Meeting Notes

Posted June 2023

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

Single Family Buried Ducts & High Performance Windows, Multifamily Envelope, and Indoor Air Quality

Meeting Information

Meeting Date: 5/17/2023
Meeting Time: 8:30 am – 11:15 am
Meeting Host: California Statewide Utility Codes and Standards Enhancement Team

Meeting Agenda

Time	Topic	Presenter
8:30 AM	Welcome and Introduction	Nikki Westfall, Energy Solutions Javier Perez, PG&E Kelly Cunningham, PG&E
8:50 AM	Single Family Buried Ducts	Simon Pallin, Frontier Energy
9:20 AM	Single Family High Performance Windows	Simon Pallin, Frontier Energy
9:50 AM	Multifamily Envelope	Avani Goyal, TRC
10:20 AM	Single Family and Multifamily Indoor Air Quality (IAQ)	Marian Goebes, TRC & Dave Springer, Frontier Energy
11:05 AM	Conclusion / Wrap-Up	Nikki Westfall, Energy Solutions
11:15 AM	Adjourn	

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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

This proposal for Single Family Buried Ducts & High Performance Windows, Multifamily Envelope, and Indoor Air Quality is important because:

Single Family Buried Ducts

- Burying ducts in attic insulation is a low-impact, cost-effective way to increase building efficiency in Climate Zones (CZs) 1-3, 5-7, and 16, where prescriptive attic and duct insulation requirements have not been upgraded for three code cycles.
- Only 11 CF3Rs were identified for buried ducts in the CalCERTS 2022 registry which illustrates that there are barriers to their use.
- The proposed change to prescriptive standards reduces barriers to buried ducts by introducing simpler modeling and verification alternatives than those required under the existing detailed buried duct compliance path.
- Existing effective R-values listed in the Residential ACM Manual tables have been re-evaluated and are significantly improved.
- The mandatory requirement for R-4 roof deck insulation in Climate Zones 4 and 8-15 is exempted if ducts are buried.

Single Family High Performance Windows

- The proposal locks in passive energy saving, reduces heating/cooling loads and provides better indoor thermal comfort.

Multifamily Envelope

- Encourages energy savings, reduces heating/cooling loads and streamlines the prescriptive requirements across different multifamily building sizes.

Single Family and Multifamily Indoor Air Quality

- At the request of Energy Commission staff, requirements for accessibility and fault detection devices (FDDs) that have resided in the ACM Manual for several code cycles are being moved to the Energy Standards to increase their visibility.
- Access requirements for replacement and cleaning apply to filters and outdoor air intakes of supply and balanced ventilation systems. Access to filters is proposed to be mandatory in single and multifamily. Access to outdoor air intakes would be mandatory in single family and prescriptive in multifamily (due to challenges in finding locations for them.) This measure facilitates cleaning and reduces risk.
- FDDs are prescriptively required for balanced systems to ensure persistence of system operation. If not installed, the fan efficacy and sensible recovery efficiency are degraded by 10% by the compliance model. About 99% of both SF and MF use performance path based on CalCERTS data.

- To address compartmentalization, a proposed mandatory measure for 2025 would prohibit exhaust ventilation for whole dwelling unit ventilation in new multifamily buildings.
- A proposed change to prescriptive standards would require HRVs or ERVs in new multifamily units in Climate Zones 1, 2, 3, 11 -14, and 16 but would still allow supply ventilation for performance-based compliance.
- Several stakeholders commented that the IAQ filter accessibility requirement needed to be revised for clarify and to accommodate more locations.
- A few stakeholders pushed back on the requirement an accessible Outdoor Air intake in multifamily units, noting this should be in the California Mechanical Code (Title 24 Part 4), not Energy Code (Title 24 Part 6).

Stakeholder Feedback Impacting Proposals

CASE Teams rely on feedback from stakeholders to create the best proposals possible. Since Round 1, stakeholder input has impacted this proposal in these ways:

Single Family Buried Ducts

As a result of feedback from the first meeting, the team made changes to the proposed measure as outlined below.

Original proposal had:

- Buried ducts would become a prescriptive alternative to roof deck insulation (Option B) in CZ 4 and 8-16
- Prescriptive requirement in CA 1-3 and 5-7.

Current proposal now includes:

- Prescriptive requirement in CZ 1-3, 5-7 and 16
- Small home exception for buried ducts
- Standardized on R-6 ducts and R-49 (or greater) ceiling insulation to simplify compliance and verification
- Mandatory requirement for R-4 roof deck insulation would be eliminated when buried ducts are installed in CZ 4 and 8-15 (radiant barrier required).

Single Family High Performance Windows

- The previously proposed U-factor requirements of 0.25 in CZs 1 and 16 were removed due to feedback from trade associations and window manufacturers about following Energy Star version 7 SHGC requirements, and concern about having two different requirements across the State, and the low density of areas affected in CA, the proposed requirement is to lower it from .30 to .28 across all CZs.
- Due to industry confusion about how to handle higher SHGC in some CZs and lower SGGC in others; and no areas of overlap. The previously proposed introduction of a SHGC minimum was withdrawn.

Multifamily Envelope

As a result of feedback from the first meeting, the team made changes to the proposed measure as outlined below.

- For high performance windows measure, the U factor change from 0.3 to 0.28 was kept as is, however, the RSHGC requirements were changed in response to the stakeholder feedback.
- The CASE Team earlier proposed minimum RSHGC requirements in heating dominated CZs1,3,5,16 of 0.35. The revised proposal for RSHGC requirements is to stay at "NR" (no requirement) for three habitable stories or less and remove the current prescriptive maximum requirements in four habitable stories or more. This helps streamline the requirements across both categories and ensures flexibility to designers.

Single Family and Multifamily Indoor Air Quality

As a result of feedback collected during stakeholder interviews and email communications, the team made changes to the proposed measure as outlined below.

- The compartmentalization aspect of the proposal was rolled back from 0.2 cfm50/sf to 0.3 cfm50/sf, to make it more feasible, especially for affordable housing developers.
- The proposal for an accessible outdoor air intake in multifamily dwellings was changed from mandatory to prescriptive due to stakeholder comments that this measure was not feasible unless units have balconies.

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. **Mentimeter Polls & Responses:** This section includes public comments and questions, including screen shots of the polls that were conducted during the meeting, and responses to those polls.

Due to time limitations, not all written questions and comments were discussed during the meeting but all have responses available in these meeting notes.

In-Meeting Questions / Comments

Single Family Buried Ducts

1. **Question submitted via GoTo Webinar asked verbally during meeting: What happens to insulation requirements when ducts are not in the attic?**
    a. **CASE Team Response (Simon Pallin):** If ducts are in conditioned space, you'd prescriptively comply with Option C and depending on which CZ, you'd have traditional vented attic requirements. The prescriptive requirement sets the standard which can be met using the performance path and any combination of measures. In a case where ducts are neither in the attic nor in the conditioned space, such as a crawl space, there is no prescriptive path in place.

2. **Question submitted via GoTo Webinar asked verbally during meeting: Will a duct buried now still be buried years from now?**
    a. **CASE Team Response (Simon Pallin):** Yes, they'll likely be buried over the lifetime of the system but even if not, there's significant benefit from their being partially covered. When insulating with cellulose the settled depth, not the depth at the time of application, should be considered.

3. **Question submitted via GoTo Webinar asked verbally during meeting: Do I have to lay ducts on drywall to meet requirements?**
    a. **CASE Team Response (Simon Pallin):** No, ducts can also rest on the joists or lower framing members of the trusses. We do see a great benefit of having ducts rest on the ceiling drywall so if possible, that should be your goal. The effective duct R-value increases when ducts are closer to the ceiling where they can exchange more heat with the indoor environment.

4. **Question submitted via GoTo Webinar asked verbally during meeting: Will QII of attic ins be required?**
    a. **CASE Team Response (Simon Pallin):** No, but credit can still be taken if a QII verification is performed. Verifying that ducts are fully covered would be required, which in effect confirms that the depth of the insulation is correct if the outside diameter of the largest duct corresponds to the depth of insulation required to achieve at least R-49 (R-60 in CZ 16).

5. **Verbal question by Marina Blanco, Able Energy: What about ducts in unconditioned crawlspace that don't apply for Option C?**
    a. **CASE Team Response (Simon Pallin):** The CASE team did not include crawlspace ducts as part of this measure. The prescriptive requirement for buried ducts sets the bar for performance. Compliance software can be used to model ducts in vented or sealed and insulated crawlspaces and that design approach may or may not achieve compliance.

Single Family High Performance Windows

1. **Question submitted via GoTo Webinar asked verbally during meeting: The vast majority of window manufacturers do have double pane options that meet .25 - it is simply wrong to state to the contrary.**
    a. **CASE Team Response (Simon Pallin):** Some window manufacturers say yes they can achieve it with double glazing and some say they cannot. The majority of window manufacturers can install .25 with double glazing; it does affect the cost also, so that's the main reason we aren't requiring .25 in all climate zones(CZs).

2. **Question submitted via GoTo Webinar asked verbally during meeting: Would your proposal be inconsistent with Energy Star in parts of CA? .28 is higher than EStar .25 in some CZs.**
    a. **CASE Team Response (Simon Pallin):** We're talking about two less populated CZs that are affected so based on our research, Most areas of CA would fall under CZ where .28 is required based on Energy Star's climate map.

