

## SECTION 122413 - ROLLER WINDOW SHADES

### PART 1- GENERAL

#### 1.1 SUMMARY

A. Section Includes:

1. Motorized roller shades.
2. Shade accessories.
3. Control systems.

B. Related Sections:

1. Section 092116 – Non-Structural Metal Framing Blocking for support of window shade brackets and pocket assemblies.
2. Section 092900 – Gypsum Board: Gypsum board substrate for window shade systems.
3. Section 095113 - Acoustical Panel Ceilings: Shade pockets, pocket closures, and accessories.
4. Division 26: Connections to electrical motor control system and lighting control system components.

#### 1.2 REFERENCES

- A. ASTM D4674 - Standard Practice for Accelerated Testing for Color Stability of Plastics Exposed to Indoor Office Environments; 2002a (R2010).
- B. ASTM E903 - Standard Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres; 2012.
- C. DIN EN 14500 - Blinds and Shutters - Thermal and Visual Comfort - Test and Calculation Methods; 2008.
- D. IEC 61000-4-2 - Electromagnetic Compatibility (EMC) - Part 4-2: Testing and Measurement Techniques - Electrostatic Discharge Immunity Test; 2008.
- E. ISO 9001 - Quality Management Systems-Requirements; 2008.
- F. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.
- G. NECA 130 - Standard for Installing and Maintaining Wiring Devices; National Electrical Contractors Association; 2010.
- H. NEMA WD 1 - General Color Requirements for Wiring Devices; National Electrical Manufacturers Association; 1999 (R 2010).
- I. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

#### 1.3 SYSTEM DESCRIPTION

- A. Roller Shade System: Ultra-quiet, precision-controlled electronic drive unit contained within head tube, controlling shade movement.

- B. Controls: Wall mounted.

#### 1.4 SUBMITTALS

##### A. Submittals for Review:

1. Shop Drawings; include:
  - a. Shade schedule indicating room number, opening sizes, quantities and key to details.
  - b. Head, jamb and sill details, and mounting dimension requirements for each product and mounting condition.
  - c. One-line wiring system diagrams including connection details and overall arrangement of shades and control locations.
2. Samples:
  - a. Fabric samples showing each specified color and openness.
  - b. Samples showing available color and finish selections for controls.
3. Product Data; include:
  - a. Descriptive literature and details for each product type including materials, finishes, construction, and dimensions of individual components, profiles, and mounting requirements.
  - b. Wiring diagrams, details on integration to lighting control systems, AV systems, and building management systems, installation instructions, and operating instructions.
  - c. Current certificates showing that line voltage components of system are either UL Listed or UL recognized.

##### B. Quality Control Submittals:

1. Test Reports: Indicating compliance with specified fabric properties.
2. Certification: Morton International Laboratory Report for PVC coated fabrics and bacterial and mildew resistance.

#### 1.5 QUALITY ASSURANCE

##### A. Manufacturer Qualifications:

1. Minimum 5 years' experience in manufacture of precision-engineered, low-voltage motorized shading systems.
2. Assign responsibility for design, engineering, installation, and performance of window shade system to single manufacturer and their qualified dealers and installers.
3. Furnish shading system and electrical control equipment for complete installation.
4. Qualified to supply specified products and to honor claims against product presented in accordance with warranty.

##### B. Installer Qualifications: Qualified to install and commission specified products by prior factory training, experience, demonstrated performance, and acceptance of any requirement of the manufacturer, subsidiary of the manufacturer, or licensed agent.

##### C. Mockups:

1. Provide mockup of window shade complete with selected shade fabric including sample of seam when applicable.
2. Locate where directed.
3. Approved mockup may remain as part of the Work.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Do not deliver shades until concrete, masonry, plaster, painting, and other wet work is complete and dry.
- C. Deliver shades to project in protective packaging, labeled to identify each shade for each opening.
- D. Include installation, programming, and maintenance instructions.

