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California Energy Commission  
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November 22, 2014

**Subject: Comments from the Steel Framing Alliance on Docket Number 14-BSTD-0  
2016 Building Standards Update**

The Steel Framing Alliance is pleased to provide comments on the proposed envelope amendments presented during the Staff Workshop of November 3, 2014. We believe our comments will improve the flexibility and cost-effectiveness of the code while helping to deliver energy efficient buildings throughout California. We have comments on two specific issues as follows:

1. **Proposed U-factors in Tables 140.3 B and 140.3 C.** Although we understand the need to continually improve building performance, we also recognize that improvements should be cost effective. We have concerns over the cost effectiveness of the proposed U-factors in Tables 140.3 B&C.

During the IOU workshop earlier this year, the facilitator indicated the intent to bring U-factors more into line with ASHRAE Standard 90.1-2013. We participate in the ASHRAE process and would encourage as much coordination with ASHRAE 90.1 as is possible and reasonable. However, bringing the prescriptive U-factors in Tables 140.3 B & C into closer alignment with ASHRAE 90.1 prescriptive U-factors will not result in the same level of performance as a building designed by ASHRAE 90.1. ASHRAE 90.1 has prescriptive U-factor requirements that go hand in hand with allowable U-factors published in their Appendix A, similar to how the Joint Appendices work with the prescriptive requirements in California. For steel framing, the method used to develop U-factors for walls in ASHRAE 90.1 Appendix A is very different than the method used in California's Joint Appendix JA4. Thus, adopting prescriptive U-factors for California similar to those in ASHRAE 90.1 for steel framing does not result in equivalent performance. If the Commission moves forward with the prescriptive U-factors in the proposed text of Tables 140.3 B&C, it would be appropriate to replace the joint appendix tables for metal framing with the U-factors in 2013 ASHRAE Appendix Table A3.3.3.1 (Assembly U-factors for steel-framed walls). This will give closer equivalence than simply decreasing the U-factors as proposed in Tables 140.3 B&C.

Our industry has conducted an extensive set of hot box tests over the last few years at Oak Ridge National Laboratory that we believe demonstrate that the Joint Appendices significantly underestimate the performance of steel framed walls relative to tested values and the ASHRAE 90.1 Appendix A U-factors, basically resulting in a higher standard for these walls in the California energy provisions even prior to considering the proposed revisions to Tables 140.3 B&C. This will be exasperated if the U-factors as proposed are adopted. We recommend that no modifications be considered to the prescriptive requirements until the U-factors in the Joint Appendices are adequately addressed.

Even if the inconsistency between U-factor calculation methods is addressed, we're concerned that the cost-benefit analysis used to support the proposed U-factors for Tables 140.3 B&C did not include significant costs unique to continuous exterior insulation related to loss of square footage, fastening of cladding systems, and detailing around openings and at building corners. Thus, we don't believe the proposed U-factors are cost-effective, especially in the warmer climate zones.

As buildings have become more efficient we also have to be aware that the very small energy savings in warm climates due to continually adding more and more insulation will start to be outweighed by the embodied energy required to manufacture, ship, install, and ultimately dispose of the continuous insulation necessary to meet the proposed U-factors. This is a variable that can no longer be ignored in establishing cost-effective energy code requirements.

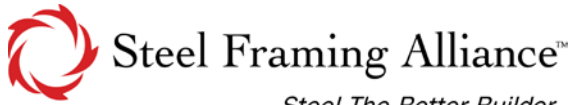
We would be happy to work with the CEC staff to help determine appropriate and cost-effective U-factors for those building with steel framing in California and recommend that the existing U-factors be retained until these issues are resolved.

- 2. Mandatory minimum insulation requirements applicable to the performance compliance paths.** The mandatory insulation requirements in Section 120.7 (and referenced in Section 150) do not facilitate cost-effective construction, and in fact, discourage builders and designers from seeking out more cost-effective and efficient buildings designs. We have no objection to minimum prescriptive insulation requirements but they are not appropriate for designs following the performance compliance path. They take away the flexibility that a performance approach should offer. With the minimum levels now in the code, there is little incentive to run the simulations that have been shown to result in better overall building performance.

In the last code cycle when the minimum insulation requirements were introduced to the performance sections, we questioned the wisdom of these requirements and were encouraged to raise the issue during the workshops in the next code change cycle. Although we believe there should not be any minimum mandatory requirements when selecting the performance option if it is truly a performance path, we provided a compromise solution that would limit

the mandatory insulation levels for framed walls to the amount that is typically used in the cavity or an equivalent level of performance. We would encourage the Commission to address this issue during this code change cycle to preserve the flexibility and integrity of the performance compliance options. Specifically, we recommend:

- a. Delete Section 120.7 in SUBCHAPTER 3 (Nonresidential) entirely from the standards. This will allow designers to determine the most cost-effective method to design buildings instead of forcing them to use specific and often costly continuous insulation practices. Further, this will encourage the use of higher efficiency heating, cooling, and water heating equipment when using the performance option. When a designer elects to use higher efficiency equipment versus a more costly approach such as continuous insulation for compliance, the building by definition has to be at least equivalent to the base prescriptive design. In reality, equipment efficiencies are available in discreet steps and the design almost always has to be increased to the next higher level of equipment efficiency. The building will almost always exceed the base code requirements. This should be encouraged by the code.
- b. In lieu of the above deletion of Section 120.7 in its entirety, we suggest that the standard at a minimum address these issues for walls since they represent the least amount of flexibility and the greatest potential cost of all the opaque assemblies. We specifically recommend that the language at Section 120.7 for walls be modified to limit the minimum insulation in framed walls (wood or steel) to the R-13 or R-19 typically used in the cavity, depending on the depth of the studs. The 2013 language for walls in Section 150 would be acceptable since it allows either the R-13 or R-19 cavity insulation as the minimum but also provides a U-factor option for assemblies with all exterior insulation and no cavity insulation such as an EIFS wall.
- c. On the low-rise residential mandatory insulation requirements at Section 150 in SUBCHAPTER 7, we also are opposed to the proposed modifications presented during the November 3 workshop for many of the same reasons as cited for nonresidential buildings. Although we question the need for any minimum insulation requirements when applying the performance option, we submitted the language that currently exists in Section 150 for minimum wall insulation requirements in the last cycle to specifically allow for a cavity-only solution for any framed wall when using the performance compliance path. The proposed revisions to Section 150 take this option off the table for steel framed walls by setting the requirements based on a wood-framed wall. There is no energy savings to be gained by changing this



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language to force a specific solution on designers and builders that may not be the best investment for energy efficiency. We recommend that the proposed changes presented on November 3 to Section 150 be rejected and the existing language be retained.

We thank you for consideration of these comments and offer our further assistance in developing appropriate requirements for the 2016 code.

A handwritten signature in black ink, appearing to read 'Mark Nowak', written in a cursive style.

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