Current

LIGHTING CONTROLS

REPCO

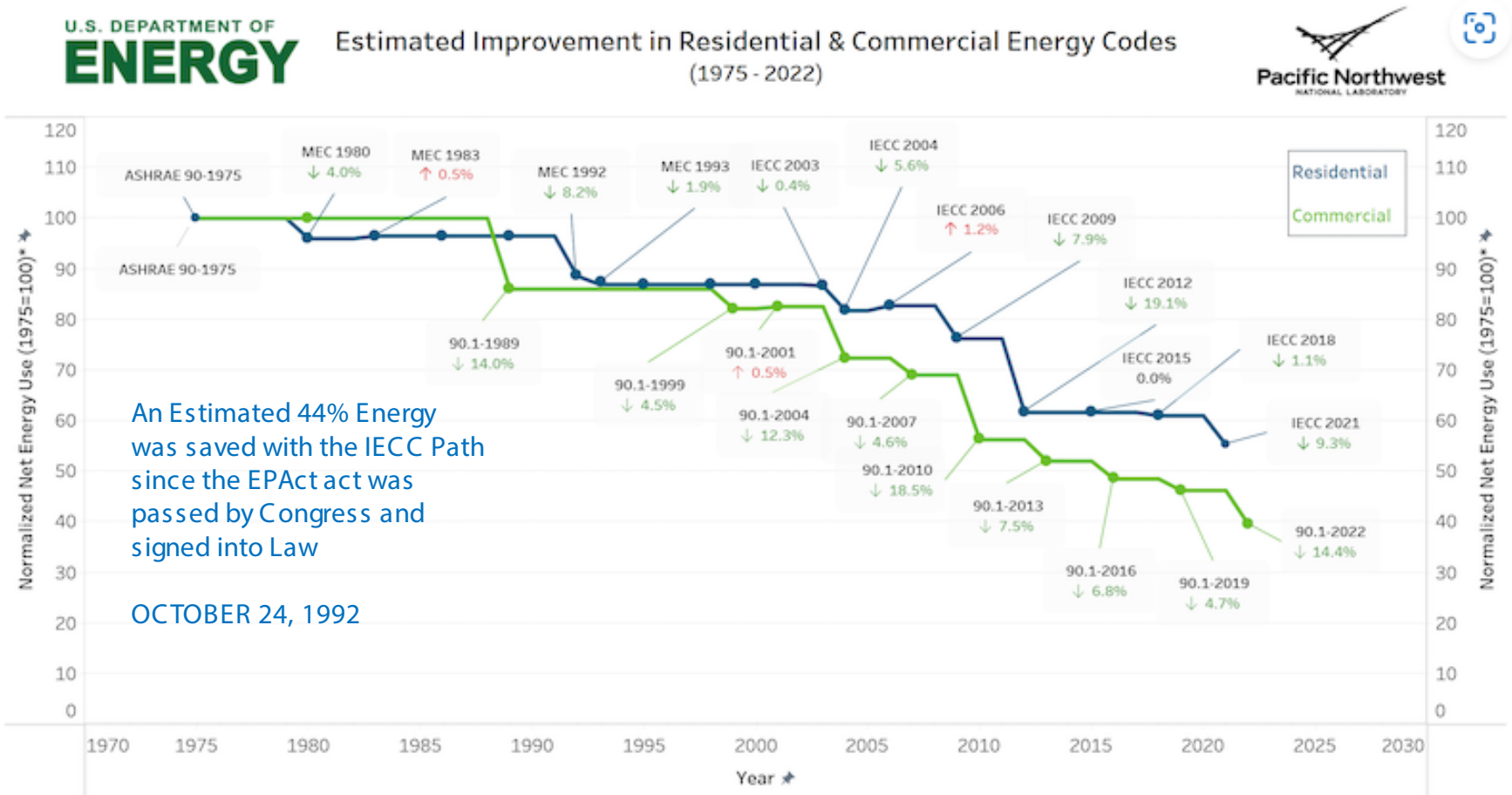
Schaedler yesco

- Introduction & Scope
  Why CODES?
- Interior Lighting Control
  Requirements/Application
- Exterior Lighting controls
  Meeting Code, Simply
- Additional Efficiency Options
- Compliance Helps

COLUMBIA COMPASS DUALLITE FORUM KURT VERSEN LITECONTROL ARCHITECTURAL AREA LIGHTING BEACON EXO KIM ALBEO EVOLVE LUMINATION

The Energy Policy Act of 1992 (EPAct 1992) was passed by Congress and signed into law on October 24, 1992. The act's goals were to increase the use of clean energy and improve energy efficiency in the United States. It did this by setting goals, creating mandates, and amending utility laws.

Figure 1: Estimated Improvement in Residential and Commercial Energy Codes



An Estimated 44% Energy was saved with the IECC Path since the EPAct act was passed by Congress and signed into Law

OCTOBER 24, 1992

*Net energy use includes the contribution of renewable energy generation

Building Energy Codes can save building owners and occupants significant amounts of money over the lifetime of a building. According to the Department of Energy (DOE), model energy codes for residential and commercial buildings are projected to save the US $138 billion in energy costs between **2010** and **2040**. This is in addition to 900 million metric tons of avoided CO2 emissions and 13.5 quads of primary energy.

2018 IECC
International Energy Conservation Code

ASHRAE/IESNA
90.1-2013 ENERGY CODE

Ohio

Pennsylvania

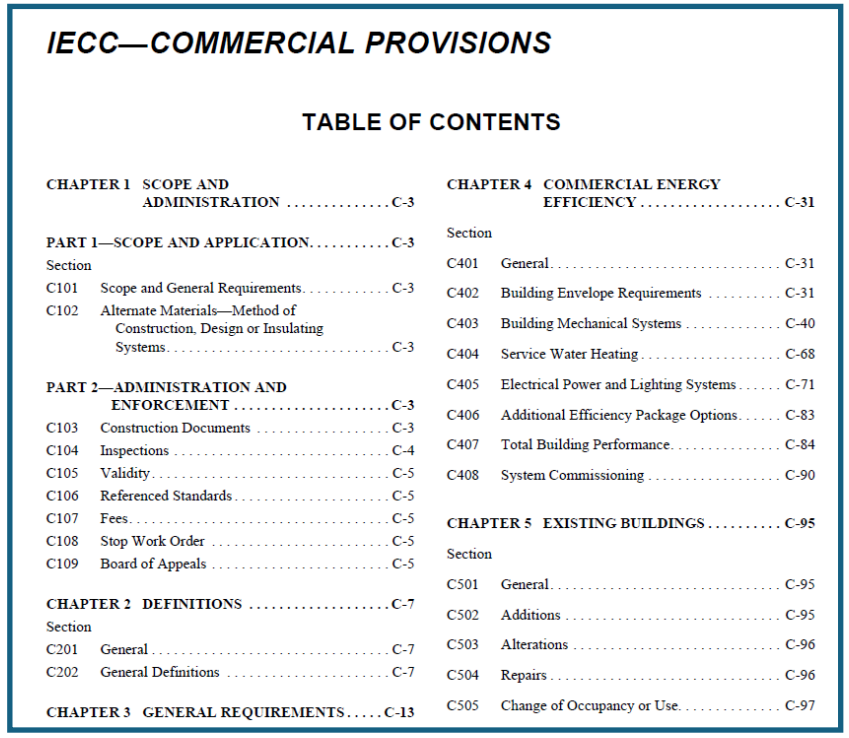
West Virginia

2021 IECC and ASHRAE 90.1-2019 with Amendments

For our purposes, we will focus on IECC 2018

Focus Sections – Commercial Provisions

- Section C405 - Electrical Power and Lighting Systems
- Section C406 – Additional Efficiency Package Options
- Section C408 - Commissioning
- Section C504 - Alterations