## 1.7 PROJECT CONDITIONS

- A. Maintain environmental conditions in installation areas within manufacturer's recommended limits:
  - 1. Ambient operating temperature: 32 to 104 degrees F.
  - 2. Humidity: 0 to 90 percent, non-condensing
- B. Do not install products under environmental conditions outside manufacturer's absolute limits.
- C. Do not install shade system until building is operating at ambient temperature and humidity ranges that are consistent with those intended for buildings ultimate use.

## 1.8 COORDINATION

- A. Coordinate pre-wiring of system utilizing manufacturer's approved low voltage wiring to each shade drive location.
- B. Fabricate shades after obtaining field dimensions for each opening.
- C. Coordinate construction of surrounding conditions to allow for timely field dimension verification.

## 1.9 WARRANTY

- A. Provide manufacturer's 2 year parts and labor and 8 years limited parts warranty for defective equipment.
- B. Provide manufacturer's 10 year warranty providing for repair or replacement of defective equipment.

## 1.10 MAINTENANCE

- A. Make ordering of new equipment for expansions, replacements, and spare parts available to qualified dealer or installer.
- B. Make replacement parts available for minimum of ten years after date of manufacture.
- C. Provide 24-hour, 7-day a week technical support to troubleshoot system wiring and aid in system programming.
- D. Provide on-site service support within 24 hours anywhere in continental United States and within 72 hours worldwide except where special visas are required.
- E. Offer renewable service contract on yearly basis to include parts, factory labor, and annual training visits. Make service contracts available up to ten years after date of system startup completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide **Sivoia QS by Lutron Electronics Co., Inc.** or Architect approved comparable product by one of the following:
1. Hunter Douglas.
  2. Mecho Systems.

### 2.2 MOTOR OPERATED SHADES

A. System Description:

1. Ultra-quiet, precision-controlled electronic drive unit housed inside roller tube, controlling shade movement.
2. Audible noise: Maximum 44 dBA measured 3 feet from electronic drive unit. No audible clicks when motor starts or stops.
3. Allow for maximum of 100 devices including roller shades, skylight shades, drapery tracks, keypads, lighting controls, and power supplies.
4. Allow for 100 zones including roller shades, skylight shades, drapery tracks, and lighting zones.
5. Operate independently, without use of external group controllers.
6. Control shade speed for tracking within plus or minus 0.0625 inch throughout entire travel.
7. Include 10 year power failure memory for preset stops, open and close limits, shade grouping and subgrouping, and system configuration.
8. Integrate directly with skylight shades, roman shades and drapery tracks incorporating electronic drive units.
9. Systems with multiple electronic drive units electronically synchronized to start, stop, and move in unison.

B. System Controls:

1. Shades controlled by built-in shade columns on lighting control or by keypad.
2. Electronic drive units, keypads, and lighting controls contain microprocessors, allowing high level programming from any source.
3. System devices, including shades and lighting controls, connected through common communication link.

C. System Performance:

1. One-touch control of shades by means of wall-mounted keypad.
2. Capable of stopping within accuracy of 0.125 inch at any point between open and close limits.
3. Store over 250 programmable stop points, including open, close, and any other position.
4. Presets set by 5-second button push and hold from keypad, lighting control, or handheld remote control.
5. Presets recalled by keypad, contact closure input, infrared receiver, or other lighting control system interface.
6. Open and close limits programmable from electronic drive unit, lighting control, wall-mounted keypad, or handheld remote control.
7. System components electro static discharge protected.

## 2.3 ROLLER SHADES

### A. Mounting:

1. Brackets to provide symmetrical light gaps of 0.75 inch on each side of shade.
2. Roller shade leveling adjustment allowing leveling adjustment while roller shades are mounted to brackets.
3. Allow side-to-side adjustment up to 0.375 inch on each side while shade is mounted to bracket.
4. Projection adjustment up to 0.50 inch.
5. Provide universal mounting brackets for wall, ceiling, and jamb mounting.
6. Two-piece mounting bracket providing level, projection, and shade centering adjustments from mounting bracket.
7. Provide dual brackets permit two shades rollers to be mounted in same opening.
8. Coupling:
  - a. Single electronic drive unit capable of driving multiple shades with coupling pin.
  - b. Pin allows for precision adjustment of bottom bar levels without removing roller from installed point or fabric from roller tube.

