

Finch Cambridge: Truly Affordable Passive House

May 28th 2:00-3:00pm

Q&A with the Presenters

Beverly Craig
Michelle Apigian
James Petersen
Tom Chase

1. **My question is about all the Massachusetts Passive House projects now in the pipeline, thanks to the Mass Save program. I am wondering if these upcoming projects are primarily affordable housing projects pursuing additional incentives, or if there's a significant fraction of those projects that are market rate developments simply pursuing the utility rebates. Is there someone either at NESEA or on the webinar team that would be able to speak to that? We are trying to advance similar incentive programs for Passive House here in Minnesota. Thanks!**
 - a. In addition to the Finch project, there are 7 affordable Passive projects in the pipeline in Massachusetts under the Passive House Design Challenge. See here for details of the projects <https://www.masscec.com/emerging-initiatives/passive-house> . The Northshore CDC project is under construction. 5 others would have had groundbreaking already but have had some delay because of COVID-19. These projects were eligible for up to a \$4K per unit incentive from the Massachusetts Clean Energy Center. The goal of that program was to show Passive multi-family could be done in MA for a low to no incremental cost. The spreadsheet showing the 1.4% incremental cost at Finch is available on the page above. Keep watching for incremental costs of the other projects as they become available. 9 months later, the MassSave program announce the \$3K per unit incentive mentioned at the bottom of the page was launched. That program is for affordable housing and market rate housing, both. We've been told at least 3,500 units have applied for at least Passive House feasibility study money. We have heard this is majority market rate and it is still unclear how many of the projects studying Passive House will move ahead.

2. **I joined the webinar a bit late, did you discuss any requirements for Unit air sealing compartmentation and blower door testing on the Finch project? I saw your color coded plans red perimeter and blue interior. Curious if so, how it went, and when did you do blower door testing in the construction sequencing schedule? And did you have scheduled values for air sealing of Units?**
 - a. We did discuss air tightness continuity, both at the perimeter as well as between units for compartmentalization. We've been doing sampling testing of individual units as they become ready in our sequence, and they've been passing with flying colors (thank

goodness!). Our full building testing is still upcoming, likely in a couple of weeks, now that we are officially back under construction, as of June 1st – yay! I frankly have no idea how they priced the air sealing. That is actually the magic question! But in the case of the units compartmentalization, we own caulk and firestopping to maintain fire and acoustic separation. I like to make the case that the code requires air tight continuity, but it's just about executing it, and designing it to facilitate replicable successful execution at scale.

- 3. Is there any water reuse on the project - I noticed a retention area?**
 - a. No, the project has water infiltration and sewage detention prior to the connection at the street to meet the City of Cambridge's "25-in-2" requirement. That means to store on site the difference in volume between the 2 yr 24 hr pre-construction runoff and the 25 yr 24hr post-construction runoff.

- 4. What is the address? I live near this & could probably walk/bike over to look @ the outside.**
 - a. 671 Concord Ave, Cambridge, MA

- 5. Hi Bev, What software/program did you use to calculate the EUI and energy loads? Thanks!**
 - a. WUFI

- 6. Were the Contractors & Installers PHC?**
 - a. No, not at first, although some staff members did attend PH builder training during construction.

- 7. Did you have to handle unit compartmentalization from corridor? What was the unit air barrier (underside of deck, ceiling?) how did you jump from unit top air barrier to corridor wall and manage joists, etc.?**
 - a. Yes, the unit air barrier is the drywall on the unit side at the corridor, the floor, and the underside of the floor above. Extensive sealing at joists, penetrations, and joints completes the box. Switching to top chord-hung trusses is an alternative we also see, but there's no replacement for careful dealing of all unit air barrier intersections.

- 8. What mostly drives the selection of the HVAC system; the fact that the goal is PH or the building type and size?**
 - a. PH, building type and size, as well as utility metering and payment responsibilities, including affordability vs. market rate, utility allowances, and local ordinances all come into play.

- 9. I see this building employs low mass walls. Which do you see more of in US Passive Haus: externally insulated mass walls, or low mass super insulated walls?**
 - a. I'd say this varies by region, but in the northeast, the typical multifamily building is wood-framed, and going from there we see mostly low-mass walls with above-average levels of insulation.

10. Why not solar hot water?

- a. Unfortunately, maximizing roof space for solar PV did not allow remaining space, and interior space for large DHW storage tanks was limited.

11. Could someone please explain if there's a difference between the total building envelope criteria vs the compartmentalization criteria for this project?

- a. There is, a big difference. The compartmentalization criteria is 0.3 CFM50/sf of unit enclosure, the whole building criteria is 0.06 CFM50/sf of whole building enclosure.

12. Do you think you could perform all details without the use of spray foam? (Could you remove spray foam from projects?)

- a. Yes, but with added labor and potentially added material cost in the short-term. I think it's more likely that we'll get better (aka low GWP spray foam) products in wider use.

13. Is there thermal bridging through the channels holding continuous insulation in place on exterior of Finch?

- a. The channels are held off the sheathing with thermally broken fiberglass clips.

14. Is the cost of monitoring equipment included in the +1.4% cost increase?

- a. No, the monitoring is not required for PH certification, it's more of an operating cost than a construction cost. Monitoring will also include some indoor air quality monitoring in units, for temperature, humidity, and possibly other factors like particulates, VOCs, CO2, etc. TBD. New Ecology's monitoring equipment and remote monitoring platform is a low-cost solution for building optimization: <https://www.newecology.org/what-we-do/mo/>

15. What thickness is the exterior insulation?

- a. 2" at most locations

16. Is carbon sequestration when specifying building materials considered?

- a. Not for this project, no

17. Have you done/considered doing any indoor air quality testing in these buildings?

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18. With regard to compartmentalization in multi-family projects, how much of the unit's air leakage is typically found to be going to adjacent units vs. to the exterior?

- a. When it's quantified using blower door testing, it depends on the exterior air barrier, but qualitatively, most of the leakage is between units and to the corridor.

19. Given MA Global Warming Solutions Act goals to 'electrify all buildings' what factors drove the decision to use gas for DHW - 1st cost? Source energy? Other?

- a. Operating cost and availability of central ASHP DHW equipment are the two main drivers here. That said, City of Cambridge required the project to provide a plan to get to net zero emissions in the future, including the elimination of fossil fuels. That was included in the materials required of the project for zoning approval.

20. Our biggest challenge has been that the mechanical engineers, for liability reasons etc., wants to do their own energy modeling rather than trust the passive house model. You end up with competing models. How have you handled it?

- a. Energy modeling has many different uses: iterative design, comparative analysis, green building certification, and code compliance, to name a few. Models should be performed according to how they will be used and for what end. It's ok to have multiple models serving different purposes on a project, even if their results vary, as I expect they would. All models are wrong, but they're also useful.

21. Can you talk about the transition from unit ceiling to corridor wall? Regarding unit compartmentalization?

- a. That transition is at the unit-side drywall, which runs from the floor to the underside of the floor above, cut and fit around and between trusses then sealed at all intersections and penetrations.

22. Are all appliances recirculating (kitchen hood, dryer)?

- a. Dryers exhaust to the exterior, all laundry is in one central location. Kitchen range hoods are recirculating with kitchen area exhaust separate.