WILSON
ARCHITECTURE

Addendum 4

Client: Creswell School District
Project: CHS Academic Building Improvements (Primary) Project
Date: March 13, 2026
To: Interested Bidder
Prepared by: Curt Wilson, AIA; Principal, Wilson Architecture

This Addendum modifies the Project Manual, Specifications, and Drawings as follows:

1. General Information

   1.1. The bid opening date has been moved from 3/17/2026 at 2:00 pm to **3/19/2026 at 11:00 am**. See below for location of changes to critical documents. Please note, all references to the bid opening date to be changed to 3/19/2026 at 11:00 am in the bid documents regardless of if listed or not below.

   1.2. The Pre-Bid Meeting was held on 2/25/2026. The meeting sign-up sheet was provided with Addendum 1.

   1.3. Addendum 1 was distributed on 2/26/2026.

   1.4. Addendum 2 was distributed on 3/5/2026. Addendum 2 identified the new bid opening date as 3/17/2026.

   1.5. Addendum 3 was distributed on 3/11/2026.

      a. Note, the intention of Addendum 3 was to clarify the TI Project will provide and install all doors, door frames, and door hardware. It came to our attention after Addendum 3 that the OFCI item in Spec Section 01 1000 was not edited accordingly. See below.

2. Changes to the Project Manual

   2.1. Section 00 0101 – Project Title and Information Page
      a. Item 4. Procurement Timetable, edit as follows:
         - Bid Period Closing 3/19/2026 at 11:00 am
         - First-Tier Sub. Disclosure Due 3/19/2026 at 1:00 pm

   2.2. Section 00 1113 – Advertisement for Bid
      a. Change date bids to be received until 3/19/2026 at 11:00 am.

   2.3. Section 01 1000 – Summary
      a. Item 1.9.B.5: Add “and install” after “Obtain” at the beginning of the statement.

      b. Item 1.9.D.1: Delete this item.

2.4. Section 26 0943.13 – Digital-Network Lighting Controls

a. Replace the original section with attached version. A brief summary of the changes include:

- Removed from spec section references to remote programming capabilities and remote support, long-term service contracts, web server-based access and control capabilities, cellular network-based access, visual programming interface, and integration capabilities with BMS systems. Red underlined implies addition to spec section. Greyed out and struck through implies removed from the project scope.

End of Addendum

3. Attachments

- Spec Sections
  - Section 26 0943.13 – Digital-Network Lighting Controls

SECTION 26 09 43.13
DIGITAL-NETWORK LIGHTING CONTROLS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. System Software Interfaces.
   2. System Backbone and Integration Equipment.
   3. Wired Networked Devices.
   4. Wireless Networked Devices.

B. Related Requirements:
   1. Section 26 27 26 Wiring Devices
   2. Section 26 09 23 Lighting Control Devices
   3. Section 26 51 00 Interior Lighting

1.02 DEFINITIONS

A. Data Bus: A wired interface used to communicate with connected devices.

B. Device: A collective term for bus or wireless connected devices, including fluorescent ballasts, LED drivers, incandescent luminaires, manual switches, switching relays, sensors, and similar.

C. Global: Communication between devices in otherwise separate spaces using a bridging device or system controller.

D. Group: A set of devices that communicate together.

E. Monitoring: Acquisition, processing, communication, and display of equipment status data, metered electrical parameter values, power quality evaluation data, event and alarm signals, tabulated reports, and event logs.

~~Scene: Digital light level associated with a preset.~~

F. System Backbone: Devices used to connect and manage otherwise separate spaces, including bridging devices and gateways or system controllers. Used to expose devices to software configuration via TCP/IP.

1.03 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference on site.

B. Preinstallation Coordination Meeting(s): For digital-network lighting controls.
   1. Attendees: Installers, fabricators, representatives of manufacturers, and administrants for field tests and inspections. Notify Architect, Construction Manager, and Owner's Commissioning Authority of scheduled meeting dates.
   2. Engage factory-authorized service representative to attend preinstallation conference and review the submittal drawing, sequence of operation, and device installation best practices with Project team.
   3. Engage factory-authorized service representative to perform cellular signal strength measurements during site walk through and compare to Project plans to verify the placement of cellular antennas and quantity of lighting control system RF access points.

1.04 ACTION SUBMITTALS

A. Product Data:
   1. Bill of Materials necessary to install the networked lighting control system.
   2. Product Specification Sheets indicating general device descriptions, dimensions, electrical specifications, wiring details, and nomenclature.

3. Information Technology (IT) connection information pertaining to interconnection with facility IT networking equipment and third-party systems.
4. Other Diagrams and Operational Descriptions - as needed to indicate system operation or interaction with other system(s).

B. Shop Drawings:
1. Riser Diagrams showing device wiring connections of system backbone and typical per room/area type.

1.05 INFORMATIONAL SUBMITTALS

A. Contractor Startup/Commissioning Worksheet.

B. Service Specification Sheets indicating general service descriptions, including startup, training, post-startup support, and service contract terms.

C. Field quality-control reports.

D. Sample Warranty: For manufacturer's special warranty.

1.06 CLOSEOUT SUBMITTALS

A. Maintenance Contracts:
1. Hardware and Software Operation Manuals
2. Maintenance service agreement.
3. Software service agreement.

