

Outdoor Lighting Alteration Compliance Considerations

<p>Retrofitting luminaires: If retrofitting an existing luminaire with new technology (i.e., rewiring HID shoebox with LED technology) in which the fixture head remains, it is not considered an alteration <i>unless</i> the connected load is increased (see below). If the fixture head is being replaced, but the pole is remaining, this is considered a luminaire alteration and may trigger code based on the following:</p>
<p>Replacing/altering ≤4 luminaires, or when ≥5 but <10% of luminaires, on the site: Since this type of project does not trigger all aspects of the Energy Code (controls and wattage allowance), it does require compliance with the Backlight, Uplight and Glare (BUG) (cutoff) requirements of §130.2(b) when the luminaire is ≥6,200 lumens.</p>
<p>Replacing/altering ≥5 luminaires and including 10-49% of the number of luminaires on the site: Luminaire Alterations (§141.0(b)2Lii) include projects that do not add to the connected load (see below). This may include adding luminaires to the site, but when in conjunction with the altered luminaires, the connected load is not increased. The added and/or altered luminaires must meet the control requirements of §§130.2(b) and (c) but are not required to show compliance with the wattage allowances.</p>
<p>Replacing/altering ≥5 luminaires and including ≥50% of the number of luminaires on the site: Luminaire Alterations (§141.0(b)2Lii) include projects that do not add to the connected load (see below). The added and/or altered luminaires must meet the control requirements of §§130.2(b) and (c), and if the project includes altering ≥50% of the number of luminaires on the site, the Prescriptive wattage allowance requirements of §140.7 also apply unless the 40% Reduced Wattage Exception is used. 40% Reduced Wattage Exception includes projects that do not add to the connected load (see below). The added and/or altered luminaires must meet the control requirements of §§130.2(b) and (c), AND the total wattage of the project must be reduced by 40% or more (but does not need to show compliance to wattage allowances). This can include adding luminaires in conjunction with altering existing luminaires, as long as total installed wattage is reduced by 40%.</p>
<p>Increasing the connected load of the site: (§141.0(b)2Li) requires that the added and/or altered luminaires meet the control requirements of §§130.2(b) and (c), and the general hardscape and specific lighting prescriptive wattage allowance requirements of §140.7 affected by the alteration.</p>

When is the Energy Code Triggered? Example Project Scopes

Upgrading 3 luminaires, which is 5% of the total number of luminaires on the site (<i>under the threshold for an alteration</i>)	No
Upgrading 3 pathway luminaires, which is 100% of the number of luminaires on the site (<i>under the threshold for an alteration</i>)	No
Replacing all 50 lamps and ballasts on site with same technology (<i>this is considered a repair</i>)	No
Rewiring all 50 lamps and ballasts on site with upgraded technology such as LED (<i>as long as the connected load is not increased</i>)	No
Adding 2 new parking lights and replacing all existing 50 pole heads in which the connected load is not increased and the overall wattage of the site is reduced by 50% (<i>alteration eligible for 40% reduced wattage exception in which only control compliance is required for all new and altered luminaires</i>)	Yes
Adding 2 new parking lights and with no changes to the existing 50 luminaires in which the connected load is increased (<i>alteration that requires controls for new luminaires and Prescriptive general hardscape wattage compliance for all luminaires</i>)	Yes
Adding new façade lighting, but not changing the general hardscape lighting (<i>alteration that requires controls for new luminaires and compliance to the Prescriptive "specific application" wattage allowance</i>)	Yes

Alteration Compliance Method Used	Mandatory Lighting Controls Required					Prescriptive Wattage Allowance per §140.7 Required
	Luminaire Cutoff (i.e., BUG) when ≥6,200 lumens §130.2(b)	Daylight Available §130.2(c)1	Motion Sensing for Parking or Sales Lot luminaires ≤24 ft above the ground and >40 watts §130.2(c)3	At least one of these controls when >24 ft above the ground or if not a Parking or Sales Lot luminaire at any height		
Acceptance testing requirements of §130.4 are not required for alterations where lighting controls are added/alterned to control ≤20 luminaires for the entire permitted project (indoor, outdoor and sign lighting)				Automatic Scheduling §130.2(c)2	Motion Sensing §130.2(c)3	
Altering < 10% / ≤4 Luminaires	Yes	No	No	No	No	No
Altering 10%-49% / ≥5 Luminaires	Yes	Yes	Yes	Either this..	Or this	No
Altering ≥50% / ≥5 Luminaires not using reduced wattage exception	Yes	Yes	Yes	Either this..	Or this	Yes
Altering ≥50% / ≥5 Luminaires using reduced wattage exception	Yes	Yes	Yes	Either this..	Or this	No
Adding to the Connected Load	Yes	Yes	Yes	Yes	Yes	Yes

