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Joan P. Crowe
Director of Codes and Regulatory Compliance
Technical Services, Codes, & Industry Relations

June 18, 2021

Docket Unit
California Energy Commission
1516 9th Street, MS-4
Sacramento, CA 95814

Re: Docket No. 21-BSTD-01
2022 Energy Code Update Rulemaking

To Whom It May Concern:

By this letter, GAF is submitting comments on the 2022 Energy Code Update Rulemaking that focuses on the proposed addition of a new mandatory requirement for installation of insulation at the roof deck.

Founded in 1886, GAF is the leading roofing manufacturer in North America. As a member of the Standard Industries family of companies, GAF is part of the largest roofing and waterproofing business in the world. The company's products include a portfolio of roofing and waterproofing solutions for residential and commercial properties.

The 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."

GAF is concerned that this current proposal may have significant detrimental effects for homeowners and building owners, particularly as it relates to asphalt shingles, as these products are the most popular and cost-effective roofing system for single-family residential buildings in California. Several of the issues are described below.

Roofing Product Code Compliance

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 also required to comply with California building codes which include 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 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



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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.

- **Wind Resistance Code Requirements:** Installation of asphalt shingles directly over 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. More importantly, this prevents the use of existing asphalt shingles' wind resistance classifications, because roofing assemblies are tested where the shingles and underlayment are installed directly over a solid substrate.
- **Fire Resistance Code Requirements:** 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. And as previously stated, this will also prevent the use of asphalt shingles' fire resistance classifications, because the roofing assemblies were not tested using this configuration.

Roofing Product Performance

Mandating insulation at the roof deck may affect the long-term effectiveness of asphalt shingles. Placement of insulation on the underside of the roof deck can interfere 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. The roofing industry's position on proper attic ventilation beneath steep-slope roof decks is well established and is expressed in many trade associations' technical publications and manufacturers' literature.

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. Installation of insulation above or below the roof deck can change the characteristics of an attic space. Without proper analysis of an additional layer of insulation that may or may not act as an air barrier and/or vapor retarder, the hygrothermal performance of the attic space is unknown and may lead to unintended consequences.

Increasing Costs to the Consumer

Regardless of the roof covering selected, the proposed new provision will cause consumers to absorb considerably 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.



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In summary, GAF recognizes and appreciates the efforts of the CEC staff and CASE team members to identify options that improve the energy efficiency of California buildings; however, we oppose the proposal to mandate roof deck insulation for the reasons stated above. GAF supports appropriate levels of energy efficiency that are based upon: sound building science; meaningful cost/benefit analyses and that retain flexibility in design and construction options; and consumer choice of materials best suited to their circumstance.

GAF appreciates the opportunity to submit a public comment. Please feel free to reach out to me for further assistance or clarification. I can be reached at 224/301-0549 or joan.crowe@gaf.com.

Respectfully submitted,

A handwritten signature in black ink that reads "Joan P. Crowe". The signature is written in a cursive, flowing style.

Joan P. Crowe, AIA
Director of Codes and Regulatory Compliance
GAF