3. **Verbal question asked by Kimberly Llewellyn, Mitsubishi Electric: How about entertaining more passive solar design requirements? We are requiring more and more from our mechanical equipment and designs. For the very reasons mentioned, balancing gains and losses in heating/cooling seasons is difficult to achieve by just focusing on static window specs. It is difficult to balance heating and cooling and peak loads just using static window specification. The loads originate with the building envelope for the most part. Have you considered raising the bar architecturally via architectural requirements to include passive solar design?**
    a. **CASE Team Response (Simon Pallin):** We don't want to over-complicate the code, but if we need to, then we should. Right now we feel we need to better understand how we can control solar heat gain coefficient; how it's affected by orientation of the building. We have the code in place for shading – could we revise or add to the code to better control SHGC? We're still looking at this. There is an ASHRAE Standard is being developed now that might be referenced.

Multifamily Envelope

1. **Are you also considering a +/- range for installed U factor compared to the CF1R? That would be helpful to smooth compliance and remove the need to redo CF1R forms after submittal over minor U factor differences.**
    a. **CASE Team Response (Avani Goyal):** No, there is no range for U-factor allowed for installed vs. compliance document.

2. **Question submitted via GoTo Webinar asked verbally during meeting: Has lowering the SHGC requirement in multifamily common use areas taken additional lighting energy into account for cost effectiveness?**
    a. **CASE Team Response (Avani Goyal):** In our performance models, the lower SHGCs do not affect VT and hence the lighting energy. The proposal is mainly to go away from lower SHGCs in certain CZs.
    b. **CASE Team Response (Michael Mutmansky, TRC) added:** we do not factor in lighting energy in GHCS changes, because the models we use don't include core common areas in buildings in the same way. So we don't factor that aspect in. In RES lighting, there isn't a lighting requirement that this would be impacted by, other than by how people turn lights on and off. The question only applies to larger, common areas in buildings. The models aren't sophisticated and detailed enough to do that kind of modeling.
3. **Question submitted via GoTo Webinar question pane and discussed during meeting: What were the B/C ratios for the climate zones where the U-factor was not found to be cost-effective (i.e. how close to 1 were they)? Is the analysis for those climate zones available?**
    a. **CASE Team Response (Avani Goyal):** Full results are in the case report on T24 website; not many of the CZs that were not cost effective were close to 1. We did not propose a change in them.

Single Family and Multifamily Indoor Air Quality

1. **Question submitted via GoTo Webinar asked verbally during meeting: Does accessible mean readily accessible and does not require a ladder to access the filter?**
    a. **CASE Team Response (Marian Goebes):** Based on our read of the Definition of accessible, it could be reached by a ladder. We will add language to state that the IAQ filter could be in an accessible location or behind an access panel or grille that is no more than 12 ft above a walking surface (which we deem reachable by a ladder).
2. **Question submitted via GoTo Webinar asked verbally during meeting: Why is higher efficiency recovery for H/ERV's not rewarded?**
    a. **CASE Team response (Marion Goebes):** It is rewarded if an FID is provided. We wanted to encourage inclusion of FID and to ensure that there is awareness if the system isn't working as it should.
3. **Comment submitted anonymously via Menti poll that asked "*What comments do you have on the proposed requirements for IAQ System Accessibility and FID?*": Not**

sure why the energy code has to dictate the location of inlets and outlets? This is something the mechanical code should be addressing.

a. **CASE Team response (Marion Goebes):** We have some references to the mechanical code. We can discuss this with the energy commission to see if it's best located here or mechanical code.

4. **Question submitted anonymously via Menti poll that asked "*What comments do you have on the proposed* requirements *for IAQ System Accessibility and FID*?": So requirements for FID are unchanged or slightly relaxed but simply moved from ACM to codes?**

   a. **CASE Team Response (Marian Goebes):** That's correct. But if you're in the small minority that uses prescriptive requirement, you would have to use the FID requirements.

5. **Question submitted via GoTo Webinar question pane and discussed during meeting: This needs to be more flexible. I put my HRV's in deep coat closets so that they are behind hanging bars.**

   a. **CASE Team response (Marion Goebes):** I believe it would be accessible if behind the coats. This should be accommodated with the proposed language that IAQ filters may be located in conditioned space, or behind access panels or grilles no more than 12 feet above a walking surface.

6. **Question submitted via GoTo Webinar question pane and discussed during meeting: Brennan Less (bdless@lbl.gov). I question why supply ventilation is allowed and not exhaust ventilation? I think that is a mistake. Exhaust fans use the least energy, are the most reliable, are the least expensive (upfront and operationally), are the easiest to measure/commission pre-occupancy, they distribute outside air throughout dwelling, and the building envelope provides filtration of incoming air. We need to know on what evidence this addition of supply fans and rejection of exhaust fans is based. I would also comment that the proposed 0.3 cfm50/ft2 is not tight enough. ASHRAE 62.2 requires 0.2 cfm50/ft2. The airtightness (not the ventilation type) is the determining factor impacting cross-contamination between units, uncontrolled airflows and variability in airflow and contaminants between units. Thank you very much for your good work and attention to my comments.**

   a. **CASE Team response (Marion Goebes):** The purpose of requiring balanced or supply-only ventilation is to ensure that all MF units receive outdoor air at the code required minimum rates. In terms of evidence, please see section 2.2.2 in the Draft CASE Report https://title24stakeholders.com/wp-content/uploads/2023/05/2025_T24_CASE-Report_MF-IAQ-DRAFT.pdf. We provide an explanation starting on p. 37. In short, the average rate of outdoor air delivered to MF units is 31 cfm, and some units receive less than 20 cfm, which is lower than the 38 to 60 cfm required by code (depending on number of bedrooms and sq footage

7. **Comment submitted anonymously via Menti poll that asked "*What comments do you have on the proposed requirements for IAQ System Accessibility and FID*?": You need to specify NOISE minimums. Low qualify HRVs have been installed in early PH Projects here in CA and were turned off due to noise.**
    a. **CASE Team response (Marion Goebes):** It's too late to include noise requirements for HRV but we could include in compliance manual.

8. **Question submitted anonymously via Menti poll that asked "*What comments do you have on the* proposed *requirements for IAQ System Accessibility and FID*?": Can you please reprise the proposed mandatory requirements for balanced ventilation or HRV in single family homes in some CZs?**
    a. **CASE Team response (Marion Goebes):** The reason for not in SF homes is because if you run it continuously, the makeup air is coming from outdoors. In multifamily buildings it's a mix of outdoor air and air from neighbors. That's why we're requiring it only for SF homes.

Wrap-Up

- All Draft CASE Reports will be posted through June at title24stakeholders.com
- Meeting adjourned at 11:07 AM PST

Questions / Comments Submitted Via GoTo Webinar

The questions and comments below are provided as-submitted in the GoTo Webinar Question pane. Responses provided by CASE Team support team. In addition, some of these questions were verbally discussed during the meeting and are captured in the In-Meeting Questions / Comments section above.

Single Family Buried Ducts		
Question Asked	**Response**	**Responder**
Will it still be a requirement to have a consistent level of insulation throughout the attic (based on worse case duct size) vs. mounding over larger duct sizes?	Mounding will continue to not be allowed and a consistent level of insulation will still be required.	Alea German
What about alterations? How would this apply?	The prescriptive requirements do not apply to alterations. As part of the proposal a credit for buried ducts will be made available for alterations though.	Alea German
What happens to the insulation requirements when the ducts are not in the attic?	In a case where ducts are neither in the attic nor in the conditioned space, such as a crawl space, there is no prescriptive path in place.	Simon Pallin
When and where are the slides going to be available? Thanks!	The slides are available in the GoTo Webinar Pane in Handouts. And also available here: https://title24stakeholders.com/event/sin	Cosimina Panetti

Single Family Buried Ducts		
Question Asked	**Response**	**Responder**
	gle-family-buried-ducts-high-performance-windows-and-multifamily-envelope-utility-sponsored-stakeholder-meeting/	
Should be minimal access but Homeowners often use attic for storage	Thank you for this comment. This is a concern with all vented attics where insulation needs to cover the entire ceiling area.	Alea German
Thicker duct insulation requires thicker ceiling depth which is often a challenge for designs due to constraints set by ZONING height limits for buildings. Our building codes don't connect and this makes for sub-optimal outcomes all around.	Thank you for this comment. The prescriptive duct insulation requirement for buried duct is R-6. Except for low-slope roofs, the prescriptive requirements for R-49 (or R-60 in Climate Zone 16) would not ordinarily require larger attics or higher roof lines.	Alea German, David Springer
I agree with earlier poll response that new construction should be encouraged to have insulated roof decking. Keep the gain out of the attic to begin with.	Thank you for your comment. Roof insulation will remain an option in the performance approach for these climate zones. Thank you for your input, Kimberly.	Alea German, Claudia Pingatore
Will there be an exception when the attic cannot accommodate the R-49 or R-60 insulation?	Thanks for bringing this up. Let's talk after the meeting further about what these situations may look like and whether it makes sense to add anything. There are no exceptions planned for this at the moment, for example if the roof slope is too low.	Alea German
Buried duct design is a 'nice in modeling' but impractical in most real building design scenario's. Most roof designs simply don't allow ducts to reach all rooms easily.	Thanks for the comment. Trade-offs via the performance approach will of course still be allowed, including other strategies to minimize duct losses by locating ducts in conditioned space or by installing roof deck insulation. We'll reach out to you to discuss your concerns further.	Alea German

