



elmhurst
energy



SAP Report Submission for Building Regulations Compliance

Client: Vivid Design Studio

Project: Oxlease House , Plot 14, Cupernham Lane
Romsey, Hampshire, SO51 7AL

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

Report Issue Date: 13/10/2023

EXCELLENCE
IN ENERGY
ASSESSMENT

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Array SAP 10 program, Array

Date: Fri 13 Oct 2023 14:50:44

Project Information			
Assessed By	Mark Rogers	Building Type	House, Semi-detached
OCDEA Registration	EES/004179	Assessment Date	2023-10-13

Dwelling Details			
Assessment Type	As designed	Total Floor Area	110 m ²
Site Reference	sc100173 P14 Oxlease House	Plot Reference	001
Address	Plot 14 Oxlease House Cupernham Lane, Romsey, SO51 7AL		

Client Details	
Name	Philip Dudley
Company	Vivid Design Studio
Address	NA, NA, NA

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate			
Fuel for main heating system	Electricity		
Target carbon dioxide emission rate	9.71 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	3.42 kgCO ₂ /m ²		OK
1b Target primary energy rate and dwelling primary energy			
Target primary energy	50.6 kWh _{PE} /m ²		
Dwelling primary energy	35.7 kWh _{PE} /m ²		OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	35.6 kWh/m ²		
Dwelling fabric energy efficiency	33.5 kWh/m ²		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.22	Walls (1) (0.22)	OK
Party walls	0.2	0	Party Wall (1) (0)	N/A
Curtain walls	1.6	0	N/A	N/A
Floors	0.18	0.12	Ground Floor (0.12)	OK
Roofs	0.16	0.09	Roof (1) (0.09)	OK
Windows, doors, and roof windows	1.6	1.2	Front North Door (1.2)	OK
Rooflights	2.2	N/A	N/A	N/A

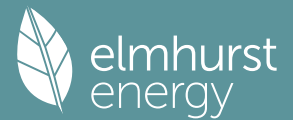
2b Envelope elements (better than typically expected values are flagged with a subsequent (!))		
Name	Net area [m ²]	U-Value [W/m ² K]
Exposed wall: Walls (1)	92.38	0.22
Party wall: Party Wall (1)	49.85	0 (!)
Ground floor: Ground Floor, Ground Floor	55.45	0.12
Exposed roof: Roof (1)	55.45	0.09 (!)

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
Front North Door, New Dwelling DG Door	2.01	North	N/A	1.2
Front North Windows, New Dwelling DG Window	5.48	North	0.7	1.2
Side East Windows, New Dwelling DG Window	1.54	East	0.7	1.2
Side West Window, New Dwelling DG Window	0.86	West	0.7	1.2
Side East Window, New Dwelling DG Window	0.86	West	0.7	1.2
Rear South Windows, New Dwelling DG Window	8.06	South	0.7	1.2

Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part 1 - Main Dwelling : Thermal bridging calculated from linear thermal transmittances for each junction				
Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.05	IG or Keystone Hi Therm Lintel
External wall	E3: Sill	Calculated by person with suitable expertise	0.018 (!)	Recognised Construction Detail
External wall	E4: Jamb	Calculated by person with suitable expertise	0.014 (!)	Recognised Construction Detail
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.063	AutoPSI Detail
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.001 (!)	Recognised Construction Detail
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.055	Recognised Construction Detail
External wall	E12: Gable (insulation at ceiling level)	Calculated by person with suitable expertise	0.058	Recognised Construction Detail
External wall	E16: Corner (normal)	Calculated by person with suitable expertise	0.051	Recognised Construction Detail
External wall	E17: Corner (inverted - internal area greater than external area)	Calculated by person with suitable expertise	-0.1	Recognised Construction Detail
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.044	Recognised Construction Detail
Party wall	P1: Ground floor	Calculated by person with suitable expertise	0.108	Recognised Construction Detail
Party wall	P2: Intermediate floor within a dwelling	SAP table default	0 (!)	Recognised Construction Detail
Party wall	P4: Roof (insulation at ceiling level)	Calculated by person with suitable expertise	0.101	Recognised Construction Detail
3 Air permeability (better than typically expected values are flagged with a subsequent (!))				
Maximum permitted air permeability at 50Pa		8 m ³ /hm ²		
Dwelling air permeability at 50Pa		5 m ³ /hm ² , Design value		OK
Air permeability test certificate reference				
4 Space heating				
Main heating system 1 : Heat pump with radiators or underfloor heating - Electricity				
Efficiency	234.1%			
Emitter type	Radiators			
Flow temperature	55°C			
System type	Heat Pump			
Manufacturer	Daikin Europe NV			
Model	EDLA04EV3			
Commissioning				
Secondary heating system : N/A				
Fuel	N/A			
Efficiency	N/A			
Commissioning				

