PROJECT NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **PART 1 – GENERAL**
	1. **GENERAL INSTRUCTION**
	2. **SUMMARY**
		1. Section Includes: Provide manual roller window shades including but not limited to following:
			1. manually operated roller window sun control shade assemblies.
			2. manually operated roller window blackout shade assemblies.
		2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:
			1. Provision of general LEED® requirements: Section 01 33 29, General LEED® Requirements.
			2. Provision of general LEED® Product requirements: Section 01 60 13, LEED® Product Requirements.
			3. Waste management and disposal requirements: Section 01 74 19, Waste Management and Disposal.
			4. Provision of indoor air quality requirements: Section 01 81 19, Indoor Air Quality Requirements.
			5. Provision of gypsum board substrate at bulkhead and accessories: Section 09 21 16, Gypsum Board Assemblies.
	3. **SUBMITTALS**
		1. Shop Drawings:
			1. Submit Shop Drawings for work of this Section in accordance with Section 01 30 00.
			2. 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. Samples: Submit samples in accordance with Section 01 30 00. Submit following samples in sizes indicated:
			1. Submit sample shade fully representing shades to be provided complete with head rail, end caps, gears, sprocket wheels, brackets and similar accessories. Submit samples of fabrics complete with edge reinforcing and finish colours for selection. Fabric sample minimum 300 mm (12") square. Submit samples of roller shade component colours for review. Roller shade components include but are not limited to fascia, guide rails and blackout channels. Do not order material until colour samples have been accepted.
		3. Certificates: Submit written certification that materials, systems and assemblies have been installed in accordance with manufacturer's requirements.
		4. Test and Evaluation Reports: Submit test data substantiating proposed shade fabric meets performance criteria specified herein. Submit independent test results showing properties and acceptable fire hazard classification of shade fabric.
	4. **QUALITY ASSURANCE**
		1. Qualifications:
			1. Installers: Provide work of this Section executed by competent installers with minimum 5 years experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.
		2. Mock-Ups: Erect 1 full size site mock-up of roller window shade at designated location for review. Once reviewed with no objections recorded mock-up sets standard for balance of work. Mock-up may be left as work of this Contract.
	5. **DELIVERY, STORAGE AND HANDLING**
		1. Delivery and Acceptance Requirements:
			1. Deliver materials to site only when work of this Section can be started.
			2. Before delivery to site verify each assembly for proper operation. Clean each assembly of marks and smudges prior to providing wrap up protective covering.
			3. Provide necessary crating and bundling for shipment of components to site including protection against weather likely to impair adequacy or appearance of material in finished assembly.
	6. **WARRANTY**
		1. Manufacturer Warranty: Warrant work of this Section for a period of 5 years against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Consultant and at no expense to Owner. 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.
2. **PART 2 – PRODUCTS**
	1. **MANUFACTURER**
		1. Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:
			1. Altex Inc; [www.altexdesign.com](http://www.altexdesign.com)
	2. **MATERIALS**
		1. System:
			1. Performance/Design Criteria:
				1. Design with final determination of limitation on site to meet requirements indicated on Drawings.
				2. Manually operated roller window shade system with wands for easy lifting, fingertip control, with infinite positioning so shade is capable of stopping and holding at any position within window opening. Provide assemblies to suit adjacent ceilings and finishes. Ensure removal does not require disassembly of shade unit. Left or right hand operative option available to suit design requirements.
				3. System must allow for the ability to lower the shade by pulling on the hembar without damage to the clutch or spring.
				4. Lifting Force:

Required lifting force of 2.5 pounds (1.134 kg) to a maximum of 4 pounds (1.814 kg) to raise or lower the shade.

* + - * 1. Shade system must have an embedded upper limit stop device to ensure a constant upper position and avoid the shade to be over lifted
				2. Roller shade system must be capable of being raised or lowered at a minimum rate of 1 meter per second (1 m/s).
				3. Accessibility:

System must be operable with one hand.

System must be operable at any height while sitting.

* + - * 1. Durability:

System must be tested for a minimum of 5500 cycles (one cycle means shade raised fully up and lowered fully down) without any failure.

* + - * 1. Safety:

System must not have any reachable cord in static or dynamic mode for an optimum safety.

* + - * 1. Dual Wand System: Extruded aluminium wands matching the finish of the curtain wall aluminium mullions.

Front wand: To raise the shade.

Back wand: To lower the shade.

