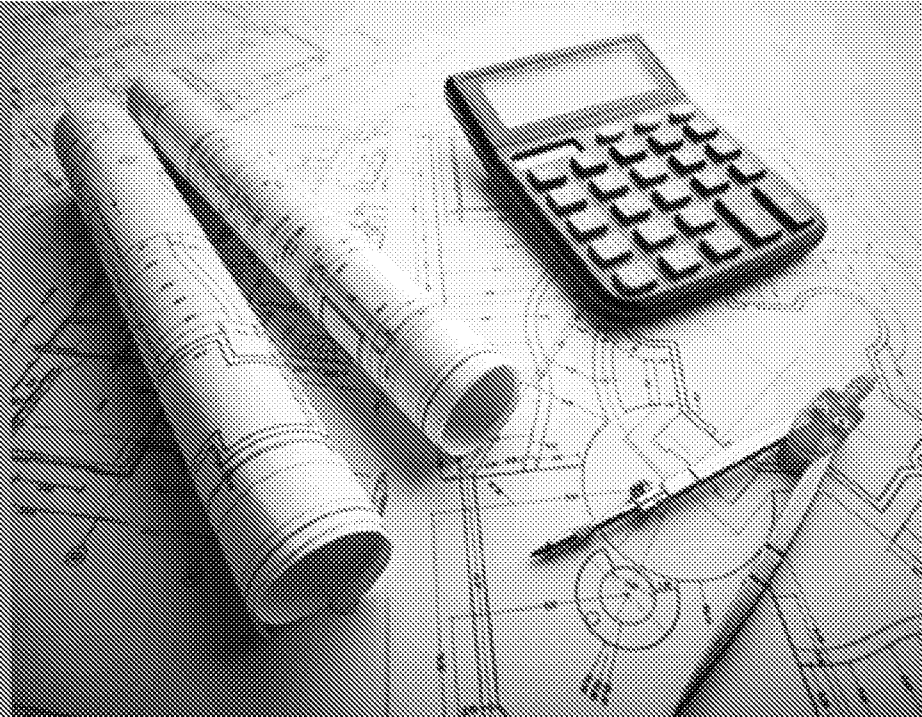




SAP Report Submission for Building Regulations Compliance

Client: Vivid Design Studio

Project: Land Adj Mistletoe Farm, Horsemere Green Lane
Climping, Littlehampton, West Sussex, BN17 5QZ

Contact: Mark Rogers
Surecalc Limited
mark@surecalc.co.uk

Report Issue Date: 01/12/2021

EXCELLENCE
IN ENERGY
ASSESSMENT

CODE FOR SUSTAINABLE HOMES

Calculation Type: New Build (As Designed)



Property Reference	sc121368	Issued on Date	01/12/2021
Assessment Reference	002 Gas System Boiler + PV	Prop Type Ref	New Dwelling
Property	Land Adj Mistletoe Farm, Horsemere Green Lane, Climping, Littlehampton, West Sussex, BN17 5QZ		

SAP Rating	90 B	DER	11.85	TER	15.15
Environmental	89 B	% DER<TER	21.79		
CO ₂ Emissions (t/year)	1.29	DFEE	50.22	TFEE	55.43
General Requirements Compliance	Pass	% DFEE<TFEE	9.41		

Assessor Details	Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk	Assessor ID	A320-0001
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Client	Vivid Design Studio, Vivid Design Studio
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ENE 1 - Dwelling Emission Rate calculation

Total floor area	173.15	m ²
DER	11.85	kgCO ₂ /yr/m ²
TER	15.15	kgCO ₂ /yr/m ²
CO ₂ emissions offset from additional allowable electricity generation	0.00	kgCO ₂ /yr/m ² (ZC7)
Residual CO ₂ emissions offset from biofuel CHP	0.00	kgCO ₂ /yr/m ² (ZC5)
Total CO ₂ emissions offset from SAP Section 16 allowances	0.00	kgCO ₂ /yr/m ²
DER accounting for SAP Section 16 allowances	11.85	kgCO ₂ /yr/m ²
Reduction DER/TER	21.79	%
CfSH ENE1 credits achieved	3.2	
CfSH ENE1 level achieved	4	

