

Suggested energy code solutions for commercial buildings

The compliant solutions listed below are suggested based on total installed cost, simplicity of design, and basic functional needs for the space. These solutions represent one of multiple compliant options to meet lighting and receptacle control requirements.

Diagram key:

● = New construction

⚙ = Lighting retrofit¹

⚙ = New construction and retrofit¹

| | | Atrium | Classroom, Lecture Hall, Training Room | Conference, Break Room | Corridor ² | Guestroom ³ | Lobby ⁴ | Open Office (>250 sq. ft.) | Parking Garage ⁵ | Private Office (<250 sq. ft.) | Restaurant/Cafeteria, Retail | Restroom | Stairwell ² | Storage Room | Warehouse and Library Stacks ⁴ | Facade/Landscape | Other Exterior ⁶ | |
|--------------------------|-----------------------------|-------------|--|------------------------|-----------------------|------------------------|--------------------|----------------------------|-----------------------------|-------------------------------|------------------------------|----------|------------------------|--------------|---|------------------|-----------------------------|---|
| Manual Control | Switch | | | | | ● | | | | | | ● | | ● | | | | |
| | Dimmer or scene control | ● | ● | ● | ● | | ● | ● | | ● | ● | | ● | | ● | | | |
| Automatic ON/OFF Control | Timeclock | ● | | | | | ● | | ● | | ● | | | | ● | ● | ● | |
| | Occupancy sensor | | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | | | |
| | Settings | Full ON | | | | ● | | ● | | ● | | ● | ● | | | ● | ● | |
| | | Partial ON | ● | | | | | | ● | | ● | | | | | ● | | |
| | | Manual ON | | ● | ● | | ● | | | | ● | | | | ● | | | |
| | | Full OFF | ● | ● | ● | | ● | ● | ● | | ● | ● | ● | | ● | ● | ● | ● |
| | | Partial OFF | | | | ● | | ● | | ● | | | | ● | | ● | | ● |
| Other | Daylight responsive control | ● | ● | ● | ● | | ● | ● | ● | ● | ● ⁷ | ● | ● | ● | ● | | | |
| | Receptacle control | | | | | | | | | | | | | | | | | |
| | Demand response | | | | | | | | | | | | | | | | | |

1 The NECB 2015 does not contain any requirements for retrofits.

2 To comply with some life safety code requirements for egress illumination, automatic full OFF is not suggested. For non-egress areas, the occupancy sensor should turn the lights to full OFF and a switching control may be used.

3 Automatic OFF is required for all luminaires and switched receptacles.

4 When typically occupied, the occupancy sensor provides partial OFF functionality. When typically unoccupied, the sensor provides full OFF functionality.

5 For entrances and exits, daylight responsive control is not required nor recommended, and the maximum light level is set to 50% at night.

6 Astronomical timeclock shall ensure all lights are off during daylight hours. Lights should be scheduled to partial OFF during night hours.

7 Not required for sidelight daylight zones in retail spaces.

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Code requirement summary

| Minimum control type | | Description | Code provision | |
|--------------------------|---|---|--|------------------------------------|
| Manual Control | Switch | Lighting shall be capable of turning ON and OFF. There shall be at least one manual device for control of the lighting within a space. See code for spaces that allow remote location of control. | 4.2.2.1 (3-5) | |
| | Dimmer or scene control | Lighting shall be capable of providing at least one level between 30% and 70% of full power, in addition to ON and OFF. Continuous dimming also complies. There shall be at least one manual device for control of the lighting within a space. See code for spaces that allow remote location of control. | 4.2.2.1 (9) | |
| Automatic ON/OFF Control | Timeclock | Interior: Scheduled control, based on time-of-day, turns lighting ON or OFF based on typical occupancy. Occupancy sensors also comply as an alternate to using a timeclock. Exterior: Scheduled control, based on time-of-day and sunrise/sunset, turns lighting ON or OFF based on typical occupancy and daylight (requires astronomical timeclock). | 4.2.2.1 (20-23) 4.2.4.1 | |
| | Occupancy sensor | Automatic control turns lighting ON upon occupancy or OFF after a vacancy of 20 minutes or less. | 4.2.2.1 (16-17) | |
| | Settings | Full ON | When initiated by a timeclock or occupancy sensor, lighting is automatically turned ON to maximum lighting power. | 4.2.2.1 (7) |
| | | Partial ON | When initiated by a timeclock or occupancy sensor, lighting is automatically turned ON to 50% or less of maximum lighting power. | 4.2.2.1 (8) |
| | | Manual ON | Lighting is turned ON manually by an occupant. | 4.2.2.1 (6) |
| | | Full OFF | When initiated by a timeclock or occupancy sensor, lighting is automatically turned OFF. | 4.2.2.1 (18-19) 4.2.2.1 (20-23) |
| Partial OFF | When initiated by a timeclock or occupancy sensor, lighting is automatically reduced by at least 50% of maximum lighting power (30% for enclosed parking garages and exterior). Automatic full OFF also complies. | 4.2.4.1 (16-17) | | |
| Other | Daylight responsive control | Interior: A sensor which adjusts lighting in response to available daylight is required for sidelight and skylight zones. There must be at least two light levels between ON and OFF. See the "Daylight Zone Requirements" diagrams for more information. The perimeter 6.1 m. of parking garages with access to daylight must automatically reduce lighting power in response to daylight. Exterior: A photosensor can be used as an alternate to the dawn/dusk operation of an astronomical timeclock. | 4.2.2.1 (10-15) 4.2.2.3 4.2.2.4 4.2.2.5 4.2.4.1 | |
| | Receptacle control | Receptacle control is not required by this energy code. | N/A | |
| | Demand response | Demand response is not required by this energy code. | N/A | |

For areas being used as a path of egress or fixtures being used for emergency, verify compliance with your local authority having jurisdiction.

