



First-Time Multi-Family PHIUS+

lessons from west side flats, st. paul, minnesota

PHIUS Conference October 15, 2021
Tarrytown, New York



presenters



Elizabeth Turner, AIA, CPHC
Precipitate, PLLC

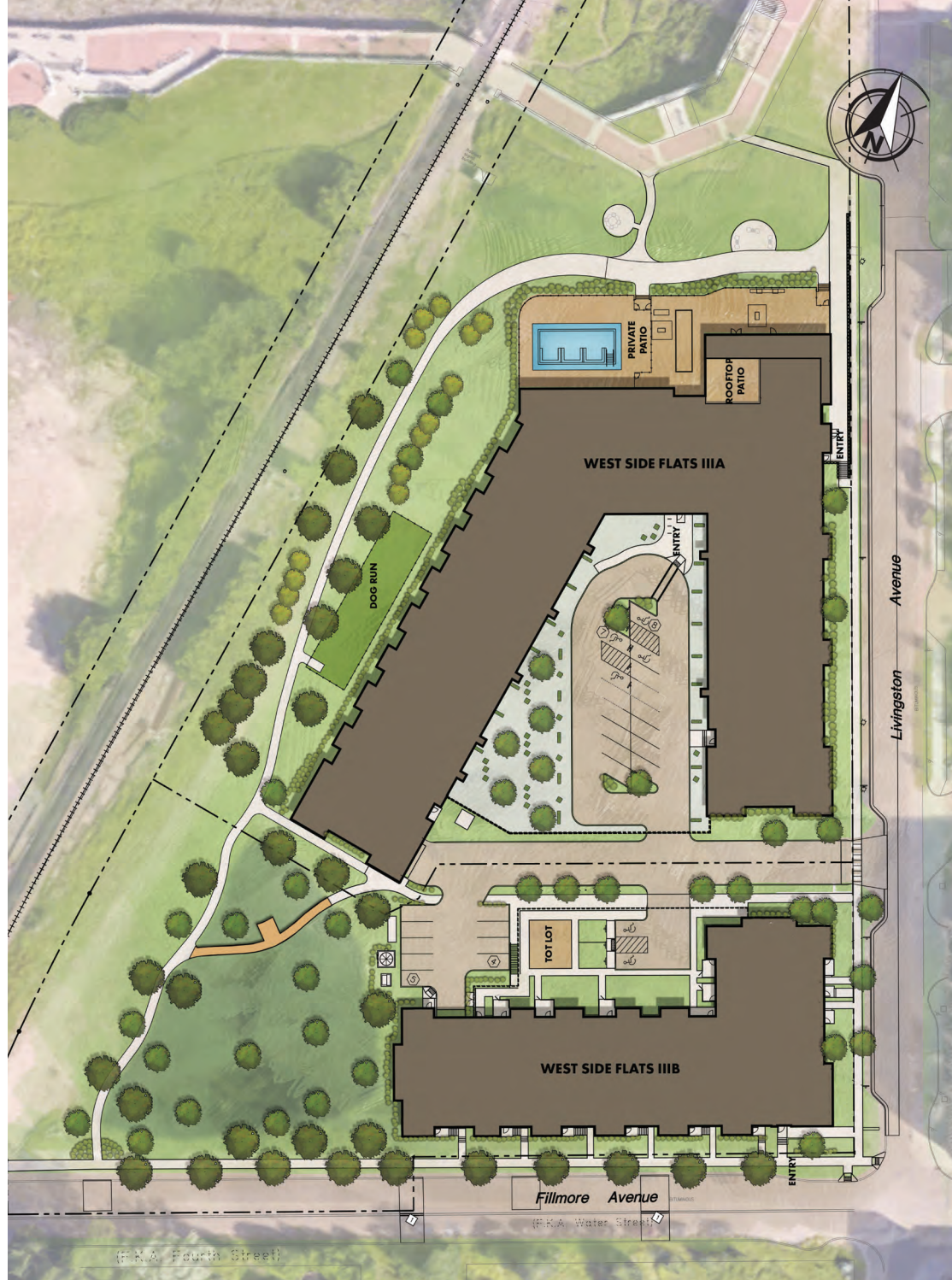


Peter Schmelzer, AIA, CPHC
Kaas Wilson Architects

learning objectives

- 1 Understand how **first-time PHIUS** projects may need to take a **different approach** than seasoned teams in order to successfully achieve PHIUS+ certification
- 2 Learn how the skills of a CPHC for new project teams must expand from WUFI Passive energy modeling only to **soft skills like relationship building and leading collaborative design workshops**
- 3 Explore the critical role that **CPHCs** play during the **construction administration** process
- 4 Leave the session equipped with **best practices** for completing your first multi-family PHIUS project

site plan





ADVANCE EQUIPMENT CO.
Sherman

1-866-GET-DUKE

TRANS
CUBE

1202
3

FRANA
companies

CONSTRUCTION SITE
NO ENTRY
WITHOUT PERMISSION
FRANA



WEST SIDE FLATS



project metrics

Occupants	227
GSF	97,519
iCFA	93,010
Envelope Area	88,068
Envelope Area / iCFA	0.95
iCFA / person	410

PHIUS+ 2018 Space Conditioning Criteria Calculator v2

METHOD: CALCULATOR

UNITS: IMPERIAL (IP)

STATE / PROVINCE: MINNESOTA

CITY: ST PAUL DOWNTOWN AP

Envelope Area (ft²) / iCFA (ft²) **0.95** or enter here:

iCFA (ft²) / person **410** or enter here:

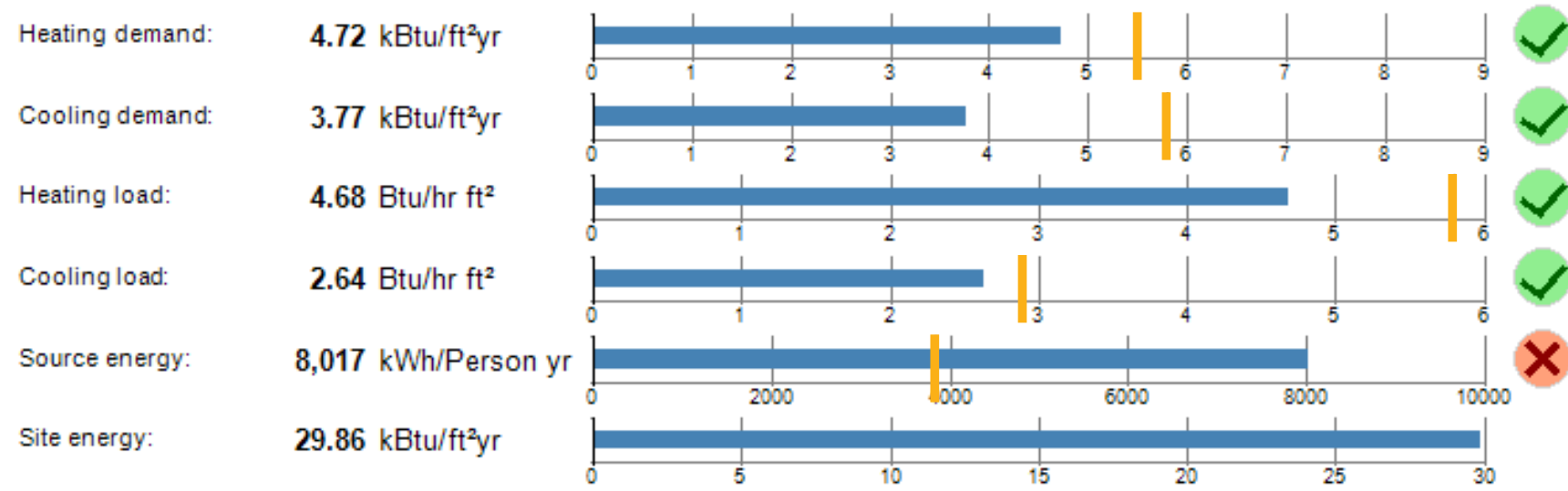
**Calculator method is used for official certification targets.*

Space Conditioning Criteria

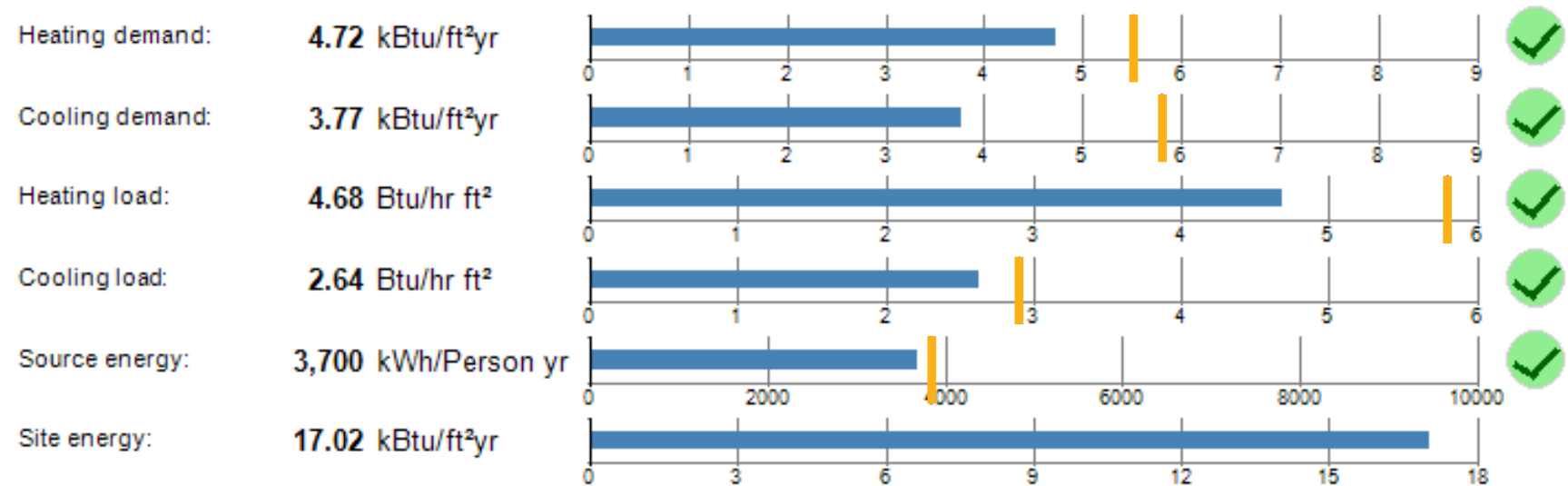
Annual Heating Demand	5.5	kBTU/ft ² yr
Annual Cooling Demand	5.8	kBTU/ft ² yr
Peak Heating Load	5.8	BTU/ft ² hr
Peak Cooling Load	2.9	BTU/ft ² hr