ENE 2 - Fabric Energy Efficiency calculation

Dwelling type	Bungalow, Detached	
Fabric energy efficiency (F.E.E.)	50.22	kWh/m ² /yr
CfSH ENE2 credits achieved	5.6	
CfSH ENE1 and 2 overall level achieved	4	

ENE 7 - Low and Zero Carbon Technologies calculation

Standard case CO₂ emissions

Total floor area	173.15	m ²
DER	17.10	kgCO ₂ /yr/m ²
CO ₂ emissions from electrical appliances	11.80	kgCO ₂ /yr/m ² (ZC2)
CO ₂ emissions from cooking	1.10	kgCO ₂ /yr/m ² (ZC3)
Standard case total CO ₂ emissions	30.00	kgCO ₂ /yr/m ² (ZC4)
Net Standard case CO ₂ emissions	30.00	kgCO ₂ /yr/m ² (ZC8)

Actual case CO₂ emissions

DER	12.78	kgCO ₂ /yr/m ²
CO ₂ emissions from electrical appliances	11.80	kgCO ₂ /yr/m ² (ZC2)
CO ₂ emissions from cooking	1.10	kgCO ₂ /yr/m ² (ZC3)
Actual case total CO ₂ emissions	25.68	kgCO ₂ /yr/m ² (ZC4)
CO ₂ emissions from Biomass	0.00	kgCO ₂ /yr/m ² (ZC5)
CO ₂ reduction from additional allowable electricity generation	0.00	kgCO ₂ /yr/m ² (ZC7)
Net Actual case CO ₂ emissions	25.68	kgCO ₂ /yr/m ² (ZC8)
Improvement in net actual/net standard case CO ₂ emissions	14	%

ENE7 credits achieved

1

PREDICTED ENERGY ASSESSMENT

surecalc ltd

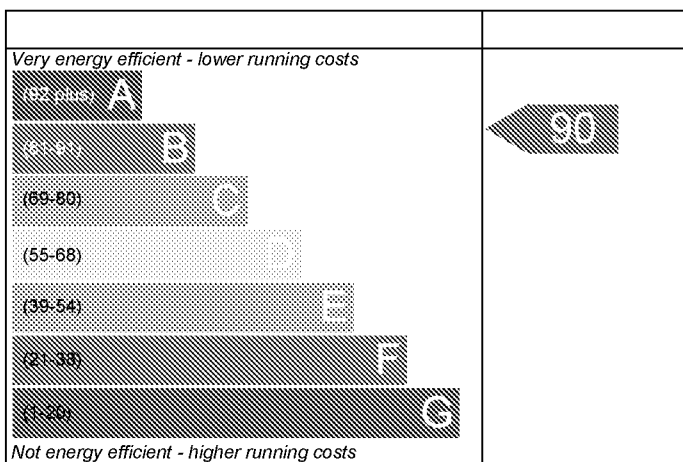
Land Adj Mistletoe Farm, Horsemere Green
Lane,
Climping,
Littlehampton,
West Sussex,
BN17 5QZ

Dwelling type: Bungalow, Detached
Date of assessment: 01/12/2021
Produced by: Surecalc Limited
Total floor area: 173.15 m²
DRRN: 6209-3121-9981

This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

The energy performance has been assessed using the Government approved SAP2012 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO₂) emissions.

Energy Efficiency Rating

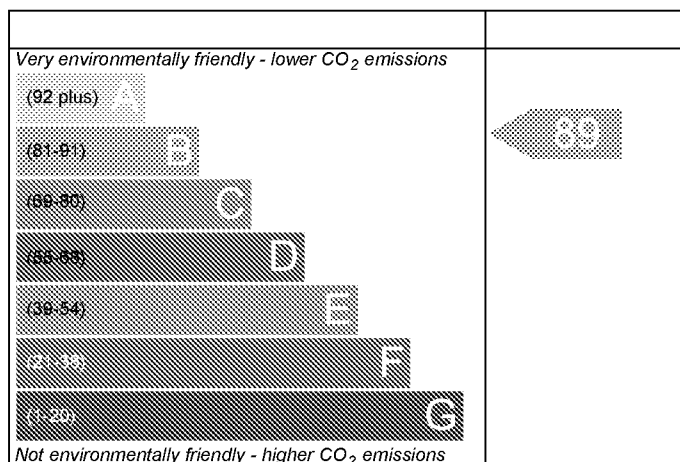


England

EU Directive
2002/91/EC

The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.