B. Warranty documentation.

1.07 QUALITY ASSURANCE

A. Manufacturer Qualifications:
1. Phone Support: Toll-free technical support available from manufacturer through an online tool to schedule a technical support appointment and provide 24/7 emergency support.
~~Remote Support: Manufacturer capable of providing remote support and ability to virtually connect with customers to address issues with visual guidance overlaid on images of real-world objects.~~
~~Cellular Connectivity: Manufacturer capable of cellular connectivity to a networked lighting control systems available to provide remote support within the continental United States.~~
2. On-Site Support: Manufacturer capable of providing a 72-hour, on-site response time within the continental United States.
~~Service Contracts: Manufacturer capable of providing service contracts for continued on-site and remote support of the lighting control system post-installation for terms up to 10 years from substantial completion, including:~~
~~Remote and on-site emergency response.~~
~~Remote system performance checks.~~
~~Remote diagnostics.~~
~~Replacement parts.~~

1.08 WARRANTY

A. Warranty: Manufacturer and Installer warrant that installed lighting control devices perform in accordance with specified requirements and agree to repair or replace, including labor, materials, and equipment, devices that fail to perform as specified within extended warranty period.
1. Failures include, but are not limited to, the following:
a. Faulty operation of lighting control hardware.
b. Faulty operation of lighting control firmware.

2. Minimum Warranty Period: Five years from date of shipment.

PART 2 PRODUCTS

2.01 SYSTEM COMPLIANCE

A. System components manufactured in accordance with UL 916 and UL 924 standards where applicable.

B. System components manufactured in accordance with CFR Title 47, Part 15 standards where applicable.

~~System components manufactured in accordance with ISED Canada RSS-247 standards where applicable.~~

C. System components manufactured in accordance with IFT-008-2015 and NOM-208-SCFI-2016 standards where applicable.

D. System listed as qualified under DesignLights Consortium Networked Lighting Control System Specification v5.0.

E. Performance Criteria:
   1. Regulatory Requirements:
      a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.

2.02 SYSTEM PERFORMANCE REQUIREMENTS

A. System Architecture:
   1. System architecture based upon the following concepts:
      a. Networkable intelligent lighting control devices.
      b. Standalone lighting control zones using distributed intelligence.
      c. Optional system backbone for remote, time-based, and global operation.
   2. Intelligent lighting control devices with individually addressable network communication capability and having one or more basic lighting control components including: occupancy sensor, photosensor, relay, dimming output, contact closure input, analog 0-10 V(dc) input, and manual wall station capable of indicating switching, dimming, and/or scene control. Combining one or more of these components into a single device enclosure permissible to minimize overall system device count.
   3. System capable of interfacing directly with networked luminaires such that either low-voltage network cabling or wireless RF communication is used to interconnect networked luminaires with control components such as sensors, switches, and system backbone. ~~Networked luminaires and intelligent lighting control devices support individual (unique) configuration of device settings and properties, with such configuration residing within the networked luminaires and intelligent control devices.~~
   4. Lighting control zones consisting of one or more networked luminaires and intelligent lighting control devices capable of providing automatic control from sensors (occupancy and/or photosensor) and manual control from local wall stations without requiring connection to a higher-level system backbone.
      a. Lighting control zones (wired and wireless) support at least 128 devices per zone.
      b. Capable of being networked with a higher-level system backbone to provide time-based control, control from inputs or systems external to control zone, and remote configuration and monitoring through a software interface.

      ~~Networked luminaires and intelligent lighting control devices with distributed intelligence programming stored in non-volatile memory, such that following any loss of power the~~

~~lighting control zones operate according to their defined default settings and sequence of operations.~~

5. System to include one or more system controllers that provide time-based control.
6. System controller provides means of connecting the lighting control system to a system software interface and building management systems via BACnet/IP or BACnet MS/TP protocol.
7. System controller supports both low-voltage wired and wireless RF communication within a single controller device.
8. System devices support firmware update, either remotely or from within the application space, for purposes of upgrading functionality at a later date.
9. System capable of reporting lighting system events and performance data to management software for display and analysis.

B. Wired Networked Control Zone Characteristics:
1. Connections to devices within a wired networked lighting control zone and to backbone components accomplished with a single type of low-voltage network cable, compliant with CAT5e specifications or higher. Use of mixed types of low-voltage network cables is unacceptable.
2. Devices connected in "daisy-chain" topology. "Hub-and-spoke" topology, requiring all individual networked devices to be connected to a central component, is unacceptable, to reduce the total amount of network cable required for each control zone.
3. Pre-terminated, plenum-rated, low-voltage network cabling supplied with hardware.
4. Following proper installation and provision of power, all networked devices connected with low-voltage network cable must automatically form a functional lighting control zone without requiring any type of programming, regardless of the programming mechanism (e.g. software application, handheld remote, pushbutton).
   a. The "out of box" default sequence of operation is intended to provide typical sequence of operation to minimize the system startup and programming requirements and to also have functional lighting control operation prior to system startup and programming.
5. System software capable of automatic discovery of all connected devices without requiring any provisioning of system or zone addresses.
6. Networked devices capable of detecting improper communication wiring and LED notification to alert installation/startup personnel.
7. Networked control devices suitable for control of egress or emergency light sources without additional, externally mounted UL 924 shunting or 0-10 V(dc) disconnect devices, to provide a compliant sequence of operation while reducing the overall installation and wiring costs of the system. Capable of supporting the following sequence of operation:
   a. Low-Voltage Power Sensing: Devices automatically provide 100 percent light level upon detection of loss of power sensed via low-voltage network cable connection where applicable.
   b. Line-Voltage Power Sensing: Devices listed as UL 924 emergency relays which automatically close load-control relay and provide 100 percent light output upon detection of loss of power sensed via line voltage connection to normal power.

