

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. ASHRAE 90.1 2010 can also be used as a compliance option in meeting IECC 2012 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	Open Office (>300 sq. ft.)	Parking Garage ⁴	Private Office (<300 sq. ft.)	Restaurant/Cafeteria, Retail	Restroom	Stairwell ²	Storage Room	Warehouse and Library Stacks	Facade/Landscape	Other Exterior	
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				⚙ ⁵								⚙ ⁵				
Other	Daylight responsive control	⚙	⚙	⚙	⚙	⚙	⚙	⚙		⚙	⚙	⚙	⚙	⚙	⚙			
	Receptacle control																	
	Demand response																	

1 All retrofits altering more than 50% of the luminaires must comply with all new construction requirements.

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 Manual shutoff is required for all permanently installed luminaires and switched receptacles.

4 Timeclock ensures the lights are on when typically occupied. Occupancy sensor controls lights when typically unoccupied.

5 Not a code requirement. Lutron recommends this solution for spaces designated as a path of egress.

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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.	C405.2.1.1	
	Dimmer or scene control	Lighting shall be capable of being reduced by at least 50% of full power, in addition to being switched 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.	C405.2.1.2	
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 (requires astronomical timeclock), turns lighting ON or OFF based on typical occupancy and daylight.	C405.2.2.1 C405.2.4	
	Occupancy sensor	Automatic control turns lighting ON upon occupancy or OFF after a vacancy of 30 minutes or less.	C405.2.2.2	
	Settings	Full ON	When initiated by a timeclock or occupancy sensor, lighting is automatically turned ON to maximum lighting power.	C405.2.2.2 Exceptions
		Partial ON	When initiated by a timeclock or occupancy sensor, lighting is automatically turned ON to 50% or less of maximum lighting power.	C405.2.2.2
		Manual ON	Lighting is turned ON manually by an occupant.	C405.2.2.2
		Full OFF	When initiated by a timeclock or occupancy sensor, lighting is automatically turned OFF.	C405.2.2.2
Partial OFF		When initiated by a timeclock or occupancy sensor, lighting is automatically reduced by at least 50% of maximum lighting power. In some spaces, partial OFF is permitted but it is not a code requirement.	C405.2.1 Exception	
Other	Daylight responsive control	Interior: Manual or automatic control of sidelight and skylight daylight zones is required. When using automatic control, there must be at least two levels between ON and OFF. See the "Daylight Zone Requirements" for more information. Exterior: A photosensor can be used as an alternate to the dawn/dusk operation of an astronomical timeclock.	C202 C405.2.2.3 C405.2.4	
	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. Acceptance (functional) testing is required for all new construction applications to ensure that control hardware and software are calibrated, programmed and functioning properly (Code provision C408.3).

Daylight zone requirements

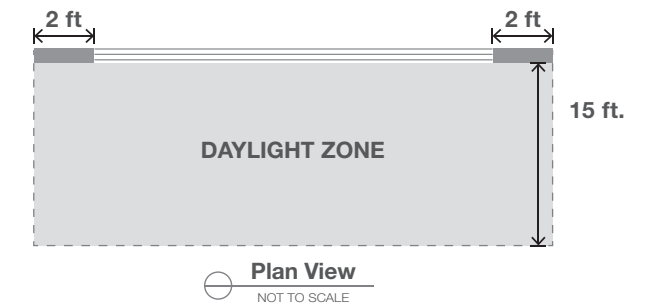
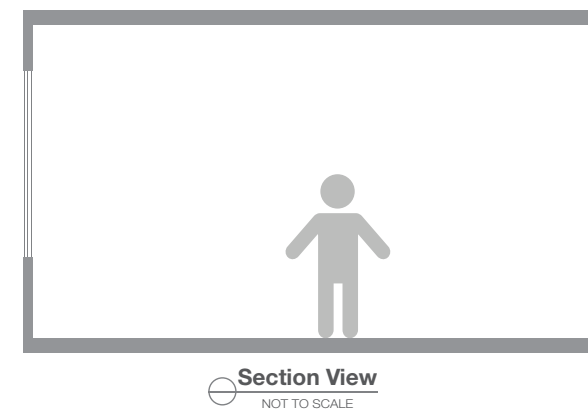
Daylight Zone Requirements:

Fixtures in primary side-light or skylight zones must be controlled by a daylight sensor in spaces greater than 10,000 sq. ft. or having greater than 30% window-to-wall ratio. All other daylit spaces only require a separate manual control for daylight zones.

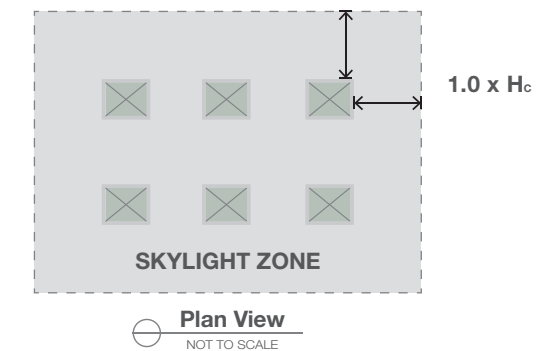
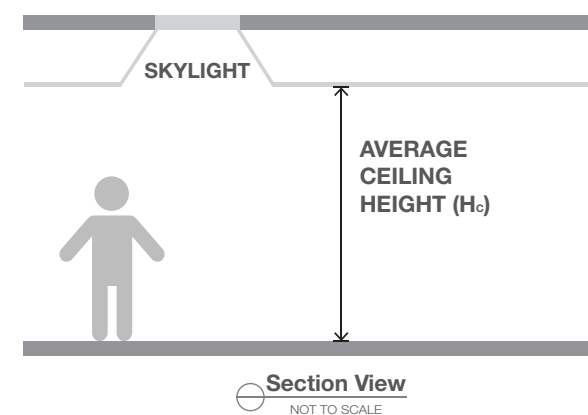
Daylight Exceptions:

Daylight control is not required for daylight zones enclosed by walls or ceiling-height partitions containing two or fewer luminaires.

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. 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.