Project Documentation

Abstract

Single Family Dwelling Unit in Vancouver, BC, Canada

Data of building			
Year of construction	2024	**Space heating requirement**	**13.3 kWh/(m²a)**
U-value external wall	0,123 W/(m²K)		
U-value basement	0,074 W/(m²K)	Primary Energy Renewable (PER)	41.7 kWh/(m²a)
U-value roof	0,074 W/(m²K)	Generation of renewable Energy	0 kWh/(m²a)
U-value window	0,76 W/(m²K)	Non-renewable Primary Energy (PE)	54 kWh/(m²a)
Heat recovery	88 %	Pressurization test n_{50}	0.59 h^{-1}
Special features			

Brief Description

Houssian- Yetman Residence

This modern Passive House is located in Vancouver, BC and was designed for a family of four. The home is a two-storey structure with a basement and has a total treated floor area of 263 m².
The basement includes a recreation room, mechanical room, den, wine cellar, storage area, and one bathroom. The main floor, where the primary entrance is located, features an open-concept layout with a kitchen, living room, a den, and a powder room. The upper floor includes three bedrooms and two bathrooms.
The house has a very open design, with the majority of the windows oriented toward the south to maximize natural light and solar gain. Construction took nearly three years to complete, and the home was occupied in early 2024.

Responsible project participants

Architect	Cedric Burgers Burgers Architecture https://burgersarchitecture.com/
Implementation planning	Cedric Burgers Burgers Architecture https://burgersarchitecture.com/
Building services	Ecolighten Energy Solutions https://www.ecolighten.com/
Structural engineering	N/A
Building physics	Sara Malekpour Ecolighten Energy Solutions https://www.ecolighten.com/
Passive House project planning	Sara Malekpour Ecolighten Energy Solutions https://www.ecolighten.com/
Construction management	AWSE Jonny Beer

Certifying body

Stich Consulting and Design Inc. Tomaz Stich https://stichpassivedesign.com/	

Certification ID

	Project ID: 7514

Author of project documentation

Sara Malekpour Passive House Designer Ecolighten Energy Solutions	
Date	Signature
05/12/2025	