5 Hot water		
Cylinder/store - type: Cylinder		
Capacity	180 litres	
Declared heat loss	1.2 kWh/day	
Primary pipework insulated	Yes	
Manufacturer		
Model		
Commissioning		
Waste water heat recovery system 1 - type: N/A		
Efficiency		
Manufacturer		
Model		
6 Controls		
Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services		
Function		
Ecodesign class		
Manufacturer		
Model		
Water heating - type: Cylinder thermostat and HW separately timed		
Manufacturer		
Model		
7 Lighting		
<i>Minimum permitted light source efficacy</i>	75 lm/W	
Lowest light source efficacy	75 lm/W	OK
External lights control	N/A	
8 Mechanical ventilation		
System type: Decentralised mechanical extract		
<i>Maximum permitted specific fan power</i>	0.7 W/(l/s)	
Specific fan power	0.19 W/(l/s)	OK
<i>Minimum permitted heat recovery efficiency</i>	N/A	
Heat recovery efficiency	N/A	N/A
Manufacturer/Model	Unity CV3	
Commissioning		
9 Local generation		
N/A		
10 Heat networks		
N/A		
11 Supporting documentary evidence		
N/A		
12 Declarations		
a. Assessor Declaration		
This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		
Signed: <i>Mark Rogers</i>	Assessor ID:	
Name:	Date:	
b. Client Declaration		
N/A		

