SECTION 26 09 23 – LIGHTING CONTROL DEVICES AND CONTROL PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Remote control lighting relays.
2. Lighting contactors.
3. Switches.
4. Switch plates.
5. Occupancy sensors.
6. Photocells.
7. Photocell control unit.

1.2 SYSTEM DESCRIPTION

A. The devices are to be connected to the Network Lighting Control System.

B. Distributed switching control using self-contained individually mounted lighting relays.

1.3 SUBMITTALS

A. Provide lighting design narrative with sequence of operations defining overall intended owner performance. Clarify, at minimum, how system shall: satisfy code, perform during normal/after-hours, and emergency (loss of normal power) conditions.

B. Shop Drawings shall include

1. Dimensioned floor plans with lighting control system components and accessories.
2. Wiring Diagram: Identify panels, number and type of switches or devices with room/area information.
   a. Define all parameters
      (1) Occupancy/Vacancy sensors: time delay/sensitivity
      (2) Loads: On/off or dimming, Manual/Auto on, Partial on/off, Blink warning
      (3) Daylighting: Type of photocell, completely off or to minimum level, Foot-candle trigger points
      (4) Time Clock: time for each event (schedules), after-hours time delay.
3. Include typical wiring diagrams for each component.

C. Product Data: Submit manufacturer's standard product data for each system component.

1.4 WARRANTY

A. Furnish five year manufacturer warranty for components.

PART 2 - PRODUCTS

2.1 REMOTE CONTROL LIGHTING RELAYS

A. Manufacturers:

1. LC & D.

2. Lutron.

3. General Electric.

B. Product Description: Heavy duty, single-coil momentary contact mechanically held remote control relays.

C. Contacts: Rated 20 amperes at 120 or 277 volts. Rated for lighting applications with high intensity discharge (HID), quartz halogen, tungsten, or fluorescent lamps.

D. Line Voltage Connections: Clamp type screw terminals.

E. Enclosure: NEMA ICS 6, to meet conditions. Fabricate enclosure from steel finished with manufacturer's standard gray enamel.

1. Interior Dry Location: Type 1
2. Exterior Locations: Type 4

2.2 LIGHTING CONTACTORS

A. Manufacturers:

1. Cutler-Hammer.

2. Square D.

3. General Electric.

B. Product Description: NEMA ICS 2, magnetic lighting contactor.

C. Configuration: Mechanical held, 3 wire control.

D. Coil Operating Voltage: 120 or 277 volts, 60 Hertz.

E. Poles: To match circuit configuration and control function.

F. Contact Rating: 20A

G. Accessories:

1. Cover Mounted Pilot Devices: NEMA ICS 5, standard-duty heavy-duty oil-tight type with Form Z contacts, rated A150.
2. Pushbutton: ON/OFF function, with unguarded recessed covered configuration.
3. Selector Switch: ON/OFF/AUTOMATIC functions, with rotary action.
4. Auxiliary Contacts: One field convertible in addition to seal-in contact.
5. Relays: NEMA ICS 2
6. Control Power Transformers: 120 volt secondary, in each enclosed contactor. Furnish fuse primary and secondary, and bond unfused leg of secondary to enclosure.

H. Enclosure: NEMA ICS 6, to meet conditions. Fabricate enclosure from steel finished with manufacturer's standard gray enamel.

1. Interior Dry Location: Type 1.
2. Exterior Locations: Type 4.

2.3 SWITCHES

A. Manufacturers:

1. Hubbell Incorporated.
2. Leviton Manufacturing Co., Inc.
3. Pass and Seymour.

B. Wall Switch: Specification Grade unlighted, momentary pushbutton type for overriding relays.

1. Material: Plastic.
2. Color: White.

C. Wall Switch: Industrial Grade non-pilot light toggle switches for overriding relays.

1. Color: White

D. Key Switch: Cylinder lock type. Match non-key switch rating.

2.4 SWITCH PLATES

A. Manufacturers:

1. Hubbel Incorporated.
2. Leviton Manufacturing Co., Inc.
3. Pass and Seymour.

B. Product Description: Specification Grade.

1. Material: Stainless steel, type 302.
2. Color: to be selected by Designer.

2.5 OCCUPANCY SENSOR

A. Manufacturers:

1. LC & D.

2. Novitas.

3. **Watt Stopper**.