~~Global Control Zones: Networked luminaires and intelligent lighting control devices located in different areas able to transmit and track information within at least 128 system-wide control zones to support required sequences of operation that may span multiple areas. Occupancy, photosensor inhibit, and switch commands available across multiple controllers.~~

C. Supported Sequence of Operations:

1. Control Zones:
    a. Local Control Zones: Networked luminaires and intelligent lighting control devices installed in an area (also referred to as a group of devices) capable of transmitting and tracking occupancy sensor, photosensor, and manual switch information within at least 48 unique control zones to support different and reconfigurable sequences of operation within area. These will also be referred to as local control zones.
    b. Adjacent Control Zones: Networked luminaires and intelligent lighting control devices capable of tracking occupancy broadcasts from adjacent zones. When this feature is enabled, luminaire output for a vacant zone will reduce to a configurable dimmed state if one or more adjacent zones are occupied. Luminaires will turn off when both primary and adjacent zones are vacant.
2. Wall Station Capabilities:
    a. Wall stations support the following capabilities:
        1) On/Off of a local or global control zone.
        2) Continuous dimming control of light level of a local or global control zone.
    b. Multi-Way Control: Multiple wall stations capable of controlling the same local or global control zones, to support "multi-way" switching and dimming control.
3. Occupancy Sensing Capabilities:
    a. Occupancy sensors configurable to control a local or global zone.
    b. Multiple occupancy sensors capable of controlling the same local or global zones. This capability combines occupancy sensing coverage from multiple sensors without consuming multiple control zones.
    c. Occupancy sensing sequence of operation modes:
        1) On/Off Occupancy Sensing.
        2) Partial-On Occupancy Sensing.
        3) Partial-Off Occupancy Sensing.
        4) Vacancy Sensing (Manual-On / Automatic-Off).
    d. On/Off, Partial-On, and Partial-Off Occupancy Sensing Modes Sequence of Operation:
        1) Occupancy automatically turn lights on to a designated level when occupancy is detected. Designated occupied light level support at least 100 dimming levels.
        2) Occupancy sensors automatically turn lights off or to a dimmed state (Partial-Off) when vacancy occurs or if sufficient daylight is detected. Designated unoccupied dim level support at least 100 dimming levels.
        3) System capable of combining Partial-Off and Full-Off operation by dimming lights to a designated level when vacant and turning the lights off completely after an additional time delay.
        4) Photosensor readings, if enabled in occupancy sensing control zone, automatically adjust light levels during occupied or unoccupied conditions as necessary.
        5) Wall station activation changes the dimming level or turn lights off as selected by the occupant. Lights optionally remain in this manually specified light level until the zone becomes vacant. Upon vacancy, normal sequence of operation resumes.
    e. Vacancy Sensing or Manual-On/Automatic-Off Mode Sequence of Operation:
        1) Activation of a wall station is required turn lights on. System capable of programming the zone to turn on to either a designated light level or previous user-set light level. Initially occupying the space without using a wall station must not result in lights turning on.

2) Occupancy sensors automatically turn lights off or to a dimmed state (Partial-Off) when vacancy occurs or if sufficient daylight is detected. Designated unoccupied dim level support at least 100 dimming levels.
3) System capable of dimming the lights when vacant and then turning the lights off completely after an additional time delay.
4) System capable of an "automatic grace period" immediately following detection of vacancy, during which time any detected occupancy results in the lights reverting to the previous level. After the grace period has expired, the use of a wall station is required to turn lights on.
5) Photosensor readings, if enabled in the Occupancy Sensing control zone, capable of automatically adjusting the light level during occupied or unoccupied conditions as necessary.
6) Wall station interaction changes the dimming level or turn lights off as selected by occupant. Lights remain at manually specified light level until zone becomes vacant; normal sequence of operation resumes upon vacancy.

f. Occupancy time delays before dimming or shutting off lights separately programmable for all control zones from 15 seconds to 2 hours.

4. Photosensor Sensing Capabilities (Automatic Daylight Sensing):
   a. Photosensor devices configurable to control a local zone.
   b. Photosensor-Based Control:
      1) Continuous Dimming: Control zone automatically adjusts dimming output in response to photosenor readings, to maintain a minimum light level consisting of both electric light and daylight sources. Photosensor response configurable to adjust set point and dimming rates.
5. Schedule Capabilities:
   a. System capable of time schedules for time-of-day to override devices including offsets from dusk and dawn.
   b. System capable of providing a visible "blink warning" five minutes prior to the end of the schedule.
   c. Wall stations may be programmed to provide timed extensions/overrides that turn the lights on for an additional time period.
      1) Timed override/extension duration programmable for each individual device, zone of devices, or customized group of devices, from five minutes to 12 hours.

2.03 SYSTEMS SOFTWARE INTERFACES

~~Management Interface:~~

~~Web-based management interface for remote system control, live status monitoring, and configuration of lighting control settings and schedules.~~
~~Compatible with industry-standard web browser clients.~~
~~Minimum of 10 unique password-protected user accounts.~~
~~Minimum of three user permission levels: read-only, read and change settings, and full administrative system access.~~
~~Capable of restricting access for user accounts to specific devices within the system.~~
~~All system devices capable of being given user-defined names.~~
~~Device identification information displayed in the Management interface including:~~
~~Model number.~~
~~Model description.~~
~~Serial number or network ID.~~
~~Manufacturing date code.~~
~~Custom label.~~