Predicted Energy Assessment



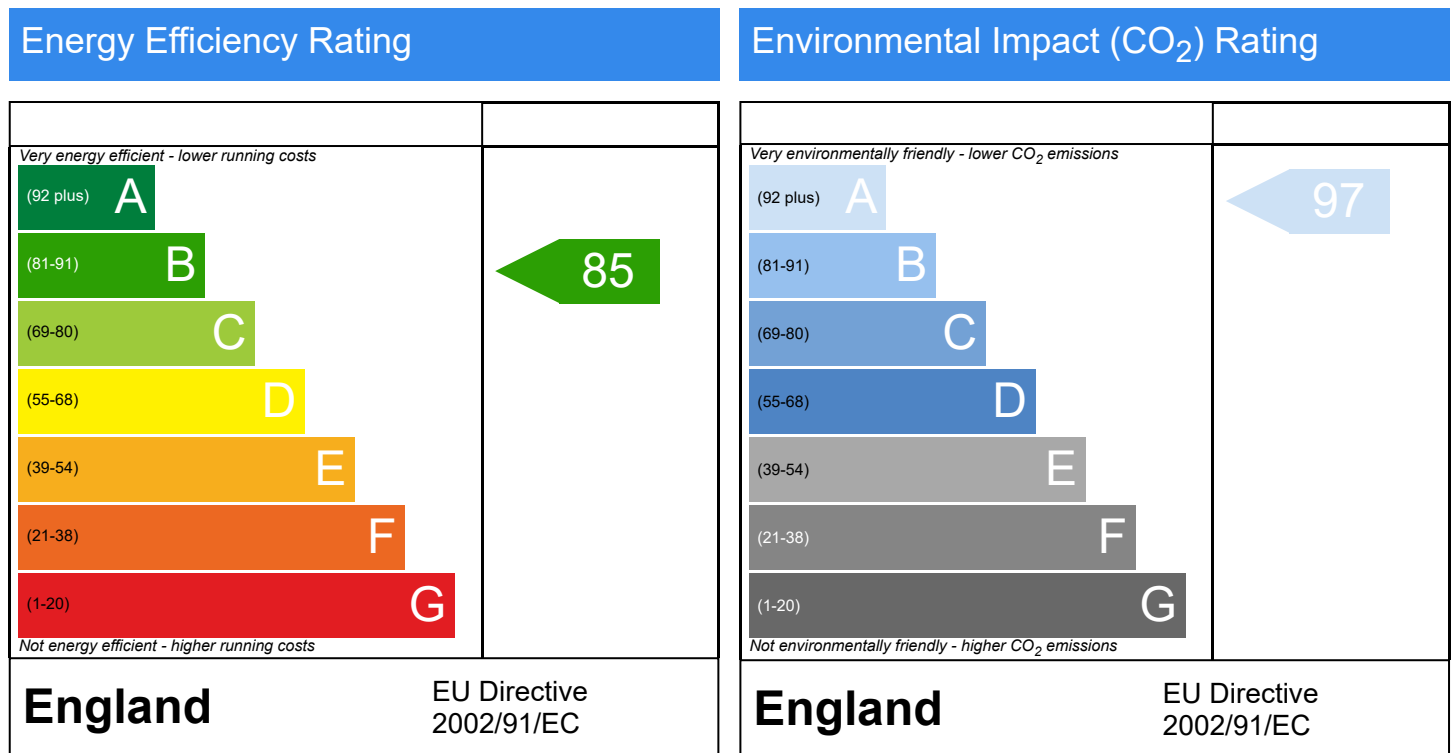
Oxlease House , Plot 14, Cupernham Lane, Romsey,
Hampshire, SO51 7AL

Dwelling type:
Date of assessment:
Produced by:
Total floor area:
DRRN:

House, Semi-Detached
13/10/2023
Mark Rogers
110.1 m²
0627-7035-9976

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.

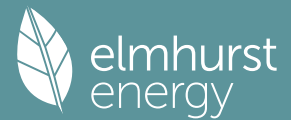
The energy performance has been assessed using the Government approved SAP 10 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO₂) emissions.



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.

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.

Summary for Input Data



Property Reference	sc100173 P14 Oxlease House	Issued on Date	13/10/2023
Assessment Reference	001	Prop Type Ref	New Dwelling Part L 2021
Property	Oxlease House , Plot 14, Cupernham Lane, Romsey, Hampshire, SO51 7AL		

SAP Rating	85 B	DER	3.42	TER	9.71
Environmental	97 A	% DER < TER			64.78
CO ₂ Emissions (t/year)	0.33	DFEE	33.53	TFEE	35.58
Compliance Check	See BREL	% DFEE < TFEE			5.74
% DPER < TPER	29.45	DPER	35.70	TPER	50.60

Assessor Details	Mr. Mark Rogers	Assessor ID	A320-0001
Client	Vivid Design Studio, Philip Dudley		

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

Orientation	North
Property Tenure	ND
Transaction Type	6
Terrain Type	Suburban
1.0 Property Type	House, Semi-Detached
2.0 Number of Storeys	2
3.0 Date Built	2023
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown
6.0 Thermal Mass Parameter	Precise calculation

7.0 Electricity Tariff	Standard
Smart electricity meter fitted	No
Smart gas meter fitted	No

7.0 Measurements	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground floor:	22.27 m	55.45 m ²	2.39 m
1st Storey:	21.00 m	54.65 m ²	2.76 m

8.0 Living Area	17.32	m ²
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9.0 External Walls	Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area(m ²)	Nett Area (m ²)	Shelter Res	Shelter	Openings	Area Calculation Type
	External Cavity Wall	Cavity Wall	Cavity wall; plasterboard on dabs or battens, lightweight aggregate block, filled cavity, any outside structure	0.22	110.00	111.19	92.38	0.00	None	18.81	Calculate Wall Area

