

Memorandum

To: **All Interested Parties**

Date : February 24, 2015

From : **California Energy Commission**
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California Energy Commission

DOCKETED

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Subject: **STAFF INTENDED CHANGES TO ADDRESS CONCERNS WITH 45-DAY LANGUAGE**

Staff has become aware of several issues related to the 2016 Building Energy Efficiency Standards 45-Day Language. The attached identifies potential changes made to address these.

Subchapter 1, Section 100.0 et seq.

- Section 100.1: Some definitions, including the definition of Glazed Door, were in incorrect alphabetical locations. As the definitions are intended to be in alphabetical order, Energy Commission staff intends to move any out-of-order definitions into correct locations within this Section.
- Section 100.1: Commission staff intends to add new definitions for the following new terms to ensure the new terms are well understood and any associated requirements are clear. Commission staff intends to add definitions for the following terms:
 - "Illuminance"
 - "Light Emitting Diode (LED)"
 - "Pendant (Suspended)"
 - "Radiant Energy"
 - "Forward Phase Cut Dimmer"Commission staff will also add "Outdoor" to the term "sales canopy" so that the defined term is consistent with both its definition and its use in Section 130.2.

Subchapter 3, Section 120.0 et seq.

- Section 120.6(f)1: This Section currently specifies that "[t]he light power density for the luminaires inside the elevator cab shall be no less than 0.6 watts per square foot." This section should instead specify that lighting power density should be "no greater than 0.6 watts per square foot". Commission staff intends to make this correction in the 15-day language.
- Section 120.7(b): The language provided in Section 120.7(b)7 permits the use of R-13 insulation in demising walls between metal studs with a resulting U-Factor of 0.203-0.217 based on stud spacing. This is in direct conflict with Section 120.7(b)2 limiting the U-Factor in metal framed wall assemblies to 0.105 between conditioned and unconditioned spaces. Therefore, Commission staff intends to separate the demising wall criteria with respect to wall construction type wood frame or metal framing. For walls it would read "Wood framed walls shall be insulated to meet a U-factor not greater than 0.102 which is equal to an installed R-value of not less than R-13 between framing members". Because metal framing is considered a conductor a thermal blocking is needed, and therefore for metal framing the requirement would read, "Metal Framed walls shall be insulated to meet a U-factor not greater than 0.151 which is equal to an installed R-value of not less than R-13 between framing members plus R-2 continuous insulation installed."

Subchapter 4, Section 130.0 et seq.

- Section 130.1(b)3: Dimmable luminaires can be controlled by a dimmer control, such as a line voltage dimmer switch, or by other controls performing the same function, such as a low voltage digital keypad. This requirement is intended to specify the function the control must perform, not to specify the use of a particular device. Commission staff therefore intends to change the multi-level

lighting controls language of “dimmer switch” to “dimmer control” in Section 130.1(b)3.

- Section 130.2(c): Commercial vehicle fuel stations are not occupied all night long. Commission staff intends to delete the controls exception for commercial vehicle fuel station in Section 130.2(c)3.
- Section 130.2(c)2: The requirement in Section 130.2(c)2 is intended to specify how outdoor lighting is controlled, not how it is circuited. Commission staff therefore intends to remove the phrase “being circuited” from Section 130.2(c)2.
- Table 130.5-B: Energy Commission staff intend to change the “All” and “Each” requirements for “Other individual non-HVAC loads or appliances rated 25kVA or greater” and “Industrial and commercial load centers 25 kVA or greater including theatrical lighting installations and commercial kitchens” to be “All loads in aggregate” consistent with other rows in this Table.

Subchapter 5, Section 140.0 et seq.

- Section 140.3(c): Commission staff is proposing, in this Section, to align the Minimum Daylighting Requirement for Large Enclosed Spaces with the requirements of ASHRAE 90.1. The 45-day language does not include the exceptions to these requirements specified in ASHRAE 90.1. Commission staff intends to add these exceptions in the 15-day language, as well as an exception for “permanent architectural features of the building” blocking direct beam sunlight (see below).
- Section 140.3(c): Permanent architectural features of a building can be a barrier to meeting the minimum daylighting requirement for large enclosed spaces of Section 140.3(c) when those architectural features block direct beam sunlight to the roof. Commission staff intends to add an exception for “permanent architectural features of the building” to the minimum daylighting requirement of Section 140.3(c).
- Section 140.6: This section uses the terms “lighting power” and “lighting power density” interchangeably when they mean different things in different contexts. Commission staff intends to make corrections throughout the section where the terms are misapplied. The corrections will be done in Section 140.6 and in the tables within this Section.

