WEINSTEIN A+U

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ADDENDUM 01

Project Name:	South King Fire Administrative Building Improvements
Owner:	South King Fire
Issued by:	Lauren Rock, Weinstein A+U
Issue Date:	May 9, 2025

To All Bidders: Attention is called to the following items effective May 9, 2025, which shall be added to, deleted from, or changed from the Contract Documents, thereby incorporating the addendum as part of the Contract Documents.

Attachments:
A002 Entry Ramp
E101 Site Plan – Electrical
E600 Lighting Fixture Schedule
26 09 23 Lighting Control System

Drawing Items (changes have been clouded)

A002	Revised 1/A002 to indicate landscape light fixture locations.
	Added 8/A002 Section Detail – Undercut for Light at Stair
	Added 9/A002 Section Detail – Undercut for Light at Ramp
E101	Revised lighting at main entry ramp and stair.
	Revised to include label for fixture type WL-03 at wall-mounted illuminated signage at main entry.
	New sheet notes #2 and #3.
E600	Added light fixture Type B.
	Revised light fixture Type UC.
	Revised light fixture Type WL-2.

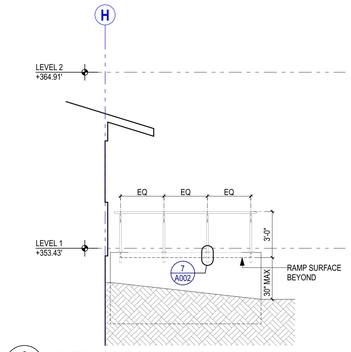
Specification Items

26 09 23	Replace section in its entirety with the attached. Lighting controls shall be nLight by Acuity to match Owner's standard. No substitutions.

Questions

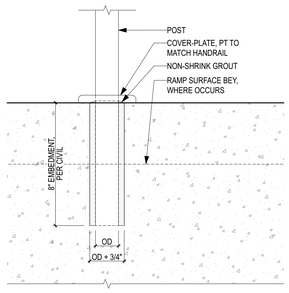
01.	Question: Are there drawings of the existing building?
	Answer: Scans of the original 1984 drawings have been posted to the SKF Bid Posting website.

End of Addendum 01.



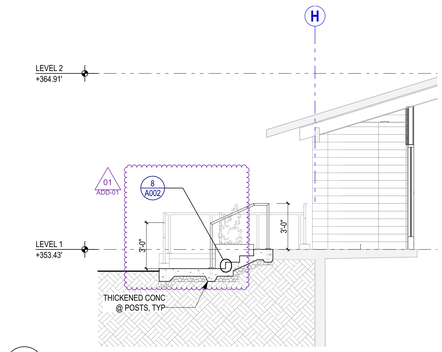
6 A002 ENTRY RAMP ELEVATION - WEST

SCALE: 1/4" = 1'-0"



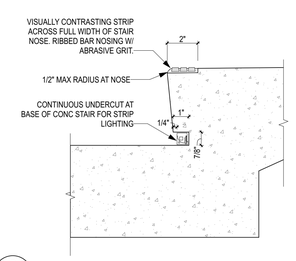
7 A002 HANDRAIL AT ENTRY RAMP - SECTION DETAIL

SCALE: 3" = 1'-0"



