



2019 TITLE 24, PART 6

WHAT'S NEW IN COMMERCIAL LIGHTING?

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CLTC's Mission: To stimulate, facilitate and accelerate the development, application and commercialization of energy-efficient lighting and daylighting technologies in partnership with utilities, manufacturers, occupants, builders, designers, researchers, academicians and government agencies.

Mission-driven Activities:

- Research and Development
- Demonstration and Outreach
- Education and Training



FOUNDING ORGANIZATIONS



UTILITIES



LARGE END-USERS



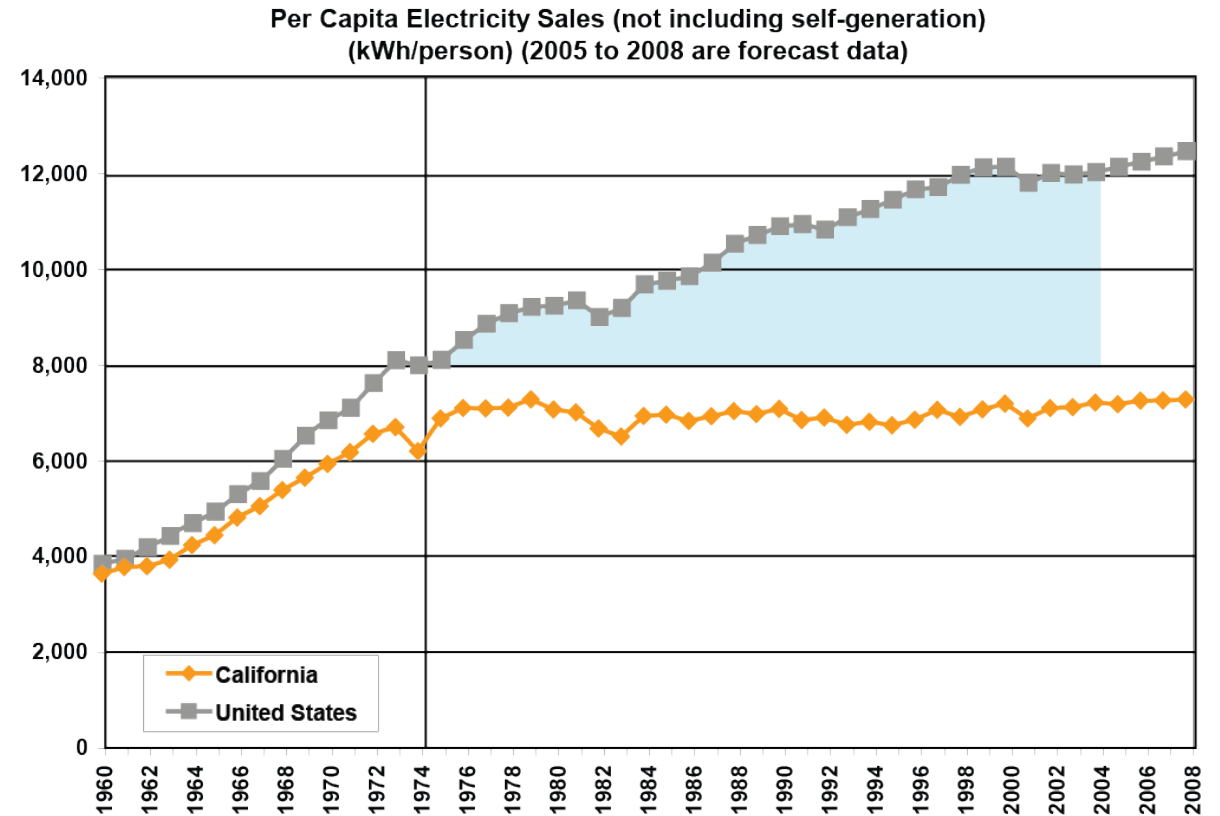
MANUFACTURERS



WHY THE ENERGY STANDARDS?

EFFICIENCY BEFORE GENERATION

The California Energy Commission has found energy efficiency and demand response as the preferred means of meeting the energy needs of a growing population.





WARREN-ALQUIST ACT — ENERGY STANDARDS DEVELOPMENT OBLIGATIONS



- Technically feasible
- Cost-effective
- Performance-based and Prescriptive compliance path

TITLE 24 CODE CYCLE TIMELINE

The most recent revision, the *2019 Title 24 Building Energy Efficiency Standards*, are effective since January 1, 2020!

The *2022 Title 24 Building Energy Efficiency Standards* are currently being researched and developed. If you are interested in the Codes and Standards Enhancement (CASE) process please participate in public events and docketing of comments on the California Energy Commission's website.

<http://www.energy.ca.gov/title24/>

<http://title24stakeholders.com/>

<https://caenergyalliance.org/2022-title-24/>

Note: This presentation is not intended to be used in lieu of the *Title 24 Building Energy Efficiency Standards*. Please visit www.energy.ca.gov/title24 to download the official *Title 24 Building Energy Efficiency Standards* as well as the *Nonresidential Compliance Manual*.



WHAT'S NEW NONRESIDENTIAL LIGHTING

Provides overview of major updates to lighting requirements in California's 2019 Building Energy Efficiency Standards.

