

1 General

1.1 RELATED SECTIONS

- .1 Section 06 08 99 - Rough Carpentry for Minor Works.
- .2 Section 06 20 00 - Finish Carpentry.
- .3 Section 08 50 00 - Windows.
- .4 Section 09 21 16.08 - Gypsum Board Assemblies for Minor Works.

1.2 REFERENCES

- .1 American Society for Testing Materials (ASTM)
 - .1 ASTM D 1784-99, Specifications for Rigid PVC Poly Vinyl Chloride Compounds (PVC) and Chlorinated Poly Vinyl Compounds (CPVC).
 - .2 ASTM G-22-80 Results for ATCC6538 and ATCC13388 indicating minimum 5mm "No Growth Contact Area"
 - .3 ASTM G-285 results for ATCC9642, ATCC9644, ATCC9348 and ATCC9645 indicating "No Growth".
 - .4 ASTM B209M-07, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - .5 ASTM B221M-07, Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - .6 CAN/ULC-S109-03, Flame Tests of Flame Resistant Fabrics and Films.
 - .7 NFPA 701- 04, Standard Methods of Fire Tests for Flame Propagation of Textiles and Films.
 - .8 CEC - Canadian Electrical Code

1.3 PERFORMANCE REQUIREMENTS

- .1 Fire: Provide shade fabrics tested in accordance with NFPA 701-vertical burn test and rate "pass".
- .2 Toxicity: Provide shade fabrics tested in accordance with University of Pittsburg Toxicity Protocol including LC50 analysis and toxicity characteristics.

1.4 DESIGN REQUIREMENTS

- .1 Design roller shades to following requirements:
 - .1 Be designed in a manner that allows wear susceptible parts to be replaceable by either the user or the manufacturer.
 - .2 A guarantee of at least (5) five-years of available replacement parts following discontinue of the products manufacture.
 - .3 Be accompanied by instruction for replacing or repairing worn parts, including inventory numbers for parts and procedures for ordering replacement parts.
 - .4 Include stamps on all major plastic components indicating composition code to facilitate recycling efforts.

1.5 SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Manufacturer's data sheets on each product specified, including:
 - .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 and switching.
- .3 Shop Drawings:
 - .1 Submit shop drawings which clearly indicate shade sizes, locations, operation, methods of attachment, and description of components, indicating for each component, size, shape, material, thickness, gauge, finish, methods of joining, joint locations, and methods of attachment and relationship with adjacent components and construction, fastening devices, anchorage components and adjacent materials.
 - .2 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.
- .4 Selection Samples:
 - .1 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.
- .5 Fabric Samples:
 - .1 Submit 75mm x 125mm fabric samples of manufacturer's full range of colors and fabrics.
- .6 Test Data:
 - .1 Submit test data substantiating that proposed shade fabric meets all performance criteria specified herein.
 - .2 Submit independent test results showing properties and acceptable fire hazard classification of shade fabric.
- .7 Manufacturers Literature:
 - .1 Manufacturer's standard installation instructions.
 - .2 Submit maintenance instructions.
- .8 Maintenance Data:
 - .1 Methods for maintaining roller shades, precautions regarding cleaning materials and methods, instructions for operating hardware and controls.
- .9 Manufacturer's Certificates:
 - .1 Certify products meet or exceed specified requirements.

1.6 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Manufacturer: 10 years minimum experience manufacturing products comparable to those specified in this section.
 - .2 Installer: 5 years minimum experience installing products comparable to those specified in this section.
- .2 Do not fabricate shades without obtaining field dimensions for each opening. Coordinate construction of surrounding conditions to allow for timely field dimension verification.
- .3 Screen fabric shall have a compliance to M1 and NFPA 701 flame retardant tests.
- .4 Opaque fabric shall have a compliance to NFPA 701 flame retardant tests.
- .5 Mock-Up:
 - .1 Provide a mock-up of one of each type roller shade assembly specified for evaluation of mounting, appearance and accessories.
 - .2 Locate mock-up in window(s) designated by Departmental Representative.
 - .3 Do not proceed with remaining work until mock-up is accepted by Departmental Representative.
 - .4 Acceptable mock may be incorporated into the work.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Do not deliver items to project until all concrete, masonry, plaster, painting and other wet work has been completed and is dry.
- .2 Deliver shades to project in labeled protective packaging. Uniquely labeled to identify each shade for each opening. Schedule delivery to prevent delays to completion of work but to minimize on site storage time.
- .3 Store materials in a dry secure place. Protect from weather, surface contaminants, corrosion, construction traffic and all other potential damage.

