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Request to refine compliance options for Insulated Headers in Quality Insulation Installation (QII) verification procedures

Additional submitted attachment is included below.



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12/16/2025
California Energy Commission
Docket Office, MS-4
Re: Docket No. 25-BSTD-03
1516 Ninth Street
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Re: Request to refine compliance options for Insulated Headers in Quality Insulation Installation (QII) verification procedures

Dear Commissioners and CEC Staff,

On behalf of the California Association of Building Energy Consultants (CABEC), we respectfully request consideration of revisions to the Quality Insulation Installation procedures with respect to insulated headers. This is one of many pain points within the regulations which frustrate cost-effective compliance and market transformation.

This letter comes as a result of a recent discussion we as a committee have had and simply wish to share our perspectives, but this otherwise comes unprompted. As we have some time to breathe on energy code changes for residential buildings, we thought it would be a good time to take a step back and reflect on places where energy code and the market are misaligned. Past code cycles have been enthusiastic towards new measures and ratcheting of existing language. Our perception is that this has taken attention away from listening and learning from the market to evaluate the success (or otherwise) of past measures. We hope to continue this series of reflections to ideate changes to the 2031 code that serve the core mission of the energy code—addressing the market failures in energy conservation via broadly cost-effective building energy efficiency standards.

Quality Insulation Installation (QII)

QII has been a prescriptive requirement for low-rise residential buildings in past code cycles. It is nominally centered around a good idea— a substantial amount of insulation installed in buildings is installed incorrectly such that it does not realize its full potential. The QII measure consists of 3rd-party verification of the insulation to ensure the quality of the installation. However the measure in recent code cycles has also included elements that do not pertain to the installation quality of the insulation, but rather to the design of the insulation systems in the building. This design cannot be changed or remedied at the installation phase, and thus result in the failure of the QII inspection. To wit— a perfect installation of insulation often does not pass QII verification.

The failure of this measure is a fairly high-stakes one and the incentives surrounding it are myriad. In most projects, this comes down to 2 outcomes— either find a remedy that can counter the performance penalty for not having QII, or cheat. The travesty here is that neither of those two options include the outcome which is the core motivation for the measure— to transform the labor market for insulation installation to ‘do it right’.

Furthermore, when we as CEAs are engaged early enough on a project to engage well enough with the project teams to evaluate cost-effective paths for compliance, QII comes out as a measure where the ‘juice isn’t worth the squeeze.’ The added costs for redesign of the building to accommodate required insulation elements (e.g. insulated headers, the subject of this letter), insulation specifications (e.g. some structural assemblies require insulation that costs 2-3x typical), and aligning construction process to satisfy QII procedures result in the whole measure being impractical. To our knowledge, none of these costs are incorporated into the cost-effectiveness analyses for this prescriptive measure¹.

QII and insulated headers

With the preamble out of the way, we’d like to focus on a specific pain point in the QII procedures that is a significant stumbling block for many projects (and not the only one for QII).

Current ACM/QII structure creates an all-or-nothing failure over a minor UA item.

The ACM allows the modeler to select QII as “yes” or “no,” and when QII is not verified, the effective insulation R-value is reduced relative to Standard Design, rendering a significant ‘penalty.’ Under current rules, if any mandatory QII item in RA3.5 is missed—including insulated headers—the entire project is derated to 70% of rated cavity R, even when the house is 99% compliant with respect to insulation installation quality. This “single-item veto” is not proportional to actual heat-loss impact and can cause an otherwise well-performing enclosure to fail QII.

¹ See <https://title24stakeholders.com/measures/cycle-2019/residential-quality-insulation-installation/>
This analysis only includes the added cost for ECC/HERS Verifications

Headers are a small fraction of wall area and already have meaningful thermal resistance.

Industry-standard studies show headers represent roughly 4% of opaque wall area within typical framing factors. At the same time, full-depth Douglas fir headers provide approximately R-6 to R-8 ($U \approx 0.12-0.17$) through the wood itself. In other words, uninsulated headers are not a zero-R condition, and their impact on whole-wall UA is small relative to the full-wall 0.70 cavity derate triggered by losing QII.

