SECTION 26 09 43 - LIGHTING CONTROLS

1.1 SECTION INCLUDES

A. This extent of lighting control system work is indicated by drawings and by the requirements of this section. It is the intent of this section to provide an integrated, energy saving lighting control system including Occupancy Sensors from a single supplier.

1.2 RELATED SECTIONS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.3 DEFINITIONS

A. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control, signaling and power-limited circuits.

1.4 REGULATORY REQUIREMENTS

A. National Fire Protection Association (NFPA): NFPA 70 – National Electrical Code

B. Underwriters Laboratories Incorporated (UL):
   1. UL 916 - Energy Management Equipment
   2. UL 508 – Industrial Control Panels

1.5 SUBMITTALS

A. Product Data: For occupancy sensors.

B. Operation and Maintenance Data: For occupancy sensor settings.

C. Warranty: Special warranty specified in this Section.

1.6 QUALITY ASSURANCE

A. Source Limitations: Obtain lighting system components through one source from a single manufacturer.

B. 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.

C. Comply with 47 CFR, Subparts A and B, for Class A digital devices.

D. Comply with NFPA 70.

1.7 PROJECT RECORD DRAWINGS

A. Submit documents under provisions of Division 1 and Section 26 00 00.

B. Record actual locations and devices, and routing of alarm wiring.

1.8 OPERATING AND MAINTENANCE INSTRUCTIONS

A. Provide written operating and maintenance instructions as specified in Section 26 00 00. Include product data and operation/maintenance information for all system components

B. The Owner may assign personnel to participate with the Contractor during installation. Without delaying work, familiarize the Owner's personnel with the installation, equipment, and maintenance.

C. During tests and adjustments, permit the Owner's personnel to observe. When feasible, explain the significance of each test.

D. Provide sufficient training to personnel selected by the Owner on operation and basic maintenance of all systems and equipment.

E. Employ manufacturer's field representative to demonstrate system operation to designated Owner personnel.

F. Conduct walking tour of project and briefly describe function, operation, and maintenance of each component.

G. Use submitted operation and maintenance manual as reference during demonstration and training.

1.9 WARRANTY

A. Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of occupancy sensors that fail in materials or workmanship for a period of two years from date of substantial completion

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Lighting systems equipment shown on the Drawings and specified herein is based on equipment as manufactured by *Hubbell Building Automation.*

2.2 OCCUPANCY SENSORS

A. Ceiling mounted passive-infrared sensors shall be *Hubbell* model OMNIIR.
   1. Sensor shall use a micro-processor for motion signal analysis and internal self-adjustment. Sensor shall adapt automatically to changing room conditions. Sensor micro-processor shall monitor PIR background levels and automatically make corresponding adjustments. Sensor shall recognize any motion detected within 15 seconds of turning off the lighting as a false off. Sensor shall recognize as a false on, the failure to detect motion 6 seconds after motion is detected initially.
      a. Test Setting: 8 second timeout.
      b. Timer Adjustability: 8 to 40 minutes (factory set at 15 minutes).
      c. Sensitivity: Adjustable from 0 to 100%.
      d. Indicator Light: LED.
      e. Detection Field: 360 degrees.
      f. Coverage: 450 square feet.
      g. Voltage: 24 volts DC.

B. Ceiling mounted dual technology sensors shall be *Hubbell* model OMNIDT2000.
   1. Sensor shall use a micro-processor for motion signal analysis and internal self-adjustment. Sensor shall adapt automatically to changing room conditions. Sensor micro-processor shall monitor PIR background levels as well as utilize Doppler shift technology with a micro-processor for motion signal analysis and automatically make corresponding adjustments. Sensor shall recognize any motion detected within 15 seconds of turning off the lighting as a false off. Sensor shall recognize as a false on, the failure to detect motion 6 seconds after motion is detected initially.
      a. Test Setting: 8 second timeout.
      b. Timer Adjustability: 8 to 30 minutes (factory set at 15 minutes).
      c. Sensitivity: Adjustable from 0 to 100%.
      d. Indicator Light: LED.
      e. Detection Field: 360 degrees.
      f. Coverage: 2000 square feet.
      g. Voltage: 24 volts DC.

C. Ceiling mounted ultrasonic sensors shall be *Hubbell* model OMNIUS500.
   1. Sensor shall utilize Doppler shift technology with a micro-processor for motion signal analysis and internal self-adjustment. Sensor shall adapt automatically to changing room conditions. Sensor micro-processor shall monitor PIR background levels and automatically make corresponding adjustments. Sensor shall recognize any motion detected within 15 seconds of turning off the lighting as a false off. Sensor shall recognize as a false on, the failure to detect motion 6 seconds after motion is detected initially.
      a. Test Setting: 8 second timeout.
      b. Timer Adjustability: 8 to 40 minutes (factory set at 15 minutes).
      c. Sensitivity: Adjustable from 0 to 100%.
      d. Ultrasonic Output: 40 kHz
      e. Indicator Light: LED.
      f. Detection Field: 360 degrees.
      g. Coverage: 500 square feet.
      h. Voltage: 24 volts DC.

D. Occupancy sensor power packs shall be *Hubbell* model UVPP.

1. Power packs shall include an integral transformer and relay designed for switching 20-ampere loads. Power packs shall be capable of being installed within a standard 4-inch square electrical box.
   a. Input Voltage: 100-277VAC
   b. Output Rating: 24VDC, 150 mA

2.3 CONDUCTORS AND CABLES

A. Classes 2 Control Cables: Multi-conductor cable with copper conductors not smaller than No.18 AWG.

PART 3 - EXECUTION

3.1 WIRING INSTALLATION

A. Wiring Method: Install low-voltage wiring in raceways except where installed above suspended accessible ceilings. Comply with Division 26 Section "Low-Voltage Electrical Power Conductors and Cables" Minimum conduit size shall be 3/4 inch.

B. Size conductors according to lighting control device manufacturer's written instructions, unless otherwise indicated.

C. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in terminal cabinets, equipment enclosures, and in junction, pull, and outlet boxes.

D. Identify components and power and control wiring according to Division 26 Section "Identification for Electrical Systems."

3.2 OCCUPANCY SENSOR INSTALLATION

A. Provide ceiling mounted dual technology occupancy sensors in the following spaces:
   1. Conference Room 281
   2. Conference Room 272

B. Provide ceiling mounted ultrasonic occupancy sensors in the following spaces:
   1. Women's Room 120
   2. Men's Room 121

C. Provide ceiling mounted passive infrared type occupancy sensors for all other sensors not listed in paragraphs A or B.

3.3 ADJUSTING

A. Occupancy Adjustments: When requested within 2 months of date of Substantial Completion, provide on-site assistance in adjusting sensors and to assist Owner's personnel in making program changes to suit actual occupied conditions.

END OF SECTION 26 09 43