1.8 WARRANTY

- .1 Manual Operating Components:
 - .1 Provide Manufacturer's Warranty under provisions of Division 1 - General Requirements. Warranty period to be 5 years from Date of Substantial Completion and contain provisions that installation is to remain operational without fault for the warranty period and include all operating parts, including shade cloth, except for the bead chain which is not covered by the Warranty and is deemed to be a maintenance / service item.
 - .2 Installation:
 - .1 Provide Contractor's warranty under provisions of Division 1 - General Requirements that installation shall be free from defects for a period of not less than 1 year.
 - .3 Shadecloth:
 - .1 Provide Warranty under provisions of Division 1 - General Requirements.
 - .2 Warranty shall be for a minimum period of 5 years from date of Substantial Completion.
 - .3 Warranty shall contain provisions that the shadecloth will not deteriorate, sag or warp and will not be unfit for the use intended for the warranty period.
 - .4 In the event of a warranted product failure, the Shade Contractor will, at no cost to Departmental Representative, facilitate acquisition and deliver of all necessary components to the Departmental Representative and will promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Departmental Representative and at no extra expense.
 - .5 Defects include but are not limited to deformation of members, mechanical failure, failure of system to operate as designed or faulty or poor quality of work.

1.9 WASTE MANAGEMENT AND DISPOSAL

- .1 Collect and separate for disposal waste material generated by this Section.
- .2 Place in appropriate on-site bins in accordance with Waste Management Plan.
- .3 A clean worksite is mandatory at all times. Failure to maintain the site in a clean, safe condition shall result in the Departmental Representative initiating a clean-up and related costs being deducted from progress claims.

2 Products

2.1 COMPONENTS - MANUAL OPERATION

- .1 Operation Type:
 - .1 Bead chain and clutch operated, vertical roll-up, fabric, opaque window shade system, complete with headbox.
- .2 Operation:
 - .1 Bead chain and clutch operating mechanism allowing shade to stop when chain is released.

- .2 Designed never to need adjustment or lubrication.
- .3 Provide limit stops to prevent shade from being raised or lowered too far.
- .3 Clutch Mechanism:
 - .1 Fabricated from high carbon steel and molded fiberglass reinforced polyester.
- .4 Bead Chain Loop:
 - .1 Stainless steel bead chain hanging at side of window.
- .5 Idler Assembly:
 - .1 Provide roller idler assembly of molded nylon with adjustable length pin to facilitate easy installation, and removal of shade for service.
- .6 Roller Tube:
 - .1 Fabricated from extruded aluminum, galvanized steel, or enameled steel.
 - .2 Diameter, wall thickness, and material selected by manufacturer to accommodate shade type and size.
 - .3 Fabric connected to the roller tube with LSE (low surface energy) double sided adhesive specifically developed to attach coated textiles to metal.
 - .4 Adhesive attachment to eliminate horizontal impression in fabric.
- .7 Headbox:
 - .1 Consists of extruded aluminum sections with endcaps and opacity plates.
 - .2 Size: 105mm high by 89mm wide by length required for shade being provided.
 - .3 L-shaped removable front face and bottom cover and L-shaped back and top.
- .8 Endcaps:
 - .1 Stamped steel with universal design suitable for mounting to ceiling, wall, and jamb. Provide size compatible with roller size.
- .9 Slat bar:
 - .1 Extruded aluminum bar attached to bottom of shade. Bar does not retract into headbox.
- .10 Opacity Plates:
 - .1 Steel plates with rubber O rings installed on end caps to eliminate light leakage.
- .11 Exposed Aluminum Finish:
 - .1 Finish: Clear anodized aluminum.

2.2 FABRICS

- .1 Fabric fraying control:
 - .1 Fabric will be cut by ultrasound, by pressure or thermally sealed to control fraying.

2.3 MOUNTING - MANUAL OPERATION

- .1 Window Mounted:
 - .1 Mount shades within window jamb. Provide extruded aluminum SnapLoc fascia to conceal operating components.
- .2 Opacity:
 - .1 3%.

