











~~17 Employees~~

10 employees



2 Principals



Design Staff



~~Construction Staff~~





Madison Haus, PHIUS Certified Olympia, Washington

Design Ethos

Urban in fill, respectful of the neighborhood

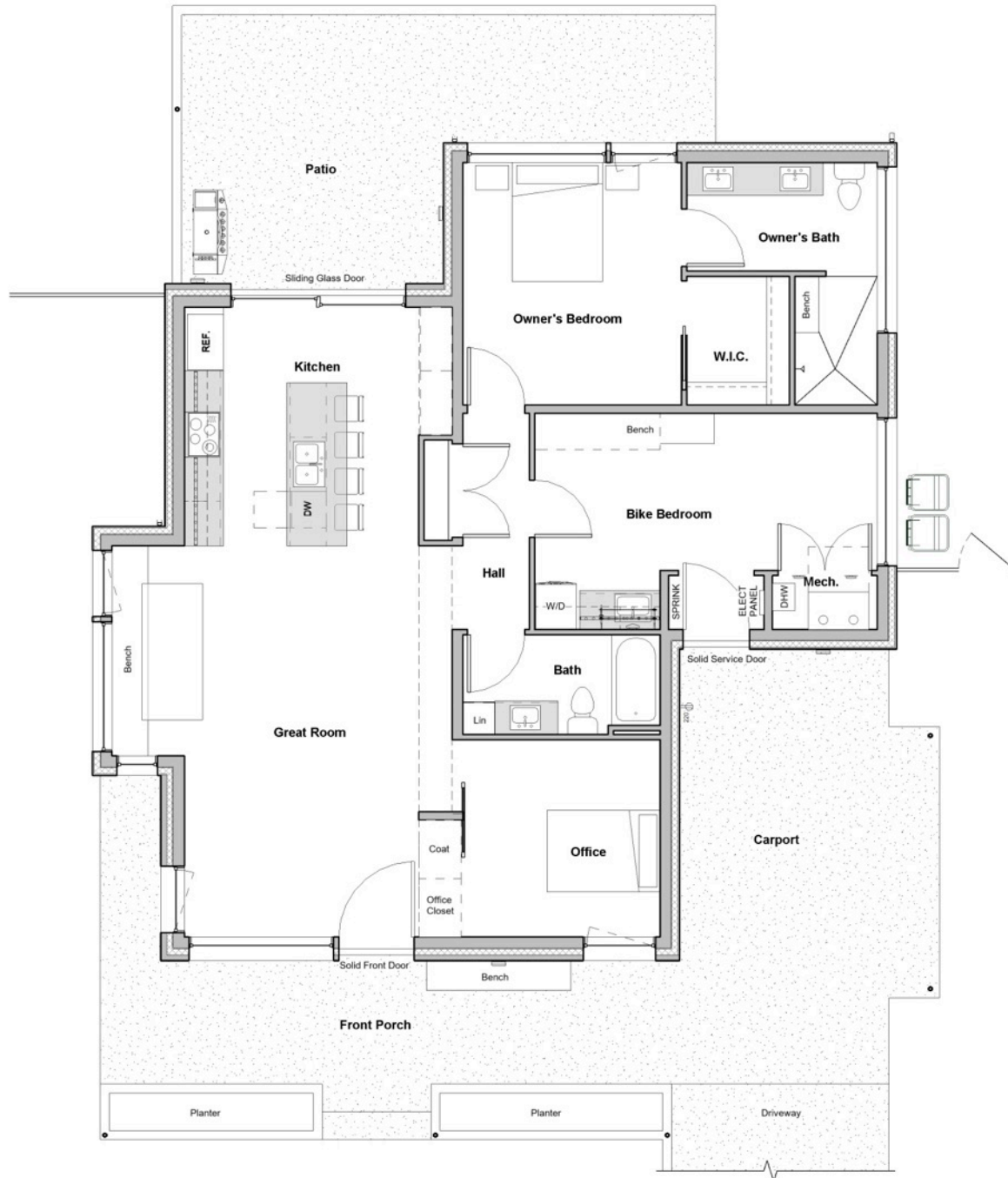
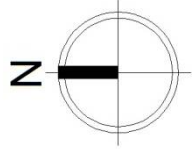
Mid century inspired with a warm, wood' ish northwest feel

Lots of glass

A large covered front porch

A *Parti* of long flat lines and strategic views and gains





Madison Haus

1358 TFA



Madison House Specs

(Nerd Stuff)

- R- 35 EPS under slab insulation
- R-41 Total wall insulation (7.5” dense pack fiberglass, 4” EPS)
- R-80 (2’ dense pack fiberglass in trusses, 6” EPS warm cap)
- Zender Novus 300 HRV
- Intellihot Combi unit: domestic hot water and in floor hydronic heating
- Zola Thermo Plus Clad windows
- Approx. 5100 heating degree days

Year of construction:	2017	Interior temperature winter:	68.0 °F	Enclosed volume V _e ft ³ :	21925
No. of dwelling units:	1	Interior temperature summer:	77.0 °F	Mechanical cooling:	
No. of occupants:	3.0	Internal heat sources winter:	1.32 BTU/h.ft ²		
Spec. capacity:	14.8 BTU/F per ft ² TFA	Ditto summer:	1.07 BTU/h.ft ²		

Fill in 'IHG' worksheet

Planned number of occupants

3	User-determined
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Specific building demands with reference to the treated floor area						
		Treated floor area		Requirements	Fulfilled?*	
Space heating	Heating demand	1358 ft ²	5.45 kBTU/(ft ² yr)	91% of 6.00 kBTU/(ft ² yr)	-	
	Heating load		3.23 BTU/(hr.ft ²)	83% of 3.90 BTU/(hr.ft ²)	yes	
Space cooling	Overall specif. space cooling demand		kBTU/(ft ² yr)	-	-	
	Cooling load		BTU/(hr.ft ²)	-	-	
	Frequency of overheating (> 77 °F)		3.9 %	-	-	
Primary energy	Heating, cooling, auxiliary electricity, dehumidification, DHW, lighting, electrical appliances		45.2 kBTU/(ft ² yr)	97% of 46.7 kBTU/(ft ² yr)	no	
	DHW, space heating and auxiliary electricity		17.6 kBTU/(ft ² yr)	-	-	
	Specific primary energy reduction through solar electricity		kBTU/(ft ² yr)	-	-	
Airtightness	Pressurization test result n ₅₀		0.4 1/h	0.6 1/h	yes	

