

Meeting Notes

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Notes from 2025 Title 24, Part 6 Code Cycle Utility-Sponsored Stakeholder Meeting for:

Nonresidential, Multifamily, Single-Family Envelope

Meeting Information

Meeting Date: 2/14/2023

Meeting Time: 8:30 am – 2:15 pm

Meeting Host: California Statewide Utility Codes and Standards Team

Meeting Agenda

Time	Topic	Presenter
8:30 AM	Introduction	Cosimina Panetti Javier Perez Kelly Cunningham
8:50 AM	Vestibules (Nonresidential (NR))	Maureen Guttman, Energy Solutions
9:25 AM	Windows (Single Family (SF), Multifamily (MF, NR))	Simon Pallin, Frontier Energy Avani Goyal, TRC Maureen Guttman, Energy Solutions
10:40 AM	Break	
10:50 AM	Opaque Envelope Assemblies (SF, MF, NR)	Simon Pallin, Frontier Energy Avani Goyal, TRC Maureen Guttman, Energy Solutions
12:05 PM	Buried Ducts and Cathedral Ceilings (SF)	Simon Pallin, Frontier Energy
12:45 PM	Lunch break	
1:00 PM	Cool Roofs (MF)	Avani Goyal, TRC
1:35 PM	Snapshot QII (MF)	Lucy Albin, TRC Elizabeth McCollum, TRC
2:15 PM	Meeting Adjourns	

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Meeting Participants (available upon request by emailing info@title24stakeholders.com)

Action Items from Meeting

- The Statewide CASE TEAM followed up on all questions or comments that required a response and were not discussed during the meeting.

Key Points from Meeting

Nonresidential Envelope

Opaque Assemblies: Walls, roof and ceiling,

This proposal would require a 20 percent (+/-) reduction of the existing mandatory U-factor values for opaque envelope assemblies in both new construction and alterations. Opaque assemblies currently identified in the code include roof/ceiling and walls. This measure would also reduce the existing prescriptive U-factor values for opaque assemblies and add prescriptive insulation requirements for alterations.

Vestibules

This proposal would establish a mandatory requirement for vestibules in mixed-used and nonresidential buildings (both new construction and additions) with high-traffic main entrances, including colleges, schools, grocery stores, hospitals, hotel/motel, industrial facilities, offices, refrigerated warehouses, restaurants, and retail.

Windows

This proposal would set a new mandatory requirement establishing U-factor and Solar Heat Gain Coefficient (SHGC) for vertical fenestration assemblies for all non-residential buildings. It would affect alterations and new construction, where cost effective, as determined by energy modeling.

Buried duct prescriptive package

This proposes a prescriptive alternative path to high performance attics (HPA) to provide an alternative to adding insulation at the roof deck to reduce thermal losses from ducts in vented attics. The measure contemplates fully covering ducts with ceiling insulation to provide an increased thermal barrier against high attic temperatures and requiring radial duct layouts to limit duct diameters to facilitate nearly complete coverage by insulation. Includes prescriptive insulation: To ensure full burial, the buried duct measure will require R-49 or higher attic insulation levels. A sub-measure will also evaluate using raised heel trusses to provide additional compliance credit for buried duct and non-buried duct designs.

Single-family High-Performance Envelope

Proposes requirements for roofs constructed as cathedral ceilings, cool roofs, high-performance windows, and higher mandatory R-value requirements for framed walls.

Multi-family Envelope

This proposal focuses on three measures grouped into the ‘envelope’ category of building systems to reduce the total amount of heat transfer that occurs in a building from the conditioned inside air to the outside ambient air: cool roofs, improved wall performance, and high-performance windows.

Snapshot Quality Insulation Installation (QII)

This measure proposes an abbreviated, or snapshot, QII procedure which would apply prescriptively to multifamily buildings with four or more habitable stories, and as a compliance option for multifamily buildings with three or fewer habitable stories. It also applies the existing full QII procedure (which is currently a prescriptive requirement for multifamily buildings with three or fewer habitable stories) as a compliance option to multifamily buildings with four or more habitable stories.

MEETING NOTES

During the meeting, questions and comments were submitted in three distinct formats which are provided in these meeting notes in these [hyperlinked for quick access] sections:

1. **In-Meeting Questions / Comments:** Questions and comments submitted verbally during the meeting via the ‘raise hand’ function in GoTo Webinar, where participants were unmuted to speak, or in some cases, comments submitted in writing were discussed verbally during the meeting (in which case the person that commented may not be identified in these notes).
2. **Questions / Comments Submitted Via GoTo Webinar:** See this section for questions and comments submitted in written format via the GoTo Webinar question pane.
3. **Public Input Submitted Via Mentimeter:** This section includes public comments and questions, including screen shots of the polls that were conducted during the meeting, and responses to those polls.

Not all written questions and comments were discussed during the meeting but all have responses available in these meeting notes.

In-Meeting Questions / Comments

Vestibules (Nonresidential (NR)), Maureen Guttman, Energy Solutions

1. **Question from Mentimeter in-meeting poll:** Are you going to include guidance of how things like revolving door, meet envelope requirements of the code? Gina Rhoda
 - a. CASE Team Response (Maureen Guttman): Yes, we've made a first attempt at this in the proposed code language and we'll need to draft this for the compliance manual when we get to that point.
2. **Question from Mentimeter in-meeting poll:** Were the building types under consideration only for hospitals, universities? I can see high end office towers maybe having trouble meeting this requirement due to certain design aspects.
 - a. CASE Team Response (Alamelu Brooks): Currently we are including large offices for energy modeling and cost-effectiveness analysis.
3. **Comment from Mentimeter in-meeting poll:** This is adding complication, which is going to put this measure into a no-go category. The industry at large needs things to be made less complicated, at all levels.
 - a. CASE Team Response (Maureen Guttman): Yes, we also want to make things less complicated but also make more buildings more energy efficient. We'll take your comment into consideration.