IECC—COMMERCIAL PROVISIONS

TABLE OF CONTENTS

Interior Lighting Controls
Sections C101 & C405

COLUMBIA COMPASS DUALLITE FORUM KURT VERSEN LITECONTROL ARCHITECTURAL AREA LIGHTING BEACON EXO KIM ALBEO EVOLVE LUMINATION

C405 – Power & Lighting Scope

Scope Includes:

- Commercial buildings
- Lighting control and power
- Interior and exterior applications
- Electrical energy consumption

Required for:

- New construction
- Additions
- Alterations
- Occupancy type change
- HVAC addition

Key Controls Exceptions:

- Multifamily dwelling units
- Continuously lit designated security or emergency areas
- Exit stairs, exit ramps, exit passageways
- Normally off emergency lighting

C503 - Lighting Alterations Scope

Alterations Must Follow:

- C405 requirements
  - Lighting power allowances
  - Interior and exterior lighting controls

Required for:

- New lighting systems

Key Exceptions:

- Provided lighting power not increased:

  <10% of luminaires are replaced

Removed 50% or less luminaire replacement exception confusion

C405.1 – Dwelling & Sleeping Unit Paths

Dwelling units in a multi-family building:	Follow residential efficacy R404.1 ≥ 90% permanent fixtures high efficacy (no incandescent)
Dwelling units in all other commercial buildings:	Follow residential efficacy R404.1 OR Follow C405.2.4 specific app control & C405.3 interior lighting power
Sleeping units follow C405.2.4 specific application control &:	Follow residential efficacy R404.1 OR Follow C405.3 interior lighting power

2021 IECC – High efficacy: 65 lm/W lamps, 45 lm/W luminaire

C405.2 – Lighting Controls (interior paths)

C405.2 Lighting Controls Compliance Path
Choose One

Interior Lighting Controls
Specified in C405.2.1 – 2.6

Luminaire Level Lighting Controls
Specified in C405.2.1, 2.4, 2.5

LUMINAIRE-LEVEL LIGHTING CONTROLS. A lighting system consisting of one or more luminaires with embedded lighting control logic, occupancy and ambient light sensors, wireless networking capabilities and local override switching capability, where required.

C405.2 (2) – Luminaire Level Lighting Controls

NX Digital Smart PIR Occupancy Sensor with Photocell

Note / C405.2.1.1 Section for Manual and Auto ON

Provisions:

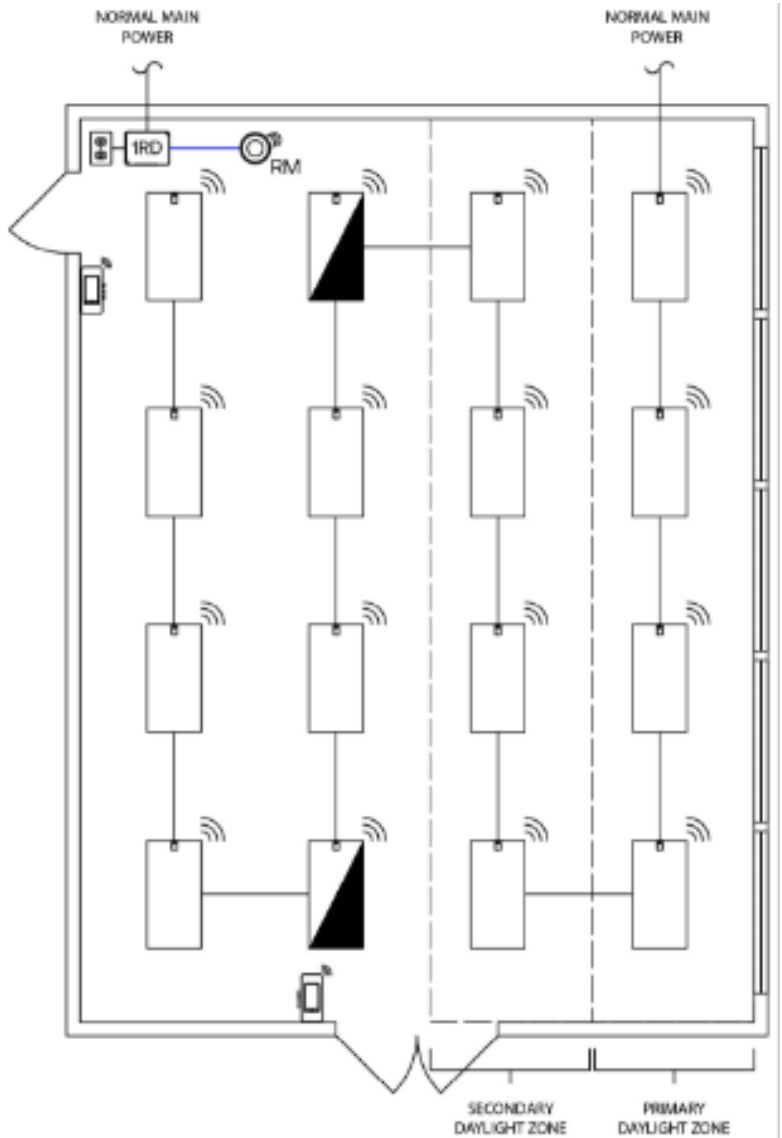
- Monitor occupant activity to brighten or dim lighting
- Monitor ambient light to maintain light level
- Bright/dim setpoints, timeouts, dimming, fade rates, sensitivity, wireless zoning

Must follow these provisions:

- Occupancy sensor C405.2.1
- Specific application controls C405.2.4
- Manual controls C405.2.5

Exceptions:

- Time-switch controls
- Light-reduction controls
- Daylight responsive controls



VERSIFY

LCAT-S

BILL OF MATERIALS		
QTY.	**Catalog #**	**Description**
1	NXRCFX2-1RD-UNV	Room Controller with 1 Relay & 0-10V Dimming Output
1	NXRM2-H	Radio Module
2	NXSW-WRS-WH	Battery-Operated Wireless Rocker Switch
16	NXWSM*	NX Enabled Current Fixture with Integral Wireless Occupancy/Daylight Sensor

*See Integrated Control Options for Indoor Luminaires Ordering Logic and Description on pg. 50 for additional details