5 A002 SECTION AT EXTERIOR RAMP & STAIR N/S

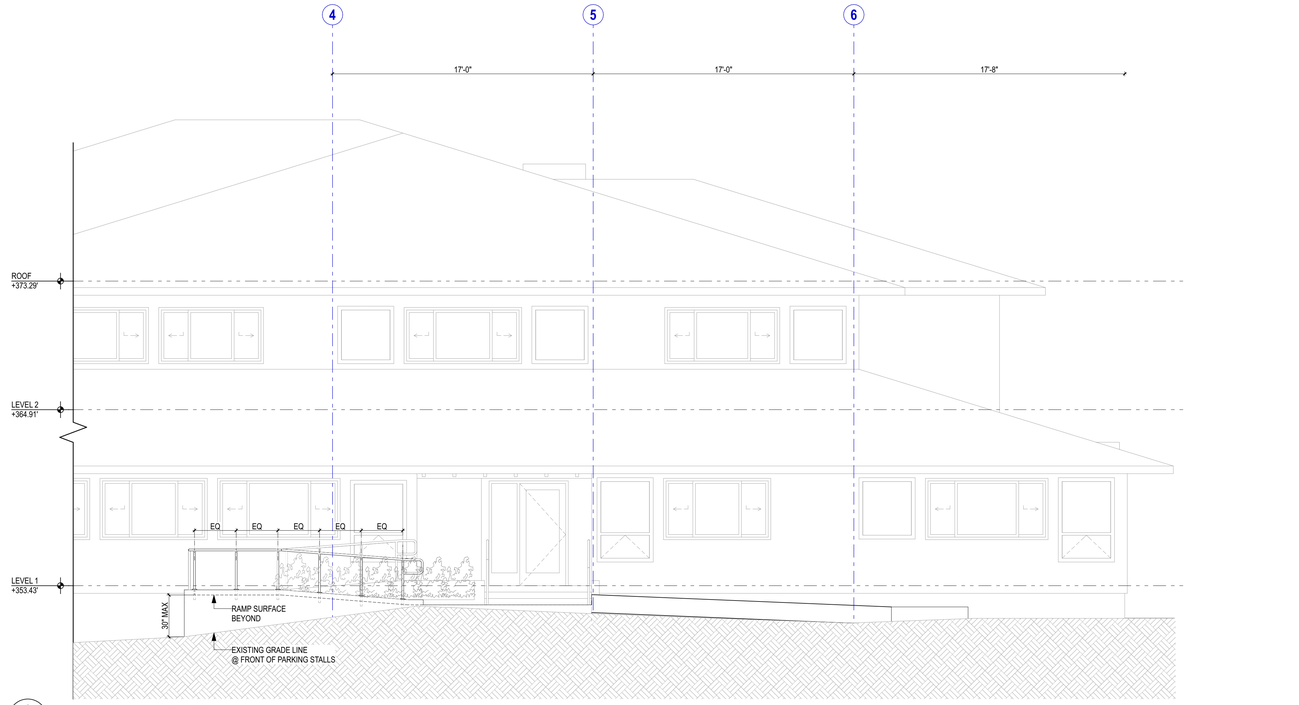
SCALE: 1/4" = 1'-0"



8 A002 SECTION DETAIL - UNDERCUT FOR LIGHT AT STAIR

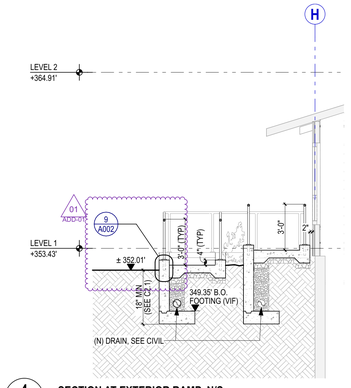
SCALE: 3" = 1'-0"

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A205-01



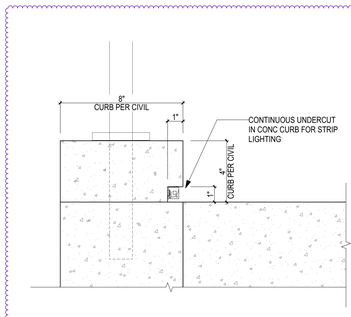
2 A002 ENTRY RAMP ELEVATION - SOUTH

SCALE: 1/4" = 1'-0"



4 A002 SECTION AT EXTERIOR RAMP N/S

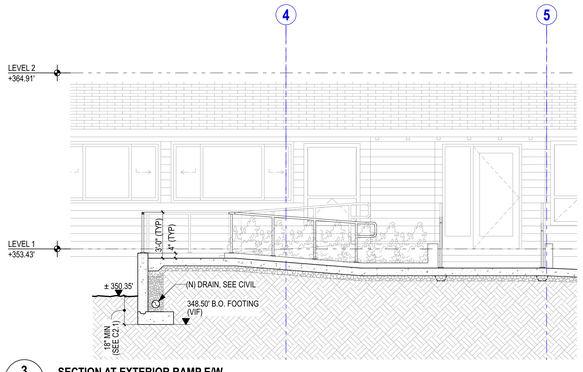
SCALE: 1/4" = 1'-0"