Windows (Single Family), Simon Pallin, Frontier Energy

4. **Question from Mentimeter in-meeting poll:** Why go U-factor of 0.35 when what is supported now (by software) is 0.40 as support by Energy Star? Gina
 - a. CASE Team Response (Simon Pallin, Frontier Energy): This could be an option as well and is something we'll evaluate.
5. **Question from Mentimeter in-meeting poll:** Have you considered the impact on peak demand of high-SHGC fenestration? Eric Lacey
 - a. CASE Team Response (Simon Pallin): This is something we should look into and we have the data but we've not yet evaluated.
6. **Question from Mentimeter in-meeting poll:** What about home is WUI? Most customer homes I work with want metal clad NOT VINYL? By lowering the U-factor (**mandatory**) you are making this very difficult. Gina
 - a. CASE Team Response (Simon Pallin, Frontier): It's important for us to see the percent of the market and how many will be affected by the change and vinyl is often used.

- 7. Comment from Mentimeter in-meeting poll:** New SHGC should be max, not min. Gina
- a. CASE Team Response (Simon Pallin, Frontier): I assume you mean for the way we propose to introduce for climates that dominate with heating, they benefit from a higher SHGC rather than a lower one.
- 8. Question from Mentimeter in-meeting poll ‘Please provide feedback and suggestions on the methodology and assumptions for energy savings estimates for this proposal’: Do you find that these lower U-factors can be achieved with dual pane window or will triple pane be required?**
- a. CASE Team Response (Simon Pallin, Frontier): For a U-factor of .28, double glazed would work, but triple pane would make more sense with .25. Pricing is something that’s hard to estimate. We mainly used the EPA work and pricing from over 30 manufacturers; we did not use RSMEAN data for this proposal. We’ve not seen a large jump in price from 2 to 3 pane windows.
- 9. Moderator posed question from chat:** Will this proposal apply to skylights?
- a. CASE Team Response (Alea German, Frontier Energy): There are unique exceptions for skylights and we’re not proposing to change any of those, but the requirements would apply otherwise. We’d like to hear how you think this proposal is a challenge or not for skylights.

Opaque Envelope Assemblies (Multifamily (MF)), Avani Goyal, TRC

- 10. Moderator posed question from chat:** Is there modeling of window wall ratio dependent upon elevation?
- a. CASE Team Response (Avani Goyal, TRC): Not yet, but we can take this into consideration.
- 11. Question from Mentimeter in-meeting poll:** Increasing summer peak AC demand in CZ 1, 3, 16? Isn’t this counterproductive? They’ll be in high TOU electric rates.
- a. CASE Team Response (Avani Goyal, TRC): In the climate zones 1,3,16 we believe the increase demand in the cold climate zones will be offset by the decrease in winter and we can look again at the KW savings in summer versus winter, but what we’ve seen in the savings estimates we see consistent savings as the winter offsets the summer.
- 12. Regarding Menti poll comment:** “Please consider common use areas. Also concerned that we don’t really know impact of 2022 and what products we really can use (Gina)”
- a. CASE Team Response (Avani Goyal, TRC): Yes, this will be considered.
- 13. Question via Menti poll:** What about alterations?
- a. CASE Team Response (Avani Goyal, TRC): We haven’t done alterations yet but we will do that before the next round of meetings.

14. Comment via Menti poll: I'm not aware of any other state with minimum SHGC requirements (even very cold states). Eric Lacey

- a. CASE Team Response (Avani Goyal, TRC): That is true, and we believe we need set a precedent in providing a better design guide for cold climates where people may be inadvertently installing inefficient products.

15. Verbal comment from CASE Team member Matt Christie, TRC. There have been a number of questions about solar heat gain coefficients requirements being applied across the whole building and orientations other than south. As building scientists we recognize the value is putting high solar heat gain on south facing windows and ideally also protecting them with overhangs for summer months; and the value of high solar heat gain on other sides is in some cases negative. We don't want a code w different solar heat gains on every façade; it would be an enforcement nightmare. That's why they're singular across a building. In practice, for those complying prescriptively, which is a very small subset of the multifamily market, relative SHGC requirements are area weighted average across the building. So there's wiggle room there to put in lower RSGC on those non-sun facing facades, and high RSGC on south facade. It's not perfect but allows for some nuance. For those complying using performance approach – the vast majority - this plays out in the modeling. So if you have compliant RSGC windows on the south façade but you choose to model low SHGC windows on the other facades, the CBECC platform will model that appropriately; there's not a lot of solar gain coming in on those other facades – you're not getting the same heating benefit, and you can still comply even with that appropriate and best practices solar heat gain placement design using the performance approach.

Windows, NR, Maureen Guttman, Energy Solutions

Discussion from Mentimeter in-meeting poll which asked “For alterations, what is a reasonable trigger to require window replacement?”

16. Comment: Include option to do EITHER window replacement or install commercial secondary window products. Not sure about trigger.

Opaque Envelope Assemblies, SF, Simon Pallin, Frontier Energy

17. Moderator posed question from chat: Why increase the mandatory minimum if prescriptive standards already exceed this and does doing so preclude the use of viable high-performance alternatives?

- a. Simon: The mandatory requirements are the lowest requirement; most of the time we see higher. This makes sure that we achieve at least this R value. On previous slide we looked at U-factor (lower is better).

Opaque Assemblies, MF, Avani Goyal, TRC

18. Verbal question posed by Gina Rodda, Gable Energy. I don't have issue with what you're proposing for wood framing but have major concerns with what you're proposing for metal framing. There are a lot of different configurations for walls associated with multifamily, especially the taller the building. Considering what needs to be supported in terms of structural and fire rating, etc, that increased stringency can really cause issues. If you want to apply it to demising walls or alteration projects, there are even more issues.

- a. CASE Team Response (Avani Goyal, TRC): Thank you for your comments Gina.

Opaque Assemblies, NR, Maureen Guttman, Energy Solutions

19. Question asked in Mentimeter, "Why have 16 climate zones if you want the same U-value across all the zones"?

- a. CASE Team Response (Maureen Guttman, Energy Solutions): We would only do this where the current requirement is very close or functionally the same between climate zones. The intent around consolidating the requirements is to clean up the code while matching requirements that climate zones need for their unique needs.

Discussion following Mentimeter poll that asked "Please provide feedback and suggestions on the market readiness and technical feasibility of this proposal".

20. Anonymous Comment: I have some clients very concerned with rigid insulation on multifamily walls due to fire fears, just so you know (I think it is needed). Gina

- a. CASE Team Response (Maureen Guttman, Energy Solutions): Thank you Gina we will take that into consideration.

