
- D. Provide shade hardware system that allows multi-banded shades to be capable of smooth operation when the axis is offset a maximum of 6 degrees on each side of the plane perpendicular to the radial line of the curve, for a 12 degrees total offset.
- E. Direction of Roll: Reverse or regular roll, as required. Provide for universal, regular and offset drive capacity, allowing drive chain to fall at front, rear or non-offset for all manual shade drive end brackets. Universal offset shall be adjustable for future change.
- F. Mounting Brackets: Provide shade hardware constructed of minimum 1/8-inch (3.18 mm) thick plated steel or heavier as required to support 150 percent of the full weight of each shade.
1. Bracket shall be fully integrated with all accessories, including, but not limited to: fascia, room darkening side / sill channels, center supports and connectors for multi-banded shades.
 2. Drive sprocket and brake assembly shall rotate and be supported on a welded 3/8 inch (9.525 mm) steel pin.
 3. The brake shall be an over - running clutch design which disengages to 90 percent during the raising and lowering of a shade. The brake shall withstand a pull force of 50 lbs. (22 kg) in the stopped position.



4. The braking mechanism shall be applied to an oil-impregnated hub on to which the brake system is mounted. The assembly shall be permanently lubricated. Products that require externally applied lubrication and or not permanently lubricated are not acceptable. The entire assembly shall be fully mounted on the steel support bracket, and fully independent of the shade tube assembly, which may be removed and reinstalled without effecting the roller shade limit adjustments.
- G. Drive Chain: #10 qualified stainless steel chain rated to 90 lb. (41 kg) minimum breaking strength. **Nickel plated steel chain shall not be accepted.**
- H. Roller Shade Pocket for recessed mounting in acoustical tile, or drywall ceilings.
1. Provide either extruded aluminum and or formed steel shade pocket, sized to accommodate roller shades, with exposed extruded removable closure panel to provide access to shades.
 2. For open return air plenum, provide "Vented Pocket" such that there will be a minimum of four 1 inch (25.4 mm) diameter holes per foot allowing the solar gain to flow above the ceiling line.
 3. Provide pocket end caps where required.
- I. Fascia:
1. Continuous removable extruded aluminum fascia that attaches to shade mounting brackets without the use of adhesives, magnetic strips, or exposed fasteners. Fascia shall be able to be installed across two or more shade bands in one piece. Fascia shall fully conceal brackets, shade roller and fabric on the tube. Provide bracket / fascia end caps where mounting conditions expose outside of roller shade brackets. Notching of Fascia for manual chain shall not be acceptable.
 - a. Color: Selected from manufacturer's standard colors.
- J. Manual Operation: Chain locations to be on right hand side of user.

2.2 ROLLER SHADE FABRICATION

- A. Fabricate units to completely fill existing openings from head to sill and jamb-to-jamb, unless specifically indicated otherwise. Fabricate shadecloth to hang flat without buckling or distortion. Fabricate with heat-sealed trimmed edges to hang straight without curling or raveling. Fabricate unguided shadecloth to roll true and straight without shifting sideways more than 1/8 inch (3.18 mm) in either direction per 8 feet (2438 mm) of shade height due to warp distortion or weave design.
- B. Installation Brackets: Designed for easy removal and reinstallation of shade, for supporting roller, and operating hardware and for hardware position and shade mounting method indicated.
- C. Installation Fasteners: No fewer than two fasteners per bracket, fabricated from metal noncorrosive to shade hardware and adjoining construction; type designed for securing to supporting substrate; and supporting shades and accessories under conditions of normal use.



- D. Color-Coated Finish: For metal components exposed to view, apply manufacturer's standard baked finish complying with manufacturer's written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness.
- E. Colors of Metal and Plastic Components Exposed to View: As selected by Architect from manufacturer's full range, unless otherwise indicated.

