

FACT SHEET



CALIFORNIA ENERGY COMMISSION

Nonresidential Lighting Alterations For Contractors and Installers 2016 California Building Energy Efficiency Standards

What is the new option for lighting alterations?

The *2016 Building Energy Efficiency Standards* added a new compliance pathway for lighting alteration projects. Projects can meet lighting power allowance (LPA) requirements, or they can comply by showing that the replaced or modified luminaires have at least 50 percent or 35 percent (50 percent for office, retail, and hotel; 35 percent for all other spaces) lower lighting power than the existing luminaires. The control requirements for these projects are the same as for the existing option of installing 85 percent or less of the space's LPA, without the requirement to install two-level lighting controls.

When is this option appropriate?

This option is intended for lighting-centric projects designed to reduce energy use by updating inefficient lighting systems, often while making very few other changes to the space. It may also provide relief for projects where two-level or multi-level lighting controls (i.e., bi-level switches, or continuous or stepped dimmers) are not already present, and where the cost to add these controls would be unexpectedly high.

Buildings with lighting systems that include efficient lighting will find this option applies a more stringent limitation on installed lighting power than calculating a LPA based on the area category method (i.e., using the square footage and primary function of the space). Also, requirements for two-level or multi-level lighting have been part of the Energy Standards for more than a decade, and many spaces will have existing controls that can be leveraged to meet current requirements. In general, if the space is roughly rectangular and if there are already two-level or multi-level controls, or if the lighting has been recently updated, then the "standard" approach of calculating the allowed lighting power based on square footage and occupancy is likely the better option.

This option is not available for projects adding, removing, or replacing walls or ceilings as it will not provide an accurate allowance if the floor area of the room changes.

What should I do to document the existing lighting?

The option is simpler for both the installer and the inspector, and allows drafting a lighting schedule for the existing lighting to be done quickly and easily. Here are some tips for projects using this option:

- **Determine each fixture's power**

Lighting fixtures are required to have their model number and relamping rated wattage marked on a permanent label. This information should be used to determine the fixture power if possible; the label is required by law and necessary for UL certification, and thus should be available in most cases. Should the label be damaged or illegible, you may be able to locate the model in the historic archive of certified fluorescent lamp ballasts available at <https://cacertappliances.energy.ca.gov/Pages/ApplianceSearch.aspx> even with a partial model number. If no information is available, for most common types of fluorescent lighting, the model can be matched to an appropriate generic luminaire power value from Reference Nonresidential Appendix NA8 and can be used for that value.

- **Use the NRCC form to determine your allowed lighting power**

The NRCC-LTI-06 and NRCC-LTO-04 forms take the place of the NRCC-LTI-03 and NRCC-LTO-03. Enter the model information and fixture power determined from examining an example of each fixture, then simply count the number of each fixture and enter their quantity in the appropriate column. Last, calculate the total power of the existing lighting, and multiply that value by the decimal noted on the form to determine the allowed lighting power (either 0.65 or 0.50 for indoor lighting, and 0.60 for outdoor lighting). This final value will be entered in your NRCC-LTI-01 or NRCC-LTO-01.

Where can I find more information?

Tables of lighting power allowances from Section 140.6 are included with this publication for easy reference, as well as a modified version of Table 141.0-E.

Compliance forms can be referenced at

http://www.energy.ca.gov/title24/2016standards/nonresidential_manual.html.

The Part 6 Regulations and the Compliance Manuals can be freely downloaded from <http://www.energy.ca.gov/title24/2016standards/>.

Help With the 2016 Energy Standards

For assistance with understanding or locating information in the 2016 Energy Standards, contact the Energy Standards Hotline at (800) 772-3300 (toll-free in California), (916) 654-5106 (outside California), or via email at title24@energy.ca.gov.

TABLE 140.6-C AREA CATEGORY METHOD - LIGHTING POWER DENSITY VALUES (WATTS/FT²)