Single Family High Performance Windows and Multifamily Envelope		
Question Asked	**Response**	**Responder**
If code will require that installed SHGC match CF1R, PLEASE change ACM baseline to match proposed. The project should not get credit or penalty because an aribitrary SHGC number is dictated by the ACM.	Thanks for your comment. The current proposal is to keep the ACM SHGC values as they are today. 0.23 in CZs 2,4,6-15 and 0.35 in CZs 1,3,5,16.	Alea German

Single Family High Performance Windows and Multifamily Envelope		
Question Asked	**Response**	**Responder**
Where did the information on 0.25 requiring triple pane come from? This is not correct. Double pane can achieve this.	Yes, many manufactures can provide a double glazed window at a 0.25 U-factor, though such will increase costs.	Simon Pallin
As a benchmark, the windows in most Californian Passive House projects are 0.3 u-factor.	Thanks for this comment.	Alea German
Please verify if this only applies to windows and not skylights or glazed doors.	The U-factor change applies to all fenestration products, including skylights and glazed doors. But, the existing exceptions for skylights would remain.	Alea German
BTW, the 0.3 windows in Californian Passivhaus buildings are triple pane.	Thank you for this comment.	Alea German
You have to look at the SHGC changes in conjuction with exterior shading.	Absolutely. These trade-offs can be accomodated in the performance model.	Alea German
Shading analysis is CRITICAL to look at in connection to window SHGC. Plus the option for building cross-ventilation (which isn't part of the energy code.)	Thank you and we agree. The trade-offs between shading and SHGC can be accommodated in the performance model, but designs that encourage natural ventilation is not.	Alea German
Is the current revised proposal potentially reviewable to take back to prior proposal. To have climate zones in California worse than Energy Star is stunning response to what was clearly already debated with Energy Star discussion and the obejctions dealt with and resolved. For California to be actually "worse" than Energy Star will be a major step backward across the country as much of the country looks to California for leadership on these types of issues. Is it settled or can it be reconsidered?	Thank you for your comments. All measures under the 2025 code cycle are still a work in progress and nothing is “settled” at this stage of the code cycle.	Simon Pallin
I'd suggest a +/- 0.05 SHGC be allowed because the labels often have slight differences from what is listed on nfrc.org and manufacturer websites and this is a de minimis difference on energy use	Thanks for this comment. The current proposal is +/- 0.01, but we are still dialing this in and would like to hear feedback on what is most appropriate. We will follow-up with you off-line.	Alea German
My feedback was not captured in the summary of feedback received. I'll send in additional comments, but I'm disappointed that this proposal stops short of U-values that are readily available and technically feasible.	Increased stringency must be justified in multiple ways. Cost-effectiveness is a key component and for U-factors below 0.28, the models start indicating negative savings in some California climates. However, proposed U-factor requirement is still under evaluation.	Simon Pallin

Single Family High Performance Windows and Multifamily Envelope		
Question Asked	**Response**	**Responder**
The vast majority of window manufacturers do have double pane options that meet .25. That is simply wrong to state to the contrary.	Thank you for your comment. In this case, it's a matter of cost, not market readiness.	Simon Pallin
FYI: U-0.25 absolutely can be achieved in double-glazing, but it requires a 4th surface low-e coating (which in rare instances poses a condensation risk). U-0.28 is an appropriate incremental improvement. Additionally, excellent decision regarding no SHGC minimum. No need to reply. Thanks!	Thank you for your comment.	Alea German
What is the square footage of windows in the 2100/2700 SF prototype?	420 ft2 for 2100 prototype, 540 ft2 for 2700	Pingatore Claudia
How about entertaining more passive solar design requirements? We are requiring more and more from our mechanical equipment and designs. For the very reasons mentioned, balancing gains and losses in heating/cooling seasons is difficult to achieve by just focusing on static window specs.	Thank you for this comment and raising your hand to discuss this!	Alea German
Have required fire rated windows been reviewed when analyzing lowering the maximum U-factor down to 0.40? Is there enough product available to meet that maximum U-factor requirement? (Understanding that area weighting is an option)	This has not come up as an issue, particularly as you point out that there is an option for area weighting. But this is a good point and the team will look into this.	Alea German
Window costs are largely driven by the function of the unit, plus the number and type of glazed doors designed on a home. How does the CASE 'cost effectiveness' analysis take this into consideration?	We use a cost model based on a standard double hung 15 square foot window.	Simon Pallin
This question is meaningless without an example. (Hard to guess this on the fly.)	Thank you for your feedback	Simon Pallin
this measure is about all fenestration not just windows	Correct. Glazed doors and skylights are included if not specifically exempt.	Simon Pallin
Energy star is aspirational and not intended to be code	Thank you for your comment	Simon Pallin

Single Family High Performance Windows and Multifamily Envelope		
Question Asked	**Response**	**Responder**
The message Caifornia is sending to the market by excluding two small climate zones below Energy Star is extremely damaging in message it sends to the marketplace. hy would a high perfomance widnow company ever invest in California any time or effort to offer better products. The mainstream industry is likely stunned at teh free pass they are getting.	(Assuming the comment is related to the U-factor requirement) What is on the table is a potential change of the prescriptive window U-factor requirement. The prescriptive path serves as the baseline for which buildings are compared to when taking the performance path (most common, >99%). As long as proven compliant, anyone is free to install windows with a lower U-factor than what is prescriptively required.	Simon Pallin
Are you also considering a +/- range for installed U factor compared to the CF1R? That would be helpful to smooth compliance and remove the need to redo CF1R forms after submittal over minor U factor differences.	Thank you for this suggestion. This is an interesting idea that hasn't been considered. We will discuss further and consider the implications.	Alea German
This is a really important discussion. The standard building models used for these simulations vary significantly from what gets built in the real world.	Thanks for your feedback. We will follow up with you on this comment.	Simon Pallin
Thank you for the flexibility.	Appreciate the feedback support.	Avani Goyal
Single Family and Multifamily Indoor Air Quality (IAQ)		
Special circumstances are the proximity of neighboring buildings. (Shadows)	Thank you for your input on these questions.	Daniel Simpson
Btw, PHPP is able to calculate this. :)	Thank you for your input.	Daniel Simpson
Why is higher effeciency recovery for H/ERV's not rewarded?	See response to this question in the “In-Meeting Questions /Comments” section above.	
This needs more flexibility in the requirements for 'accessiblity' of the outdoor air intake. Pre-filters for outdoor air intake can be installed interior of outdoor grille, so can be attic accessible.	Thank you for your comment. This is a good point about pre-filters, particularly given the existing requirement for MERV 13 filters. Pre-filters can reduce the frequency for replacing MERV 13 filters. The proposed requirement for filter accessibility language applies to pre-filters, and includes accessible attics, behind access panels and grilles that are within 12 ft of a walking surface.	Marian Goebes
Manufacturers need a step code with defined targets to tell them where we are going in future codes... (BC Step Code does this.)	Thank you for this comment. This is a good consideration for future code cycles.	Marian Goebes

Single Family High Performance Windows and Multifamily Envelope		
Question Asked	**Response**	**Responder**
This needs to be more flexible. I put my HRV's in deep coat closets so that they are behind hanging bars.	See response to this question in the “In-Meeting Questions /Comments” section above.	
NOISE!!!!	The Statewide CASE Team is not proposing any additional noise limits for ventilation equipment in this cycle. If this is a concern, we could propose adding such a requirement in future cycles. Note that the Standard already provides noise limits for local exhaust fans.	Marian Goebes
Yes - behind the coats.	See response to this question in the “In-Meeting Questions /Comments” section above.	
Thank you for removing exhaust only ventilation. (Should also be done for SfH's)	Thank you for your comment. We are not proposing to remove exhaust-only ventilation in single-family homes, because all make-up air should come from the outdoors (except for a small portion that likely infiltrates from the garage). In contrast, in multifamily units, exhaust-only ventilation draws a mix of outdoor air, corridor air, and neighboring units’ air, so some MF units do not receive the required code minimum of outdoor air.	Marian Goebes
Come and visit my Passive House projects to see accesible HRV's and outdoor intake any time. [bronwyn@passivehousebb.com]	Thank you for your offer. Please let me know if you have any Passive House projects under construction (preferably pre-drywall phase) in the Bay Area.	Marian Goebes
Thanks to the CASE teams for doing this work.	Thank you for participating!	CASE team
Has lowering the SHGC requirement in multifamily common use areas taken additional lighting energy into account for cost effectiveness?	To clarify, the SHGC requirement is not being lowered so we haven’t looked at the lighting energy. Because of the nature of the lighting requirements for dwelling units (mandatory, rather than prescriptive) ,To clarify, the SHGC requirement is not being lowered so we haven’t looked at the lighting energy. Because of the nature of the lighting requirements for dwelling units (mandatory, rather than prescriptive) we did not look at lighting energy.	Daniel Simpson, David Douglass-Jaimes