Field reality and ECC QA risk.

Full-depth headers remain common practice for cost and constructability reasons, especially in seismically active areas of the state. Headers are specified at structural design, prior to insulation installation in the field. Insulation installers have no ability to reconcile header insulation with the structural design (nor should insulation installers be making any changes to that design), and so these failures come as a matter of design, and not installation. This is counterintuitive, however, since the measure is nominally about installation and not design. We find that most jobs fail QII even before the ground is broken...

The insulated-header requirement is often unacknowledged² until after framing and partial sheathing are complete, at which point remediation may require removing exterior finishes, reworking shear, or other high-cost measures. In most cases, such remediation is impractical, and in a local benefit-to-cost analysis, have simple payback periods on the order of millenia. Most of the time, raters are called onto site at the framing stage to do their pre-insulation walkthrough, only to be in the unfortunate position to indicate likely failure unless the house is reframed.

This is a high-stakes negotiation, and one where the ECC-Rater is at a significant disadvantage. And now with the recently strengthened Energy Code Compliance (ECC) quality-assurance requirements, raters are placed in a difficult position when this minor defect alone would force a QII fail. This also creates downstream liability for energy consultants and builders when a project loses QII credit late in construction for a small UA issue.

² As CEAs, we will share that this generally is *not* an issue for our projects where we are documentation authors. Different consultants have different strategies for navigating this challenge. But among an informal poll, the most successful strategy to QII compliance is simply to avoid it altogether—header issue is but one of many issues where many of us find that the ‘juice isn’t worth the squeeze’. This is not a measure of the *measure* (sic), but rather an indication that the requirements and procedures are too high a bar. It is ‘perfect’ being the enemy of market transformation.

Possible Fixes for this challenge:

As a committee, we have discussed many possible solutions. And we recognize them in the spirit of real-world solutions— they all come with trade-offs. As such, we thought it would be most helpful to not present one agreed to solution, but many, as to foster a spirit of problem-solving.

Idea #1: allow for compliance without header insulation along with a Performance penalty

For this solution, the software (and with upstream RA/ACM changes of course) would need to add an option for Documentation Author to indicate a boolean for header insulation. An input of 'no' for all header insulation would derate the framing factor of the wall(s) by some prescribed or calculated amount. Based on the research cited above, this might be an increase of 4% for framing factor in the CBECC software. Otherwise, full-credit could be maintained for cavity insulation pending ECC-Rater inspection.

Idea #2: Allow explicit modeling of uninsulated headers in compliance software

For this approach, the Commission could issue an advisory (or perhaps blueprint) indicating that an acceptable compliance path for uninsulated headers would be to model those areas explicitly in compliance software consistent with assembly U-factors calculated via Joint Appendix 4.1. These areas and their assemblies would then be inspected and verified by ECC-Raters.

Idea #3: Remove insulated headers from QII altogether

As observed before, insulated headers do not pertain to the quality of insulation installation by contractors. They are better categorized as a matter of thermal bridging and should be treated as such among the litany of other compromises in the thermal enclosure of any building. In the Passive House certification system, these are specifically quantified, evaluated, and negotiated as that is the only pragmatic approach in the real world.

Given the posture of the Commission to interpret AB130 as a kibosh on all regulations and procedures applicable to residential buildings regardless of whether or not they're reviewed by the BSC, we acknowledge this as an unrealistic idea for the near future.

Why this matters.

This change would not weaken the Standards or create a loophole. It would simply allow accurate, performance-based accounting of a known, small UA deficiency while maintaining the integrity and intent of QII for the rest of the enclosure. More importantly, it would allow projects to focus on the 'Installation' part of QII. If the procedures can allow for insulators to get to a QII 'pass' on every project within their scope of work as installers, then ECC-Raters can be in a position to implement the work that QII intends— market transformation of insulation installation practices.

CABEC appreciates the Commission's ongoing work to improve compliance accuracy and field verification. We would welcome the opportunity to elaborate on these or any other ideas of interest to the Commission.

Respectfully submitted,

On behalf of the CABEC Policy Committee

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