9 A002 SECTION DETAIL - UNDERCUT FOR LIGHT AT RAMP

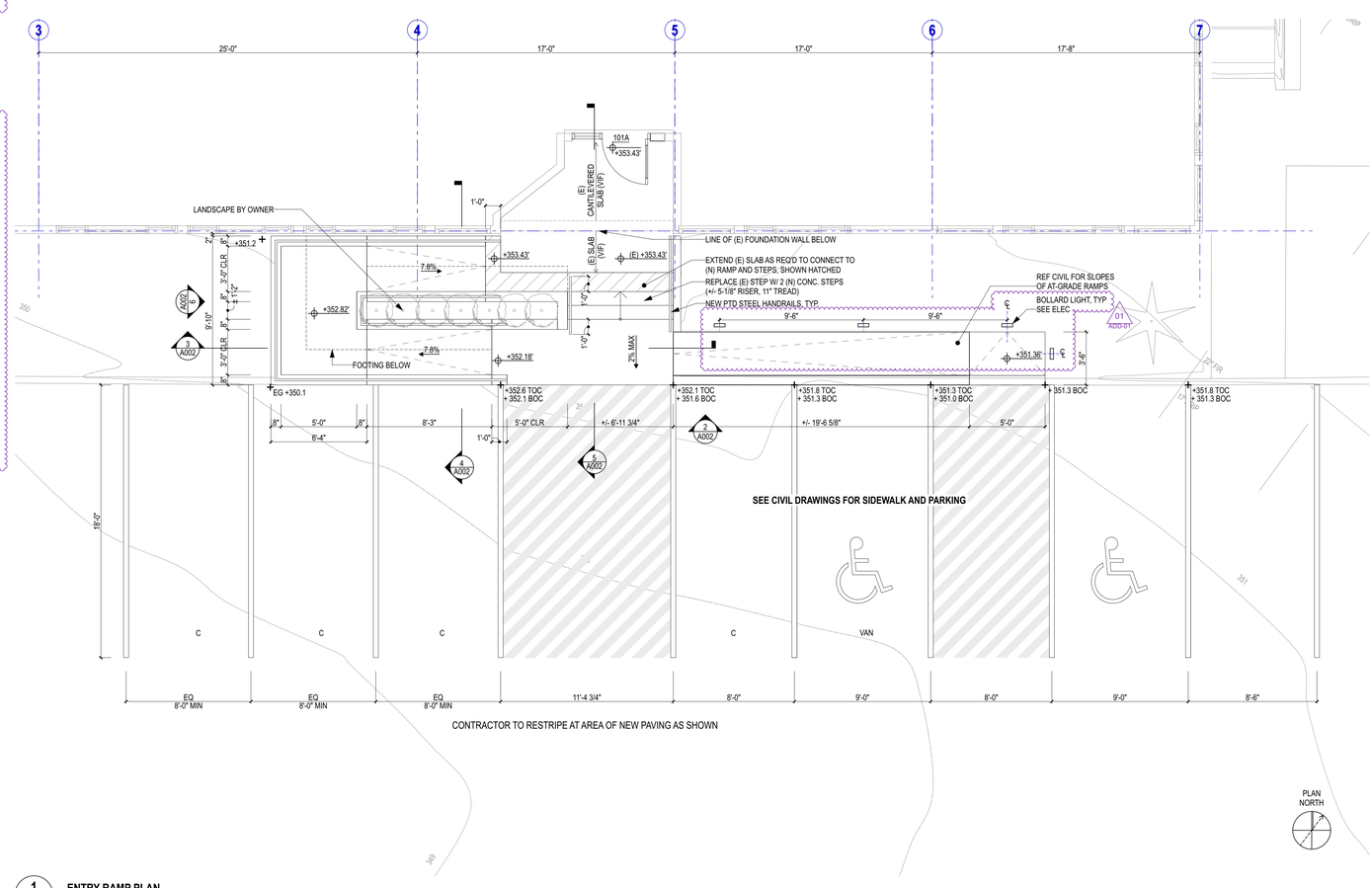
SCALE: 3" = 1'-0"

01
A205-01



3 A002 SECTION AT EXTERIOR RAMP E/W

SCALE: 1/4" = 1'-0"



1 A002 ENTRY RAMP PLAN

SCALE: 1/4" = 1'-0"

Rev	Date	Issue
01	05/09/25	ADD-01

CONSULTANT'S LOGO

SOUTH KING FIRE ADMINISTRATIVE BUILDING IMPROVEMENTS

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Federal Way, WA 98003

24022
Project #

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JURISDICTIONAL APPROVAL STAMP