- Parent network device.
- Management interface capable of displaying live status of a networked luminaire or intelligent control device including:
  - Luminaire on/off status.
  - Dim level.
  - Power consumption.
  - Device temperature.
  - PIR occupancy sensor status.
  - Microphonic occupancy sensor status.
  - Remaining occupancy time delay.
  - Photosensor reading.
  - Active Profiles.
- Management interface capable of displaying and modifying the current active settings of a networked luminaire or intelligent control device including:
  - Dimming trim levels.
  - Occupancy sensor and photosensor enable/disable.
  - Occupancy sensor time delay and light level settings.
  - Occupancy sensor response (normal or vacancy).
  - Photosensor setpoints and transition time delays.
- Management interface capable of applying settings changes for a zone of devices or a group of selected devices using a single action that does not require the user to apply settings changes for each individual device.
- Management interface capable of compiling a printable network inventory report.
- Management interface capable of compiling a printable report detailing all system profiles.
- All sensitive information stored encrypted.
- System software updates available for automatic download and installation via the Internet.

- System Energy Analysis and Reporting:
  - Intuitive graphical screens to facilitate simple viewing of system energy performance.
  - Energy Scorecard: Summarized display that indicates calculated energy savings in dollars or KWh.
  - Software calculates allocation of energy savings by control measures including occupancy sensors, photosensors, and manual switching.
  - Energy savings data calculated for the system as a whole.
  - Time-scaled graph showing all relay transitions.
  - Time-scaled graph showing zone occupancy time delays.
  - Time-scaled graph showing the total light level.
  - Software capable of storing information remotely onto an open-source, object-relational database, such as PostgreSQL.
  - Data stored in the database will be accessed utilizing an open standard, application programming interface, such as Open Database Connectivity (ODBC).
- Visualization and Programming Interfaces:
  - System provides an optional web-based visualization interface that displays a graphical floorplan.
  - Programming capabilities through the application will include the following:
    - Switch, occupancy sensor, and photosensor zone configuration.
    - Manual-on or automatic-on modes.
    - Turn-on and dim-to-dimming levels.

~~Occupancy sensor time delays and PIR sensitivity.~~
~~Dual technology occupancy sensors sensitivity.~~
~~Photosensor calibration adjustment and auto-setpoint.~~
~~Multiple photosensor zone offset.~~
~~Trim level settings.~~
~~Preset scene creation and copy for scene-capable devices.~~
~~Application of custom device labels to the Bluetooth Low-Energy Programming Devices and individual connected lighting control devices.~~
~~Fade rate settings.~~

A. Smartphone Programming Interface for Wired and Wireless Devices:
   1. Interface provided for both Apple iOS and Android operating systems that allows configuration of lighting control settings.
   2. Application supports configuration of wireless networked control devices.
      a. Application access granted with valid user name and password.
      b. Access to program information governed by permission system that allows users to share access with other users and restrict access to those who should not be able to reconfigure the equipment.
      c. Indication of signal strength where multiple Bluetooth Low-Energy Programming Devices are available for configuration.
   3. Application supports configuration or wired networked control devices.
      a. Connected device access granted through user-defined passcode at initial install.
      b. Indication of signal strength where multiple Bluetooth Low-Energy Programming Devices are available for configuration.
   4. Programming Capabilities:
      a. Switch, occupancy sensor, and photosensor group configuration.
      b. Manual-on or automatic-on modes.
      c. Turn-on and dim to dimming levels.
      d. Occupancy sensor time delays and PIR sensitivity.
      e. Dual technology occupancy sensors sensitivity.
      f. Photosensor calibration adjustment and auto-setpoint.
      g. Multiple photosensor zone offset.
      h. Trim level settings.
      i. Preset scene creation.
      j. Application of custom device labels for individual connected lighting control devices.
      k. Fade rate settings.

2.04 SYSTEM BACKBONE AND SYSTEM INTEGRATION EQUIPMENT

A. System Controller: Multi-tasking, real-time digital control processor consisting of modular hardware with plug-in enclosed processors, communication controllers, and power supplies.
   1. Basis-of-Design Product: Subject to compliance with requirements, provide nLight; Acuity Brands Lighting, Inc.;
   2. System Controller Processor: 32-bit microprocessor operating at a minimum of 1 GHz.
   3. System Controller Memory: Minimum of 512MB memory, with a minimum of 4GB non-volatile flash, to support operating system and databases.
   4. System Controller Functions:
      a. Time-based control of downstream wired and wireless network devices.
      b. Linking into an Ethernet network.
         ~~Integration with Building Management Systems (BMS) and Heating, Ventilation and Air Conditioning (HVAC) equipment.~~

~~Connection to various software interfaces, including management interface, historical database and analytics interface, and visualization interface.~~

~~Integral web server to support system controller configuration and diagnostics with control and visualization of connected devices.~~

~~Web Server Control Interface:~~

~~Display associated devices within the context of a graphical floorplan.~~

~~Provide control of output-capable devices through virtual sliders, toggle buttons, preset level widgets, and transparent layers on floorplan.~~

~~Control Capabilities:~~

~~Control of individual output devices, including control of relay state and analog dimming level where applicable.~~

~~Control of local lighting control zones, including control of relay state and analog dimming level where applicable.~~

~~Control of global lighting control zones, including control of relay state and analog dimming level where applicable.~~

~~Control of Global Profiles.~~

~~Visualization Interface:~~

~~Customizable display with the ability to superimpose colored, transparent layers representing real-time property values, including occupancy status, dimming level status, light level status, and online or offline status where applicable.~~

~~Ad hoc display of trended information via an intuitive values-over-time graph.~~

~~Report Creation:~~

~~Reports accept and graphically display trended status datasets for creator selected devices or zones of devices.~~

~~Report information displayed over a user-defined interval and date range.~~

~~Reports exportable to a standard CSV format.~~

~~Graphical touch screen to support configuration and diagnostics.~~

5. Minimum of three RJ-45 networked lighting control ports for connection to any of the following:
   a. Graphical touch screen.
   b. Wired communication bridges.
   c. Direct connection to networked wired luminaires and intelligent lighting control devices (up to 128 total devices per port).
6. Device will automatically detect all network-connected devices.
7. Capable of managing and operating a minimum of 750 networked devices (wired or wireless) per system controller.