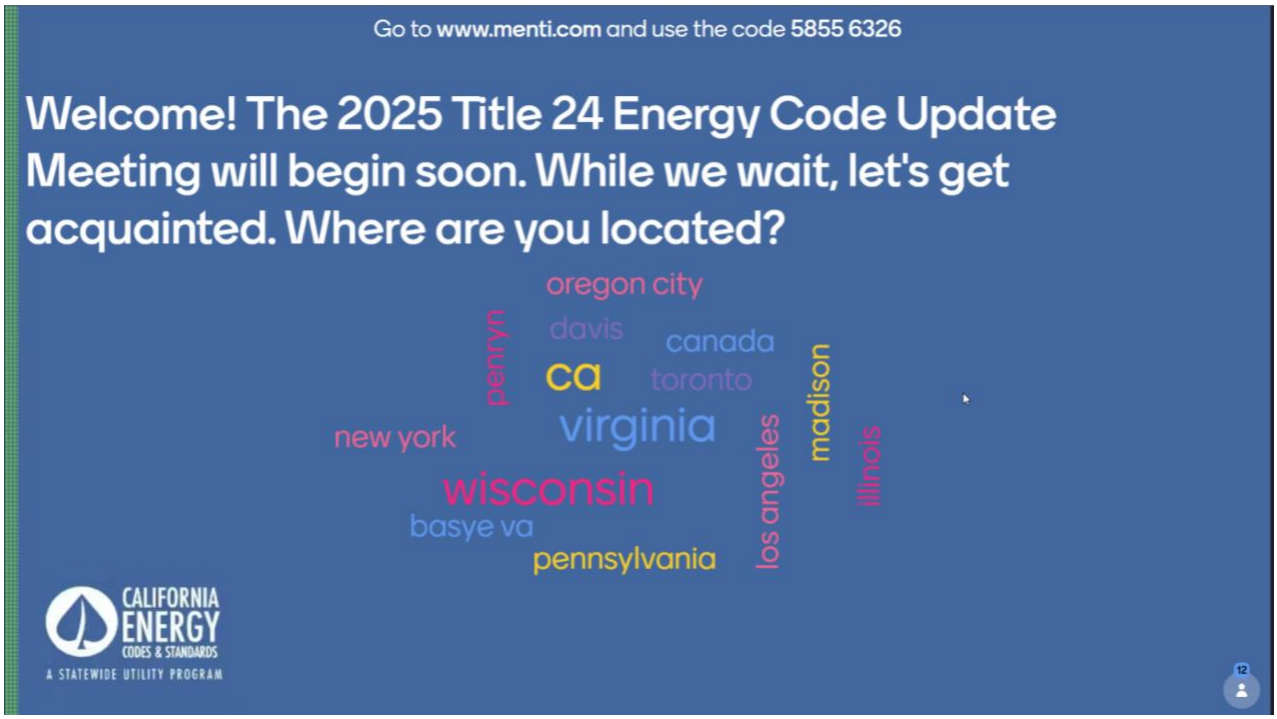
Single Family High Performance Windows and Multifamily Envelope		
Question Asked	**Response**	**Responder**
My "not sure" means that the question is outside of my area of expertise. You might want to provide a "not my area of expertise" option in the polls.	Thank you for this suggestion. We will consider that in future polls, Thank you for your feedback. We are always trying to improve our stakeholder interactions.	Elizabeth McCollum, Daniel Simpson
I have comments on other aspects of MF requirements, not accessibility and FID. Is now an ok time to comment?	Yes, we welcome any comments you may have on the IAQ proposal, though we are primarily focused on accessibility and FID for this presentation.	David Douglass-Jaimes
Brennan Less (bdless@lbl.gov). I question why supply ventilation is allowed and not exhaust ventilation? I think that is a mistake. Exhaust fans use the least energy, are the most reliable, are the least expensive (upfront and operationally), are the easiest to measure/commission pre-occupancy, they distribute outside air throughout dwelling, and the building envelope provides filtration of incoming air. We need to know on what evidence this addition of supply fans and rejection of exhaust fans is based. I would also comment that the proposed 0.3 cfm50/ft2 is not tight enough. ASHRAE 62.2 requires 0.2 cfm50/ft2. The airtightness (not the ventilation type) is the determining factor impacting cross-contamination between units, uncontrolled airflows and variability in airflow and contaminants between units. Thank you very much for your good work and attention to my comments.	See response to this question in the “In-Meeting Questions /Comments” section above.	

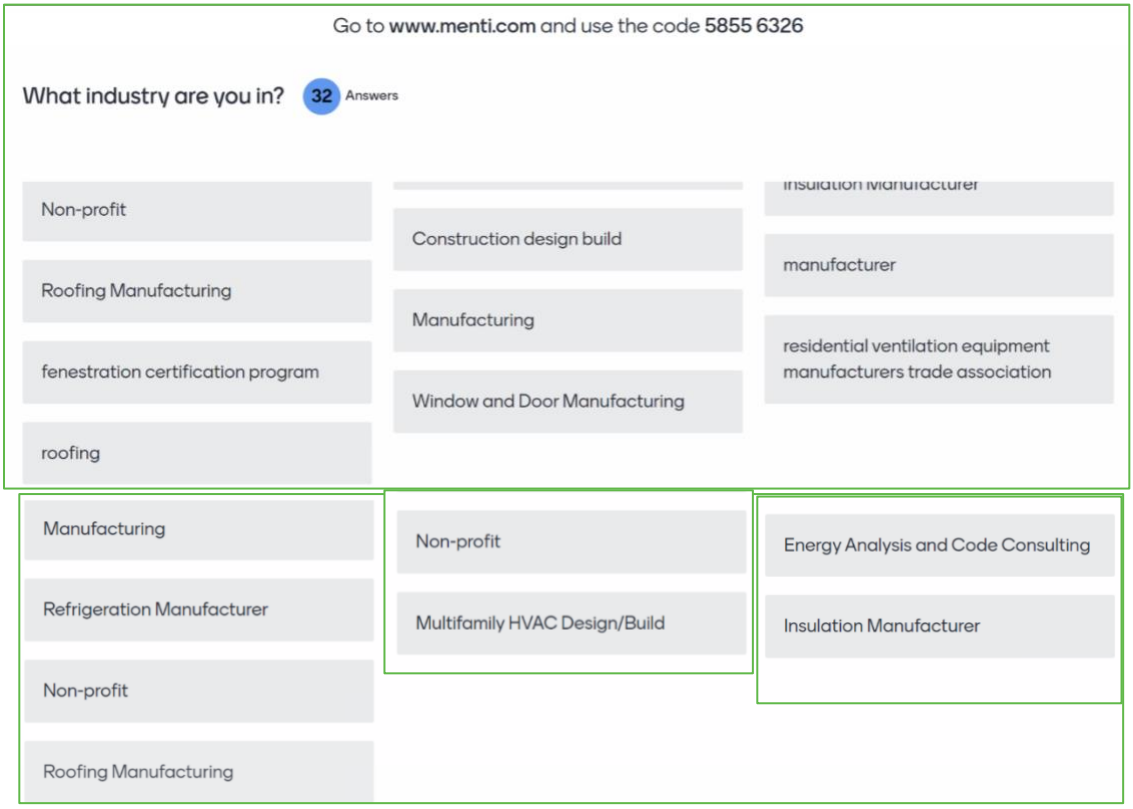
Single Family High Performance Windows and Multifamily Envelope		
Question Asked	**Response**	**Responder**
We are not aware of good evidence that exhaust ventilation draws air from adjacent units in a way that differs from other system types. Please provide evidence.	Our overall proposal is to require both: Compartmentalization to reduce pollutant transfer between units, AND balanced or supply-only ventilation to provide a dedicated source of outdoor air that can be filtered. The purpose of requiring balanced or supply-only ventilation is to ensure that all MF units receive outdoor air at the code required minimum rates. In terms of evidence, please see section 2.2.2 in the Draft CASE Report https://title24stakeholders.com/wp-content/uploads/2023/05/2025_T24_CASE-Report_MF-IAQ-DRAFT.pdf We provide an explanation starting on p. 37. In short, the average rate of outdoor air delivered to MF units is 31 cfm, and some units receive less than 20 cfm, which is lower than the 38 to 60 cfm required by code (depending on number of bedrooms and sq footage).	
Does accessible mean readily accessible and does not require a ladder to access the filter?	See response to this question in the “In-Meeting Questions /Comments” section above.	
What does this mean - this is from definitions in T-24: ACCESSIBLE is having access thereto, but which first may require removal or opening of access panels, doors, or similar obstructions.	This is the definition of accessible in 2022-Title 24 Part 6. For the IAQ filter accessibility requirement, we have proposed that IAQ filters be in accessible locations, per the definition you pasted in your question, or reachable by a ladder, which we’ve identified as within 12 ft of a walking surface. This means that all conditioned spaces, as well as basements and garages, could be deemed “accessible”.	
Are we interested in the location of the air intake to HRVs or the location of the outside air filter? For apts safer if the filters are accessible from indoors.	See response to this question in the “In-Meeting Questions /Comments” section above.	
the polls are sometimes not open as long at our end as they seem to be for the presenter.	Thank you for your feedback. We will try to fix this disconnect.	Daniel Simpson

Single Family High Performance Windows and Multifamily Envelope		
Question Asked	**Response**	**Responder**
Team, there is a long, deep discussion on the CA Decarb group about the ACTUAL IAQ effects of balanced, supply-only, and exhaust-only ventilation strategies. it might help for you to read those too.	Thank you for this recommendation, the team will look into these resources.	David Douglass-Jaimes
Will the presentations be posted and if so when and where? Thanks!	The presentation slides are available at title24stakeholders.com (under "Public Meetings" tab).	CASE team
What were the B/C ratios for the climate zones where the U-factor was not found to be cost-effective (i.e. how close to 1 were they)? Is the analysis for those climate zones available?	Full B/C tables of all analysis conducted will be made available in the published CASE report. See response to this question in the "In-Meeting Questions/Comments" section above.	Daniel Simpson
I think option 1 is more clear, option 2 does not seem enforceable.	Thank you for the feedback.	CASE team

