SECTION 260923 - LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. This sections is a Division 26 Basic Electrical Materials and Methods section and is part of each Division 26 section making reference to electrical connections for equipment specified herein.

1.02 SUMMARY

- A. This Section includes the following lighting control devices:
 - 1. Switch-box sensors.
 - 2. Indoor sensors.

1.03 DEFINITIONS

- A. LED: Light-emitting diode.
- B. PIR: Passive infrared.

1.04 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show installation details for occupancy and light-level sensors.
 - 1. Lighting plan showing location, orientation, and coverage area of each sensor.
 - 2. Interconnection diagrams showing field-installed wiring.
- C. Field quality-control test reports.
- D. Operation and Maintenance Data: For each type of product to include in emergency, operation, and maintenance manuals.

1.05 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

Riverhouse at Odette's 100% Construction - June 25, 2018 Stokes Architecture LIGHTING CONTROL DEVICES

1.06 COORDINATION

A. Coordinate layout and installation of ceiling-mounted devices with other construction that penetrates ceilings or is supported by them, including luminaires, HVAC equipment, fire-suppression system, and partition assemblies.

PART 2 - PRODUCTS

2.01 GENERAL LIGHTING CONTROL DEVICE REQUIREMENTS

A. Line-Voltage Surge Protection: An integral part of the devices for 120- and 277-V solid-state equipment. For devices without integral line-voltage surge protection, field-mounting surge protection shall comply with IEEE C62.41 and with UL 1449.

2.02 SWITCH-BOX SENSORS

- A. Description: PIR type with integral power-switching contacts rated for 800 W at 120-V ac, suitable for incandescent light fixtures, fluorescent light fixtures with magnetic or electronic ballasts, or 1/6-hp motors; and rated for 1000 W at 277-V ac, suitable for incandescent light fixtures, fluorescent light fixtures with magnetic or electronic ballasts, or 1/3-hp motors, minimum.
 - 1. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc (215 to 2150 lx); keeps lighting off when selected lighting level is present.
 - 2. Field selectable to convert sensor operation from automatic ON to manual ON.

2.03 INDOOR SENSORS

- A. General Description: Wall- or ceiling-mounting, solid-state units with a separate relay unit.
 - 1. Operation: Unless otherwise indicated, turn lights on when covered area is occupied and off when unoccupied; with a time delay for turning lights off, adjustable over a minimum range of 1 to 30 minutes. Set at 15 minutes.
 - 2. Sensor Output: Contacts rated to operate the connected relay, complying with UL 773A. Sensor shall be powered from the relay unit.
 - 3. Relay Unit: Dry contacts rated for 20A ballast load at 120 and 277V ac, for 13A tungsten at 120V ac, and for 1 hp at 120V ac. Power supply to sensor shall be 24V dc, 150-mA, Class 2 power source as defined by NFPA 70.
 - 4. Mounting:
 - a. Sensor: Suitable for mounting in any position on a standard outlet box.