* empty field: data missing; '-': no requirement



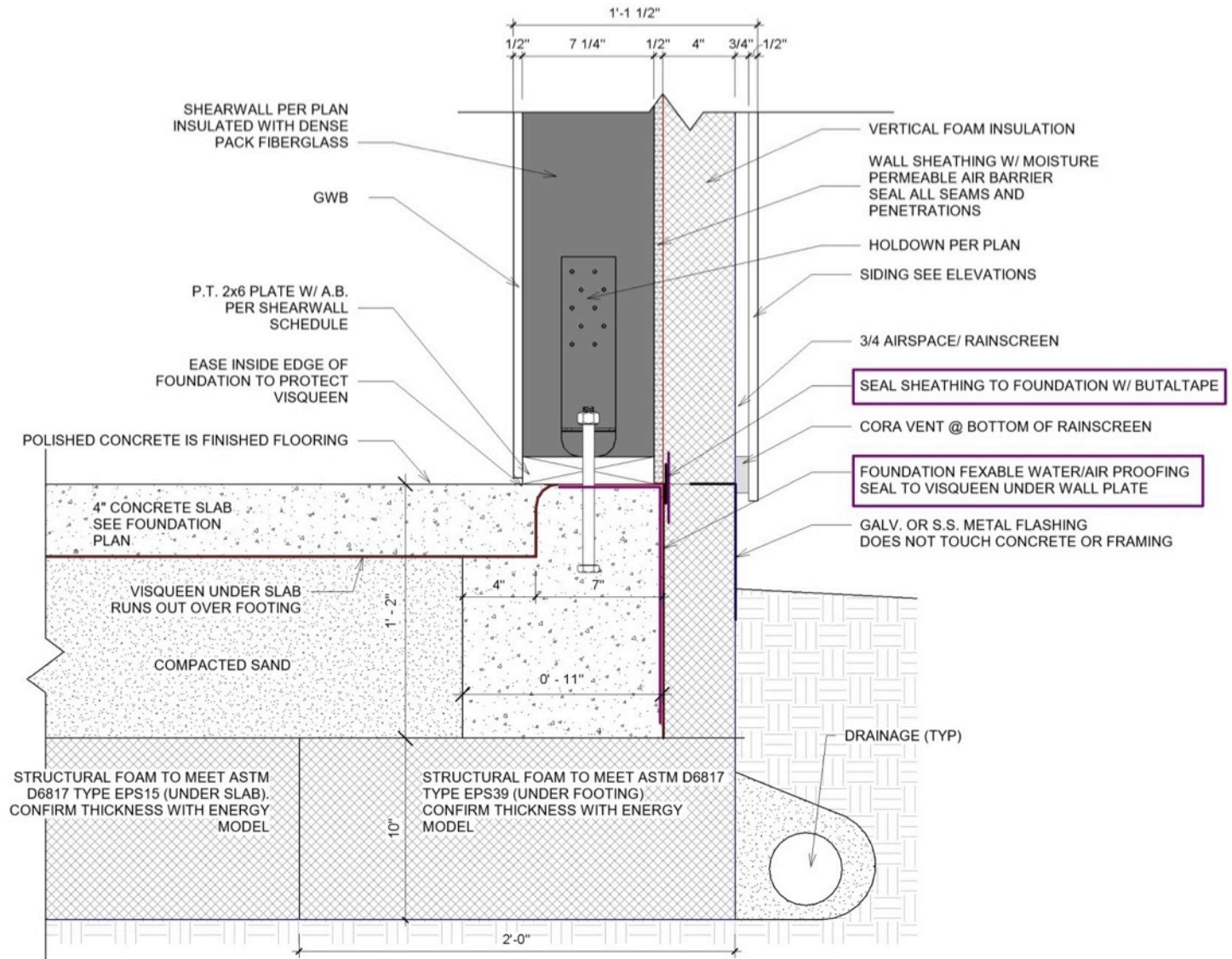
Passive House?	no
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Certification type Passive House

“This project suffered from the usual small project challenges of hitting the heat demand, but the PHIUS 'climate optimized' heat demand and higher (likely more realistic) PHIUS internal gains made Passive House pretty manageable. While some may question a project with a 5.45 kbtu/ft/yr heat demand and not the 4.75 target, the peak heat load is barely above 3 btu/hr/sf and could have likely been certifiable under the PHI peak heat load criteria also.”

Skylar Swinford

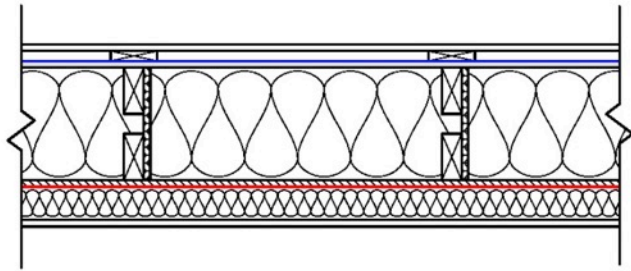




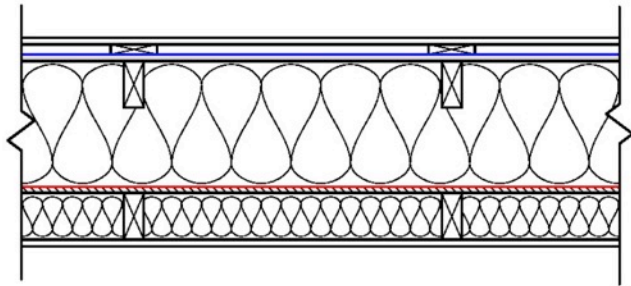
Slab and Footing Detail

We have started wrapping our footings with a heavy butyl membrane, and taping our wall sealing layer down to this foundation wrapping. This also keeps bulk water from migrating under the mudsill during the course of construction.

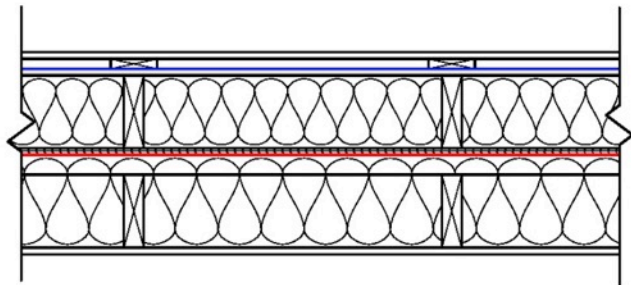




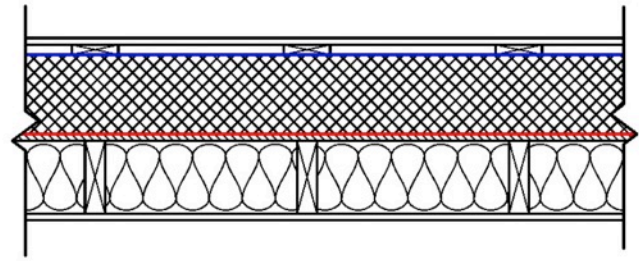
1. Larsen Truss



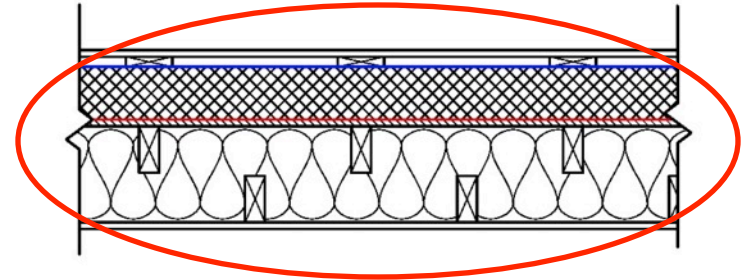
2. Double 2x4 w/ Zip Sheathing



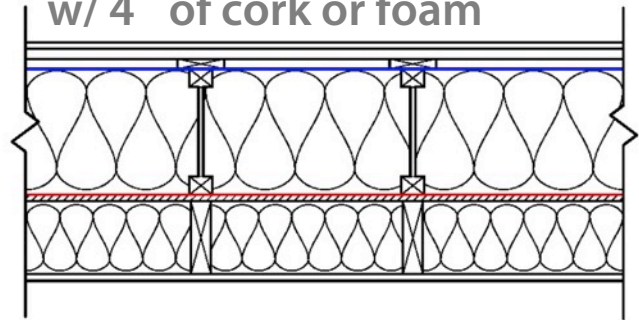
3. Homemade Prefab Walls
2x6 w/ Horiz. 2x4 & 2x6