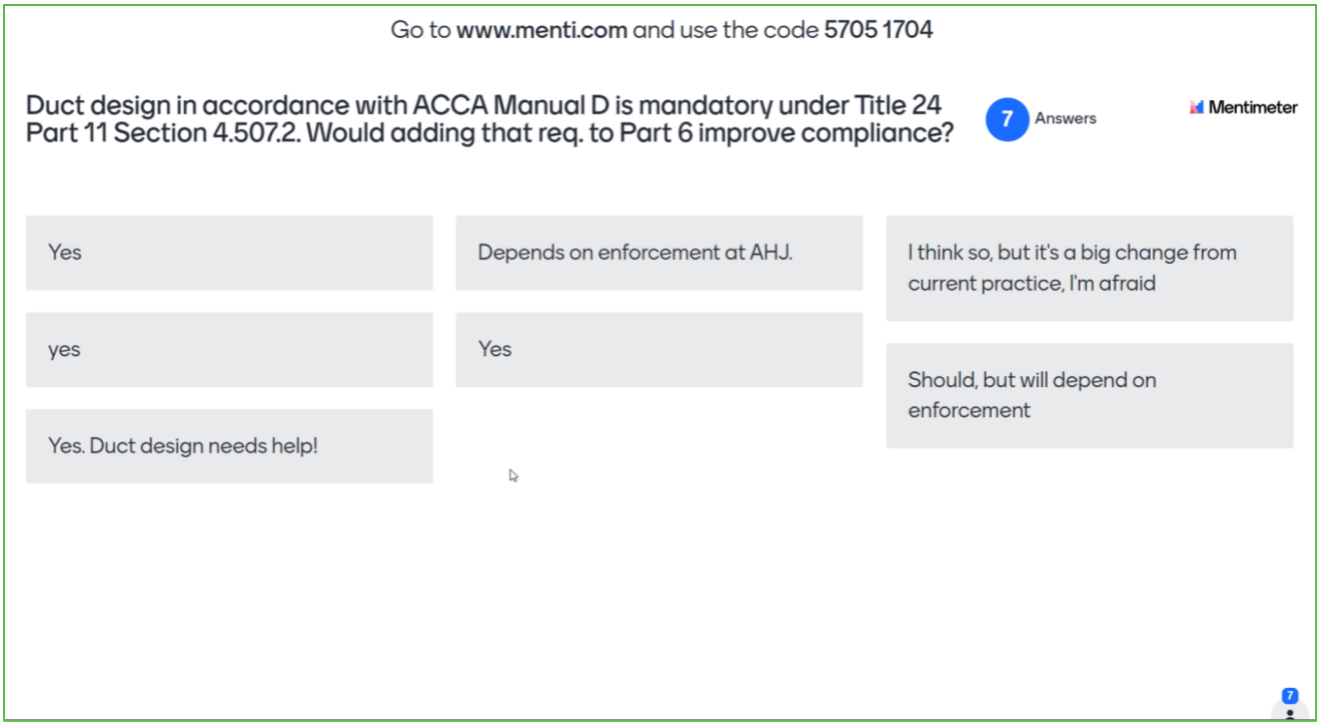
Mentimeter Polls & Responses

Introduction





Single Family Buried Ducts



Go to **www.menti.com** and use the code **5705 1704**

Duct design in accordance with ACCA Manual D is mandatory under Title 24 Part 11 Section 4.507.2. Would adding that req. to Part 6 improve compliance?

11 Answers

Mentimeter

yes

Yes. Duct design needs help!

Is there substantial non compliance today that this requirement would fix?

Yes

It would be more helpful if this was part of the energy model info done by T-24 professionals.

Reference existing requirement to avoid possibility of diverging language in future edits.

current practice, I'm afraid

Should, but will depend on enforcement

Not necessarily. If enforcement doesn't enforce now, no additional incentive. Plus this adds a layer of complication to make sure both parts of code stay lined up.

Go to **www.menti.com** and use the code **5705 1704**

Open Mentimote

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12 Answers

Mentimeter

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Go to **www.menti.com** and use the code **5705 1704**

Do you have concerns about being able to keep duct sizes small enough so they can be fully buried?

7 Answers

Mentimeter

.	Yes.	.
Yes, that's a reasonable concern	no	It's much easier to insulate roofs at the rafters to negate this issue.
Yes, zoned systems often have 18in ducts at the plenum		

6

Go to **www.menti.com** and use the code **5705 1704**

Do you have concerns about being able to keep duct sizes small enough so they can be fully buried?

12 Answers

Mentimeter

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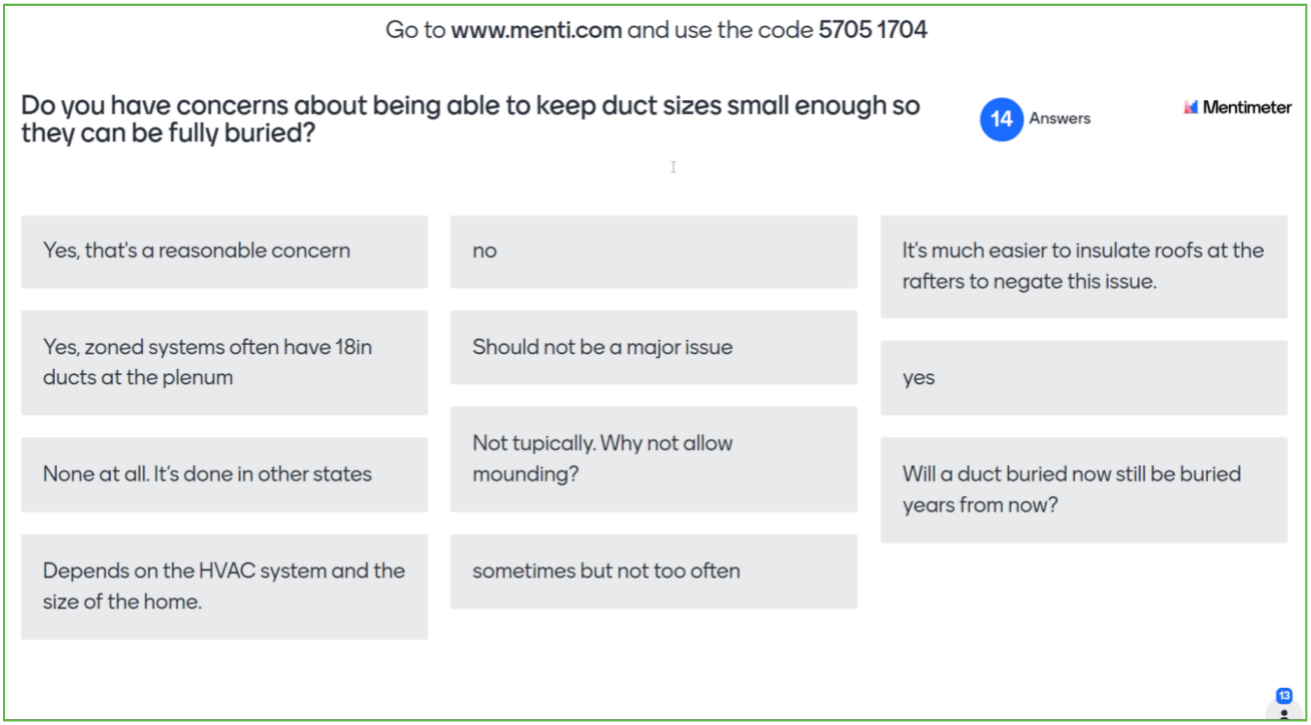
Yes, that's a reasonable concern	no	It's much easier to insulate roofs at the rafters to negate this issue.
Yes, zoned systems often have 18in ducts at the plenum	Should not be a major issue	yes
None at all. It's done in other states	Not tupically. Why not allow mounding?	Will a duct buried now still be buried years from now?

