

## Abstract



ACF Passive House, Pine Plains, NY

Data of building			
Year of construction	2021		
U-value external wall	0,116	Space heating	<b>13.1</b> kWh/(m <sup>2</sup> a)
	W/(m <sup>2</sup> K)		
U-value basement	0,143	Primary Energy Renewable (PER)	57.1
	W/(m <sup>2</sup> K)		kWh/(m <sup>2</sup> a)
U-value roof	0,126	Generation of renewable Energy	64.4
	W/(m <sup>2</sup> K)		kWh/(m <sup>2</sup> a)
U-value window	0,78	Non-renewable Primary Energy (PE)	0
	W/(m <sup>2</sup> K)		kWh/(m <sup>2</sup> a)
Heat recovery	79 %	Pressurization test n <sub>50</sub>	0.37ach50
Special features	Thermal isolation of exterior covered spaces including Carport and Porch.		

## Brief Description

### ACF Passive House

This house provides accommodation for multi-generational family use. Set on a hillside commanding 270 degree views of farmland and adjacent valleys, the house accommodated ample common spaces and four bedroom suites.

The angled geometry of the house responds to the sweep of the south facing panoramic views, and allows for the differentiation of the central common spaces from the bent bedroom wings to the east and west.

A carport and two porches are integrated withing the primary roof form, but supported by clearly articulated (thermally isolated) steel support structures.

The construction is otherwise wood/stick framed, limiting the utilization of EPS foam to the basement subslab and wall insulation.

A north skylit stair is the vertical architectural element that unites the various components of the house.

Clad in copper, ipe and stone, the house utilizes durable and natural materials that will mature in appearance with the exposure and oxidation the design anticipates and welcomes.

**Project Team:**

Architect	Barry Price, AIA www.barryprice.com
HVAC & Enclosure Consultant	Cramer Silkworth, Baukraft Engineering https://www.baukraft.com
Structural Engineer	Stinemire Engineering http://www.stinemireengineering.com
Passive House Certification	Certiphiers https://www.certiphiers.com
Contractor	Wolcott Builders http://www.wolcottbuilders.com

**Certifying body:**

Passivhaus Institut Darmstadt  
www.passiv.de

**Certification ID**

**6712**

Project-ID ([www.passivehouse-database.org](http://www.passivehouse-database.org))

**Author of project documentation:**

Barry Price Architecture  
www.barryprice.com

Date

Signature

10.25.2021



# I. Exterior Photos

from South



From East



from Southeast



from North

# I. Interior Photos



Looking South @ Interior



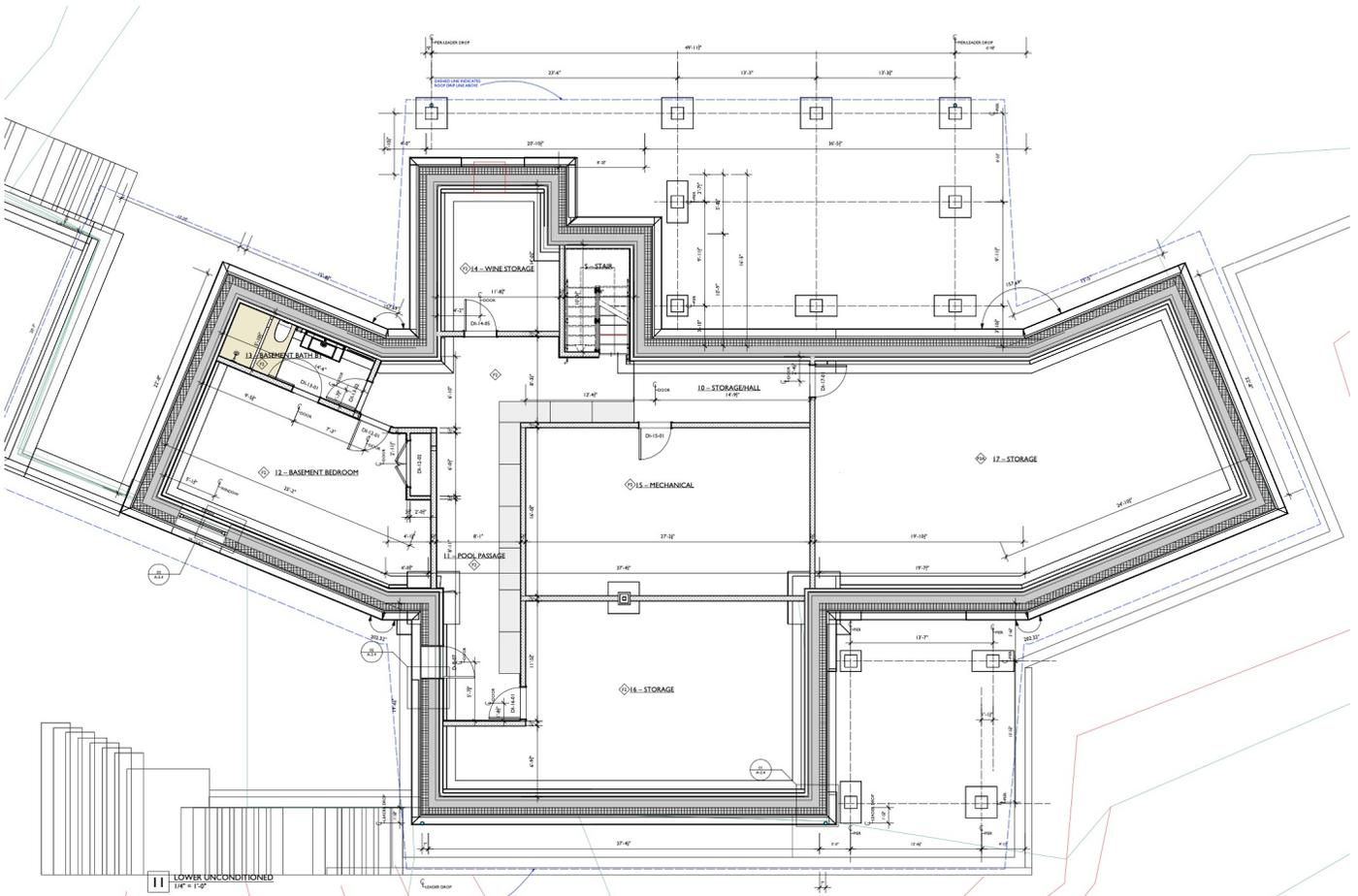
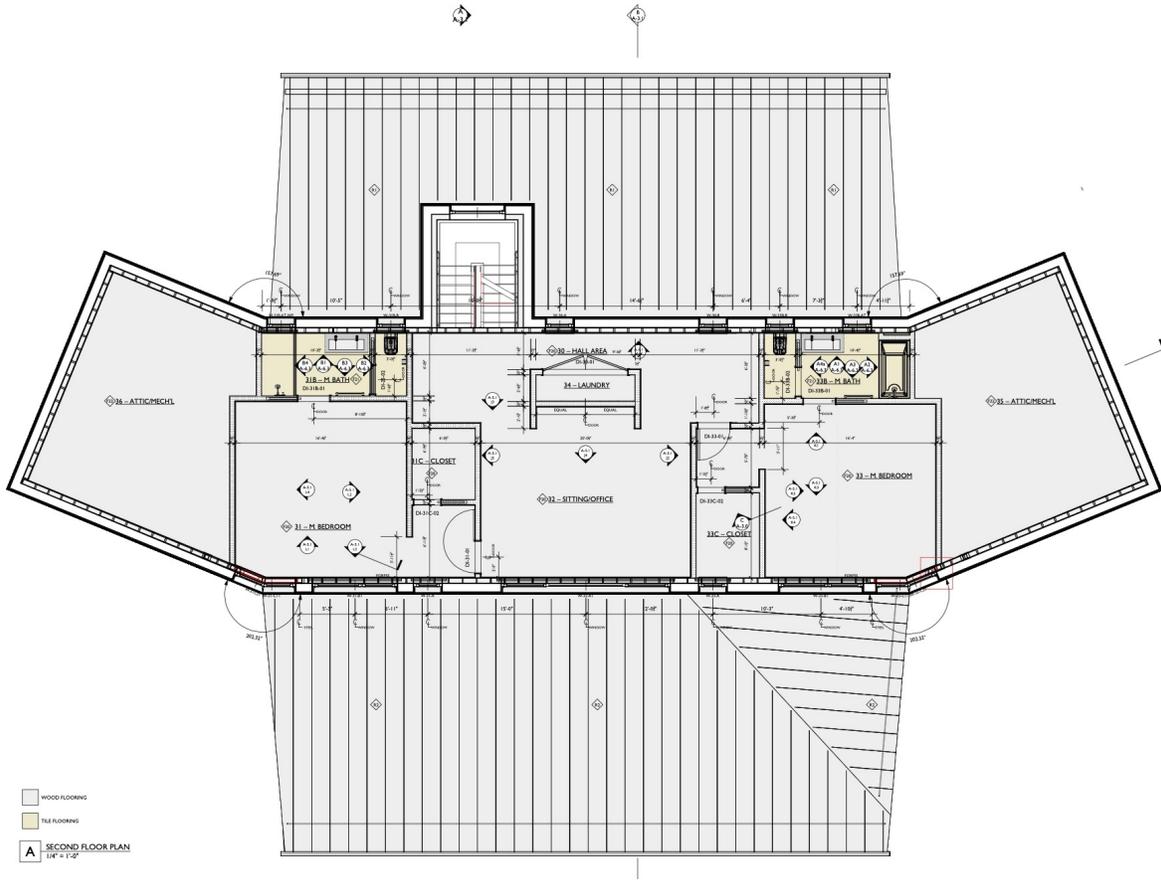
Stair



Kitchen

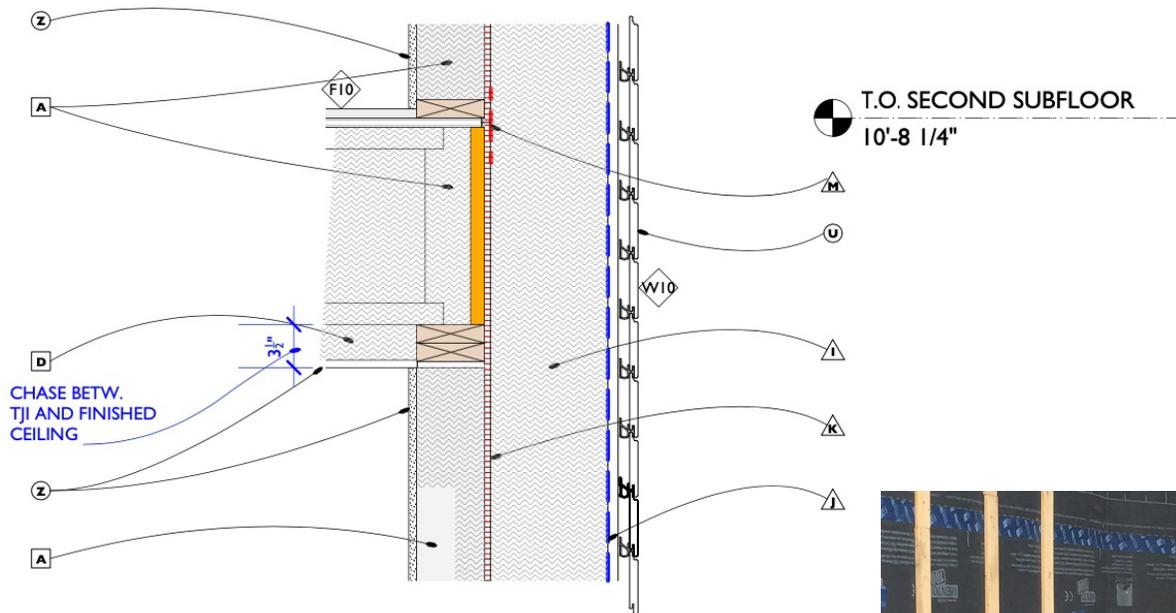


# 4. Floor Plans cont: Upper (above) and Basement (below):





## 6. Construction of the outer walls:



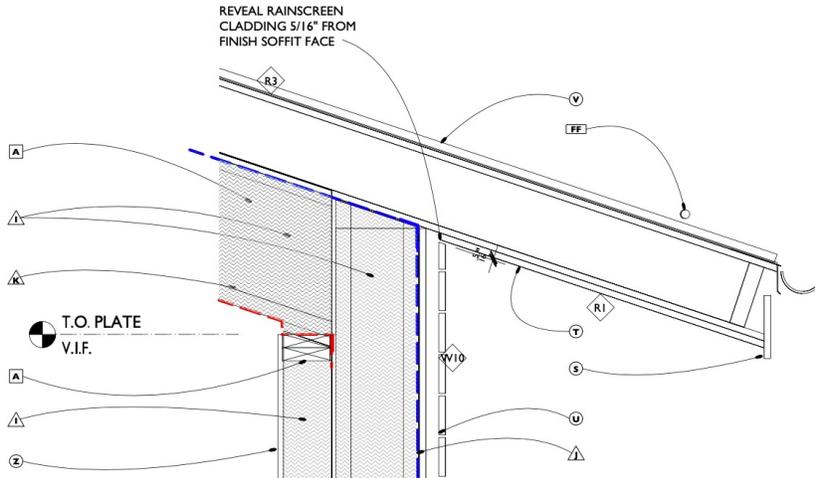
**03** 2ND FLOOR @ EXT'R WALL  
1" = 1'-0"

The wall construction consists of an interior Insulated service wall, wrapped with a vertical I-joist insulated buildout. The core structure accommodates and protects building services, remaining robustly insulated from exterior air.



Assembly no.	Building assembly description					Interior insulation?
04ud	Above Grade Walls					<input checked="" type="checkbox"/>
Orientation of building element		Heat transmission resistance [hr.ft <sup>2</sup> .F/BTU]				
2-Wall		interior R <sub>si</sub>		0.74		
Adjacent to		exterior R <sub>se</sub>		0.74		
3-Ventilated						
Area section 1	R per inch	Area section 2 (optional)	R per inch	Area section 3 (optional)	R per inch	Thickness [in]
GWB	0.85					0.50
(air gap)						
Cellulose	3.70	Wood (softwood)*	1.11	Wood (softwood)*	1.11	5.50
Plywood	1.20					0.50
Cellulose	3.70	Wood (softwood)*	1.11	Wood (softwood)*	1.11	1.50
Cellulose	3.70	Cellulose	3.70	OSB	1.11	6.50
Cellulose	3.70	Wood (softwood)*	1.11	Wood (softwood)*	1.11	1.50
Percentage of sec. 1		Percentage of sec. 2		Percentage of sec. 3		Total
84%		13.3%		2.3%		16.00 in
U-value supplement		BTU/hr.ft <sup>2</sup> .°F		R-value: 49.9 hr.ft <sup>2</sup> .°F/BTU		

## 7. Construction of the Roof:



The denspack insulated cavity Framed structure is capped with a structural overbuild to Provide for thermally isolated Overhangs and rakes.

### R-value of building assemblies

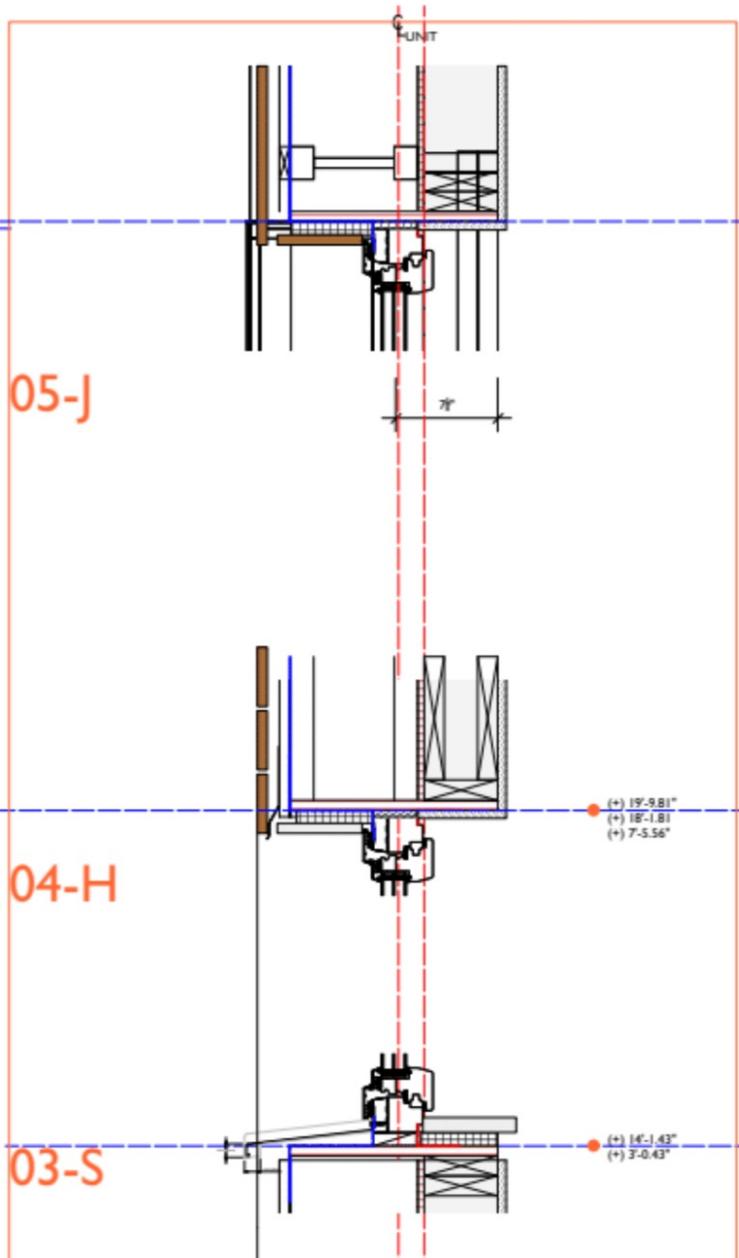
Passive House with PHPP Version 9.6a IP

A Country Farmhouse / Climate: US0106(a)-Poughkeepsie / TFA: 7742 ft<sup>2</sup> / Heating: 4.16 kBTU/(ft<sup>2</sup>yr) / Cooling: 2.74 kBTU/(ft<sup>2</sup>yr) / PER: 18.11 kBTU/(ft<sup>2</sup>yr)

Assembly no.	Building assembly description					Interior insulation?																																																								
05ud	Roof																																																													
Heat transmission resistance [hr.ft <sup>2</sup> .F/BTU]																																																														
Orientation of building element		interior R <sub>si</sub>		0.57																																																										
Adjacent to		exterior R <sub>se</sub>		0.23																																																										
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84%		12.5%		3.1%		12.88 in																																																								
U-value supplement				R-value: 41.4 hr.ft <sup>2</sup> .F/BTU																																																										

Assembly no.	Building assembly description					Interior insulation?																																			
06ud	Attic Floor (with Trusses)																																								
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99%		0.9%				18.50 in																																			
U-value supplement				R-value: 63.0 hr.ft <sup>2</sup> .F/BTU																																					

## 8. Window and window installation:



Description of the window (frame) construction, manufacturer

Aluminum clad, wood framed units, with triple glazing.

Window Manufacturer

Yaro Windows, <http://www.yarowindows.com>

Frame U-value  $U_f$

0.13 BTU/hr.ft<sup>2</sup>°F

Type of glazing

Krypton filled tri-pane

Glass U-value  $U_g$

0.09 BTU/hr.ft<sup>2</sup>°F

## 9. Measurement of the airtight envelope:

The first pressure test was carried out by Baukraft Engineering after the airtight envelope had been completed on June 21, 2018.

The final pressure test was carried out by Baukraft Engineering after the finishes had been completed on June 18, 2020.



Measurement	50 Pa pressure test air change n50 h-1
June 21, 2018	0.38
June 18, 2020	0.38

### Concept airtightness

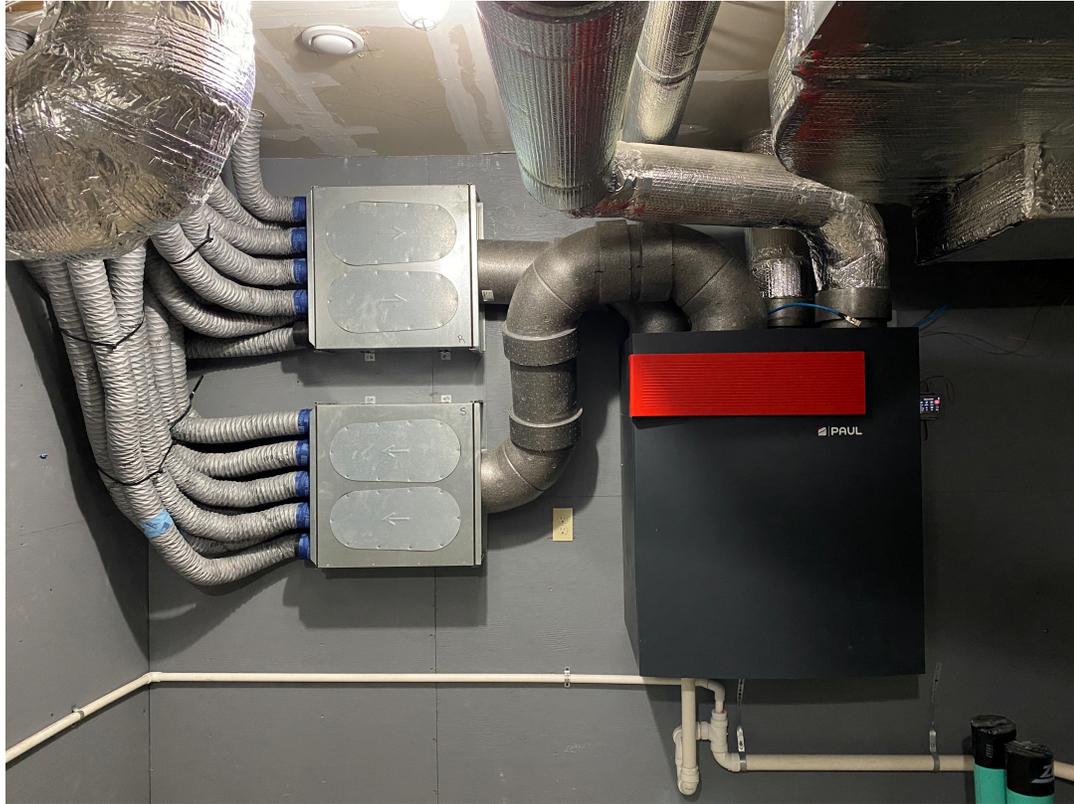
Walls: interior sheetrock, taped and painted

Floor: concrete, 20mil vapor barrier

Fenestration: airtight/watertight tapes

Roof: smart barrier membrane

## 10. Ventilation Unit:



Ventilation system manuf'r	Zehnder Novus 300
Heat Recovery efficiency	0.77 Unit $\eta_{HR}$
Humidity Recovery efficiency	0.64

## 11. Ventilation Planning:

Supply air rooms are all main common rooms including living, dining, bedrooms, den and media room.

Exhaust air rooms are bathrooms, toilets and the kitchen.

## 12. Conditioning & Hot Water:



Description here:

## 13. Construction Costs:

Project costs have been withheld at the Owner's request.

# 15. PHPP Results:

## Passive House Verification

Photo or Drawing

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Architecture: **Barry Price**  
 Street: **PO Box 724**  
 Postcode/City: **12409 Bearsville**  
 Province/Country: **NY US-United States of America**

Energy consultancy: **Cramer Silkworth, Baukraft Engineering**  
 Street: **102 Catherine St**  
 Postcode/City: **12508 Beacon**  
 Province/Country: **NY US-United States of America**

Year of construction: **2017**  
 No. of dwelling units: **1**  
 No. of occupants: **3.6**

Building: **A Country Farmhouse**  
 Street: **25 Schultz Hill Rd**  
 Postcode/City: **12567 Pine Plains**  
 Province/Country: **NY US-United States of America**

Building type: **Single Family Residence**  
 Climate data set: **us---01-US0106(a)-Poughkeepsie**  
 Climate zone: **3: Cool-Temperate** Altitude of location: **830 ft**

Home owner / Client: **June Wu**  
 Street: **25 Schultz Hill Rd**  
 Postcode/City: **12567 Pine Plains**  
 Province/Country: **NY US-United States of America**

Mechanical engineer: **Cramer Silkworth, Baukraft Engineering**  
 Street: **102 Catherine St**  
 Postcode/City: **12508 Beacon**  
 Province/Country: **NY US-United States of America**

Certification: **CertIPHiers Cooperative**  
 Street: **639 SE 59th Ct**  
 Postcode/City: **97215 Portland**  
 Province/Country: **OR US-United States of America**

Interior temperature winter [°F]: **68.0** Interior temp. summer [°F]: **77.0**  
 Internal heat gains (IHG) heating case [BTU/(hr.ft²)]: **0.69** IHG cooling case [BTU/(hr.ft²)]: **0.83**  
 Specific capacity [BTU/F per ft² TFA]: **10.6** Mechanical cooling: **x**

**Calculation electricity / Internal heat gains**  
 Building type: **1-Residential building**

**Internal heat gains**  
 Utilization pattern: **10-Dwelling**  
 Values: **2-Standard**

**Occupancy**  
**1-Standard (only for residential buildings)**

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**Specific building characteristics with reference to the treated floor area**

			Criteria	Alternative criteria	Fulfilled? <sup>2</sup>
<b>Space heating</b>	Treated floor area ft²	<b>7742</b>			
	Heating demand kBTU/(ft²·yr)	<b>4.16</b>	≤	4.75	<b>yes</b>
	Heating load BTU/(hr.ft²)	<b>3.73</b>	≤	-	3.17
<b>Space cooling</b>	Cooling & dehum. demand kBTU/(ft²·yr)	<b>2.74</b>	≤	4.75	4.75
	Cooling load BTU/(hr.ft²)	<b>2.64</b>	≤	-	3.19
	Frequency of overheating (> 77 °F) %	<b>-</b>	≤	-	-
	Frequency of excessively high humidity (> 0.012 lb/lb) %	<b>0.0</b>	≤	10	-
<b>Airtightness</b>	Pressurization test result n <sub>50</sub> 1/hr	<b>0.4</b>	≤	0.6	-
<b>Non-renewable Primary Energy (PE)</b>	PE demand kBTU/(ft²·yr)	<b>20.40</b>	≤	38.04	-
	PER demand kBTU/(ft²·yr)	<b>18.11</b>	≤	-	-
<b>Primary Energy Renewable (PER)</b>	Generation of renewable energy (in relation to pro-jected building kBTU/(ft²·yr) footprint area)	<b>0.00</b>	≥	-	-

<sup>2</sup> Empty field; Data missing; -: No requirement

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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.

Task: \_\_\_\_\_ First name: \_\_\_\_\_ Surname: \_\_\_\_\_  
 Issued on: \_\_\_\_\_ City: \_\_\_\_\_

Passive House Classic? **yes** Signature: \_\_\_\_\_

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**Building energy standard**  
 Class: **1-Passive House**

Verification of primary energy  
**1-Classical**  
**1-PE (non-renewable)**

EnerPHI verification method  
**1-New building / Refurbishment**  
**1-New building**