1. Overview photos

House Front

Back

2. Interior photo example

Living room

Bedroom

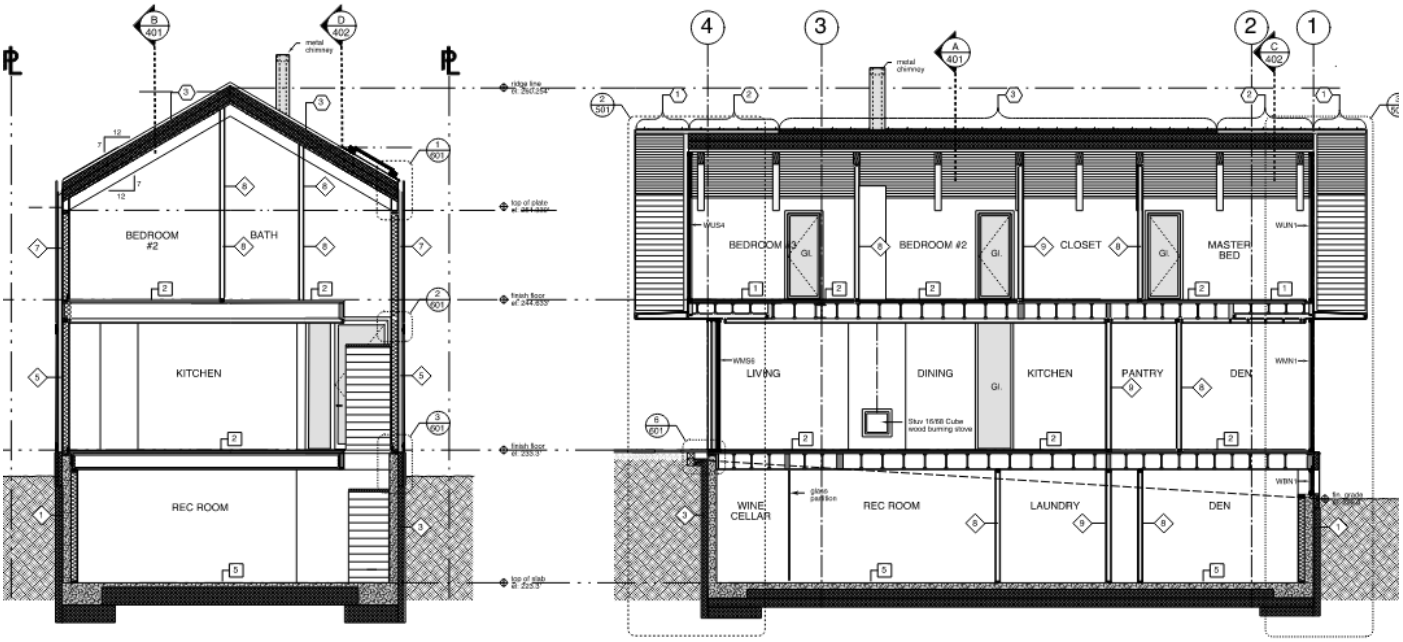
Entrance door

Master bedroom

Bathroom

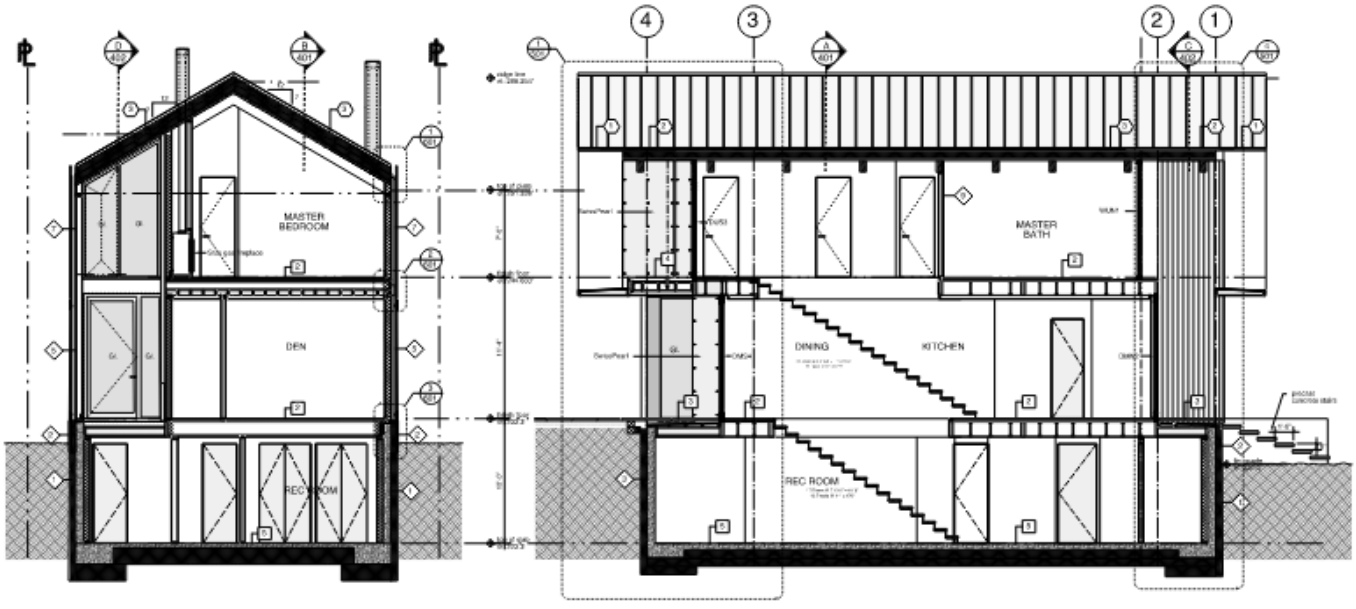
Kitchen

Sectional drawing



SECTION A-A

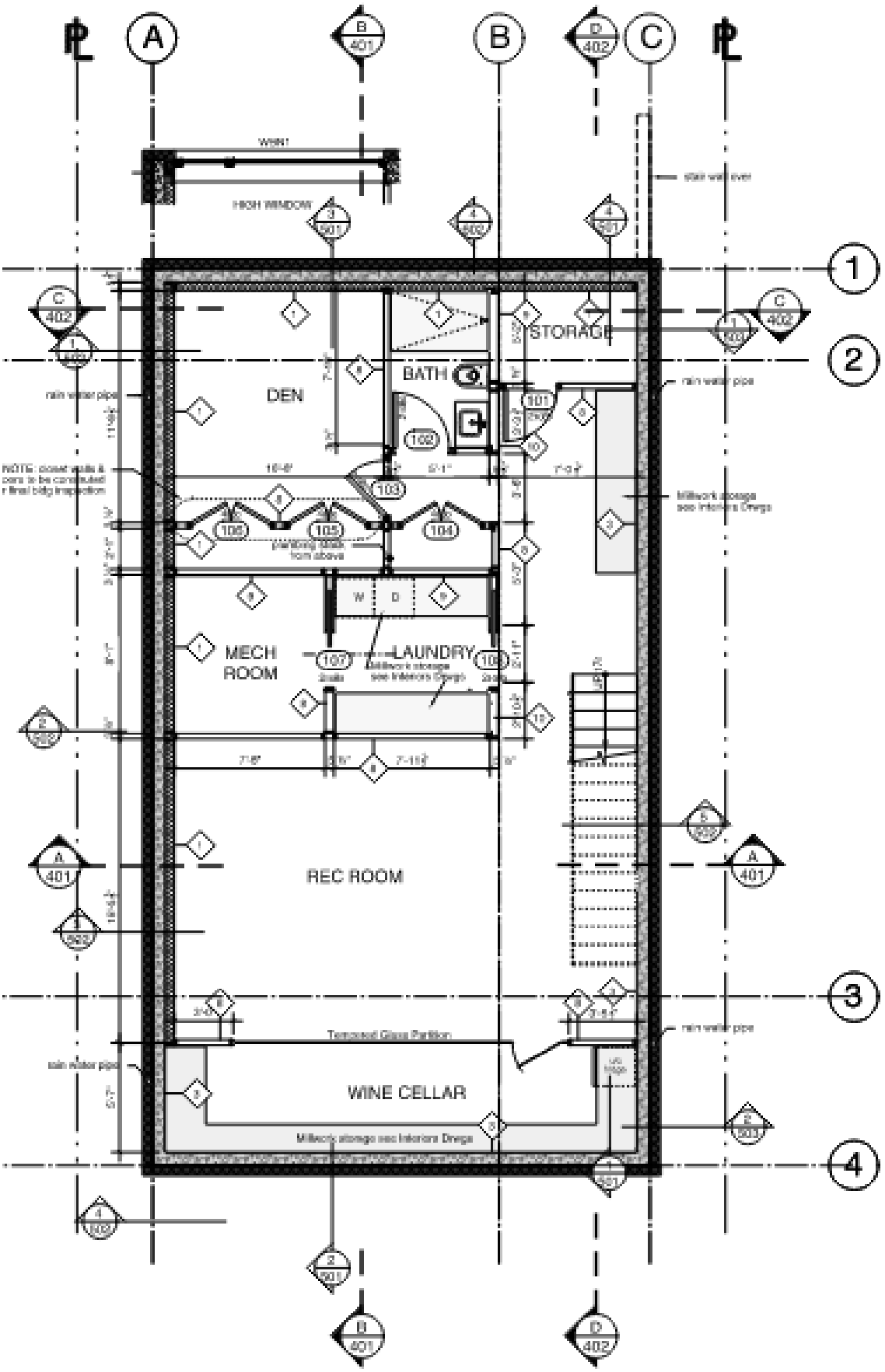
SECTION B-B



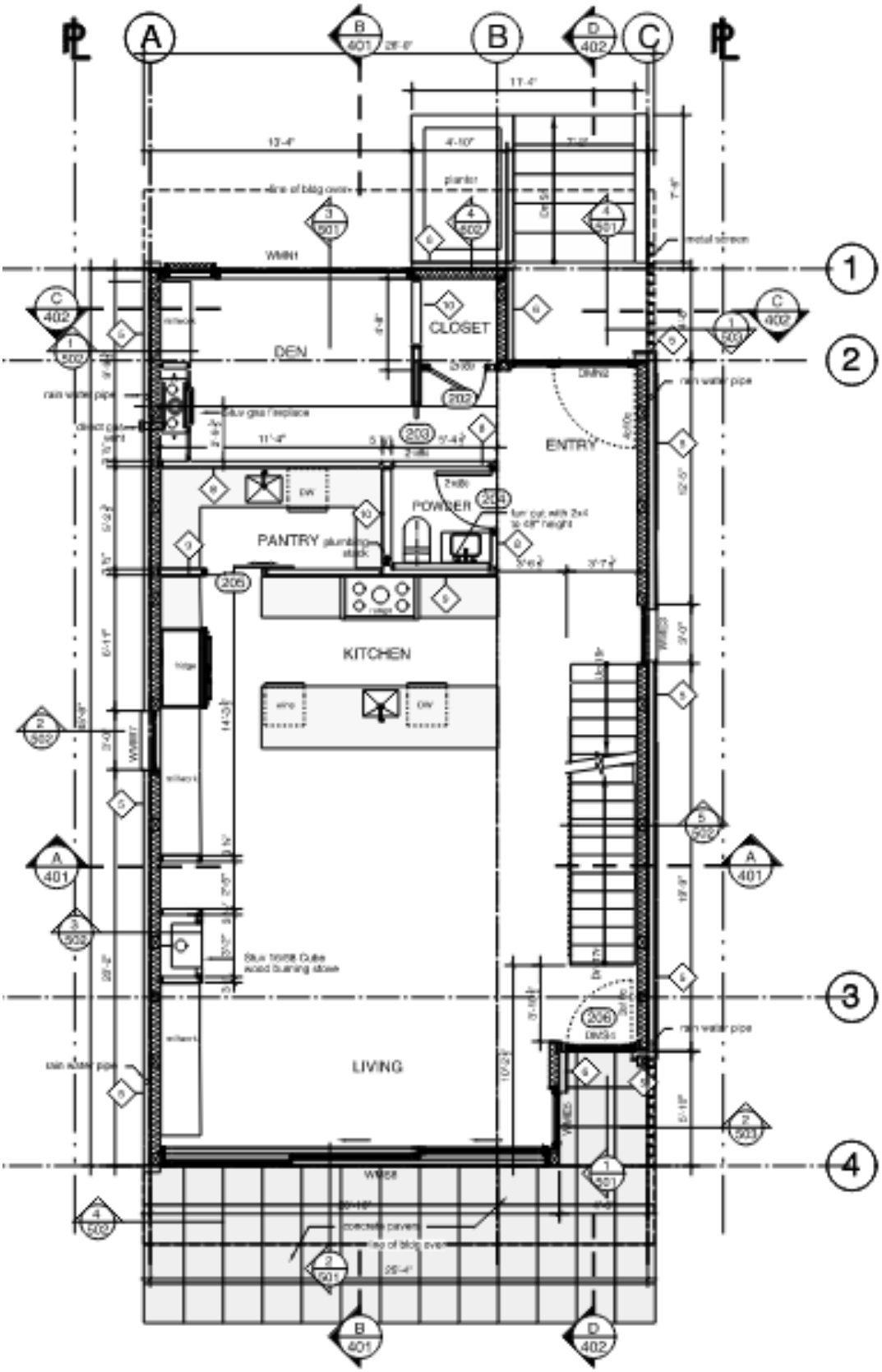
SECTION C-C

SECTION D-D