TYPICAL SEQUENCE OF OPERATIONS

- 0-10V Dimmable fixtures
- Auto ON upon occupancy for each occupancy control zone not exceeding 600ft²
- Auto OFF after period of vacancy ≤ 20min for each occupancy zone
- Manual On/Off/Raise/Lower control of fixtures
- Plug load auto ON based on occupancy, auto OFF after period of vacancy ≤ 20min
- Fixture Integrated Daylight Responsive Control required if there is more than 150w of lighting in the primary daylight zone or 300w in the primary and secondary daylight zones

C405.2.1 – Occupancy Sensor Controls

Note / C405.2.1.1 Section for Manual and Auto ON

Provisions:

- Lights auto off within 20 minutes
- Manual off control

Required for:

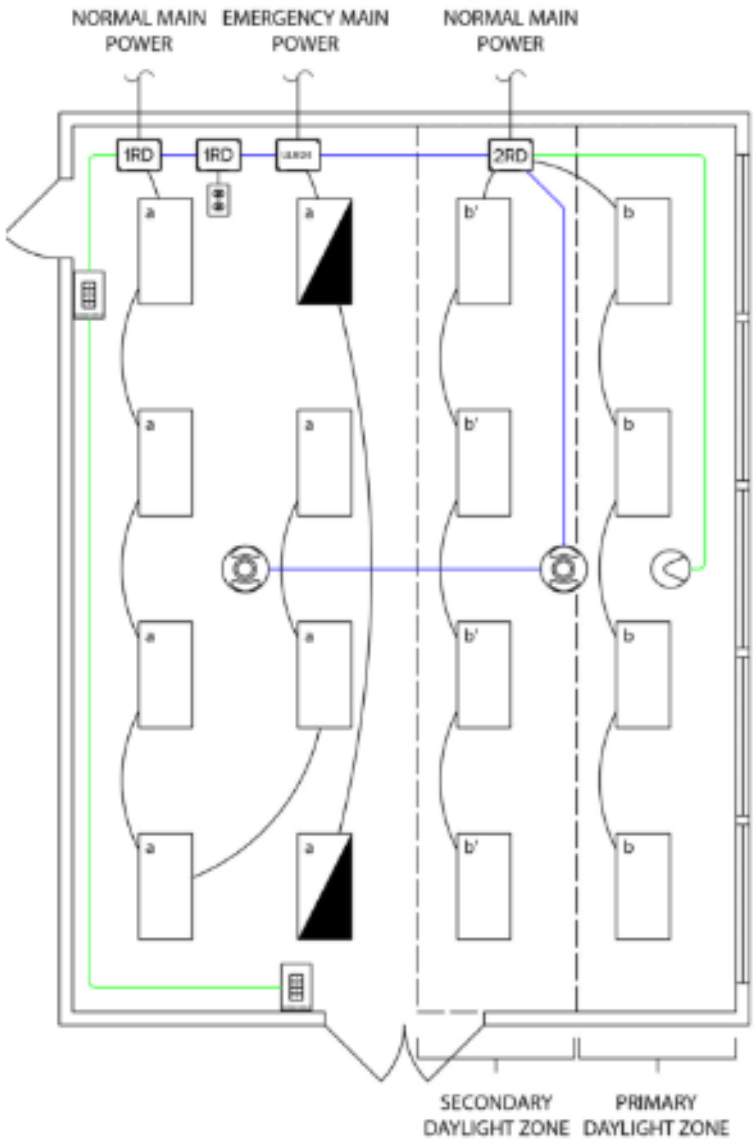
Classrooms	Enclosed offices
Lecture hall	Restrooms
Training rooms	Storage rooms
Conference	Janitor closets
Multipurpose	Locker rooms
Copy/Print	Spaces ≤300ft^2
Lounges	Warehouses
Break rooms	Open plan office

Key Exceptions:

- None

2021 IECC – Some full auto on spaces do not require manual controls

2021 IECC – Corridors added to occupancy sensor control list



VERSIFY

LCAT-S

BILL OF MATERIALS		
QTY.	**Catalog #**	**Description**
2	NXRCFX2-1RD-UNV	Room Controller with 1 Relay & 0-10V Dimming Output
2	NXSW2-ORLO	On/Raise/Lower/Off Specialty Switch
1	NXRCFX2-2RD-UNV	Room Controller with 2 Relays & 0-10V Dimming Outputs
2	NXSMDT-OMNI	Dual Technology Ceiling Mounted Occupancy Sensor
1	NXDS	Multi-Zone Daylight Sensor
1	NXRC-UL924-UNV	Emergency Room Controller with 1 Relay & (2) 0-10V Dimming Outputs

TYPICAL SEQUENCE OF OPERATIONS

- 0-10V Dimmable fixtures
- Auto ON upon occupancy for each occupancy control zone not exceeding 600ft²
- Auto OFF after period of vacancy ≤ 20min for each occupancy zone
- Manual On/Off/Raise/Lower control of fixtures
- Plug load auto ON based on occupancy, and auto OFF after period of vacancy ≤ 20min or scheduled to turn off based on time clock
- Daylight Responsive Control required if there is more than 150w of lighting in the primary daylight zone or 300w in the primary and secondary daylight zones

C405.2.1.2 – Occupancy Sensors in Warehouses

Provision:

- Automatically reduce lighting power ≥50% when unoccupied

Required for:

Warehouse aisleways
Warehouse open areas

Each aisle independently controlled, cannot control lighting beyond aisles

Key Exceptions:

- Need not comply with occupancy sensor auto off, manual or partial on requirements

2021 IECC – Further clarifies automatic shut off required,
Corridors must have ≥50% lighting power reduction when unoccupied

Current

LIGHTING CONTROLS

REPCO

WAREHOUSE - WIRED

WIRED

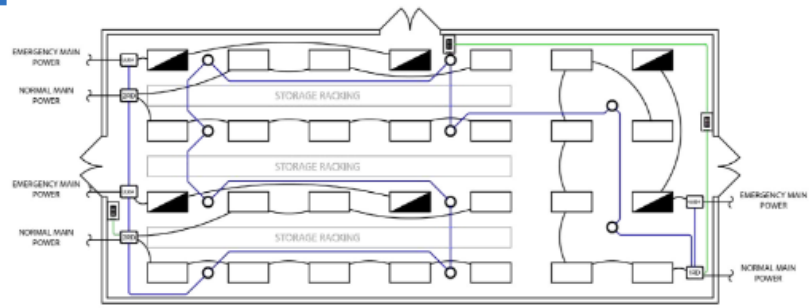
KEY

- 2RD — 2RD Room Controller
- UL924 Room Controller
- 1RD — 1RD Room Controller
- High Mount PIR Occupancy Sensor
- 8-Button Switch

Main Power (120/277V)

FX BUS CAT5

SP BUS CAT5



Note: Drawings not shown to scale and are intended as illustrative example of the application.

