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ARMA Comments on Building Energy Efficiency Standards Express Terms

Additional submitted attachment is included below.



Comments to the California Energy Commission (CEC)

Docket No. 21-BSTD-01, TN # 237717

2022 Energy Code Update Rulemaking (Comment deadline June 21, 2021)

Express Terms 2022 Energy Code, Title 24 Parts 1 and 6

Submitted by Aaron R. Phillips, Vice President of Technical Services
on behalf of the Asphalt Roofing Manufacturers Association (ARMA)

The Asphalt Roofing Manufacturers Association (ARMA) appreciates the opportunity to comment on standards development for the 2022 California Energy Code. ARMA is the trade association representing North America's asphalt roofing manufacturing companies and their raw material suppliers. The association includes the majority of North American manufacturers of asphalt shingles and asphalt low slope roof membrane systems.

A Proposal Mandating Insulation at the Roof Deck

ARMA's comments on the 2022 Energy Code Update Rulemaking focus on the proposed addition of a new mandatory requirement for installation of insulation at the roof deck. As we read it, this proposed provision applies to all newly constructed single-family residential buildings and all additions to single-family residential buildings in climate zones 4 and 8 through 16. The specific provision in Section 150.0(a)1 states, "In climate zones 4 and 8 through 16 Roof [sic] decks in newly constructed attic systems shall be insulated to achieve an area-weighted average U-factor not exceeding 0.184." The new provision includes an exception for cases "when ducts and air handler are located in conditioned space."

This concept was first introduced during this rulemaking cycle in the Pre-rulemaking Express Terms which were publicly released February 22, 2021. Late introduction of this concept during the rulemaking cycle limits opportunity for thoughtful and thorough vetting of this mandatory provision. ARMA offered written comments (see TN# 236914, Docket Date 2/26/2021) communicating concerns about the Section 150.0(a)1 proposal in the Pre-rulemaking Express Terms. Reference to those earlier comments will illustrate ARMA's ongoing concern with mandating insulation at the roof deck. The current proposal is the latest in a series of attempts to implement requirements that may have significant detrimental effects for California homeowners and building owners. Several of the issues are described in these comments.

In addressing the proposed change to Section 150.0(a)1, the Initial Statement of Reasons (ISOR) indicates the purpose of this provision is "to require a mandatory minimum level of insulation for roof decks" It further states the intent to guarantee "that a minimum fraction of required insulation is located at the roof deck for buildings where ducts and air handlers are located in the attic space." Based on careful review of the language, it is unclear whether the proposal will accomplish that goal. Nevertheless, the concerns expressed herein speak to the objective stated in the ISOR.



Mandating Insulation at the Roof Deck May Affect Roofing Product Code Compliance, Installation, and Performance

By using a U-factor to express the requirement, the proposed provision permits insulation to be located either above or beneath the roof deck. Placement in either of these locations is problematic. Roofing systems of all types are required to comply with requirements of the California building codes in addition to those of the building energy efficiency standards, including requirements related to proper product installation, wind resistance, and fire resistance. Mandating insulation at the roof deck may impact compliance with one or more of those existing provisions, creating conflicts for designers and installers.

Code Compliant Installation. Asphalt shingles—the most prolific and cost-effective roofing system for single-family residential buildings in California—are designed for installation to a rigid substrate, making insulation on top of a steep-slope roof deck an unsuitable option for an asphalt shingle system. Attempts to install asphalt shingles on a non-rigid substrate may lead to damage of the shingles. Further, California building codes require asphalt shingle installation in accordance with manufacturer instructions, which prescribe application to a rigid deck. Therefore, the proposed new language creates a conflict with provisions of the existing building codes. Although it may be the intent of the CEC to have insulation placed beneath the roof deck rather than above, use of a U-factor to express the requirement creates opportunity for misinterpretation with unintended consequences such as those described herein.

Code Provisions for Wind and Fire Resistance. Installation of asphalt shingles onto insulation instead of a rigid substrate affects critical performance characteristics of the installed system. Wind resistance may be compromised due to inadequate nail holding ability when fasteners are driven into insulation instead of a proper deck sheathing material. And there are potential adverse effects on the fire classification of the installed asphalt shingle roofing assembly when insulation is positioned between the roof deck and the asphalt shingles. Although there are prefabricated products that combine a rigid substrate with insulation, evaluation of such installations may be limited with respect to fire classification. Additional study is advisable before mandating such a widespread design change.

Long-term Effectiveness of Roofing System. Placement of insulation on the underside of the roof deck interferes with continuous, free-flow ventilation beneath the roof deck surface, leading to higher exposure temperatures for the asphalt shingles and the potential for moisture buildup within the attic space, both of which may impact system durability and disadvantage consumers who select asphalt shingles as their preferred roof covering. ARMA's position on free-flow ventilation beneath steep-slope roof decks is well established and is expressed in many ARMA technical publications and manufacturer literature.

Mandating Insulation at the Roof Deck Affects Consumer Choice and Cost

Asphalt shingles—the most widely selected roof covering for steep-slope roofs—are the preferred choice of the majority of California homeowners and building owners due to their beauty, affordability, and



reliability. The new provision may alter the product selection paradigm for consumers and is expected to discourage some consumers from making the highest value choice for their roof covering material. Regardless of the roof covering selected, the proposed new provision will cause building owners to absorb significantly higher construction costs attributable to the extra labor and materials associated with insulation installation at the roof deck level, which is a more complicated and challenging process than placement of insulation at the ceiling level. Whether these higher costs will be returned to owners via energy savings is uncertain.

Mandating Insulation at the Roof Deck Raises Concerns about Proper Moisture Management

The effect of mandatory insulation at the roof deck level on management of moisture in an attic space is another important consideration. ARMA is not aware of any publicly available, peer-reviewed studies that consider the ability of the wide variety of attic designs permissible under the proposed language to properly dissipate moisture that enters the attic, either through exchange with the exterior via openings into the attic space or occupant-generated moisture that rises into the attic. The lack of substantiation that the proposed language will lead to attics that properly manage moisture constitutes an undefined, unnecessary, and unacceptable risk for California homeowners and building owners that must not be ignored, given the potential for adverse health and environmental consequences for building occupants if mold and mildew growth occurs. In extreme cases, moisture accumulation can lead to accelerated deterioration of building components, causing unwanted financial consequences for owners.

In summary, although ARMA recognizes and appreciates the efforts of the CEC staff and CASE team members to identify options that improve the energy efficiency of California buildings, we oppose the proposal to mandate roof deck insulation. ARMA supports appropriate levels of energy efficiency that are based upon meaningful cost/benefit analyses and that retain flexibility in design and construction options and consumer choice of materials best suited to their circumstance. Mandates such as this that do not appropriately and adequately consider all aspects of design and implementation shortsightedly remove flexibility and often have unintended, detrimental consequences, resulting in both short-term expenses for California homeowners and building owners that may not be offset by supposed benefits, and long-term expenses related to remediation of problems the provisions may create.

Thank you for considering the concerns expressed herein.