21. Anonymous Comment: Thicker insulation takes up more space in a push for smaller interior spaces to be more energy efficient, this makes meeting this requirement much more difficult. Especially in California where cost per sq ft is huge.

- a. CASE Team Response (Maureen Guttman, Energy Solutions): Thank you we will take that into consideration.

22. Anonymous Comment: Adding R2 to current prescriptive standards seems arbitrary, In some cases it could be a big cost difference and in others it may not.

- a. CASE Team Response (Maureen Guttman, Energy Solutions): Yes, cost per square foot is definitely a consideration and we are sensitive to these considerations in the state.

Discussion following Mentimeter poll that asked “Please provide feedback and suggestions on the methodology and assumptions for energy savings estimates for this proposal”.

23. Anonymous Comment: It would be helpful to get actual bids rather than using RS Means and retail material costs.

- a. CASE Team Response (Maureen Guttman, Energy Solutions): We agree and we are talking to contractors and material suppliers to get costs and not relying on RS Means.

Buried Ducts and Cathedral Ceilings, SF, Simon Pallin, Frontier Energy

24. Moderator posed question from chat: Why is there no requirement for air impermeable insulation around the ducts to prevent rampant condensation of vapor in the attic air or exfiltrating house air on the cold ductwork?

- a. CASE Team Response (Simon Pallin, Frontier Energy): The ducts are designed to be air tight and there are requirements for duct air leakage. In terms of vapor transfer through a material it’s relatively slow - much slower than convection moisture transfer. With that said, I assume the inner layer of a duct acts more like a class one vapor retarder, which reduces vapor transfer significantly, so that the condensation issue for ducts is apparent but more relevant to air leakage from the ducts than vapor transfer.
- b. CASE Team Response (Dave Springer, Frontier Energy): A lot of research shows that in humid climates ducts should be encapsulated, but in dry climates it’s not necessary, so burying them is not needed.
- c. CASE Team Response (Simon Pallin, Frontier Energy added): We need to make sure the dew point temperature (at what point will water vapor in air condensate); compare to outer temperature on ducts to avoid condensation. It’s a valid question that we are including in our work; R-6 insulation is enough in dry climates.

25. Moderator posed question from chat: Presumably there shouldn’t be a requirement to buy air handlers and some length of duct in proximity to them. How will this detail be communicated?

- a. CASE Team Response (Simon Pallin, Frontier Energy): Yes, we are considering options now for ducts only.

Discussion following Menti poll: “Please provide feedback and suggestions on the market readiness and technical feasibility of this proposal”.

26. Comment: Surprising that more insulation needed in mild CZs.

27. Comment: Why R-50 in the mild CZs? Gina

- a. CASE Team Response (Simon Pallin, Frontier Energy added): These are great comments; it’s because we compare against the proposed increased stringency for buried ducts.

Cool Roofs, MF, Avani Goyal, TRC

28. Verbal question asked by Reed Hitchcock, Asphalt Roofing Manufacturing

Association: You’ve categorized the 0.20 - 0.25 as a minor change. The impact on available products for all roofing types is significantly affected for all steep slope materials just going up by percent. Regarding asphalt, looking at the cool roof rating council database, that increase reduces the number of products available in the database by 50%. And of those still available, almost half have the word ‘white’ in them. So we’re looking at a very light pallet of materials and people are not that interested in those materials. That’s a substantial impact to consumers. Just because it’s in the CRRC database doesn’t mean it’s available.

- a. CASE Team Response (Avani Goyal, TRC): I agree that it’s not a minor change in terms of how it affects the market and product availability. We recognize that the CRRC database, we’ve talked to manufacturers that produce reflective shingles and have gotten information that there are shingles in other colors such as reddish that meet the requirements. We would like to learn more, so please reach out to us for a more in-depth discussion.
- b. CASE Team member (Michael) added: We expect that the TPO roofing material is the most common approach for low-sloped roofs for new construction. For existing buildings, using a coating approach would certainly make a more cost-effective renewal of the roof and allow it to be a cool roof, but we are not analyzing that at this point. This will start to apply to alterations in the future and that is a lower-cost option for some circumstances.

Discussion following Menti poll that asked “Please share any additional questions, comments and feedback”.

29. Anonymous question: Are cool roofs labeled for inspection that correct product installed?

- a. CASE Team Response (Avani Goyal, TRC): My understanding is that there is not a label, but the documentation should show what product was installed. The building inspector can do due diligence. If you have additional ideas, please reach out to u.

Michael we'll have to get back to you on the inspection aspect of that, but the packaging and specifications should show information.

30. Do we have data on how cool roofs impact urban heat island effect?

- a. CASE Team Response (Avani Goyal, TRC): We have some literature published by national laboratories including the heat island effect from LBNL – if you reach out to us we can share this information.

Multifamily Restructuring, Lucy Albin, TRC

Discussion following Menti poll that asked “What technical challenges have you faced complying with the existing QII requirement in multifamily buildings, if any?”

31. Anonymous comment: Requirement for insulated headers is overly rigid, disallows many equivalent options.

- a. CASE Team Response (Lucy Albin, TRC): We've mentioned that we're not proposing changes to the existing QII requirements but we are planning to include an exception for multifamily building for insulated headers so that will be addressed with this proposal.

32. Anonymous comment: Why not extend low-rise multifamily compartmentalization requirement to high-rise multifamily?

- a. CASE Team Response (Elizabeth): Currently low-rise and high-rise have the same compartmentalization or balanced ventilation requirements and we presented on a measure to extend compartmentalization last week – reach out to us and we can get you more information.

33. Anonymous comment: Checklist approach to air sealing is not as good as blower door test.

- a. CASE Team Response (Lucy Albin, TRC): This gets to the difference between air sealing of cavities and air sealing of total building.
- b. CASE Team (Matt Christie, TRC) added: We're testing a different thing than what the blower door tests. Each cavity itself is isolated and air sealed and a blower door won't pick that up. For example, the stack effect can drive air flow through a building for example and reduce insulation R-value and the blower door can't identify that. Blower door test happens after the house is drywalled and issues can't be fixed – issues must be addressed while the cavity is accessible.

