



# The Compound Rowhouses

Palimpsest: Layering Thermal Control into an Existing Building

NEW ECOLOGY

QUINN EVANS

# History

- December 2, 2016 Ghost Ship Warehouse Fire, Oakland, CA
- Artist housing (lack of affordability)
- 36 lives lost
- Spurred a nationwide crackdown, and subsequently a change in Baltimore City building code to enshrine safe, legal artist housing



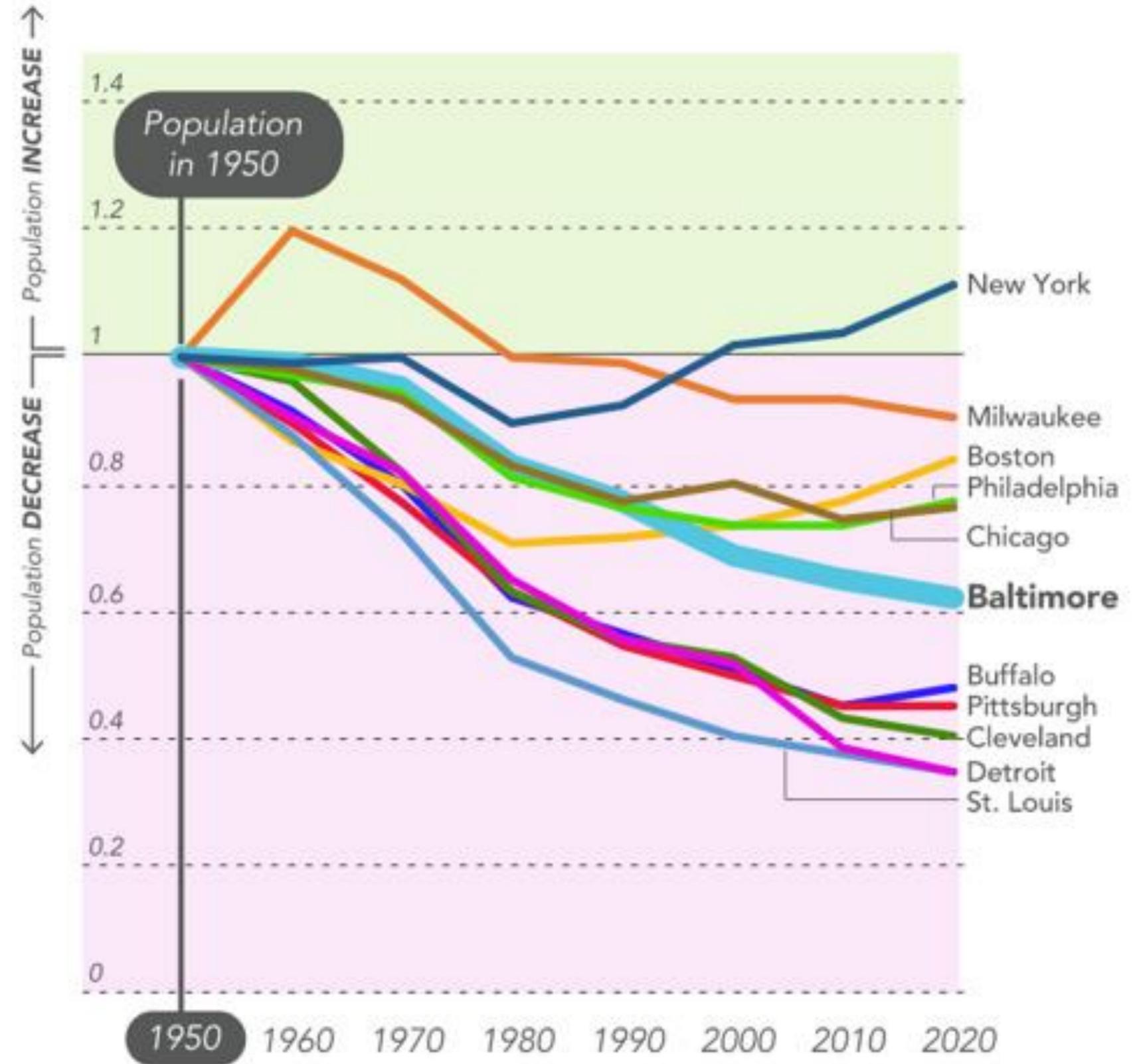
Men Charged In Deadly Calif. Ghost Ship Warehouse Fire Plead No Contest : NPR

Creator: Josh Edelson | Credit: AFP/Getty Images

# History

- Due to population decline and disinvestment in Baltimore City, vacant housing is prevalent

### Population change since 1950 in Baltimore and major industrial peers



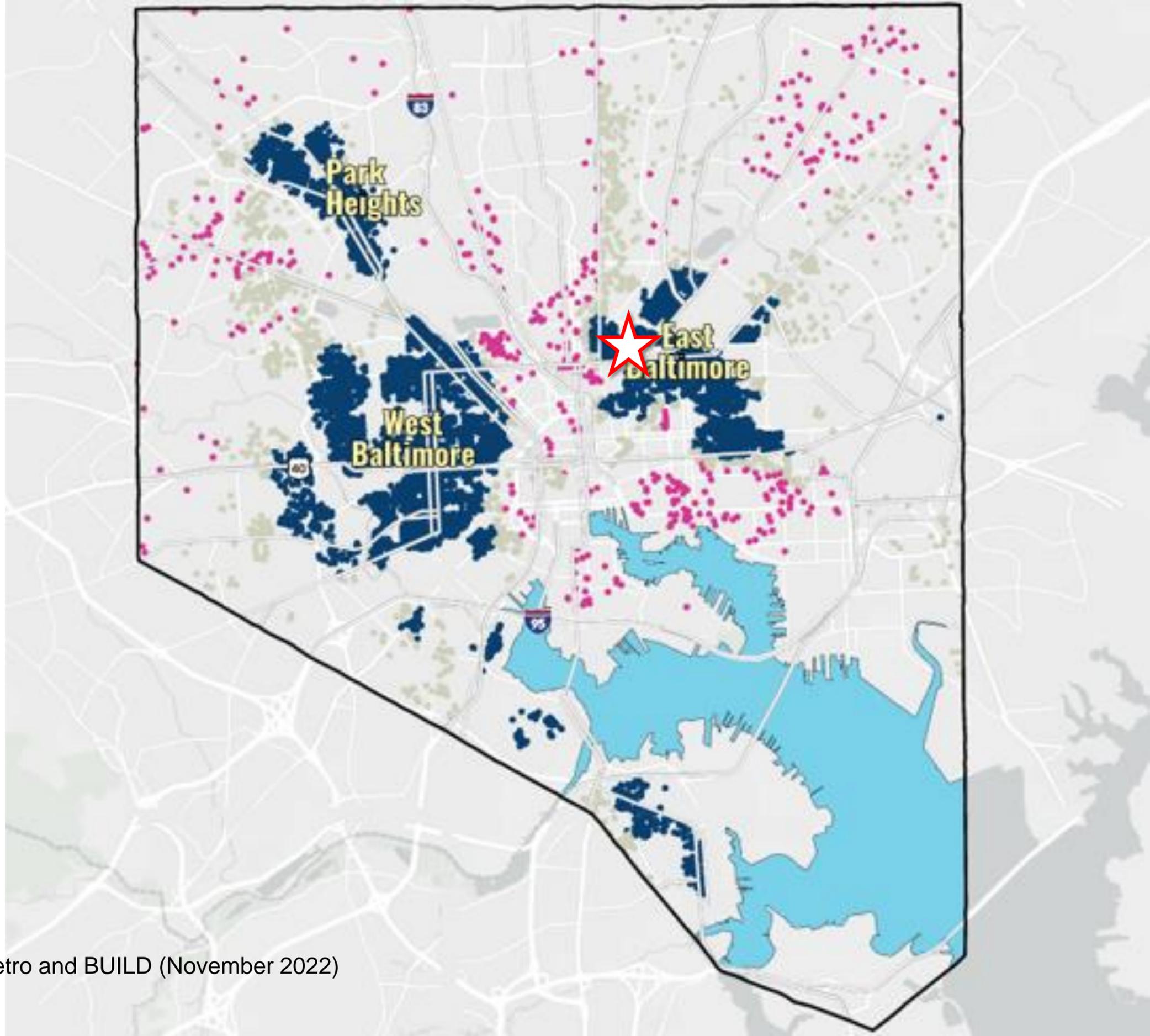
Whole Blocks, Whole City report by czbLLC for ReBUILD Metro and BUILD (November 2022)

Source: U.S. Census Bureau, Decennial Census; all cities presented had 500,000 or more residents in 1950 and were manufacturing hubs

# Location

- Vacant homes in areas where property values are below average
- Vacant homes in areas with average property values
- Vacant homes in area where property values are above average