3300 REGISTERED ARCHITECT
EDWARD WEINSTEIN
State of Washington

BID SET
Issue

05/02/25
Issue Date

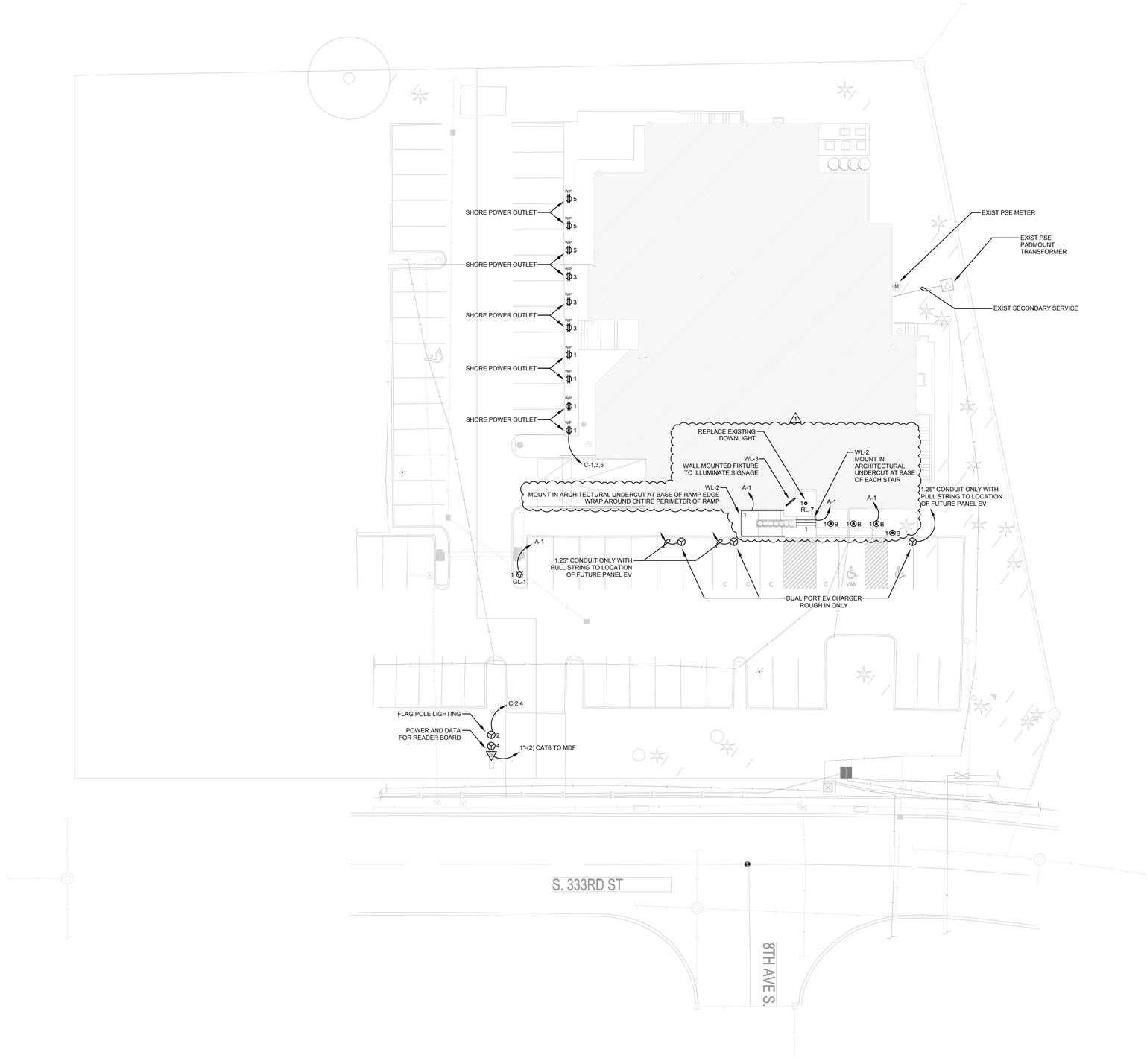
ENTRY RAMP
Sheet Title

A002

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SHEET NOTES:

1. SAWCUT, CUT, EXCAVATE, BACKFILL AND PATCH EXISTING CONCRETE, ASPHALT, EARTH, AND LANDSCAPING AS REQUIRED TO INSTALL UNDERGROUND CONDUITS TO DEVICES SHOWN.
2. CORE AND SLEEVE EXTERIOR WALL OF BUILDING AS REQUIRED TO ROUTE CONDUITS INTO BUILDING FROM EXTERIOR DEVICES.
3. ROUTE CIRCUITRY FOR TYPE WL-2 FIXTURES VIA REMOTE POWER SUPPLY IN GARAGE.



1 E101 SITE PLAN - ELECTRICAL
SCALE: 3/32" = 1'-0"

Rev	Date	Issue
1	5/9/2025	ADDENDUM 01

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BID SET
Issue

5/2/25
Issue Date

SITE PLAN - ELECTRICAL
Sheet Title

E101

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Template version: WAU-ACZ7-MAIN Release date: 03/20/2024 Server Path: //Volumes/FileServer/Office/Project/Resources/5-Design/01-Archicad 27-Resources/01-AC27-Templates/WAU-ACZ7-MAIN.tpl
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LIGHTING FIXTURE SCHEDULE