11


Go to www.menti.com and use the code 5705 1704
Do you have concerns about being able to keep duct sizes small enough so they can be fully buried?
14 Answers
Mentimeter
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no
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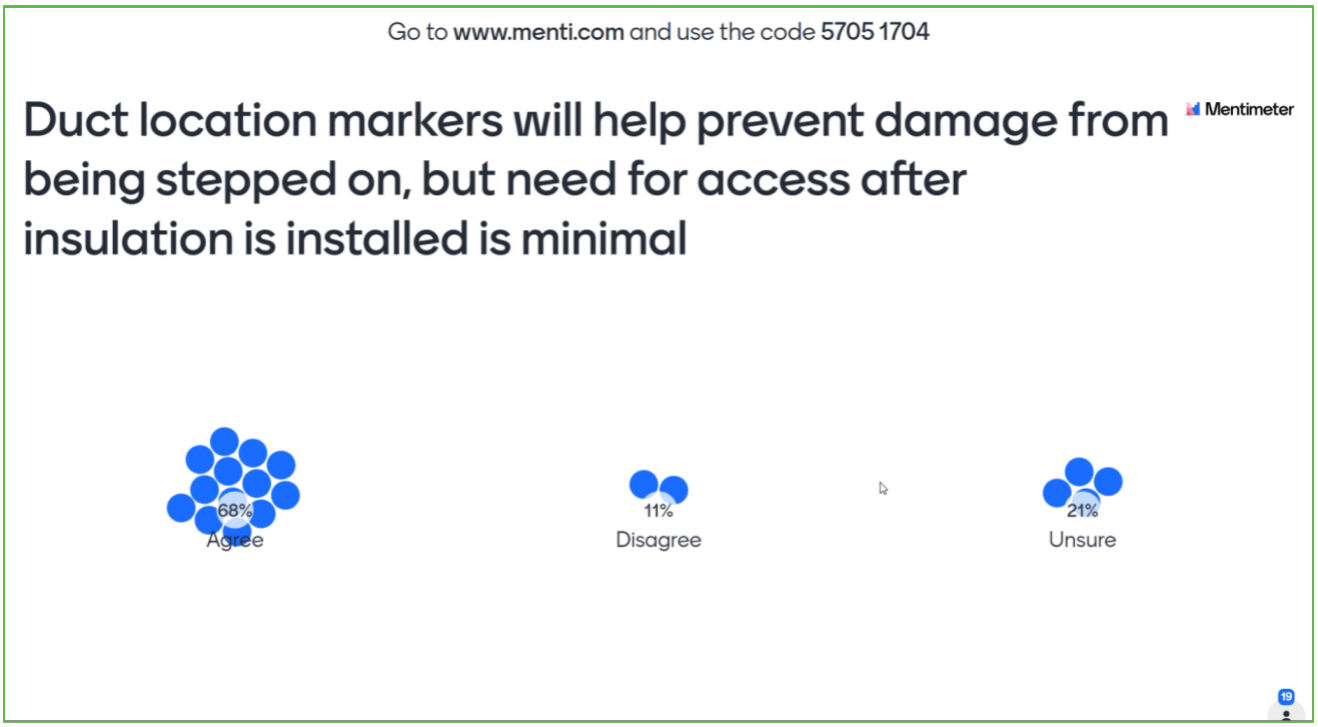
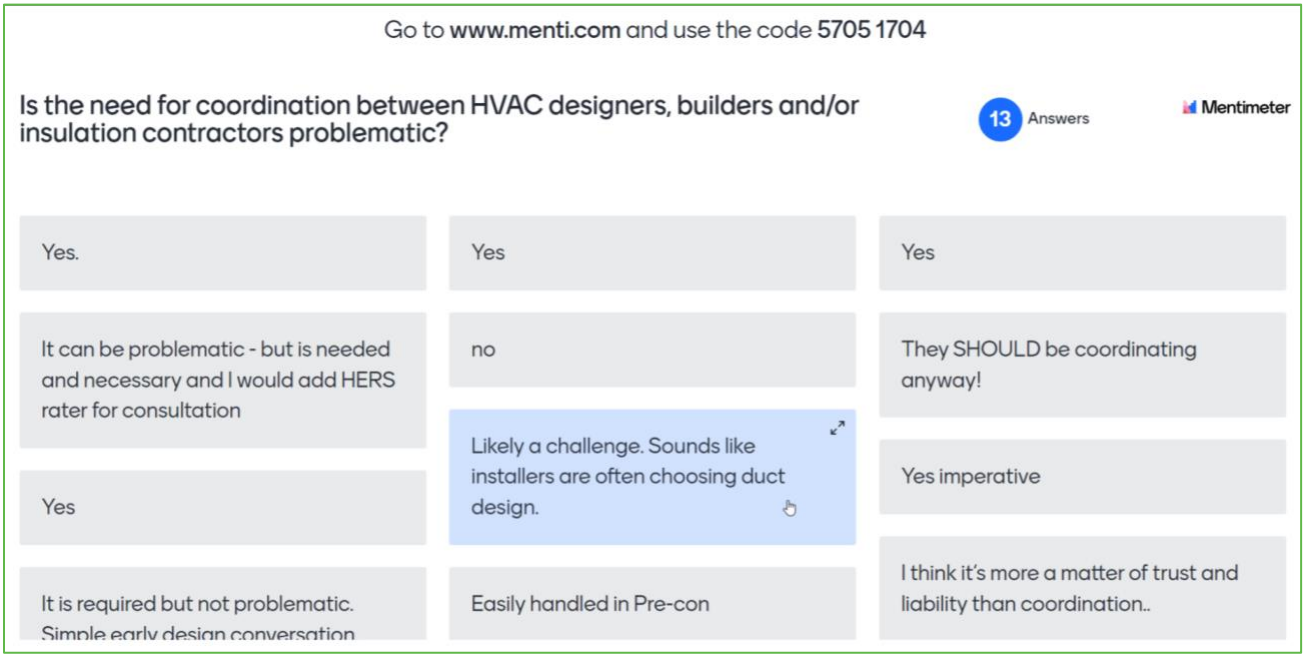
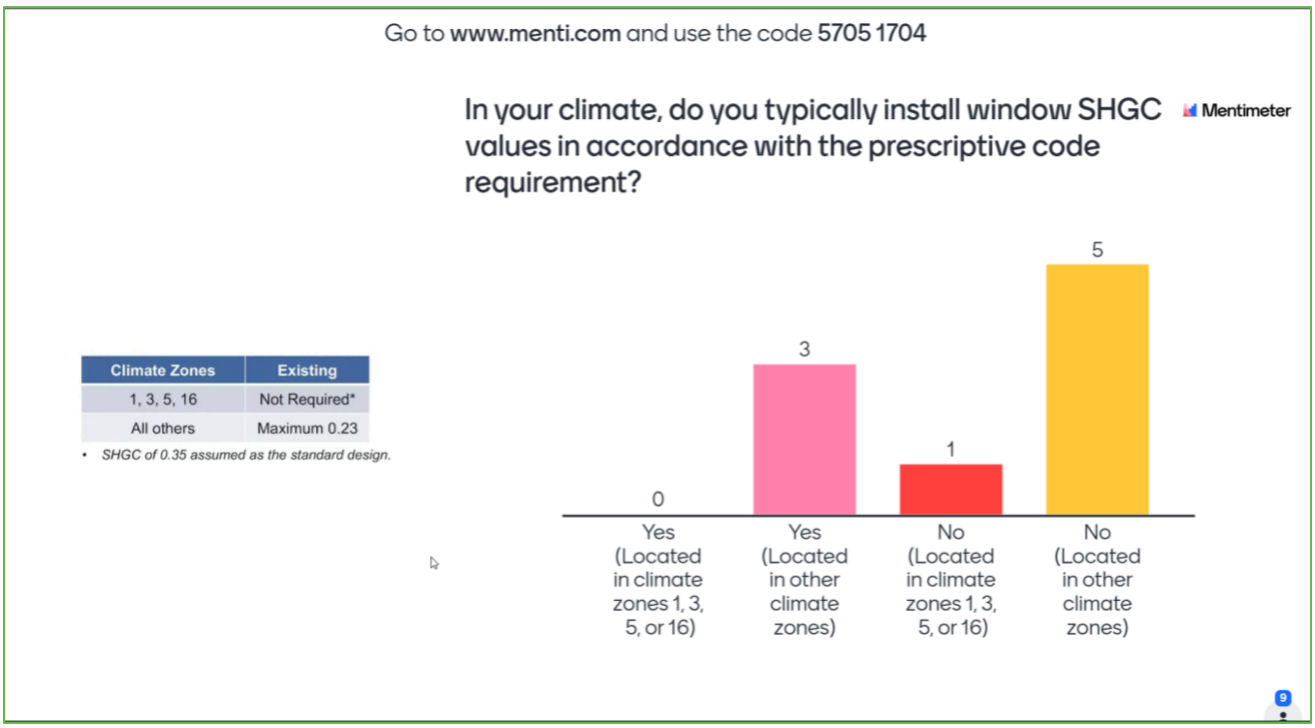
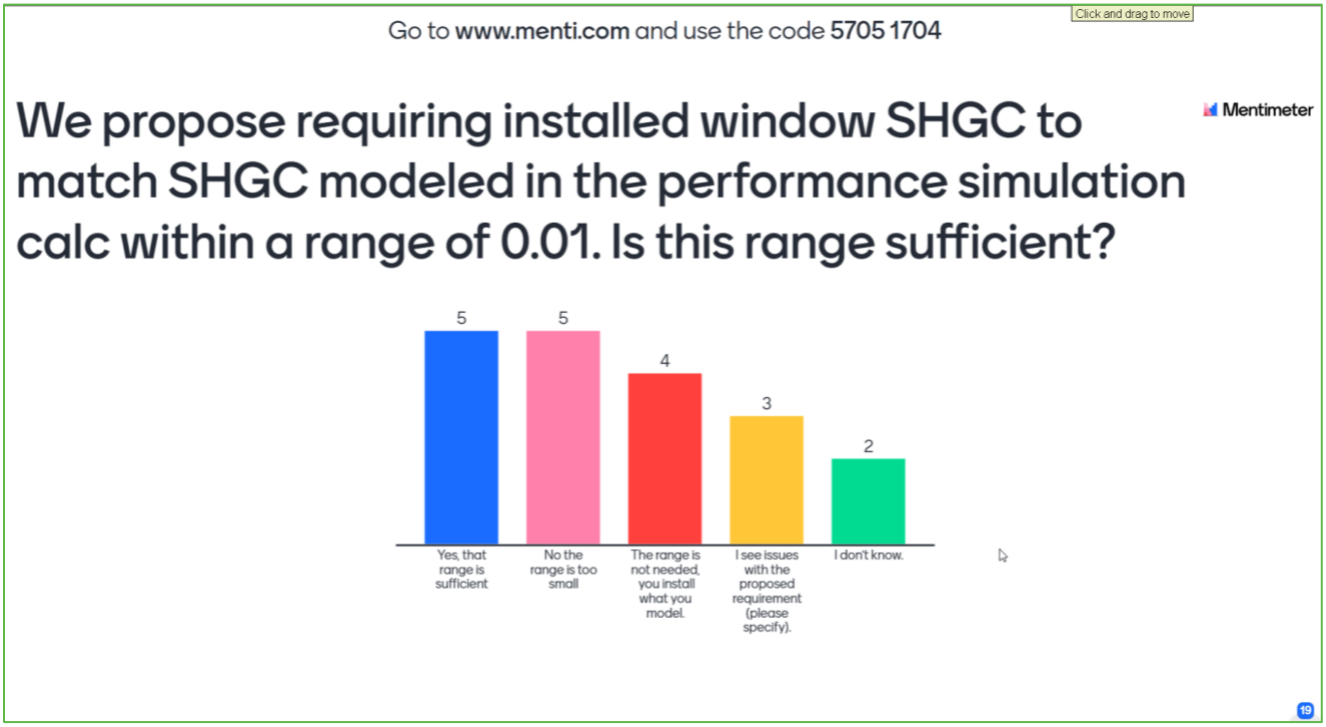
Yes, zoned systems often have 18in ducts at the plenum
Should not be a major issue
yes
Not tupically. Why not allow mounding?
None at all. It's done in other states
Will a duct buried now still be buried years from now?
Depends on the HVAC system and the size of the home.
sometimes but not too often
13