Subchapter 6, Section 141.0 et seq.

- Section 141(b)2: Subsections I, J, and K have been edited to clarify and simplify the nonresidential lighting alteration requirements. Commission staff intends to continue refining the language in this Section to improve clarity.
- Section 141(b)3B: Commission staff intend to edit this Section to clarify that third-party verification is only required for the altered components for which the additional credit is being taken, and not for other components not subject to the additional credit.

Subchapter 7, Section 150.0 et seq.

- Section 150.0(j)2C : The intent of the language is to require all distribution piping for steam and hydronic heating systems to have insulation. Commission staff intends to update this language to specify distribution piping for steam and hydronic heating systems and to delete reference to “hot water systems with pressure above 15 psig.”
- Section 150.0(k)1C: The intent of the Section 150.0(k) lighting requirements is to prevent recessed downlight luminaires in ceilings from containing screw based sockets. Recessed downlights are one of many different types of recessed luminaires, and it is not the intent of the residential lighting section to exclude other recessed luminaire types from containing a screw based socket. Commission staff intends to add “downlight” as a qualifier to Section 150.0(k)1C, 150.0(k)1Gi, and Table 150.0-A to clarify that only “recessed downlight luminaires” must meet the requirement.
- Section 150.0(k)2A: NEMA SSL-7A contains compatibility requirements when a forward (or leading edge) phase-cut dimmer is combined with one or more LED light engines which power LED light sources, and the requirement does not apply to other dimmer types and light source types. Commission staff intends to revise this Section to apply specifically to forward phase-cut dimmers, and intends to make matching changes to JA 8.4.6.
- Section 150.0(m)15: Commission staff is proposing, in this Section, to move the requirements for fan efficacy for zonal control systems to section 150.0(m)13 which also contains requirements for fan efficacy. This change will involve some clean up language and the deletion of section 150.0(m)14 and 150.0(m)15.
- Section 150.0(n)3: Current language requires that solar water heating systems be certified and rated by the Solar Rating and Certification Corporation (SRCC) or by a “testing agency” approved by the Executive Director. Commission staff intends to replace the term “testing agency” with the term “accredited listing agency.”
- Table 150.0-A: Commission staff intends to revise this table to specify that outdoor luminaires using integral LEDs are not required to meet the requirements of JA-8 to be considered high efficacy.

Subchapter 8, Section 150.1 et seq.

- Section 150.1(c)7: Commission staff is proposing to restructure the refrigerant charge requirements to further clarify the applicability of the requirement. This Section currently specifies that refrigerant charge be confirmed through the procedures specified in RA3.3. Although this statement is true, the standards could be clearer as to which specific procedure applies and who is eligible to perform it. Additionally, the airflow target (in cfm/ton) can be directly specified instead of referencing another section. Commission staff intends to make additional clarifying edits to this section.
- Section 150.1(c)12A: Commission staff intends to change the whole house fan required CFM/SF from 1.2 to 1.5, based on late stakeholder comments on the pre-rulemaking language.
- Section 150.1, Table 150.1-A: The U-factor for framed walls above grade for Climate Zone 6 is currently proposed to be 0.051. Based on additional cost information, Commission staff has determined that this U-factor is not cost

effective for Climate Zone 6, and intendeds to remove this change in 15-Day Language, leaving the requirement of 0.065 unchanged.

- Table 150.1-A: Based on new cost information, Commission staff has found that it is not cost-effective to require roof deck insulation in Climate Zones 1 and 2. Accordingly, Commission staff intends to update this table to have no requirement for roof deck insulation in Climate Zones 1 and 2.

Subchapter 9, Section 150.2 et seq.