TYPE	LAMPS	MANUFACTURER	DESCRIPTION
B	LED 12.5W 3000K	SISTEMALUX MINI LOOK	8.5" ALUMINUM BOLLARD. PROVIDE CONCRETE BASE FOR MOUNTING. UL LISTED FOR WET LOCATIONS.
GL-1	LED 7W 3500K	B-K LIGHTING DELTA STAR LED	ROTATABLE GROUND MOUNTED FLOOD LIGHT. POWER PIPE MOUNTED WITH KNUCKLE. MEDIUM FLOOD DISTRIBUTION. TYPE TR SERIES REMOTE MOUNTED, TRANSFORMER. DIMMABLE.
PL-1	LED	FINELITE	AIRCRAFT CABLE HUNG 2" WIDE X 4' LONG LINEAR DIRECT. SUSPEND FLUSH WITH WOOD SLAT CEILING OPENING.
PL-2	LED	FINELITE	AIRCRAFT CABLE HUNG 2" WIDE X 2' LONG LINEAR DIRECT. SUSPEND FLUSH WITH WOOD SLAT CEILING OPENING.
PL-3	LED 13W 3500K	BETA CALCO EXY MIDNIGHT BLUE	DECORATIVE CABLE HUNG PENDANT. SMALL 6.3" DIAMETER.
PL-4	LED 26W 3500K	BETA CALCO EXY RED	DECORATIVE CABLE HUNG PENDANT. LARGE 15" DIAMETER. MOUNTING ACCESSORIES FOR SLOPED CEILING.
RL-1	LED 18.4W 3500K	PINNACLE EV4D	RECESSED 4" X 6' LED FIXTURE WITH LENS. COMPATIBLE WITH ARMSTRONG TECH ZONE CEILING SYSTEM. PROVIDE REQUIRED RECESSED MOUNTING TRIMS. 0-10V DIMMING DRIVER. SHALLOW DEPTH.
RL-2	LED 18.4W 3500K	PINNACLE EV4D	SAME AS RL-1 EXCEPT MOUNT IN GWB CEILING.
RL-3	LED 18.4W 3500K	PINNACLE EV4D	RECESSED 4" X 4' LED FIXTURE WITH LENS. COMPATIBLE WITH ARMSTRONG TECH ZONE CEILING SYSTEM. PROVIDE REQUIRED RECESSED MOUNTING TRIMS. 0-10V DIMMING DRIVER. SHALLOW DEPTH.
RL-4	LED 18.4W 3500K	PINNACLE EV4D	RECESSED 4" X 8' LED FIXTURE WITH LENS. COMPATIBLE WITH ARMSTRONG TECH ZONE CEILING SYSTEM. PROVIDE REQUIRED RECESSED MOUNTING TRIMS. 0-10V DIMMING DRIVER. SHALLOW DEPTH.
RL-5	LED 11.8W 3500K	GOTHAM EVO SERIES	4 INCH ROUND RECESSED LED DOWNLIGHT WITH SPECULAR CLEAR ALZAK REFLECTOR. SHALLOW DEPTH.
RL-6	LED 11.8W 3500K	GOTHAM EVO SERIES	SAME AS RL-5 EXCEPT WALL WASH DISTRIBUTION
RL-7	LED 11.8W 3500K	GOTHAM EVO SERIES	4 INCH ROUND RECESSED LED DOWNLIGHT WITH SPECULAR CLEAR ALZAK REFLECTOR. SHALLOW DEPTH. UL LISTED FOR WET LOCATIONS.
RL-8	LED 18.4W 3500K	PINNACLE EV4D	RECESSED 4" X 3' LED FIXTURE WITH LENS. COMPATIBLE WITH ARMSTRONG TECH ZONE CEILING SYSTEM. PROVIDE REQUIRED RECESSED MOUNTING TRIMS. 0-10V DIMMING DRIVER. SHALLOW DEPTH.
RL-9	LED 11.8W 3500K	GOTHAM EVO SERIES	4 INCH ROUND RECESSED LED DOWNLIGHT WITH SHOWER RATED TRIM. SHALLOW DEPTH.
SL-1	LED 22W 3500K	LITHONIA BLWP	SURFACE MOUNTED WRAPAROUND
UC	LED	KELVIX 409 I	UNDERCOUNTER LINEAR STRIP. PROVIDE SWITCH AND OCCUPANCY SENSOR AT FIXTURE.
WL-1	LED 18W 3500K	WAC LIGHTING BRINK BATHROOM SCONCE	36" WIDE VANITY FIXTURE
WL-2	LED 5W/FT 3000K	PURE EDGE LIGHTING FN LR7	FLEXIBLE LED STRIP WITH 3 SIDED LENS AND UNIFORM ILLUMINATION. CONTINUOUS ROW. SURFACE MOUNTED. PROVIDE WITH REMOTE POWER SUPPLY. UL LISTED FOR WET LOCATIONS.
WL-3	LED 18W 3500K	LUMINII KLW	KENDO L SURFACE WET LINEAR ILLUMINATION SYSTEM WITH ADJUSTABLE HINGED BRACKET. 4' LONG. STATIC WHITE. UL LISTED FOR WET LOCATIONS.
X	LED 1W	PHILIPS 45V SERIES BEGHELLI OL2 SERIES EMERGILITE WLSNX SERIES	CEILING/WALL MOUNT EDGE LIT LED EXIT SIGN WITH BATTERIES, SELF DIAGNOSTICS AND ALL MOUNTING ACCESSORIES REQUIRED. PROVIDE ARROWS AND FACES AS SHOWN ON DRAWINGS. PROVIDE WHITE BODY WITH GREEN LETTERS AND UNIFORM LENS OVER LED.