BEST PRACTICE LAYOUT

- Switch stations should be located near each entrance to the space
- Ensure proper placement of occupancy sensors in space, keeping clear of any obstructions
- Space can be networked back to an Area Controller for BMS integration or networked Automated Demand Response with only a few additional components, please see networking page for additional details

BILL OF MATERIALS

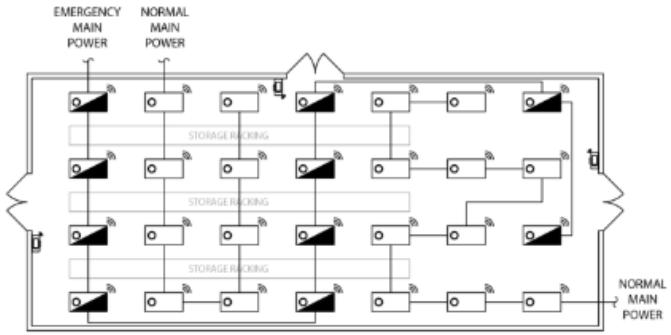
QTY.	Catalog #	Description
2	NXRCFX2-2RD-UNV	Room Controller with 2 Relays & 0-10V Dimming Outputs
5	NXRC-UL924-UNV	UL924 Emergency Room Controller with 1 Relay & (2) 0-10V Dimming Outputs
10	NXSMP2-HMO	High Mount PIR Occupancy Sensor
1	NXRCFX2-1RD-UNV	Room Controller with 1 Relay & 0-10V Dimming Output
3	NXSW2-8	8-Button Smart Switch

TYPICAL SEQUENCE OF OPERATIONS

- 0-10V Dimmable fixtures
- Auto full ON upon occupancy
- Partial OFF to ≤50% after period of vacancy ≤ 20min
- Full off by Occupancy Sensor "grace period" or time schedule
- Manual On/Off/Raise/Lower control of fixtures

WAREHOUSE - WIRELESS

WIRELESS



KEY

- Wireless Rocker Switch
- Fixture Integrated Occupancy & Daylight Sensor

Main Power (120/277V)

Note: Drawings not shown to scale and are intended as illustrative example of the application.

Wiring shown assumes emergency fixtures ordered with integral UL924 dimming bypass module. Please see fixture spec sheet for details on ordering options.

BILL OF MATERIALS

QTY.	Catalog #	Description
3	NXSW-WRS-WH	Battery-Operated Wireless Rocker Switch
28	NXWHM*	NX Enabled Current Fixture with Integral Wireless Occupancy/Daylight Sensor

* See Integrated Control Options for Indoor Luminaires Ordering Logic and Description on pg. 50 for additional details.

TYPICAL SEQUENCE OF OPERATIONS

- 0-10V Dimmable fixtures
- Auto full ON upon occupancy
- Partial OFF to ≤50% after period of vacancy ≤ 20min
- Manual On/Off/Raise/Lower control of fixtures
- Full off by Occupancy Sensor "grace period" or time schedule

BEST PRACTICE LAYOUT

- Fixture integrated NX sensors can be used for both occupancy sensing and daylight harvesting when required
- Switch stations should be located near each entrance to the space
- Space can be networked back to an Area Controller for BMS integration or networked Automated Demand Response with only a few additional components, please see networking page for additional details

C405.2.1.3 – Open Plan Office Area Control

Provision:

- Control zones limited to no greater than 600ft^2
- Shut off or reduce lighting ≥80% within 20 minutes of occupants leaving the individual zone
- Auto off all lighting when no occupants are in entire open office

2021 IECC – Time Switch permitted for entire open office off control

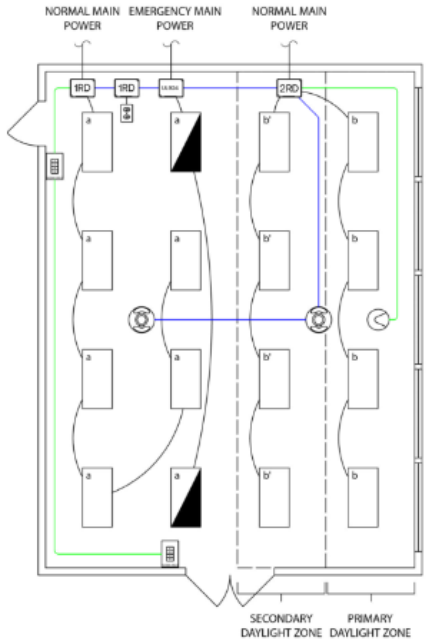
OPEN OFFICE >300ft² WITH WINDOWS AND DAYLIGHTING ZONE - WIRED

WIRED

KEY

- 1RD Room Controller
- UL924 Room Controller
- ORLO Switch
- Dual Technology Ceiling Mounted Occupancy Sensor
- 2RD Room Controller
- Multi-Zone Daylight Sensor
- Controlled Receptacle
- Main Power (120/277V)
- FX BUS CAT5
- SP BUS CAT5

Note: Drawings not shown to scale and are intended as illustrative example of the application.



BEST PRACTICE LAYOUT

- For optimal performance, the daylight sensor should be mounted near the window aperture and aligned to the middle of the opening for accurate measurement
- Switch stations should be located near each entrance to the space
- Each occupancy control zone shall not exceed 600 ft²
- Ensure proper placement of occupancy sensors in space, keeping clear of any obstructions
- Space can be networked back to an Area Controller for BMS integration or networked Automated Demand Response with only a few additional components, please see networking page for additional details

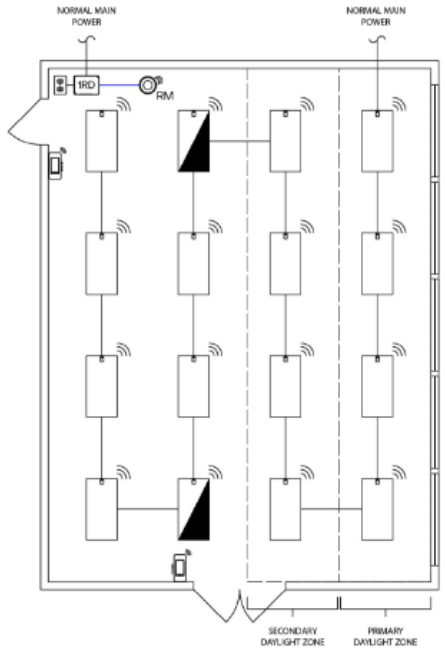
BILL OF MATERIALS

QTY.	Catalog #	Description
2	NXRCFX2-1RD-UNV	Room Controller with 1 Relay & 0-10V Dimming Output
2	NXSW2-ORLO	On/Raise/Lower/Off Specialty Switch
1	NXRCFX2-2RD-UNV	Room Controller with 2 Relays & 0-10V Dimming Outputs
2	NXSMDT-OMNI	Dual Technology Ceiling Mounted Occupancy Sensor
1	NXDS	Multi-Zone Daylight Sensor
1	NXRC-UL924-UNV	Emergency Room Controller with 1 Relay & (2) 0-10V Dimming Outputs

TYPICAL SEQUENCE OF OPERATIONS

- 0-10V Dimmable fixtures
- Auto ON upon occupancy for each occupancy control zone not exceeding 600ft²
- Auto OFF after period of vacancy ≤ 20min for each occupancy zone
- Manual On/Off/Raise/Lower
- Plug load auto ON based on occupancy, and auto OFF after period of vacancy ≤ 20min or scheduled to turn off based on time clock
- Daylight Responsive Control required if there is more than 150w of lighting in the primary daylight zone or 300w in the primary and

OPEN OFFICE >300ft² WITH WINDOWS AND DAYLIGHTING ZONE - WIRELESS



Wiring shown assumes emergency fixtures ordered with integral battery backup. Please see fixture spec sheet for details on ordering options.