Discussion following Menti poll that asked “Please provide feedback and suggestions on the methodology and assumptions for energy savings estimates for this proposal.”

34. Anonymous comment: When lowrise market went through this shift, the installers absolutely charged an increase fee for labor and air sealing material. Its assumed that its no cost NOW because it is normal to use in SFD.

- a. CASE Team Response (Lucy Albin, TRC): That is helpful. If you have information on the labor and material cost please reach out to us and we'll look into that.

35. Anonymous comment: If you're going to require contractor training, you have to add that cost.

- a. CASE Team Response (Lucy Albin, TRC): I agree. This is not a part of the code proposal at this time but it's an option we wanted to get your feedback on; if we do go that route, we would take cost into account.

36. Anonymous comment: Nice to have snapshot QII as option for low-rise MF but at compliance penalty.

- a. CASE Team Response (Lucy Albin, TRC): That is true. There would be credit to make up for in other areas if a low-rise multifamily building with a snapshot QII pathway, but this opens up options partially because we've heard that the 30% derate is hard to overcome with other measures as-is, so this would help to get some credit out of QII without having to do the full inspection of the full envelope. Also having the failure mitigation here would help – if someone were to go for a full QII and fail it would be too late to take it into account in the design of the building so this gives more options.

Final Discussion

No final questions or comments were posed.

Wrap-Up

- All CASE Reports will be posted on title24stakeholders.com/events
- Round 2 meetings begin in April
- Meeting adjourned at 2:15 PM PST

Questions / Comments Submitted Via GoTo Webinar

The questions and comments below are provided verbatim (as-submitted) in the GoTo Webinar Question pane.

Name	Time Asked	Question / Comment	CASE Team Response
Nick Brown	9:25:06 AM	The mandatory maximum U-factor change proposed would make Aluminum fenestrations difficult to use and there are some situations like large sliding glass doors where Aluminum (non-thermally broken) are the best choice structurally. Would suggest not reducing mandatory max U factor; prescriptive change will have the desired effect on its own	Thank you for your feedback. This is something we are considering. We will follow-up with you to discuss further.
Tan Diep	9:52:31 AM	Are the values posted center of glass u-value or overall assembly?	Thank you for the question. The values are for the overall assembly for punched opening, and center glass for curtainwall/storefront fenestration.
Tan Diep	10:40:32 AM	Were the cost for center of glass only?	Thank you for your question. It is for the whole assembly. It is the incremental cost not the absolute cost.
Steve Dubin	12:00:20 PM	for anyone that wants to discuss rigid insulations option/ pricing/ availability, feel free to reach out to me. (dubin.steve@us.sika.com or 707-392-7269)	Thank you, Steve. Guaranteed you will hear from one or more of us!
Jeremiah Ellis	10:58:55 AM	Making it mandatory removes ALL flexibility from the code. You are removing the necessity of performance based code options	Thank you for the feedback. This is an important factor we are considering. The mandatory requirement is much less stringent than the prescriptive code so there remains flexibility in the performance approach.
Jeremiah Ellis	11:00:00 AM	They seem commonly used because builders are trying to use this to offset other items to remain cost effective	Thank you for this comment. The data comes from 2019 projects in the HERS Registry.

Allen Karpman	1:14:29 PM	we support extending the cool roof requirement to additional Climate Zones! Why not make the existing Cool Roof Zone more strict for new construction/refurbishment?	Thank you for your question. We have evaluated the cost effectiveness of a cool roof measure and also the limitations that increasing the ASR will have on aesthetic options and believe the current recommendations are the best balance of design and technology options for the market. ,Thank you for your question. We have evaluated the cost effectiveness of a cool roof measure and also the limitations that increasing the ASR will have on aesthetic options and believe the current recommendations are the best balance of design and technology options for the market.
Greg Keeler	1:37:41 PM	Do you have data that correlates the impact of cool roofing on Urban Heat Island effect?	Thank you for the question, this is an important point. Unfortunately, at this time Title 24 analysis is focused primarily on building-by-building energy savings and cost effectiveness and we are not able to consider the heat island impact in our current calculations. ,Thank you for the question, this is an important point. Unfortunately, at this time Title 24 analysis is focused primarily on building-by-building energy savings and cost effectiveness and it is not able to consider the heat island impact in our calculations. We are happy to share our literature review sources with you.
Greg Keeler	1:39:07 PM	I also concur with other stakeholders regarding the decrease in available product choices in asphalt shingles if the SR/SRI is increased to the levels proposed.	Thank you for your comment. We understand this does have an aesthetic change to the market, but there are dark roof options that can meet the 0.25 value, so we feel that there is still a range of aesthetic options that should meet the interests of the market. A specifier who is very intent on a very dark roof will need to consider the performance option.
Ron Kliewer	11:17:33 AM	Typically when you compress fiberglass insulation from the design thickness, the rated R value is reduced.	Thank you for the comment. An insulation product that is designed for a specific cavity space will meet the R-value if it is not excessively compresses. So for a 2x6 cavity, a 2x6 insulation will meet the R-21 if that is what it is rated for.
Paul Lavallee	1:08:14 PM	Can the economic analyses for Climate Zones 1,2,5, and 16 be shared?	All analysis performed in all Climate zones, including those not in the measure proposal- will be made available in the CASE report.
Paul Lavallee	1:22:10 PM	Incremental Cost Information (Slide 18) - Low Slope costs assume new membrane, but a reflective coating/paint would be a lower cost solution to meet the requirements.	Thank you for your comment. We are assuming new construction, but if this were an alteration condition, that path would certainly make a lower-cost approach to be used, including coatings.
Gina Rodda	12:44:27 PM	WOO HOO Rafter roof option, so excited!!!	Thanks Gina!
Gina Rodda	12:45:26 PM	Huh, R-50 in the mildest CZ's???	Great question. We are still working through the energy simulations but this is what the preliminary simulations are