energy targets

WITHOUT SOLAR



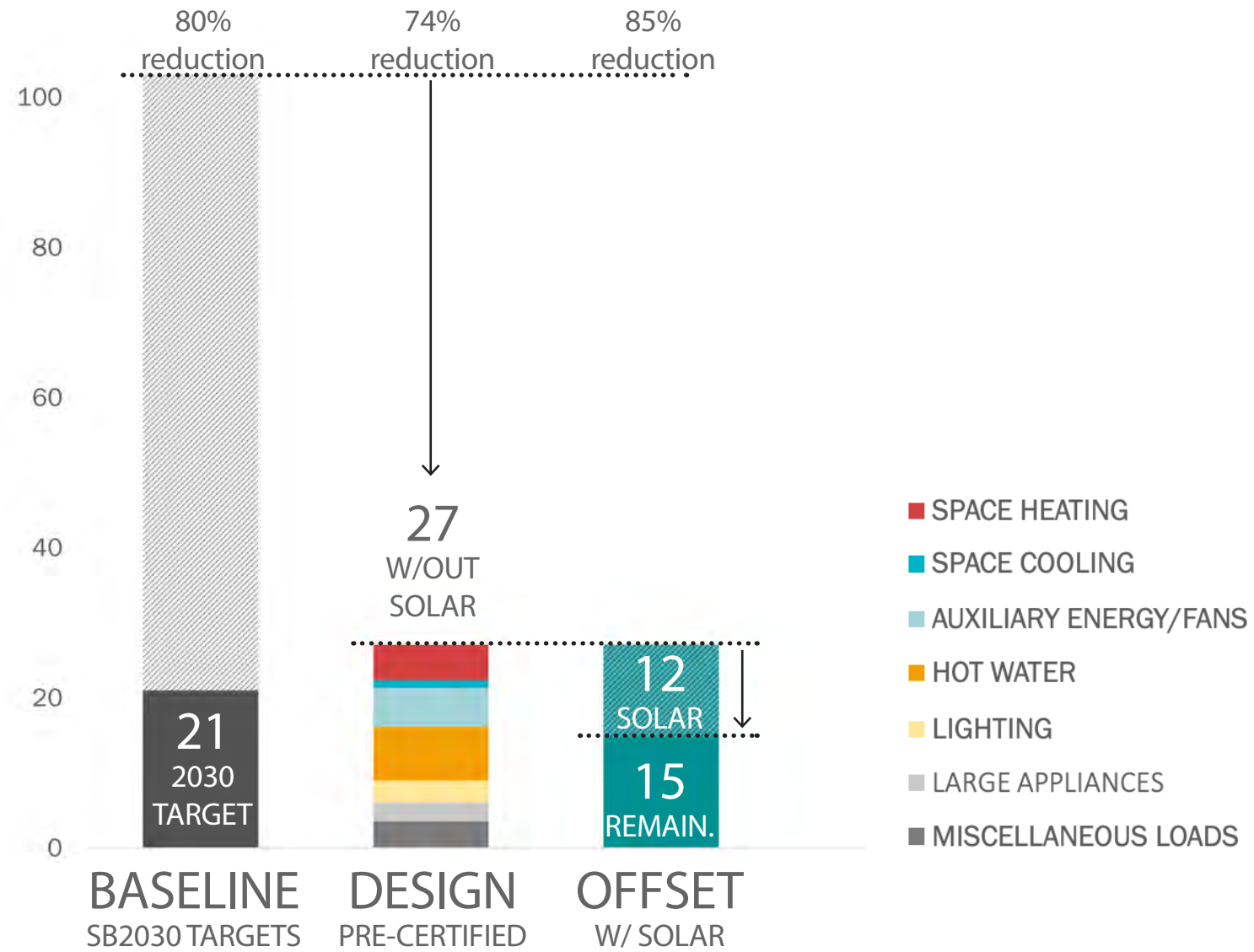
WITH SOLAR



screenshots from WUFI Passive

annual energy use

site | kBtu/GSF/year

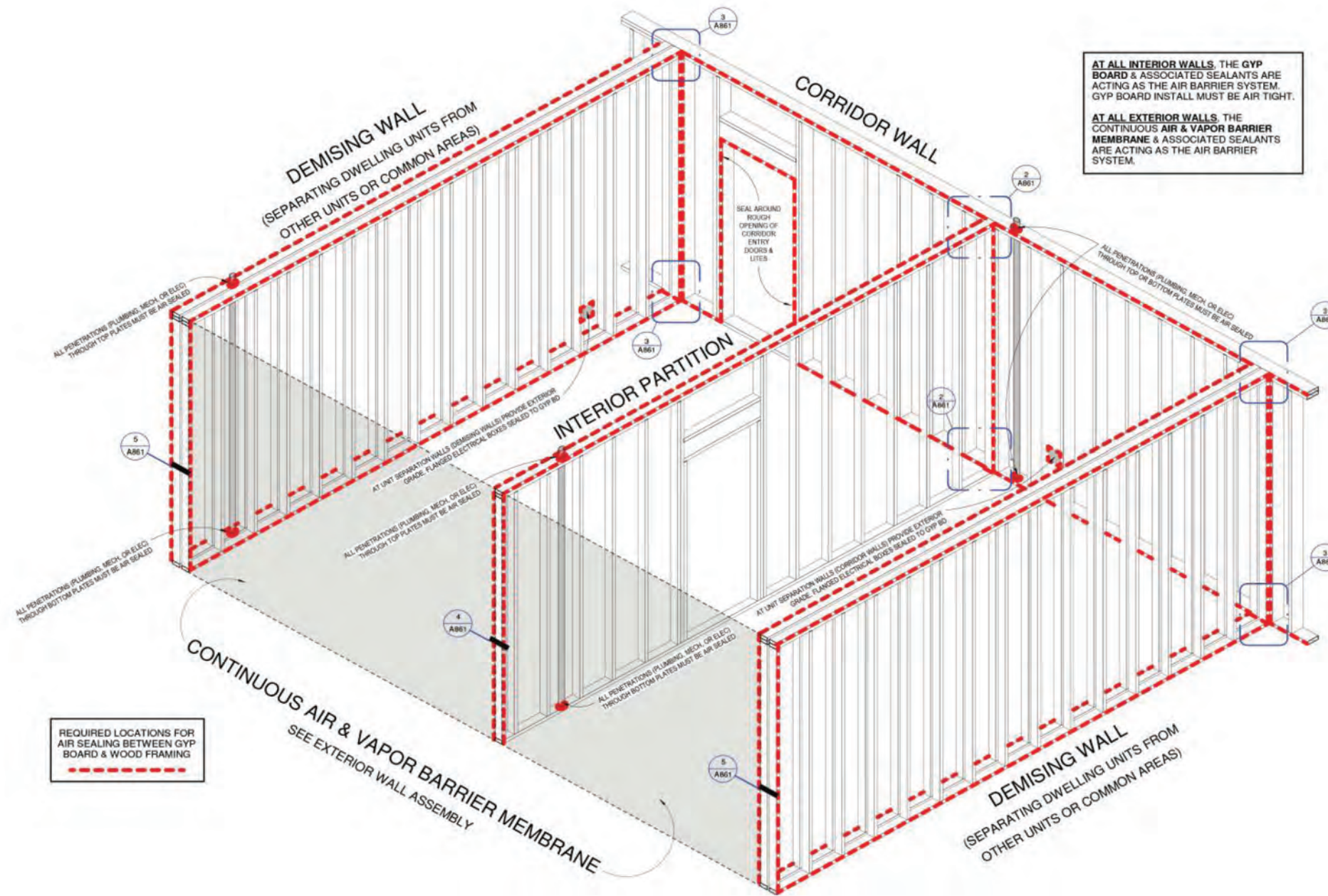


project challenges

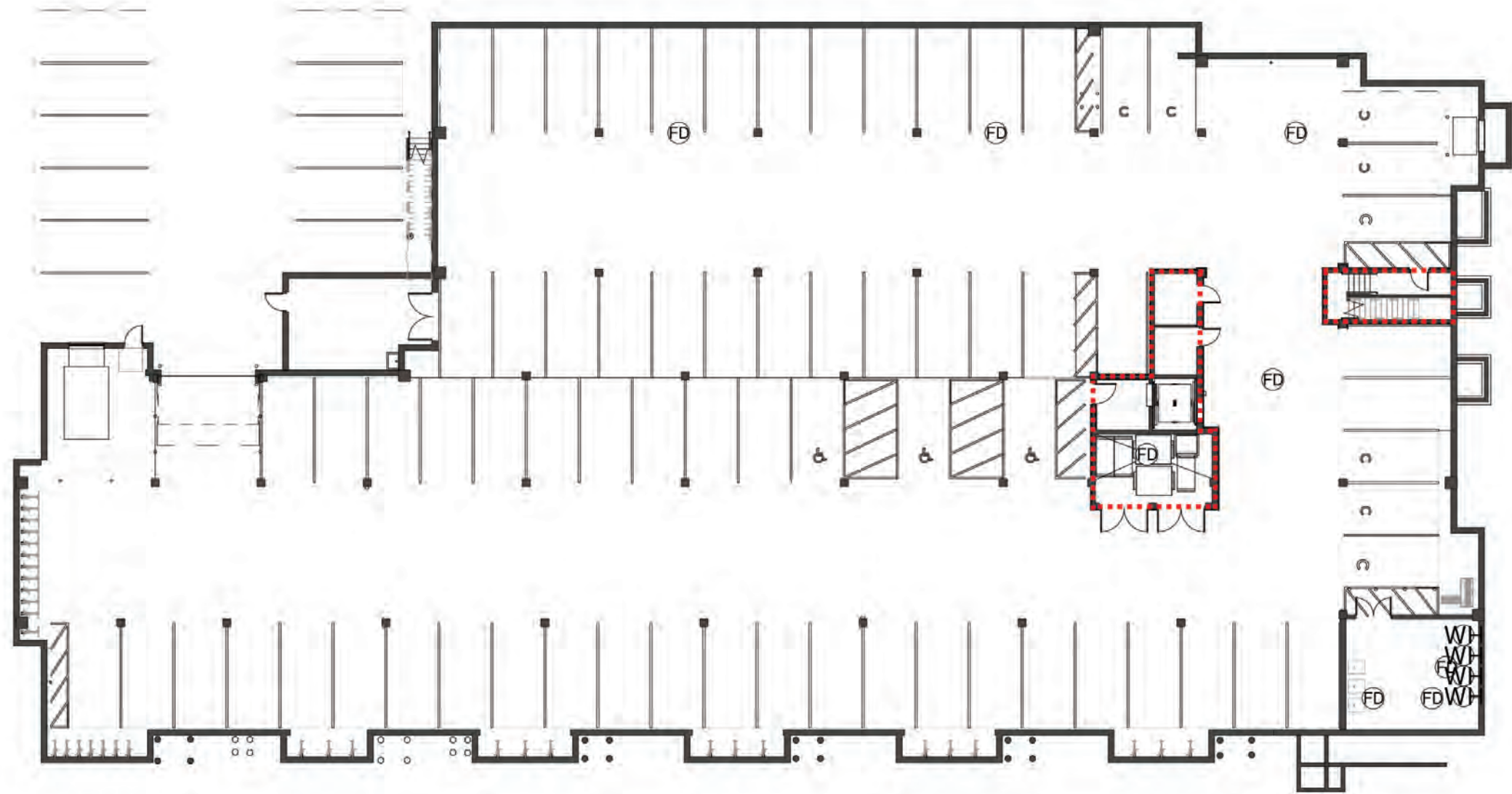
- Timeline
- Passive House comes late to the table
- Starts and Stops (financing)
- Type IIIB Construction above a Podium
Fire treated lumber
5 stories, so NFPA 285 testing required
- This was the first Passive House project for the Architect, Engineer, and Contractor