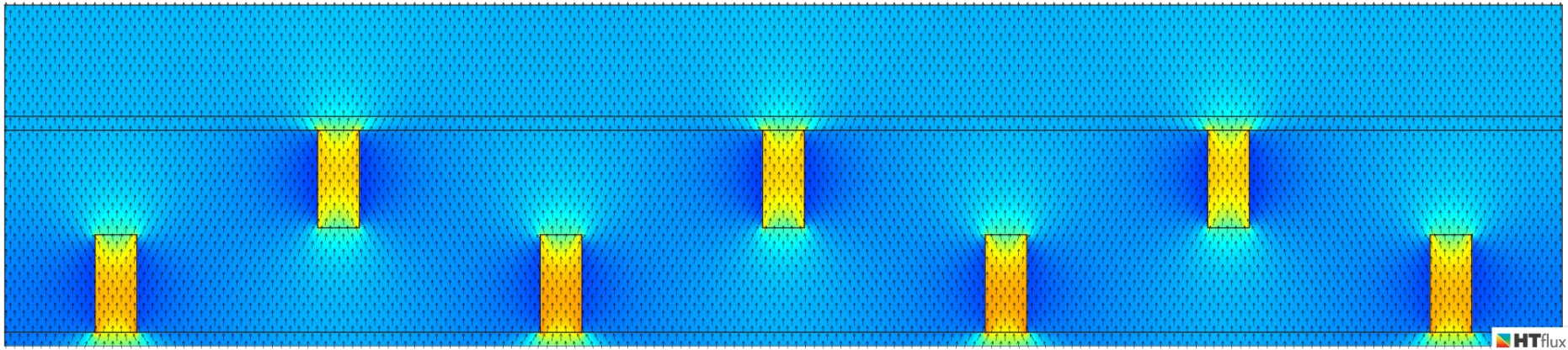
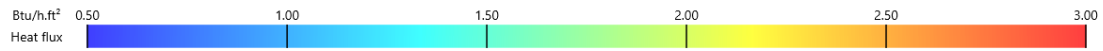
4. 2x6 w/ 6" of Exterior Insul.



5. 2x4 staggered on 2x8 plates
w/ 4" of cork or foam



6. *Collective Carpentry* Prefab
wall, 2x4 with Larsen Truss



Detailed Thermal Bridge Analysis

Wall Assembly Analysis



$R = 48.291 \text{ h.ft}^2\text{°F/BTU}$

$R_{1d} = 52.240 \text{ h.ft}^2\text{°F/BTU}$

$R_{\text{top},2d} = 48.291 \text{ h.ft}^2\text{°F/BTU}$

$R_{\text{bottom},2d} = 48.291 \text{ h.ft}^2\text{°F/BTU}$

$l_{\text{top}} = 56.00 \text{ in} / l_{\text{bottom}} = 56.00 \text{ in}$

$\Phi_{\text{top}} = -5.218 \text{ BTU/h}\cdot\text{ft}$

$\Phi_{\text{bottom}} = 5.218 \text{ BTU/h}\cdot\text{ft}$

$\Delta T = -54.0 \text{ °F}$

Layers

|| $R_s 0.738 \text{ h.ft}^2\text{°F/BTU}$

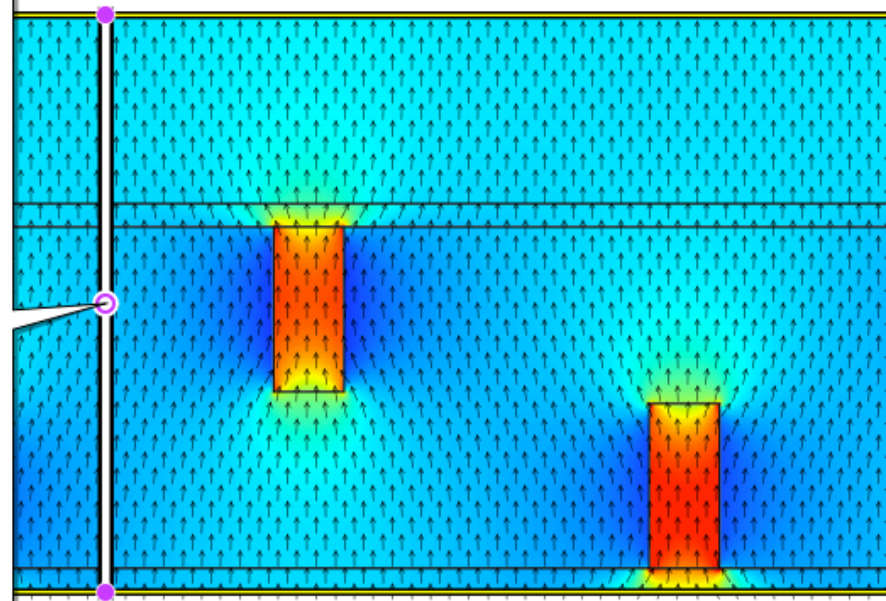
4.00 in EPS Neopor $R-4.61$, $R/\text{in}=4.61 \text{ h.ft}^2\text{°F/BTU}\cdot\text{in}$

0.50 in Oriented strand board (OSB) $R-1.39$, $R/\text{in}=1.3908 \text{ h.ft}^2\text{°F/BTU}\cdot\text{in}$

7.25 in Fiberglass $R-4.3$, $R/\text{in}=4.3 \text{ h.ft}^2\text{°F/BTU}\cdot\text{in}$

0.50 in Gypsum $R-0.91$, $R/\text{in}=0.9071 \text{ h.ft}^2\text{°F/BTU}\cdot\text{in}$