- Section 150.2(b)1F: Commission staff intends to restructure the refrigerant charge requirements to clarify the applicability of the requirement. This Section currently specifies refrigerant charge be confirmed through the procedures specified in RA3.3. Although this statement is true, the requirements could be clearer as to which specific procedure applies and who is eligible to perform it. Commission staff therefore intends to edit the language of this Section to improve its clarity in these areas.
- Section 150.2(b)1Hii: Option g in Exception to 150.2(b)1Hii reads, “In Climate Zones 10-15, R-4 or greater insulation above the roof deck.” The proposed language would raise this R-value by two, to R-6. This is in error: calculations using current roof deck modeling show that the R-value should be decreased by two, not increased by two. Commission staff therefore intends to correct the proposed R-value to R-2, as this insulation level is found to be equivalent in effect to a cool roof in the noted Climate Zones.
- Section 150.2(b)2: This Section will be edited to clarify that “tradeoffs between two or more altered components” may include components of the same “system”, such as two windows.
- Section 150.2(b)2B: This Section will be edited to clarify that third-party verification is only required for those altered components for which the additional credit specified in Table 150.2-C is taken, and not for other components not subject to additional credit.

Joint Appendices

- JA 4, Table 4.2.7: The 2013 edition of ASHRAE 90.1 includes updates to U-factors in Table 2.3.3. Commission staff intends to update Table 4.2.7 to align with ASHRAE 90.1 Table 2.3.3.
- JA 8.3.1: The IES LM-66 test standard is for integrated electrode-less (induction) lamps. Commission staff intends to revise the test specifications to correctly reference IES LM-66 for induction lamp testing; the current reference to LM-79 for these lamps is erroneous.
- JA 8.4.6: Commission staff intends to add criteria for reduced flicker operation to Section JA8.4.6(d) to match the requirement in Table JA-8. In addition, the definition of “100 percent full light output” and the criteria of “reduced flickering when tested at 100% and 20% of full light output” in JA 10 are intended to be added to JA8 to clarify the reduced flickering performance criteria.
- JA 8.4.7: The JA8 lumen maintenance, rated life and survival rate criteria apply to the ambient temperature test and elevated temperature test. Commission staff intends to merge the JA8.4.8 criteria with the JA8.4.7 criteria so that it is clear how these criteria apply.

- Table JA-8: Commission staff intends to further refine the reporting requirements in Table JA-8, primarily to narrow the information fields that are expected.
- JA 10.1: This section incorrectly describes a signal “above” a cut-off frequency; it should say “below” a cut-off frequency. Commission staff intends to make this correction.
- JA 10.6: this section contains calculation requirements for dimming levels of 80% and 50% even though these dimming levels are not performance criteria for JA8 light sources. Commission staff intends to remove these requirements from this Section and from Table JA 10. In addition, “windowing procedures” are not used for the JA10 Test Method for measuring flicker. Commission staff intends to remove the “windowing procedure” from Section JA10.6.

Nonresidential Appendices

- NA6.5.1: The last sentence of this Section reads, “All non-certified fenestration products and is less than 1,000 ft² or skylights for commercial and requires a filled FC-1 or for Residential up to 250 ft² in area or 0.5% time CFA whichever is greater.” The square foot thresholds apply to how the forms are completed, but not whether the forms are required, and therefore should not be stated in this paragraph. Additionally, this Section is not intending to separate the skylight from the rest of the non-certified fenestration products. Commission staff intends to edit the sentence to more clearly read, “All non-certified fenestration products, including skylights, require a completed FC-1.”

Residential Appendices

- RA 3.2.4: Commission staff intends to move the procedure for alternative compliance with minimum system airflow to section RA 3.3.3, which is the procedure for measuring airflow. This change will require updating references throughout the Standards and Reference Appendices.
- RA 3.5: RA 3.5 refers to Section 110.7(a) and (b) in multiple locations. These references should be to Section 110.7, without subsections, as Section 110.7 does not have subsections. Commission staff intends to correct these references to Section 110.7 by striking the subsection letters.
- RA 3.6.8: This section has a formatting error with incorrect numbering; Commission staff intends to renumber RA 3.6.8(f) and (g) as subparagraphs 2 and 3 of (e), and to renumber the subsequent sections.
- RA 4.4: RA 4.4.9(f) and RA 4.4.10(f) are intended to require either that items 1 and 3 or that items 2 and 3 be true. To make it clearer that item 3 should be true in all cases, item 3 will be renumbered as a separate item (g).