   ~~Supports BACnet/IP and BACnet MS/TP protocols to directly interface with BMS and HVAC equipment without additional protocol translation gateways.~~

   ~~BACnet MS/TP Connection Speed: 9600 to 115200 baud rate.~~

   ~~BACnet Testing Laboratory (BTL listed) using Device Profile BACnet Building Controller (B-BC) with outlined enhanced features.~~

   ~~Integral FIPS 140-2, Level 1 cryptographic module.~~

   ~~Supports RESTful API for control of BACnet objects, user management, date and time, and file management.~~
8. NEMA 1 enclosure with Class 1 and Class 2 separation.
   a. Power Supply Voltage: 120 to 277V(ac).
9. Automatic algorithm to eliminate redundant, wireless networked paths to streamline communication between the system controller and end devices.
10. System Controller Security Provisions:

a. Disallow the use of default passwords and require passwords to be updated prior to use.
b. Support user role-based access, such as administrator, user, and viewer.
c. Signed firmware to ensure that unmodified, authentic software is always installed.
d. IP-based communication protected with strong encryption algorithms such as AES or TLS1.2+.
e. Prevent rollback of firmware to firmware versions with known, critical vulnerabilities.
f. Valid cybersecurity listing through a third party.

~~Cellular Remote Access: Cellular router and modem for remote access.~~

~~Router supports remote access to at least five system controllers on its local area network or network subnet.~~

~~Remote access capable of device setting updates, schedule updates, system performance optimization, and diagnostics.~~

~~Remote access enabled through outbound communication from router to an outside source. Solutions that begin communication via inbound requests for network access are unacceptable.~~

~~Router supports outbound communication to manufacturer-hosted portal using TLS1.2 or greater in-transit encryption over a cellular or Ethernet connection.~~

~~Router with integral firewall to prevent unauthorized access to devices connected to its local area network port.~~

~~Router includes cellular SIM capable of connection to AT&T, or T-Mobile where networks are available.~~

~~Outbound communication from the router limited to whitelisted endpoints. Devices that allow unrestricted communication are unacceptable.~~

~~Outbound communication from router includes only lighting control system information.~~

2.05 WIRED NETWORKED DEVICES

A. Wired Networked Wall Switches, Dimmers, Scene Controllers:
1. Basis-of-Design Product: Subject to compliance with requirements, provide nLight; Acuity Brands Lighting, Inc.; nPODMA series. nPODM or comparable product by one of the following:
   a. Cooper Industries, Inc.
   b. Current Lighting, NX Wired
2. Mounting: Suitable for installation in single-gang switch box.
3. Communication and low-voltage power delivered via standard low-voltage network cabling with RJ-45 connectors.
4. All switches detect valid communication and blink a unique LED pattern to visually indicate a potential wiring issue.
5. Devices with mechanical push buttons provide tactile and LED user feedback.
6. Devices with mechanical push buttons manufactured with custom button labeling.
7. Wall switch and dimmer options:
   a. Number of control zones: As indicated on drawings.
   b. Control Types Supported:
      1) On/Off.
      2) On/Off/Dimming.
      3) On/Off/Dimming/Correlated Color Temperature Control for specific luminaire types.
   c. Color: White.

8. Scene Controller Options:
    a. Number of Scenes: 1.
    b. Control Types Supported:
        1) On/Off.
        2) On/Off/Dimming.
        3) Preset Level Scene Type.
        4) On/Off/Dimming/Preset Level for Correlated Color Temperature.
        5) Reprogramming of other devices within daisy-chained zone to implement user-selected lighting scene including manual start/stop from the scene controller, or optionally programmed automatic stop after a user-selectable duration between five minutes and 12 hours.
        6) Selecting a lighting profile to be run by device's upstream controller to implement a selected lighting profile across multiple zones including manual start/stop from the scene controller, or optionally programmed automatic stop after a user selectable duration between five minutes and 12 hours.
    c. Color: Ivory.

B. Networked Graphic Wall Stations:
1. Basis-of-Design Product: Subject to compliance with requirements, provide nLight; Acuity Brands Lighting, Inc.; nPOD TOUCH or comparable product by one of the following:
    a. Cooper Industries, Inc.
    b. Current Lighting, NX Wired
2. Mounting: Suitable for installation in single-gang switch box.
3. Integral 3.5-inch (88 mm) capacitive full-color touch screen.
4. Power via polarity insensitive Class 2 low-voltage 15 to 24V (dc) power supply.
5. Device enables mobile application control of control zones and scenes through Bluetooth.
6. Communication over standard low-voltage network cabling with RJ-45 connectors.
7. User-customizable screen saver utilizing uploaded image file in common file format including jpg, png, gif, bmp, or tif.
8. Capable of configuration of all switches, dimmers, control zones, and lighting preset scenes via password-protected setup screens.
9. Graphic Wall Station Options:
    a. Number of Control Zones: Up to 16.
    b. Number of Scenes: Up to 16.
    c. Profile Scene Duration: User configurable from five minutes to 12 hours.
    d. Color: White.