Go to www.menti.com and use the code 5705 1704
Duct location markers will help prevent damage from being stepped on, but need for access after insulation is installed is minimal
Mentimeter
68%
Agree
11%
Disagree
21%
Unsure
19

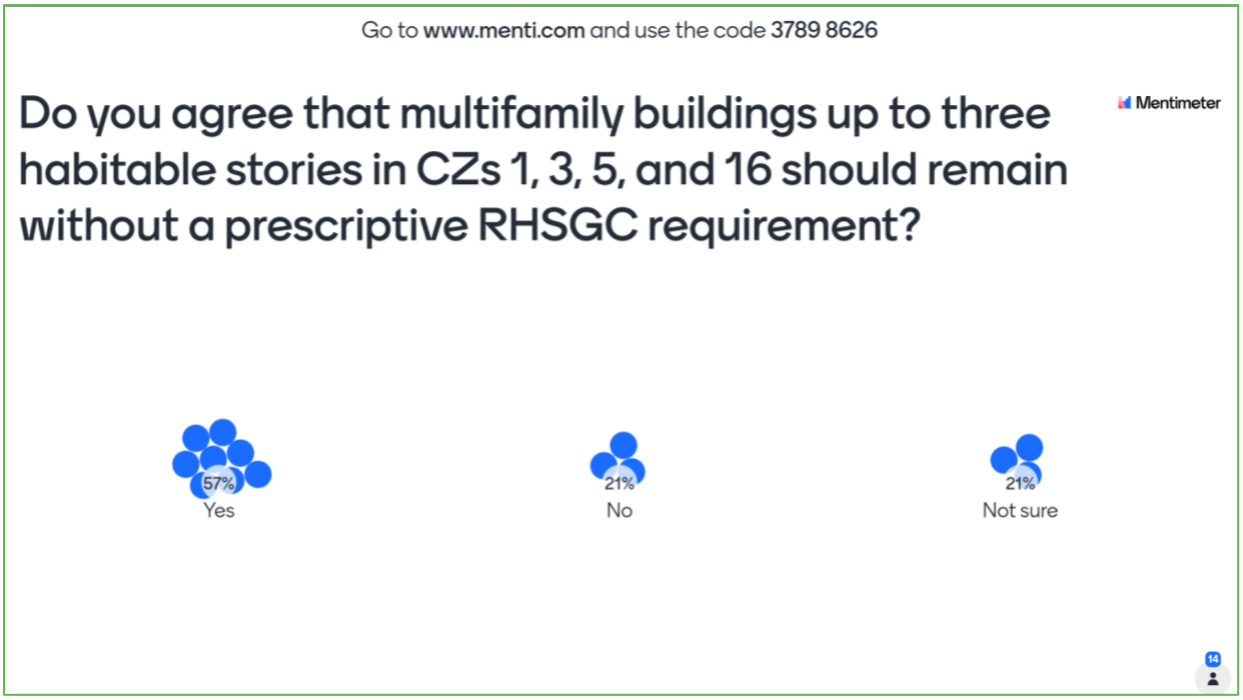


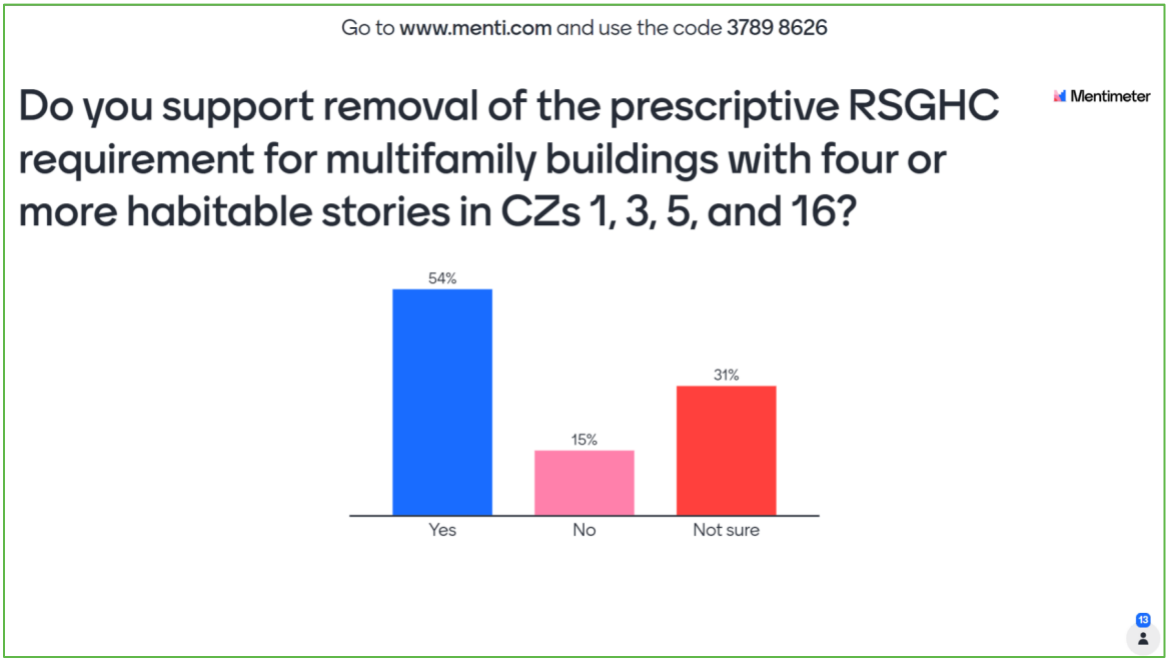
Single Family High Performance Windows

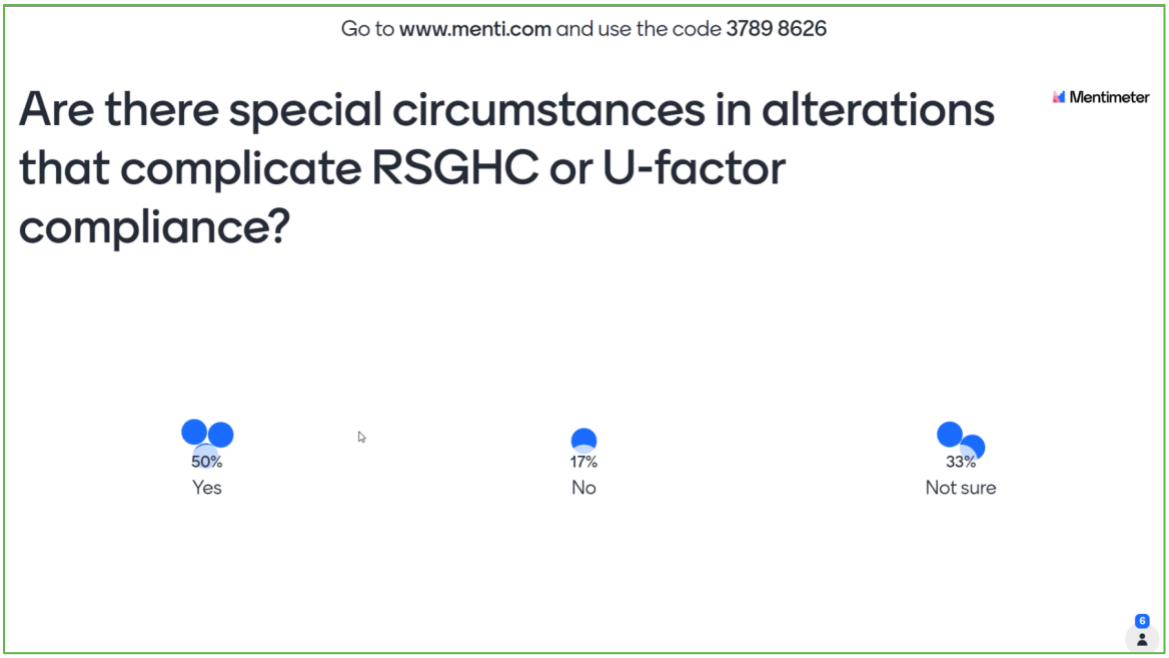


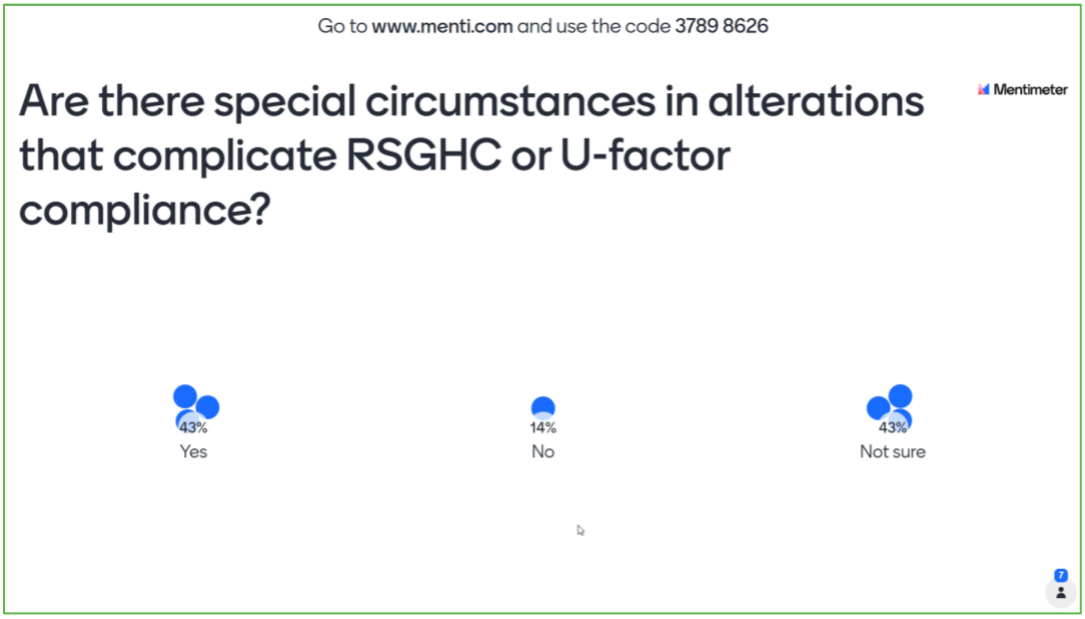


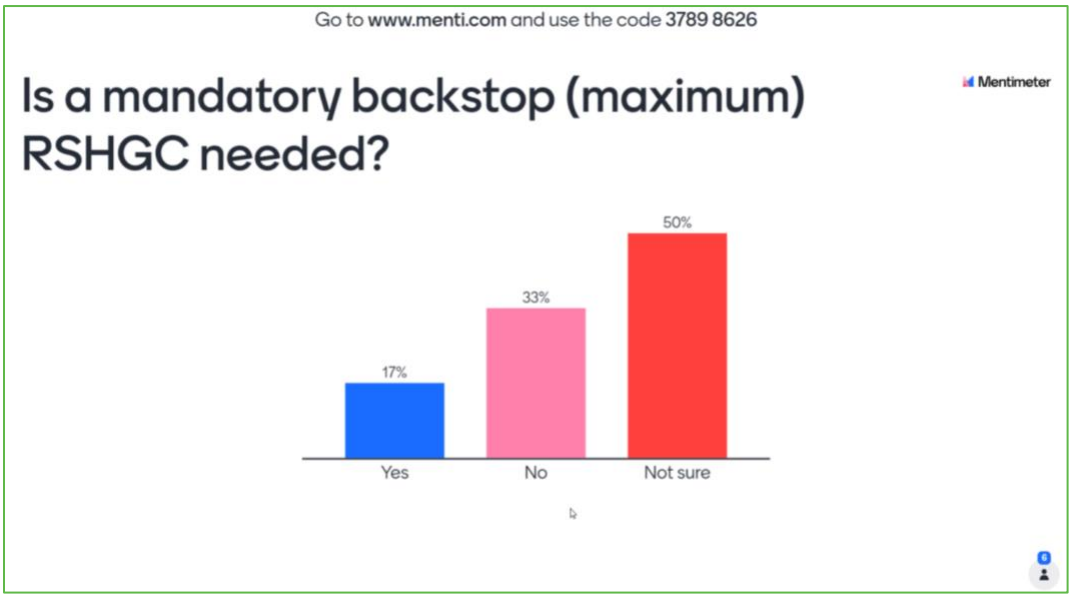
Multifamily Envelope




Go to www.menti.com and use the code 3789 8626
Do you support removal of the prescriptive RSGHC requirement for multifamily buildings with four or more habitable stories in CZs 1, 3, 5, and 16?
Mentimeter
54%
15%
31%
Yes
No
Not sure
13


Go to www.menti.com and use the code 3789 8626
Are there special circumstances in alterations that complicate RSGHC or U-factor compliance?
Mentimeter
50%
Yes
17%
No
33%
Not sure
6


Go to www.menti.com and use the code 3789 8626
Are there special circumstances in alterations that complicate RSGHC or U-factor compliance?
Mentimeter
43%
Yes
14%
No
43%
Not sure
7


Go to www.menti.com and use the code 3789 8626
Is a mandatory backstop (maximum) RSHGC needed?
Mentimeter
17%
33%
50%
Yes
No
Not sure
6

Single Family and Multifamily Indoor Air Quality

Go to **www.menti.com** and use the code **4446 4481**

Click and drag to m

What comments do you have on the proposed requirements for IAQ System Accessibility and FID?

14 Answers

Mentimeter

Can you please reprise the proposed mandatory requirements for balanced ventilation (or HERV?) in SF homes in some zones?

Isn't the FID for HRV only required if the HRV is located in an attic?

Add dB requirements or sound isolation. Also ERV's should be included for some climates here

do not have comment on accessibility / FID.

Yes. HRV's can be installed in coat closets that are deeper than standard closets (so behind the hanging bar.) This makes for easy client access.

Note that there are no test standards for noise output from ducted ventilators .

Agree with Loic's comments re: instrumentation. Simple CO2 monitor could provide alert to occupants that HRV is not working.