There are major changes in:

- Lighting Power Allowances
- Power Adjustment Factors
- Additions, Alterations and Repairs

Available online for download!
cltc.ucdavis.edu



WHAT'S NEW IN THE 2019 CODE?

NONRESIDENTIAL LIGHTING

Changes to mandatory and prescriptive lighting requirements in California's 2019 Building Energy Efficiency Standards

California's new nonresidential Building Energy Efficiency Standards (Energy Standards) take effect on January 1, 2020. The 2019 Energy Standards focus on several key areas to improve the energy efficiency of newly constructed buildings, additions and alterations to existing buildings.

Significant changes in the 2019 Energy Standards address ventilation, HVAC, demand response and lighting. Notably, the 2019 Energy Standards now include requirements for healthcare facilities, although there are many exceptions for this building type.

MAJOR CHANGES



LIGHTING POWER ALLOWANCES

On average, indoor lighting power allowances have been reduced by 37 percent for the complete building method, and 29 percent for the area category method. These reductions are based on the assumption that all new construction, alterations and additions will be installing LED lighting technologies by January 1, 2020. The Energy Commission estimates this to be the single largest savings in the 2019 Energy Standards.



POWER ADJUSTMENT FACTORS

New power adjustment factors (PAFs) have been added to encourage the use of clerestory fenestration, horizontal slats and light shelves. Existing PAFs from the previous code cycle also remain as options for a total of seven PAFs.



ADDITIONS, ALTERATIONS AND REPAIRS

The additions, alterations and repairs section has been simplified. Now, the trigger for all alterations is 10 percent of the luminaires serving an enclosed space. Similar to 2016, there are three paths to compliance but now all share a universal set of exemptions and more clear cut requirements.

This guide is not intended to be used in lieu of California's Building Energy Efficiency Standards, and it is not a substitute for the code itself.

Please visit energy.ca.gov/title24/2019standards to download the official 2019 Building Energy Efficiency Standards, Reference Appendices, and the Nonresidential Compliance Manual.



HEALTHCARE FACILITIES NOW INCLUDED

- One of the largest changes in the 2019 Energy Code is the inclusion of **healthcare facilities** as a **newly regulated** building type (Occupancy Classification Group I-2)
 - Detoxification facilities
 - Hospitals
 - Nursing homes
 - Psychiatric hospitals
- **Lighting power allowance** for this building type using the *Complete Building Method* is **0.9 W/ft²**.
- It is important to note that **healthcare facilities are exempt** from multi-level lighting controls, shut-OFF controls and demand responsive **controls**.



THE COMPLIANCE PROCESS

There are two major steps to Energy Code compliance:

1. Meet all Mandatory requirements by installing required controls and devices and ensuring that they have all of the required functionality.
2. Meet all Prescriptive or Performance requirements by ensuring that the **actual** lighting power installed in a space is less than the **allowed** lighting power for that space.



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MANDATORY INDOOR LIGHTING CONTROLS

- 1. Area Controls** *130.1(a)*
Manual controls that control lighting in each area separately
- 2. Multi-level Controls** *130.1(b)*
“Dimmability.” Allow occupants to choose the appropriate light level for each area
- 3. Shut-off Controls** *130.1(c)*
Automatically shut OFF lighting or reduce light levels when illumination is not needed
- 4. Automatic Daylighting Controls** *130.1(d)*
Adjust electric lighting in response to the presence of daylight
- 5. Automated Demand Response** *130.1(e)*
Receive and automatically response to demand response (DR) signals
- 6. Control Interactions** *130.1(f)*
Defines interactions of all mandatory lighting controls



INDOOR LIGHTING CONTROL — MAJOR UPDATES

- Mandatory lighting control requirements contain minor revisions throughout, which are designed to make requirements more consistent and easier to apply in practice
- The most significant updates were made to the **automatic daylighting controls** and **demand responsive lighting** controls
- **Shut-OFF control** requirements for **restrooms** updated
- Additionally, a new section titled '**Control Interactions**' has been added (Section 130.1(f))



SHUT-OFF CONTROLS IN RESTROOMS

- Now, **restrooms of any size** are required to be equipped with occupancy sensing controls that **shut-OFF all lights** when the space is **unoccupied**. This can be achieved using an occupancy sensor, partial-ON occupancy sensor or vacancy sensor.



*Occupancy Sensors (top row, left to right):
Leviton OSSMT Occupancy Sensor,
Lighting Control & Design xCella Wireless
Occupancy Sensor, Lutron Radio Power
Savr Wireless Occupancy Sensor*

*Vacancy Sensors (bottom row, left to
right): Leviton Provolt Vacancy Sensor,
WattStopper CU-250 Ultrasonic Multi-way
Wall Switch Vacancy Sensor*



AUTOMATIC DAYLIGHTING CONTROLS

- The mandatory automatic daylighting control language has been restructured and clarified, **combining language for parking garages and indoor-only applications.**
- Explicit direction is now included **requiring separate controls** for luminaires in each daylit zone type: skylight, primary sidelit and secondary sidelit.



*Examples of Daylight Harvesting Controls:
Leviton ODC05-MDW,
WattStopper LMS-600,
Lutron Radio Powr Savr
Wireless Daylight Sensor*

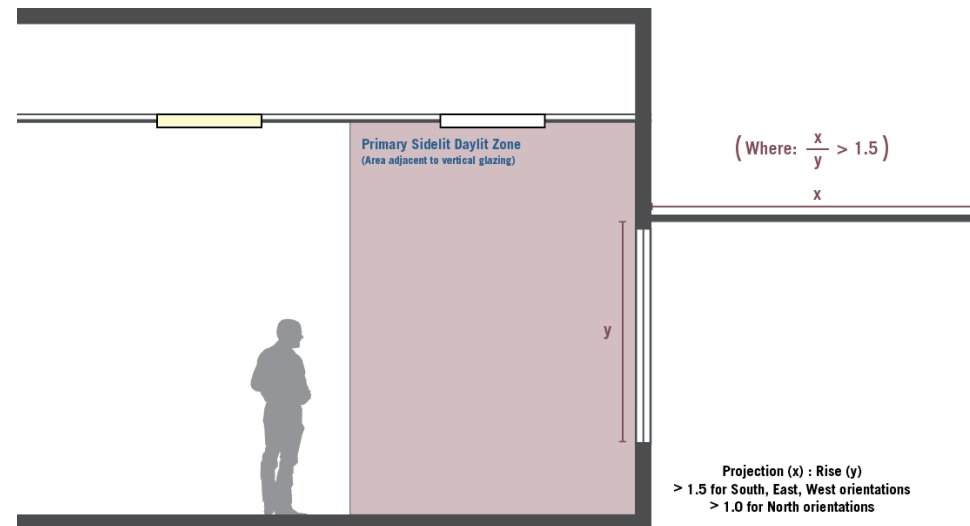


AUTOMATIC DAYLIGHTING CONTROLS

- A **new exception** has been added for **areas under skylights** where existing adjacent structures or outdoor objects **block direct sunlight for more than 1,500 daytime hours per year** between the hours of **8 A.M. and 4 P.M.**
- A **new exception** has been added for **areas adjacent to vertical glazing below an exterior overhang** that meets specific sizing requirements.



Examples of Daylight Harvesting Controls: Leviton ODC05-MDW, WattStopper LMS-600, Lutron Radio Powr Savr Wireless Daylight Sensor



AUTOMATED DEMAND RESPONSE

- Lighting demand responsive controls requirements are now listed under **Section 110.12–Demand Management**, which also include demand response requirements for other building systems including air conditioning units and electronic message boards.
- Updates **now require demand responsive controls to either be a certified OpenADR 2.0a or OpenADR 2.0b Virtual End Node (VEN)**, or be certified by the manufacturer as being capable of responding to a demand response signal from a certified OpenADR 2.0b VEN.



*Examples of Demand Response Controls:
Leviton GreenMax Relay Panel, WattStopper Digital Lighting Management*



AUTOMATED DEMAND RESPONSE

- Updates allow for the **use of alternative communication protocols**, so long as the system also uses one of the mandatory protocols: Wi-Fi, ZigBee, BACnet, Ethernet or hard-wiring.

This allowance is ideal for **cloud-based systems** that offer demand response capabilities.



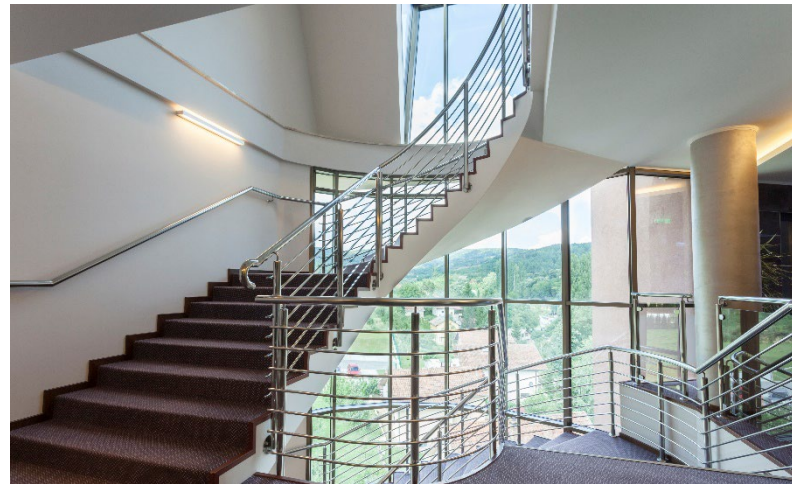
*Examples of Demand Response Controls:
Leviton GreenMax Relay Panel, WattStopper Digital Lighting Management*



CONTROL INTERACTIONS

The mandatory lighting controls section defines the interactions of all mandatory indoor lighting controls (manual ON/OFF, multi-level lighting, shut-OFF controls, automatic daylighting controls and demand responsive controls).

The section outlines how each system should operate in order to ensure that all functions of the mandatory lighting controls are permitted or incorporated by the system as a whole.



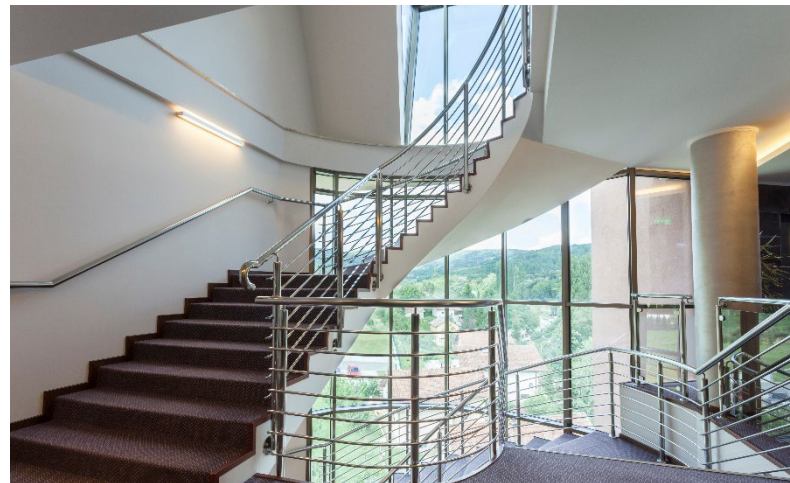
CONTROL INTERACTIONS

1. For general lighting, the manual area control must permit the amount of light provided while the lighting is ON to be set or adjusted by the controls specified in Section 130.1(b), (c), (d) and (e).
2. The manual area control must permit the shut-OFF control to turn the lighting down or OFF.
3. The multi-level lighting control must permit the automatic daylighting control to adjust the electric lighting level in response to changes in the amount of daylight in the daylit zone.



CONTROL INTERACTIONS

4. The multi-level lighting control must permit the demand responsive control to adjust the lighting during a demand response event and to return it to the level set by the multi-level control after the event.
5. The shut-OFF control must permit the manual area control to turn the lighting ON. If the ON request occurs while an automatic time-switch control would turn the lighting OFF, then the ON request must be treated as an override request consistent with Section 130.1(c)3.



CONTROL INTERACTIONS

6. The automatic daylighting control must permit the multi-level lighting control to adjust the level of lighting.
7. For lighting controlled by multi-level lighting controls and by occupancy sensing controls with an automatic-ON function, the controls shall provide a partial-ON function that is capable of automatically activating between 50–70% of controlled lighting power.



THE COMPLIANCE PROCESS

There are two major steps to Energy Code compliance:

1. Meet all Mandatory requirements by installing required controls and devices and ensuring that they have all of the required functionality.
2. Meet all Prescriptive or Performance requirements by ensuring that the **actual** lighting power installed in a space is less than the **allowed** lighting power for that space.



THE PRESCRIPTIVE APPROACH FOR INDOOR LIGHTING

The Prescriptive lighting power requirements are determined by one of three methods:

- Complete Building Method
- Area Category Method
- Tailored Method

The allowed lighting varies according to building occupancy and task.



THE PRESCRIPTIVE METHODS

COMPLETE BUILDING METHOD

- Usable when at least 90% of the building is one primary type of use or sometimes for a single tenant space within a building. A **single allowed lighting power** value governs the entire building

AREA CATEGORY METHOD

- Applicable for any permit situation, including tenant improvements. Lighting power values are assigned to **each major function areas** of a building (offices, lobbies, etc.). The allowed lighting power is the weighted average of these areas.

TAILORED METHOD

- Applicable when additional flexibility is needed to accommodate special task lighting needs in specific task areas. Lighting power allowances are determined **room-by-room and task-by-task**, with the Area Category Method used for other areas in the building.



INDOOR LIGHTING POWER ALLOWANCES

- On average, indoor lighting power allowances have reduced by 37% for the Complete Building Method and 29% for the Area Category Method.
- These reductions are based on the assumption that all New Construction, Alterations and Additions will be installing LED lighting technologies by January 1, 2020.
- For the **Complete Building Method**, the most significant changes impact the following building types:
 - Religious facilities,
 - Assembly buildings,
 - Motion picture theaters and
 - Grocery Stores
- For the **Area Category Method**, the most significant changes impact the following function areas:
 - Museum displays,
 - Dining areas in cafeterias and fast food,
 - Video conferencing studios,
 - Beauty salons and
 - Auditoriums



COMPLETE BUILDING METHOD — LIGHTING POWER ALLOWANCES

Lighting Power Density Updates from 2016 to 2019 for the Complete Building Method

Type of Building	Lighting Power Density (W/ft ²)		Type of Building	Lighting Power Density (W/ft ²)	
	2019	Δ		2019	Δ
Assembly ¹	0.7	↓ 0.7	Religious	0.7	↓ 0.8
Financial Institution	0.65	↓ 0.35	Restaurant	0.7	↓ 0.4
Industrial/Manufacturing	0.6	↓ 0.4	Retail Store	0.9	New
Grocery Store	0.95	↓ 0.55	School	0.65	↓ 0.3
Gymnasium	0.65	New	Sports Arena	0.75	New
Library	0.7	↓ 0.5	Motion Picture Theater ²	0.7	↓ 0.6
Healthcare	0.9	New	Performing Arts Theater ²	0.8	↓ 0.5
Office	0.65	↓ 0.15	All Other Buildings	0.4	↓ 0.1
Parking Garage	0.13	↓ 0.07			

¹ Previously "Auditorium" building type under 2016 Energy Code.

² Previously "Theater" building type under 2016 Energy Code.

Based on Table 140.6-B in the Energy Code



2019 INDOOR LIGHTING POWER ALLOWANCE VALUES

Table 140.6-C: Area Category Method — Lighting Power Density Values (W/ft²)

Primary Function Area	Allowed Lighting Power Density for General Lighting (W/ft ²)	Additional Lighting Power ¹	
		Qualified Lighting systems	Additional Allowance (W/ft ² , unless noted otherwise)
Auditorium Area	0.7	Ornamental	0.3
		Accent, display and feature	0.2
Auto Repair/Maintenance Area	0.55	Detailed Task Work	0.2
Audience Seating Area	0.6	Ornamental	0.3
Beauty Salon Area	0.8	Detailed Task Work	0.2
		Ornamental	0.3
Civic Meeting Place Area	1.0	Ornamental	0.3
Classroom, Lecture, Training, Vocational Area	0.7	White or Chalk Board	4.5 W/ft
Commercial/Industrial Storage	Warehouse	—	—
	Shipping & Handling	0.6	—
Convention, Conference, Multipurpose and Meeting Area	0.85	Ornamental	0.3
Copy Room	0.5	—	—



UPDATED POWER ADJUSTMENT FACTORS

- Power adjustment factors (PAFs) provide **flexibility** when developing a lighting design, effectively allowing projects to reduce their reported lighting power use.
- PAFs **incentivize** the use of additional, specific lighting controls and daylighting strategies. These strategies allow for light levels to be increased when needed, and automatically reduced to meet energy savings goals.
- Three new PAFs have been added to the Energy Code to encourage the use of **clerestory fenestration, horizontal slats and light shelves**. Four PAFs from the 2016 Energy Code are still available for use in your designs.



Clerestory Fenestration



Horizontal Slats



Light Shelves



LIGHTING POWER ADJUSTMENT FACTORS (PAFs)

Table 140.6-A: Lighting Power Adjustment Factors (PAF)

Type of Control	Type of Area	Factor
<p>a. To qualify for any of the Power Adjustment Factors in this table, the installation shall comply with the applicable requirements in Section 140.6(a)2.</p> <p>b. Only one PAF may be used for each qualifying luminaire unless stated below.</p> <p>c. Lighting controls that are required for compliance with Part 6 shall not be eligible for a PAF.</p>		
Daylighting Dimming plus OFF Control	Luminaires in skylit daylit zone or primary sidelit daylit zone.	0.10
Occupant Sensing Controls in Large Open Plan Offices	In open plan offices > 250 ft ² , one sensor controlling an area that is:	No larger than 125 ft ²
		From 126 to 250 ft ²
		From 251 to 500 ft ²
Institutional Tuning	Luminaires in non-daylit areas. Luminaires that qualify for other PAFs in this table may also qualify for this tuning PAF.	0.10
	Luminaires in daylit areas. Luminaires that qualify for other PAFs in this table may also qualify for this tuning PAF.	0.05
Demand Responsive Control	All building types of 10,000 ft ² or smaller. Luminaires that qualify for other PAFs in this table may also qualify for this PAF.	0.05
Clerestory Fenestration*	Luminaires in daylit areas adjacent to the clerestory. Luminaires that qualify for daylight dimming plus OFF control may also qualify for this PAF.	0.05
Horizontal Slats*	Luminaires in daylit areas adjacent to vertical fenestration with interior or exterior horizontal slats. Luminaires that qualify for daylight dimming plus OFF control may also qualify for this PAF.	0.05
Light Shelves*	Luminaires in daylit areas adjacent to clerestory fenestration with interior or exterior light shelves. This PAF may be combined with the PAF for clerestory fenestration. Luminaires that qualify for daylight dimming plus OFF control may also qualify for this PAF.	0.10

* New for 2019

Based on Table 140.6-A in the Energy Code



ADDITIONS, ALTERATIONS & REPAIRS

- Indoor Alteration requirements are now simpler and easier to apply in practice. In addition, compliance thresholds and exemptions are now consistent across all compliance options.



ADDITIONS, ALTERATIONS & REPAIRS

- Now, Alterations to indoor lighting systems that include 10% or more of the luminaires serving an enclosed space must meet one of the following requirements:

- Comply with the indoor lighting power and lighting control requirements for New Construction in the middle column of **Table 3**.

- Alterations using 80% or less of the indoor lighting power allowances for New Construction must adhere to the lighting control requirements in the right column of **Table 3**.

This is a reduction from 85% under the 2016 Energy Code.

- Projects in small buildings, or tenant spaces (5,000 ft² or less) that include one-for-one luminaire Alterations to 50 or more luminaires can retrofit with new luminaires that achieve at least 40% power reductions over pre-Alterations luminaires. The project must include the lighting controls shown in the right column of **Table 3**.

- If the project includes less than 10% of the luminaires in the enclosed space, or the enclosed space has just one luminaire, the project is exempt for these requirements.

2019 INDOOR LIGHTING ALTERATIONS

Control Requirements for Indoor Lighting System Alterations

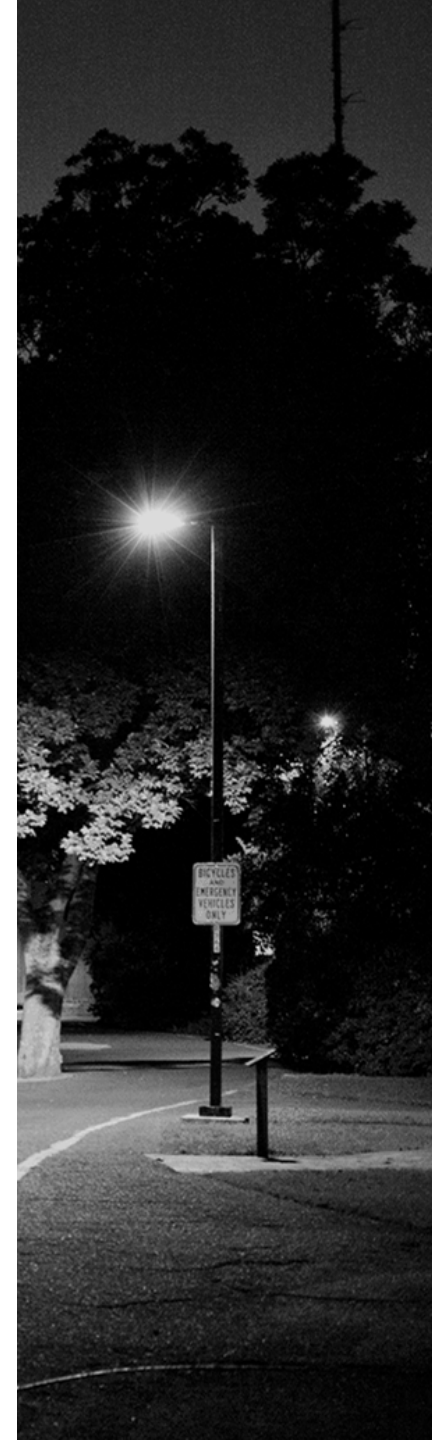
Based on Table 141.0-F from the Energy Code

Control Specifications		Trigger	Projects Complying with Section 141.0(b)2li	Projects Complying with Sections 141.0(b)2lii & 141.0(b)2liii
Manual Area Controls	130.1(a)1 – Be readily accessible.	Enclosed areas with ceiling-height partitions of any size. Healthcare buildings are exempt.	Required	Required
	130.1(a)2 – Be located in the same enclosed area with the lighting fixture it controls.		Required	Required
	130.1(a)3 – Provide separate control of general, display, ornamental and special effects lighting.		Only required for new or completely replaced circuits	Only required for new or completely replaced circuits
Multi-Level Controls	130.1(b) – Allow level of lighting to adjust up and down.	Enclosed areas 100 ft ² or larger with connected lighting load that exceeds 0.5 watts per ft ² . Healthcare buildings are exempt.	Required	Not Required
	130.1(c)1 – Be controlled by an occupant sensing control, automatic time-switch control or other control capable of automatically shutting OFF all lighting when the space is typically unoccupied; provide separate controls as specified in 130.1(c)1B-D; and include a manual-ON mode for automatic time-switch controls.		Required; 130.1(c)1D only required for new or completely replaced circuits	Required; 130.1(c)1D only required for new or completely replaced circuits
	130.1(c)2 – Countdown timer switches may be used to comply with shut-OFF control requirements in closets less than 70 ft ² and server aisles in server rooms.		Required	Required



OUTDOOR LIGHTING REQUIREMENTS

- The Energy Commission has updated three key areas related to outdoor lighting:
 - Outdoor lighting power allowance reductions
 - Luminaire cutoff requirements
 - Lighting control requirements



OUTDOOR LIGHTING POWER ALLOWANCES

- **Outdoor lighting power allowances** have been **reduced** by an average of **23%**.
- These reductions are based on the **assumption** that all New Construction, Alterations and Additions will be **installing LED lighting** technologies by January 1, 2020.
- Outdoor lighting power allowances vary based on sites with **concrete** surfaces and those with **asphalt** surfaces.
- **Clarifications** have been added to make the lighting allowances for lighting systems serving outdoor areas with concrete hardscape in Lighting Zones 2 and 3 more transparent.



OUTDOOR LIGHTING POWER ALLOWANCES

General Hardscape Lighting Power Allowances

Type of Power Allowance	Lighting Zone 0 ³	Lighting Zone 1 ³	Lighting Zone 2 ³		Lighting Zone 3 ³		Lighting Zone 4 ³
	Asphalt/Concrete	Asphalt/Concrete	Asphalt	Concrete ²	Asphalt	Concrete ²	Asphalt/Concrete
Area Wattage Allowance (AWA)	No allowance ¹	0.018 W/ft ²	0.023 W/ft ²	0.025 W/ft ²	0.025 W/ft ²	0.03 W/ft ²	0.03 W/ft ²
Linear Wattage Allowance (LWA)		0.15 W/lf	0.17 W/lf	0.4 W/lf	0.25 W/lf	0.4 W/lf	0.35 W/lf
Initial Wattage Allowance (IWA)		180W	250W		350W		400W

¹ Continuous lighting is explicitly prohibited in Lighting Zone 0. A single luminaire of 15 watts or less may be installed at an entrance to a parking area, trail head, fee payment kiosk, outhouse or toilet facility, as required to provide safe navigation of the site infrastructure. Luminaires installed shall meet the maximum zonal lumens as specified in Section 130.2(b).

² Where greater than 50% of the paved surface of a parking lot is finished with concrete. This does not extend beyond the parking lot and does not include any other General Hardscape areas.

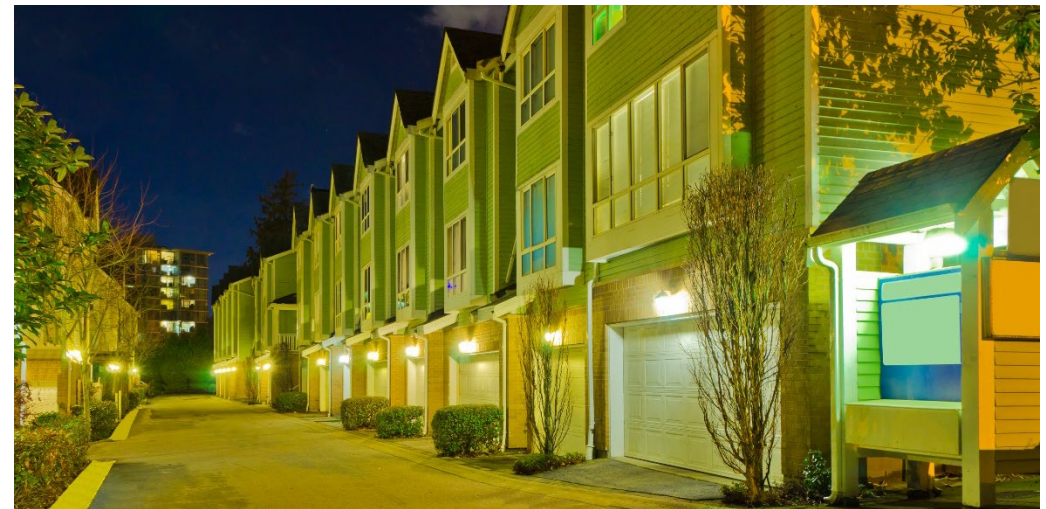
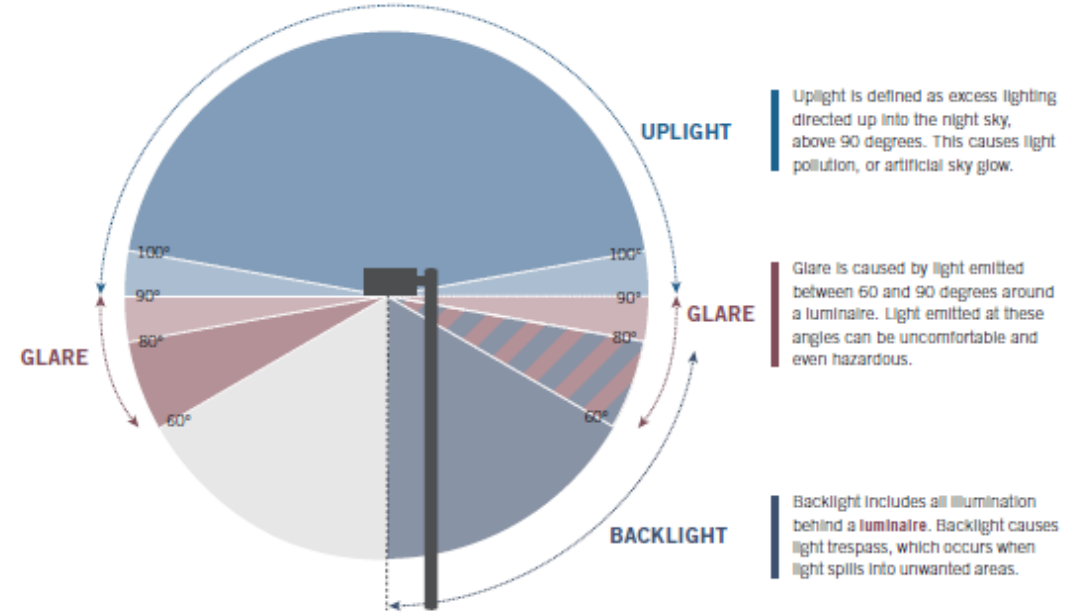
³ Narrow band spectrum light sources with a dominant peak wavelength greater than 580 nm — as mandated by local, state or federal agencies to minimize the impact on local, active professional astronomy or nocturnal habitat of specific local fauna — shall be allowed a 2.0 lighting power allowance multiplier.

Based on Table 140.7-A from the Energy Code



LUMINAIRE CUTOFF REQUIREMENTS

- The 2019 Energy Code updated luminaire cutoff requirements now apply to **luminaires with a light output of 6,200 lumens or greater**.
- This is a change from the 2016 Energy Code which required all lamps greater than 150 watts to comply with the luminaire cutoff requirements.
- Notably, **backlight requirements** have been added to the **Mandatory requirements** in addition to uplight and glare.
- An exception has been added for outdoor lighting attached to high-rise residential or hotel and motel buildings that is controlled from the inside of a dwelling unit or guest room, such as porch lights.



High-Rise Porch Light Controlled from Inside the Dwelling Unit

OUTDOOR LIGHTING CONTROLS

- The 2019 Energy Code have clarified the functionality for many types of outdoor lighting controls.
- Specifically, language has been refined for:
 - Automatic scheduling controls
 - Motion sensing controls



Examples of automatic scheduling controls: Leviton EZ-MAX Plus 8 Relay Panel, WattStopper LP8 Peanut Lighting Control Panels



Example of motion sensor controls: WattStopper EW-200-120 Outdoor Motion Sensor, PIR technology



OUTDOOR AUTOMATIC SCHEDULING CONTROLS

- New language refines the automatic scheduling controls functionality requirements and acceptance testing procedure to verify installed systems.
 - Automatic scheduling controls need to be capable of reducing the outdoor lighting power **by at least 50%** and **no more than 90%**.
 - The device needs to be able to **turn the lights OFF during periods of scheduled, unoccupied time** and
 - The device needs to **allow for the scheduling of at least two nighttime periods**.



