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MEMORANDUM

TO: **S. Graveline**

FROM: **John Arent**

CC: **Payam Bozorgchami, David Ware**

DATE: **5/10/2012**

SUBJECT: **Response to Stakeholder Comments on Nonresidential Cool Roof Proposal**

This letter addresses the comments sent by Sika Sarnafil to the California Energy Commission as opposition to the proposed requirements for cool roofs in the 45-day language. AEC would like this opportunity to address each of their concerns.

General Comments

They question the evidence supporting the need for changes. The need is tied to California Public Utilities Commission (CPUC) publicly stated goals of zero net energy buildings by 2030 for nonresidential new construction. Since all changes must be shown to be cost effective, they result in a substantial net present value to the building owner or tenants. They mention that the benefits have not been demonstrated. The proposed change is estimated to result in a life-cycle cost savings of $190 million for new construction, over $12 million for high-rise residential and hotels/motels and over $500 million in alterations over the measure life.

The Sika Sarnfil letter also stresses market disruption, but does not mention that fact that for all roofing types there are products being used today in California that are available from California distributors that meet the proposed requirements. While a phased approach would provide some flexibility for roof contractors, there are several alternatives, including a simple table of insulation tradeoffs with reflectance, that make this requirement more easily achieved today. Moreover, I feel that a phased approach could create confusion in the marketplace and could create additional burden for code officials when verifying compliance.

In response to industry concerns about product availability and the number of products that the proposed aged solar reflectance would impact, AEC and CEC staff lowered this requirement to 0.65 first, and then to 0.63 for alterations. The alterations reflectance requirement was set slightly lower to acknowledge the fact that there are fewer alternatives to meeting the standard if a product with lower reflectance is used. It should be noted that with the current proposal, any roofing product can be used for new construction if the performance method is used, which allows for tradeoffs with any number of building efficiency measures, such as lighting, HVAC or other measures. The performance approach allows designers to tailor their mix of energy efficiency features to the specific building designed.

SRI Equivalence

Sika Sarnafil has pointed out that the equivalent solar reflectance index (SRI) for the prescriptive standard of 78 is not consistent with the prescriptive aged reflectance and thermal emittance levels, 0.63 and 0.75 respectively. The emittance requirement was initially set at 0.85, which is common for most roofing products; however, a GAF representative pointed out that there are products that would meet the proposed reflectance (then at 0.67) but not the emittance requirements. To accommodate more reflective products, the emittance requirement was lowered to 0.75.

Since then, the proposed aged reflectance requirement has been lowered twice to accommodate industry concerns about product availability, first to 0.65 and then to 0.63, and as a result, many more products are available that can meet the emittance requirement. Lowering the SRI to reflect an emittance level of 0.75 would create a de facto aged reflectance requirement of 0.61, undermining the basis of the proposal. Moreover, the Title 24 Alternate Calculation Method (ACM), also known as the performance approach, has always used 0.85 thermal emittance as the basis for compliance calculations, since a lower emittance would give a compliance credit for what has been and still is standard practice. Over two-thirds of cool roofing products in the CRRC database (314 of 467) have an aged thermal emittance of 0.85 or above. The SRI number is not used in the performance approach and is not needed in the prescriptive standard but is provided for additional flexibility.

Moreover, compared to solar reflectance, emittance is a secondary effect on roof heat transfer and is close to 1 for most roofing products (generally between the range of 0.8 and 0.95). The only real purpose of an SRI equivalence is to allow highly reflective products that have a lower emittance.

In summary, the SRI has only a limited use in the prescriptive approach, and there are a number of alternatives for demonstrating compliance. The SRI is more useful for steep-slope applications since there are a much wider range of reflectance levels encountered in tiles and other roofing that can be used for tradeoffs. I strongly urge the California Energy Commission to retain the existing SRI levels in the current Standards language.

I can be reached for comment or further discussion via email at jarent@archenergy.com or by phone at 415-970-6513.

Sincerely,

John J. Arent, PE