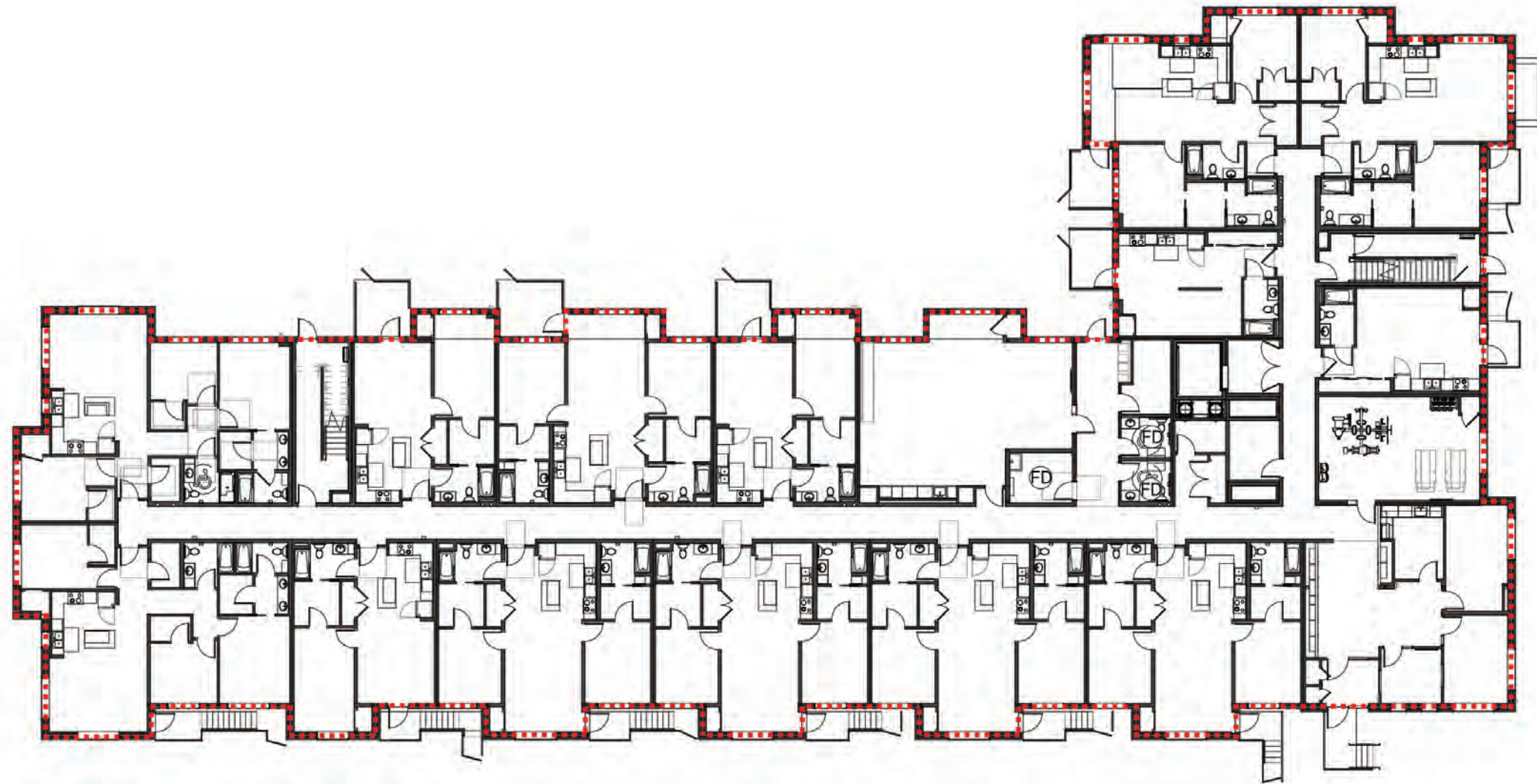
collaborative design workshops



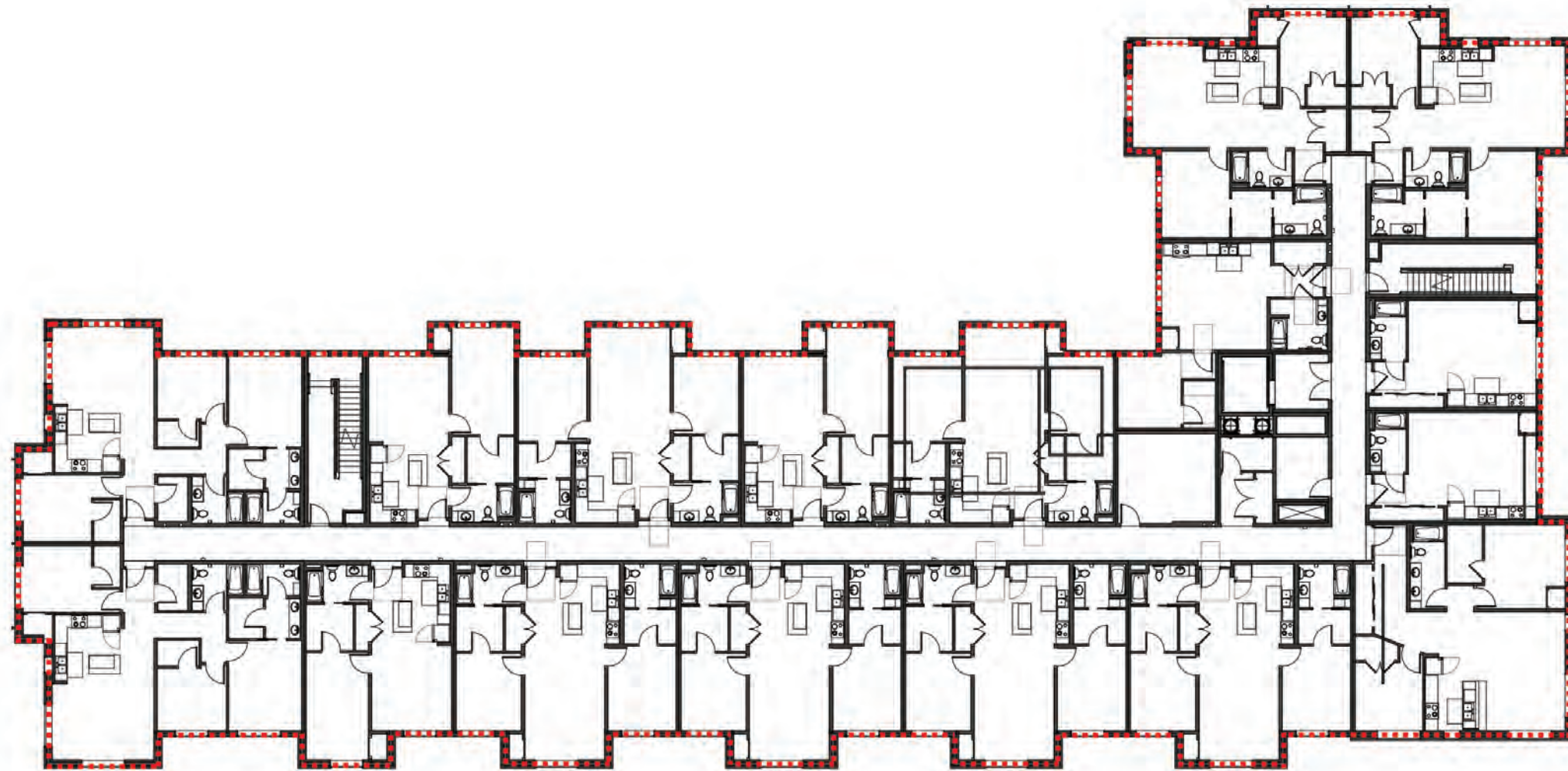
passive house envelope: garage



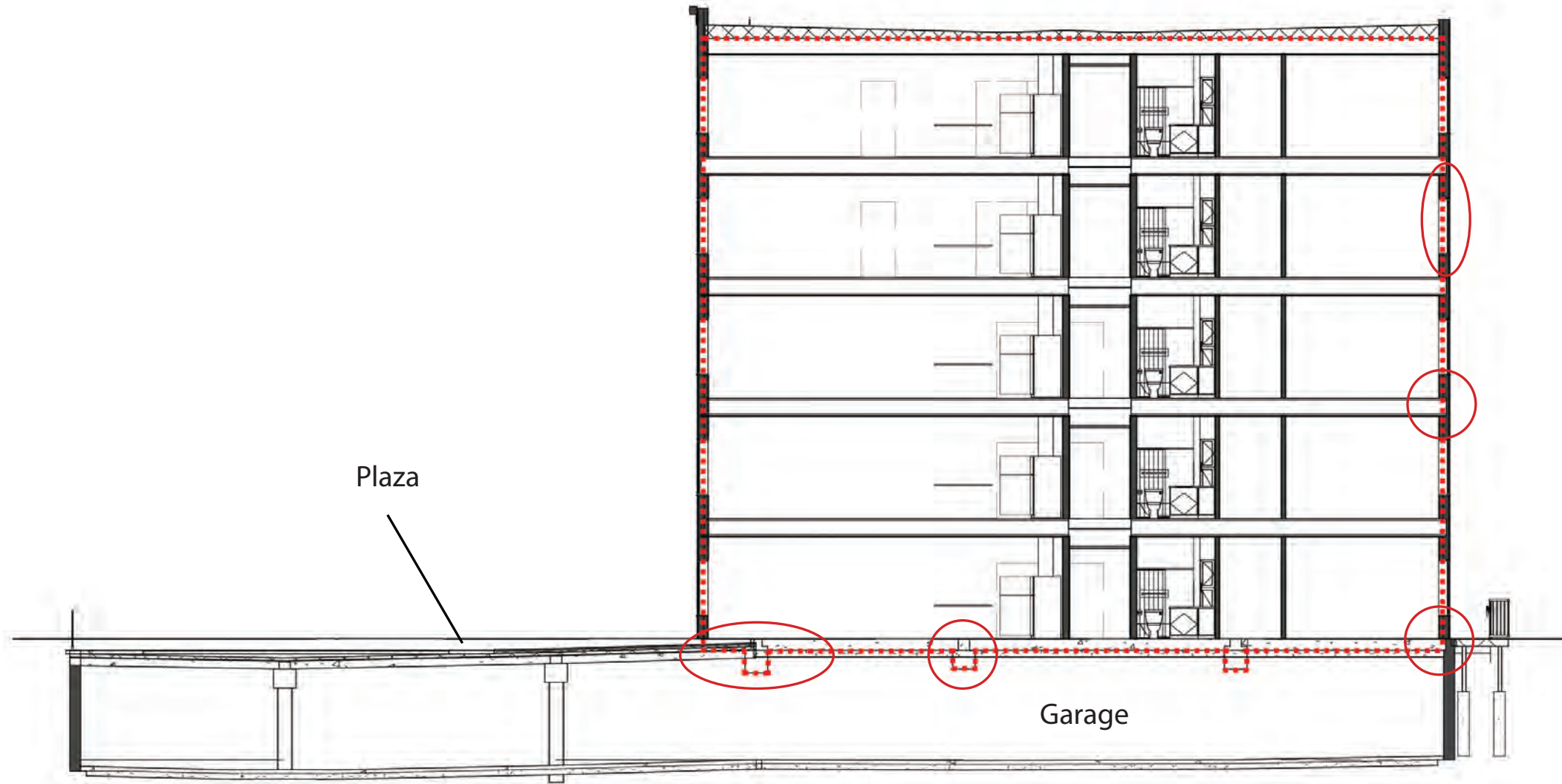
passive house envelope: first floor