ALL COLORS, FINISHES, ETC. ARE BY ARCHITECT FROM MANUFACTURER'S STANDARD COLOR OPTIONS

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JURISDICTIONAL APPROVAL STAMP

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Issue

5/2/25
Issue Date

LIGHTING FIXTURE SCHEDULE
Sheet Title

E600

SECTION 260923 – LIGHTING CONTROL

PART 1 - GENERAL

1.1 SUMMARY

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

1.2 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.

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

G. 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.

1.3 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.

C. Contractor Startup/Commissioning Worksheet.

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

E. Field quality-control reports.

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

1.4 CLOSEOUT SUBMITTALS

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

B. Warranty documentation.

1.5 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.
   2. 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.
   3. Cellular Connectivity: Manufacturer capable of cellular connectivity to a networked lighting control systems available to provide remote support within the continental United States.
   4. On-Site Support: Manufacturer capable of providing a 72-hour, on-site response time within the continental United States.
   5. 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:
      a. Remote and on-site emergency response.
      b. Remote system performance checks.
      c. Remote diagnostics.
      d. Replacement parts.

1.6 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

2.1 MANUFACTURER

A. Specification is based on Nlight by Acuity. No substitutions allowed.

2.2 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.

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

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

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.

2.3 SYSTEM PERFORMANCE REQUIREMENTS

A. System Architecture:
   1. System architecture based upon the following concepts:
      a. Networkable intelligent lighting control devices.
   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.
   4. 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.
   5. 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.
   6. 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.
   7. System to include one or more system controllers that provide time-based control.
   8. 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.
   9. System controller supports both low-voltage wired and wireless RF communication within a single controller device.
   10. System devices support firmware update, either remotely or from within the application space, for purposes of upgrading functionality at a later date.
   11. 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
   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. 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.

4. System software capable of automatic discovery of all connected devices without requiring any provisioning of system or zone addresses.
5. Networked devices capable of detecting improper communication wiring and LED notification to alert installation/startup personnel.
6. 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.
7. 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.
8. Wired Networked Wall Station Scene-Control Capabilities:
    a. Preset Scenes that activate a specific combination of light levels across multiple local and global channels.
    b. Local Profile Support: Profile Scenes that modify the sequence of operation for devices in the area (group) in response to a button press to dynamically optimize occupant experience and lighting energy usage.
        1) Wall stations able to manually start and stop local profiles, or local profile capable of ending after a specific duration of time between five minutes and 12 hours.
        2) Configurable Parameters:
            a) Fixture light level.
            b) Occupancy time delay.
            c) Response to occupancy sensors (including enabling/disabling response).
            d) Response to daylight sensors (including enabling/disabling response).
            e) Enabling/disabling wall stations.
    c. Three-Way or Multi-Way Control: Multiple wall stations capable of controlling the same local and global control zones, to support "multi-way" preset scene and profile scene control.

C. System Integration Capabilities:
1. Capable of interface with third-party building management systems (BMS) to support two-way communication using BACnet/IP protocol, BACnet MS/TP protocol, and RESTful API including the following system integration capabilities:
    a. "Write" messages for control of individual devices, including control of relay and dimming output.
    b. "Write" messages for control of groups of devices through a single command, including control of relay and dimming output of all devices.
    c. "Read" messages for individual device status information.
        1) Available status will vary based on device type and capabilities, which may include relay state, dimming output, power measurement, occupancy sensor status, and photosensor light measurement.
    d. "Read" messages for group status information for occupancy, relay state, and dimming output.
    e. Activation of pre-defined system Global Profiles.

D. 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.

c. 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 across multiple areas. Occupancy, photosensor inhibit, and switch commands available across multiple controllers.

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.
6. Global Profile Capabilities:
   a. System capable of automatically modifying the sequence of operation for selected devices in response to any of the following:
      1) Time-of-day schedule.
      2) Contact closure input state.
      3) Manually triggered wired wall station input.
      4) RS-232/RS-485 command to wired input device.
      5) BACnet input command.
   b. Global Profile Capabilities:
      1) Global Profiles stored within and executed from the system controller (via internal timeclock). Dedicated software host or server is not required to be online to support automatic scheduling and/or operation of Global Profiles.
      2) Global Profile time-of-day schedules capable of recurrence settings including daily, specific days of week, every "n" number of days, weekly, monthly, and yearly. Lighting control global profile schedules support definition of start date, end date, end after "n" recurrences, or never ending.
      3) Daylight savings time adjustments capable of being performed automatically, if desired.
      4) Global Profile holiday schedules follow recurrent settings for specific U.S. holiday dates regardless if they always occur on a specific date or are determined by day/week of the month.
      5) Global Profiles capable of being scheduled to run according to timed offsets relative to sunrise or sunset. Sunrise/sunset times automatically derived from location information using an astronomical clock.
      6) Software management interface capable of displaying a graphic calendar view of profile schedules for each control zone.
      7) Global Profiles capable of manual activation directly from system controller, specially programmed wired input devices, scene-capable wired wall stations, and software management interface.
      8) Global Profiles selectable to apply to a single device, zone of devices, or customized group of devices.
      9) Global Profile Configurable Parameters:
         a) Fixture light level.

