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NGA AEC comments on NR envelope CASE

Additional submitted attachment is included below.

Docket number 22-BSTD-01   September 15, 2023

Re: Concerns regarding proposed mandatory fenestration backstops

Thank you for the opportunity to comment on the Nonresidential Envelope CASE report. I represent the National Glass Association and Aluminum Extruders Council, whom together have over 1800 member companies and manufacturing across North America. We represent the entire supply chain and broad interests across the commercial and residential glazing and fenestration industry, from primary glass manufacturers, commercial window and curtain wall frame extruders, glass and metal fabricators, insulating glass manufacturers, component suppliers, fabricators/manufacturers of completed systems, window and door dealers, to the final retail glass businesses and installers/contract glaziers.

Our comments are focused on the proposed new mandatory fenestration requirement in Sections 120.7 and 141.0, also known as a "backstop" or "trade-off limit" that may not be exceeded even when using the performance path to show equivalent or superior overall energy performance. We shared our concerns about this requirement with the CASE team earlier in the year, but those concerns are not reflected in the final CASE report, so we are repeating our comments here.

It should be noted that backstop requirements are not a problem for standard products in the market – but they do impact nonstandard products and applications that do not necessarily fit into the typical prescriptive bucket. As such, it is important to approach mandatory backstops very cautiously as whatever does not meet the requirement becomes essentially *illegal*. Unlike prescriptive requirements where a designer can use the performance path to accommodate any unique attributes that may not fit the prescriptive criteria, there is no option to bypass mandatory limits short of convincing the code official to waive the requirements, which creates potential project delays and legal liability. Therefore, every potential scenario must be carefully considered when determining whether to establish such mandatory backstops or, if they are going to be imposed, establishing their appropriate level and any needed exceptions.

Flaw in the Calculation of Energy Savings and Cost Effectiveness
We want to reiterate that *backstops do not save energy*, as the building must still show compliance with the overall energy requirements of the performance path. This is clearly seen by looking at the impact if you simply removed this requirement. There would be no impact on overall energy performance because the building would still have to demonstrate the same overall performance level through the performance path.

This highlights that there is a fundamental flaw in the CASE report in how the energy savings and cost effectiveness are calculated. The CASE report treats the energy savings as if it were changing a prescriptive requirement, going from one U-factor to another. However, there are actually no energy savings as any changes higher or lower are offset in the performance path to demonstrate the same

overall energy performance of the building. This fundamental flaw then extends to the aggregated state energy and emissions savings. I'll also note that there is no basis given for assuming 12.5% of new construction square footage is impacted by this proposed requirement (Table 127). I would be surprised if it were 1/10th of this. Even so, any percentage multiplied by zero savings is still zero.

This then raises the question how cost effectiveness can be justified. The CASE report erroneously states that a cost effectiveness analysis is not required because the proposed backstop U-factor is higher than the existing prescriptive U-factors, which have already been shown to be cost effective. However, that is not the correct comparison or question. Prescriptive criteria are set for 'typical' products in the market, and we agree that the current prescriptive requirements are reasonable and cost effective for those. However, a fundamental premise of the prescriptive path is that when *nontypical* products are used in the building that may not comply with the prescriptive criteria, then they may be used via trade-offs in the performance path. Assessing the cost effectiveness of a new limitation for this latter case *not* in the prescriptive path is a different and new question.

Cost effectiveness of any proposed new requirement is based on a comparison on the energy savings of the requirement relative to the increased cost of imposing that requirement. As noted, there are no energy savings from the imposing a backstop requirement. However, basic economics will tell you that there will be a non-zero increased cost by restricting product choice and design flexibility for the design team and building owner – any reduction in supply options for a given application will increase cost. Yet with no overall energy savings, there is no economic payback, and it is impossible to conclude that the measure is cost effective. *This may run afoul of the state's legal obligations regarding cost effectiveness.*

Unique Applications and Life-Safety Exceptions

If a mandatory fenestration backstop requirement is to be added, it must be done carefully, conservatively, and with all necessary exceptions. This requires a different mindset. The prescriptive path is the place to push energy efficient technologies that also satisfy cost effectiveness and practicality requirements. In contrast, the mandatory backstop limits should be approached with the mindset of "what is the worst product that should legally be allowed?" while the building still meets the required overall energy performance.
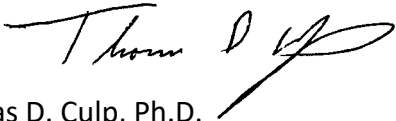
Any backstop must be conservative and flexible enough to address not just "regular" products, but also smaller areas and minority / custom products as well. Including area-weighted averages does help allow for local areas of design flexibility on projects with large volumes of glazing, but it does not allow for such flexibility on smaller projects with limited glazing, such as single-story retail, small additions, or in alterations.

Scenarios must also be considered where higher performance framing and glazing cannot be used because of structural, fire, or other application requirements. Exceptions must be included for fire-rated fenestration assemblies, blast-resistant fenestration assemblies, and historic renovation projects. (Note that the broader term "fire-rated fenestration assemblies" would cover both fire-protection and fire-resistance rated assemblies.) Also, the impact of backstops on fenestration assemblies designed for seismic considerations is an open question that should be carefully considered.

In summary, we have concerns about imposing a new mandatory backstop on fenestration, which as noted in the CASE report, is also inconsistent with ASHRAE 90.1 and IECC. There are issues with the claimed energy savings and cost effectiveness, and the proposed backstop lacks some necessary exceptions. Despite our concerns with this one specific issue, we do appreciate the hard effort of all the CASE teams and staff working on the 2025 code cycle and its many advancements.

Thank you again for the opportunity to comment.

Best regards,

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