* + - 1. Fabrication:
				1. Coordinate and verify job site dimensions affecting this work. Submit in writing dimensions or conditions which vary from those on reviewed Shop Drawings or detrimental to installation. Obtain corrective measures from consultant prior to fabrication. Ensure suitability of adjacent building components in relationship to work of this Section.
				2. Submit in writing defects in work prepared under other Sections. Commencement of work implies acceptance of substrates and conditions.
				3. Formed Aluminum: ASTM B221, Aluminum alloy 6063-T5. Ensure surfaces are free from defects impairing appearance, strength and durability.
				4. Roller Window Shade Assembly:

Design and fabricate heavy-duty roller window shade assembly to keep maintenance to minimum.

Ensure clutch, spring and sprocket of the roller window shade assembly operates smoothly having capability to control rate of fall, to adjust stop and hold at an infinite number of positions as required.

Ensure assembly allows fingertip control with built-in shock absorber system to prevent clutch breakage under normal operating conditions, even when shades are lowered by pulling on the hembar. Factory set for size and travel of shades.

Ensure assembly mechanism has structural capacity to accommodate specified shades in window sizes required for this Project. Design assembly mechanism to suit size of windows and mass of system.

* + - * 1. Roller Tube: Extruded aluminum roller tube to suit assembly design.

Ensure roller tube is sized and reinforced internally as necessary to prevent excessive deflection in span of tube.

Fabric Mounting Spline: Fabricate slipped-in-place spline of extruded vinyl with asymmetrical insertion locking channels and embossed fabric guide. Ensure spline has sufficient capacity to hold shades when spline is slipped and locked into the tube.

* + - * 1. Fascia:

Square fascia to be extruded aluminum alloy 6063T5.

Fascia system should have 89mm minimum and must be square.

Fascia must cover the front and bottom of the shade.

* + - * 1. Shade Fabric Hem Tube: hem tube may be extruded aluminum, flat rectangular in shape, designed to hang perfectly perpendicular and contained within a heat welded fabric pocket.
			1. Finishes:
				1. Aluminium: Ensure exposed aluminum surfaces are finished clear anodized.
			2. Basis of design: Newton High-Speed Lite-Lift with fascia by Altex inc.
			3. Substitutions: Not permitted.
		1. Fabric:
			1. General:
				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 or horizontal seams.
				3. Ensure fabric tracks perfectly straight in its movement to within ±1% of its width from fully open to fully closed position and when rolled onto tube, ensure it is stacked in layers to within +/-3 mm (+/-1/8") of edge alignment.
				4. Fabric Performance: Hang flat shade fabric without buckling or distortion. When trimmed, hang edge straight without ravelling. Ensure unguided roller shade cloth rolls true and straight without shifting sideways more than 3 mm (1/8") in either direction due to wrap distortion or weave design.
			2. Solar shade type:
				1. Description: Solar Screen fabric with 3% Openess, made of Fiber Glass (36%) coated with vinyl (64%) with a patented technology that Reflects Near Infrared (NIR) solar energy, maximum thickness of 0.020 inches (0.51mm), maximum weight of 382 g/m2, GREENGUARD Gold certified, RoHS Lead Free certified, CAN/ULC-S109-03 Small & Large Flame Test certified, ASTM E2180 for Bacterial Resistance certified. Basketweave Weave 2x2 screen construction fabric available in 310cm wide roll (122’’).
				2. Performance/Design Criteria:

Minimum total Solar Reflectance (Rs) of 34%

Minimum total Solar Reflectance in Infrared (Rs IR) of 61%

Minimum total Visible Transmission (Tv) of 6%

* + - * 1. Basis of design: E-Screen KOOLBLACK 3% 035035 charcoal/charcoal by Altex inc.
				2. Substitutions: Not permitted.
1. **PART 3 – EXECUTION**
	1. **EXAMINATION**
		1. Verification of Conditions: Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation.
		2. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.
	2. **INSTALLATION**
		1. Coordinate installation and fastenings with trades providing adjacent components. Coordinate location of support framing and blocking for installation of roller window shades.
		2. Install shades in accordance with manufacturer's instructions in accordance with reviewed Shop Drawings and as indicated, in true, flat planes.
		3. Securely attach installation fittings to their mounting surfaces with screws of correct length and type and with compatible plugs or anchors where required.
	3. **SITE QUALITY CONTROL**
		1. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Consultant at no cost to Owner.
	4. **CLEANING**
		1. Leave shades in raised position at completion of work of this Section.
		2. Upon completion of work of this Section, remove Products, materials, debris and equipment from site.
		3. Leave site in a neat and tidy condition, acceptable to Consultant.
		4. Do touch-up required to satisfaction of Consultant.

**END OF SECTION**