

## 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 2013 can also be used as a compliance option in meeting SEC 2015 requirements.

Diagram key:

● = New construction

⚙ = Lighting retrofit<sup>1</sup>

⚙ = 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</sup>	Private Office (<300 sq. ft.)	Restaurant/Cafeteria, Retail	Restroom	Stairwell <sup>2</sup>	Storage Room	Warehouse and Library Stacks <sup>5</sup>	Facade/Landscape	Other Exterior <sup>6</sup>	
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					● <sup>7</sup>				●				● <sup>7</sup>		●		●	
Other	Daylight responsive control	●	● <sup>8</sup>	●	●		●	● <sup>8</sup>		● <sup>8</sup>	● <sup>9</sup>	●	●	●	●			
	Receptacle control		●	●				●		●								
	Demand response																	

1 All retrofits that add luminaires, or alter or replace 20% or more of the luminaires or lamps plus ballasts must comply with the lighting power requirements in section C405.4. Retrofits that replace 50% or more of parking garage luminaires, or 50% or more of the total installed lighting power of exterior luminaires must also comply with the lighting power requirements in C405.5. Retrofits that add less than 20% of the existing luminaires in an interior space or parking garage, or alter less than 20% of the total installed exterior lighting power must maintain or reduce the installed lighting power. Additional requirements may exist for retrofits that alter circuiting and/or wall/partition layouts.

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 Sensor must reduce lighting power by at least 50% after a vacancy of 15 minutes or less.

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

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

6 Astronomical timeclock shall ensure all lights are off during daylight hours. Lights should be scheduled to Partial OFF during night hours. See section C405.2.5 for scheduling times.

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

8 These spaces require continuous daylight dimming to OFF.

9 Not required for sidelight daylight zones in ground-level occupancies, provided that the daylight zone is controlled independently from general lighting.

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# Seattle Commercial Energy Code 2015: Application Summary

## 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.	C405.2.3	
	Dimmer or scene control	Lighting shall be capable of being reduced by at least 50% of maximum lighting power. There shall be a manual device allowing an occupant to reduce lighting by at least 50% of maximum lighting power within a space. See code for spaces that allow remote location of control. Automatic daylight control may be used instead of manual control.	C405.2.2.2	
Automatic ON/OFF Control	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.	C405.2.2 C405.2.7	
	Occupancy sensor	Automatic control turns lighting ON upon occupancy or OFF after a vacancy of 30 minutes or less. Sensor timeout upon initial install shall be set to 15 minutes.	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
		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. Automatic full OFF also complies.	C405.2.5 C405.2.7	
Other	Daylight responsive control	<b>Interior:</b> A sensor which adjusts lighting in response to available daylight is required for sidelight and skylight zones. Daylight override is restricted to a reduction in light output from the current daylighting level. The perimeter 20 ft of parking garages with access to daylight and an opening to wall ratio of at least 40% must automatically reduce lighting in response to daylight. 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 C405.2.7	
	Receptacle control	At least 50% of the receptacles shall automatically turn OFF based on typical occupancy or after a vacancy of 20 minutes or less. Plug-in devices do not comply	C405.10	
	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

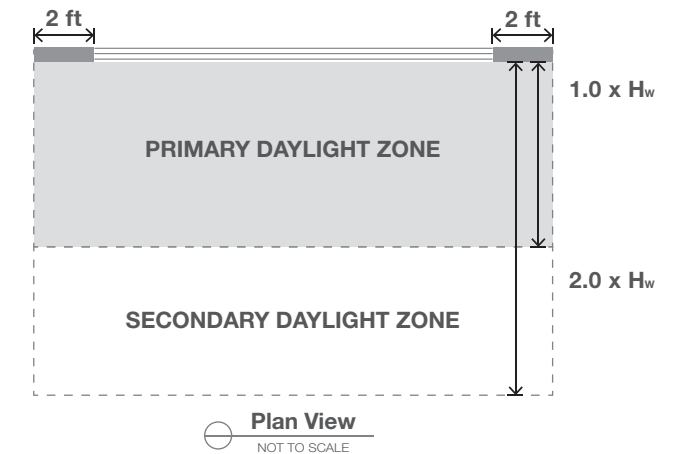
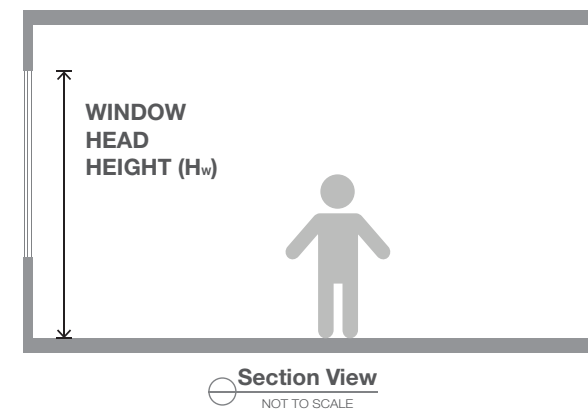
### Daylight Zone Requirements:

Fixtures in the primary and secondary daylight zones must be independently controlled by zone. Sidelighted daylight zones must be controlled separately from toplighted zones. North, South, East, and West zones must also be controlled separately. Each daylight control device can control no more than 2,500sq. ft. and no more than 60ft. of façade.

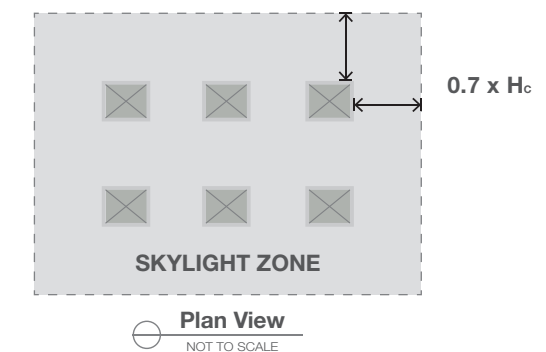
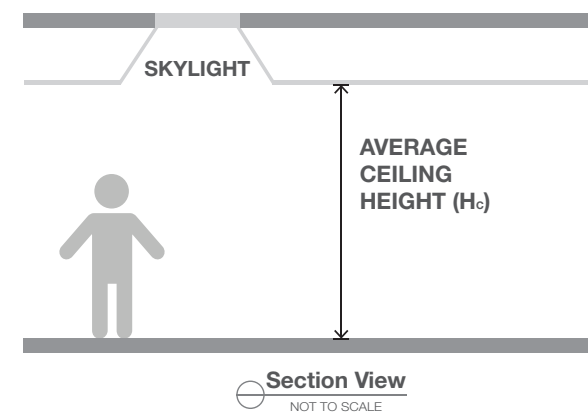
### Daylight Exceptions:

Daylight control is not required when the new lighting power is less than 35% of the allowance, or when the area of the vertical fenestration is less than 10% of the calculated area of its associated primary daylight zone. Other exceptions exist based on space type, neighboring obstructions, and glass transmittance.

### 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.