			showing as equivalency to the current requirements. We are looking into these results and can share our thoughts with you.
Gina Rodda	12:50:15 PM	Next time, make sure you have enough time to take our feedback, otherwise this is a waste of my time. Gina	Apologies Gina and we understand. Any feedback you provide during this presentation will be reviewed and considered by the CASE Team, even if we don't have a change to discuss it during the presentation. The same goes for any feedback that you provide after this event, please email it to info@title24stakeholders.com .
Chris Rosemond	12:57:42 PM	Discussion - back and forth conversation - is what provides value and helps progress good ideas. Simply soliciting questions and comments, that are then not provided an opportunity for clarification, elaboration, or counter point for further discussion does not help progress ideas	Thank you for your comment. Please follow up with us directly – we would like to discuss your ideas.
Mazi Shirakh	9:25:21 AM	Min SHGC of 0.35 can be confusing, because if they install a window with SHGC of 0.23 in these climate zones, the energy usage can go up.	The goal of the proposed changes to SHGC requirements is to clarify the role of SHGC in heating dominant climate zones. It is true that in these CZs the energy use will go up with lower SHGCs. The goal of the proposed changes to SHGC requirements is to clarify the role of SHGC in heating dominant climate zones.
Martha VanGeem	9:12:52 AM	Where is the draft language? Could you put the website here?	You can access here: https://title24stakeholders.com/event/nonresidential-multifamily-and-single-family-envelope-utility-sponsored-stakeholder-meeting/
Martha VanGeem	9:17:50 AM	I can't find the draft vestibule text. Please provide more specificity on where it is.	Vestibule draft language is in the Nonresidential Envelope Measure Summary, Section 120.7. It is a new section at the end., https://title24stakeholders.com/event/nonresidential-multifamily-and-single-family-envelope-utility-sponsored-stakeholder-meeting/ All of the material should be on the website at this location All draft code language for building Envelope is available under the Proposal Summary Documents available here: https://title24stakeholders.com/event/nonresidential-multifamily-and-single-family-envelope-utility-sponsored-stakeholder-meeting/ .
Meg Waltner	9:28:03 AM	I'd recommend looking at U-factor levels more stringent than Energy Star. I've found products at 0.22-0.23 U-factor in the Pacific	Thank you, we have considered this and there are various considerations that impact going lower than 0.25. We would be happy to discuss this with you further.

		NW at minimal incremental cost compared to U =0.3 windows.	
Meg Waltner	9:32:10 AM	To clarify, are the proposed window values prescriptive or mandatory?	These proposals are for prescriptive requirements.
Meg Waltner	10:31:58 AM	I may be able to share data/project experience on secondary windows. Please reach out if you are looking for data on this.	Thank you for your comment. The CASE Team will reach out to discuss this further with you.

Public Input Submitted Via Mentimeter

Note: all questions and comments submitted via Mentimeter are anonymous. Those that were discussed during the meeting are incorporated into the 'In-Meeting Questions / Comments' section above; others are shown below.

Mentimeter Polls & Responses

Vestibules (Nonresidential (NR)), Maureen Guttman, Energy Solutions

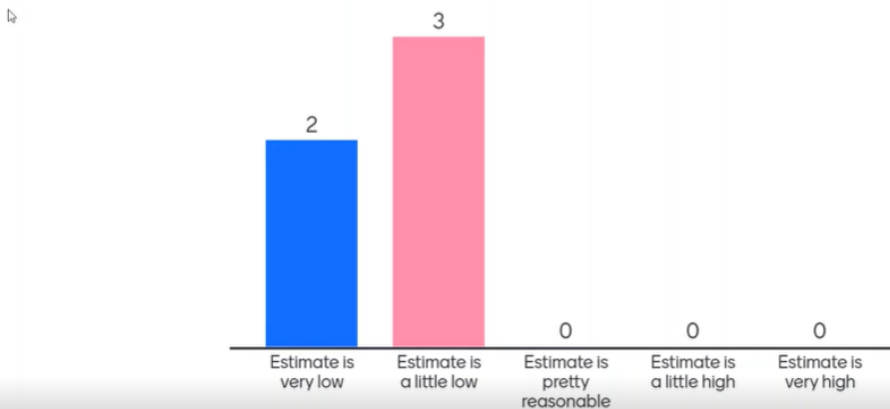
Please provide feedback and suggestions on the market readiness and technical feasibility of this proposal.



This measure is technically feasible and makes a lot of sense.

Projects are already struggling with finding space for battery on the main floor, this will cause more heartache.
Gina Rodda

Do the presented cost estimates seem reasonable for a vestibule in a nonresidential building?



Open Ended

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Are you going to include guidance of how things, like revolving door, meet envelope requirements of the code?
Gina

<https://title24stakeholders.com/>

Where the building types under consideration only for hospitals, universities? I can see high end office towers maybe having trouble meeting this requirement due to certain design aspects.

Key take away was that even the team making the proposal is aware that it is adding complication, which is going to put this measure into a no-go category. The industry at large needs things to be made less complicated, at all levels.

Please share any additional questions, comments and feedback.

What simulation tool are you using?

update the prescriptive. don't change the mandatory - doesn't save energy, but restricts design flexibility and potentially causes problems

You're assuming new homes in CZ1, 16 have air conditioning, and can remain comfortable with high SHGC in summer. My projects in these areas don't have AC so we use low SHGC facing east and west

Was there any consideration for the costs and savings of setting stricter mandatory measures and doing away with the prescriptive option?

Standard design in performance model should match the Prescriptive allowance for skylights

Even imported Euro skylights can't quite meet the current U for windows. Velux is U-0.43 or higher. But Standard design in Performance has

Please provide feedback and suggestions on the market readiness and technical feasibility of this proposal.

Why go U-factor of 0.35 when what is supported no (by software) is 0.40 as support by Energy Star? Gina

Windows and glazing products to meet these proposed criteria are available.

Have you considered the impact on peak demand of high-SHGC fenestration? Eric Lacey

Krypton is extremely expensive and hard to fill the cavity.

Min shgc in 1,3,5,16 should help manufacturers stock that glass in their factories, which may be a current barrier to sourcing mid and high gain products

WHAT about home is WUI? Most custom homes I work with want metal clad NOT VINYL? By lowering the U-factor (mandatory) you are making this very difficult. Gina

I have a few cities that are very against vinyl windows due to environmental concerns. Gina

Triple IGU's tend to have overall thickness increase and will require a wall assembly that is thicker to accommodate the thickness. Air tightness will be more important than lower u-value.

Windows at these U-values and more efficient are readily available.

Product availability seems tough, and it strips away any trade off on the performance side of things. The builders won't have any choices any longer if we keep ratcheting down the prescriptive case.