Environmental Impact (CO₂) Rating

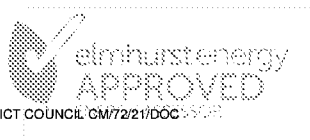


England

EU Directive
2002/91/EC

The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO₂) emissions. The higher the rating the less impact it has on the environment.

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BUILDING REGULATION COMPLIANCE

Calculation Type: New Build (As Designed)



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Environmental	89 B	% DER<TER	21.79
CO ₂ Emissions (t/year)	1.29	DFEE	50.22
General Requirements Compliance	Pass	% DFEE<TFEE	9.41
Assessor Details	Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk		Assessor ID
Client	Vivid Design Studio, Vivid Design Studio		

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

Criterion 1 – Achieving the TER and TFEE rate

1a TER and DER

Fuel for main heating	Mains gas		
Fuel factor	1.00 (mains gas)		
Target Carbon Dioxide Emission Rate (TER)	15.15	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	11.85	kgCO ₂ /m ²	Pass
	-3.30 (-21.8%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	55.43	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	50.22	kWh/m ² /yr	
	-5.2 (-9.4%)	kWh/m ² /yr	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.24 (max. 0.30)	0.28 (max. 0.70)	Pass
Floor	0.15 (max. 0.25)	0.15 (max. 0.70)	Pass
Roof	0.13 (max. 0.20)	0.14 (max. 0.35)	Pass
Openings	1.42 (max. 2.00)	1.80 (max. 3.30)	Pass

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

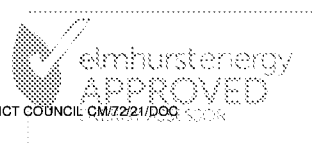
3 Air permeability

Air permeability at 50 pascals	5.00 (design value)	m ³ /(h.m ²) @ 50 Pa	
Maximum	10.0	m ³ /(h.m ²) @ 50 Pa	Pass

Limiting System Efficiencies

4 Heating efficiency

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BUILDING REGULATION COMPLIANCE

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Main heating system	Boiler system with radiators or underfloor - Mains gas Data from database Glow-worm ULTIMATE 3 25r-A (H-GB) Efficiency: 89.6% SEDBUK2009 Minimum: 88.0%	Pass
Secondary heating system	None	
5 Cylinder insulation		
Hot water storage	Measured cylinder loss: 1.42 kWh/day Permitted by DBSCG 2.30	Pass
Primary pipework insulated	Yes	Pass
6 Controls		
Space heating controls	Time and temperature zone control	Pass
Hot water controls	Cylinderstat	Pass
	Independent timer for DHW	Pass
Boiler interlock	Yes	Pass
7 Low energy lights		
Percentage of fixed lights with low-energy fittings	100 %	
Minimum	75 %	Pass
8 Mechanical ventilation		
Not applicable		

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (South East England)	Not significant	Pass
Based on:		
Overshading	Average	
Windows facing North	3.25 m ² , No overhang	
Windows facing East	1.45 m ² , No overhang	
Windows facing South	15.70 m ² , No overhang	
Windows facing West	4.87 m ² , No overhang	
Air change rate	4.00 ach	
Blinds/curtains	None	

Criterion 4 – Building performance consistent with DER and DFEF rate

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals	5.00 (design value)	m ³ /(h.m ²) @ 50 Pa	
Maximum	10.0	m ³ /(h.m ²) @ 50 Pa	Pass
10 Key features			
Roof U-value	0.11	W/m ² K	
Thermal bridging y-value	0.036	W/m ² K	
Photovoltaic array	2.64	kW	

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SUMMARY FOR INPUT DATA

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Environmental	89 B	% DER<TER	21.79
CO ₂ Emissions (t/year)	1.29	DEFE	50.22
General Requirements Compliance	Pass	% DEFE<TFEE	55.43
Assessor Details	Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk		Assessor ID
Client	Vivid Design Studio, Vivid Design Studio		