4. Floor plans

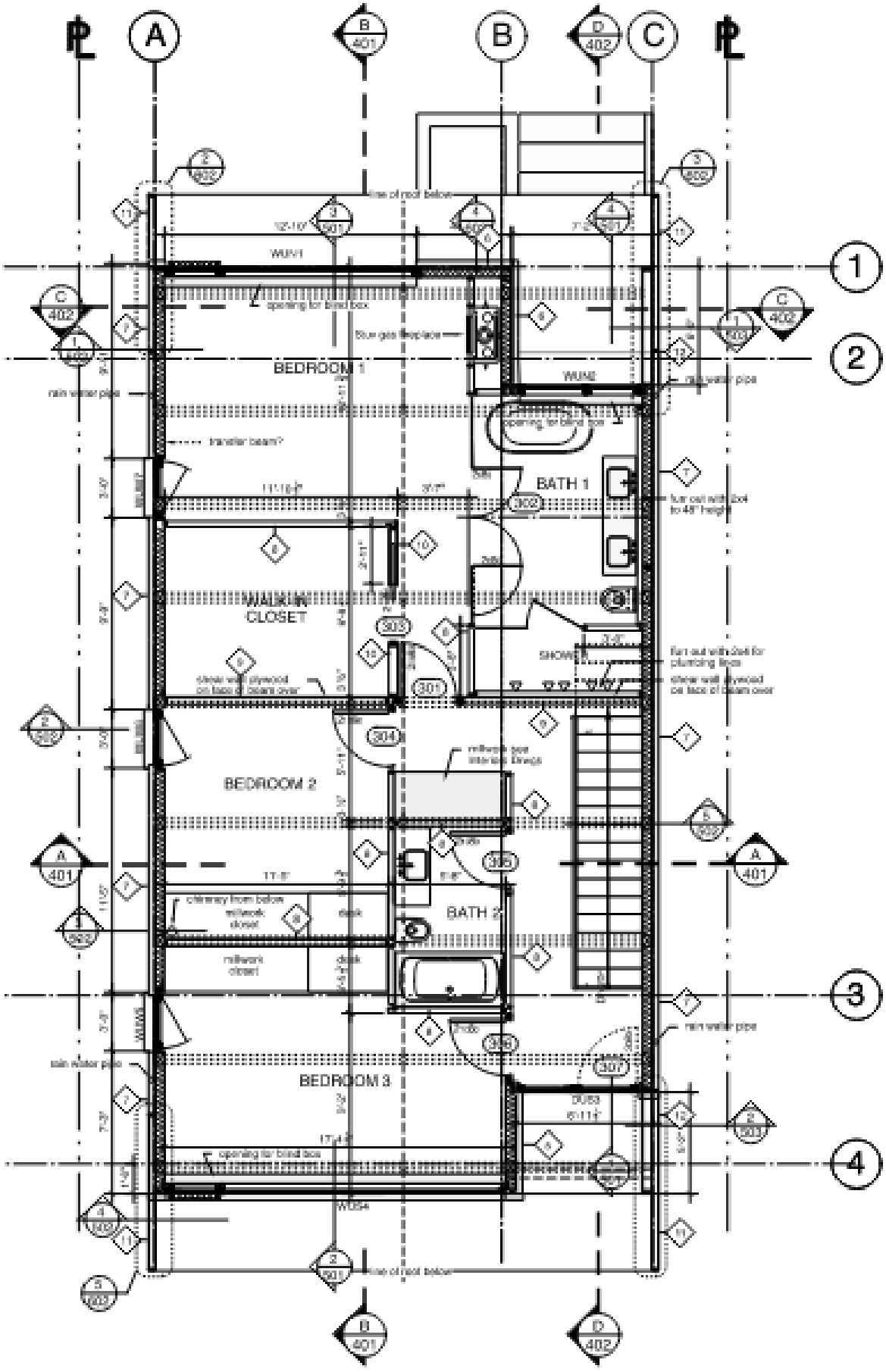


BASEMENT PLAN



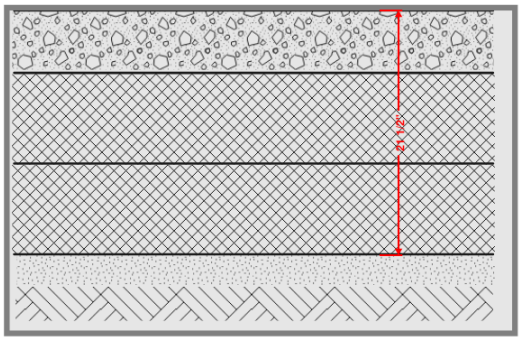
MAIN FLOOR PLAN

Floor Area: 1,105 Sq ft

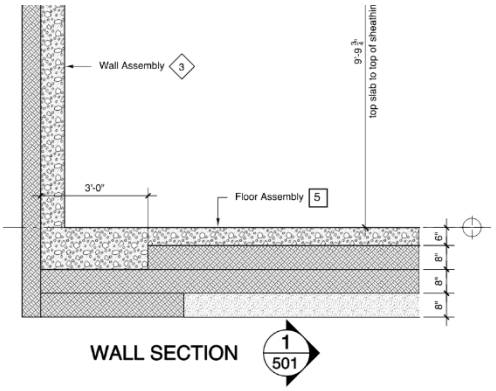


UPPER FLOOR PLAN

5. Floor slab construction



FLOOR TYPE 5
6" Polished Concrete Slab
6 mil Poly Vapour Barrier
2 layers 8" Rigid Insulation
Compacted Construction Sand
Native Soil



To minimize construction-related thermal bridging, the basement walls are fully covered with XPS insulation, and 20 inches of insulation were installed beneath the slab. This continuous insulation layer wraps the slab-to-wall connection, creating an effective thermal break at the perimeter.

Assembly no. 08ud — Floor Type 5 (Floor Slab) — Interior insulation?

