METAL BUILDING MANUFACTURERS ASSOCIATION
1300 SUMNER AVE., CLEVELAND, OHIO 44115-2851 • (216) 241-7333 FAX (216) 241-0105
E-Mail: mbma@mbma.com • URL: www.mbma.com

*General Manager* – THOMAS ASSOCIATES, INC.



June 9, 2015

Mr. Mazi Shirakh
California Energy Commission
Dockets Office, MS-4
1516 Ninth Street, MS-25
Sacramento, CA 95814-5512
Via E-Mail: docket@energy.ca.gov

SUBJECT: Docket No. 15-BSTD-01
Adoption of 15-Day Language for the 2016 Energy Efficiency Building Standards

Dear Mazi:

Please accept the attached comments on the 2016 Title 24 draft on behalf of the Metal Building Manufacturers Association.

We would be happy to discuss any of these comments, which we feel are valid concerns and/or improvements. We look forward to continuing to work with the CEC in developing the next edition of this important standard.

Sincerely,

W. LEE SHOEMAKER, PH.D., P.E.
Director of Research & Engineering

**California Title 24 Energy Code**

**MBMA Comments on 15-Day Draft – 2016 Title 24 Energy Code**

## 1. Prescriptive Requirements for Building Envelopes (Section 140.3)

There were two similar exceptions included in the 2008 Title 24 provisions based on the LBNL cost studies of cool roof requirements. These exceptions to Section 140.3(a)1Ai recognized that the cost effectiveness of providing a cool roof in climate zones 3 and 5 for certain roof construction was marginal, and that an alternative to achieving the same energy efficiency provided by a cool roof could be achieved by using more insulation in Zones 3 and 5 in lieu of a cool roof.

These two exceptions are:

**EXCEPTION 1 to Section 140.3(a)1Aia**: Wood-framed roofs in Climate Zones 3 and 5 are exempt from the requirements of Section 140.3(a)1Aia if the roof assembly has a U-factor of 0.039 or lower.

**EXCEPTION 2 to Section 140.3(a)1Aia:** Metal building roofs in Climate Zones 3 and 5 are exempt from the requirements if the roof assembly has a U-factor of 0.048 or lower.

The latest study to determine appropriate U-factors for the building envelope, Case Report "Nonresidential Opaque Envelope," December 2014, proposed lowering the maximum U-factors for these roof constructions from 0.049 to 0.034 and from 0.065 to 0.041 for wood framed roofs and metal building roofs, respectively. We have not seen any cost study addressing the tradeoff provided by the exceptions above, but the 15-Day language proposes to eliminate exception 2 altogether. It also proposes to keep exception 1 but revising the U-factor requirement from 0.039 to 0.034. This is inconsistent treatment of the two exceptions at best, and unsupported by any analysis that we have seen.

In looking at the proposed exception 1, it makes no sense that the U-factor requirement for the cool roof trade-off would be equal to the new prescriptive requirement. We really think this highlights the need for a new cost effective study for cool roofs since the insulation requirements for the roofs have been increased. The energy efficiency of a roof system is based on both the insulation and cool roof properties. Determining the prescriptive requirements of either of these has to be based on an appropriate cost effective study that considers both contributions. Based on the last study on the cost effectiveness of cool roofs, and the most recent study of the opaque envelope U-factor requirements, it would make sense that the cool roof requirement for climate zones 3 and 5 are actually no longer justified, since the U-factor requirement is now lower than the previous triggers.

Any change that gives an advantage to one form of construction over another, without any justification is not acceptable. Our recommendation is that these exceptions be treated consistently, and that they should read that the wood-framed roofs and metal building roofs in climate zones 3 and 5 are exempt from the requirements of Section 140.3(a)1Aia, period.

## 2. JOINT APPENDICES, U-FACTORS FOR METAL BUILDING ROOFS/WALLS

There was an attempt to update Table 4.2.7 (U-factors for Metal Building Roofs) and Table 4.3.9 (U-factors for Metal Building Walls) to be consistent with the new prescriptive U-factor requirements. In reviewing the results of the cost/benefit study done for CA Title 24, it appears that the prescriptive requirements for metal building roofs are closely aligned with ASHRAE 90.1-2013, and that the prescriptive requirements for metal building walls are closely aligned with ASHRAE 90.1-2010. This difference is explainable give that the Title 24 requirements were based on the cost study done by California that utilized different cost data and evaluation criteria.

The proposed changes to the Joint Appendix Tables 4.2.7 and 4.3.9 are consistent with similar systems from Table A2.3.3 in ASHRAE 90.1-2013 and Table A3.2 in ASHRAE 90.1-2010, respectively, as they should be to match the prescriptive requirements. However, there are some insulation systems from these editions of ASHRAE 90.1 that have <u>not</u> been included in the Joint Appendices, and we are recommending that these validated systems also be included in the Joint Appendices.

<u>Table 4.2.7 Additions</u> – There are insulation systems referred to as "Liner System" in ASHRAE 90.1-2013 for metal building roofs that should be included. This is similar to the filled cavity system, except that the vapor retarder, or liner, runs below the purlins instead of draping up and over the purlins. There are 5 insulation combinations listed for liner systems, as well as a liner system for a standing seam roof without thermal blocks and a screw down roof with a liner system. We would be happy to follow up with all of the data and figures if you agree that this would be an enhancement to the Joint Appendices. Also, note that the "Assumptions" listed after Figure 4.2.8 should be updated to reflect that the data is from ASHRAE 90.1-<u>2013</u>, Appendix A (this is irrespective of any additional systems being added).

<u>Table 4.3.9 Additions</u> – For metal building walls, to be consistent with ASHRAE 90.1-2010 and to give as many validated options as possible in the Joint Appendices, there are two single layer systems, i.e. R-16 and R-19, that should be added to Table 4.3.9. The U-factors of these two systems given in Table A3.2 of ASHRAE 90.1-2010 are 0.093 and 0.084, respectively. Also, similar to the comment above for roofs, the "Assumptions" listed after Figure 4.3.9 should be updated to reflect that the data is from ASHRAE 90.1-<u>2010</u>, Appendix A.