Have you considered matching fenestration U-factors proposed for 2024 IECC? Eric Lacey

Agree, please don't lower mandatory maximum U factor

How do you think the proposal should apply to small homes including ADUs?



Please provide feedback and suggestions on the methodology and assumptions for energy savings estimates for this proposal.

What about skylights? I am very concerned these values cannot be achieved with any skylight product out there. Gina

Get real bids on the proposed design, not RS Means

Window U-value is not a spectrum, there is a jump from 2pane to 3 pane with no products in between

Did you find that these lower U factors can be achieved with dual pane or will triple pane be needed?

Consider a moderate, statewide change to U-factor statewide. It would streamline production and lower costs, improving cost-effectiveness. Eric Lacey

Installed costs, not manufacturer retail prices

Your costs do not seem accurate - you are only costing the material from the manufacturer. You are not collecting the increases in design fees and wall changes to accommodate this change.

Generally, the breakpoint from 2- to 3-pane is U~0.28.

3-pane cannot have simulated divided lites, so low-U-values mandate a certain modern appearance

I also believe that your no cost labor is not accurate- labor has shot through the roof in recent years (12-20%) to keep skilled labor and windows installation needs skilled labor or it is a risk for a major malfunction.

Incremental cost for the U-0.28 level seem right (or even low); incremental cost for the U-0.25 level may be a bit low. There is no cost impact for min 0.35 SHGC in those cold regions

Please share any additional questions, comments and feedback.

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By changing the Mandatory, you're basically only hitting Fleetwood

Even imported Euro skylights can't quite meet the current U for windows. Velux is U-0.43 or higher. But Standard design in Performance has

Are there any other market or technical barriers to the proposed changes that we need to investigate further?

You're basically asking designers to put high-gain windows on west facing facades, OMG

Is there modeling of window wall ratio dependent upon elevations? This could be more of value in certain climate areas.

Please provide feedback and suggestions on the methodology and assumptions for energy savings estimates for this proposal.

Increasing summer peak AC demand in CZ1,3,16? Isn't this counterproductive? They'll be in high TOU electric rates

the cited incremental costs seem reasonable

Please, please please consider common use areas. Also concerned that we don't really know impact of 2022 and what products we really can use. Gina

High SHGC (LoE-180) can be a special order, higher cost, no cost savings here

What about alterations? How did you even do studies since software can't do alterations yet? Gina

I'm not aware of any other state with minimum SHGC requirements (even very cold states). Eric Lacey

Winter morning heating is low TOU rate period, can't offset increased summer peak. Also this assumes that CZ1,3,16 homes have air conditioning at all

Please share any additional questions, comments and feedback.

Because the U-values don't vary by climate zone like walls and roof U, this seems like it's not cost optimized

You ARE adding complexity of enforcement with the mix of min. versus max. SHGC. Gina

Agree with Gina

Code already has different %-glazing allowed on different facades

Then keep this to the performance approach and don't add complexity to the prescriptive approach written within the code. Gina

The Prescriptive code is written for those who don't understand building science, and they will put high-SHGC on west facades

I have yet to have a client willing to have different window products on different facades. Gina



For alterations, what is a reasonable trigger to require window replacement?

When you are replacing windows. Don't go there!!! Gina

Include option to do EITHER window replacement or install commercial secondary window products. Not sure about trigger

If it can be shown to be cost effective... it is a worthwhile thing to consider.

Agree with idea re: secondary windows. Could have trigger with % of facade being renovated, but don't know right %.

Be very careful about mandatory U-factor when we HAVE to consider fire rated assemblies, and cities that require the "look" of metal. Gina

Please provide feedback and suggestions on the market readiness and technical feasibility of this proposal.

We have to get installed products to match NRCC requirements before we can win the game. Gina

We can't get any projects to use the NFRC CMA approach, they all use default performance

Mandatory backstops cause problems without saving any energy - fine for "standard" products, but there is a diverse range of special applications that can be problems. Fire, structural, etc.

Is there a consider if fenestration area is 40% or more of the gross above-grade wall area, the analysis must account for an additional solar heat gain coefficient. Currently New York has this requirement.

I support looking at a mandatory minimum for nonres fenestration.

What performance tradeoff is so undesirable that it's motivating mandatory values for windows?

Please provide feedback and suggestions on the methodology and assumptions for energy savings estimates for this proposal.

Focus on the alterations item which could have significant energy savings; don't waste time on the mandatory item.

Were the cost provided by Nippon glass center of glass? If the assumption is whole assembly the cost should be much higher.

Agree with comment just provided. Gina

Please provide feedback and suggestions on the methodology and assumptions for energy savings estimates for this proposal.

increasing the r value on the CI by 1 or 2 would be WAY more impactful than increasing the batt insulation by 1 or 2

You are basically removing the Performance method as an option for cavity insulation

How will this affect use of alternative assemblies such as Bamcore, Straw bale, etc.? Gina

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Will the insulation levels for wall exceptions, like extended walls and existing siding remain the same for additions? i.e. 2x4-R-15 and 2x6-R-21

YES! u factor is lowered much faster with better CI

Some of those energy savings seem very low.

Ahh, if you really want to regulate the U-factor, stay away from talking

Please provide feedback and suggestions on the market readiness and technical feasibility of this proposal.

No no no! You are cutting dense-pack cellulose out of the market, but this is the best insulation for QII and for carbon storage!

Dense pack cellulose is max R13 and R20

labor may not increase, but material costs would

I don't understand how this helps with QII? Batt is batt and always has install issues. Gina

This removes all performance options that make sense to the builders. No trades offs any longer without using foam

Make this prescriptive if you really want it, not mandatory

Please explore granting automatic QII to dense-pack cellulose, since installation is so much better by default than batts

Why the obsession with Mandatory in these presentations?

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For Builders UValue does not help them on the performance path and when they are speaking to product manufacturers- this is why R value is so important

Ahh, if you really want to regulate the U-factor, stay away from talking about R21/20, this makes people think you are banning cellulose and requiring HD batts

Please share any additional questions, comments and feedback.

It is important to understand that mandatory minimums often get inspected independently of the approved performance or prescriptive design. Be careful of unintended consequences.

it's baffling that the commonly used exterior insulation is the same material used for at least the last 4 code cycles. Why has there been no increase to the performance on this?