C. Digital Time Clock:
1. Basis-of-Design Product: Subject to compliance with requirements, provide nLight; Acuity Brands Lighting, Inc.; nDTC or comparable product by one of the following:
    a. Cooper Industries, Inc.
    b. Current Lighting, NX Wired
2. Controls a linear bus of lighting devices suppling all time functions without connection to a system controller.
    a. Programming of the linear bus of lighting devices must not require additional hardware, including computers, specialized dongles, or other connection devices.
    b. Programming of the linear bus exclusively done through the touch-screen interface.
3. Capable of up to 32 schedules. Each schedule consists of one set of On and Off times per day for each day of the week and for each of two holiday lists. Schedules assignable to any individual relay or group of relays.

4. Operates from non-volatile memory so that all system programming is retained indefinitely.
5. Mounted inside a relay panel to eliminate the necessity for additional enclosures for complete installation.
6. Capacitive 3.5-inch (88 mm), full-color touch screen.

D. Wired Networked Auxiliary Input / Output (I/O) Devices:
1. Basis-of-Design Product: Subject to compliance with requirements, provide nLight; Acuity Brands Lighting, Inc.; nIO series or comparable product by one of the following:
   a. Cooper Industries, Inc.
   b. Current Lighting, NX Wired
2. Plenum rated.
3. Mounting: inline wired.
4. Communication and low-voltage power delivered to each device via standard low-voltage network cabling with RJ-45 connectors.
5. Auxiliary Input/Output Devices Options:
   a. Contact closure or pull-high input.
      1) Input programmable to support maintained or momentary inputs that can activate local or global scenes and profiles, activate lights at a preconfigured level, ramp light level up or down, or toggle lights on/off.
   b. 0-10V analog input.
      1) Input supports zero to 10 V dimming output control from a dimmer switch.
      2) Input programmable to function as a daylight sensor.
   c. RS-232/RS-485 digital input.
      1) Input supports activation of up to four local or global scenes and profiles, and on/off/dimming control of up to 16 local control zones.
      2) Provides relay and dimming level status to external device (e.g. Touchscreen) when polled.
   d. 0-10V dimming control output, capable of sinking up to 20mA.
      1) Output programmable to support all standard sequence of operations supported by system.
   e. Digital control output via eldoLED LEDcode communication.
      1) Output programmable to support light intensity control, as well as optional correlated color temperature (CCT) control, of the connected luminaire.

E. Wired Networked Occupancy and Photosensors:
1. Basis-of-Design Product: Subject to compliance with requirements, provide nLight; Acuity Brands Lighting, Inc.; nCM, nCMB, nWV, or nHW series nCM or comparable product by one of the following:
   a. Cooper Industries, Inc.
   b. Current Lighting, NX Wired
2. Detect the presence of human activity within space and fully control the on/off function of lights.
3. Utilize passive infrared (PIR) technology, which detects occupant motion, to initially turn lights on from an off state, thus preventing false on conditions. Ultrasonic and Microwave-based sensing technologies are unacceptable.
4. Dual technology sensors used in locations where a second method of sensing is necessary to adequately detect maintained occupancy (such as in rooms with obstructions).
5. Dual technology sensors must have one sensing technology not motion dependent to detect occupancy. Acceptable dual technology includes PIR/Microphonics (also known as

Passive Dual Technology or PDT), which detects both occupant motion and sounds indicating occupants. Sensors where both technologies detect motion (PIR/Ultrasonic) are unacceptable.

6. All sensing technologies are acoustically passive, meaning they do not transmit sounds waves of any frequency (for example in the Ultrasonic range), as these technologies have the potential for interference with other electronic devices within the space (such as electronic white board readers and hearing devices). Acceptable detection technologies include Passive Infrared (PIR), and/or Microphonic technology. Ultrasonic and Microwave-based sensing technologies are unacceptable.
7. Ceiling, fixture, recessed, and corner mounted sensors available, with multiple lens options available customized for specific applications.
8. Communication and low-voltage power delivered to each device via standard low-voltage network cabling with RJ-45 connectors.
9. All sensors detect valid communication and blink a unique LED pattern to visually indicate a potential wiring issue.
10. Sensor programming parameter available and configurable remotely from the software and locally via the device push button.
11. Ceiling mount occupancy sensors include one integrated dry contact switching relay, capable of switching 1 A at 24 V, resistive only.
12. Sensors available with one or two occupancy "poles," each of which provides a programmable time delay.
13. Photosensor/daylight override, automatic dimming control, and low temperature/high humidity operation.
14. Photosensor provide one on/off set-point and include a dead band to prevent the artificial light from cycling. Delay incorporated into the photosensor to prevent rapid response to passing clouds.
15. Photosensor and dimming sensor's set-point and dead band automatically calibrated through the sensor's microprocessor by initiating an "Automatic Set-Point Programming" procedure. Min and max dim settings as well as set-point may be manually entered or modified.
16. Dead band setting verified and modified by the sensor automatically every time the lights cycle to accommodate physical changes in the space (i.e., furniture layouts, lamp depreciation, or lamp outages).
17. Dual zone option available for On/Off Photosensor, Automatic Dimming Control Photosensor, or Combination units. The secondary daylight zone capable of being controlled as an "offset" from the primary zone.