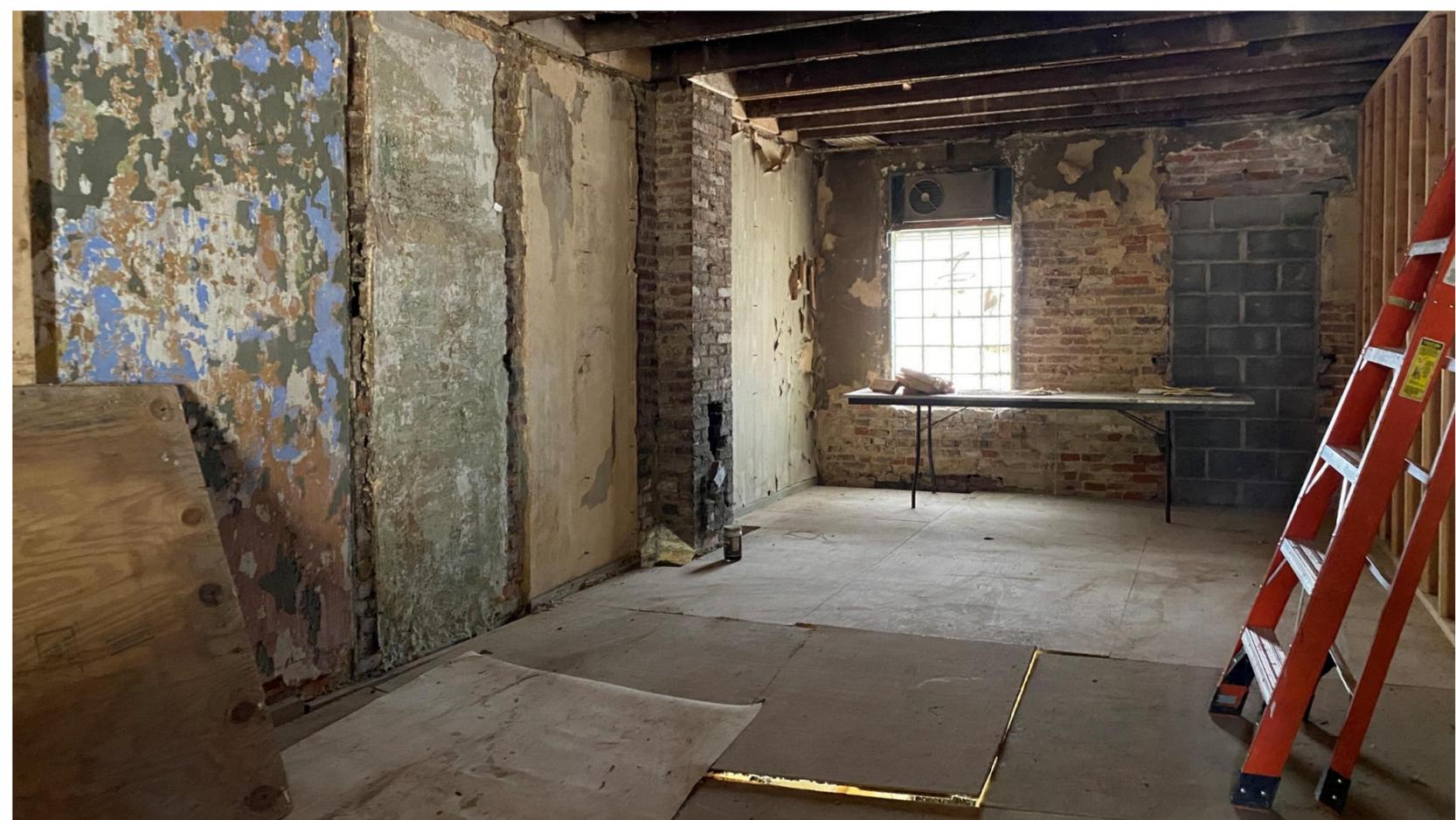
★ Project site

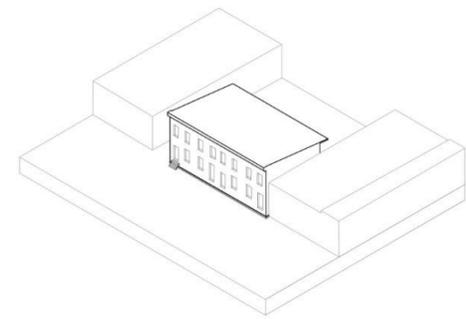
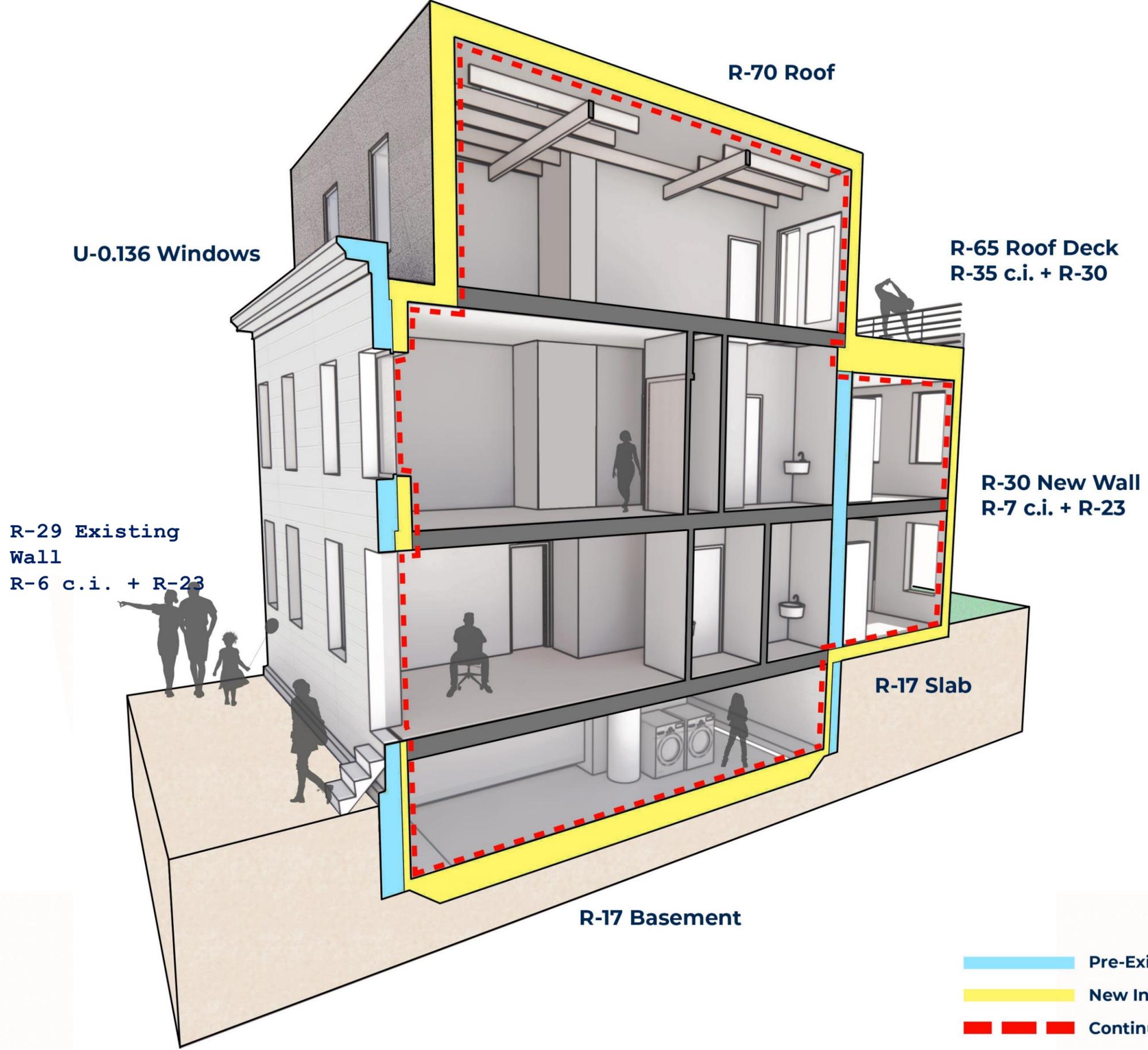


## Client / Inspiration

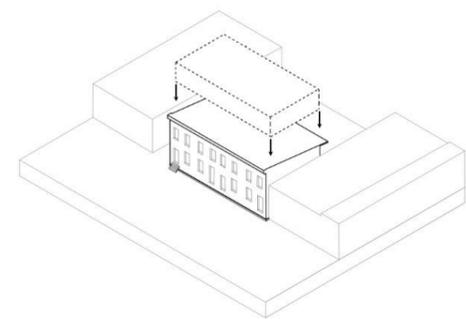
The **Midway Neighborhood Cooperative** is a cooperatively owned and run construction and neighborhood development company. Made up of Midway residents and business owners, MNC is dedicated to principles of affordability, sustainability, solidarity and participatory planning rooted in a democratic workplace. We work to build neighborhood resources for and by residents of the Midway neighborhood where we work and live.



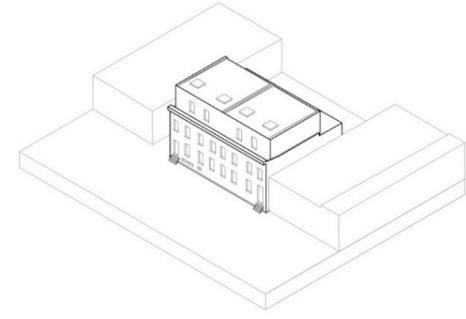




**Four individual pre-existing unoccupied rowhomes**



**Addition of third level to pre-existing structure**

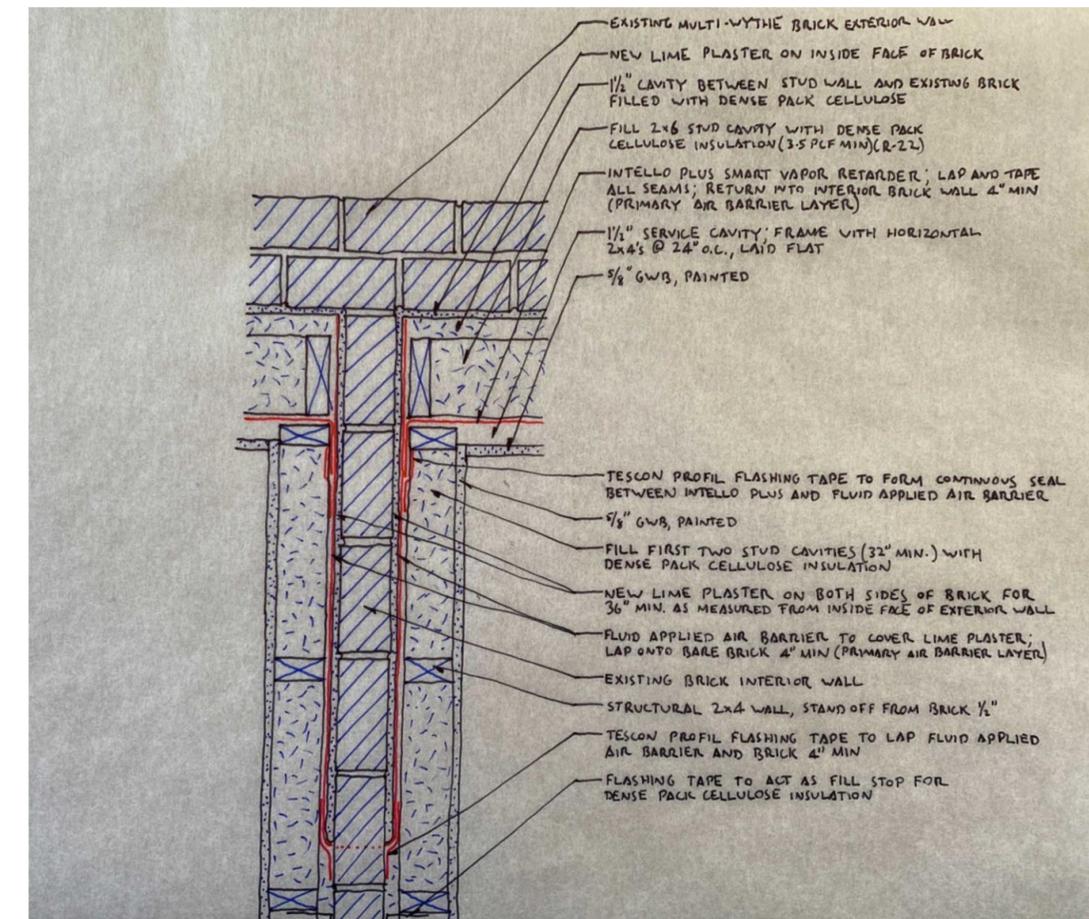
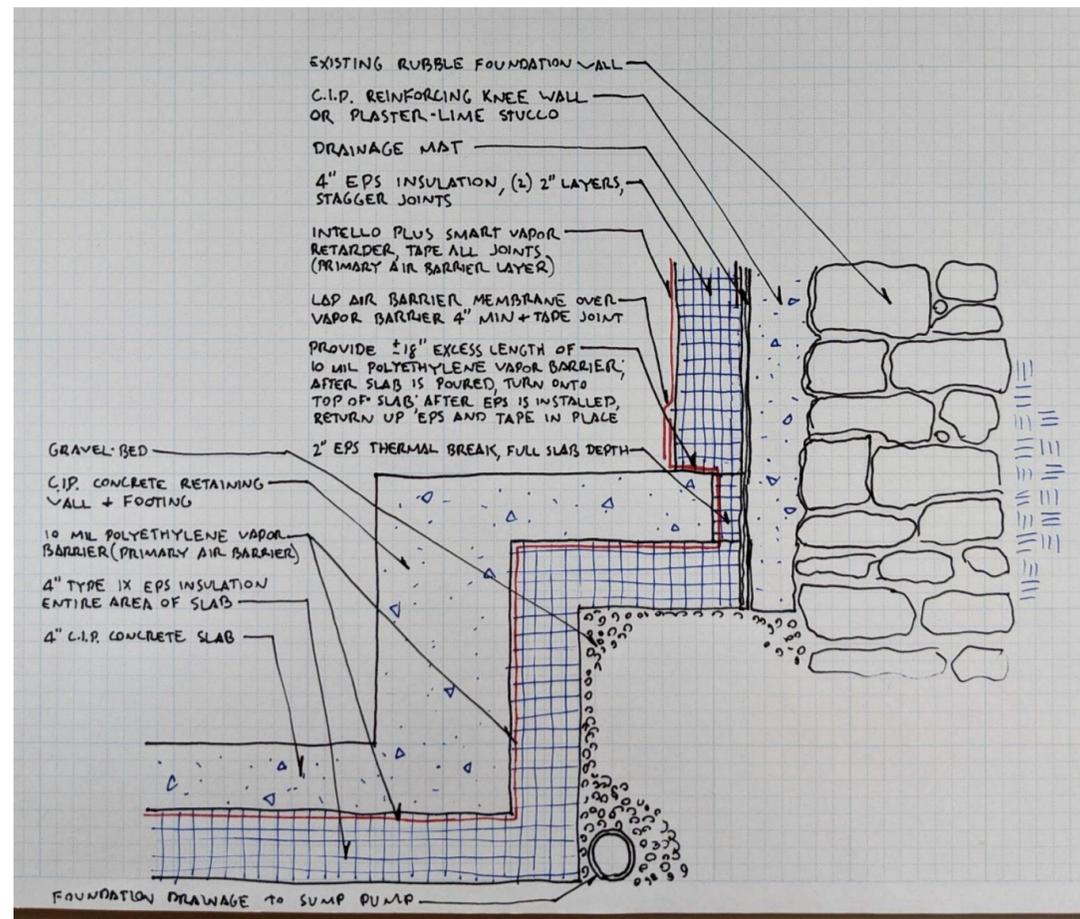
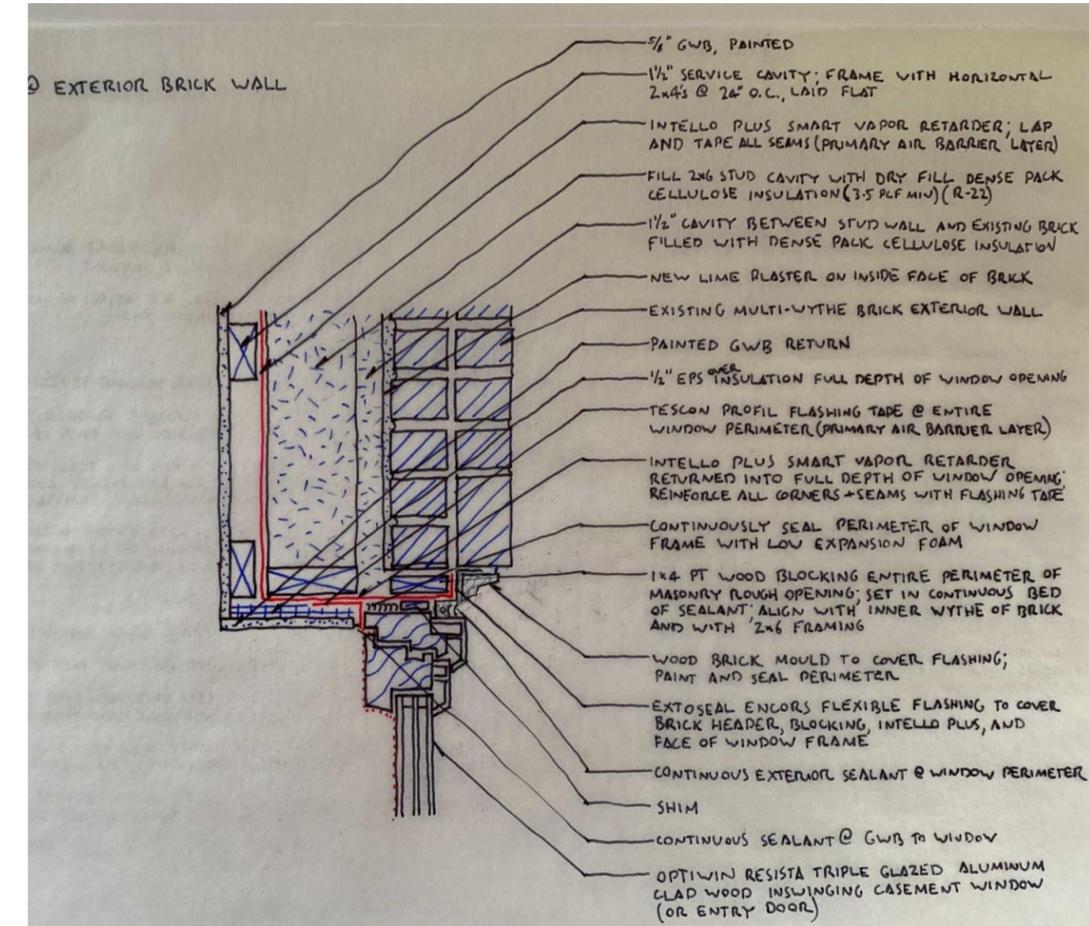
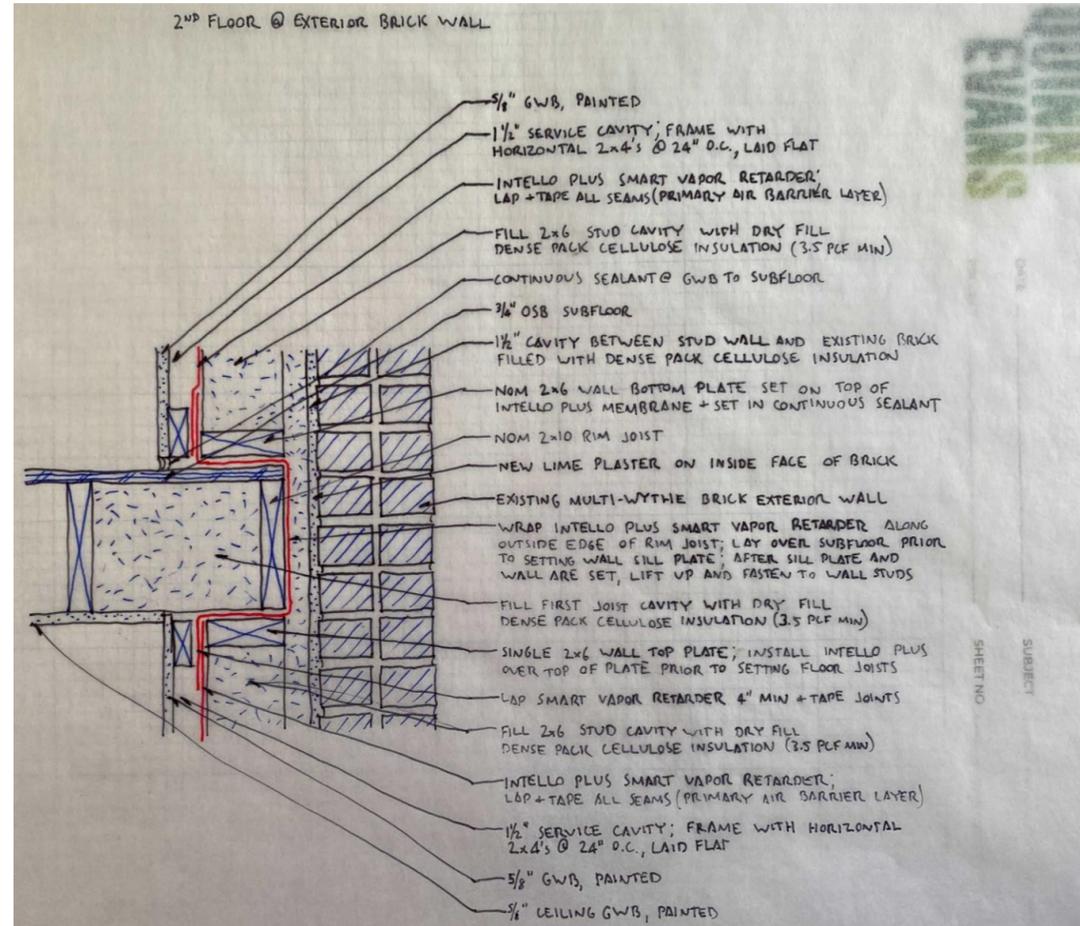


**Completed two-unit individual family rowhomes**



# Details

- Interior side masonry retrofit
- Identification of critical junctions
- Basement curbing and underpinning
- Existing masonry party walls embedded within conditioned area
- Addressing bulk wind washing through existing masonry wall
- Interior side smart vapor retarder
- Prescriptive new construction assemblies on 3<sup>rd</sup> floor and rear additions





# PHIUS+ Thermal Bridging Psi-Value Calculator & Report v2.2

**Detail**

Description: **Wall 1XF6 at old rowhouse party wall**

File name: \_\_\_\_\_

Project name: **The Compound Rowhouses**

Project #: **1799**

Date: **4/16/2023**

Company: **Quinn Evans**

**General Scheme** (select)

**Boundary Conditions**

	T (F)	Surface Film Resist. (R-Value)
<b>Indoor</b>		
Wall Ex.	68	0.74
Roof Ex.	68	0.57
Floor Ex.	68	0.97
<b>Outdoor</b>		
Ambient Ex.	14	0.23/0.45
Ground Ex.	41	0

\*Enter values from Trn/TrM into yellow cells

**2D model**

	U (btu/hr.sq.ft)	dT (F)	L (in)	ULdT (btu/hr.ft)	error (%)
Interior	0.0285	54	189.00	17.70	1.60%
Exterior	0.0285	54	72.00	9.17	1.60%

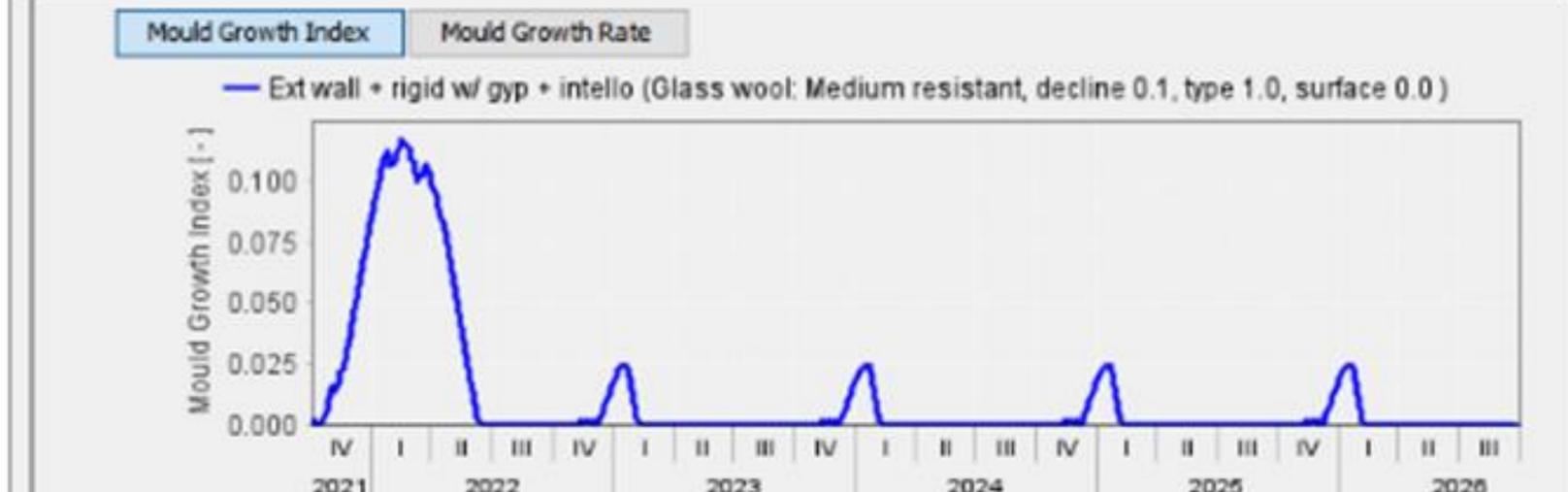
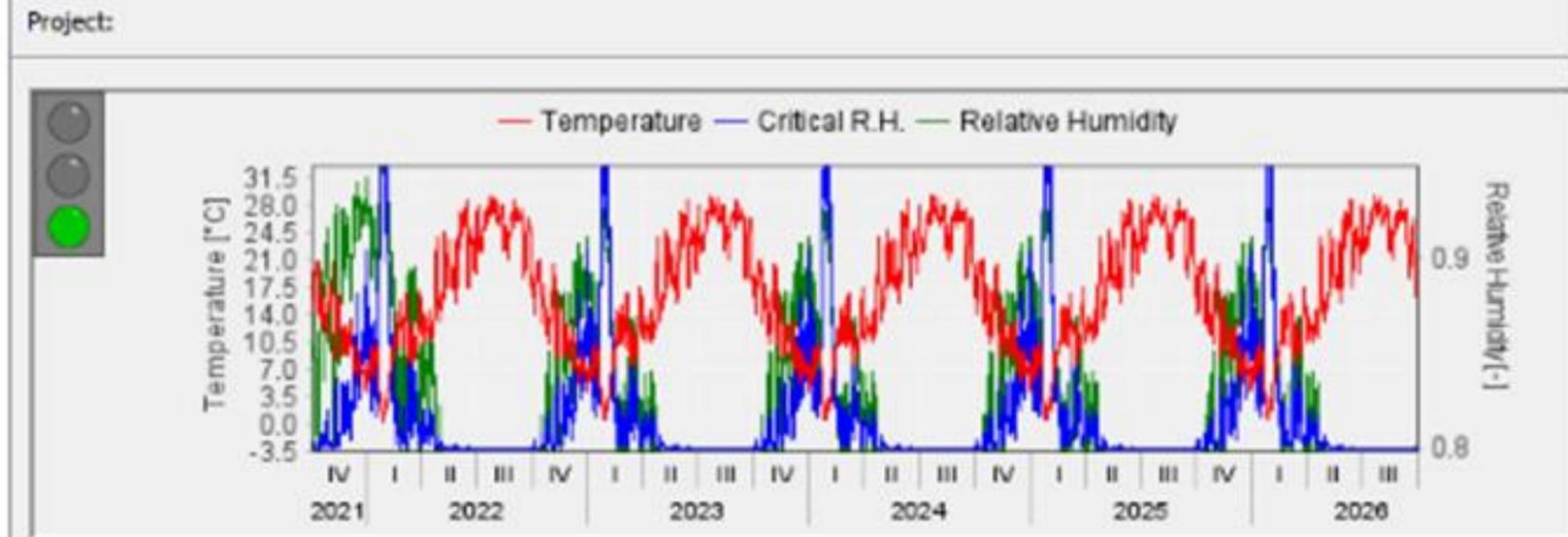
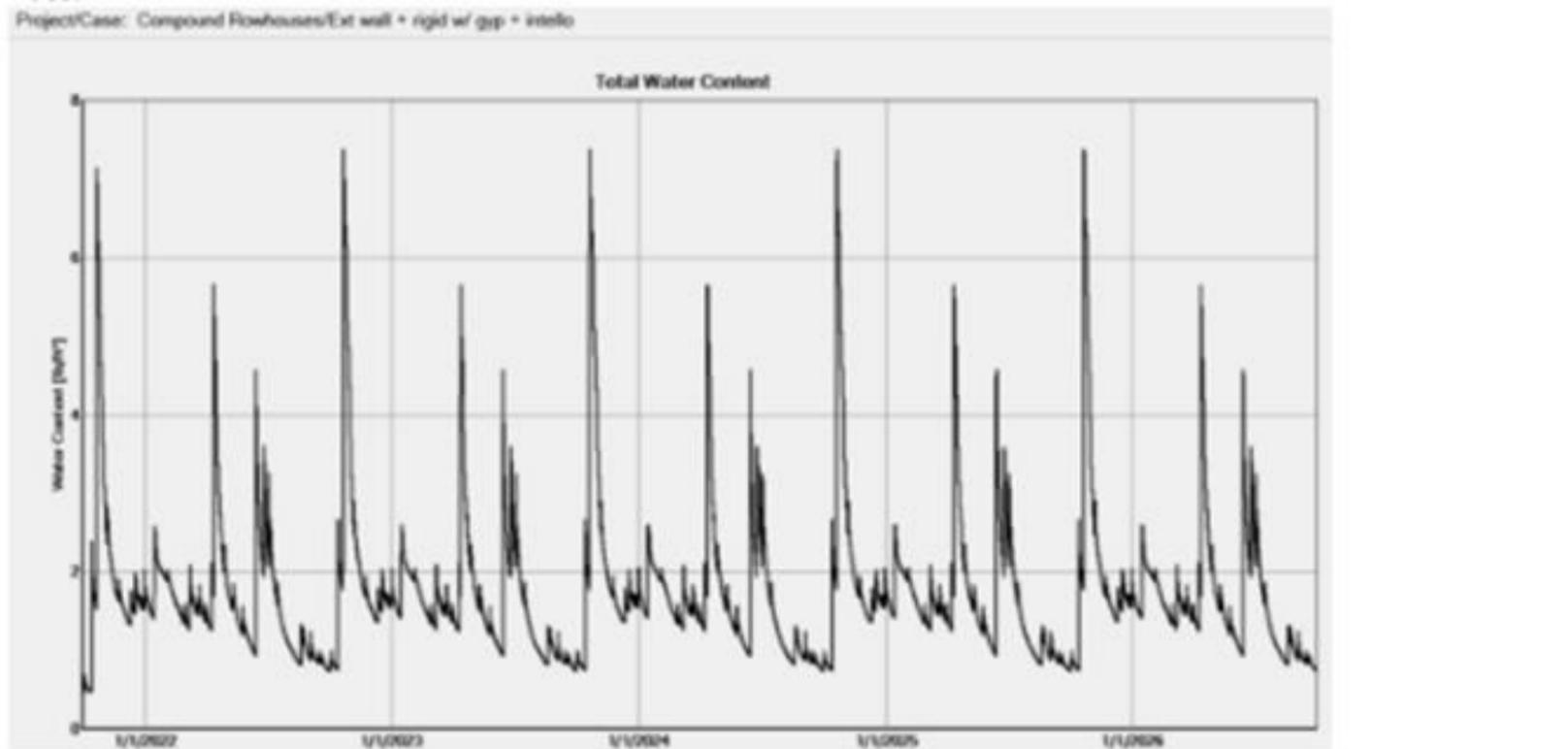
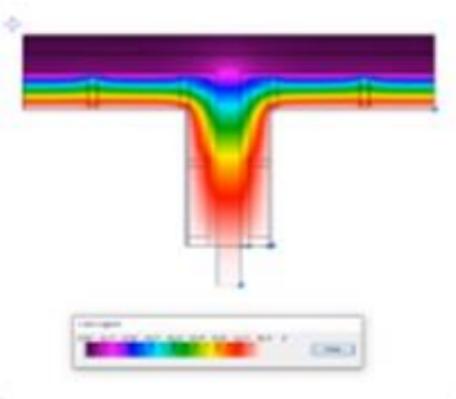
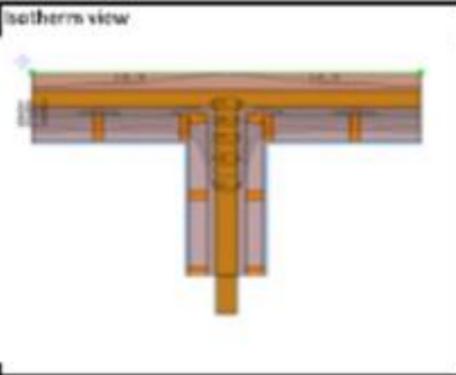
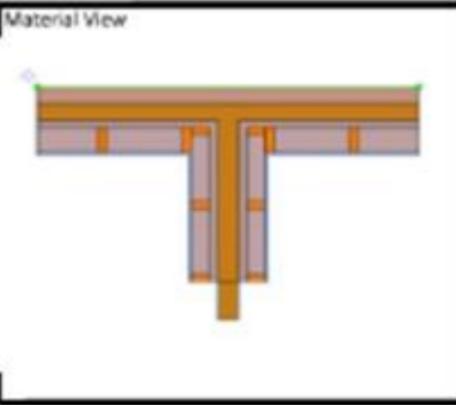
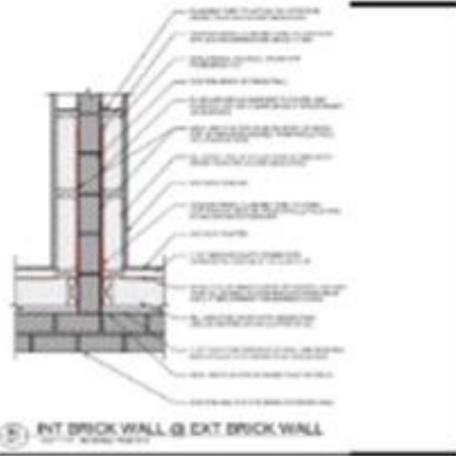
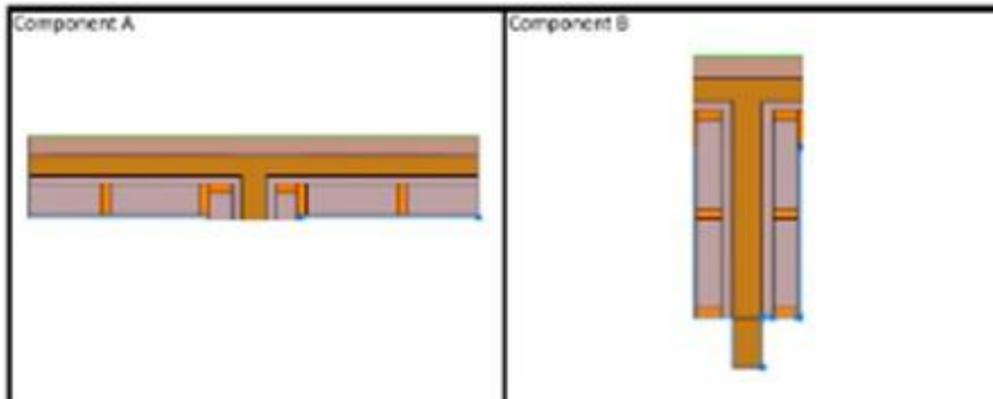
**Component**

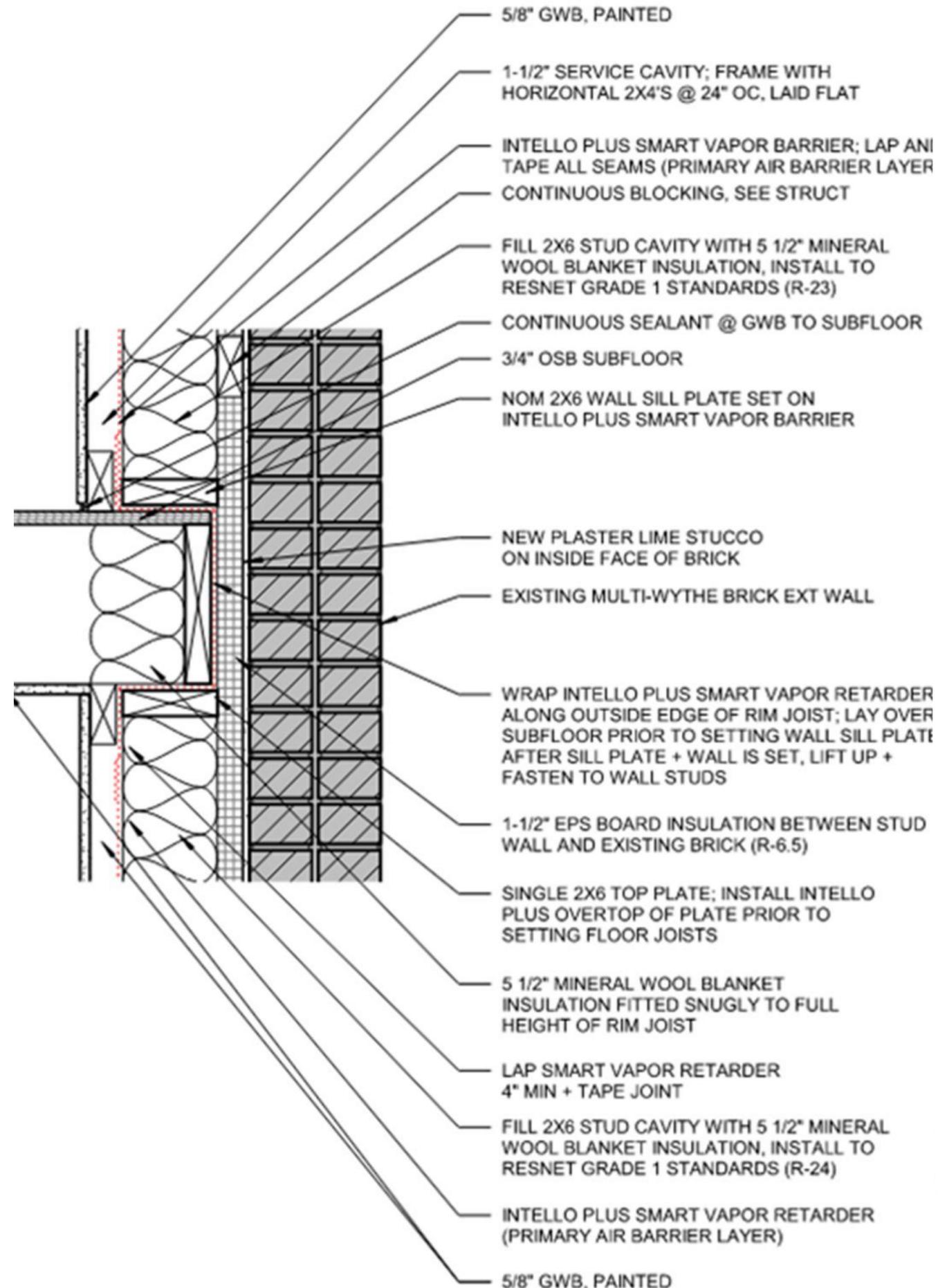
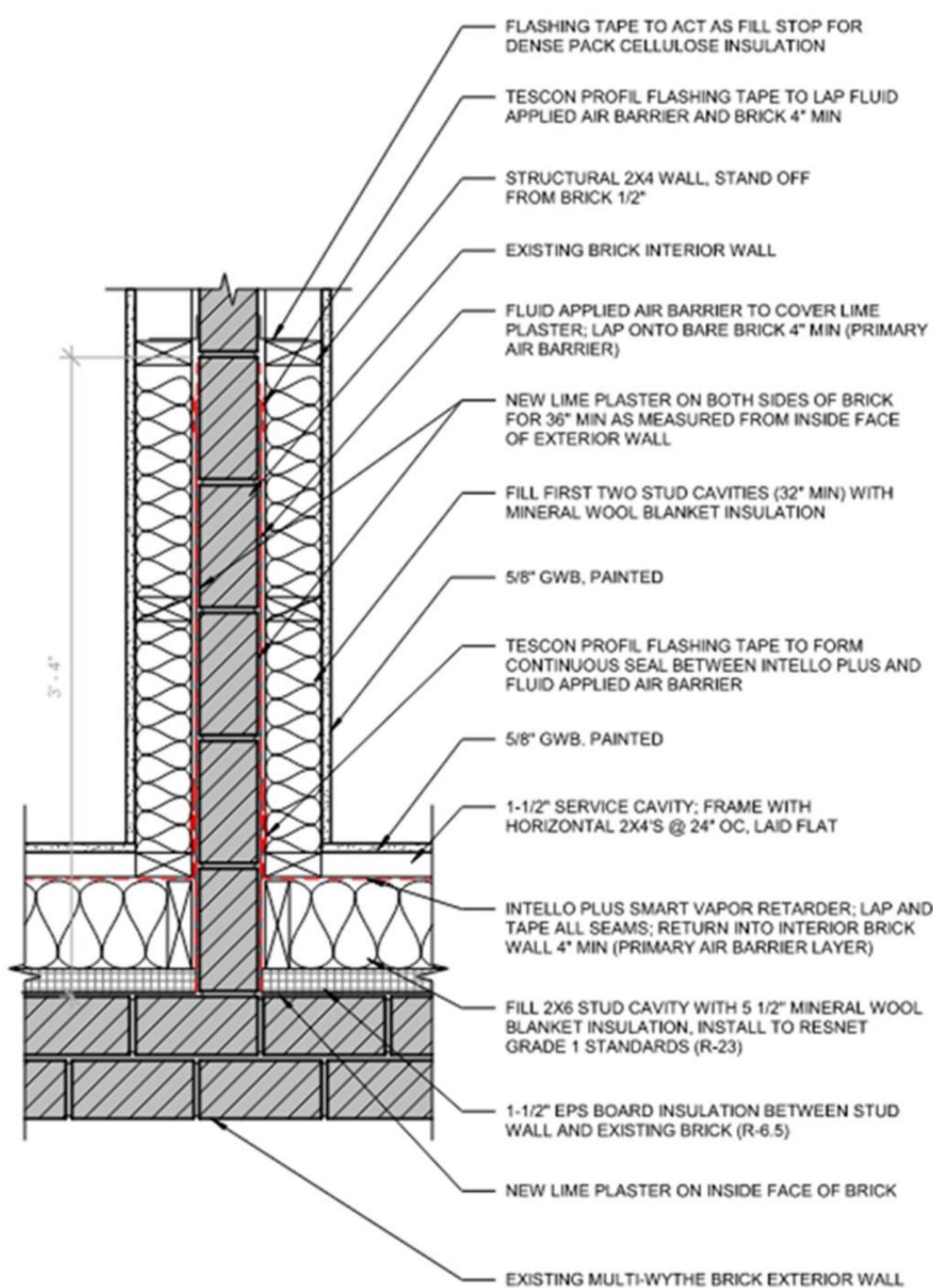
Component	U (btu/hr.sq.ft)	dT (F)	L (in)	ULdT (btu/hr.ft)	error (%)
Component A	0.0444	54	62.50	12.49	1.49%
Wall 1XF6	0.044	54.00	62.50	12.49	1.49%
Component B	0.0782	0	35.5	0.00	1.49%
Interior Old Party Wall	0.0782	0.00	35.50	0.00	1.49%

**Psi**

	PsidT (btu/hr.ft)	dT (F)	Psi (btu/hr.ft)	Psi for WUFI (btu/hr.ft)
Interior	5.21	54.00	0.097	<b>0.018</b>
Exterior	-3.32	54.00	-0.061	

Average psi value is too far off from individual interior and exterior values, please check yellow inputs or use the complete psi value calculated in cell B4 or B5.





Project: Passive house verification

Localization/Climate: BALTIMORE BLT-WASHINGTON INT MD

Building: PH case: Passive house: Residential

Zone 1

Visualized components

- Component 1: 1XF6 - Retrofitted Existing Brick Wall
- Component 2: Concrete Slab
- Component 3: Existing Rubble Foundation Wall
- Component 4: 1XF6 - Retrofitted Existing Brick Wall
- Component 5: R1 - TPO on 12" Polyiso Insulation
- Component 6: R1 - TPO on 12" Polyiso Insulation
- Component 7: Lamilux FE Passivhaus Skylight
- Component 8: Lamilux Skylight Upstand
- Component 9: Lamilux Skylight Upstand
- Component 10: Component 10
- Component 11: Lamilux Skylight Upstand
- Component 12: 0X6 - New Construction Wall
- Component 13: 0X6 - New Construction Wall
- Component 14: 1XF6 - Retrofitted Existing Brick Wall
- Component 15: Existing Rubble Foundation Wall
- Component 16: Roof Deck - TPO, Combination Polyiso + Mineral Wool Blanket
- Component 17: Tarredo Passiva Category 1 Entry Door
- Component 18: Optiwin Resista Fixed Sidelight
- Component 19: Optiwin Entrada Entry Door
- Component 20: Optiwin Resista Inswinging Casement
- Component 21: Optiwin Resista Inswinging Casement
- Component 22: Optiwin Resista Tilt/Turn Balcony Door

Not visualized components

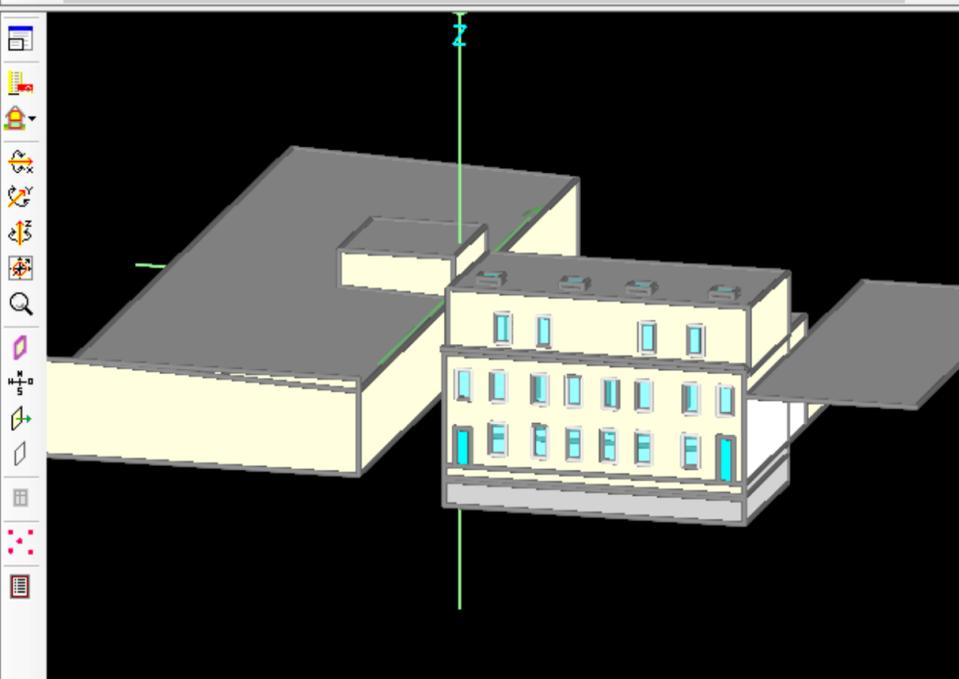
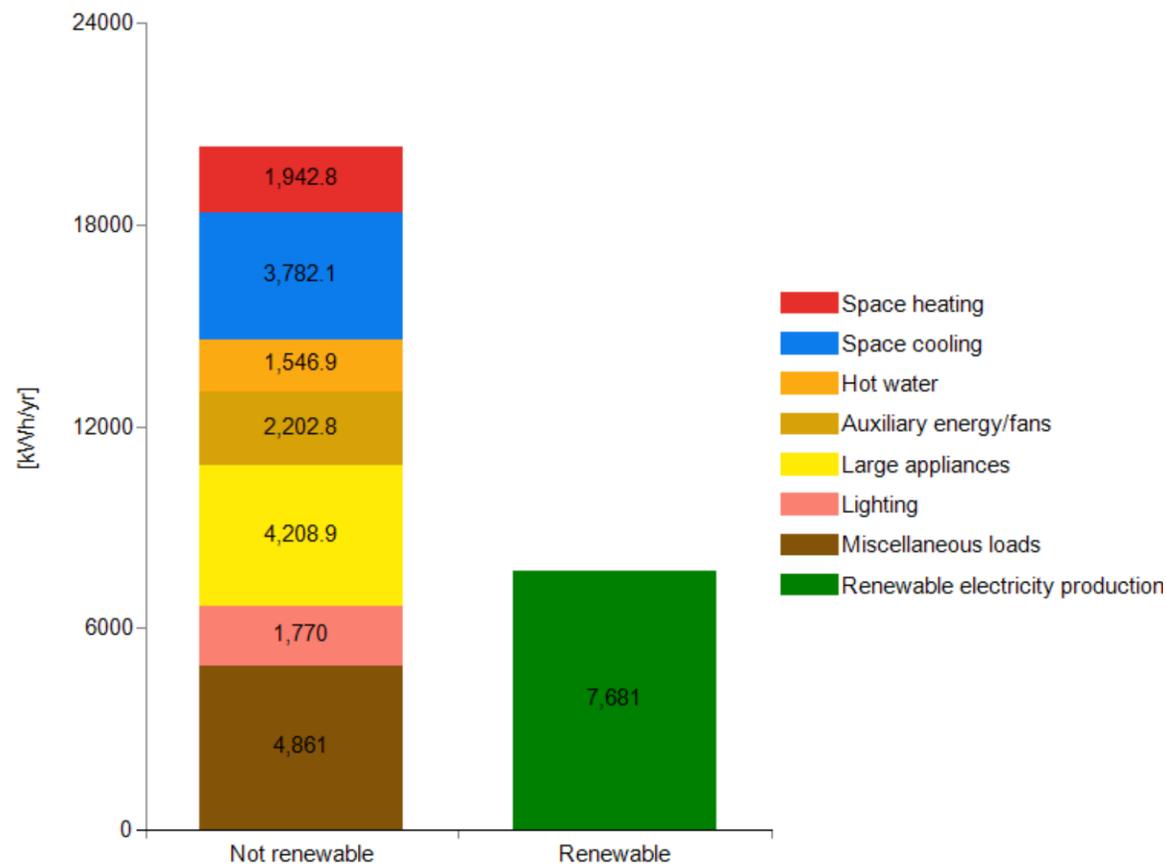
- Thermal bridges
- Internal Loads/Occupancy
- Ventilation/Rooms

English/IP/Outer dimensions/PHIUS+ 2018 | Assign data | Project/Cases/Case 1

General | Report: data & results

Scope: Passive House Site Energy Report | View: Normal

### OVERVIEW



Data state/results | Calculate WUFI shading

Heating demand:	4.28 kBtu/ft²yr	0 1 2 3 4 5 6 7 8 9	✓
Cooling demand:	6.46 kBtu/ft²yr	0 1 2 3 4 5 6 7 8 9	✓
Heating load:	3.91 Btu/hr ft²	0 1 2 3 4 5 6	✓
Cooling load:	2.98 Btu/hr ft²	0 1 2 3 4 5 6	✓
Source energy:	3,537 kWh/Person yr	0 2000 4000 6000 8000 10000	✓
Site energy:	8.36 kBtu/ft²yr	0 1.5 3 4.5 6 7.5 9	✓