### B. Shade Tube: Fabric connected to tube using double-sided adhesive strip with minimum of one turn of fabric on roller before working section of fabric starts.

### C. Fabric:

1. Pass NFPA 701 large and small scale tests.
2. Minimum 5 mm “No Growth Contact Area”, tested to ASTM G22 for ATCC6538 (*Staphylococcus aureus*) and ATCC13388 (*Pseudomonas aeruginosa*).
3. No growth, tested to ASTM G21 for ATCC9642, ATCC9348, and ATCC9645.
4. Basis-of-Design Fabric: Lutron E Screen THEIA, complying with the following:
  - a. Color: White/Pearl.
  - b. Material: 36% fiberglass, 64% vinyl.
  - c. Openness Factor: 4.0%.
  - d. Visible Light Transmittance: 8.7%.
  - e. Solar Transmittance: 10%.
  - f. Solar Reflectance: 52%.
  - g. Required Properties: Railroadable, seamable, max. usable width 120”.

### D. Bottom Bar:

1. End cap color coordinated with fabric selection.
2. Contain spline groove at top to receive and secure fabric.
3. Full wrap, with fabric wrapped around bottom bar.
4. Provide slot at bottom with wool-pile light seal.

### E. Bottom Bar: 1 inch wide x 0.1875 inch thick extruded aluminum enclosed on all sides in thermally sealed pocket across bottom of shading fabric.

## 2.4 CONTROLS

### A. Wall Mounted, Wired Controls:

1. Low voltage keypads with faceplates attached without visible means of attachments, product

- color to match NEMA WD1, with backlit buttons.
- 2. Type: Five button with raise/lower; 3 presets.
- 3. Communications: Utilize RS485 wiring for low-voltage communications link.
- 4. Mounting: Wallbox or low-voltage mounting bracket; provide wall plates with concealed mounting hardware.
- 5. Design keypads to allow field-customization of button color, configuration, and engraving using field-changeable replacement kits.
- 6. Contact Closure Interface: Provide two contact closure inputs on back of unit which provide independent functions from front buttons; accepts both momentary and maintained contact closures.
- 7. Terminal block inputs to be over-voltage and miswire-protected against wire reversals and shorts
- 8. Finish: As selected by Architect.
- 9. Basis-of-Design Product: Lutron seeTouch QS Keypads or equal.

B. Low-Voltage Control Interfaces:

- 1. Provide low-voltage, UL listed control interfaces as indicated or as required to control the loads as indicated.
- 2. Contact Closure Interface: Contact closure input device to accept both momentary and maintained contact closures; configured for maintained or pulsed outputs; programmable using conditional logic off of a state variable such as time of day or partition status.
- 3. Basis-of-Design Product: Lutron Model QSE-10 or equal.

## 2.5 SOURCE QUALITY CONTROL

- A. Perform full-function testing on completed assemblies prior to shipment.

## PART 3- EXECUTION

### 3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions and approved Shop Drawings.
- B. Install shades to provide smooth operation.
- C. Locate controls where directed.
- D. Connect to power supply and control wiring.

### 3.2 ADJUSTING

- A. Adjust level, projection, and shade centering from mounting brackets.
- B. Adjust fabric on tube if visibly telescoping.

### 3.3 DEMONSTRATION

- A. Demonstrate proper operation and maintenance of window shade system to Owner.

END OF SECTION 122413

## SECTION 127300 - STADIUM SEATING (EXTERIOR)

### PART 1 - GENERAL

#### 1.01 SECTION INCLUDES

- A. Stadium chairs.
- B. Installation accessories and anchorage materials.

#### 1.02 RELATED REQUIREMENTS

- A. Division 13 Section "Grandstands and Bleachers".

#### 1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's specifications, installation instructions, and general recommendations for each major product required. Include data substantiating that products to be furnished comply with requirements of the contract documents.
- B. Shop Drawings: Submit complete shop drawings for fabrication and erection, including plans, elevations, and large scale details of typical sections and connections.
  - 1. Provide layout, dimensions, and identification of each unit corresponding to sequence of installation and erection procedures.
  - 2. Provide location and details of anchorage devices to be embedded in or fastened to other construction. Furnish templates if required for accurate placement.
- C. Verification Samples: To verify compliance with requirements of contract documents, submit complete sets of samples, illustrating full range of color and texture to be expected in the completed work. Provide samples of minimum size as follows:
  - 1. Two (2) complete chairs mounted to wood platform simulating actual conditions of one section of the stadium. One chair shall be end of row normal condition and one chair shall be handicap accessible end of row condition.

#### 1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Obtain required products from a single manufacturer.
  - 1. Accessories: Provide accessory items only as produced or recommended by manufacturer of primary products.
- B. Installer Qualifications: Installer must be acceptable to or licensed by manufacturer of products being installed.
- C. Preinstallation Conference: Prior to installation of work of this section, conduct a meeting at the project site to discuss quality assurance requirements. In addition to the Contractor and the installer, arrange for attendance of the following:
  - 1. Other installers affected by the work of this section.
  - 2. Manufacturer's representative.

#### 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Delivery and handling: Do not deliver seating to project site until all other construction operations are completed, sealants have been installed and cured, and clear water repellent work is complete.

#### 1.06 WARRANTY

- A. Special Project Warranty: Submit a written warranty signed by the manufacturer, the Contractor, and the installer, guaranteeing to correct failures in materials and workmanship which occur within the warranty period, including those attributable to abnormal aging, without reducing or otherwise limiting any other rights to correction which the Owner may have under the contract documents.
  - 1. The warranty shall include responsibility for removing and replacing other work as necessary to accomplish repairs or replacement of materials covered by the warranty.

2. Warranty period: 3 years after date of substantial completion.

## PART 2 - PRODUCTS

### 2.01 STADIUM CHAIRS

- A. Basis of Design Product: Subject to compliance with requirements, provide **Centurion 130.45.35.35 by Irwin Seating Company**.
- B. Other Acceptable Manufacturers matching options of Basis of Design product:
  1. Hussey Seating Company; Product: "Fusion".
  2. Camatic Seating, Inc.; Product: "Alpha".
- C. Characteristics:
  1. Mounting: Chairs shall be riser mounted or floor (tread) mounted where indicated on the Drawings. Standards shall be designed to provide sturdy support for chairs in rugged service with generous material thickness.
    - a. Mounting standards: Class 30 Cast iron.
    - b. Aisle Standards: Cast iron modern pedestal design with simple decorative closed ends.
  2. Size: 21" wide chairs minimum with 20" wide chairs at aisles only. Identification: Provide each chair with number and letter plates. A numbering system shall be provided for identification of all chairs. Number and letter plates shall be furnished as indicated on the approved seating layout, and shall be 1-3/4" x 2-3/4" elliptically-shaped anodized aluminum. Number plates shall be located in a molded recess in the upper corner of the back, while row letters shall be located on a raised band on the side of the aisle standards. Number and letter plates shall be attached with bright-plated matching hardware.
  3. Molded Plastic - Upholstered Cushion Chairs:
    - a. Backs shall be double-wall, blow-molded plastic with compound contoured, modern shape; and shall be smooth on the face except for a decorative stepped reveal to provide a continuity of visual detail between the seat and back. Backs shall extend to 31-3/4" above finished level floor and shall be directly attached to the upper extensions of the standards.
    - b. Seats shall provide ergonomically correct upholstered toppers, with injection molded, engineered plastic foundations having cast structural hinge pivots.
  4. Armrest: Integral cast iron with generous 2" width and attractive scrolled shape.

### 2.02 MATERIALS AND FINISHES

- A. Cast Iron: Shall be Grey cast iron conforming to ASTM A48/A48M-03 Class 30 (30,000 PSI) minimum strength, and shall be free of blow holes and hot checks with parting lines ground smooth and shall be free of inordinately rough surfaces.
- B. Plastic Components:
  1. Blow-molded plastic back components shall be high impact-resistant, HDPE polyethylene.
  2. Injection molded structural plastic shall be one-piece, high impact resistant, 25% glass-filled polypropylene with anti-static compounds to retard dirt attraction.
  3. All exposed plastic shall be treated in concert with molding process to resist severe outdoor exposure with UV stabilizer (ultra violet light inhibitor) to retard fading. Concern for the environment requires that major molded plastic parts be designed to be recyclable, and shall be clearly designated with a "RECYCLE" symbol on each piece.
  4. Plastic shall have a maximum burn rate of 1" per minute when tested in accordance with ASTM D635, or Department of Transportation Motor Vehicle Safety Standard No. 302.
- C. Padding Materials: Seat and back padding material shall be of new (prime manufacture) polyurethane foam. Padding material shall comply with the flammability requirements outlined in the California Technical Information Bulletin #117, Resilient Cellular Materials, Section A & D, dated February 1975, when tested in accordance with Federal Test Method Standard 191, Method 5903.2.
- D. Fabric: Upholstery fabric shall be marine vinyl for extreme outdoor exposure. Fabric shall be UV stable and suitable for temperature extremes of minus 20 and plus 115F, 50 mils thickness expanded vinyl



surface on jersey knit, and shall be capable of 250,000 double rubs when tested to CCFA-1a. Fabric shall be Spirit Millennium pattern by Naugahyde. Fabric shall meet Class 1 flammability requirements of the U.S. Dept. of Commerce Commercial Standard 191-53 per Bulletin #117 (California Code). Manufacturer's standard color range shall be utilized.

E. Finish:

1. Metal Parts: All exposed metal parts shall be treated with a 3-step corrosion-resistance and appearance treatment consisting of bonderization, electro-deposition epoxy paint, and polyester powder coat. Final coating shall be ARC 2001 Modified Polyester thermosetting powder decorative top-coat finish, complying with AAMA 2604-02 specifications. The final, decorative powder coat finish shall be applied by electrostatic means to a thickness of 2-3 mils, and shall provide a durable coating having a 2H Pencil hardness, and shall pass accelerated weathering testing. Prior to powder coating, metal parts shall be treated with a 9-stage bonderization process for superior finish adhesion, and afterward electro-deposition epoxy paint coated. The final powder coating shall be oven baked to cause proper flow of the powder to result in a smooth durable finish. Custom color to match University's standard colors.
2. Plastic Parts: Color of plastic shall be custom color to match University's standard colors .
3. Assembly Hardware: All assembly hardware, excepting expansion anchors for concrete, shall be stainless steel.
4. Lead-shielded expansion anchors for mounting to concrete shall be cadmium plated for weather resistance.