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	North
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	Bungalow, Detached
2.0 Number of Storeys	2
3.0 Date Built	2021
4.0 Sheltered Sides	1
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
	Ground Floor:	54.51 m	117.29 m ²
	1st Storey:	36.86 m	55.86 m ²
			2.45 m
			2.34 m

7.0 Living Area	20.85	m ²
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8.0 Thermal Mass Parameter	Simple calculation - Medium	
Thermal Mass	250.00	kJ/m²K

9.0 External Walls		U-Value (W/m ² K)	Gross Area (m ²)	Nett Area (m ²)
Description	Type			
External Cavity Wall	Cavity Wall	0.25	145.85	120.96
Dwelling to Garage Wall	Solid Wall	0.22	23.00	21.05
Dormers	Cavity Wall	0.28	12.02	7.68

10.0 External Roofs		U-Value (W/m ² K)	Gross Area (m ²)	Nett Area (m ²)
Description	Type			
External Roofspace	External Plane Roof	0.11	64.11	64.11
External Roof Skilling	External Slope Roof	0.14	69.80	68.28

11.0 Heat Loss Floors		U-Value (W/m ² K)	Area (m ²)
Description	Type		
Ground Floor	Ground Floor - Solid	0.15	117.29

12.0 Opening Types

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)



Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
New Dwelling DG Door	Manufacturer	Half Glazed Door	Double Low-E Soft 0.05			0.71		0.70	1.40
New Dwelling Fire Door	Manufacturer	Solid Door							1.80
New Dwelling DG Window	Manufacturer	Window	Double Low-E Soft 0.05			0.71		0.70	1.40
New Dwelling DG Rooflight	Manufacturer	Roof Window	Double Low-E Soft 0.05			0.64		0.70	1.40

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front North Windows	Window	[1] External Cavity Wall	North	None	0.00					3.25	
Front North Rls	Roof Window	[2] External Roof Skilling	North	None						1.52	
Side West Door	Half Glazed Door	[1] External Cavity Wall	West							2.01	
Side West Windows	Window	[1] External Cavity Wall	West	None	0.00					4.87	
Side East Door	Half Glazed Door	[1] External Cavity Wall	East							1.95	
Side East Windows	Window	[1] External Cavity Wall	East	None	0.00					1.45	
Rear South Windows	Window	[1] External Cavity Wall	South	None	0.00					11.36	
Rear South Windows	Window	[3] Dormers	South	None	0.00					4.34	
Garage Fire Door	Solid Door	[2] Dwelling to Garage Wall	North							1.95	

14.0 Conservatory

None

15.0 Draught Proofing

100

%

16.0 Draught Lobby

No

17.0 Thermal Bridging

Calculate Bridges

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported	Reference:
Independently assessed	E2 Other lintels (including other steel lintels)	15.91	0.291	No	LABC Construction Details
Table K1 - Default	E2 Other lintels (including other steel lintels)	3.60	1.000	No	
Independently assessed	E3 Sill	14.95	0.027	No	LABC Construction Details
Table K1 - Default	E3 Sill	3.60	0.080	No	
Independently assessed	E4 Jamb	34.80	0.029	No	LABC Construction Details
Table K1 - Default	E4 Jamb	4.80	0.100	No	
Independently assessed	E5 Ground floor (normal)	54.51	0.000	No	LABC Construction Details
Independently assessed	E6 Intermediate floor within a dwelling	9.69	0.003	No	LABC Construction Details
Independently assessed	E10 Eaves (insulation at ceiling level)	14.86	0.029	No	LABC Construction Details
Table K1 - Default	E10 Eaves (insulation at ceiling level)	4.80	0.120	No	
Independently assessed	E11 Eaves (insulation at rafter level)	2.25	0.029	No	LABC Construction Details
Independently assessed	E12 Gable (insulation at ceiling level)	6.60	0.054	No	LABC Construction Details
Independently assessed	E13 Gable (insulation at rafter level)	16.80	0.052	No	LABC Construction Details
Independently assessed	E16 Corner (normal)	9.80	0.050	No	LABC Construction Details
Table K1 - Default	E16 Corner (normal)	4.90	0.180	No	
Independently assessed	E17 Corner (inverted – internal area greater than external area)	2.45	-0.029	No	
Table K1 - Default	E17 Corner (inverted – internal area greater than external area)	2.45	0.000	No	
Table K1 - Default	R1 Head of roof window	1.56	0.080	No	
Table K1 - Default	R2 Sill of roof window	1.56	0.060	No	
Table K1 - Default	R3 Jamb of roof window	3.92	0.080	No	
Table K1 - Default	R6 Flat ceiling	15.19	0.060	No	

