Passivhaus Design Stage Assessment

prepared by Claire Jamieson, Phi Architecture, Architect and Certified Passivhaus Designer

New build dwelling 'Ithaca' on the site to the rear of Greenland Cottage, High Hoyland Lane, High Hoyland, Yorkshire

A design stage PHPP model has been prepared in relation to the proposed design of Ithaca.

The assessment evaluates the following data:-

- Climate data and altitude of the site
- Surface area of all external elements to the thermal extents
- Ground footprint, associated perimeter and sub ground context
- Anticipated U values of each surface of the thermal envelope, relative to it's context and orientation
- Fenestration and shading parameters with associated orientation
- Ventilation requirements and anticipated efficiency of the MVHR
- Anticipated air pressure test result in ach. to 50 Pa

The resulting Verification is a useful design tool to establish the potential of the architect's proposal to achieve Passivhaus standards.
In this case the Verification is conclusive at the design stage

Passive House Verification

Photo or Drawing

Building:	Ithaka
Street:	Hgh Hoyland Lane
Postcode/City:	High Hoyland
Province/Country:	UK
Building type:	Detached house
Climate data set:	GB0012a-Waddington
Climate zone:	3: Cool-temperate
Altitude of location:	200 m
Home owner / Client:	Steve Warsop
Street:	Greenland Cottage, High Hoyland
Postcode/City:	
Province/Country:	UK

Architecture:	Phi Architecture
Street:	The Barge 5 Canal Road
Postcode/City:	HG4 1QN
Province/Country:	UK
Energy consultancy:	
Street:	
Postcode/City:	
Province/Country:	
Mechanical system:	
Street:	
Postcode/City:	
Province/Country:	
Certification:	
Street:	
Postcode/City:	
Province/Country:	

Year of construction:	2021	Interior temperature winter [°C]:	20.0
No. of dwelling units:	1	Internal heat gains (IHG) heating case [W/m²]:	2.2
No. of occupants:	3.3	Specific capacity [Wh/K per m² TFA]:	60
		Interior temp. summer [°C]:	25.0
		IHG cooling case [W/m²]:	2.2
		Mechanical cooling:	

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

Internal heat gains
Utilisation pattern: 10-Dwelling
Values: 2-Standard

Occupancy
1-Standard (only for residential buildings)

Specific building characteristics with reference to the treated floor area — The PHPP has not been filled completely; it is not valid as verification

					Alternative criteria	Fullfilled?[2]
	Treated floor area m²	393.1				
Space heating	Heating demand kWh/(m²a)	6	≤	15	-	yes
	Heating load W/m²	8	≤	-	10	
Space cooling	Cooling & dehum. demand kWh/(m²a)	-	≤	-	-	-
	Cooling load W/m²	-	≤	-	-	
	Frequency of overheating (> 25 °C) %	0	≤	10		yes
	Frequency excessively high humidity (> 12 g/kg) %	0	≤	20		yes
Airtightness	Pressurization test result n_{50} 1/h	0.6	≤	0.6		yes
Non-renewable Primary Energy (PE)	PE demand kWh/(m²a)	3	≤	-		-
Primary Energy Renewable (PER)	PER demand kWh/(m²a)	1	≤	60	60	
	Generation of renewable energy kWh/(m²a)		≥	-	#VALUE!	

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

1-PE-factors (non-renewable) PHI Certification
(Selected primary energy factors for calculation of PE dem

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?

Task: First name: Surname: Signature:

Issued on: City:

Building energy standard
1-Passive House

Class
1-Classic

Verification of primary energy
2-PER (renewable)

EnerPHit verification method

New building / Refurbishment
1-New building

The data input into the PHPP is derived from drawings and specification as provided by the architect Peter Dimberline. Where design decisions are yet to be determined assumptions have been made with achievable values.

The PHPP indicates the ability for Ithaca to reach PH Classic criteria. The Primary Energy demand has not been modelled. This input will form part of the final scheme design with the relevant consultants' input. Energy consumption demands and storage will be comprehensively determined to perform within the design stage PHPP limitations, such that the PER criteria will be met.

This PHPP is for detailed design reference and planning information purposes only.

Design Stage PHPP criteria

CLIMATE	UK Zone 12 - East Penines Cool temperate Altitude 200m
AREAS	Ground floor area - 191m^2
	Treated floor area - 393.08m^2
	Thermal envelope walls and roofs - 882.26m^2
U values	Ground floor - 0.107 W/(m^2K)
	First floor above garage - 0.095 W/(m^2K)
	External walls below ground - 0.14 W/(m^2K)
	External walls above ground - 0.138 W/(m^2K)
	Roof - 0.110 W/(m^2K)
Fenestration	Glass U_g - 0.60 W/(m^2K)
	Glass $_g$ - 0.62
	Triple glazed hermetically sealed with warm spacers and Class 4 air tightness - EN12207 (EN1026)
	Window U_f - 0.98 to 1.38 W/m2K depending on adjacent parameters
	P_{si} Installation assumed to be 0.04 W/(mK)
	P_{si} Glazing edge 0.036 to 0.038 W/(mK)
MVHR	Conservative estimate of efficiency 85.5%
Air tightness	≤ 0.6 ach. @ 50 Pa.
Thermal bridges	Assumed to be thermal bridge free < 0.01 W/(mK)