You need to specify NOISE minimums. Low quality HRV's have been installed in early PH projects here in California and were turned off due to noise.

addressing.

Outdoor intake pre-filters can be installed in attics, so more flexibility needs to be written into this 'accessible' requirements.

Can you please reprise the proposed mandatory requirements for balanced ventilation (or HERV?) in SF homes in some zones?

Can you clarify if an FID is required if the unit is accessible in the livable space as oposed to an attic?

Is now an OK time to comment on other IAQ/ventilation requirements? I do not have comment on accessibility / FID.

Loic Ares; aresl@venmar.ca Instrumentation and reporting requirement are not clear, it should be tied to the design airflow for the specific dwelling not necessary the maximum rated SRE

Agree with Loic's comments re: instrumentation. Simple CO2 monitor could provide alert to occupants that HRV is not working.

Not sure why the energy code has to dictate the location of inlets and outlets? This is something the mechanical code should be addressing.

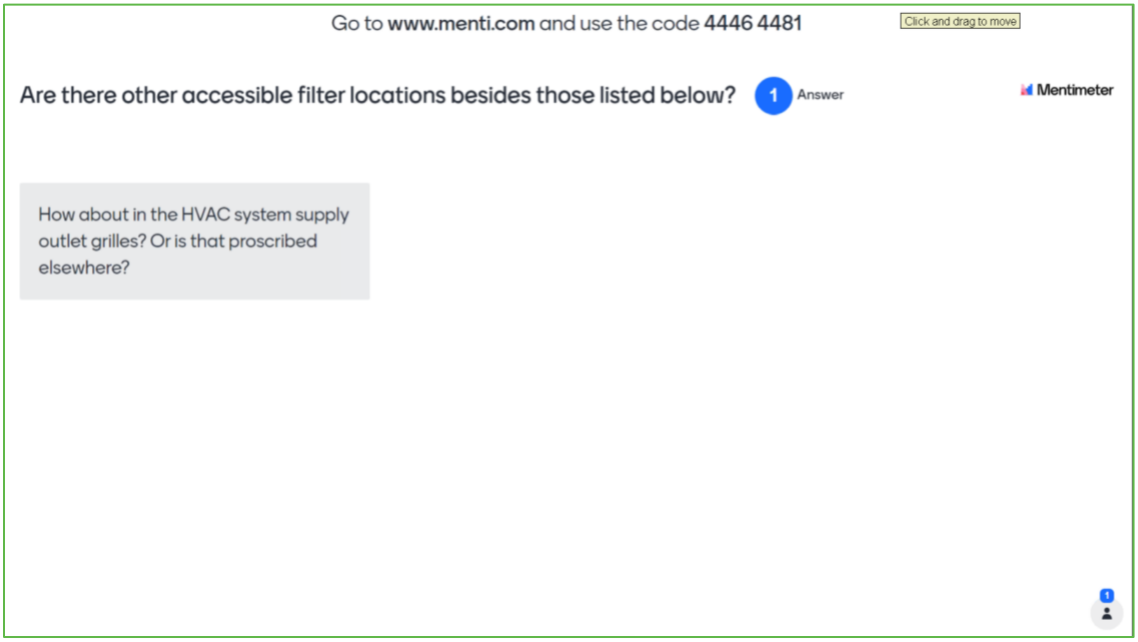
Outdoor intake pre-filters can be installed in attics, so more flexibility needs to be written into this 'accessible' requirements.

Will these be applicable to additions of new dwelling units in existing envelopes?

Can you clarify if an FID is required if the unit is accessible in the livable space as oposed to an attic?

So requirements for FID are unchanged or slightly relaxed, but simply moved from ACM to the code?

Loic Ares; aresl@venmar.ca Instrumentation and reporting requirement are not clear, it should be tied to the design airflow for the specific dwelling not necessary the maximum rated SRE



Response from CASE Team member Marion Goebes to the above question from poll:

This was to allow access to panels in the ceiling. Our proposed language will include filters behind access panels or grilles located a certain distance above a walking surface. That should cover the locations you're describing.