Heat transmission resistance [m²K/W]

Orientation of building element: 3-Floor — interior R_{si}: 0.17
Adjacent to: 2-Ground — exterior R_{se}: 0.00

Area section 1	λ [W/(mK)]	Area section 2 (optional)	λ [W/(mK)]	Area section 3 (optional)	λ [W/(mK)]	Thickness [mm]	R Valu
20" EPS type 2	0.038					508	75.91
6" Concrete Slab	2.300					152	0.38

Percentage of sec. 1: 100% — Percentage of sec. 2 — Percentage of sec. 3 — Total: 66.0 cm (26.0 in)

U-value supplement: W/(m²K)

U-value: 0.074 W/(m²K)

Total R value: 77.2

Assembly no.			Interior insulation?
02ud	Foundation wall 1 (BGW)		

Heat transmission resistance [m²K/W]

Orientation of building element	2-Wall	interior R_{si}	0.13
Adjacent to	2-Ground	exterior R_{se}	0.00

Area section 1	λ [W/(mK)]	Area section 2 (optional)	λ [W/(mK)]	Area section 3 (optional)	λ [W/(mK)]	Thickness [mm]	*R Valu*
6" Dow XPS	0.030					152	*28.84*
8" concrete	2.300					203	*0.50*
R22 Roxul batt insulatiton	0.036	2x6 Studs @24" OC	0.130			140	*22.03*
1/2" GWB	0.250					13	*0.29*

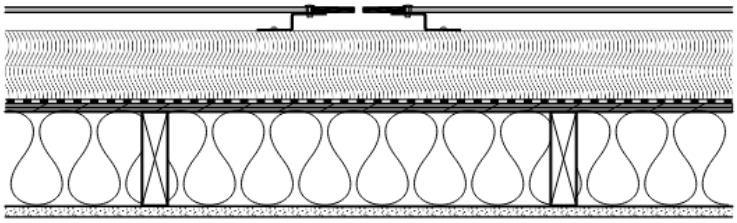
Percentage of sec. 1	Percentage of sec. 2	Percentage of sec. 3	Total
91%	6.3%	3.1%	50.8 cm
			20.0 In

U-value supplement: W/(m²K)

U-value: 0.113 W/(m²K)

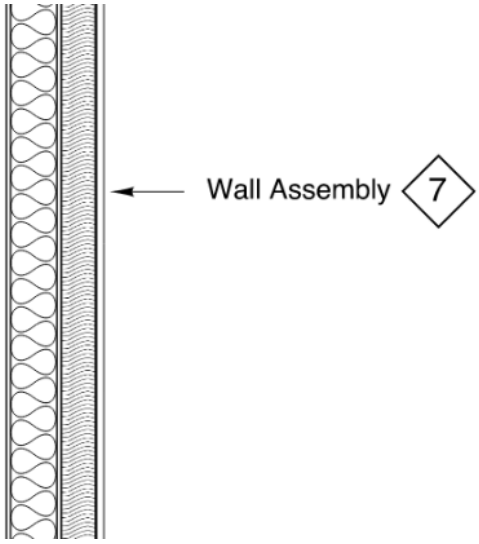
Total R value: *50.2*

6. External wall construction



WALL TYPE 5
Swiss Pearl panels
on 1" proprietary strapping system
4" Roxul Comfort Board Insulation
self adhereing breathable membrane
1/2" Plywood Sheathing
2" x 6" studs @ 16" o/c
Roxul R28 batt insulation
1/2" Gypsum Board

The wall assembly consists of 2×6 wood-frame studs spaced at 24” on center and insulated with R-22 batt insulation. On the exterior, the wall is further wrapped with 6” of XPS insulation, while the interior is finished with gypsum wallboard. The total thickness of the wall assembly is 50.8 cm.



Assembly no. 06ud — Wood Framed Wall 5/6/7(Above Grade wall)

Interior insulation?

Heat transmission resistance [m²K/W]

Orientation of building element: 2-Wall — interior R_{si}: 0.13

Adjacent to: 3-Ventilated — exterior R_{se}: 0.13

Area section 1	λ [W/(mK)]	Area section 2 (optional)	λ [W/(mK)]	Area section 3 (optional)	λ [W/(mK)]	Thickness [mm]	R Value
6" Roxul comfort board	0.036					152	24.04
Plywood sheathing	0.130					13	0.55
filled with Roxul batt	0.036	2x6 wood studs@24" OC	0.130			140	22.03
1/2" GWB	0.250					13	

Percentage of sec. 1: 94% — Percentage of sec. 2: 6.3% — Percentage of sec. 3:

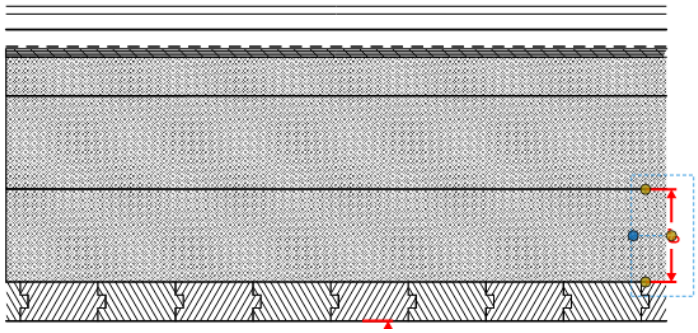
Total: 31.8 cm (12.5 in)

U-value supplement: W/(m²K)

U-value: 0.123 W/(m²K)

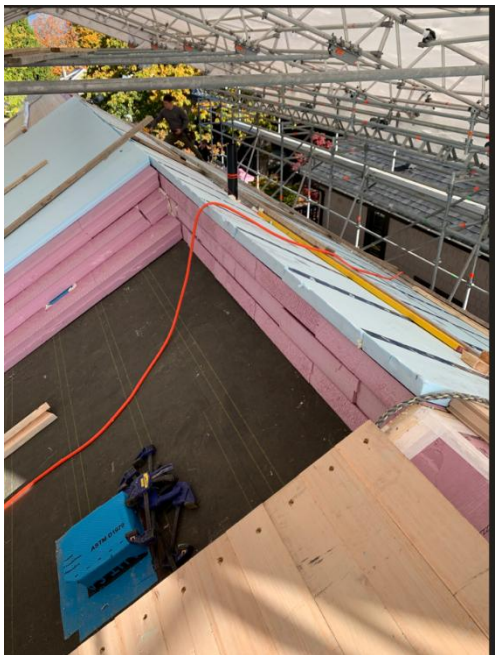
Total R value: 46.1

7. Roof construction



ROOF TYPE 3
Standing seam zinc roofing
Enkamat drainage mat
Zinc Plus membrane
1/2" plywood
2 1/2" Type 4 insulation
6" Type 4 insulation-2 layers
3 x 6 T&G hemlock decking
6 x 10 hemlock purlins

The roof structure consists of tongue-and-groove (T&G) decking and is insulated with 14.5" of Type 4 XPS insulation. The total thickness of the roof assembly is 68.6 cm.