2.3 MOTORIZED SHADE HARDWARE AND SHADE BRACKETS

- A. Provide shade hardware constructed of minimum 1/8-inch (3.18 mm) thick plated steel, or heavier, thicker, as required to support 150 percent of the full weight of each shade.
- B. Provide shade hardware system that allows for field adjustment of motor or replacement of any operable hardware component without requiring removal of brackets, regardless of mounting position (inside, or outside mount).
- C. Provide shade hardware system that allows for operation of multiple shade bands offset by a maximum of 8-45 degrees from the motor axis between shade bands (4-22.5 degrees) on each side of the radial line, by a single shade motor (multi-banded shade, subject to manufacturer's design criteria).

2.4 SHADE MOTOR DRIVE SYSTEM

- A. Shade Motors: Tubular, asynchronous (non-synchronous) motors, with built-in reversible capacitor operating at 110v AC (60hz), single phase, temperature Class A, thermally protected, totally enclosed, maintenance free with line voltage power supply equipped with locking disconnect plug assembly furnished with each motor. Conceal motors inside shade roller tube. Maximum current draw for each shade motor of 2.3 amps. Use motors rated at the same nominal speed for all shades in the same room. Total hanging weight of shade band shall not exceed 80 percent of the rated lifting capacity of the shade motor and tube assembly.

2.5 MOTOR CONTROL SYSTEMS

- A. Specifications and design of shade motors and motor control system are based on a motor logic control system that provides all of the following performance capabilities. Motor logic control systems not in complete compliance with these performance criteria shall not be accepted as equal systems.
 - 1. Motor Control System:
 - a. Provide power to each shade motor via individual 3 conductor line voltage circuits connecting each motor to the relay based motor logic controllers.
 - b. Control system components shall provide appropriate (spike and brown out) over-current protection (+/- 10 percent of line voltage) for each of the four individual motor circuits and shall be rated by UL or ETL as a recognized component of this system and tested as an integrated system.
 - c. Motor control system shall allow each group of four shade motors in any combination to be controlled by each of four local switch ports, with up to fourteen



- possible "sub-group" combinations via local 3 button wall switches and all at once via a master 3 button switch. System shall allow for overlapping switch combinations from two or more local switches.
- d. Multiple "sub-groups" from different motor control components shall be capable of being combined to form "groups" operated by a single 3 button wall switch, from either the master port or in series from a local switch port.
 - e. Each shade motor shall be accessible (for control purposes) from up to four local switches and one master switch.
 - f. Control system shall allow for automatic alignment of shade hem bars in stopped position at 25 percent, 50 percent, and 75 percent of opening heights, and up to three user-defined intermediate stopping positions in addition to all up / all down, regardless of shade height, for a total of five positions. Control system shall allow shades to be stopped at any point in the opening height noting that shades may not be in alignment at these non-defined positions).
 - g. Control system shall have two standard operating modes: Normal mode allowing the shades to be stopped anywhere in the window's opening height and uniform mode, allowing the shades to only be stopped at the predefined intermediate stop positions. Both modes shall allow for all up / all down positioning.
 - h. Control system components shall allow for interface with both audiovisual system components and building fire and life safety system via a dry contact terminal block.
 - i. Control system components shall allow for interface with external analog input control devices such as solar activated controllers, 24 hour timers, and similar items; via a dry contact terminal block.
 - j. Reconfiguration of switch groups shall not require rewiring of the hardwired line voltage motor power supply wiring, or the low voltage control wiring. Reconfiguration of switch groups shall be accomplished within the motor control device.
2. Wall Switches:
- a. Three-button architectural flush mounted switches with metal cover plate and no exposed fasteners.
 - b. Connect local wall switches to control system components via low voltage (12V DC) 4-conductor modular cable equipped with RJ-11 type connectors supplied, installed and certified.
 - c. Connect master wall switches to control system components via low voltage (12V DC) 6-conductor modular cable equipped with RJ-12 type connectors supplied, installed and certified.

PART 3 - EXECUTION

3.1 EXAMINATION

- 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.
 - 1. 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. Allow clearances for window operation hardware.
- B. Installer shall train LAWA's maintenance personnel to adjust, operate and maintain roller shade systems.

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, which 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 LAWA, before time of Substantial Completion.

3.5 DEMONSTRATION

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

END OF SECTION 12 24 13