Daylight zone requirements

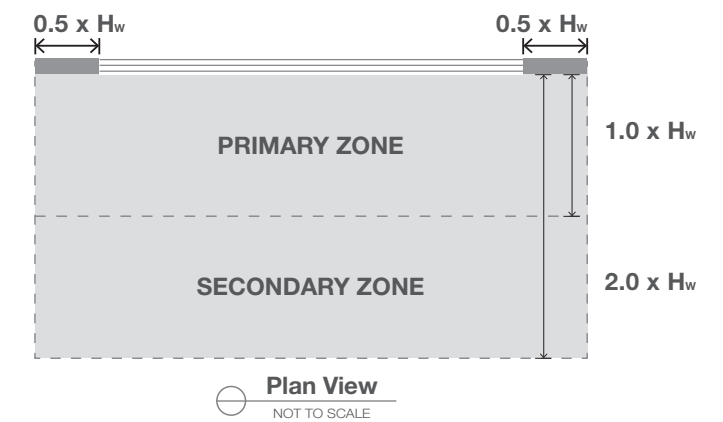
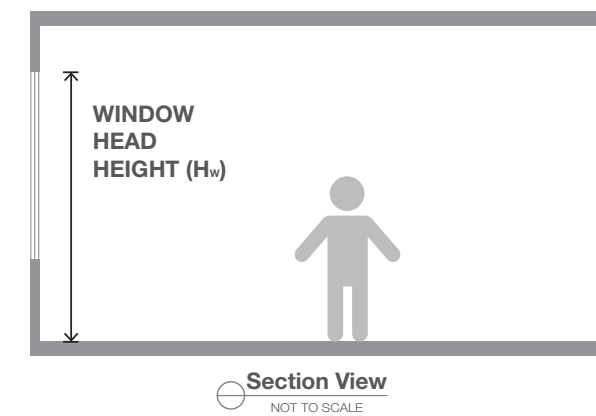
Daylight Zone Requirements:

Fixtures in the primary and secondary daylight zones must be independently controlled by zone. Sidelighted zones must be controlled separately from top lighted zones.

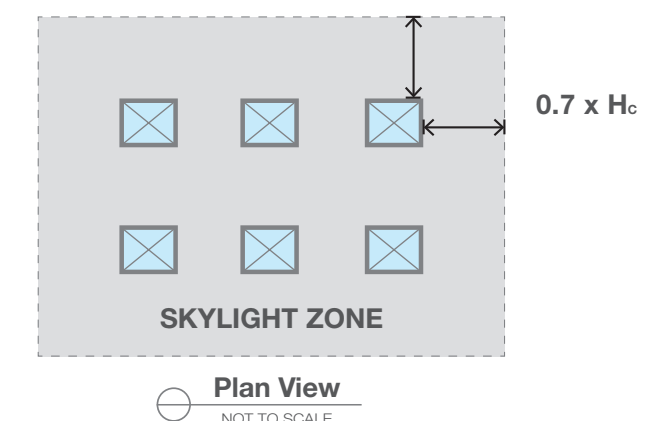
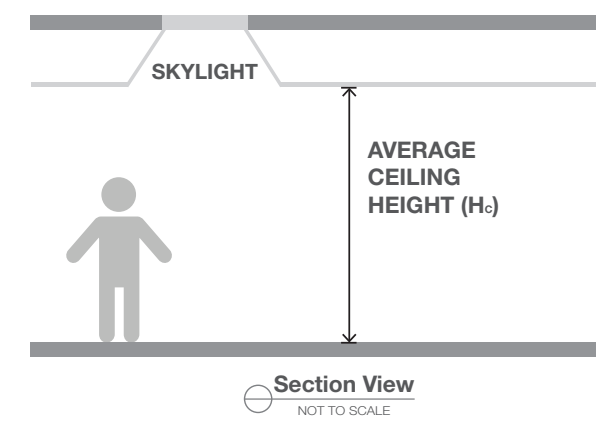
Daylight Exceptions:

Daylight control is not required when the total lighting power of a daylight zone is less than 150W or when the total glazing area is less than 2 sq. m.

Sidelighting (Window)



Toplighting (Skylight)



This document summarizes the lighting and receptacle control requirements for commercial buildings. It is for information purposes only. It is not meant to replace your state's or local jurisdiction's official energy code. The recommendations presented in this guide are based on the originally published code prior to addenda. Please refer to your local building energy code or authority having jurisdiction for your precise requirements. Only the authority having jurisdiction can guarantee code compliance.