WIRELESS

KEY

- 1RD Room Controller
- Fixture Integrated Occupancy & Daylight Sensor
- RM Radio Module
- Wireless Rocker Switch
- Controlled Receptacle
- Main Power (120/277V)
- FX BUS CAT5

Note: Drawings not shown to scale and are intended as illustrative example of the application.

BILL OF MATERIALS

QTY.	Catalog #	Description
1	NXRCFX2-1RD-UNV	Room Controller with 1 Relay & 0-10V Dimming Output
1	NXRM2-H	Radio Module
2	NXSW-WRS-WH	Battery-Operated Wireless Rocker Switch
16	NXWSM*	NX Enabled Current Fixture with Integral Wireless Occupancy/Daylight Sensor

*See Integrated Control Options for Indoor Luminaires Ordering Logic and Description on pg. 50 for additional details

TYPICAL SEQUENCE OF OPERATIONS

- 0-10V Dimmable fixtures
- Auto ON upon occupancy for each occupancy control zone not exceeding 600ft²
- Auto OFF after period of vacancy ≤ 20min for each occupancy zone
- Manual On/Off/Raise/Lower
- Plug load auto ON based on occupancy, auto OFF after period of vacancy ≤ 20min
- Fixture Integrated Daylight Responsive Control required if there is more than 150w of lighting in the primary daylight zone or 300w in the primary

BEST PRACTICE LAYOUT

- Fixture integrated NX sensors can be used for both occupancy sensing and daylight harvesting when required
- For indoor spaces, place radios within 100' line of sight of at least two other wireless devices
- Switch stations should be located near each entrance to the space
- Each occupancy control zone shall not exceed 600 ft²
- Space can be networked back to an Area Controller for BMS integration or networked Automated Demand Response with only a few additional components, please see networking page for additional details

C405.2.5 Manual Lighting Controls

Provision:

- Manual control
- Readily accessible
- Controlled lighting is visible from manual control device

Key Exceptions:

- When installed remotely, identify/label area controlled, indicate lighting status

C405.2.2.2 – Light Reduction Control

Provision:

- Manual controls uniformly dim or switch off ≥ 50% lighting

Key Exceptions:

- One luminaire <100W
- Space lighting <0.6W/ft^2
- Daylight responsive area
- Corridors
- Public lobbies
- Equip rooms
- Elect/mech rooms

C405.2.3 –Daylight Responsive Control

Provisions:

- Automatic continuous dimming in offices, classrooms, labs, library reading rooms
- Automatic dimming or on/off control all other space types
- Configured to turn lighting off
- Ready access calibration
- Control sidelit independent of toplit area

Primary daylight area lighting power > 150W

YES → Daylight Control Required Choose dimming or on/off control

NO → Daylight Control Not Required

2021 IECC – Requires dimming in all daylight areas

C405.2.3.2 & 3– Sidelight & Toplight daylight zone

C405.2.3.2 Sidelighting:

- Single primary zone adjacent to windows

Key Exceptions:

- Windows < 24ft^2, low transmittance
- Blocking obstructions
- Patient care areas, specific application lighting

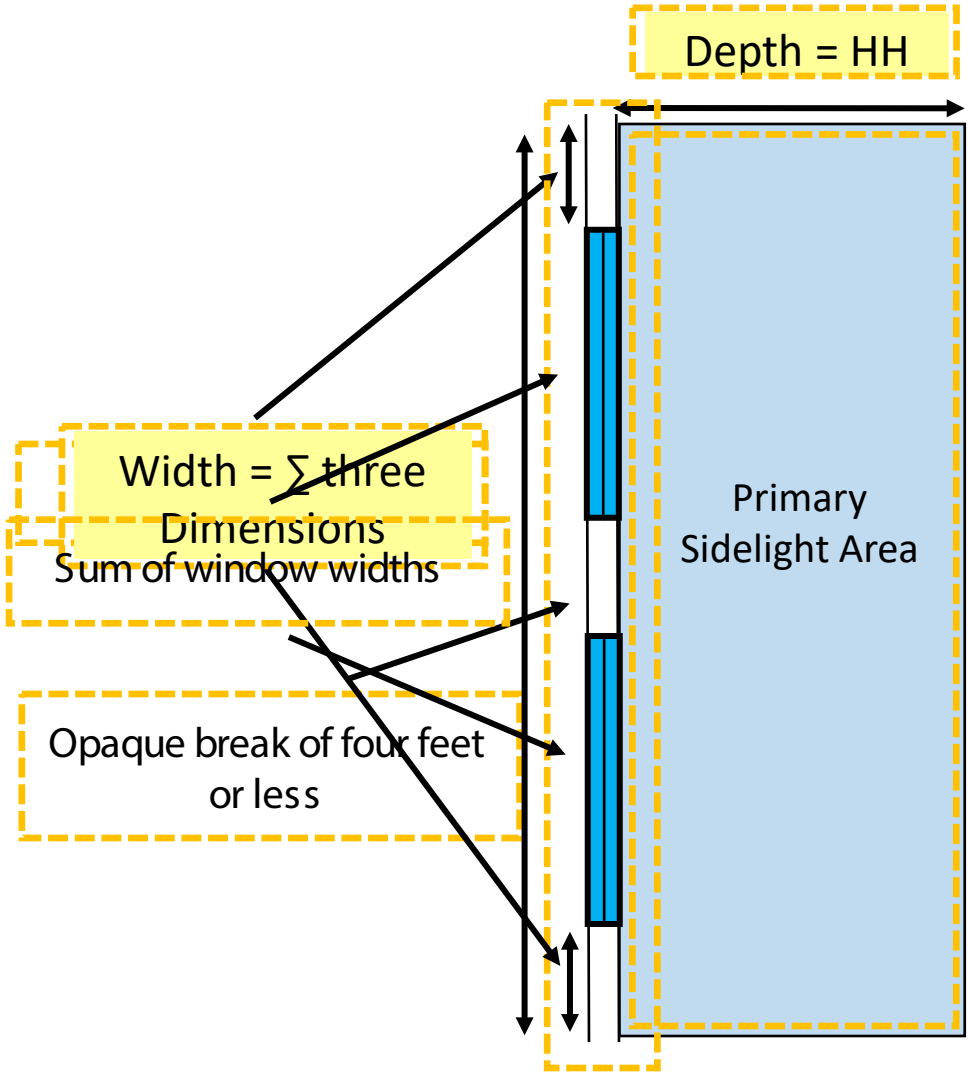
C405.2.3.3 Toplighting:

- Single primary zone under skylights and roof monitors

Key Exceptions:

- Blocking obstructions
- Low toplight transmittance
- Patient care areas, specific application lighting

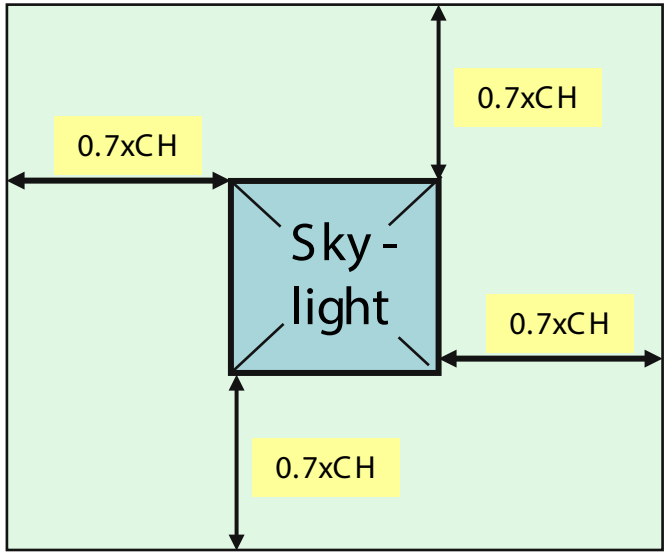
Primary Sidelight Area



If the total lighting power of luminaries that contribute to lighting in the daylight area are >150W, they are required to be controlled by daylight responsive controls

Sidelight Area Dimensions
Depth of sidelight area is distance from floor to top of window (HH=head height), unless it reaches a full-height wall **Widths** of sidelight area is windows + width of opaque break ≤4ft + 2ft on each side of window

Primary Toplighting Area



If the total lighting power of luminaries that contribute to lighting in the daylight area are >150W, they are required to be controlled by daylight responsive controls

Toplight Area Dimensions
Daylight area under a skylight is the opening beneath the skylight plus 70% of the ceiling height (CH) in each direction. (unless it reaches an obstruction >70% of CH)

See the standard for daylight areas under roof monitors, or area modifications when obstructions are considered.

2021 IECC – Daylight area for atrium applications is clarified

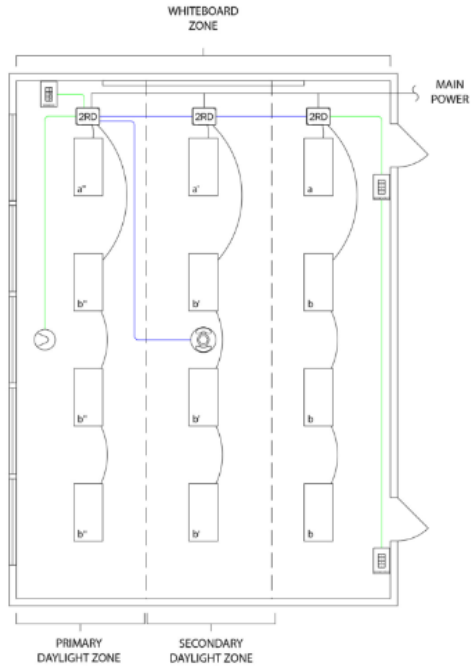
CLASSROOM WITH WINDOWS AND DAYLIGHTING ZONE - WIRED

KEY

- 2RD — 2RD Room Controller
- Scene Switch
- Dual Technology Ceiling Mounted Occupancy Sensor
- ORLO Switch
- Multi-Zone Daylight Sensor

Main Power (120/277V)
FX BUS CAT5
SP BUS CAT5

Note: Drawings not shown to scale and are intended as illustrative example of the application.



BILL OF MATERIALS

QTY.	Catalog #	Description
3	NXRCFX2-2RD-UNV	Room Controller with 2 Relays & 0-10V Dimming Outputs
1	NXSMDT-OMNI	Dual Technology Ceiling Mounted Occupancy Sensor
1	NXDS	Multi-Zone Daylight Sensor
1	NXSW2-SS	Scene Switch Specialty Switch
2	NXSW2-ORLO	On/Raise/Lower/Off Specialty Switch

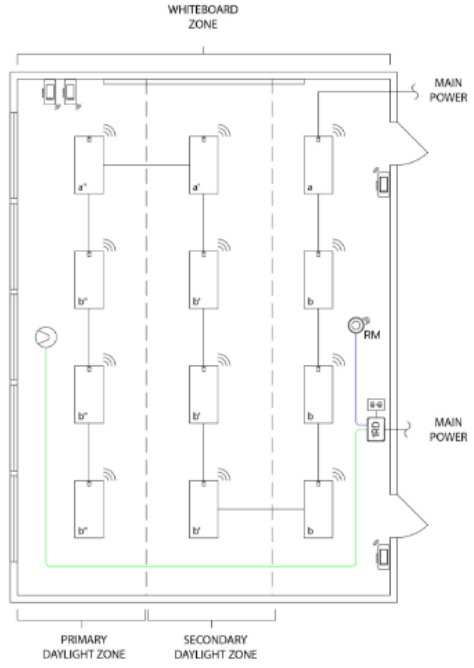
TYPICAL SEQUENCE OF OPERATIONS

- 0-10V Dimming
- 2 Manual control groups - front of class and general lighting
- Auto ON <50% upon occupancy, or manual ON
- Auto OFF after period of vacancy ≤ 20min
- Manual On/Off/Raise/Lower control of fixtures
- and auto OFF after period of vacancy ≤20min or by scheduled OFF
- Scene switch at teacher station for recall of presets and manual Raise/Lower control
- Daylight Responsive Control required if there is more than 150w of lighting in the primary daylight zone or 300w in the primary and

BEST PRACTICE LAYOUT

- For optimal performance, the daylight sensor should be mounted near the window aperture and aligned to the middle of the opening for accurate measurement
- ORLO switch stations should be located near each entrance to the space, and scene control switch should be located near the front of the classroom at teacher station for convenient adjustment of lighting levels during instruction
- Ensure proper placement of occupancy sensors in space, keeping clear of any obstructions
- Space can be networked back to an Area Controller for BMS integration or networked Automated Demand Response with only a few additional components, please see networking page for additional details

CLASSROOM WITH WINDOWS AND DAYLIGHTING ZONE - WIRELESS



KEY

- Fixture Integrated Occupancy & Daylight Sensor
- Wireless Rocker Switch
- Multi-Zone Daylight Sensor
- RM — Radio Module
- 1RD — 1RD Room Controller
- Controlled Receptacle

Main Power (120/277V)

Note: Drawings not shown to scale and are intended as illustrative example of the application.

BILL OF MATERIALS

QTY.	Catalog#	Description
4	NXSW-WRS-WH	Battery-Operated Wireless Rocker Switch
12	NXWSM*	NX Enabled Current Fixture with Integral Wireless Occupancy/Daylight Sensor
1	NXRM2-H	Radio Module
1	NXDS	Multi-Zone Daylight Sensor
1	NXRCFX2-1RD-UNV	Room Controller with 1 Relay & 0-10V Dimming Output

* See Integrated Control Options for Indoor Luminaires Ordering Logic and Description on pg. 50 for additional details.