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)



Y-value	0.036	W/m²K
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18.0 Pressure Testing	Yes	
Designed AP ₅₀	5.00	m³/(h.m²) @ 50 Pa
Property Tested ?		
As Built AP ₅₀		m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation	
Summer Overheating	
Windows open in hot weather	Windows half open
Cross ventilation possible	Yes
Night Ventilation	Yes
Air change rate	4.00
Mechanical Ventilation	
Mechanical Ventilation System Present	No

20.0 Fans, Open Fireplaces, Flues	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				6
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No
----------------------------------	---------------------------------

22.0 Lighting	
Internal	
Total number of light fittings	48
Total number of L.E.L. fittings	48
Percentage of L.E.L. fittings	100.00 %
External	
External lights fitted	Yes
Light and motion sensor	Yes

23.0 Electricity Tariff	Standard
--------------------------------	---------------------------------------

24.0 Main Heating 1	Database	
Description	Gas System Boiler	
Percentage of Heat	100	%
Database Ref. No.	18232	
Fuel Type	Mains gas	
Main Heating	BGB	
SAP Code	102	
In Winter	90.5	
In Summer	80.4	
Controls	CBI Time and temperature zone control	
PCDF Controls	0	
Delayed Start Stat	Yes	
Sap Code	2110	
Flue Type	Balanced	
Fan Assisted Flue	Yes	
Is MHS Pumped	Pump in heated space	

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)



Heat Emitter	Radiators and Underfloor			
Underfloor Heating	Yes - Pipes in thin screed			
Flow Temperature	Unknown			
25.0 Main Heating 2	None			
Community Heating	None			
28.0 Water Heating	HWP From main heating 1			
Water Heating	Main Heating 1			
Flue Gas Heat Recovery System	No			
Waste Water Heat Recovery Instantaneous System 1	No			
Waste Water Heat Recovery Instantaneous System 2	No			
Waste Water Heat Recovery Storage System	No			
Solar Panel	No			
Water use <= 125 litres/person/day	Yes			
SAP Code	901			
29.0 Hot Water Cylinder	Hot Water Cylinder			
Cylinder Stat	Yes			
Cylinder In Heated Space	Yes			
Independent Time Control	Yes			
Insulation Type	Measured Loss			
Cylinder Volume	210.00			
Loss	1.42			
Pipes Insulation	Fully insulated primary pipework			
31.0 Thermal Store	None			
32.0 Photovoltaic Unit	One Dwelling			
PV Cells kWp	Orientation	Elevation	Overshading	Connected to Dwelling
1.32	West	45°	Modest	Yes
1.32	East	45°	Modest	Yes

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

	Typical Cost	Typical savings per year	Ratings after improvement	
			SAP rating	Environmental impact
Solar water heating	£4,000 - £6,000	£41	B 91	

U-VALUE CALCULATOR REPORT

surecalc ltd

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Assessor Details	Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk	Assessor ID	A320-0001
Client	Vivid Design Studio, Vivid Design Studio		

Building Elements

Roof 000003 - Pitched Roof Insulated Ceiling Vivid

Roof Type: Pitched Roof, insulated flat ceiling

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	Loft Space				
	Main construction	0	0.0600	0.0600	100.00
Layer 2	Mineral wool				
	Main construction	250	0.0440	5.6818	100.00
	Corrections - Air Gap: Level 0, Fasteners: None or plastic				
Layer 3	Mineral wool quilt				
	Main construction	150	0.0440	3.4091	91.67
	Main construction	150	0.1300	1.1538	8.33
	Corrections - Air Gap: Level 0, Fasteners: None or plastic				
Layer 4	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1000	

