VISION
ENERGY

PROJECT SPECIFICATION

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SAP04579 Design Stage SAP Calculations **3 Gyles Court**

Newquay

TR7 3ER

VISION ENERGY

Document Version

Rev	Date	Description	Prepared	Proofed
1	12/03/2024	First Draft V1	M. Paez	D. Barsted

Contents

1. Proposed Specification V1

Element	Designed U-Value (W/m²k)
Ground Floor Slab	0.11
External Cavity Wall – Render on Block	0.16
Cold Roof	0.11

1.1 Fabric U-Values

U-Value calculations can be found at the ending of this report, for suitability review by Design Team.

1.2 Thermal Bridging

- Y-Value: 0.049W/mK

Thermal bridging has been calculated with a combination of Recognised Construction Details, and SAP Table K1 "Default". Recognised Construction Details are available online if consultation is required to meet key performance criteria that permit the use of the Psi-Value.

1.3 Glazing Specification

Windows assessed as Double Glazed Low-Emissivity Soft 0.1 (G-Value=0.63)

Element	Designed U-Value (W/m²k)	Proposed U-Value (W/m²k)
External Doors	1.60	1.20
Windows	1.60	1.20
French Doors	1.60	1.20

1.4 Space & Water Heating – As Designed

Element	Specification
Type	Boiler
Fuel Source	Mains Gas
System	System Boiler
Manufacturer	Ideal Boilers
Product Model	Logic Combi ESP1 30
Space Heating Controls	Time and Temperature Zone Control by Arrangement
Minimum Heating Zones	Minimum of Two Heating Zones
Interlock	Yes
Delayed Start Thermostat	Yes
Compensation	No
Emitter	Underfloor Heating
Underfloor Heating	Pipes in Thin Screed

1.5 Space & Water Heating - Proposed

Element	Specification
Type	Air Source Heat Pumps (Wet System)
Fuel Source	Electricity
Manufacturer	Mitsubishi
Product Model	Ecodan R32 5.0kW Compact PUZ Monobloc Air Source Heat Pump
Flow Temperature	45 °C
Space Heating Controls	Time and Temperature Zone Control
Minimum Heating Zones	Minimum of Two Heating Zones
Emitter	Radiators and Underfloor
Hot Water Cylinder	Mitsubishi Ecodan R32 FTC6 Monobloc Pre-plumbed Standard Cylinder
Volume	150 Litres
Declared Loss Factor	1.15 kWh/day
Independent Time Control	Yes
Cylinder Thermostat	Yes
Primary Pipework Insulated	Fully Insulated
Cold Water Source	From Mains
Showers	Non-Electric
Non Electric Shower Flow Rate	≤ 11 litres/min

Heating Design: *Vision Energy do not design heating systems and assume no responsibility for the design. The specified manufacturer, or specialist consultant, should be approached to undertake a system design for each dwelling type, and the specification of their system should be communicated to us when available.*

Space Heating Controls (Zoning): *Where 'Time and Temperature Zone Control' is specified, this requires a system of control that allows the heating times of at least two zones to be programmed independently as well as having independent temperature control.*

1.6 Ventilation – As Designed

Element	Specification
System Type	Decentralised Whole House Extract (dMEV)
Manufacturer	Vent Axia Ltd.
Product / Model	Lo-Carbon NBR dMEV 100 HT (SAP 10)
Duct Type	Rigid
Design Air Permeability (ACH@50Pa)	5

1.7 Ventilation – Proposed

Element	Specification
System Type	Mechanical Ventilation with Heat Recovery (MVHR)
Manufacturer	Vent Axia Ltd.
Product / Model	Sentinel Kinetic B
Duct Type	Rigid
Design Air Permeability (ACH@50Pa)	0.6

Ventilation System Design: *Vision Energy do not design ventilation systems and assume no responsibility for the design. The specified ventilation manufacturer, or specialist consultant, should be approached to undertake a system design for each dwelling type, and the specification of their system should be communicated to us when available.*

1.8 Renewables Strategy

	As Designed	As Proposed
Type	-	Photovoltaic Panels
Peak Power	-	4.00kW facing West
Tilt Angle	-	30° (Panels to Achieve Tilt Angle Between 15-37°)
Connection	-	Individual Dwelling
Excess Energy	-	Exported to Grid

Renewable Energy System Design: Vision Energy do not design renewable energy systems and assume no responsibility for the design. The specified manufacturer, or specialist consultant, should be approached to undertake a system design for each dwelling / block type based on the above SAP parameters.

1.9 Results Overview

Element	As Designed Results	As Proposed Results
EPC Rating	B 83	A 100
t/yr of CO2	1.00	-0.21
Emissions Rating Compliance Margin	-74.67%	116.65%
Primary Energy Compliance Margin	-81.70%	90.66%
Fabric Efficiency Compliance Margin	-4.97%	12.14%

1.10 Project U-Values

U-value calculation
by BRE U-value Calculator version 2.04g
Printed on 04 Mar 2024 at 15:45

Element type: Floor - Suspended beam-and-block floor
Calculation Method: BS EN ISO 6946, BS EN ISO 13370

SAP04579 - Kairos Architecture
- Ground Floor System
150mm PIR

U-value of floor construction:

Layer	d (mm)	λ layer	λ bridge	Fraction	R layer	R bridge	Description
					0.170		Rsi
1	50	1.150			0.043		Screed
2	150	0.022			6.818		PIR
3	100	0.180			0.556		Reinforce Concrete Slab
					0.170		Rs (underfloor)
	300 mm				7.757		

Total resistance: Upper limit: 7.757 Lower limit: 7.757 Ratio: 1.000 Average: 7.757 m²K/W
U-value of floor construction: 0.129 W/m²K

Ground parameters:

Perimeter P:	35.39 m	Wall thickness:	300 mm
Area A:	68.96 m²	Ground type:	Clay/silt (λ = 1.5 W/m·K)
P/A:	0.513	Rse:	0.04 m²K/W
Resistance on solum Rg:			0.000 m²K/W
Depth of underfloor space below ground:			0.200 m
Floor height above ground:			0.000 m
Mean wind speed:			5.00 m/s
Wind shielding factor:			0.050
Ventilation openings per metre length:			0.0015 m²/m

U-value for ground (Ug)	0.709
U-value of floor deck (Uf)	0.129
Ventilation equivalent U-value (Ux)	0.140

U-value overall	0.112
U-value (rounded)	**0.11 W/m²K**

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U-value calculation
by BRE U-value Calculator version 2.04g
Printed on 04 Mar 2024 at 15:43

Element type: Wall - Masonry - partial cavity fill
Calculation Method: BS EN ISO 6946

SAP04579 - Kairos Architecture
- Cavity Wall (Partial Fill)
100mm PIR
Render on Block

Layer	d (mm)	λ layer	λ bridge	Fraction	R layer	R bridge	Description
					0.130		Rsi
1	32.5	0.019			1.711		Insulated Plasterboard
2	100	1.130			0.088		Concrete block (dense)
3	100	0.022			4.545		PIR
4	50	R-value			0.180		Cavity unventilated
5	100	1.130			0.088		Concrete block (dense)
					0.040		Rse
	383 mm (total wall thickness)				6.783		

Total resistance: Upper limit: 6.783 Lower limit: 6.783 Ratio: 1.000 Average: 6.783 m²K/W

U-value (uncorrected) 0.147

U-value corrections
Air gaps in layer 3 ΔU = 0.0045 (Level 1)
Wall ties in layer 3 ΔU = 0.0122 (2.50 per m², 80.0 mm² cross-section, λ = 17.0)

Total ΔU 0.017

U-value (corrected) 0.164
U-value (rounded) 0.16 W/m²K

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U-value calculation
by BRE U-value Calculator version 2.04g
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Element type: Roof - Pitched roof - insulated ceiling
Calculation Method: BS EN ISO 6946

SAP04579 - Kairos Architecture
- Cold Roof
400mm Mineral Wool

Layer	d (mm)	λ layer	λ bridge	Fraction	R layer	R bridge	Description
					0.100		Rsi
1	12.5	0.210			0.060		Plasterboard
2							Vapour Control Layer
3	200	0.040	0.130	0.0900	5.000	1.538	Mineral Wool Between Joists
4	200	0.040			5.000		Mineral Wool Over Joists
5		R-value[1]			0.300		Roof space
					0.040		Rse
	413 mm				10.500		

[1]Roof space - tiled roof, with felt and sarking boards

Total resistance: Upper limit: 10.054 Lower limit: 9.658 Ratio: 1.041 Average: 9.856 m²K/W

U-value (uncorrected) 0.101

U-value corrections

Air gaps in layer 3	ΔU = 0.000	(Level 0)
Loft hatch	ΔU = 0.004	(Insulation thickness = 50 mm)

Total ΔU 0.004

U-value (corrected) 0.105
U-value (rounded) 0.11 W/m²K

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