TYPICAL SEQUENCE OF OPERATIONS

- 0-10V Dimming
- Auto ON to 50-70% upon occupancy, or manual ON
- Auto OFF after period of vacancy ≤ 20min
- Manual On/Off/Raise/Lower control of each group of fixtures
- Integral Daylight Responsive Control required if there is more than 150w of lighting in the primary daylight zone or 300w in the primary and secondary daylight zones

BEST PRACTICE LAYOUT

- Fixture integrated NX sensors can be used for both occupancy sensing and daylight harvesting when required
- Switch stations should be located near each entrance to space and teacher's station for convenient access
- Space can be networked back to an Area Controller for BMS integration or networked Automated Demand Response with only a few additional components, please see networking page for additional details

C405.2.3 Daylight Exemption (4) Tradeoff

- Trades lower Lighting Power Allowance for exemption of automatic daylighting controls
- Adjusts LPA down by 40% of lighting power allowed in daylight areas

$$LPA_{adj} = [LPA_{norm} \times (1.0 - 0.4 \times UDZFA / TBFA)] \quad \text{(Eq 4-9)}$$

Uncontrolled Daylighting Zone Floor Area

Total Building Floor Area

405.2.4 – Specific Application Controls

Provision:

- Manual control separate from general lighting
- Must have auto off control by occupancy sensor or timeswitch

Required for:

- Display/accent
- Display cases
- Lighting for sale
- Lighting for education
- Supplemental task lighting
- Under shelf
- Under cabinet

Key Exceptions:

- None

Provision:

- Control with time switch

Required for:

- Nonvisual applications
- Plant growth
- Food warming

Key Exceptions:

- None

C405.2.4 – Hotel/Motel Guestroom Control

Provision:

- Auto off all lighting and switched receptacles within 20 minutes of occupants leaving

Required for all hotel/motel sleeping units and guest suites

Key Exceptions:

- Lighting and switched receptacles controlled by a card key controls
- Spaces where direct patient care is provided

C405.3.2 Lighting Power Allowances

Building Area Method (W/SqFt)

AREA TYPE	2015 IECC	2018 IECC	2021 IECC
Office	0.82	0.79	0.66
Retail	1.26	1.06	0.85
School	0.87	0.81	0.74
Warehouse	0.66	0.48	0.46

Exterior Lighting

ZONE 3	2015 IECC	2018 IECC	2021 IECC
Base Site Allowance	750W	500W	500W
Parking & Drives	0.10W/ft^2	0.06W/ft^2	0.06W/ft^2

Exterior Lighting Controls
Sections C405.2.X.X

C405.2.6.1 – Automatic Off: • Auto off when daylight is available	Required for: Applicable to all exterior lighting	Key Exceptions: • Covered vehicle entrance/exits for eye adaptation • Lighting controlled from dwelling units
C405.2.6.2 – Decorative Lighting: • Auto off no later than one hour after business closing to one hour before business opening	Required lighting: Building façade Landscape	Key Exceptions: • None

C405.2.6– Exterior Lighting Controls

C405.2.6.3 – Lighting Setback:

- Automatically reduce lighting ≥30%
  - No later than midnight and 6am, or
  - Within one hour after business close to one hour before open, or
  - Reduce lighting when no activity detected >15 minutes

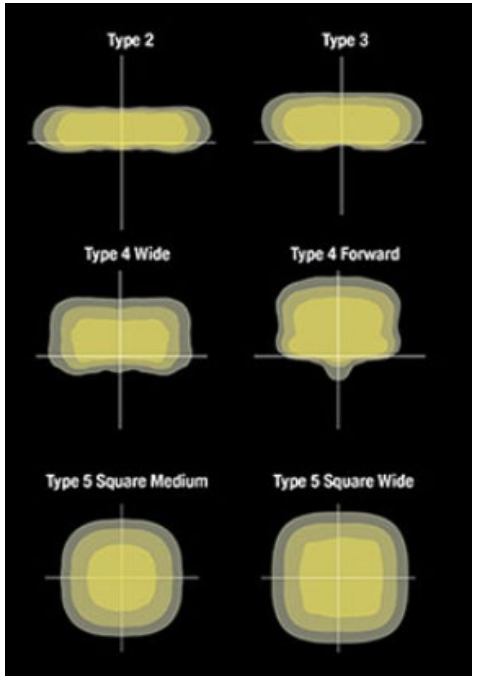
2021 IECC – Lighting setback reduces to ≥50% lighting power

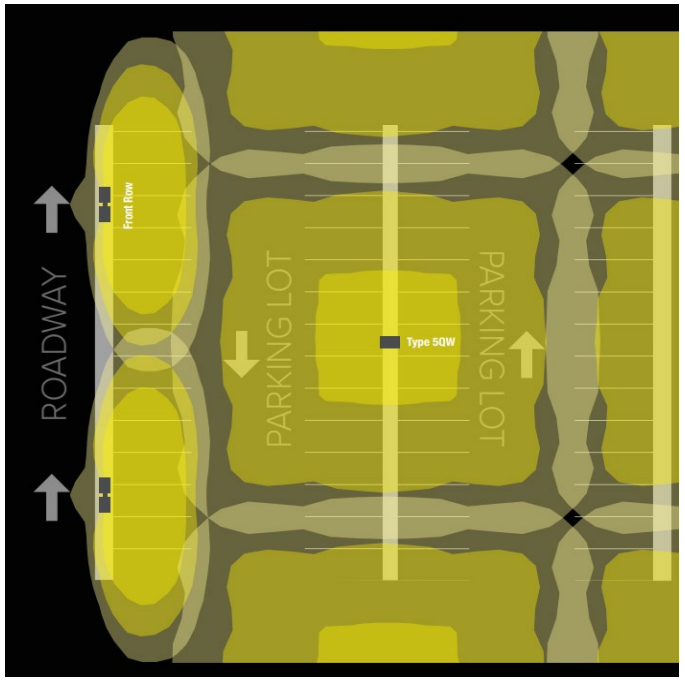
Parking area lighting ≤24' height and >78W,
use occupancy sensors to reduce lighting

Current

LIGHTING CONTROLS

REPCO





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VIPER

COLUMBIA COMPASS DUALLITE FORUM KURT VERSEN LITECONTROL ARCHITECTURAL AREA LIGHTING BEACON EXO KIM ALBEO EVOLVE LUMINATION

C406 – Additional Efficiency Package Options

C406 – Additional Efficiency Package Options

Comply with at least one:

1. More efficient HVAC performance
2. Reduced lighting power to < 90%
3. Enhanced digital lighting controls
4. On-site renewable energy
5. Dedicated outdoor air provision
6. Reduce water heating energy use
7. Enhanced envelope performance
8. Reduced air infiltration

All buildings must select and comply with at least one additional efficiency option package

Key Exceptions:

- Tenant spaces alterations which previously complied with one of these provisions

2021 IECC – Greatly expands options, uses a credit system

C408.3 – Functional Testing of Lighting Controls

Provision:

Before passing final inspection, the registered design professional provides evidence that lighting controls have been tested, calibrated, adjusted, programmed and in working condition

Required:

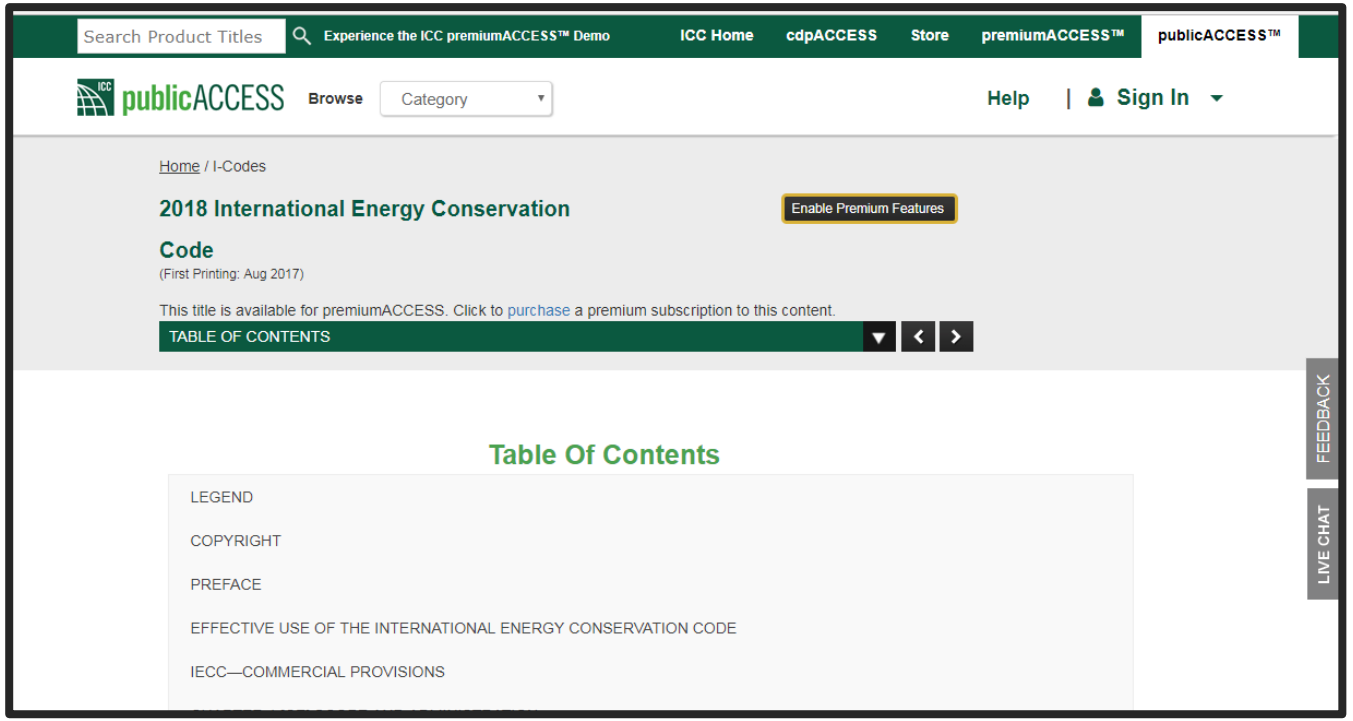
Test occupancy sensors (C408.3.1.1)
Test auto time switch (C408.3.1.2)
Test daylight responsive controls (C408.3.1.1)

Provide owner certifying documents within 90 days of certificate of occupancy

Compliance Help and Applications

IECC - International Code Council (ICC)

Free IECC public access online or for purchase at: www.iccsafe.org



Current

LIGHTING CONTROLS

REPCO

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COLUMBIA COMPASS DUALLITE FORUM KURT VERSEN LITECONTROL ARCHITECTURAL AREA LIGHTING BEACON EXO KIM ALBEO EVOLVE LUMINATION

Current

NX LIGHTING CONTROLS

REPCO

NX Room Control

NX Wireless

NX Mobile App

NX Site Manager

NX Connect

LightGRID+

Sensors

Lighting Control Panel

COLUMBIA COMPASS DUALLITE FORUM KURT VERSEN LITECONTROL ARCHITECTURAL AREA LIGHTING BEACON EXO KIM ALBEO EVOLVE LUMINATION

IECC Code Change Summary

- Lighting system alterations of 10% or more triggers lighting power and controls compliance
- When luminaire level lighting controls are used, they follow select provisions from the regular controls path
- Open offices added to occupancy sensor list spaces. Limited to 600ft^2 areas. Shut off or reduce ≥80% when unoccupied and shut all lighting off when entire open office is unoccupied
- New daylighting control exception trades reduced lighting power equal to at least 40% of daylight area LPD

2018 International Energy Conservation Code

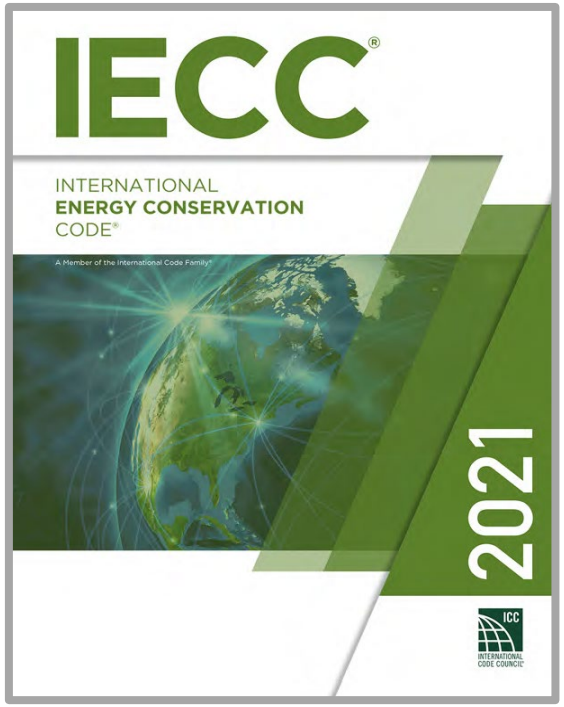
IECC Code Change Summary

- Clarified that special application lighting must have separate manual controls and automatically shut off
- Exterior decorative lighting (façade and landscape) must shut off within one hour of business close and turn on no earlier than one hour of business opening
- Sleeping unit lighting was revised and now excludes controlling areas of direct patient care
- Two non-lighting related options were added to the Additional Efficiency Package Options list

2018 International Energy Conservation Code

2021 IECC – Key Change Summary

- Automatic receptacle controls – control 50% of receptacles in offices, conference rooms, breakrooms, copy/print, classrooms, modular furniture & furniture circuit feeds
- Specific garage lighting control requirements
- Secondary sidelight daylight zone, continuous dimming
- Occupancy sensing control in corridors with 50% automatic reduction when unoccupied
- Occupancy detection light power reduction ≥50% in parking area when luminaires ≤24' height and >78W



Current

LIGHTING CONTROLS

REPCO

Perfectly Clear…
Questions?