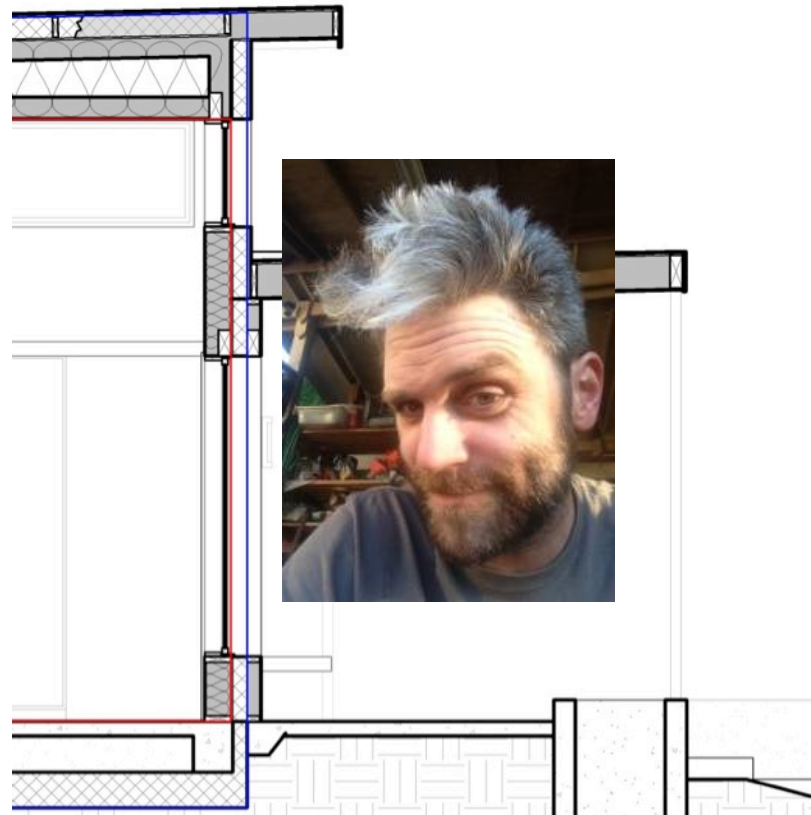
|| $R_s 0.738 \text{ h.ft}^2\text{°F/BTU}$