LIGHTING CONTROL DEVICES

- b. Time-Delay and Sensitivity Adjustments: Recessed and concealed behind hinged door.
- 5. Indicator: LED, to show when motion is being detected during testing and normal operation of the sensor.
- 6. Bypass Switch: Manual override in case of sensor failure.
- 7. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc; keeps lighting off when selected lighting level is present.
- B. PIR Type: Ceiling mounting; detect occupancy by sensing a combination of heat and movement in area of coverage.
 - 1. Detector Sensitivity: Detect occurrences of 6-inch minimum movement of any portion of a human body that presents a target of at least 36 sq. in.
 - 2. Detection Coverage (Room): Detect occupancy anywhere in a circular area of 1000 sq. ft. when mounted on a 96-inch high ceiling.
 - 3. Detection Coverage (Corridor): Detect occupancy within 90-feet when mounted on a 10-foot high ceiling.
- C. Ultrasonic Type: Ceiling mounting; detect occupancy by sensing a change in pattern of reflected ultrasonic energy in area of coverage.
 - 1. Detector Sensitivity: Detect a person of average size and weight moving at least 12-inches in either a horizontal or a vertical manner at an approximate speed of 12-inches per second.
 - 2. Detection Coverage (Small Room): Detect occupancy anywhere within a circular area of 600 sq. ft. when mounted on a 96-inch high ceiling.
 - 3. Detection Coverage (Standard Room): Detect occupancy anywhere within a circular area of 1000 sq. ft. when mounted on an 8-foot high ceiling.
 - 4. Detection Coverage (Large Room): Detect occupancy anywhere within a circular area of 2000 sq. ft. when mounted on a 96-inch high ceiling.
 - 5. Detection Coverage (Corridor): Detect occupancy anywhere within 90-feet when mounted on a 10-foot high ceiling in a corridor not wider than 14-feet.
- D. Dual-Technology Type: Ceiling mounting; detect occupancy by using a combination of PIR and ultrasonic detection methods in area of coverage. Particular technology or combination of technologies that controls on and off functions shall be selectable in the field by operating controls on unit.

Riverhouse at Odette's 100% Construction - June 25, 2018 Stokes Architecture LIGHTING CONTROL DEVICES

- 1. Sensitivity Adjustment: Separate for each sensing technology.
- 2. Detector Sensitivity: Detect occurrences of 6-inch minimum movement of any portion of a human body that presents a target of at least 36 sq. in., and detect a person of average size and weight moving at least 12-inches in either a horizontal or a vertical manner at an approximate speed of 12-inches per second.
- 3. Detection Coverage (Standard Room): Detect occupancy anywhere within a circular area of 1000 sq. ft. when mounted on a 96-inch high ceiling.

2.04 CONDUCTORS AND CABLES

- A. Power Wiring to Supply Side of Remote-Control Power Sources: Not smaller than No. 12 AWG, complying with Division 16 Section 16120.
- B. Classes 2 and 3 Control Cable: Multiconductor cable with stranded copper conductors not smaller than No. 18 AWG.
- C. Class 1 Control Cable: Multiconductor cable with stranded copper conductors not smaller than No. 14 AWG.
- D. Install unshielded, twisted-pair cable for control and signal transmission conductors.

PART 3 - EXECUTION

3.01 SENSOR INSTALLATION

A. Install and aim sensors in locations to achieve at least 90 percent coverage of areas indicated. Do not exceed coverage limits specified in manufacturer's written instructions.

3.02 WIRING INSTALLATION

- A. Wiring Method: Comply with Division 16 Section 16120. Minimum conduit size shall be 3/4 inch.
- B. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points. Separate power-limited and nonpower-limited conductors according to conductor manufacturer's written instructions.
- C. Install field-mounting transient voltage suppressors for lighting control devices in Category A locations that do not have integral line-voltage surge protection.
- D. Size conductors according to lighting control device manufacturer's written instructions, unless otherwise indicated.

Riverhouse at Odette's 100% Construction - June 25, 2018 Stokes Architecture LIGHTING CONTROL DEVICES

- E. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.
- F. Tighten electrical connectors and terminals according to manufacturer's published torquetightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.03 IDENTIFICATION

- A. Identify components and power and control wiring according to Division 16 Section 16195.
- B. Label time switches and contactors with a unique designation.

3.04 FIELD QUALITY CONTROL

- A. Perform the following field tests and inspections and prepare test reports:
 - 1. After installing time switches and sensors, and after electrical circuitry has been energized, adjust and test for compliance with requirements.
 - 2. Operational Test: Verify actuation of each sensor and adjust time delays.
- B. Remove and replace lighting control devices where test results indicate that they do not comply with specified requirements.
- C. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.05 ADJUSTING

A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting sensors to suit actual occupied conditions. Provide up to two visits to site outside normal occupancy hours for this purpose.

END OF SECTION 260923

LIGHTING CONTROL DEVICES