2.4 FABRICATION

- .1 Coordinate and verify job site dimensions affecting this work.
 - .2 Submit in writing dimensions or conditions which vary from those on reviewed shop drawings or detrimental to installation.
 - .3 Obtain corrective measures from Departmental Representative prior to fabrication.
 - .4 Ensure suitability of adjacent building components in relationship to work of this Section.
 - .5 Submit in writing defects in work prepared under other Sections.
 - .6 Commencement of work shall imply acceptance of substrates and conditions.
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- .7 Roller Window Shade Assembly:
 - .1 Design and fabricate heavy duty roller window shade assembly to keep maintenance to minimum.
 - .2 Chain and sprocket operated roller window shade assembly shall operate smoothly having capability to control rate of fall, to adjust stop and hold at an infinite number of positions as required.
 - .3 Assembly at highest and lowest shade position shall have automatic stop to prevent over winding or unrolling.
 - .4 Provide built-in, internal limit control winding stop contained within roller tube for shades as recommended by manufacturer.
 - .5 Limit stop shall be adjustable without special tools.
 - .6 Assembly shall allow finger tip control with built-in shock absorber system to prevent chain breakage under normal operating conditions.
 - .7 Factory set for size and travel of shades.
 - .8 Assembly mechanism shall have structural capacity to accommodate specified shades in window sizes required for this project.
 - .9 Design assembly mechanism to suit size of windows and mass of system.
 - .8 Shade Mounting Brackets:
 - .1 Fabricate from minimum 3 mm thick sheet steel and minimum 11 mm welded steel shaft which serves as axis for entire sprocket and spring clutch assembly.
 - .2 Make reversible for left or right hand operation as directed by Departmental Representative on shop drawings.
 - .3 Chain fall shall always be located away from an abutting partition to avoid marking of partition.
 - .4 Provide mounting in accordance with reviewed shop drawings as required to keep mechanism and brackets totally concealed from view when fully assembled.
 - .5 Mechanically attached cover plates to sheet steel brackets.
 - .6 Provide means of attaching fabric without exposed hardware.
 - .7 Use guides to retain chain gear assembly.
 - .8 Brackets shall act as protective retainer for tube and shade assembly preventing accidental dislocation of tube and shade.
 - .9 Roller Tube:
 - .1 Design extruded aluminum alloy roller tube to suit assembly design with either end of tube to engage drive system through internal or external extruded keyway.
 - .2 Extruded roller tube shall have wall thickness to suit design requirements with minimum wall thickness of 1.39 mm with reinforcement for fabric to provide anti-deflection support for wide span shades.
 - .3 Formed aluminum tube is unacceptable.
 - .4 Design tubes to be removable without removing the drive assembly, block resetting, or readjusting the pre-set stops. Shade tube shall be self-aligning.
 - .5 Roller tube shall be sized and reinforced internally as necessary to prevent excessive deflection in span of tube.
 - .6 Excessive deflection is defined by observation whereby shades in their open position reveal puckering, sagging or billowing, or where the tube deflects beyond 4% of roller length.
 - .7 Each roller tube shall be identified to its location in accordance with reviewed shop drawings.
 - .10 Fabric Mounting Spline:
 - .1 Fabricate snap-in-place spline of extruded vinyl with asymmetrical insertion
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- locking channels and embossed fabric guide.
 - .2 Spline shall have sufficient capacity to hold shades when spline is snapped and locked into the tube.
 - .3 Fabric shade shall be readily removable without removing the tube from the retainer brackets, or removing the brackets from the wall.
 - .11 Fabric-Guide End Cap:
 - .1 Fit delrin end cap with steel pin which permits up to 7 mm lateral adjustment in tube width.
 - .2 End cap shall have 55 mm outside diameter minimum fabric guide tapered disc feature to assure alignment and protection of shade cloth.
 - .3 Provide integral stainless steel eyelet at guide cables.
 - .12 Snap-In-Place Fascia:
 - .1 Provide rectangular formed metal fascia where shown of minimum 1.29 mm thick formed aluminum or extruded aluminum of minimum 2 mm thick housing.
 - .2 Fascia shall snap onto shade bracket without any exposed fastening devices.
 - .3 Visible edges of ceiling brackets shall be continuous.
 - .4 Clearance between arc of fascia and end of bracket shall be a minimum of 9 mm, a minimum reveal of 10 mm will be permitted when two shades with fascia are butted together.
 - .5 Finished fascia shall return back at bottom to permit a maximum opening of 50 mm.
 - .6 Furnish in lengths of up to 3000 mm unsupported without any visible sag or distortion.
 - .7 Fascia members are not required for overhead concealed application.
 - .8 Where shades are face mounted to faceted window arrangement, provide matching closure section and bridging clips between ends of abutting units.
 - .13 Shade Fabric Hem Tube:
 - .1 Provide full shade width, single piece, prefinished, extruded aluminum section of approximately 15 mm od with additional non-corrosive weight to maintain a weight of 1.4 kg/m except for shades having a height dimension greater than the width, in which case weight shall be 2.0 kg/m.
 - .2 At manufacturer's option, hem tube may be extruded aluminum, rectangular in shape, designed to hang perfectly perpendicular, and to totally conceal any heat-set or sewn seams within the tube.
 - .3 The internal spline shall secure the fabric evenly across its full width.
 - .4 Provide a separate port within the tube to allow storage of non-corrosive weight.
 - .14 Shade Fabrication:
 - .1 Do necessary cutting and sewing of fabric to produce finished product having neat, even appearance and meeting performance requirements specified.
 - .2 Fabricate shades with no vertical seams, and with a maximum of 2 horizontal seams per shade. Furnish fabric in adequate width to avoid horizontal seams at spacings of less than 1900 mm. Seams shall be straight, even and offer minimum visual obstruction.
 - .3 Fabric shall track perfectly straight in its movement to within $\pm 1\%$ of its width from fully open to fully closed position, and when rolled onto tube, it shall be stacked in layers to within ± 3 mm of edge alignment.
 - .4 Provide clear, 10-12 mm wide plastic edge tape reinforcing to prevent ravelling of raw edge of shades having glass fibre cores.
 - .5 Bottom edge shall hang straight and true, with hem weights totally enclosed in extruded hem tube. Heat sealing alone is not acceptable.
 - .6 All sewing shall incorporate heavy denier polyester yarn and machine stitching
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shall be straight and neatly finished with no loose threads visible in finished work.