Total resistance: Upper limit = 9.109 m² K/W Lower limit = 8.873 m² K/W Average = 8.991 m² K/W
Total correction = 0.0030 m² K/W U-value (unrounded) = 0.11 W/m² K

Unheated space: None

Total thickness: 413 mm

U-value: 0.11 W/m² K

Kappa: n/a

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Building Elements

Roof 000004 - vivid skilling

Roof Type: Pitched Roof, insulated sloping ceiling

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)	Density (kg/m ³)	Heat Cap. (J/kgK)
Ext surface				0.0400			
Layer 1	Tiles, clay						
	Main construction	15	1.0000	0.0150	100.00		
Layer 2	airspace/timber battens						
	Main construction	25	0.1000	0.2500	89.63		
	Main construction	25	0.1563	0.1600	10.37		
	Corrections - Cavity Unventilated, Emissivity: Normal						
Layer 3	Breather membrane						
	Main construction	0.5	0.0000	0.0000	100.00		
Layer 4	Air layer unventilated						
	Main construction	45	0.0973	0.4624	92.17		
	Main construction	45	0.1300	0.3462	7.83		
	Corrections - Cavity Unventilated, Emissivity: Low Emissivity (BR443)						
Layer 5	Thermapitch TP10						
	Main construction	100	0.0220	4.5455	92.17		
	Main construction	100	0.1300	0.7692	7.83		
	Corrections - Air Gap: Level 1, Fasteners: None or plastic						
Layer 6	Kooltherm K18 Insulated Plasterboard (62.5mm)						
	Main construction	62.5	0.0245	2.5500	100.00		
	Corrections - Air Gap: Level 1, Fasteners: None or plastic						
Int surface				0.1000			

Total resistance: Upper limit = 7.418 m² K/W Lower limit = 6.675 m² K/W Average = 7.046 m² K/W
Total correction = 0.0035 m² K/W U-value (unrounded) = 0.14 W/m² K

Unheated space: None

Total thickness: 248 mm

U-value: 0.14 W/m² K

Kappa: 0.00 kJ/m² K

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surecalc ltd

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Building Elements

Wall 000001 - Vivid 100 Cavity Wall Earthwool Dritherm 32

Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	Brick, outer leaf				
	Main construction	102	0.7700	0.1325	82.81
	Main construction	102	0.9407	0.1084	17.19
Layer 2	Knauf Supafil 34 blown Cavity Fill				
	Main construction	100	0.0340	2.9412	100.00
	Corrections - Air Gap: Level 0, Fasteners: Wall ties, Cross sectional area: 12.50 mm ² , Lambda: 17.000 W/m.K, per m ² : 2.500				
Layer 3	Celcon Standard - Normal - Trad joint 10mm				
	Main construction	100	0.1500	0.6667	93.18
	Main construction	100	0.8803	0.1136	6.82
Layer 4	airspace/plaster dabs				
	Main construction	15	0.1000	0.1500	80.00
	Main construction	15	0.0882	0.1700	20.00
	Corrections - Cavity Unventilated, Emissivity: Normal				
Layer 5	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1300	

Total resistance: Upper limit = 4.077 m² K/W Lower limit = 3.952 m² K/W Average = 4.015 m² K/W
Total correction = 0.0022 m² K/W U-value (unrounded) = 0.25 W/m² K

Unheated space: None

Total thickness: 330 mm

U-value: 0.25 W/m² K

Kappa: n/a

U-VALUE CALCULATOR REPORT

surecalc ltd

Property Reference	sc121368	Issued on Date	01/12/2021
Assessment Reference	002 Gas System Boiler + PV	Prop Type Ref	New Dwelling
Project	Land Adj Mistletoe Farm, Horsemere Green Lane, Climping, Littlehampton, West Sussex, BN17 5QZ		
Calculation Type	New Build (As Designed)		

SAP Rating	90 B	DER	11.85	TBR	15.15
Environmental	89 B	% DER < TBR	21.79		
CO ₂ Emissions (t/year)	1.29	DREE	50.22	TREE	55.43
General Requirements Compliance	Pass	% DPER < TPER	9.41		

