

FACT SHEET



CALIFORNIA ENERGY COMMISSION

Nonresidential Lighting Alterations For Building Officials *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.

What does compliance using this option look like at the counter?

Projects using this approach will complete the NRCC-LTI-01 the same way, and will use the new NRCC-LTI-06 form to calculate the value for allowed lighting power in Part C, Row 5. There's a checkbox on the first page of NRCC-LTI letting you know when the new form is being used.

The new form has a table similar to NRCC-LTI-01's Lighting Schedule and Field Inspection Checklist. This table is used to document the existing (pre-project) lighting and to calculate the allowed lighting power based on reducing the total by a specified percentage.

Outdoor lighting projects also have a new LTO-04 form that provides the same ability to determine the allowed lighting power based on a percent reduction in the installed power.

What should I look for at inspection?

The new option is simpler for both the installer and the inspector, and allows confirming the lighting schedule to be done quickly and easily. Here are some tips for inspecting projects using the new option:

- **Compare and contrast**

Is the lighting moving from a less efficient to a more efficient technology? Is the number of installed luminaires or troffers decreasing? If the answer to both of these questions is no, then it is worth taking a closer look at the lighting at the time of inspection as it is less likely to achieve the needed reduction.

- **When in doubt, issue a correction notice**

If the description of the prior lighting does not make sense, if there is any deviation from the lighting schedule on the LTI-01, or if the installed lighting raises any red flags during inspection, issue a correction that two-level or multi-level lighting is needed for the space.

- **If additional certainty is needed, use the square foot calculation**

The most thorough way to check the installation is to perform the same verification of lighting power density that would apply to a “traditional” lighting alteration project. The percent reduction pathway is designed to come in at or below 85 percent of the LPA in even the worst performing buildings and spaces, meaning that the same verification can be applied.

To do so, multiply the fixture wattages on the NRCC-LTI-01 form by the number of fixtures observed in the space, then divide that total power by the square footage of the space in question. If the amount is at or below 85 percent of the space’s LPA, then it has hit its intended target. If, instead, the amount of new lighting in the space is above this level, issue a correction notice that the space needs to install full multilevel lighting controls and, when applicable, daylight and demand response controls.

Where can I find more information?

Tables of LPA 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 found at

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

The Part 6 regulations and the compliance manuals can be downloaded freely 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.