- .7 Heat seaming is not acceptable in areas in which fabric is exposed.

2.5 FINISHES

- .1 Aluminum Components: clear anodized aluminum finish.

3 Execution

3.1 EXAMINATION

- .1 Examine substrate and conditions for installation.
- .2 Do not commence installation until conditions are satisfactory. Commencement of installation indicates acceptance of site conditions by Contractor.
- .3 Notify the Departmental Representative upon when the project conditions are unacceptable for shade installation. "Commencement of Work" means acceptance of substrate and project conditions.

3.2 INSTALLATION

- .1 Install units to comply with the Manufacturer's instructions for the type mounting and operation required. Provide units plumb, true, and securely anchored in place with recommended hardware and accessories to provide smooth operation without binding.
- .2 Install units within the following tolerances:
 - .1 Maximum variation of gap at window opening perimeter: 6mm, per 2440mm (+/- 3mm) of shade height.
 - .2 Maximum offset from level: 1mm per 1520mm of shade width.

3.3 ADJUSTING

- .1 Adjust drive / brake mechanism of units for smooth operation. Adjust shade and shadecloth to hang flat without buckling or distortion. Replace any units or components which do not hang properly or operate smoothly.

3.4 CLEANING

- .1 Touch up damaged finishes and repair minor damage in order to eliminate evidence of repair. Remove and replace work that cannot be satisfactorily repaired.
- .2 Clean exposed surfaces, including metal and shadecloth, using non-abrasive materials and methods recommended by the Shadecloth Manufacturer. Remove and replace work which cannot be satisfactorily cleaned.

3.5 TESTING

- .1 Test window shades to verify that operating mechanism, fabric retainer, and other operating components are functional. Correct deficiencies.
- .2 During daylight hours, lower shades and turn off interior lights. Verify that there are no light leaks within shade assembly. Correct deficiencies.

3.6 DEMONSTRATION

- .1 Demonstrate operation of shades to Departmental Representative's designated representatives.

END OF SECTION