F. Wired Networked Wall Switch Sensors:
   1. Basis-of-Design Product: Subject to compliance with requirements, provide nLight; Acuity Brands Lighting, Inc.; nWSXA LV nWSX LV or comparable product by one of the following:
      a. Cooper Industries, Inc.
      b. Current Lighting, NX Wired
   2. Mounting: Suitable for installation in single-gang switch box.
   3. Communication and low-voltage power delivered via standard low-voltage network cabling with RJ-45 connectors.
   4. All switches detect valid communication and blink a unique LED pattern to visually indicate a potential wiring issue.
   5. Devices with mechanical push buttons provide tactile and LED user feedback.
   6. Wall Switch Sensor Options:

a. User Input Control Types: As indicated on drawings.
b. Occupancy Sensing Technology: As indicated on drawings.
c. Daylight Sensing Option: Inhibit Photosensor.
d. Color: White.

G. Wired Networked Power Packs:
1. Basis-of-Design Product: Subject to compliance with requirements, provide nLight; Acuity Brands Lighting, Inc.; nPP16 series or comparable product by one of the following:
a. Cooper Industries, Inc.
b. Current Lighting, NX Wired.
2. Plenum rated.
3. Communication will be delivered to each device via standard low-voltage network cabling with RJ-45 connectors.
4. Supply Voltage: 120 to 277 V(ac).
5. Relay Output: Class 1 relay rated for 16 A at 277 V(ac) and 1/2 HP at 120 V(ac).
6. Dimming Output: 0-10 VDC Dimming output.
7. Sink Current: 100 mA at 0-10 V(dc).
8. Mounting: Integral 1/2-inch (16-mm) chase nipple. Plastic clips into junction box are unacceptable.

H. Wired Networked Relay and Dimming Panel:
1. Basis-of-Design Product: Subject to compliance with requirements, provide nLight; Acuity Brands Lighting, Inc.; ARP or comparable product by one of the following:
a. Cooper Industries, Inc.
b. Current Lighting, NX Wired
2. Outputs: 4 Individual relays per panel, with an equal number of individual 0-10 V(dc) dimming outputs.
3. Field Configurable Relays (FCR):
a. Field configurable to operate in single-, double-, or triple-pole relay groupings.
b. Field configurable to operate as normally closed or normally open.
c. Provides visual status of current state and manual override control of each relay.
d. Minimum Relay Contact Ratings:
1) 40 A at 120-480 V(ac) Ballast.
2) 16 A at 120-277 V(ac) Electronic.
3) 20 A at 120-277 V(ac) Tungsten.
4) 20 A at 48V (dc) Resistive.
5) 2 HP at 120 V(ac).
6) 3 HP at 240-277 V(ac).
7) 65kA SCCR at 480 V(ac).
4. Dimming Output Rating: Minimum of 100 mA sink current per dimming output.
5. Relay and dimming outputs individually programmable.
6. Listing: UL 924 for control of emergency lighting circuits.
7. Power Supply: Integrated 120-277 V(ac) supply.
8. Low-Voltage Sensor Input:
a. Configurable to support any of the following input types:
1) Indoor Photosensor.
2) Outdoor Photosensor.
3) Occupancy Sensor.
4) Contact Closure.

b. Low-voltage sensor input provides 24 V(dc) power for sensor so additional auxiliary power supplies are not required.
c. Sensor input supports all standard sequence of operations.

9. Integrated Digital Time Clock for local schedule control.
10. Contact Closure Input: One for each group of eight output relays that acts as a panel override to activate the normally configured state of all associated relays (i.e., normally open or normally closed).
11. Panel supplies current limited low-voltage power to other networked devices connected via low-voltage network cable.
12. Enclosure:
    a. Enclosure Rating: NEMA 1.
    b. Mounting: Surface mounted.
    c. Cover: Hinged cover with keyed lock.

I. Wired Networked Bluetooth Low-Energy Programming Device:
1. Basis-of-Design Product: Subject to compliance with requirements, provide nLight; Acuity Brands Lighting, Inc.; nIO BT or comparable product by one of the following:
    a. Cooper Industries, Inc.
    b. Current Lighting, NX Wired
2. Plenum rated, inline wired, and screw mountable.
3. Communication and low-voltage power delivered to device via standard low-voltage network cabling with RJ-45 connectors.
4. Bluetooth communication allows connection from smartphone application for programming device settings within the local daisy-chain zone.
5. Device provides visual indication of remote Bluetooth connection via LED integrated into device enclosure such that it is visible from all angles while the zone is being programmed.

J. Wired Networked Communication Bridge:
1. Basis-of-Design Product: Subject to compliance with requirements, provide nLight; Acuity Brands Lighting, Inc.; nBRG or comparable product by one of the following:
    a. Cooper Industries, Inc.
    b. Leviton Manufacturing Co., Inc.
2. Suitable for surface mount to a standard 4 by 4-inch (100 by 100 mm) square junction box.
3. Communication Ports: Eight RJ-45 ports for connection to lighting control zones (up to 128 devices per port), additional network bridges, and System Controller.
4. Capable of aggregating communication from multiple lighting control zones for purposes of minimizing backbone wiring requirements back to System Controller.
5. Power Input: Class 2 low-voltage supplied locally via a directly wired power supply.
6. Wired Bridge capable of redistributing power from its local supply and connected lighting control zones with excess power to lighting control zones with insufficient local power. Architecture enables loss of power to a particular area to be less impactful on network lighting control system.

PART 3 EXECUTION

3.01 INSTALLATION OF WIRING

A. Wiring Method: Comply with Section 260519 "Low-Voltage Electrical Power Conductors and Cables" and Section 260523 "Control-Voltage Electrical Power Cables." Minimum conduit size is 1/2 inch.