b) Occupancy time delay.
c) Response to occupancy sensors (including enabling/disabling response).
d) Response to daylight sensors (including enabling/disabling response).
e) Enabling/disabling of wall stations.

c. Local and Global Profiles backed up and stored on software's host server such that Profile backup can be applied to a replacement system controller or wired wall station.

7. System supports automated demand response capabilities with automatic reduction of light level to at least three levels of demand response, configurable for each output device.

2.4 SYSTEMS SOFTWARE INTERFACES

A. Management Interface:
1. Web-based management interface for remote system control, live status monitoring, and configuration of lighting control settings and schedules.
2. Compatible with industry-standard web browser clients.
3. Minimum of 100 unique password-protected user accounts.
4. Minimum of three user permission levels: read-only, read and change settings, and full administrative system access.
5. Capable of restricting access for user accounts to specific devices within the system.
6. All system devices capable of being given user-defined names.
7. Device identification information displayed in the Management interface including:
a. Model number.
b. Model description.
c. Serial number or network ID.
d. Manufacturing date code.
e. Custom label.
f. Parent network device.
8. Management interface capable of displaying live status of a networked luminaire or intelligent control device including:
a. Luminaire on/off status.
b. Dim level.
c. Power consumption.
d. Device temperature.
e. PIR occupancy sensor status.
f. Microphonic occupancy sensor status.
g. Remaining occupancy time delay.
h. Photosensor reading.
i. Active Profiles.
9. Management interface capable of displaying and modifying the current active settings of a networked luminaire or intelligent control device including:
a. Dimming trim levels.
b. Occupancy sensor and photosensor enable/disable.
c. Occupancy sensor time delay and light level settings.
d. Occupancy sensor response (normal or vacancy).
e. Photosensor setpoints and transition time delays.
10. 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.
11. Management interface capable of compiling a printable network inventory report.
12. Management interface capable of compiling a printable report detailing all system profiles.
13. All sensitive information stored encrypted.
14. System software updates available for automatic download and installation via the Internet.

B. System Energy Analysis and Reporting:
1. Intuitive graphical screens to facilitate simple viewing of system energy performance.
2. Energy Scorecard: Summarized display that indicates calculated energy savings in dollars or KWh.

3. Software calculates allocation of energy savings by control measures including occupancy sensors, photosensors, and manual switching.
4. Energy savings data calculated for the system as a whole.
5. Time-scaled graph showing all relay transitions.
6. Time-scaled graph showing zone occupancy time delays.
7. Time-scaled graph showing the total light level.
8. Software capable of storing information remotely onto an open-source, object-relational database, such as PostgreSQL.
9. Data stored in the database will be accessed utilizing an open standard, application programming interface, such as Open Database Connectivity (ODBC).

C. Visualization and Programming Interfaces:
1. System provides an optional web-based visualization interface that displays a graphical floorplan.
2. Graphical floorplan will offer the following types of system visualization:
a. Full Device Option: Master graphic of entire building, by floor, showing each control device installed with zones outlined including:
1) Controls embedded light fixtures.
2) Controls devices not embedded in light fixtures.
3) Daylight sensors.
4) Occupancy sensors.
5) Wall switches and dimmers.
6) Scene controllers.
7) Networked relays.
8) Wired bridges.
9) System Controllers.
10) Wired relay panels.
11) Group outlines.
b. Group-Only Option: Master graphic of the entire building, by floor, showing only control groups outlined.
c. Pan and zoom commands supported to allow smaller areas to be displayed on a larger scale simply by panning and zooming each floor's master graphic.
d. Selecting any control device displays the following as applicable:
1) Device catalog number.
2) Device name and custom label.
3) Device diagnostic information.
4) Link to further information on device including status or current configuration.
3. Programming capabilities through the application will include the following:
a. Switch, occupancy sensor, and photosensor zone 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 and copy for scene-capable devices.
j. Application of custom device labels to the Bluetooth Low-Energy Programming Devices and individual connected lighting control devices.
k. Fade rate settings.

