

## 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 in the 2018 Washington State Energy Code (WSEC) and the 2018 Seattle Energy Code (SEC). Applications in this guide will illustrate these solutions and/or alternate solutions for advanced functionality.

Diagram key:  
 = New construction and retrofit<sup>1</sup>

		Atrium	Classroom, Lecture Hall, Training Room	Conference, Break Room	Corridor <sup>2</sup>	Guestroom <sup>3</sup>	Lobby	Open Office (>300 sq. ft.)	Parking Garage <sup>4, 2</sup>	Private Office (<300 sq. ft.)	Restroom	Stairwell <sup>2</sup>	Storage Room	Facade/Landscape	Parking Lot/Other Exterior <sup>5</sup>	
Manual Control	Switch															
	Dimmer or scene control											<sup>7</sup>				
Automatic ON/OFF Control	Timeclock															
	Occupancy sensor															
	Settings	Full ON														
		Partial ON														
		Manual ON														
		Full OFF <sup>9</sup>														
		Partial OFF														
Daylight responsive control <sup>10</sup>																
Receptacle control																
Demand response																

1 All lighting retrofits that rewire or recircuit added or relocated luminaires, or new or moved lighting panels with new wiring from the panel to 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. Up to 0.02 W/ft<sup>2</sup> (0.01 W/ft<sup>2</sup> for SEC) of lighting power for means of egress illumination serving the exit access are exempt from lighting control requirements.  
 3 Automatic shutoff is required for all installed luminaires and switched receptacles.  
 4 Timeclock ensures the lights are on when typically occupied. Occupancy sensor controls lights when unoccupied.

5 Astronomical timeclock shall ensure all lights are off during daylight hours. Lights should be scheduled to Partial OFF during night hours. See section C405.2.6.3 for scheduling times.  
 6 Control zones are limited to 600 sq. ft. or less. Once a zone is vacant for 20 minutes, the occupancy sensor automatically reduces lighting in the zone by 80% of full light output or turns lighting OFF in the vacant zone.  
 7 For the SEC, manual control is not permitted in stairwells and parking garages.  
 8 These spaces require continuous daylight dimming to OFF.  
 9 Sensor(s) automatically turns lighting OFF in the entire space within 20 minutes of vacancy in the whole space.  
 10 Occupant override capability of daylight dimming controls is not permitted, other than a reduction of light output from the level established by the daylighting controls.

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# WSEC and SEC 2018: Application Summary

## Code requirement summary

	Minimum control type	Description	Code provision	
Manual Control <sup>1</sup>	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.	C405.2.3	
	Dimmer or scene control	Controls shall allow occupants to select a 30% to 70% lighting level of maximum lighting power. There shall be at least one manual control device for light reduction within a space. See code for spaces that allow remote location of control. Automatic daylight control may be used instead of manual control.	C405.2.3.1	
Automatic ON/OFF Control <sup>1</sup>	Timeclock	<b>Interior:</b> 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. <b>Exterior:</b> Scheduled control, based on time-of-day and sunrise/sunset (requires astronomical timeclock), turns lighting ON or OFF based on typical occupancy and daylight.	C405.2.1 C405.2.2 C405.2.6	
	Occupancy sensor	Automatic control turns lighting ON upon occupancy or OFF after a vacancy of 20 minutes or less.	C405.2.1	
	Settings	Full ON	When initiated by a timeclock or occupancy sensor, lighting is automatically turned ON to maximum lighting power.	C405.2.1.1 Exception
		Partial ON	When initiated by a timeclock or occupancy sensor, lighting is automatically turned ON to 50% or less of maximum lighting power.	C405.2.1.1
		Manual ON	Lighting is turned ON manually by an occupant.	C405.2.1.1
		Full OFF	When initiated by a timeclock or occupancy sensor, lighting is automatically turned OFF.	C405.2.1
Partial OFF		When initiated by a timeclock or occupancy sensor, lighting is automatically reduced by at least 50% of maximum lighting power (30% for parking garages and exterior lighting; and 80% for open offices). Automatic full OFF also complies.	C405.2.1.2 C405.2.1.3 C405.2.1.4 C405.2.1.5 C405.2.6.3	
Other <sup>1</sup>	Daylight responsive control	<b>Interior:</b> A sensor which adjusts lighting in response to available daylight is required for sidelight and skylight zones. Some spaces, including offices and classrooms require dimming. See the "Daylight Zone Requirements" diagrams for more information. <b>Exterior:</b> A photosensor can be used as an alternate to the dawn/dusk operation of an astronomical timeclock.	C405.2.4 C405.2.6.1	
	Receptacle control	50% of the receptacles in offices, conference rooms, break rooms, copying rooms, and classrooms shall be automatically controlled with automatic shutoff controls.	C405.10	
	Demand response	Demand response is not required by this energy code.	N/A	

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 C408.4).