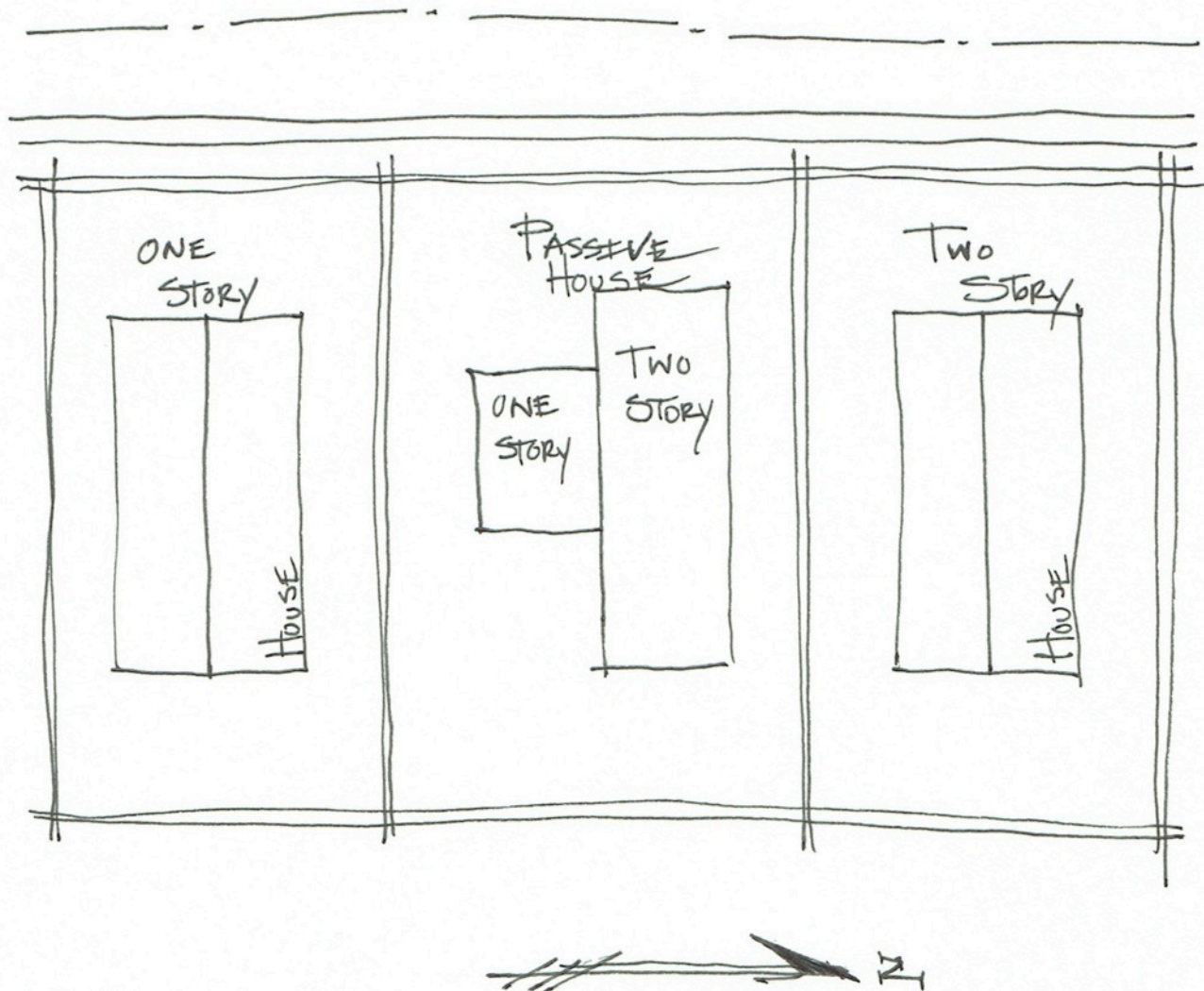


Detailed Thermal Bridge Analysis

Wall Assembly Analysis 2D w/ HTflux



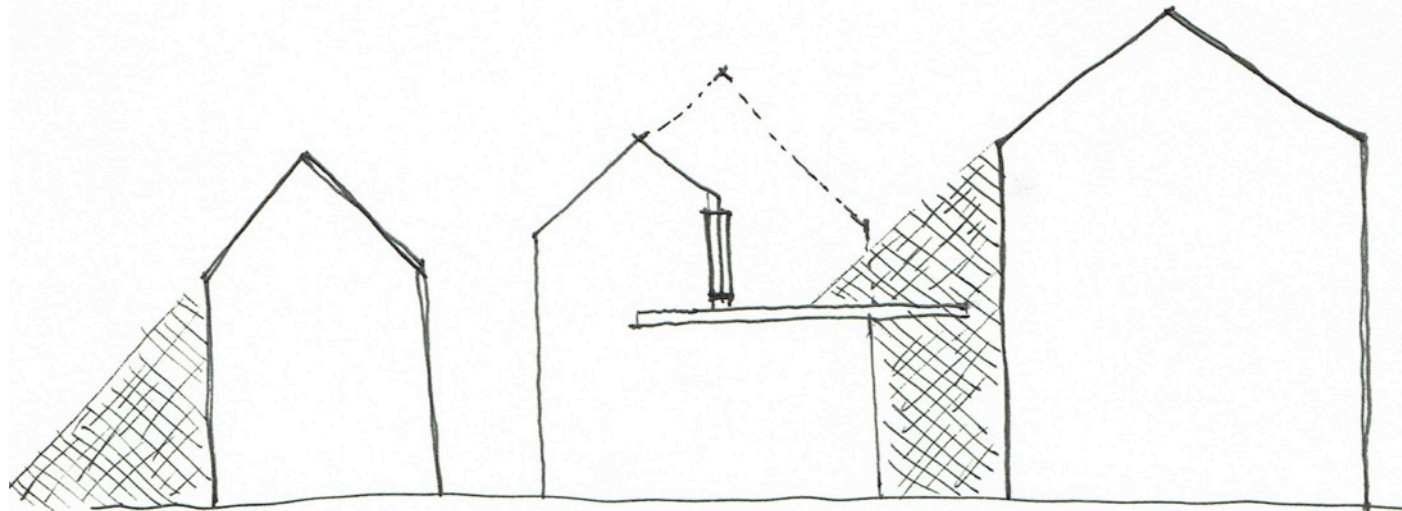




Massing & Shading

Depending on surroundings articulating shape to catch more southern exposure can be worth the extra surface area, and sometimes the only way to get to compliance.

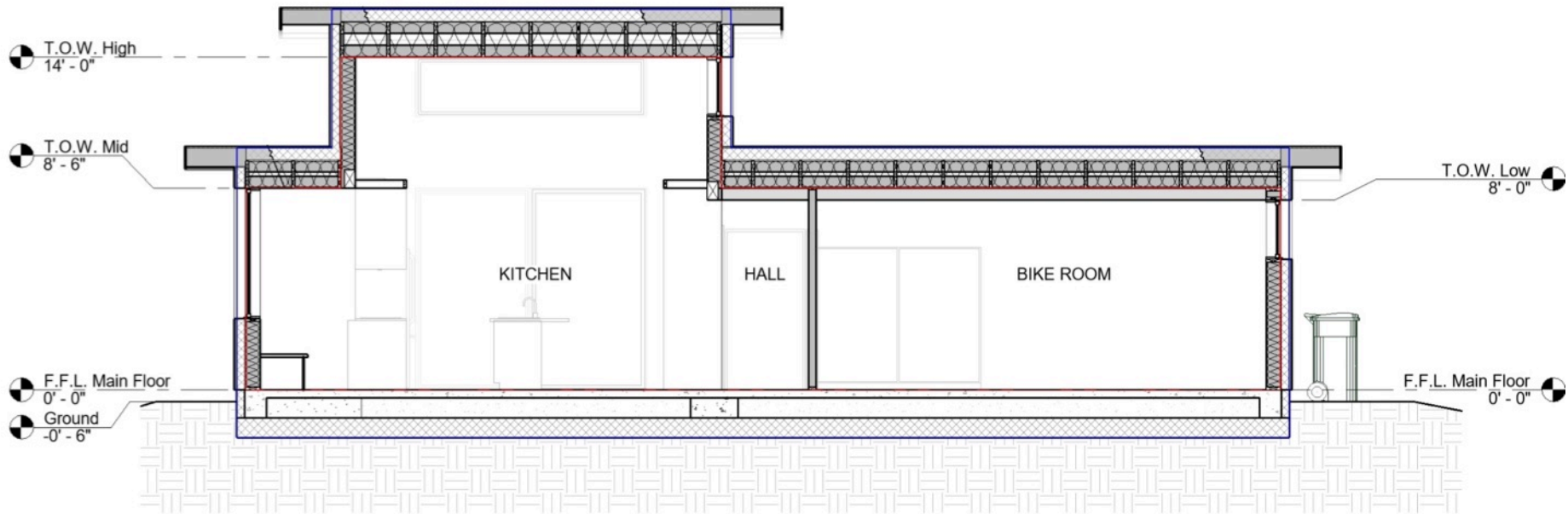
by [signature]



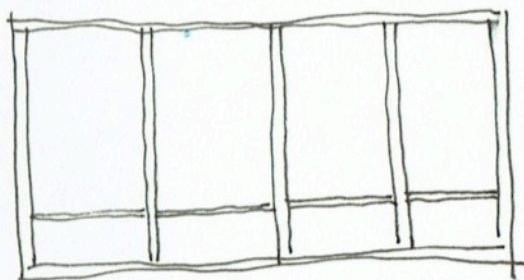
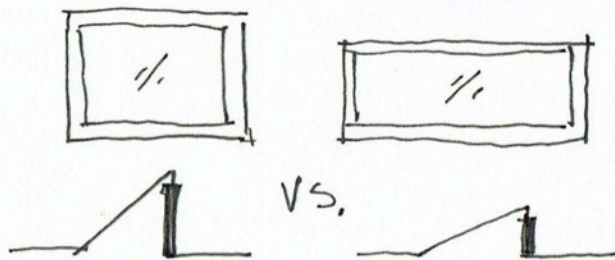
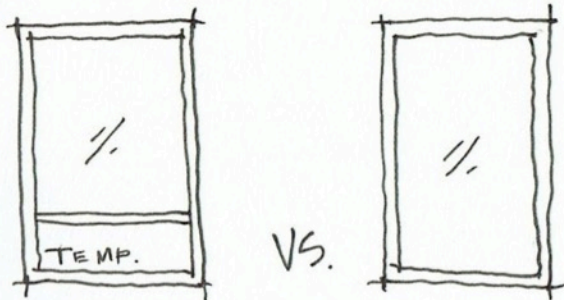
Passive House

Massing & Shading

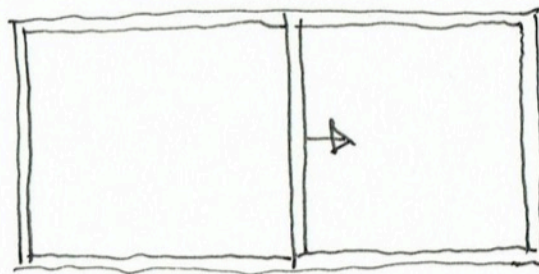
Depending on surroundings articulating shape to catch more southern exposure can be worth the extra surface area, and sometimes the only way to get to compliance.