Assessor Details	Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk	Assessor ID	A320-0001
Client	Vivid Design Studio, Vivid Design Studio		

Building Elements

Wall 000002 - Dry Lined Solid Masonry Wall

Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	Celcon Standard - Normal - Trad joint 10mm				
	Main construction	140	0.1500	0.9333	93.18
	Main construction	140	0.8803	0.1590	6.82
Layer 2	Celotex GA4000				
	Main construction	80	0.0220	3.6364	100.00
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 3	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1300	

Total resistance: Upper limit = 4.737 m² K/W Lower limit = 4.567 m² K/W Average = 4.652 m² K/W
Total correction = 0.0061 m² K/W U-value (unrounded) = 0.22 W/m² K

Unheated space: None

Total thickness: 233 mm

U-value: 0.22 W/m² K

Kappa: n/a

U-VALUE CALCULATOR REPORT

surecalc ltd

Property Reference	sc121368	Issued on Date	01/12/2021
Assessment Reference	002 Gas System Boiler + PV	Prop Type Ref	New Dwelling
Project	Land Adj Mistletoe Farm, Horsemere Green Lane, Climping, Littlehampton, West Sussex, BN17 5QZ		
Calculation Type	New Build (As Designed)		

SAP Rating	90 B	DER	11.85	TER	15.15
Environmental	89 B	% DER < TER	21.79		
CO ₂ Emissions (t/year)	1.29	DREE	50.22	TREE	55.43
General Requirements Compliance	Pass	% DPER < TPER	9.41		

Assessor Details	Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk	Assessor ID	A320-0001
Client	Vivid Design Studio, Vivid Design Studio		

Building Elements

Wall 000006 - TF Metal Clad

Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)	Density (kg/m ³)	Heat Cap. (J/kgK)
Ext surface				0.0400			
Layer 1	Code 4 Lead						
	Main construction	2	35.0000	0.0001	100.00		
Layer 2	Plywood						
	Main construction	18	0.1300	0.1385	100.00		
Layer 3	Mineral wool quilt						
	Main construction	150	0.0420	3.5714	87.50		
	Main construction	150	0.1300	1.1538	12.50		
	Corrections - Air Gap: Level 1, Fasteners: None or plastic						
Layer 4	Thermaline Basic (22mm)						
	Main construction	22	0.0629	0.3500	100.00		
	Corrections - Air Gap: Level 1, Fasteners: None or plastic						
Int surface				0.1300			

Total resistance: Upper limit = 3.625 m² K/W Lower limit = 3.489 m² K/W Average = 3.557 m² K/W
Total correction = 0.0064 m² K/W U-value (unrounded) = 0.28 W/m² K

Unheated space: None

Total thickness: 192 mm

U-value: 0.28 W/m² K

Kappa: 0.00 kJ/m² K

U-VALUE CALCULATOR REPORT

surecalc ltd

Property Reference	sc121368	Issued on Date	01/12/2021
Assessment Reference	002 Gas System Boiler + PV	Prop Type Ref	New Dwelling
Project	Land Adj Mistletoe Farm, Horsemere Green Lane, Climping, Littlehampton, West Sussex, BN17 5QZ		
Calculation Type	New Build (As Designed)		

SAP Rating	90 B	DER	11.85	TER	15.15
Environmental	89 B	% DER<TER	21.79		
CO ₂ Emissions (t/year)	1.29	DREE	50.22	TREE	55.43
General Requirements Compliance	Pass	% DPER<TPER	9.41		

Assessor Details	Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk	Assessor ID	A320-0001
Client	Vivid Design Studio, Vivid Design Studio		

Building Elements

Floor 000005 - Vivid GF Beam & Block

Floor Type: Suspended Floor

Area = 117.29 m², Perimeter = 54.51 m, Wall thickness = 300.00 mm, Soil: Unknown

Depth of underfloor space below ground: 0.200 m Floor wind shielding: Average (suburban)