Assembly no.	Building assembly description					Interior insulation?	
01ud	Main Roof Type 3						
		Heat transmission resistance [m²K/W]					
Orientation of building element	1-Roof	interior R_{si}	0.10				
Adjacent to	1-Outdoor air	exterior R_{se}	0.04				
Area section 1	λ [W/(mK)]	Area section 2 (optional)	λ [W/(mK)]	Area section 3 (optional)	λ [W/(mK)]	Thickness [mm]	R Value
1/2" plywood sheathing	1.130					13	0.06
14.5" Type 4 insulation	0.029					368	72.11
2.5" T&G decking	0.130					64	2.77
Air	1.400					229	0.93
GWB	0.250					13	0.29
		Percentage of sec. 1	Percentage of sec. 2		Percentage of sec. 3	Total	
		78%	18.8%		3.1%	68.6 cm	
						27.0 in	
U-value supplement	W/(m²K)			U-value:	0.074 W/(m²K)		
				Total R value:	77.0		

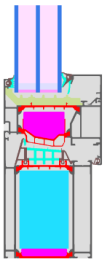
8. Window and window installation

Category: **Window Frame**
Manufacturer: **SCHÜCO International KG, Bielefeld, Germany**
Product name: **AWS 90.SI+**

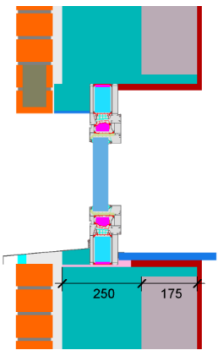
This certificate was awarded based on the following criteria for the cool, temperate climate zone

Comfort $U_W = 0.79 \leq 0.80\ W/(m^2 K)$
$U_{W,installed} \leq 0.85\ W/(m^2 K)$
with $U_g = 0.70\ W/(m^2 K)$

Hygiene $f_{Rsi=0.25} \geq 0.70$



Cavity wall (operable)

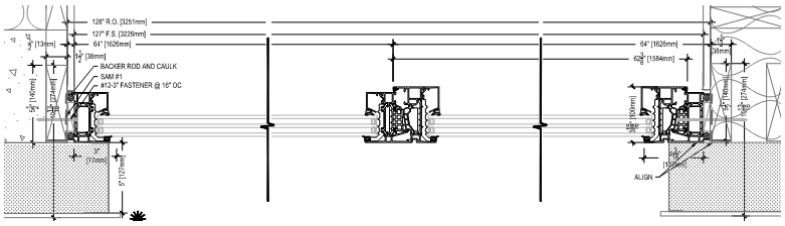


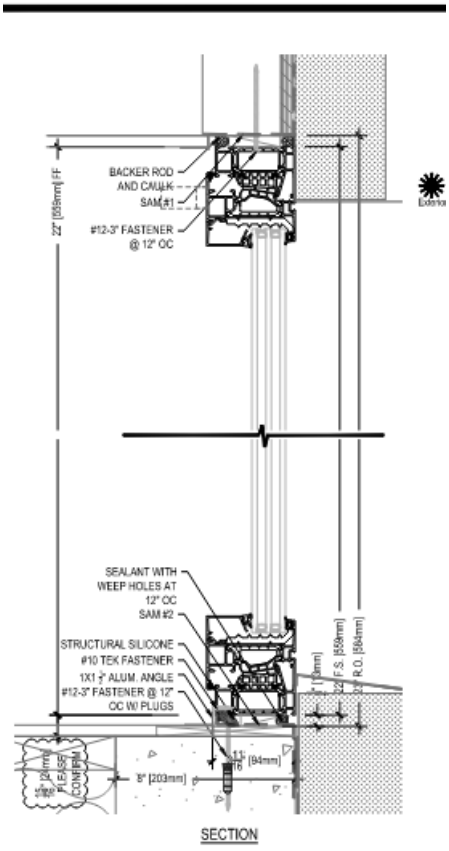
$\Psi_{install}$	W/(m K)
Top	0.009
Side	0.009
Bottom	0.013

$U_{W,installed} = 0.82\ W/(m^2 K)$

All the windows used in the house are Passive house certified from Schuco.

Description of the window (frame) construction, manufacturer	**Schuco and Panaroma**
Make window (frame; product name)	Aluminum window frame insualted by PU foam, pane thickness 48mm abd spacer is swissspacer ultimate
Frame U-value Uf	0.79 W/(m²K)
Glazing construction	Krypton filled; 4 | 8 | 4 | 8 | 4
Glass U-value Ug	0.70 W/(m²K)
G-value of the glazing	0,50





SECTION

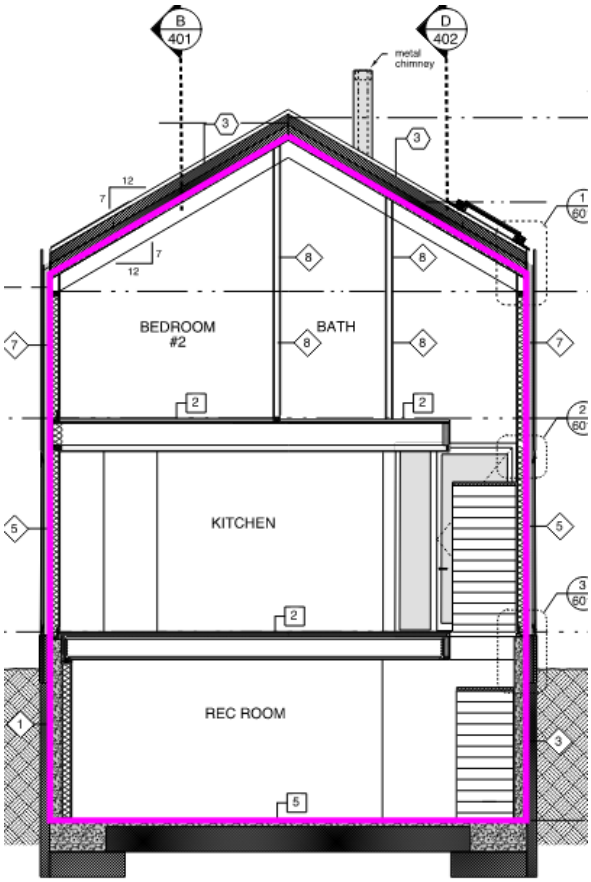
9. Description of the airtight envelope

The initial pressure test was conducted mid-construction The final blower door test was completed on January 3, 2024, by Ecolighten and was operated by myself.

Measurement	**pressure test** **air exchange n h_{50} at 50 Pa**
Whole House as one zone	0.59 ACH @ 50 pa

Air tightness concept

An exterior air barrier system was installed for this building, consisting of Majvest SA house wrap in combination with Wigluv tapes, adhesives, caulking, and concrete to ensure a continuous and durable airtight layer.



10. Ventilation unit

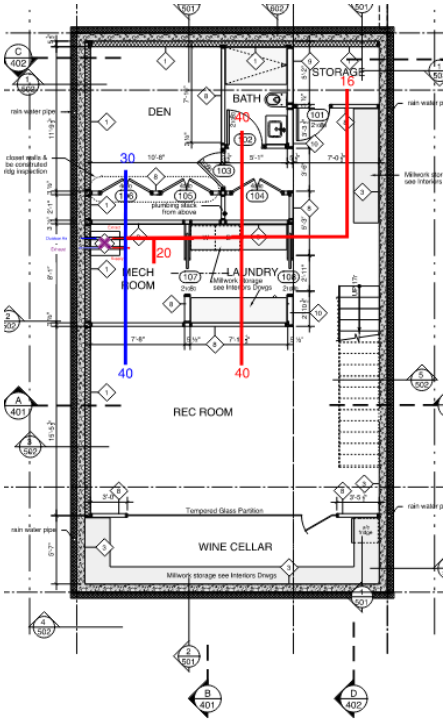
To greatly reduce ventilation losses, a balanced supply/exhaust air system with a highly efficient counterflow air-to-air heat exchanger was used.

Make ventilation system	**Zhender**
effective heat supply rate	88 %
Electrical efficiency	0.21 Wh/m³

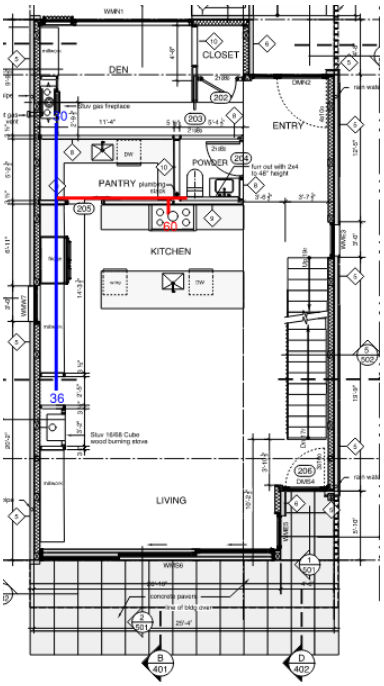
11. Ventilation planning

Supply air rooms is delivered to all primary living spaces through dedicated supply ducts, including the study, den, children's rooms, bedroom, dining room, and living room.

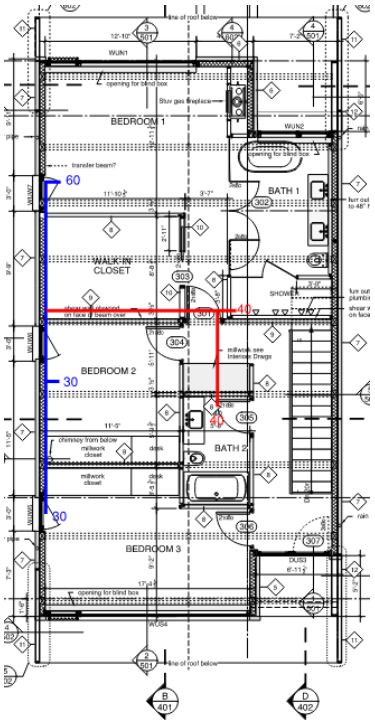
Exhaust air rooms is extracted from the bathrooms, WCs, and the kitchen
The overflow Air transfer between rooms occurs via overflow grilles installed in the interior doors, allowing air to move into the hallway and stairwell. From there, overflow openings above the doors direct air into the wet rooms, where stale air is collected and returned to the heat exchanger through the exhaust duct network.