## 2.03 FABRICATION

- A. Standards: Stadium chairs shall be furnished riser mounted, utilizing one-piece Class 30 cast gray iron standards. Standards shall be cast to provide substantial front-face, rear-face, and internal flanges and shall be compatible with the riser heights to place chairs in a proper proximity to the riser face, while maintaining proper seat and back height and angle. Standards for floor mounted chairs shall be cast to maintain proper seat and back height and angle, regardless of floor slope. Armrests shall also be an integral part of the standards castings.
1. Aisle Standards: Aisle standards shall be cast to provide the same functions as the center standards. Aisle standard shall include decorative metal plate containing University logo.
- B. Molded Plastic Backs: Back components shall be one-piece, double-wall blow-molded plastic construction, high density, high impact-resistance linear polyethylene with smooth surface. Backs shall be molded to a compound contour shape with a perimeter boxed construction to enhance strength. The backs shall be 18-1/2" length, extending to a height of 31-3/4 inches above level floor. The backs shall be recessed for provision of 1-3/4" x 2-3/4" elliptical-shaped aluminum number plates, featuring black number characters 1-1/2" high.
- C. Upholstered Self-Lifting Seats: The seat components shall be padded and upholstered on their top surface. Seat component shall be specially designed for severe outdoor exposure. Seat foundation shall be structural, injection molded polypropylene, and automatically self-lifting to a full, vertical fold position when unoccupied. Seats shall be ISO 9001 certified through routine testing during manufacturing to pass seat cycle oscillation, ASTM Designation F851-87 Test Method for Self-Rising Seat Mechanism, and 600 lb. static load to front of seat. Testing shall further prove that seats are durable throughout their life in outdoor atmospheres.
- D. Armrests: Armrests shall be solid, integrally molded cast iron with a gently rounded front edge, and 2" width.
- E. Number and Letter Plates: A numbering system shall be provided for identification of all chairs. Number and letter plates shall be furnished as shown on the approved seating layout, and shall be 1-3/4" x 2-3/4" elliptical-shaped anodized aluminum. Number plates shall be located in a molded recess in the upper corner of the back, while row letters shall be located on a raised land on the side of the aisle standards. Number and letter plates shall be attached with bright-plated matching hardware.
- F. Handicapped Access Aisle Standards: Aisle standards indicated on the drawings shall be arranged for easy access by handicapped individuals and shall be designed to allow the individual to transfer easily from a wheelchair to the stadium chair. The aisle standard support column shall be eliminate obstruction

at the side of the chair, and shall be equipped with an armrest capable of lifting to a position parallel with the chair back, opening sideways access to the seat. Aisle standards so equipped shall be provided with a label, displaying an easily recognizable "handicapped" symbol. Decorative requirements of aisle standards are waived for the Handicapped Access Standards.

- G. Cupholders: Provide rear-mounted cupholders.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

- A. Inspect substrates and conditions under which the work of this section will be performed, and verify that installation properly may commence. Do not proceed with the work until unsatisfactory conditions have been resolved fully.

### 3.02 PREPARATION

- A. Set mounting inserts or provide setting templates and inserts to other trades involved in substrate construction.

### 3.03 INSTALLATION

- A. General: Comply with manufacturer's instructions, except where more stringent requirements are shown or specified, and except where project conditions require extra precautions or provisions to ensure satisfactory performance of the work.
- B. Method of Installation:
  - 1. The seating plan shall be reproduced on the floor and/or risers, all dimensions checked against the plan and necessary adjustments made in the layout for all discrepancies.
  - 2. Chairs shall be attached by means of an approved style of wedge-type, zinc plated expansion anchors installed strictly according to the manufacturers' instructions. Riser mount chairs shall be attached with 3/8" expansion anchors by not less than 3" long. Floor mount chairs shall be attached with 1/4" expansion anchors by not less than 2-1/4" long. There shall be two (2) bolts per standard.

### 3.04 ADJUSTING

- A. Final Adjustments: Upon achieving substantial completion of the work, adjust all operable components to ensure that they are properly installed and functioning smoothly. Replace any component which cannot be adjusted for proper operation.

### 3.05 CLEANING

- A. Upon completion, clean all surfaces which have become soiled or coated as a result of work of this section, using proper methods which will not scratch or otherwise damage finished surfaces.
  - 1. For cleaning, use only products and techniques acceptable to manufacturer of products being cleaned.

### 3.06 PROTECTION

- A. General: Institute protective procedures and install protective materials as required to ensure that work of this section will be without damage or deterioration at substantial completion.

END OF SECTION 127300