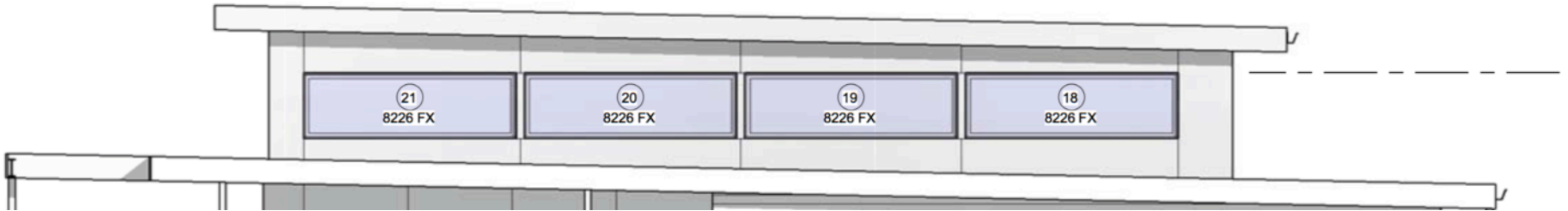
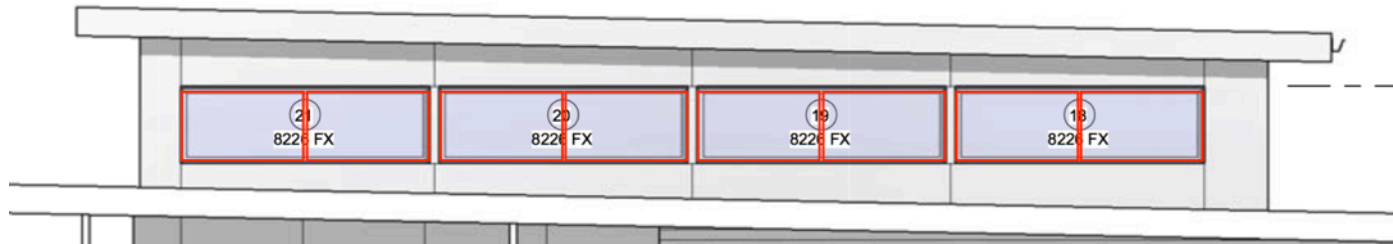
VS.





WINDOW U-VALUE

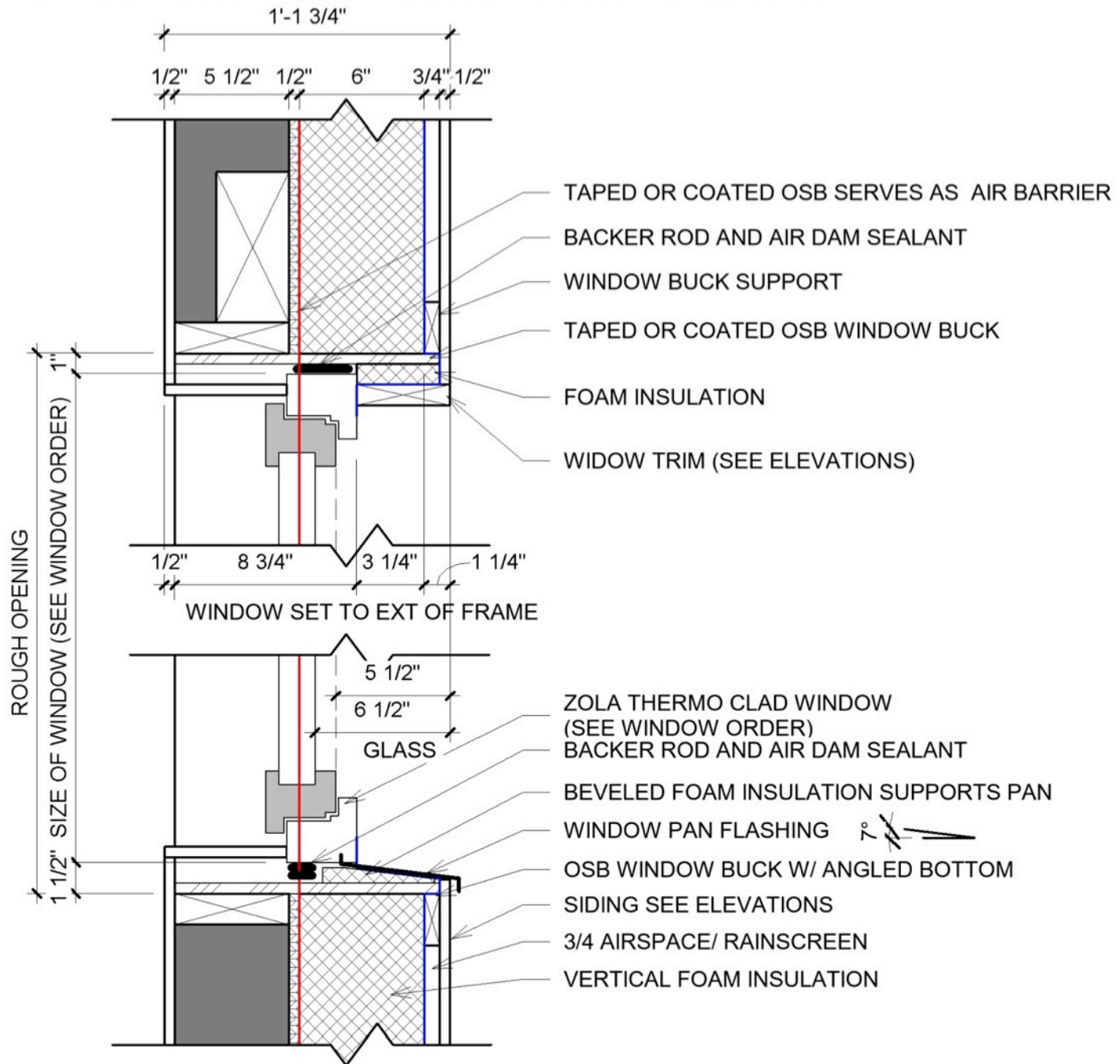
Annual heating demand:	5.98	kBTU/(ft ² yr)			
Solar irradiation reduction factor	Window area	Window U-Value	Glazing area	Average global radiation	