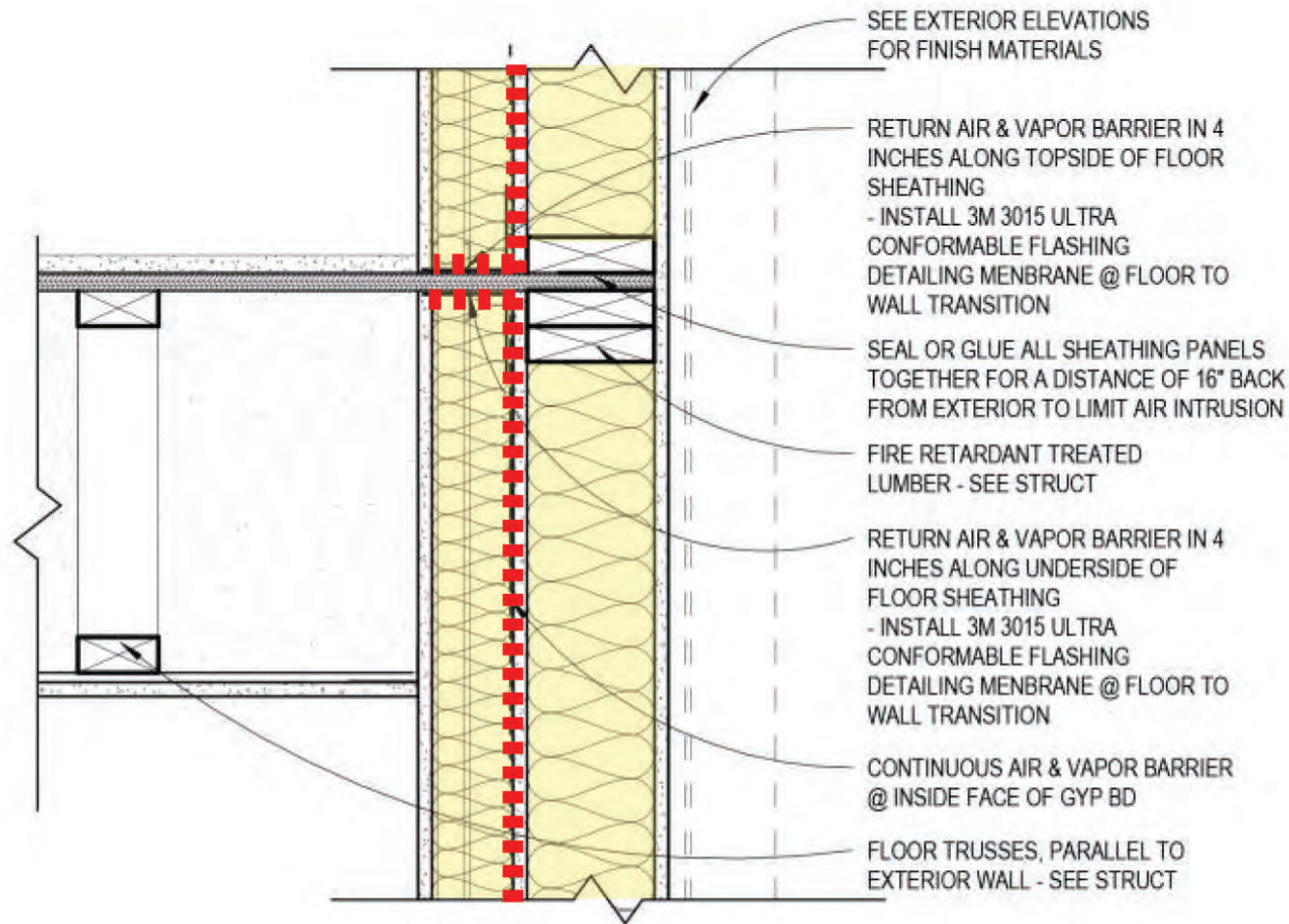
passive house envelope: floors 2-5



passive house envelope: section

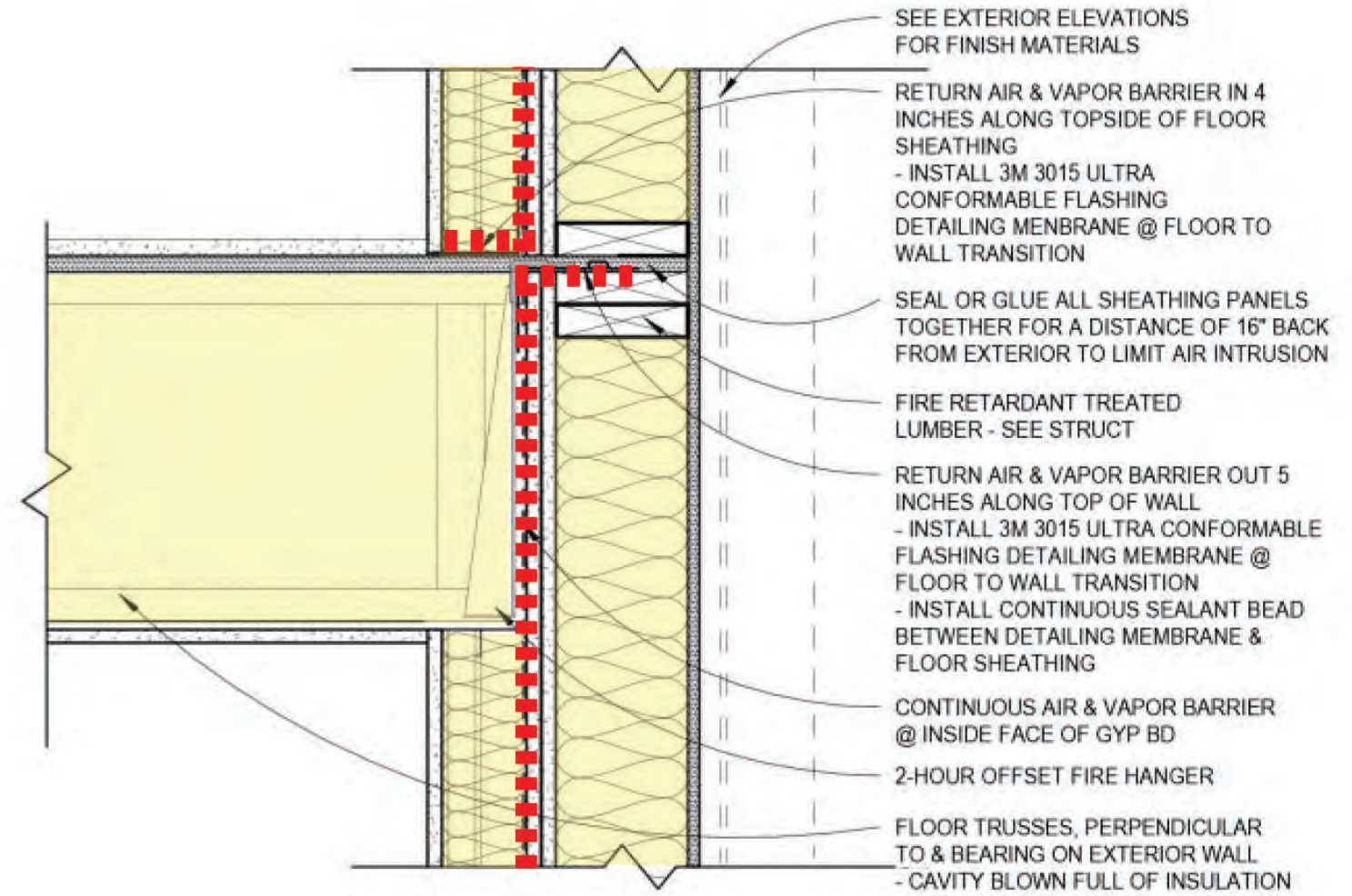


passive house envelope



Exterior Wall - Floor Truss @ Ext. Wall
Section - 1HR WALL1

17
1 1/2" = 1'-0"



Exterior Wall - Floor Truss @ Ext. Wall
Section - 2HR WALL1

15
1 1/2" = 1'-0"

RH
RH



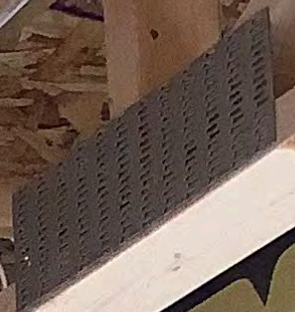
DensGlass[®] Sheathing

WARNING! CAUSES EYE IRRITATION. OBSERVE GOOD INDUSTRIAL HYGIENE PRACTICES. WASH THOROUGHLY AFTER HANDLING. DO NOT EAT, DRINK OR SMOKE WHEN USING. IF SWALLOWED, CALL A DOCTOR IF YOU FEEL UNWELL. IF IN EYES, RINSE WITH WATER FOR SEVERAL MINUTES. REMOVE CONTACT LENSES, IF EYE IRRITATION PERSISTS, GET MEDICAL ATTENTION. STORE AWAY FROM STRONG ACIDS. DISPOSE IN ACCORDANCE WITH LOCAL AUTHORITY REQUIREMENTS. FOR ADDITIONAL FIRE SAFETY AND USE INFORMATION GO TO WWW.BUILDGP.COM/SAFETYINFO OR CALL 1-800-225-6119.

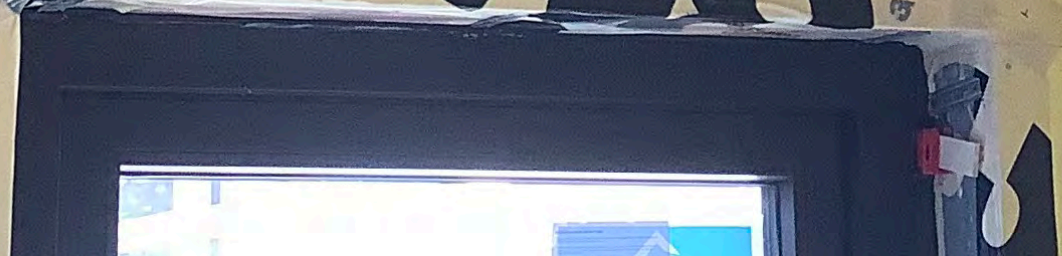
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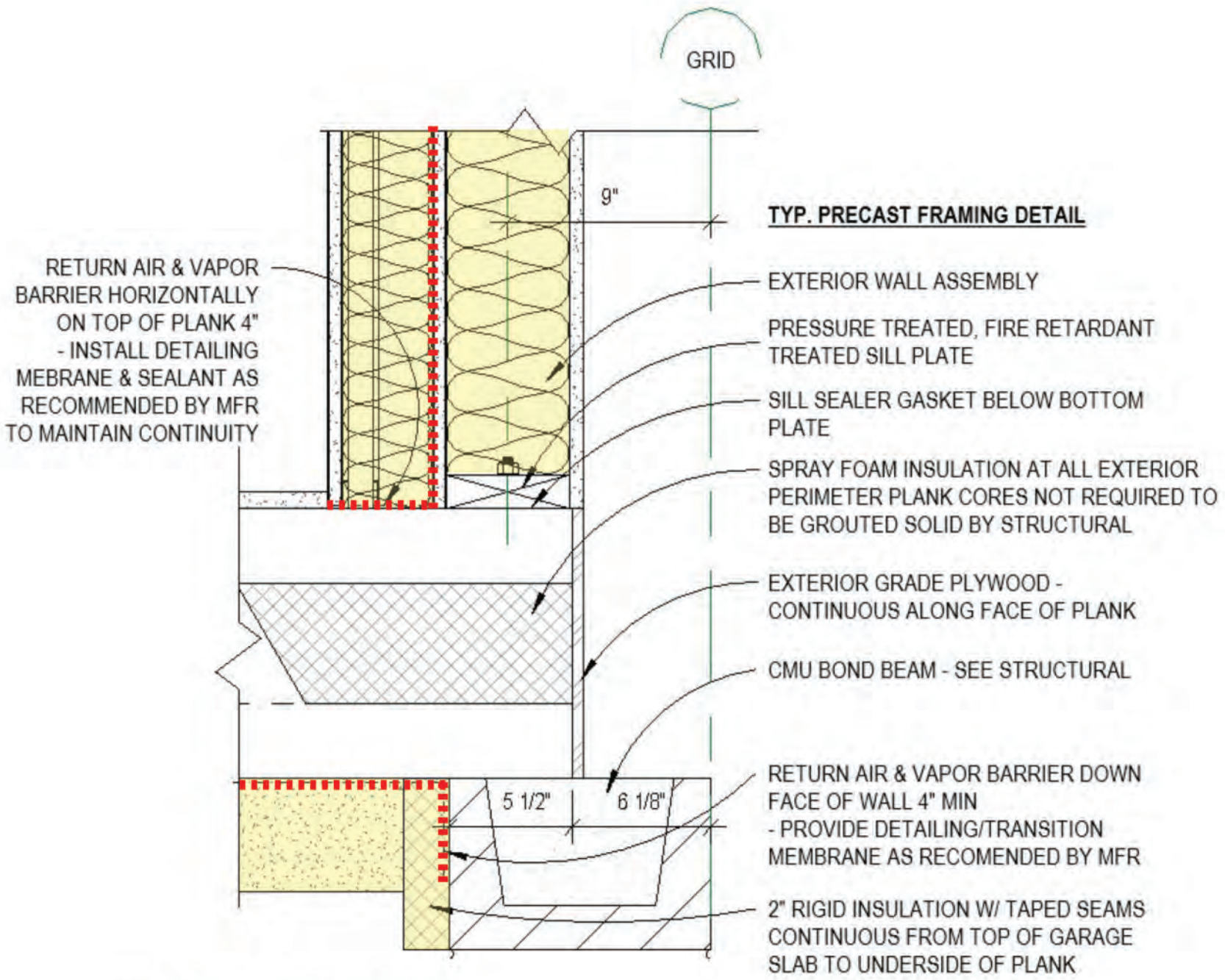
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Diap Opening



passive house envelope



16 5100 - Typical Precast
1 1/2" = 1'-0"





Tyvek

Tyvek

Tyvek

Tyvek

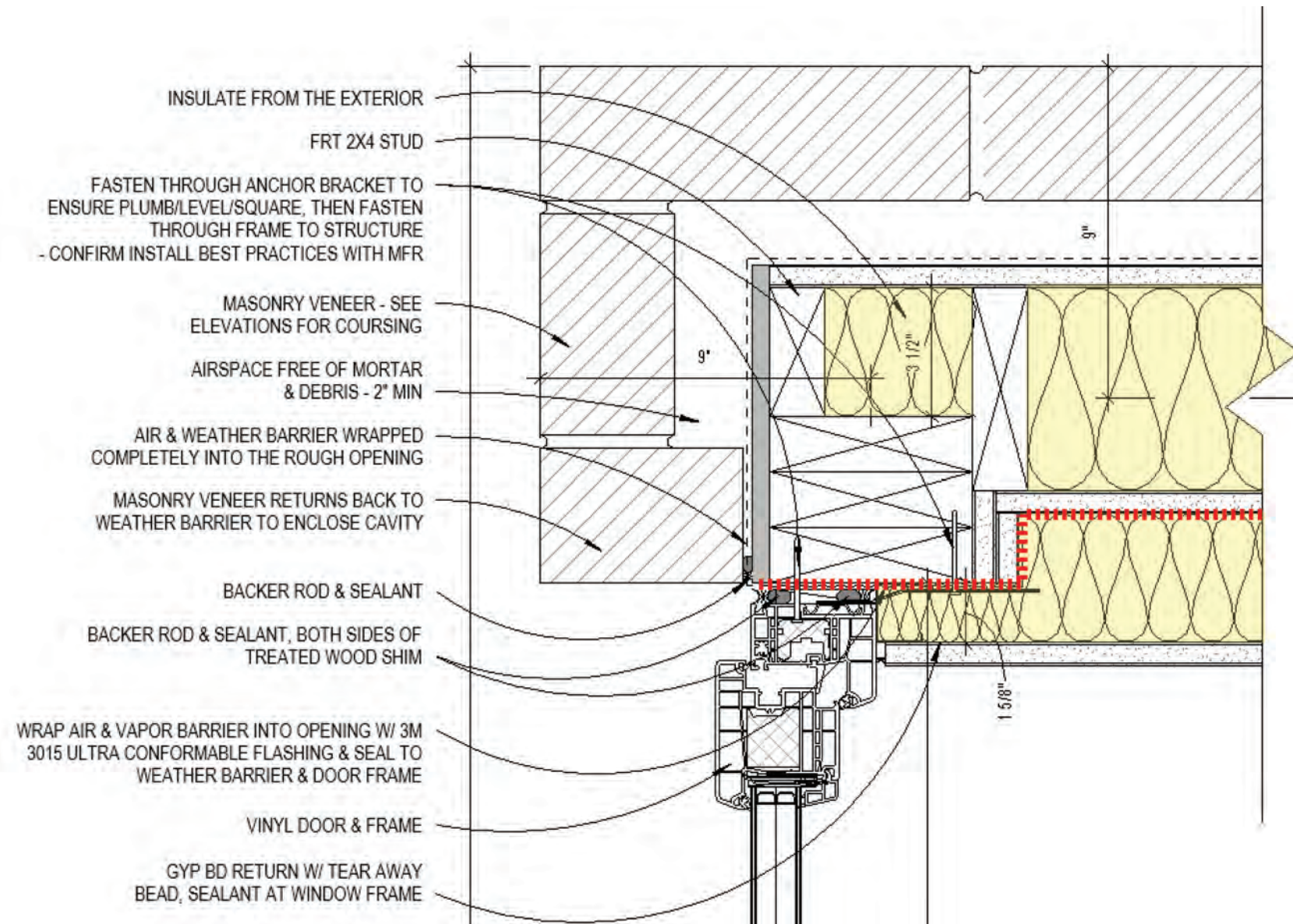
Tyvek

Tyvek

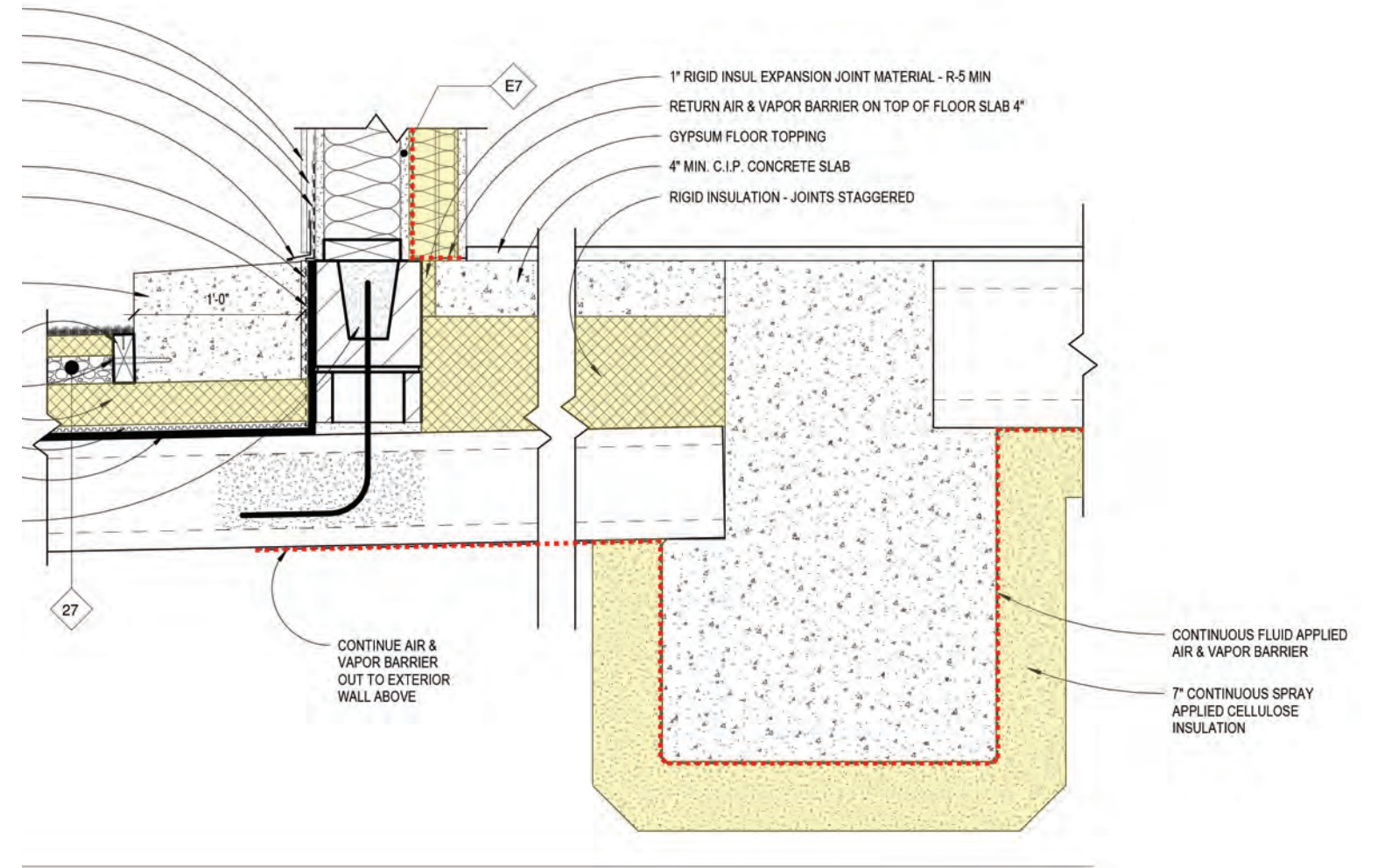
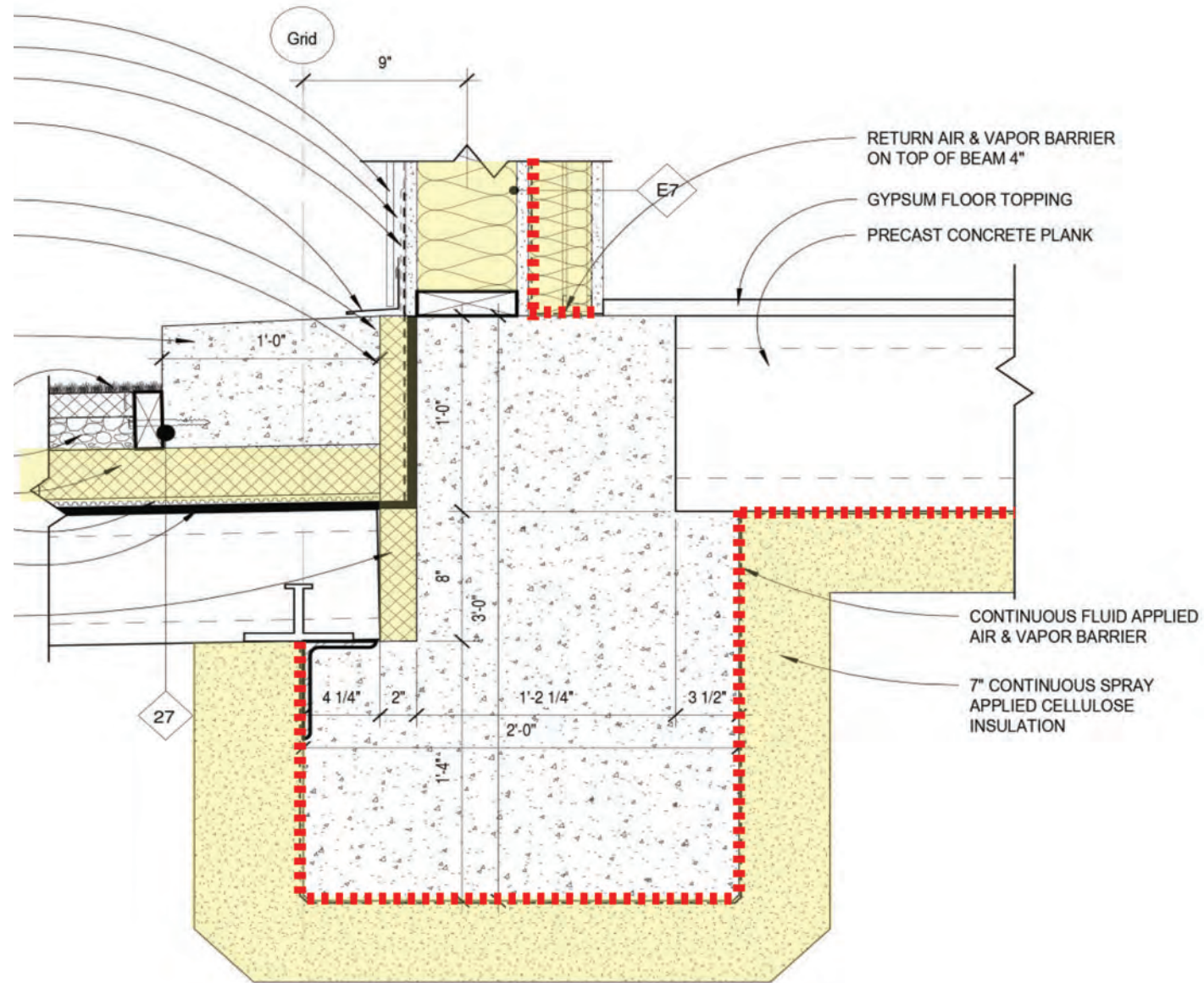
235