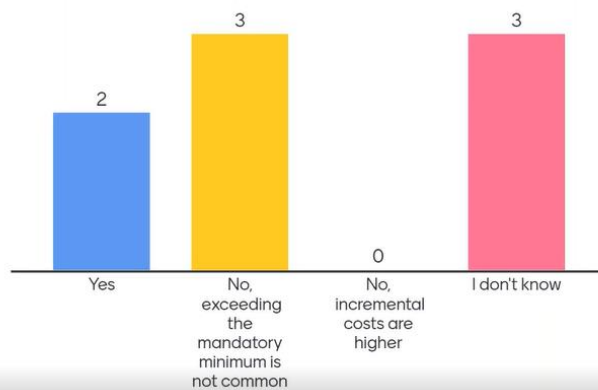
Exterior rigid CI has high GWP that is counter to carbon goals. Please reevaluate this including the high GWP

not all rigids have high GWP

Look at ways to expand cellulose market share, for QII and carbon storage benefit. This proposal basically bans cellulose

if you want to make a change, it should be in assembly U-value, NOT specified R-value.

Does this depiction of insulation in the multifamily construction market seem accurate?



Opaque Assemblies, Multifamily, Avani Goyal, TRC

Any Questions? Please share any additional questions, comments and feedback.

CEC seems to opt to "aim low" and see what happens, rather than "aim high" and work their way backwards. The best energy is saved energy. Make a better envelope, and active measures wont be as stringent

I'm uncertain as the to benefit of increasing mandatory insulation requirements for Multifamily. Are you sure this is appropriate for ALL cases? I've seen projects ask for exotic assemblies behind electrical panels and other unintended stuff.

Please provide feedback on the proposals to improve opaque assembly thermal resistance.

shooting too high is the only way to enact changes to higher performance options on the envelope- otherwise people go to lowest common denominator

wear layers.. you can always take some off

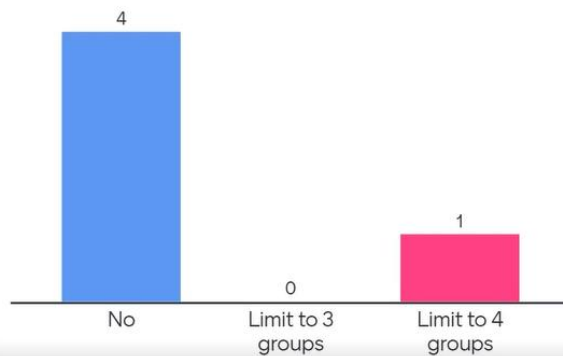
Shoot as high as you want on Prescriptive

The challenge is that you have not considered the increase in cost of insulation attachments for mass walls when no insulation was required before.

Please explain why the focus on Mandatories, which don't result in TDV savings, only restrict compliance options

trade-offs necessitate mandatory measures.

Do we need to reduce the prescriptive requirements for mass walls and wood-framed walls by grouping climate zones?



Please provide feedback and suggestions on the market readiness and technical feasibility of this proposal.

It's important to consider the costs of attachments for these provisions especially where no insulation was required.

Thicker insulation takes up more space in a push for smaller interior spaces to be more energy efficient, this makes meeting this requirements much more difficult. Especially in California where cost per sq ft is huge.

I have some clients who are very concerned with rigid insulation on multifamily walls due to fire fears, just so you know (I think it is needed). Gina

Why have 16 climate zones if you want the same U-values across all of them. There should be 16 U-values, the most cost effective for each zone. Otherwise, consolidate climate zones or simply use IBC/IRC/IECC

Adding R2 to current prescriptive standards seems arbitrary. In some cases it could be a big cost difference and in others it may not

fire concerns on some insulations, Gine.. not all

The thickness option is a non-starter. there are plenty of insulation options that have higher performance at the same thickness- and thinner actually

Each CZ proposal should be considered in terms of the precise wall assembly (cavity and CI combination). Walls are complex and must provide waterproofing and

Please provide feedback and suggestions on the methodology and assumptions for energy savings estimates for this proposal.

Costs should be adjusted for each climate zone, corresponding to price differentials by region

many material manufacturers have costs that transcend most climate zones

might be different costs from southern to northern california, but you wont find 16 different costs

It would be helpful to get actual bids rather than using RS Means and retail material costs

Contractor interviews are different from contractor bids

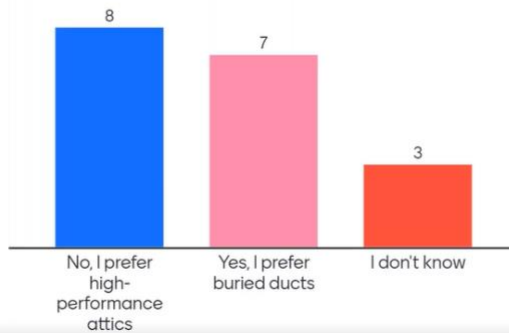
Please share any additional questions, comments and feedback. (Add contact info if you want to be contacted)

Great job presenting.. keep shooting high

Buried Ducts and Cathedral Ceilings, Single Family, Simon Pallin, Frontier Energy

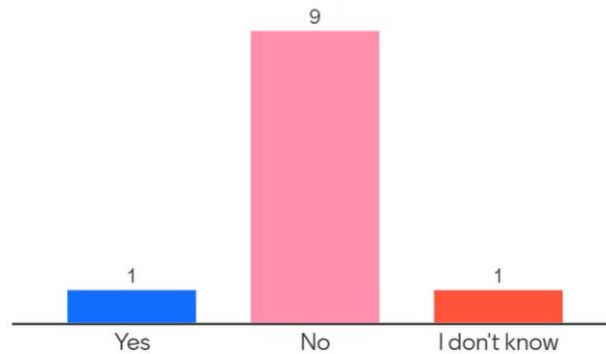
If an equivalent path with buried ducts were added to the code, would you prefer this to a high-performance attic with roof deck insulation?

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Are you supportive of a proposal that increases stringency in climate zones 1-3 and 5-7?

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Please provide feedback and suggestions on the market readiness and technical feasibility of this proposal.