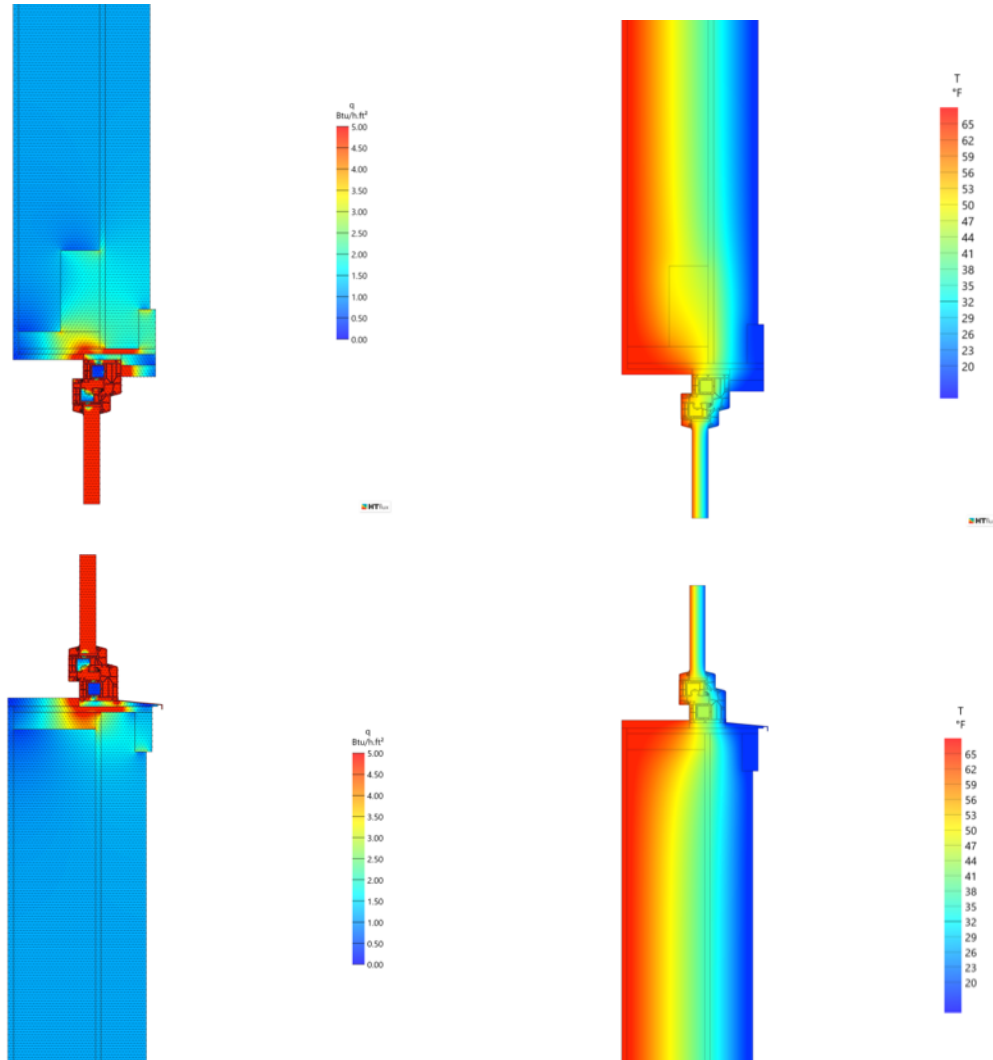


WINDOW U-VALUE

Annual heating demand:	5.60	kBTU/(ft ² yr)			
Solar irradiation reduction factor	Window area	Window U-Value	Glazing area	Average global radiation	







Detailed Thermal Bridge Analysis

Window Head and Sill Analysis 2D w/ HTflux



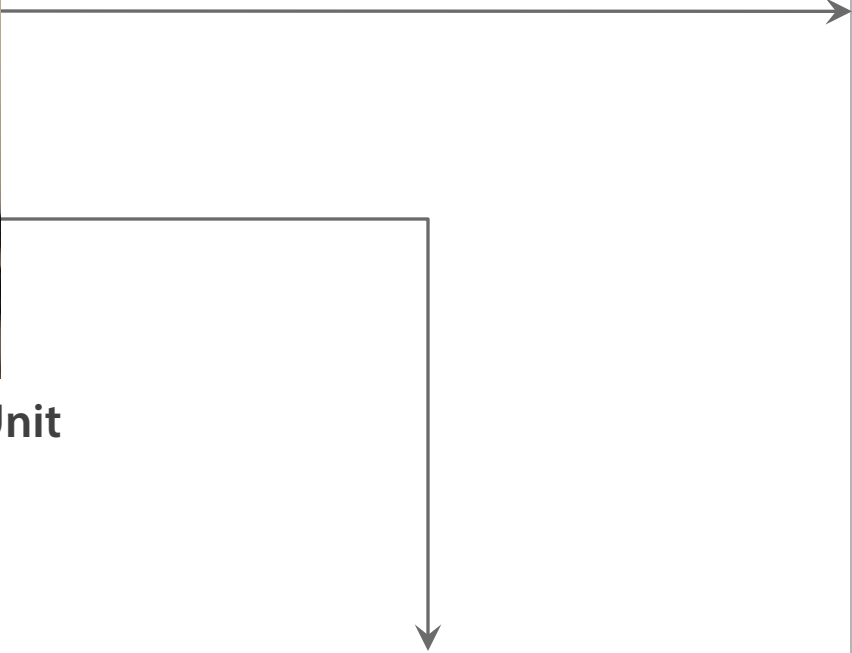
Zehnder Novus Paul unit HRV

Sealed chase way in truss bay





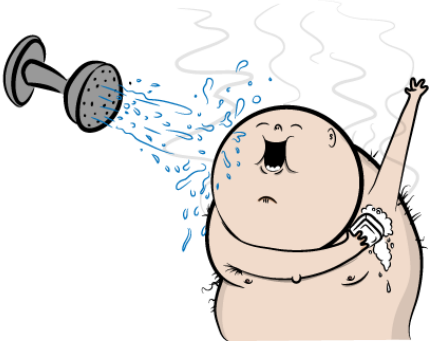
Navien Combi Unit



Space Heating



showering at your favorite temperature



showering at one degree colder than your favorite temperature.



Domestic Hot Water



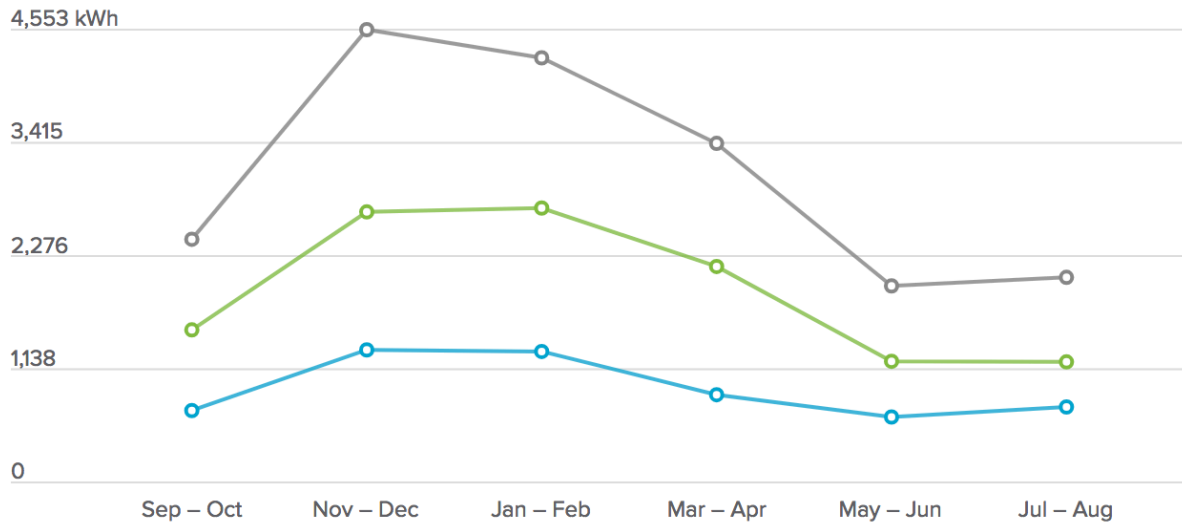


Fuel type: electricity



Sep 2017 – Aug 2018
My neighbor comparison

Select view: by year



Find tips to reduce your use:

- [Free steps to take](#)
- [Smart purchases](#)
- [Great investments](#)

Neighbors

Usage

Costs

Weather

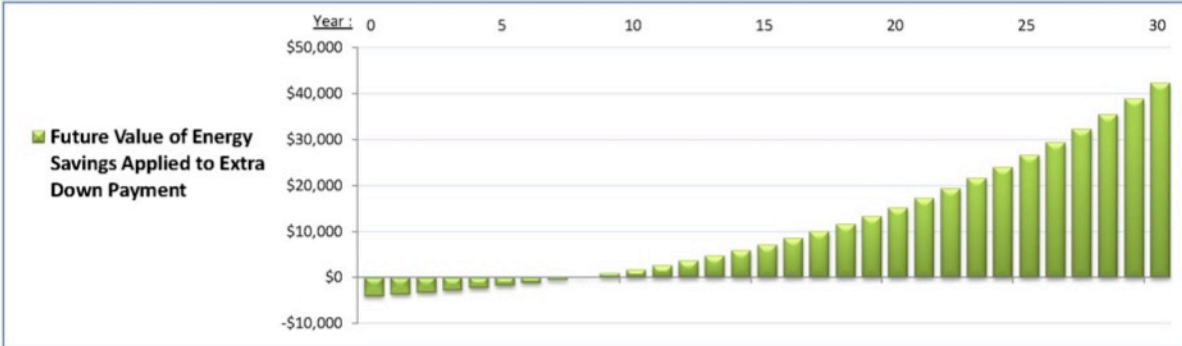
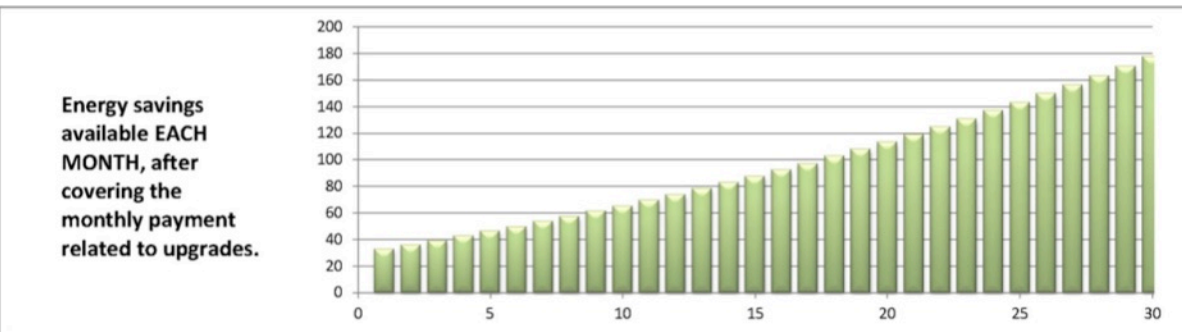
- You
- All neighbors
- Efficient neighbors

[Who are my neighbors?](#)

Cost of Home Options	Cost of Baseline Home	Upgrade to Passive House *	Cost of Passive House
	509,500	4%	530,000

Energy Cost, Baseline Home (\$ per month)	157
Annual Rate of increase in Energy Costs Projected	3%
Energy Reduction from Passive House Approach (%)	68%

Costs to Upgrade to Passive House	
Incremental Costs of Improving The Thermal Performance of The Home	
Item:	\$
Increase in cost of framing labor	6,000
Increase in cost of framing materials	4,000
Zola upvc vs Domestic vinyl and sliding wall glazing	8,000
Increase in cost of insulation, labor and materials	5,000
Cost of upgrading to whole house Heat Recovery Ventilator vs code required ventilation systems.	7,500
Sanden vs central heating and cooling and heat pump wh	-10,000
* Total Costs to Upgrade to Passive House	20,500



INFORMATION PRESENTED BY: **Randy Foster**



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Per actual utility bills first year of operation

Time Period	kWh per mo	
	All neighbors	This PH
Sep-Oct	2,400	900
Nov-Dec	4,553	1,138
Jan-Feb	4,400	1,138
Mar-Apr	3,415	1,000
May-Jun	2,000	900
Jul-Aug	2,100	1,000
Total kWh for 1 year	18,868	6,076
Ave kWh per mo.	1,572	506
Ave. \$ per mo., @ \$0.10/kWh	\$157	\$51

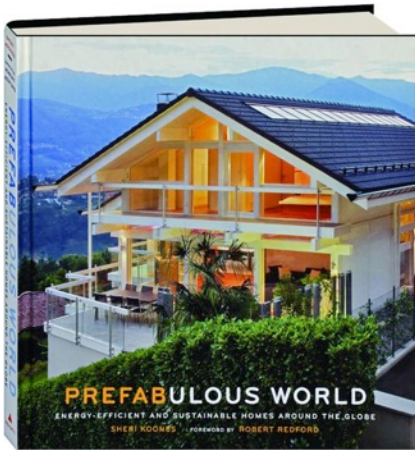
Cost of Passive House ROI Model



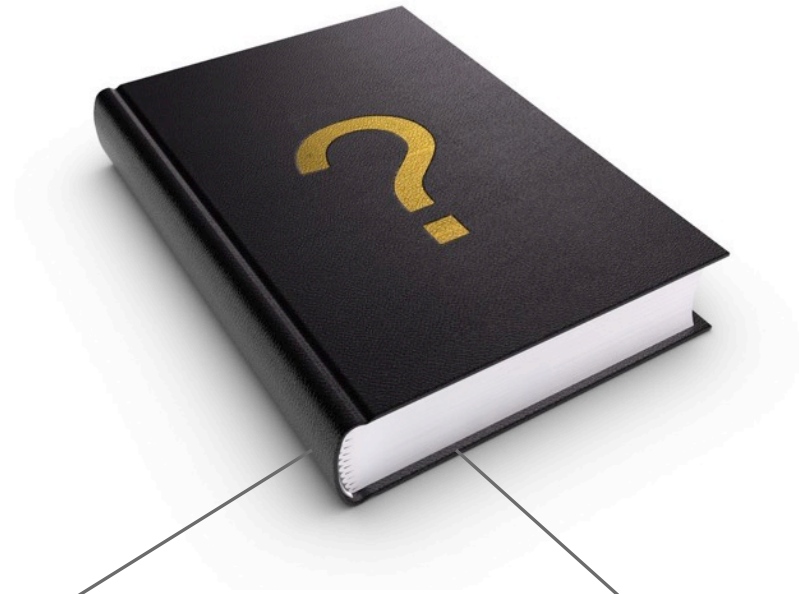








Madison Haus and Heron Haus featured
Sheri Koones new book *Downsize*
coming this spring



Coming Soon- Prefab Passive House
outside of Seattle



Coming Soon- Bainbridge Island,
Rolling Bay Passive House



