Division 260943
Low Voltage Lighting Controls
DESIGN GUIDE

1 General

1.1 Introduction

A. This section applies to the following:

1. Manufacturers
2. Wiring
3. Devices
4. Software

B. CWU utilizes a distributed digital low voltage lighting control system. Where there is opportunity for embedded fixture controls, it should be considered by the electrical designer.

C. Lighting controls shall follow the state energy code and other local ordinances. Where required to meet state energy efficiency credits, provide enhanced digital lighting controls.

2 Materials

2.1 General

A. Manufacturers: nLight (Acuity Brand)

B. System shall have an architecture that is based upon three main concepts; 1) intelligent lighting control devices 2) standalone lighting control zones 3) network backbone for remote or time based operation.

C. Control system design shall be based upon a wired system. Where approved by the ELCM, a wireless system can be used.

2.2 Control Wiring

A. Network Control Wiring: Cat-5e, plenum rated.

B. Dimming Wiring (0-10V): Low Voltage, Class 2.

C. Load Wiring: Line Voltage, Class 1.

D. System shall provide the option of having pre-terminated plenum rated CAT-5e cabling supplied with hardware.

2.3 Control Devices

A. Control devices shall be intelligent type and shall communicate digitally.

B. Intelligent lighting control devices shall consist of one or more basic lighting control components; occupancy sensors, photocell sensors, relays, dimming outputs, manual switch stations, and manual dimming stations.

C. Lighting control zones shall consist of one or more intelligent lighting control components, be capable of stand-alone operation, and be capable of being connected to a higher level network backbone.

D. Devices within a lighting control zone shall be connected with CAT-5e low voltage cabling in any order.

E. All switching and dimming for a specific lighting zone shall take place within the devices located in the zone itself (i.e. not in a remotely located devices such as panels) to facilitate system robustness and minimize wiring requirements.

F. Occupancy sensors shall be provided with an auxiliary low voltage relay for BMS system integration. Where requested by the ELSM, provide (2) auxiliary low voltage relays per occupancy sensor.

2.4 Control Software

A. System shall have a web-based software management program that enables remote system control, status monitoring, and creation of lighting control profiles.

B. Control software shall enable logging of system performance data and presenting information in a web-based graphical format and downloadable format.

C. Control software shall enable integration with a BMS via BACnet IP.

3 Execution

3.1 Pre-Installation

A. Contractor shall arrange a pre installation meeting with the Owner and engineer prior to the development of shop drawings to confirm control intent.

3.2 Documentation

A. Each relay shall have an identification label indicating the originating branch circuit number and panelboard name along with the relay number as indicated on the drawings. Each line side branch circuit conductor shall have an identification tag indicating the branch circuit number.

B. Shop drawings shall be updated to reflect the final location of each specific device. Include copy of updated shop drawings with O&M manuals.

3.3 Devices

A. Centralized relay groupings shall be accessible without a ladder.

B. Relays installed in accessible ceilings shall be located such that they are within 18” of the ceiling opening.

3.4 Wiring

A. Neatly lace and rack wiring in cabinets.

B. Provide all necessary barriers where different voltages or emergency circuits are switched in a common relay panel.

C. Open network control cabling shall not be permitted in finished rooms without ceilings. Conceal cabling in pathways for finished rooms.

D. Open network control cabling supported with j-hook supports is permitted where completely concealed from view above an accessible ceiling. Cabling shall be routed such that it aligns with adjacent structure or walls. Open network cabling shall be plenum rated.

E. Open network cabling shall be supported every 4 feet or less.

3.5 Testing

A. The contractor shall test all devices to ensure proper wiring and programming. The Contractor shall coordinate with the Owner and make any necessary programming changes prior to project completion at no expense to the Owner.

3.6 Service

A. The contractor shall provide a minimum of 3 site trips during the first year of Owner occupancy to adjust lighting control sensors, programming and time schedules at no expense to the Owner.

4 Appendix

4.1 Reserved for future.