Outdoor Lighting Control
<p>Luminaire Cutoff (BUG) §130.2(b) and per Title 24, Part 11 Section 5.106.8. Luminaires ≥6,200 lumens.</p> <ul style="list-style-type: none"> Excludes signs, façade, public monuments, vertical surfaces of bridges, temporary lighting, public right-of-way, attached to multifamily/hotel/motel and controlled from dwelling unit/guest room, and when health & safety statute/ordinance/regulation does not permit lighting to be cutoff Excludes replacement of existing pole mounted luminaires when all the following apply: <ul style="list-style-type: none"> Existing luminaire does not meet BUG requirements AND Existing poles spacing greater than 6 times the mounting height AND No new poles being added AND No rewiring to existing poles AND Connected load is not increased
<p>Daylight Availability §130.2(c)1 requires controls that can automatically turn the luminaire off when daylight is available.</p>
<p>Automatic Scheduling §130.2(c)2 requires that there be automatic controls that can do all of the following:</p> <ul style="list-style-type: none"> Reduce outdoor lighting power by at least 50% but no more than 90% AND Allow the ability to turn lighting off per scheduled unoccupied periods AND Allow for the ability to schedule a minimum of 2 periods during the night at different lighting levels <ul style="list-style-type: none"> Acceptance testing will require these 2 periods be programmed, or a "default" schedule will be programmed by the Acceptance Test Technician (ATT)
<p>Motion Sensing §130.2(c)3 controls are required when the luminaire is within 24 ft² of the ground and exceeds 40W for each luminaire.</p> <ul style="list-style-type: none"> Must provide the following functionality: <ul style="list-style-type: none"> Reduce outdoor lighting power of each luminaire by at least 50% but no more than 90% AND Capable of turning lighting off during unoccupied periods AND Be able to reduce or turn off within 15 minutes of the space being vacated, then return to programmed lighting level when area becomes occupied No more than 1,500W may be controlled with one sensor Required for building façade, ornamental hardscape or outdoor dining using bilaterally symmetric distribution (i.e., up & down wall packs) when the luminaire is within 24 ft² <ul style="list-style-type: none"> Not required for these lighting applications if >24 ft² or when not using bilateral wall packs no matter the height Excludes lighting applications listed in §140.7(a) When luminaire is subject to health & safety statute/ordinance/regulations, the time-out period may be longer than 15 minutes and the minimum dimming level can be above 50%, as needed to comply

*Operation of existing controls must not be removed or altered with lighting alteration project.
Lighting system and equipment requirements of §130.0 apply to all alteration projects.*

For More Information

Primary Sources

- Energy Code Section 130.2 – Outdoor Lighting Controls and Equipment:
energycodeace.com/site/custom/public/reference-ace-2019/Documents/section1302outdoorlightingcontrolsandequipment.htm
- Energy Code Section 130.4 – Lighting Control Acceptance and Installation Certificate Requirements
energycodeace.com/site/custom/public/reference-ace-2019/Documents/section1304lightingcontrolacceptanceandinstallationcertificatere.htm
- Energy Code Section 140.7 – Requirements for Outdoor Lighting:
energycodeace.com/site/custom/public/reference-ace-2019/Documents/section1407prescriptiverequirementsforoutdoorlighting.htm
- Energy Code 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
energycodeace.com/site/custom/public/reference-ace-2019/Documents/section1410additionalterationsandrepairstoexistingnonresidential1.htm
- Energy Code Nonresidential Compliance Manual Chapter 6 – Outdoor Lighting:
energycodeace.com/site/custom/public/reference-ace-2019/Documents/6outdoorlighting.htm
- Energy Code Nonresidential Compliance Manual Chapter 7 – Sign Lighting:
energycodeace.com/site/custom/public/reference-ace-2019/Documents/7signlighting.htm

California Energy Commission Information & Services

- Energy Code Hotline: 1-800-772-3300 (Free) or Title24@energy.ca.gov
- Online Resource Center:
www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/online-resource-center
 - The Energy Commission’s main web portal for the Energy Code, including information, documents and historical information

Additional Resources

- California Lighting Technology Center (CLTC) Guides: Nonresidential Lighting: What’s New in the 2019 Title 24, Part 6 Code?
cltc.ucdavis.edu/article/nonresidential-lighting-whats-new-2019-title-24-part-6-energy-code
- Illuminating Engineering Society (IES):
www.ies.org
 - Technical Memorandum: IES TM-15-11 - Luminaire Classification System for Outdoor Luminaires
www.ies.org/product/luminaire-classification-system-for-outdoor-luminaires/
 - IES TM-15-11 BUG Ratings Addendum
www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf
- Energy Code Ace:
EnergyCodeAce.com
 - An online “one-stop-shop” providing free resources and training to help appliance and building industry professionals decode and comply with Title 24, Part 6 and Title 20. The site is administered by California’s investor-owned utilities.
Of special interest:
 - Fact Sheets
EnergyCodeAce.com/content/resources-fact-sheets
 - Healthcare Facilities 2019
 - Nonresidential Daylighting and Daylighting Controls 2019
 - Nonresidential Electrical Power Distribution (EPD) 2019
 - Nonresidential Mandatory Lighting Controls 2019
 - Application Guides
EnergyCodeAce.com/content/resources-ace/file_type=application-guide
 - Nonresidential Lighting and Electrical Power Distribution 2019
 - Training
EnergyCodeAce.com/training
 - 2019 Title 24, Part 6 Essentials on Demand – Nonresidential Standards: Using the Lighting Wheel
 - Decoding 2019 Title 24, Part 6: Let’s Talk Healthcare Facilities
 - Decoding What’s New: Let’s Talk 2019 Title 24, Part 6 – Nonresidential

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