ADVANCE
SOMER
TUBE

detailing patio entry doors - larger frame

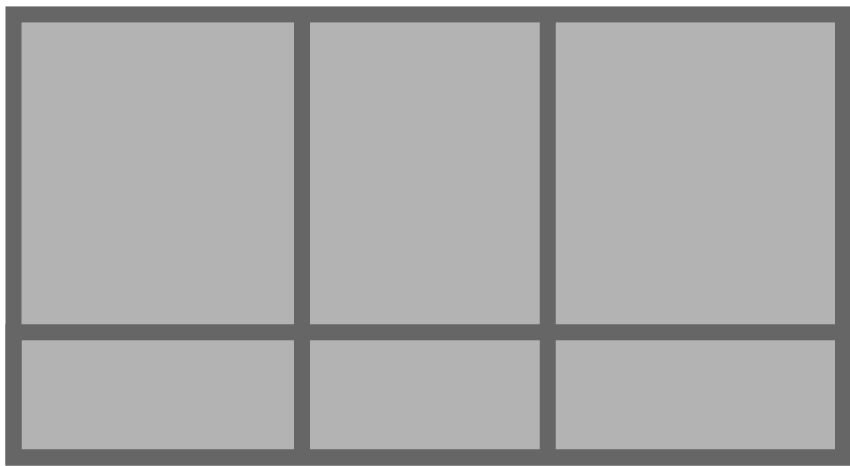
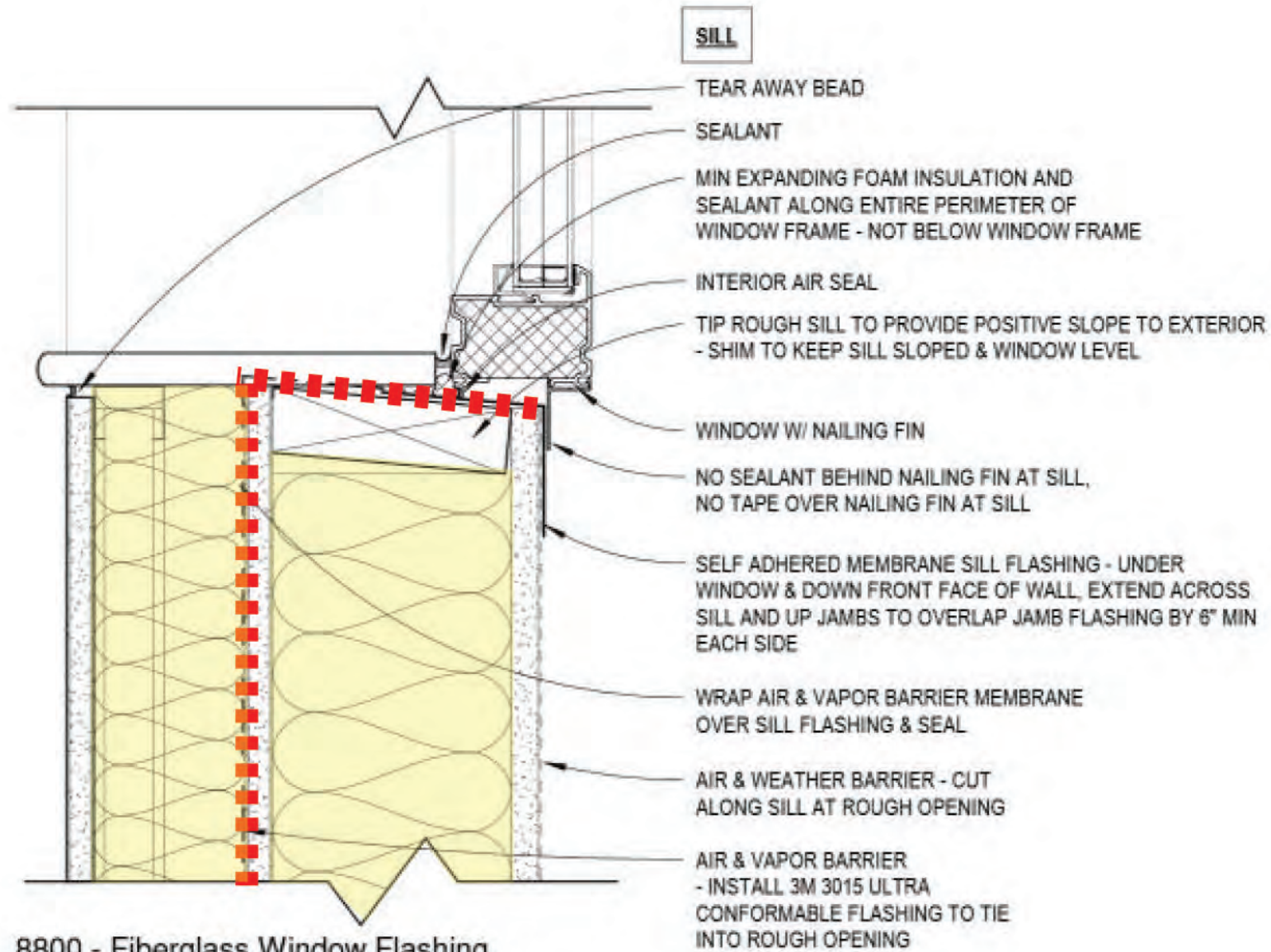