B. Compatible with modular relay panels. Capable of being wired directly to Class 2 wiring without auxiliary components or devices.

C. Separate sensitivity and time delay adjustments with LED indication of sensed movement. User adjustable time-delay: 30 seconds to 12 minutes.

D. Furnish with manual override.

E. Operation: Silent.

F. Room Sensors: Dual Technology.

G. Corridor and Hallway Sensors:

1. Capable of detecting motion 14 feet wide and 80 feet long with one sensor mounted 10 feet above floor.
2. Capable of detecting motion in warehouse aisle 10 feet wide and 60 feet long or 100 feet long when mounted 22 feet above floor.
3. Capable of being wired in master-slave configuration to extend area of coverage.

2.6 PHOTOCELLS

A. Manufacturers:

1. LC & D.

2. Novitas.

3. Watt Stopper.

B. General: Consist of sensor mounted with separate control-calibration module. Sensor connected to control-calibration module via single shielded conductor with maximum distance of 500 feet (150 m).

C. Control-Calibration Module: Furnish with the following:

1. Capable of being switched between 4 measurement ranges.
2. Separate trip points for high and low response settings.
3. Momentary contact device to override photocell relays.
4. Three minute time delay between switching outputs to avoid nuisance tripping.

D. Sensor Devices: Each sensor employs photo diode technology to allow linear response to daylight within illuminance range.

1. Exterior Lighting: Hooded sensor, horizontally mounted, employing flat lens, and working range 1-10 foot-candles in 10 percent increments. Entire sensor encased in optically clear epoxy resin.
2. Indoor Lighting: Sensor with Fresnel lens providing for 60 degree cone shaped response area to monitor indoor office lighting levels.
3. Atriums: Sensor with translucent dome with 180 degree field of view and respond in range of 100-1,000 foot-candles.
4. Skylights: Sensor with translucent dome with 180 degree field of view and respond in range of 1,000-10,000 foot-candles.

2.7 PHOTOCELL CONTROL UNIT

A. Manufacturers:

1. LC & D.

2. Novitas.

3. Watt Stopper.

B. Product Description: Photodiode control unit with PHOTOCELL ENABLE and MASTER OVERRIDE input for remote control, 3 minute time delay, and with selectable ranges for 1-10 foot-candle, 10-100 foot-candle, 100-1,000 foot-candle, and 1,000-10,000 foot-candle.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Mount switches, occupancy sensors, and photocells.

B. Use only properly color coded, stranded wire, installed in conduit.

C. Label each low voltage wire clearly indicating connecting relay panel.

D. Mount relays. Provide wiring to numbered relays in panel to control each load.

E. Install relays to be accessible. Allow space around relays for ventilation and circulation of

air.

F. Identify power wiring with circuit breaker number controlling load. When multiple circuit breaker panels are feeding into relay panel, label wires to indicate originating panel designation.

G. Label each low voltage wire with relay number at each switch or sensor.

3.2 MANUFACTURER'S FIELD SERVICES

A. Furnish services for minimum of one day for check, test, and start-up. Perform the following services:

1. Check installation of panel boards.
2. Test operation of remote controlled devices.
3. Repair or replace defective components.

3.3 TRAINING

A. Demonstrate operation of the following system components to staff to be trained:

1. Operation of switches.
2. Operation of each type of occupancy sensors.
3. Operation of each type of photocell.

B. Furnish 4 hours to instruct LAWA's personnel in operation and maintenance of system. Schedule training with LAWA, provide at least 7 days notice to Designer of training date.

C. Provide manuals for attendees.

END OF SECTION 26 09 23