D. 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.

2.5 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. System Controller Processor: 32-bit microprocessor operating at a minimum of 1 GHz.
   2. System Controller Memory: Minimum of 512MB memory, with a minimum of 4GB non-volatile flash, to support operating system and databases.
   3. System Controller Functions:
      a. Time-based control of downstream wired and wireless network devices.
      b. Linking into an Ethernet network.
      c. Integration with Building Management Systems (BMS) and Heating, Ventilation and Air Conditioning (HVAC) equipment.
      d. Connection to various software interfaces, including management interface, historical database and analytics interface, and visualization interface.
   4. Integral web server to support system controller configuration and diagnostics
      a. Web Server Control Interface:
         1) Display associated devices within the context of a graphical floorplan.
         2) Provide control of output-capable devices through virtual sliders, toggle buttons, preset level widgets, and transparent layers on floorplan.
         3) Control Capabilities:
            a) Control of individual output devices, including control of relay state and analog dimming level where applicable.
            b) Control of local lighting control zones, including control of relay state and analog dimming level where applicable.
            c) Control of global lighting control zones, including control of relay state and analog dimming level where applicable.
            d) Control of Global Profiles.
   5. Minimum of three RJ-45 networked lighting control ports for connection to any of the following:
   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.
   8. Multiple System Controllers capable of connection via LAN for scalability to a minimum of 20,000 networked devices.
   9. Supports BACnet/IP and BACnet MS/TP protocols to directly interface with BMS and HVAC equipment without additional protocol translation gateways.
      a. BACnet MS/TP Connection Speed: 9600 to 115200 baud rate.

b. BACnet Testing Laboratory (BTL listed) using Device Profile BACnet Building Controller (B-BC) with outlined enhanced features.
10. Integral FIPS 140-2, Level 1 cryptographic module.
11. Supports RESTful API for control of BACnet objects, user management, date and time, and file management.
12. NEMA 1 enclosure with Class 1 and Class 2 separation.
    a. Power Supply Voltage: 120 to 277V(ac).
13. Automatic algorithm to eliminate redundant, wireless networked paths to streamline communication between the system controller and end devices.
14. 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.

2.6 WIRED NETWORKED DEVICES

A. Wired Networked Wall Switches
1. Mounting: Suitable for installation in single-gang switch box.
2. Communication and low-voltage power delivered via standard low-voltage network cabling with RJ-45 connectors.
3. All switches detect valid communication and blink a unique LED pattern to visually indicate a potential wiring issue.
4. Devices with mechanical push buttons provide tactile and LED user feedback.
5. Devices with mechanical push buttons manufactured with custom button labeling.
6. Wall switch and dimmer options:
    a. Control Types Supported:
        1) On/Off.
        2) On/Off/Dimming.
        3) On/Off/Dimming/Correlated Color Temperature Control for specific luminaire types.
    b. Color: Per 262726

B. Wall Switch Occupancy Sensor: WSXA or equal

C. Exterior photocell input to relay panel

D. Wired Networked Relay Panel:
1. Outputs: 16 Individual relays per pane
2. 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).
3. Dimming Output Rating: Minimum of 100 mA sink current per dimming output.
4. Relay and dimming outputs individually programmable.
5. Listing: UL 924 for control of emergency lighting circuits.
6. 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.

7. Integrated Digital Time Clock for local schedule control.
8. Panel supplies current limited low-voltage power to other networked devices connected via low-voltage network cable.
9. Enclosure:
   a. Enclosure Rating: NEMA 1. Divide emergency circuits
   b. Surface mount with switch adjacent

PART 3 - EXECUTION

3.1 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 (13 mm).
   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.

3.2 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 (152 mm) of connection to bus power supply or termination block.

3.3 FIELD QUALITY CONTROL

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

B. 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.

C. 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.

D. 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.

3.4 REMOTE ACCESS

A. Digital network lighting control system capable of remote access by manufacturer with the following features:
   1. System diagnostics including detection of fault condition in hardware or connected devices.
   2. 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.
   3. Browser-based interface to verify system functionality.
   4. On-demand access to manufacturer technical support for remote troubleshooting, diagnostics, configuration, and programming.
   5. Owner training on the digital network lighting control system available remotely.

B. Remote access system fully functional over commercial cellular connection or Internet-connected ethernet network.

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

3.5 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: Collaborate with third-party commissioning agent to demonstrate lighting control system functionality and verify the system meets the specified Project requirements.

3.6 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.

3.7 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.

3.8 MAINTENANCE

A. Engage a factory-authorized service representative to perform on-site system adjustments.
   1. On-Site Occupancy Adjustments: When requested within 12 months from date of Substantial Completion, provide on-site settings adjustments to suit actual occupied conditions. Provide up to 2 visits to Project during other-than-normal occupancy hours for this purpose.
   2. Prepare and submit report after each visit that details activities performed.
   3. Prepare and submit report after each session that details activities performed.

END OF SECTION 26 09 23