beam / wall / plaza connection





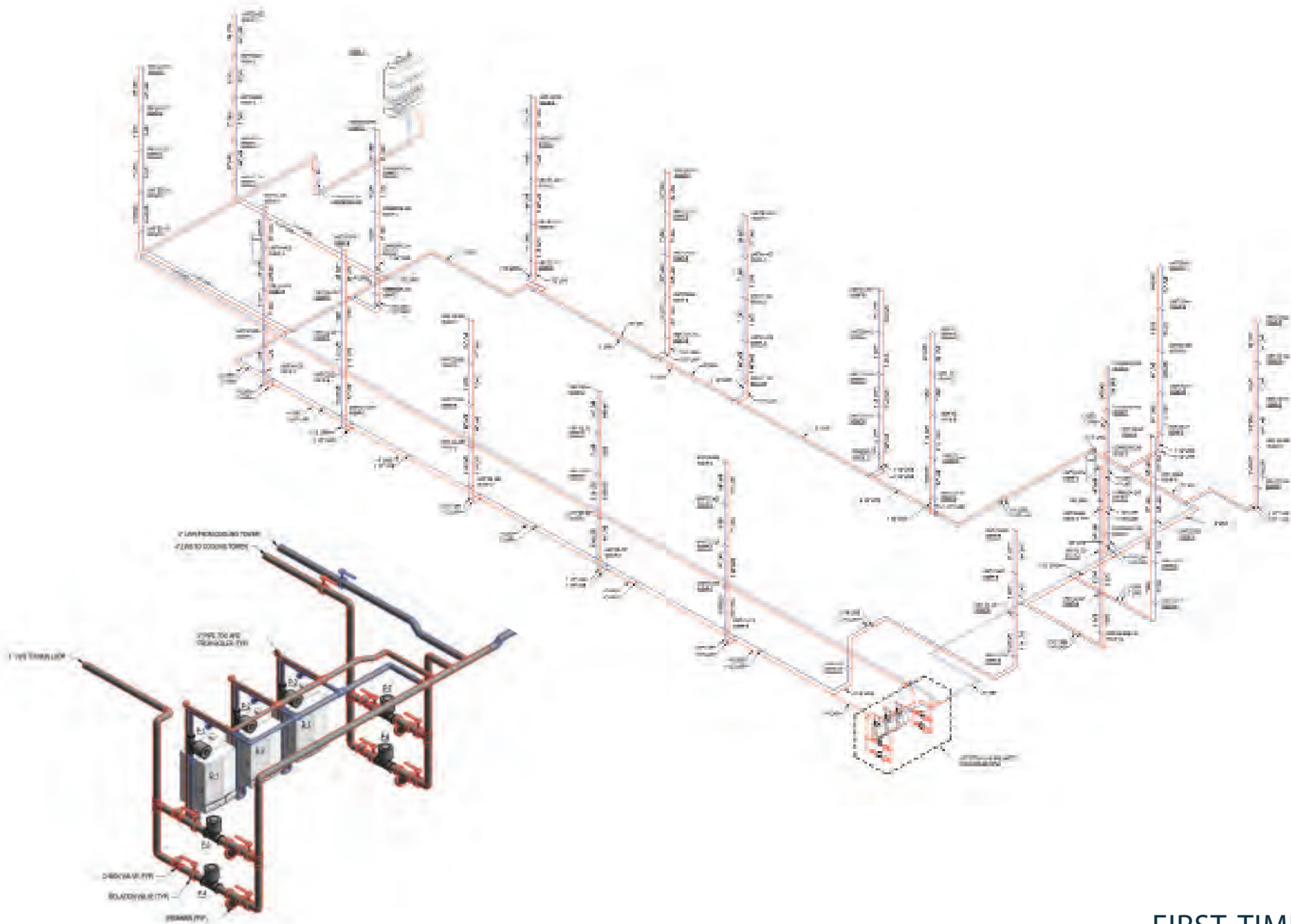
window details



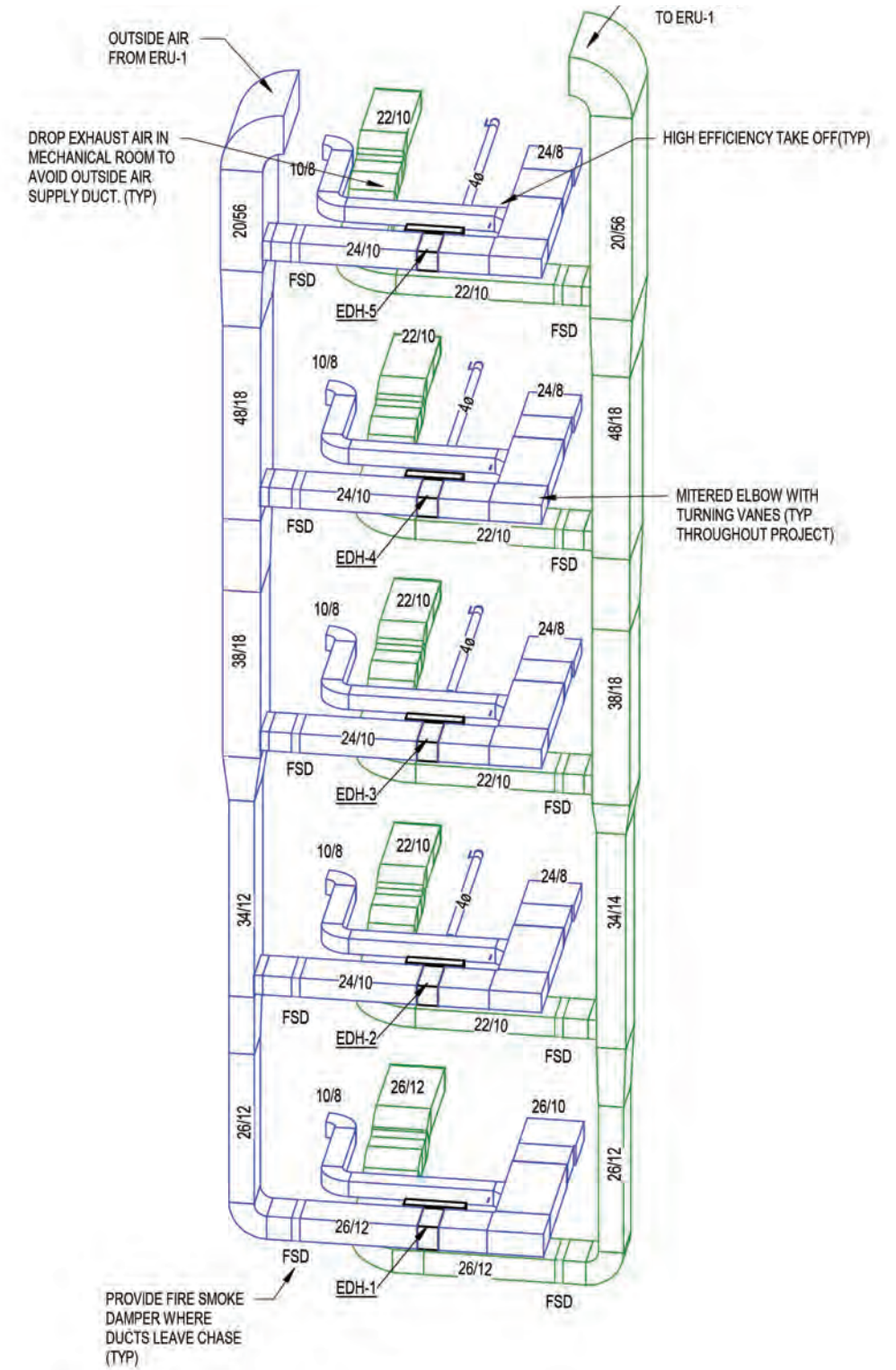
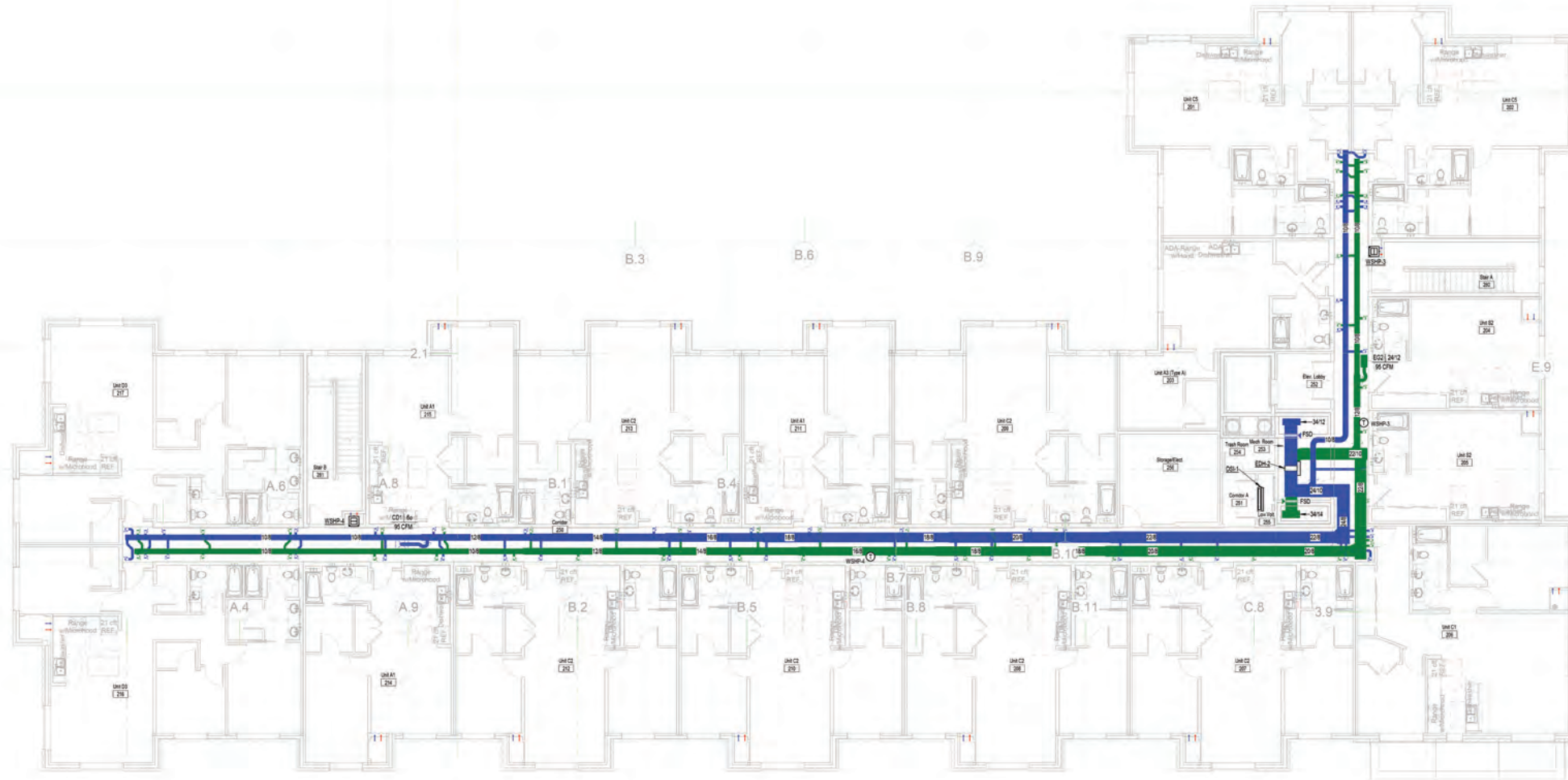
1 8800 - Fiberglass Window Flashing Head/Jamb/Sill
3" = 1'-0"



loop water system

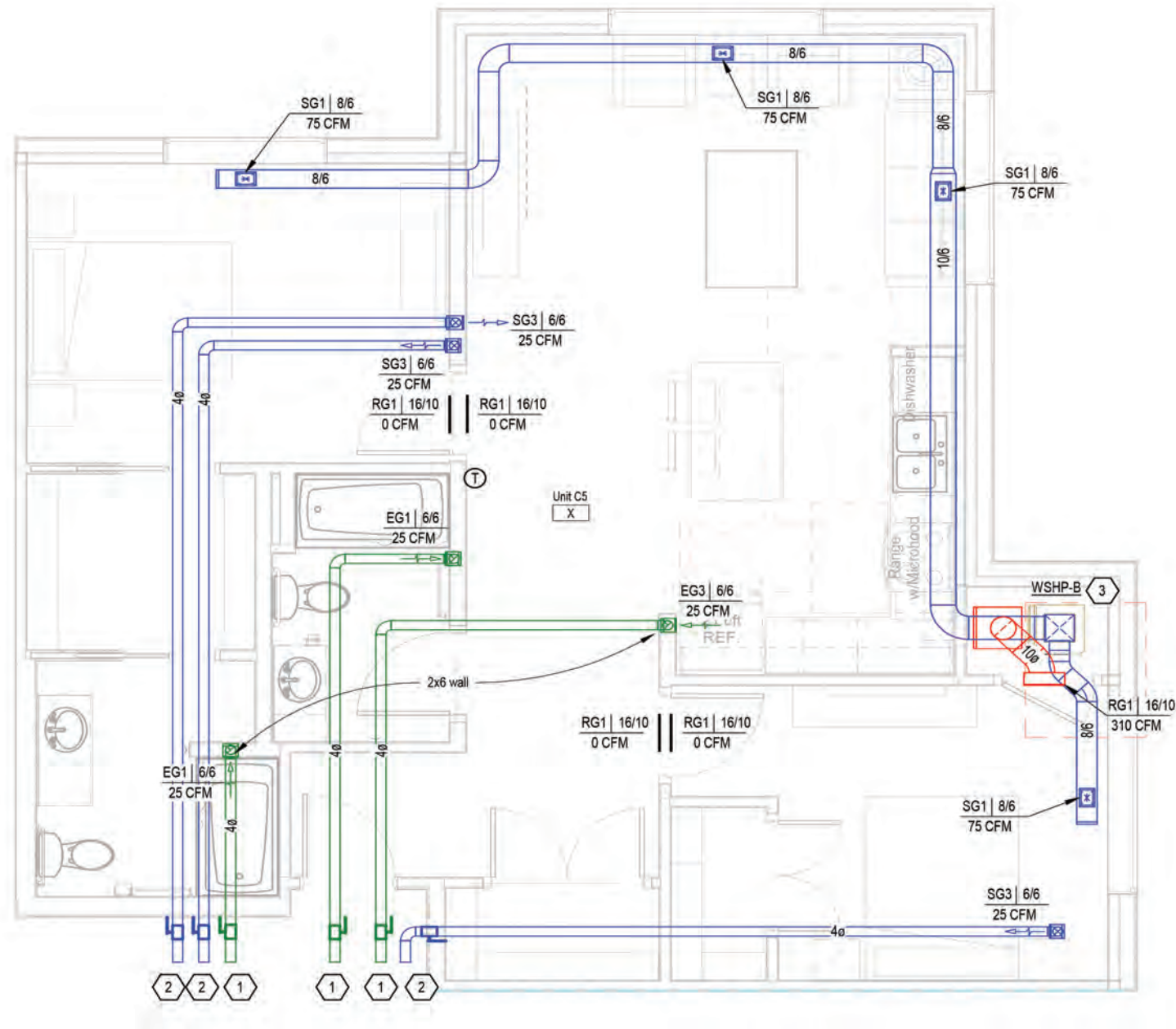


energy recovery system (ERV)





typical unit hvac plan



PRICING: switching out units

phiuscon october 2021
FIRST-TIME MULTI-FAMILY PHIUS+: LESSONS FROM WEST SIDE FLATS
© precipitate and kaas wilson 2021

cost impact of phius+

CSI Div.	High Efficiency \$/GSF	Passive House \$/GSF
6	\$ 23.00	\$ 24.51
7	\$ 10.78	\$ 17.90
8	\$ 5.47	\$ 6.79
9	\$ 17.30	\$ 17.90
22/23	\$ 20.90	\$ 28.06
26/27	\$ 9.85	\$ 10.35
1	\$ 4.37	\$ 5.28
Misc Building Trades	<u>\$ 64.81</u>	<u>\$ 64.81</u>
	\$ 156.48	\$ 175.60
PH Premium		\$ 19.12 12%

takeaways

- Start the project day one as Passive House
- Get full team buy in on the process
- Keep the building form simple
- Pay attention to thermal bridges at balconies
- Plan for centralized MEP approach up front
- Avoid precast garage lid - use cast in place
- Select a PHIUS green-lit exterior wall assembly
- Avoid IIB construction type if five+ stories
- The information you learn through this process carries over to ALL projects!



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thank you

precipitate
ARCHITECTURE PLANNING RESEARCH

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ALL VISITORS MUST REPORT
TO THE FRANK FIELD OFFICE

800S



DETOUR
←

FINANCED BY
MINNWEST
FLOYD

DEAD
END



3-046
SHOEMAKER

COX

BACK

25



←EXIT

EXIT

500

FIRE