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There will be extra costs, and additional HERS measures, but I like it.
Gina

Oops, I thought I was responding to buried ducts! Gina

Will this require some redesign of attics and roofs? Raised heel truss to accommodate that amount of insulation?

In my experience there is no duct design in advance of the day the installer arrives

Might help inspection and verification to leave a section of duct near attic hatch unburied

If ACCA Manuals are not being used, that is a compliance problem that CASE can address

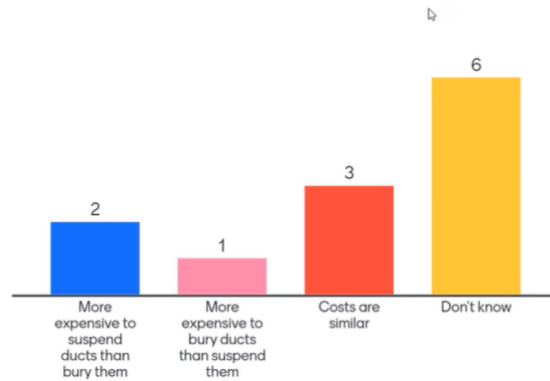
Buried ducts, and deeply buried ducts, are viable options. Conflating duct size limits with insulation presents challenges to coordinate with HVAC designers

This is a creative proposal with good potential!

If the CZ3 Option B requirement is "N/A" then what do you mean by

What is the cost difference between suspending ducts in an attic and burying them? Don't consider the cost of insulation

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Please provide feedback and suggestions on the methodology and assumptions for energy savings estimates for this proposal.

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(No responses were provided for the above)

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Surprising that more insulation needed in mild CZs

Why R-50 in the mild CZ's? Gina

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Please share any additional questions, comments and feedback.

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I support looking at a prescriptive path for cathedral ceilings.

Prescriptive options for cathedral ceilings is a good thing.

would complete cathedral ceilings automatically result in credit for ducts in conditioned space (since there's no default attic into which the Standard Design ducts can go)?

Would standard design with cathedral ceiling models equal proposed U factor from this CASE report or stay as is (eg R38+19)?

Are there any other market or technical barriers to the proposed changes that we need to investigate further?



Moisture issues are real in low-slope, but are more critical for re-roofing versus new construction.

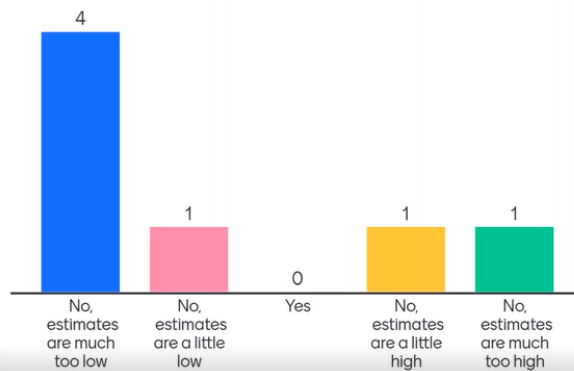
The limitation on the choice for colors will be very significant on certain types of roof coverings. This should be further researched.

If the roof complies with R806.5 or equiv. CBC, then there are no moisture issues with white roofs

Many local Planning departments don't allow white roofs

What typical meteorological years (TMY) are used for the energy saving estimates? There was discussion during a Staff Workshop in 2022 about changing from 1998-2017 to 2000-2020. Was that change made?

Do the presented cost estimates seem reasonable?



Please share any additional questions, comments and feedback.



Are cool roofs labeled for inspection that correct product installed?

What technical challenges have you faced complying with the existing QII requirement in multifamily buildings, if any?

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Requirement for insulated headers is overly rigid, disallows many equivalent options

insulated headers are required only if entire exterior wall insulation value is not at least R-2 (see RA language), most wood framed assemblies would be at least R2

ah stack effect within high rise wall assemblies, that's plausible

Checklist approach to air sealing is not as good as blower door test

Why not extend low-rise multifamily compartmentalization requirements to high-rise multifamily?

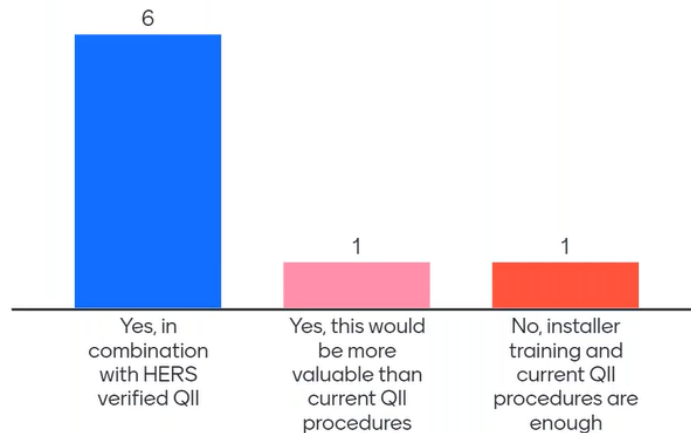
Blower door should be done before insulation, in order to fix leaks while they are still accessible

Long build times mean they are building in phases. Installer awareness of QII and how it is tied to Balanced Ventilation requirements for Blower Door Testing if Balanced is not used insulated Headers do not make sense.

CRC requires fire blocking every 10', how do you get a stack effect inside wall extending 2 stories?

Would requiring insulation installers to undergo QII training increase insulation installation quality?

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How could we time Snapshot QII visits so the building is in the right phase of construction to verify air sealing and insulation quality?

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Require that the HERS rater be identified when registering the LMCC forms

requirements for at least each stage for each floor of the building. Count of dwelling units as Separators for requirements.

Please provide feedback and suggestions on the methodology and assumptions for energy savings estimates for this proposal.

when lowrise market went through this shift, the installers absolutely charged an increase fee for labor and air sealing material. Its assumed that its no cost NOW because it is normal to use in SFD

If you are going to require contractor training, you have to add that cost.

Nice to have snapshot qii as option for low-rise MF but at compliance penalty

How could we time Snapshot QII visits so the building is in the right phase of construction to verify air sealing and insulation quality?

(No responses provided but the meeting was running over time and not much time was allotted for answering this question; moderator referred attendees to [Title24stakeholders.com](https://www.title24.com) for more information)