# WUFI Passive Energy Model

## The Compound

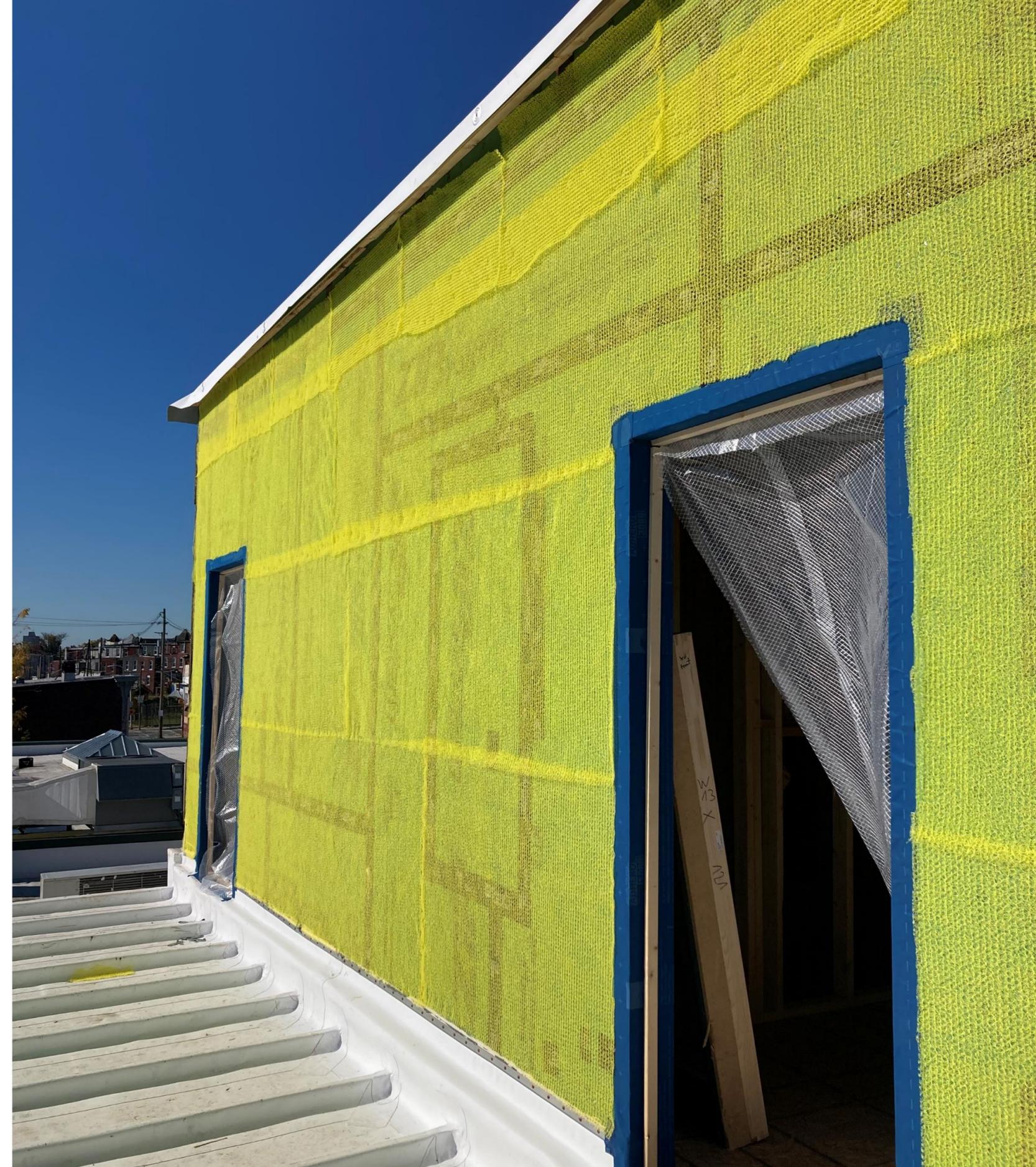
**8.4**  
Kbtu/sf/  
yr

**83%**  
2030 savings



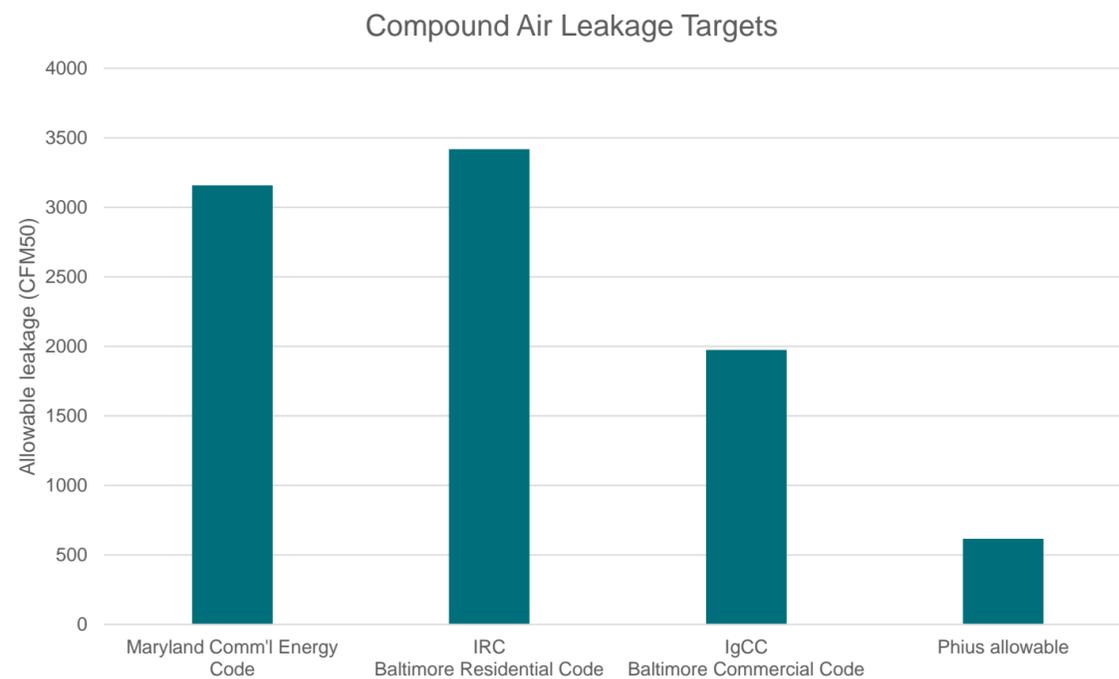






# Cornice

- The existing wood cornice detail proved to be a large source of air leakage during the midpoint blower door test, and complicated hitting the strict Phius air leakage target.





# Aerobarrier & Doors

- Despite the team's best detailing and air sealing, the target CFM50 value was still slightly out of reach.



# Accolades

- [One of the?] First Phius pre-certified building in Baltimore
- First Phius pre-certified masonry retrofit in Maryland

## Work Remaining

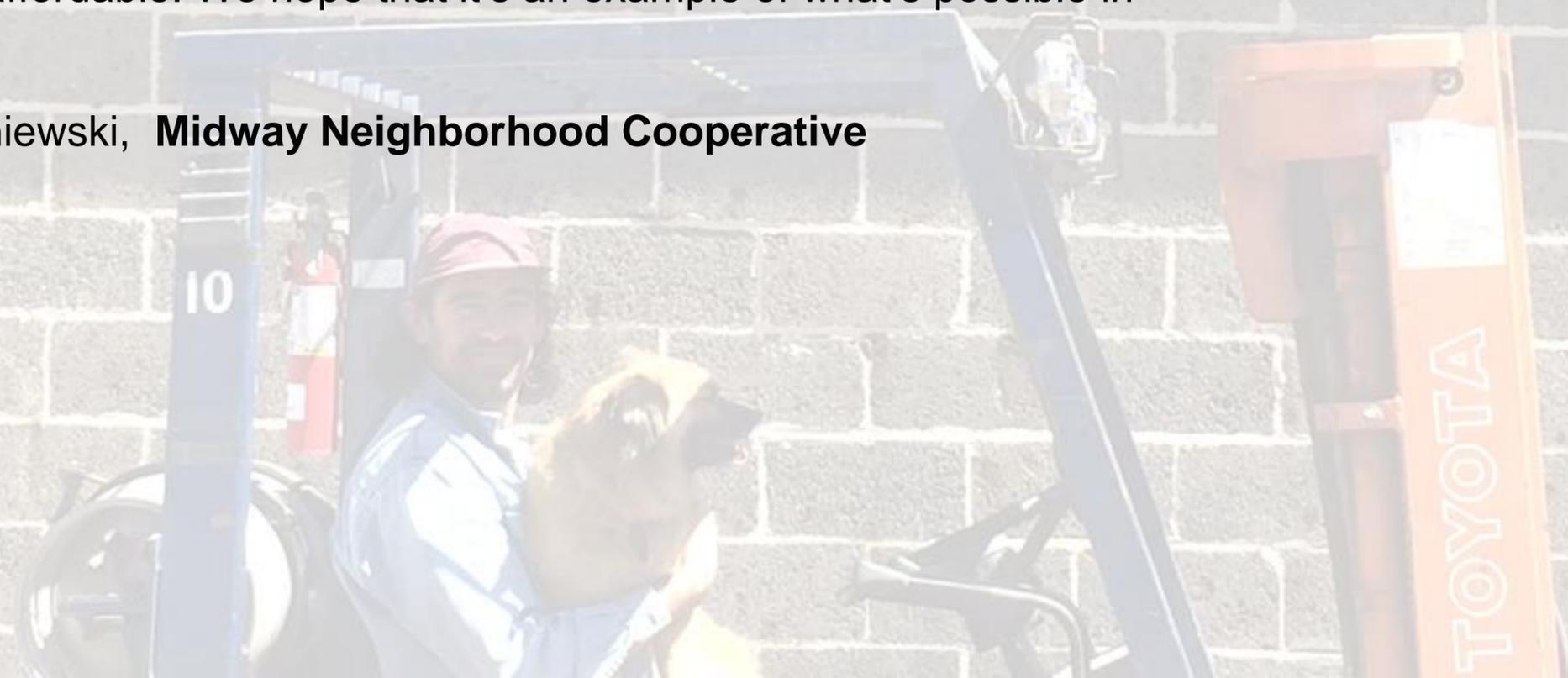
- Finishes
- Final MEP installs & verification
- Certificate of Occupancy



# Community Vision

Modeling healthy, high-quality housing for our community and neighborhood is a major motivation for working with passive buildings. Many Baltimore artists and also many Midway residents don't have a lot of financial power, and our neighborhood is one that has been disinvested for decades...We wanted to upend this trend and show that these two overlapping groups actually deserve the highest quality housing in terms of environmental health, functionality, and beauty—that's also affordable. We hope that it's an example of what's possible in Baltimore.

– Nick Wisniewski, **Midway Neighborhood Cooperative**





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