1. Comply with requirements for cable trays specified in Section 260536 "Cable Trays for Electrical Systems."
2. Comply with requirements for raceways and boxes specified in Section 260533.13 "Conduits for Electrical Systems," and Section 260533.16 "Boxes and Covers for Electrical Systems,"

B. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Install lacing bars and distribution spools.

3.02 IDENTIFICATION

A. Identify system components, wiring, cabling, boxes, cabinets, and terminals. Comply with identification requirements specified in Section 260553 "Identification for Electrical Systems."

B. Identify field-installed conductors, interconnecting wiring, and components; install warning signs complying with Section 260553 "Identification for Electrical Systems."

C. Identify all controls with device address.

D. Label each device cable within 6 inch of connection to bus power supply or termination block.

3.03 FIELD QUALITY CONTROL

A. Acceptance Testing Preparation:
1. Test continuity of each circuit.

B. Field tests and inspections must be witnessed by Owner and Architect, or by authorities having jurisdiction upon request. Tenant

C. Tests and Inspections: Engage a factory-authorized service representative to perform test inspections.
1. Test each zone using local and remote control hardware.
2. Perform each visual and mechanical inspection and electrical test stated in NETA ATS. Certify compliance with test parameters.

D. Nonconforming Work:
1. Lighting controls will be considered defective if they do not pass tests and inspections.
2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

E. Field Test Reports: Prepare field test reports.
1. Prepare functionality and inspection reports, including a certified report that identifies controls included and describes test results. Include notation of deficiencies detected, remedial action taken, and observations made after remedial action.
2. Include list of all points created from actual tests of all addressed control points for lamps, ballasts, manual controls, and sensors.

~~**REMOTE ACCESS**~~

~~Digital network lighting control system capable of remote access by manufacturer with the following features:~~

~~System diagnostics including detection of fault condition in hardware or connected devices.~~

~~Access to all connected devices for complete programming including scheduling of time-of-day events and device parameters necessary to meet required sequence of operations.~~

~~Browser-based interface to verify system functionality.~~

~~On-demand access to manufacturer technical support for remote troubleshooting, diagnostics, configuration, and programming.~~

~~Owner training on the digital network lighting control system available remotely.~~

~~Remote access system fully functional over commercial celluar connection or Internet-connected ethernet network.~~

~~All hardware associated with remote access including cellular modem and cellular antenna are to remain on-site regardless of warranty or cellular contract status.~~

3.04 SYSTEM STARTUP

A. Engage a factory-authorized service representative to perform startup service.
   1. Complete installation and startup checks in accordance with manufacturer's published instructions.
   2. Activate luminaires and verify that all maximum output levels match output levels detailed in an Owner-approved sequence of operations.
   3. Confirm correct communications wiring, initiate communications between control devices and controller/gateways, and program the lighting control system in accordance with approved configuration schedules, time-of-day schedules, and input override assignments.
   4. Program network devices to meet required sequence of operations.
   5. Program and verify all sequence of operations.
   6. Create backup of system programming.
   7. Assist in installation of system software on customer-provided workstation or server.
   8. Verify bidirectional communication of manufacturer-provided cellular router with manufacturer-managed remote access portal.

B. Commissioning Walkthrough: Engage factory-authorized service representative to collaborate with third-party commissioning agent Collaborate with third-party commissioning agent to demonstrate lighting control system functionality and verify the system meets the specified Project requirements.

3.05 CLOSEOUT ACTIVITIES

A. Enhanced Documentation: Engage lighting system manufacturer to provide comprehensive system documentation including detailed programming, sequence of operation data per Project specifications, and related code requirements.

B. Training: Engage lighting system manufacturer to provide comprehensive system overview, software overview, and documentation relating to system operation and maintenance.

3.06 PROTECTION

A. After installation, protect digital network lighting controls from construction activities. Remove and replace items that are contaminated, defaced, damaged, or otherwise caused to be unfit for use prior to acceptance by Owner.

3.07 MAINTENANCE

A. Engage a factory-authorized service representative to perform on-site system adjustments.
   1. On-Site Occupancy Adjustments: When requested within 24 months from date of Substantial Completion, provide on-site settings adjustments to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.
   2. Prepare and submit report after each visit that details activities performed.

B. Engage a factory-authorized service representative to perform remote system adjustments.
   1. Remote Occupancy Adjustments: When requested within 12 months from date of Substantial Completion and project registration with lighting control system manufacturer,

provide remote settings adjustments to suit actual occupied conditions. Provide up to ~~???Insert number???~~2 sessions to Project during other-than-normal occupancy hours for this purpose.

~~System to include manufacturer-provided cellular communication hardware and connection to the system for a minimum of 12 months after substantial completion to allow for factory representative assistance with settings adjustments and system sustainment.~~

~~For the remaining duration of the maintenance term, or in the event cellular connectivity is not available, manufacturer assistance must be available through an Owner-provided, Internet-connected network.~~

2. Prepare and submit report after each session that details activities performed.

~~Maintenance Service Agreement:~~

~~Beginning at Substantial Completion, verify that maintenance service agreement includes 12 months' full maintenance by manufacturer's authorized service representative.~~

~~Include semiannual onsite and remote monthly preventive maintenance.~~

~~Preventative maintenance to include:~~

~~System diagnostic reports.~~

~~System performance checks.~~

~~Device firmware updates.~~

~~Programming adjustment as required for proper lighting system operation.~~

~~Expedited factory direct warranty processing, replacement, and programming of defective components.~~

~~Verify that parts and supplies are manufacturer's authorized replacement parts and supplies.~~

END OF SECTION