<sup>1</sup> Luminaire level lighting controls (LLLC) can be used as an alternate compliance path. See Section C405.2 for more information.

## Daylight zone requirements

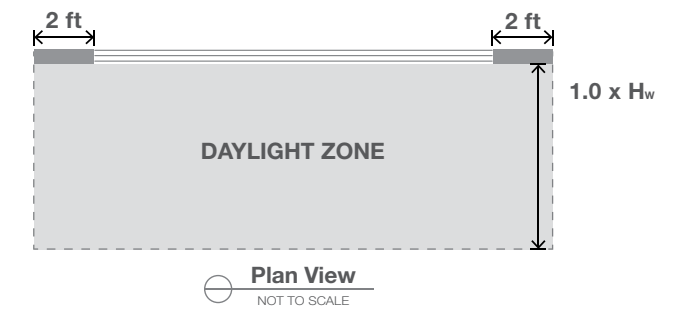
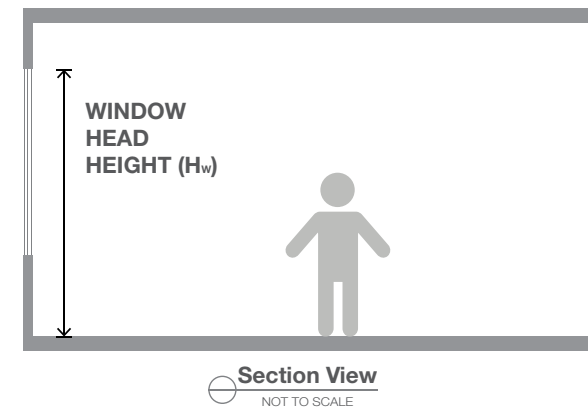
### Daylight Zone Requirements:

Sidelighted daylight zones must be controlled separately from toplighted zones. North, South, East, and West zones must also be controlled separately.

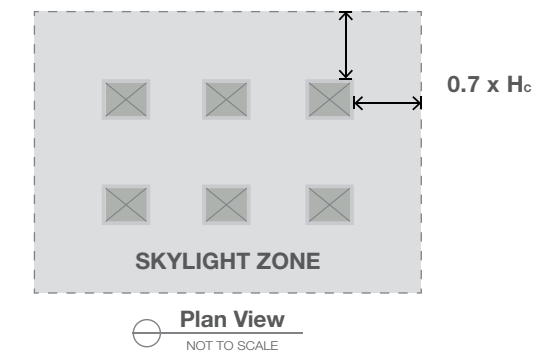
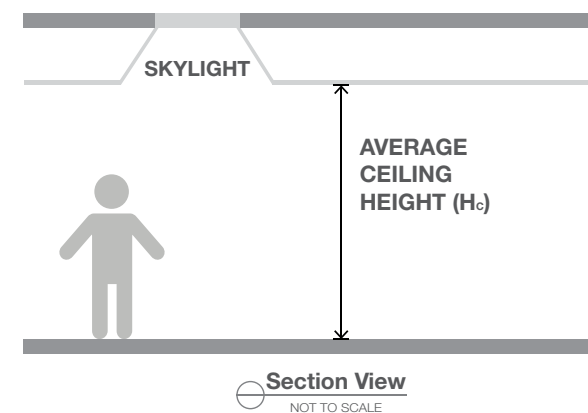
### Daylight Exceptions:

Daylight control is not required when there are fewer than two general lighting fixtures in the combined primary and secondary sidelit zones or fewer than two fixtures in the toplit zone. Also, daylight responsive controls are not required in spaces with a lighting power density that is less than 35% of the lighting power allowance. Other exceptions exist.

### 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.