Floor height above ground: h = 0.000 m

U-value of walls above ground: U_w = 1.500 m

Ventilation openings per perimeter length: e = 0.0015 %

Mean wind speed: v = 5.000 m/s

Resistance on solum: R_g = 0.000 m²K/W

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.1700	
Layer 1	Celcon Flooring -				
	Main construction	100	0.1500	0.6667	90.91
	Main construction	100	1.0000	0.1000	9.09
Layer 2	VITA Kay-Cel EPS70 Superplus				
	Main construction	150	0.0320	4.6875	100.00
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 3	Screed				
	Main construction	65	1.1500	0.0565	100.00
Int surface				0.1700	

Total resistance: Upper limit = 5.694 m² K/W Lower limit = 5.524 m² K/W Average = 5.609 m² K/W

Total correction = 0.0070 m² K/W

U-value (unrounded) = 0.15 W/m² K

Unheated space: None

Total thickness: 315 mm

U-value: 0.15 W/m² K

Kappa: n/a

THERMAL BRIDGING

Calculation Type: New Build (As Designed)



Property Reference	sc121368			Issued on Date	01/12/2021
Assessment Reference	002 Gas System Boiler + PV		Prop Type Ref	New Dwelling	
Property	Land Adj Mistletoe Farm, Horsemere Green Lane, Climping, Littlehampton, West Sussex, BN17 5QZ				
SAP Rating	90 B	DER	11.85	TER	15.15
Environmental	89 B	% DER<TER	21.79		
CO ₂ Emissions (t/year)	1.29	DFEE	50.22	TFEE	55.43
General Requirements Compliance	Pass	% DFEE<TFEE	9.41		
Assessor Details	Mr. Mark Rogers, Surecalc Limited, Tel: 01243572695, mark@surecalc.co.uk			Assessor ID	A320-0001
Client	Vivid Design Studio, Vivid Design Studio				

THERMAL BRIDGING

Calculation Type: New Build (As Designed)



	Junction detail	Source Type	Psi (W/mK)	Length (m)	Result	Reference
External wall	E2 Other lintels (including other steel lintels)	Independently assessed	0.291	15.91	4.63	LABC Construction Details
External wall	E2 Other lintels (including other steel lintels)	Table K1 - Default	1.000	3.60	3.60	
External wall	E3 Sill	Independently assessed	0.027	14.95	0.40	LABC Construction Details
External wall	E3 Sill	Table K1 - Default	0.080	3.60	0.29	
External wall	E4 Jamb	Independently assessed	0.029	34.80	1.01	LABC Construction Details
External wall	E4 Jamb	Table K1 - Default	0.100	4.80	0.48	
External wall	E5 Ground floor (normal)	Independently assessed	0.000	54.51	0.00	LABC Construction Details
External wall	E6 Intermediate floor within a dwelling	Independently assessed	0.003	9.69	0.03	LABC Construction Details
External wall	E10 Eaves (insulation at ceiling level)	Independently assessed	0.029	14.86	0.43	LABC Construction Details
External wall	E10 Eaves (insulation at ceiling level)	Table K1 - Default	0.120	4.80	0.58	
External wall	E11 Eaves (insulation at rafter level)	Independently assessed	0.029	2.25	0.07	LABC Construction Details
External wall	E12 Gable (insulation at ceiling level)	Independently assessed	0.054	6.60	0.36	LABC Construction Details
External wall	E13 Gable (insulation at rafter level)	Independently assessed	0.052	16.80	0.87	LABC Construction Details
External wall	E16 Corner (normal)	Independently assessed	0.050	9.80	0.49	LABC Construction Details
External wall	E16 Corner (normal)	Table K1 - Default	0.180	4.90	0.88	
External wall	E17 Corner (inverted – internal area greater than external area)	Independently assessed	-0.029	2.45	-0.07	
External wall	E17 Corner (inverted – internal area greater than external area)	Table K1 - Default	0.000	2.45	0.00	
External roof	R1 Head of roof window	Table K1 - Default	0.080	1.56	0.12	
External roof	R2 Sill of roof window	Table K1 - Default	0.060	1.56	0.09	
External roof	R3 Jamb of roof window	Table K1 - Default	0.080	3.92	0.31	
External roof	R6 Flat ceiling	Table K1 - Default	0.060	15.19	0.91	

Total: 15.49 W/mK:
Y-Value: 0.035 W/m²K: