

# **Proposed 15-Day Language for Section 141.0(b)2, Nonresidential Lighting Alteration Provisions**

**October 27, 2015**

This document shows the proposed changes to the nonresidential lighting alteration provisions found in Sections 141.0(b)2I and J, and Tables 141.0-E and F, of the 2013 Building Energy Efficiency Standards. The proposed changes include dividing 141.0(b)2I into three Sections (141.0(b)2I, J, and K, with the current J renumbered as L), and consolidating Tables 141.0-E and F into one Table (141.0-E).

Changes to these Sections are shown in underline and strikethrough. Note that the changes are shown in relation to the previously proposed 15-Day Language, and do not include the language previously proposed in the 45-Day Draft Express Terms and superseded by the prior release of 15-Day Language. Single-underline and single-strikethrough changes were published in the previous 15-Day Language. Double-underline and double-strikethrough changes are new to this 15-Day Language.

California Energy Commission

**DOCKETED**

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## SUBCHAPTER 6

# NONRESIDENTIAL, HIGH-RISE RESIDENTIAL, AND HOTEL/MOTEL OCCUPANCIES—ADDITIONS, ALTERATIONS, AND REPAIRS

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### SECTION 141.0 – ADDITIONS, ALTERATIONS, AND REPAIRS TO EXISTING NONRESIDENTIAL, HIGH-RISE RESIDENTIAL, AND HOTEL/MOTEL BUILDINGS, TO EXISTING OUTDOOR LIGHTING, AND TO INTERNALLY AND EXTERNALLY ILLUMINATED SIGNS

[...]

- (b) **Alterations.** Alterations to existing nonresidential, high-rise residential, or hotel/motel buildings, relocatable public school buildings or alterations in conjunction with a change in building occupancy to a nonresidential, high-rise residential, or hotel/motel occupancy are not subject to Subsection (a) and shall meet item 1, and either Item 2 or 3 below:

[...]

2. **Prescriptive approach.** The altered components of the envelope, or space conditioning, lighting, electrical power distribution and water heating systems, and any newly installed equipment serving the alteration, shall meet the applicable requirements of Sections 110.0 through 110.9, Sections 120.0 through 120.6, and Sections 120.9 through 130.5.

[...]

~~I. For each enclosed space, alterations to existing indoor lighting shall meet the following requirements:~~

~~i. Luminaire Classification and Power shall be determined in accordance with Section 130.0(c).~~

~~EXCEPTION to Section 141.0(b)2Ii: For only a Lighting System Alteration in accordance with Section 141.0(b)2Iii, or a Luminaire Modifications in Place in accordance with Section 141.0(b)2Iiii; an existing incandescent, fluorescent or HID luminaire may be modified and classified as a luminaire having a different number of, or type of light source(s), provided all of the following conditions are met:~~

- ~~a. The luminaire has been previously used and is in an existing installation; and,~~
- ~~b. The modified luminaire is listed with the different number or type of light source(s) under the installed conditions; and~~
- ~~c. The different light source(s) is not an LED lamp, integrated or nonintegrated type, as defined by ANSI/IES RP-16-2010; and~~
- ~~d. The modified luminaire does not contain:~~
  - ~~1. Unused fluorescent or HID ballast(s); or~~
  - ~~2. Unused HID or fluorescent lamp sockets; or~~
  - ~~3. Sockets used only for lamp support; or~~
  - ~~4. Screw sockets of any kind or for any purpose; and~~
- ~~e. The wattage of the modified luminaire shall be published in the manufacturer's catalog based on accredited testing lab reports.~~

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ii. ~~Lighting System Alterations shall meet the applicable requirements in TABLE 141.0 E and the following:~~

a. ~~Lighting System Alterations include alterations where an existing lighting system is modified, luminaires are replaced, or luminaires are disconnected from the circuit, removed and reinstalled, whether in the same location or installed elsewhere.~~

~~EXCEPTION 1 to Section 141.0(b)2Iii: Alterations that qualify as a Luminaire Modification in Place.~~

~~EXCEPTION 2 to Section 141.0(b)2Iii: Portable luminaires, luminaires affixed to moveable partitions, and lighting excluded in accordance to Section 140.6(a)3.~~

iii. ~~Luminaire Modifications in Place shall meet the applicable requirements in TABLE 141.0 F and the following:~~

a. ~~To qualify as a Luminaire Modification in Place, luminaires shall only be modified by one or more of the following methods:~~

- ~~1. Replacing lamps and ballasts with like type or quantity in a manner that preserves the original luminaire listing.~~
- ~~2. Changing the number or type of light source in a luminaire including: socket renewal, removal or relocation of sockets or lampholders, and/or related wiring internal to the luminaire including the addition of safety disconnecting devices.~~
- ~~3. Changing the optical system of a luminaire in part or in whole.~~
- ~~4. Replacement of whole luminaires one for one in which the only electrical modification involves disconnecting the existing luminaire and reconnecting the replacement luminaire.~~

b. ~~Luminaire Modifications In Place shall include only alterations to lighting system meeting the following conditions:~~

- ~~1. Luminaire Modifications in Place shall not be part of or the result of any general remodeling or renovation of the enclosed space in which they are located.~~
- ~~2. Luminaire Modifications in Place shall not cause, be the result of, or involve any changes to the panelboard or branch circuit wiring, including line voltage switches, relays, contactors, dimmers and other control devices providing power to the lighting system.~~

~~EXCEPTION to Section 141.0(b)2Iiii2. Circuit modifications strictly limited to the addition of occupancy or vacancy sensors and class two lighting controls are permitted for Luminaire Modifications in Place~~

iv. ~~Lighting Wiring Alterations shall meet the applicable requirements in Sections 110.9, 130.1, and 130.4.~~

a. ~~Lighting Wiring Alterations include the following:~~

- ~~1. Adding a circuit feeding luminaires.~~
- ~~2. Modifying or relocating wiring to provide power to new or relocated luminaires.~~
- ~~3. Replacing wiring between a switch or panelboard and luminaire(s).~~
- ~~4. Replacing or installing a new panelboard feeding lighting systems.~~

~~EXCEPTION to Section 141.0(b)2Iiv. Lighting Wiring Alterations allowed for Luminaire Modifications in Place in accordance with Section 141.0(b)2Iiii.~~

v. ~~Any lighting alteration that increases the installed lighting power in an enclosed space shall meet the requirements of Sections 110.9, 130.0, 130.1, 130.4, 140.3(e) and 140.6.~~

vi. ~~Lighting Alterations and Luminaire Modifications in Place shall not exceed the lighting power allowance in Section 140.6.~~

vii. ~~The following indoor lighting alterations are not required to comply with the lighting requirements in Title 24, Part 6:~~

- a. ~~Replacement in kind of parts of an existing luminaire that include only new lamps, lamp holders, or lenses, when replacement of those parts is not a Luminaire Modification in Place in accordance with Section 141.0(b)2Iiii.~~
- b. ~~Lighting Alterations directly caused by the disturbance of asbestos.~~

**EXCEPTION to Section 141.0(b)2Iviib:** ~~Lighting alterations made in conjunction with asbestos abatement shall comply with the applicable requirements in Section 141.0(b)2I.~~

**J. Alterations to existing outdoor lighting systems shall meet the following requirements:**

- i. ~~Alterations that increase the connected lighting load in a lighting application listed in TABLE 140.7 A or 140.7 B shall meet the applicable requirements of Sections 130.0, 130.2, 130.4, and 140.7; and~~
- ii. ~~In alterations that replace 10 percent or more of the luminaires in a lighting application listed in TABLE 140.7 A or 140.7 B, the altered luminaires shall meet the applicable requirements of Sections 130.0, 130.2 and 130.4; and~~
- iii. ~~In alterations that replace more than 50 percent of the luminaires in a lighting application listed in TABLE 140.7 A or 140.7 B, the lighting in that application shall meet the applicable requirements of Sections 130.0, 130.2, 130.4 and 140.7.~~

**I. Entire Luminaire Alterations.** Entire luminaire alterations shall meet the following requirements:

- i. For each enclosed space, alterations that consist of either (a) removing and reinstalling a total of 10 percent or more of the existing luminaires; or (b) replacing or adding entire luminaires; or (c) adding, removing, or replacing walls or ceilings along with any redesign of the lighting system, shall meet the lighting power allowance in Section 140.6, and the altered luminaires shall meet the applicable requirements in Table 141.0-E; or
- ii. For alterations where existing luminaires are replaced with new luminaires, and that do not include adding, removing, or replacing walls or ceilings along with redesign of the lighting system, ~~all~~ the replacement luminaires in each office, retail, and hotel occupancy shall collectively have at least 35 percent, and in all other occupancies at least 35 percent, lower rated power at full light output ~~as~~ compared to the existing luminaires being replaced, and shall meet the applicable requirements of Sections 130.1(a)1, 2, and 3, 130.1(c)1A through C, 130.1(c)2, 130.1(c)3, 130.1(c)4, 130.1(c)5, 130.1(c)6A, and for parking garages 130.1(c)7B.

**EXCEPTION 1 to Section 141.0(b)2I.** Alteration of portable luminaires, luminaires affixed to moveable partitions, or lighting excluded as specified in Section 140.6(a)3.

**EXCEPTION 2 to Section 141.0(b)2I.** In an enclosed space where two or fewer luminaires are replaced or reinstalled.

**EXCEPTION 3 to Section 141.0(b)2I.** Alterations that would directly cause the disturbance of asbestos, unless the alterations are made in conjunction with asbestos abatement.

**EXCEPTION 4 to Section 141.0(b)2I.** Acceptance testing requirements of Section 130.4 are not required for alterations where lighting controls are added to control 20 or fewer luminaires.

- J. Luminaire Component Modifications.** Luminaire component modifications in place that include replacing the ballasts or drivers and the associated lamps in the luminaire, ~~or~~ permanently changing the light source of the luminaire, or changing the optical system of the luminaire, where 70 or more existing luminaires are modified either on any single floor of a building or, where multiple tenants inhabit the same floor, in any single tenant space, in any single year, shall meet the applicable requirements of Sections 130.1(a)1, 2, and 3, 130.1(c)1A through C, 130.1(c)2, 130.1(c)3, 130.1(c)4, 130.1(c)5, 130.1(c)6A, and for parking garages 130.1(c)7B, shall not prevent or disable the operation of any multi-level, shut-off, or daylighting controls, and shall ~~either~~:
- i. Meet the lighting power allowance in Section 140.6 and comply with Table 141.0-E; or

- ii. In office, retail, and hotel occupancies ~~Collectively~~ have at least ~~35-50~~ percent, and in all other occupancies have at least 35 percent, lower rated power at full light output as compared to the original luminaires prior to being modified, and meet the requirements of Sections 130.1(a)1, 2, and 3, 130.1(c)1A through C, 130.1(c)2, 130.1(c)3, 130.1(c)4, 130.1(c)5, 130.1(c)6A, and for parking garages 130.1(c)7B.

Lamp replacements alone and ballast replacements alone shall not be considered a modification of the luminaire provided that the replacement lamps or ballasts are installed and powered without modifying the luminaire.

**EXCEPTION 1 to Section 141.0(b)2J.** Modification of portable luminaires, luminaires affixed to moveable partitions, or lighting excluded by Section 140.6(a)3.

**EXCEPTION 2 to Section 141.0(b)2J.** In an enclosed space where two or fewer luminaires are modified.

**EXCEPTION 3 to Section 141.0(b)2J.** Modifications that would directly cause the disturbance of asbestos, unless the modifications are made in conjunction with asbestos abatement.

**EXCEPTION 4 to Section 141.0(b)2J.** Acceptance testing requirements of Section 130.4 are not required for modifications where lighting controls are added to control 20 or fewer luminaires.

- K. **Lighting Wiring Alterations.** For each enclosed space, wiring alterations that add a circuit feeding luminaires; that replace, modify, or relocate wiring between a switch or panelboard and luminaires; or that replace lighting control panels, panelboards, or branch circuit wiring; shall:

- i. meet the lighting power allowance in Section 140.6;
- ii. meet the requirements in Sections 130.1(a)1, 2, and 3, 130.1(c)1A through C, 130.1(c)3, and 130.1(c)4;
- iii. for each enclosed space, be wired to create a minimum of one step between 30-70 percent of lighting power or meet Section 130.1(b); and
- iv. for each enclosed space where wiring alterations include ~~20-10~~ or more luminaires that provide general lighting are located within the primary sidelit daylight zone ~~and or~~ the skylit daylight zone, meet the requirements of 130.1(d).

**NOTE:** As specified in Section 141.0(b)2I, alterations that include adding, removing, or replacing walls or ceilings resulting in redesign of the lighting system shall meet the requirements of Table 141.0-E.

**EXCEPTION 1 to Section 141.0(b)2K.** Alterations strictly limited to addition of lighting controls.

**EXCEPTION 2 to Section 141.0(b)2K.** In an enclosed space where wiring alterations involve two or fewer luminaires.

**EXCEPTION 3 to Section 141.0(b)2K.** Alterations that would directly cause the disturbance of asbestos, unless the alterations are made in conjunction with asbestos abatement.

**EXCEPTION 4 to Section 141.0(b)2K.** Acceptance testing requirements of Section 130.4 are not required for wiring alterations where lighting controls are added to control 20 or fewer luminaires.

- L. Alterations to existing outdoor lighting systems in a lighting application listed in TABLE 140.7-A or 140.7-B shall meet the applicable requirements of Sections 130.0, 130.2(a), 130.2(b), and 130.4, and:
  - i. In alterations that increase the connected lighting load, the added or altered luminaires shall meet the applicable requirements of Section 130.2(c) and the requirements of Section 140.7 for general hardscape lighting or for the specific lighting applications containing the alterations; and
  - ii. In alterations that do not increase the connected lighting load, where the greater of 5 luminaires or 10 percent of the existing luminaires are replaced in a general hardscape or a specific lighting application, the alterations shall meet the following requirements:

- a. In parking lots and outdoor sales lots where the bottom of the luminaire is mounted 24 feet or less above the ground, the replacement luminaires shall comply with Section 130.2(c)1 AND Section 130.2(c)3;
- b. For all other lighting applications and where the bottom of the luminaire is mounted greater than 24 feet above the ground, the replacement luminaires shall comply with Section 130.2(c)1 AND EITHER comply with Section 130.2(c)2 or be controlled by lighting control systems, including motion sensors, that automatically reduces lighting power by at least 40 percent in response to the area being vacated of occupants; and
- iii. In alterations that do not increase the connected lighting load, where the greater of 5 luminaires or 50 percent of the existing luminaires are replaced in general hardscape or a specific application, the replacement luminaires shall meet the requirements of subsection ii above and the requirements of Section 140.7 for general hardscape lighting or specific lighting applications containing the alterations.

**EXCEPTION to Section 141.0(b)2Liii.** Alterations where the replacement luminaires have at least 40 percent lower power consumption compared to the original luminaires are not required to comply with the lighting power allowances of Section 140.7.

**EXCEPTION to Section 141.0(b)2L.** Acceptance testing requirements of Section 130.4 are not required for alterations where controls are added to 20 or fewer luminaires.

[...]

TABLE 141.0-E Control Requirements for Entire Luminaire Alterations

Control requirements that shall be met <del>when 10% or more of existing luminaires in an enclosed space are altered</del>	Resulting lighting power, compared to the lighting power allowance specified in Section 140.6(c)2, Area Category Method	
	Lighting power is $\leq$ 85% of allowance	Lighting power is $>$ 85% to 100% of allowance
Section 130.1(a)1, 2, and 3 Area Controls	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	For each enclosed space, minimum one step between 30-70 percent of lighting power regardless of luminaire type, or meet Section 130.1(b)	Yes
Section 130.1(c) Shut-Off Controls	Yes	Yes
Section 130.1(d) Automatic Daylight Controls	Not Required	Yes
Section 130.1(e) Demand Responsive Controls – only for alterations $>$ 10,000 ft <sup>2</sup> 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	Not Required	Yes

TABLE 141.0-E Requirements for Luminaire Alterations

Quantity of existing affected luminaires per Enclosed Space <sup>1</sup>	Resulting Lighting Power for Each Enclosed Space	Applicable Mandatory Control Provisions for Each Enclosed Space	Multi-level Lighting Control Requirements for Each Altered Luminaire
<b>Alterations that do not change the area of the enclosed space or the space type</b>			
Sum total $<$ 10% of existing luminaires	Existing lighting power is permitted	Existing provisions are permitted	Existing controls are permitted
Sum total $\geq$ 10% of existing luminaires	$\leq$ 85% of allowed lighting power per Section 140.6 Area Category Method	§130.1(a), (c)	Two level lighting control <sup>2</sup> or §130.1(b)
	$>$ 85% of allowed lighting power per Section 140.6 Area Category Method	§130.1(a), (c), (d) <sup>3</sup>	§130.1(b)
<b>Alterations that change the area of the enclosed space or the space type or increase the lighting power in the enclosed space</b>			
Any number	Comply with Section 140.6	§130.0(d) <sup>3</sup> §130.1(a), (c), (d) <sup>3</sup> , (e)	§130.1(b)
1. Affected luminaires include any luminaire that is changed, replaced, removed, relocated; or, connected to, altered or revised wiring, except as permitted by EXCEPTIONS 1 and 2 to Section 141.0(b)2iii: 2. Two level lighting control shall have at least one control step between 30 percent and 70 percent of design lighting power in a manner providing reasonably uniform illuminations 3. Daylight controls in accordance with Section 130.0(d) are required only for luminaires that are altered.			

**TABLE 141.0-F Requirements for Luminaire Modifications in Place**

<p>For compliance with this Table, building space is defined as any of the following:</p> <ol style="list-style-type: none"> <li>1.—A complete single-story building</li> <li>2.—A complete floor of a multifloor building</li> <li>3.—The entire space in a building of a single tenant under a single lease</li> <li>4.—All of the common, not leasable space in single building</li> </ol>			
<b>Quantity of affected luminaires per Building Space per annum</b>	<b>Resulting Lighting Power per Each Enclosed Space Where <math>\geq 10\%</math> of Existing Luminaires are Luminaire Modifications in Place</b>	<b>Applicable mandatory control provisions for each enclosed space<sup>1</sup></b>	<b>Applicable multi-level lighting control requirements for each modified luminaire<sup>2</sup></b>
Sum total < 40 Luminaire Modifications in Place	Existing lighting power is permitted	Existing provisions are permitted	Existing controls are permitted
Sum total $\geq 40$ Luminaire Modifications in Place	$\leq 85\%$ of allowed lighting power per Section 140.6 Area Category Method	§130.1(a), (c)	Two-level lighting control <sup>3</sup> Or §130.1(b)
	$> 85\%$ of allowed lighting power per Section 140.6 Area Category Method	§130.0(d) <sup>4</sup> §130.1(a), (c), (d) <sup>4</sup>	§130.1(b)
<ol style="list-style-type: none"> <li>1. Control requirements only apply to enclosed spaces for which there are Luminaire Modifications in Place.</li> <li>2. Multi-level controls are required only for luminaires for which there are Luminaire Modifications in Place.</li> <li>3. Two-level lighting control shall have at least one control step between 30 percent and 70 percent of design lighting power in a manner providing reasonably uniform illuminations.</li> <li>4. Daylight controls in accordance with Section 130.0(d) are required only for luminaires that are modified in place.</li> </ol>			