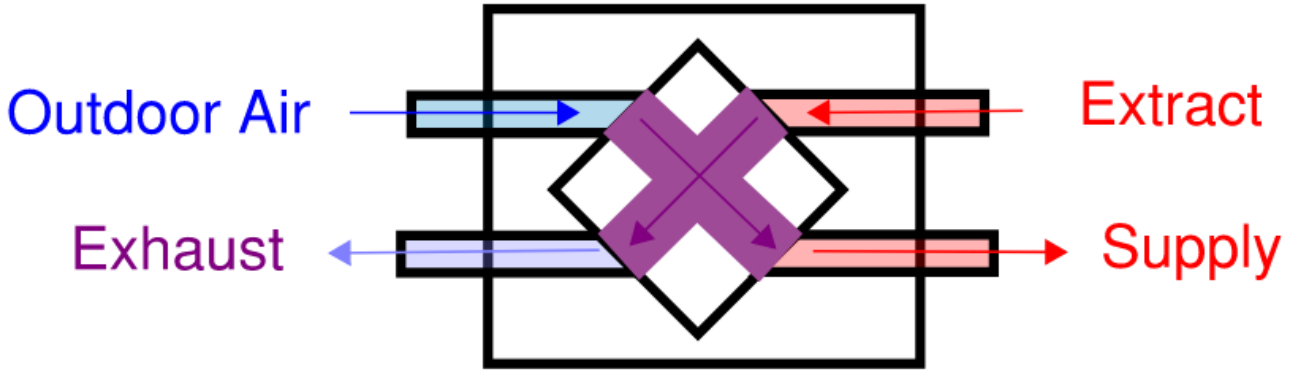
BASEMENT PLAN



MAIN FLOOR PLAN



UPPER FLOOR PLAN



12. Heat supply

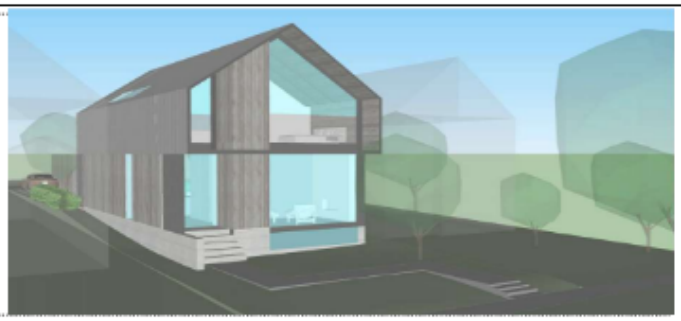
Heating and cooling for the house is provided by Fujitsu air source heat pump, and domestic hot water is provided by Sanden CO2 heat pump.

13. Construction costs

Construction Cost was not at this point of time. If more information is needed can be provided by the builder.

15. PHPP results

Passive House Verification



Building:	Houssian-Yetman Residence		
Street:	26 West 22nd Ave		
Postcode/City:	V5Y2E8	Vancouver	
Province/Country:	BC	CA-Canada	
Building type:	Residential House		
Climate data set:	CA0003d-Vancouver		
Climate zone:	3: Cool-temperate	Altitude of location:	73 m
Home owner / Client:	James Yetman		
Street:	902-221 Union Street		
Postcode/City:		Vancouevr	
Province/Country:	BC	CA-Canada	

Architecture:	Burgers Architecture		
Street:	2486 Haywood Ave		
Postcode/City:	V7V 1Y1	West Vancouver	
Province/Country:	BC	CA-Canada	
Mechanical engineer:	Ecolighten Energy Solutions		
Street:	1515 Barrow St		
Postcode/City:	V7J 1B2	North Vancouver	
Province/Country:	BC	CA-Canada	
Energy consultancy:	Sara Malekpour/ Ecolighten Energy Solutions		
Street:	1515 Barrow St		
Postcode/City:	V7J 1B2	North Vancouver	
Province/Country:	BC	CA-Canada	
Certification:	Tomaz Stich		
Street:	703 13th. Ave	Invermere	
Postcode/City:	V0A1K4		
Province/Country:	BC/ CA-Canada		

Year of construction:	2024	Interior temperature winter [°C]:	20.0	Interior temp. summer [°C]:	25.0
No. of dwelling units:	1	Internal heat gains (IHG) heating case [W/m²]:	2.3	IHG cooling case [W/m²]:	2.3
No. of occupants:	3.2	Specific capacity [Wh/K per m² TFA]:	60	Mechanical cooling:	x

Specific building characteristics with reference to the treated floor area

					Criteria	Alternative criteria	Fullfilled?[2]
	Treated floor area	m²	263.0				
Space heating	Heating demand	kWh/(m²a)	13	≤	15	-	yes
	Heating load	W/m²	14	≤	-	10	
Space cooling	Cooling & dehum. demand	kWh/(m²a)	2	≤	15	15	yes
	Cooling load	W/m²	3	≤	-	10	
	Frequency of overheating (> 25 °C)	%	-	≤	-		-
	Frequency of excessively high humidity (> 12 g/kg)	%	0	≤	10		yes
Airtightness	Pressurization test result n_{50}	1/h	0.6	≤	0.6		yes
Non-renewable Primary Energy (PE)	PE demand	kWh/(m²a)	90	≤	-		-
Primary Energy Renewable (PER)	PER demand	kWh/(m²a)	41	≤	60	60	yes
	Generation of renewable energy (in relation to projected building footprint area)	kWh/(m²a)	0	≥	-	-	

[2] Empty field: Data missing; '-': No requirement

I confirm that the values given herein have been determined following the PHPP methodology and based on the characteristic values of the building. The PHPP calculations are attached to this verification.

Passive House Classic? yes

Task:	First name:	Surname:	Signature:
2-Certifier	Tomaz	Stich	

Certificate ID	Issued on:	City:
		North Vancouver