

To: Dockets Office, California Energy Commission
 From: Gary Farber, Farber Energy Design
 RE: Comments on 45 Day Language Express Terms – 2013 Building
Energy Efficiency Standards
 Docket number 12-BSTD-1

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SECTION 120.7 -MANDATORY INSULATION REQUIREMENTS

Background: I and CABEC have long advocated that Nonresidential, High-Rise Residential and Hotel/Motel buildings be subject to minimum insulation requirements (as Low-Rise Residential buildings have been for many code cycles). For the first time, the 2013 Standards include such a provision. However, the draft requirements meet the cautionary advice “be careful what you wish for”.

Issues:

1. Proposed U-factors would require continuous insulative sheathing at metal frame assemblies. In commercial buildings, which have high internal heat gain and typically do not operate 24 hours, such insulation levels can result in greater annual energy use. Even when insulative sheathing might result in annual energy savings, investing the cost of this insulation instead in other efficiency measures will sometimes yield even greater energy savings.
2. Draft requirements are expressed in U-factor rather than R-value. U-factor maximums will be much less likely to be checked by designers and enforcement agencies for compliance.
3. An ‘E’ is missing in the word “requirements” in the title.

Proposed changes:

1. Eliminate requirement for insulative sheathing for Nonresidential buildings. A modest continuous insulative sheathing requirement would be appropriate for High-Rise Residential and Hotel/Motel occupancies using metal frame walls.
2. Express all requirements in insulation R-value; delete references to assembly U-factor.
3. Proposed minimum wall insulation requirements:

occupancy	wall insulation requirement
Nonresidential, except at CZ’s 14,15 and 16	R-13 for all framing
High-Rise Residential, Hotel/Motel, and Nonresidential at CZ’s 14,15 and 16	R-13 for wood framing. R-13 at cavity plus R-5 continuous for metal framing.

SECTION 140.3 – PRESCRIPTIVE REQUIREMENTS FOR BUILDING ENVELOPES

VT

Issue: Derivation of VT when glazing is not NFRC certified. Previous drafts included a formula for converting VT_c to VT. I did not find such a formula in the current draft.

Considerations:

1. Should the VT_c to VT formula be written into the Standards? Or will inclusion only in the NCM be appropriate?
2. If VT enters into envelope compliance in Performance-based compliance, and if the VT_c to VT formula will be expressed in the Standards, the formula will need to be located in a section that applies to both Prescriptive and Performance compliance.

METAL FRAME WALL INSULATION

Issue: Prescriptive metal frame wall insulation requirements are often greater for Nonresidential occupancies than for High-Rise Residential & Hotel/Motel (HRR/HM) occupancies.

For nonresidential buildings, typically operated daytime hours only, and with relatively high internal heat gain, the most efficient envelope thermal resistance will in practice be lower than for residential and guest room facilities that have lower internal heat gain, and are always operated 24 hours/day.

I brought this issue up regarding the 2008 Standards, and in earlier comments regarding the 2013 Standards, and no one has produced a credible rationale for Nonresidential occupancies to have higher wall thermal requirements than for HRR/HM occupancies. In fact, the opposite ought to be the case.

Proposal: Where Tables 140.3-B and 140.3-C indicate lower U-factors for Nonresidential occupancies than for HRR/HM occupancies, for the same CZ, re-assign the lower U-factor to HRR/HM and re-assign the higher U-factor to Nonresidential.

140.3(c)1. DAYLIGHT AREA REQUIREMENTS

Issues:

1. Use of term “or” at the end of 140.3(c)1.i. could be taken to mean that the 75% requirement cannot be met by combining Sidelit and Skylit areas.
2. Both the Sidelit daylight area definition and Skylit daylight area definition are incomplete. Draft language only mentions Sidelit depth, not width. And draft language does not include the skylight footprint area portion of the Skylit area.

Proposed language: The sum of the floor area that is within the Primary Sidelit Daylight areas, and the floor area that is within the Skylit Daylight areas, as defined at **T-24 ref.***, shall be at least 75% of the total space floor area.

SECTION 140.6 - PRESCRIPTIVE REQUIREMENTS FOR INDOOR LIGHTING **ORNAMENTAL LIGHTING**

Background: The Area Category method of Prescriptive lighting compliance has, for several code cycles, provided an additional lighting power allowance for “ornamental” luminaires. However, “ornamental” was never previously defined; instead, certain types of luminaires were defined as being “ornamental”, regardless of their actual usage. In discussions with CEC staff, I expressed the need for the “ornamental” lighting power allowance to be based on the type of use of the luminaire, rather than declaring all luminaires of a certain type to be “ornamental regardless of their usage.

The problem with developing a definition of “ornamental” is that it will be, at least to some degree, subjective. This is especially true with fixtures that are often simultaneously ornamental and functional, such as many chandeliers.

For that reason, for this code cycle, I will limit comments to one luminaire type:
Sconces.

Issues:

1. In section 100.1, the draft language reads: **SCONCE is a wall mounted decorative accent luminaire.**
2. In section 1--.1, the draft language reads: **Decorative Lighting is lighting installed only for aesthetic purposes and that does not serve as display lighting or general lighting.**
3. Because sconce lights are often used primarily, or only, to light certain spaces, the declaration in 100.1 that Sconce lights are purely for aesthetic purposes and do not provide general lighting is false as global declaration.
4. The Standards do not explain how to calculate the task area of an ornamental light fixture. It is not clear that a definition can be developed that would be easy to apply and to enforce.

Proposal: In my opinion, in order for the criteria for “ornamental” and “decorative” lighting to not be subjective (i.e. based on aesthetics), the only way to reasonably differentiate decorative from non-decorative luminaires is to limit the lamp wattage for "decorative" sconces to a level where they would be unlikely to provide much usable light. If they do provide much usable light, they ought to be treated like any other lighting that provides usable general space lighting.

Therefore:

- a) Define “ornamental” sconces as those that have a manufacturer's permanent label indicating a maximum lamp power of 7 watts, or for luminaires with ballasts, a maximum luminaire power of 9 watts.
- b) Simply allow “ornamental” sconces to be used without counting their watts toward the Area Category maximum lighting power allowance.

LOW-RISE RESIDENTIAL BUILDINGS – MANDATORY FEATURES AND DEVICES

150.0(k) Residential Lighting 5. Lighting in Bathrooms

Issue: The Standards have no provision for ceiling heat lamps.

Proposal: Allow luminaires specifically designed for heat lamps to be controlled by a timer switch, maximum 30 minute on time.

SECTION 150.1 – PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES FOR NEWLY CONSTRUCTED BUILDINGS

150.1(c)1.A. Language says more than once "... minimum ... R-values or U-factors ...".

Issues:

1. U is for assembly;
2. U is maximum.

Proposal: Revised language should read in each applicable instance: "... minimum ...insulation R-values or maximum assembly U-factors ...".

150.2 Res Additions and Alterations

EXCEPTION 2 to Section 150.2(a)

Question/Comment: Is the intent of this language, which allows roof insulation to not meet Prescriptive requirements when there is inadequate space, to allow such construction to meet Prescriptive compliance in spite of not meeting Prescriptive criteria? If that is the purpose, I can state that whenever we have been presented with projects that cannot meet Prescriptive compliance, we use Performance compliance, and have not found this in general to be a hardship for our clients.

Proposal: Delete this exception. Projects that cannot meet Prescriptive insulation requirements must comply under the Performance approach.