Examples of automatic scheduling controls: Leviton EZ-MAX Plus 8 Relay Panel, WattStopper LP8 Peanut Lighting Control Panels



OUTDOOR MOTION SENSING CONTROLS

- The motion sensor control must be capable of reducing the lighting power by **at least 50%** and **no greater than 90%**, and separately capable of **turning OFF the lights during periods of vacancy**.
- **Maximum timeout of 15 minutes** when there is **no motion** in the area, after which the system returns to its dimmed or OFF mode.
- While it is still required for outdoor luminaires mounted at 24 feet or lower to be paired with motion sensors, the exceptions have been updated.
 - **All luminaires 40 watts or less are exempt** from the motion sensing control requirement regardless of their form factor or product category.



Example of motion sensor controls: WattStopper EW-200-120 Outdoor Motion Sensor, PIR technology



UPDATED CERTIFICATES OF COMPLIANCE

- Indoor lighting certificates of compliance (or design forms) are now consolidated to one interactive form, **NRCC-LTI-E**.
- Outdoor lighting certificates of compliance (or design forms) are now consolidated to one interactive form, **NRCC-LTO-E**.

NRCC-LTI-E

Indoor Lighting

NRCC-LTO-E

Outdoor Lighting

NRCC-LTS-E

Sign Lighting

NRCC-ELC-E

Electrical Power Distribution



UPDATED INDOOR LIGHTING CERTIFICATE OF COMPLIANCE

Example of the Certificate of Compliance for Nonresidential Indoor Lighting (NRCC-LTI-E).

This new form can be downloaded from the Energy Commission's website:

https://ww2.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/

NRCC-LTI-01-E:
 Indoor Lighting

STATE OF CALIFORNIA
Indoor Lighting
 NRCC-LTI-E (Revised 10/18)

CALIFORNIA ENERGY COMMISSION
 NRCC-LTI-E

This document is used to demonstrate compliance with requirements in §110.9, §110.12(e), §130.0, §130.1, §140.6, and §141.0(b)2 for indoor lighting scopes using the prescriptive path.

Project Name: _____ Report Page: _____ Page # of ##
 Project Address: _____ Date Prepared: _____

A. GENERAL INFORMATION

01 Project Location (city)	04 Total Conditioned Floor Area (ft ²)
02 Climate Zone	05 Total Unconditioned Floor Area (ft ²)
03 Occupancy Types Within Project (select all that apply):	06 # of Stories (Habitable Above Grade)
<input type="checkbox"/> Office <input type="checkbox"/> Retail <input type="checkbox"/> Warehouse <input type="checkbox"/> Hotel/Motel <input type="checkbox"/> School <input type="checkbox"/> Support Areas <input type="checkbox"/> Parking Garage <input type="checkbox"/> High-Rise Residential <input type="checkbox"/> Relocatable <input type="checkbox"/> Healthcare <input type="checkbox"/> Other (write in):	

B. PROJECT SCOPE

Table instructions: Include any lighting systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in §140.6 or §141.0(b)2 for alterations. WARNING: Changing the Calculation Method in this table will result in the deletion of data previously input. If you need to change the calculation method, please open a new form or use "Save As".

Scope of Work	Conditioned Spaces		Unconditioned Spaces	
	01	02	03	05
My Project Consists of (check all that apply):	Calculation Method	Area (ft ²)	Calculation Method	Area (ft ²)
<input type="checkbox"/> New Lighting System				
		Add Parking Garage Complete Bldg Method		Remove Parking Garage
<input type="checkbox"/> Altered Lighting System				
		Add Altered Lighting System		Remove Last Altered System
Total Area of Work (ft²)				

C. COMPLIANCE RESULTS

Table instructions: If any cell on this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D. for guidance.

Lighting in conditioned and unconditioned spaces must not be combined for compliance per §140.6(b)1.	Allowed Lighting Power per §140.6(b) (Watts)					Adjusted Lighting Power per §140.6(a) (Watts)			Compliance Results
	01	02	03	04	05	06	07	08	
	Complete Building §140.6(c)1	Area Category §140.6(c)2	Area Category Additional §140.6(c)2G (+)	Tailored §140.6(c)3 (+)	Total Allowed (Watts)	Total Designed (Watts)	Adjustments PAF Control Credits §140.6(a)2 (-)	Total Adjusted (Watts) *Includes Adjustments	05 Must be ≥ 08 §140.6
	(See Table I)	(See Table I)	(See Table J)	(See Table K)		(See Table F)	(See Table P)		
Conditioned:					≥	≥			
Unconditioned:					≥	≥			

Controls Compliance (See Table H for Details)
 Rated Power Reduction Compliance (See Table Q for Details)





2019 TITLE 24, PART 6

THANK YOU!

*For more information and
resources about Title 24, Part 6:
cltc.ucdavis.edu/title24*

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