PRIMARY FUNCTION AREA		ALLOWED LIGHTING POWER DENSITY (W/ft ²)	PRIMARY FUNCTION AREA	ALLOWED LIGHTING POWER DENSITY (W/ft ²)	
Auditorium Area		1.40 ³	Library Area	Reading areas	1.1 ³
Auto Repair Area		0.90 ²		Stack areas	1.5 ³
Beauty Salon Area		1.7	Lobby Area	Hotel lobby	0.95 ³
Civic Meeting Place Area		1.3 ³		Main entry lobby	0.95 ³
Classroom, Lecture, Training, Vocational Areas		1.2 ⁵	Locker/Dressing Room		0.70
Commercial and Industrial Storage Areas (conditioned and unconditioned)		0.60	Lounge Area		0.90 ³
Commercial and Industrial Storage Areas (refrigerated)		0.7	Malls and Atria		0.95 ³
Convention, Conference, Multipurpose and Meeting Center Areas		1.2 ³	Medical and Clinical Care Area		1.2
Corridor, Restroom, Stair, and Support Areas		0.60	Office Area	> 250 square feet	0.75
Dining Area		1.0 ³		≤ 250 square feet	1.0
Electrical, Mechanical, Telephone Rooms		0.55 ²	Parking Garage Area	Parking Area ¹⁰	0.14
Exercise Center, Gymnasium Areas		1.0		Dedicated Ramps	0.30
Exhibit, Museum Areas		1.8		Daylight Adaptation Zones ⁹	0.60
Financial Transaction Area		1.0 ³	Religious Worship Area		1.5 ³
General Commercial and Industrial Work Areas	Low bay	0.9 ²	Retail Merchandise Sales, Wholesale Showroom Areas		1.2 ^{6 and 7}
	High bay	1.0 ²			
	Precision	1.2 ⁴	Theater Area	Motion picture	0.90 ³
Grocery Sales Area	1.2 ^{6 and 7}	Performance		1.4 ³	
Hotel Function Area		1.4 ³	Transportation Function Area	Concourse & Baggage	0.50
				Ticketing	1.0
Kitchen, Food Preparation Areas		1.2	Videoconferencing Studio		1.2 ⁸
Laboratory Area, Scientific		1.4 ¹	Waiting Area		0.80 ³
Laundry Area		0.70	All other areas		0.50

Footnotes for this table are listed below.

FOOTNOTES FOR TABLE 140.6-C:

See Section 140.6(c)2 for an explanation of additional lighting power available for specialized task work, ornamental, precision, accent, display, decorative, and white boards and chalk boards, in accordance with the footnotes in this table. The smallest of the added lighting power listed in each footnote below, or the actual design wattage, may be added to the allowed lighting power only when using the Area Category Method of compliance.

Footnote number	Type of lighting system allowed	Allowed lighting power density. (W/ft ² of task area unless otherwise noted)
1	Specialized task work	0.20 W/ft ²
2	Specialized task work	0.50 W/ft ²
3	Ornamental lighting as defined in Section 100.1 and in accordance with Section 140.6.(c)2.	0.50 W/ft ²
4	Precision commercial and industrial work	1.0 W/ft ²
5	Per linear foot of white board or chalk board.	5.5 W per linear foot
6	Accent, display and feature lighting – luminaires shall be adjustable or directional	0.30 W/ft ²
7	Decorative lighting - primary function shall be decorative and shall be in addition to general illumination.	0.20 W/ft ²
8	Additional Videoconferencing Studio lighting complying with all of the requirements in Section 140.6(c)2Gvii.	1.5 W/ft ²
9	Daylight Adaptation Zones shall be no longer than 66 feet from the entrance to the parking garage	
10	Additional allowance for ATM locations in Parking Garages. Allowance per ATM.	200 watts for first ATM location. 50 watt for each additional ATM location in a group.

Table 1: Control Requirements for Luminaire Alterations

Applicable Section 130.1 control requirements:	Resulting lighting power, compared to the lighting power allowance in Section 140.6(c)2, Area Category Method		
	EXISTING OPTION 1 Lighting power density is > 85% of allowance	EXISTING OPTION 2 Lighting power density is ≤ 85% of allowance	NEW OPTION Existing lighting power is reduced by 50/35%
Section 130.1(a)1, 2, and 3 Area Controls	Yes	Yes	Yes
Section 130.1(b) Multi-Level Lighting Controls - only for alterations to general lighting of enclosed spaces 100 square feet or larger with a connected lighting load that exceeds 0.5 watts per square foot	Yes	Bilevel Switching – for each enclosed space, minimum one step between 30-70 percent of lighting power regardless of luminaire type, or meet Section 130.1(b)	Not Required
Section 130.1(c) Shut-Off Controls	Yes	Yes	Yes ¹
Section 130.1(d) Automatic Daylight Controls	Yes	Not Required	Not Required
Section 130.1(e) Demand Responsive Controls - only for alterations >10,000 sq. ft. in a single building, where the alteration also changes the area of the space, or changes the occupancy type of the space, or increases the lighting power	Yes	Not Required	Not Required

¹ As bilevel controls are not required for this option, partial off controls are not required to be installed in place of “full off” automatic shutoff controls; this difference is included in the analysis of anticipated energy savings.

Source: California Energy Commission staff

Note on NEW OPTION: Reduction is at least 50 percent lower compared to existing rated power at full light output for hotel, office, and retail occupancies, and at least 35 percent lower rated power at full light output for all other occupancies.