9.1 Party Walls	Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)	Shelter Res	Shelter
	Party Wall	Filled Cavity with Edge Sealing	Single plasterboard on dabs both sides, lightweight aggregate blocks, cavity or cavity fill	0.00	110.00	49.85		None

9.2 Internal Walls	Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
	Internal Block Walls	Dense block, plasterboard on dabs	75.00	67.25
	Internal Stud Walls	Plasterboard on timber frame	9.00	112.07

10.0 External Roofs	Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area(m ²)	Nett Area (m ²)	Shelter Code	Shelter Factor	Calculation Type	Openings
	External Roof Space	External Plane Roof	Plasterboard, insulated at ceiling level	0.09	9.00	55.45	55.45	None	0.00	Calculate Wall Area	0.00

10.2 Internal Ceilings	Description	Storey	Construction	Area (m ²)
	Internal Ceiling	Lowest occupied	Plasterboard ceiling, carpeted chipboard floor	54.65

11.0 Heat Loss Floors	Description	Type	Storey Index	Construction	U-Value (W/m ² K)	Shelter Code	Shelter Factor	Kappa (kJ/m ² K)	Area (m ²)
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Summary for Input Data



Ground Floor Ground Floor - Solid Lowest occupied Suspended concrete floor, carpeted 0.12 None 0.00 75.00 55.45

11.2 Internal Floors

Description	Storey Index	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Floor		Plasterboard ceiling, carpeted chipboard floor	9.00	54.65

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m ² K)
New Dwelling DG Door	Manufacturer	Half Glazed Door	Double Low-E Soft 0.05			0.71		0.70	1.20
New Dwelling DG Window	Manufacturer	Window	Double Low-E Soft 0.05			0.71		0.70	1.20

13.0 Openings

Name	Opening Type	Location	Orientation	Area (m ²)	Pitch
Front North Door	New Dwelling DG Door	External Cavity Wall	North	2.01	
Front North Windows	New Dwelling DG Window	External Cavity Wall	North	5.48	
Side East Windows	New Dwelling DG Window	External Cavity Wall	East	1.54	
Side West Window	New Dwelling DG Window	External Cavity Wall	West	0.86	
Side East Window	New Dwelling DG Window	External Cavity Wall	West	0.86	
Rear South Windows	New Dwelling DG Window	External Cavity Wall	South	8.06	

14.0 Conservatory

15.0 Draught Proofing

%

16.0 Draught Lobby

17.0 Thermal Bridging

17.1 List of Bridges

Bridge Type	Source Type	Length	Psi	Adjusted Reference:	Imported
E2 Other lintels (including other steel lintels)	Independently assessed	15.12	0.05	0.05 IG or Keystone Hi Therm Lintel	No
E3 Sill	Independently assessed	14.16	0.02	0.02 Recognised Construction Detail	No
E4 Jamb	Independently assessed	31.50	0.01	0.01 Recognised Construction Detail	No
E5 Ground floor (normal)	Independently assessed	22.27	0.06	0.06 AutoPSI Detail	No
E6 Intermediate floor within a dwelling	Independently assessed	21.00	0.00	0.00 Recognised Construction Detail	No
E10 Eaves (insulation at ceiling level)	Independently assessed	16.60	0.06	0.06 Recognised Construction Detail	No
E12 Gable (insulation at ceiling level)	Independently assessed	5.67	0.06	0.06 Recognised Construction Detail	No
E16 Corner (normal)	Independently assessed	15.08	0.05	0.05 Recognised Construction Detail	No
E17 Corner (inverted – internal area greater than external area)	Independently assessed	4.78	-0.10	-0.10 Recognised Construction Detail	No
E18 Party wall between dwellings	Independently assessed	10.30	0.04	0.04 Recognised Construction Detail	No
P1 Party wall - Ground floor	Independently assessed	9.62	0.11	0.11 Recognised Construction Detail	No
P2 Party wall - Intermediate floor within a dwelling	Table K1 - Default	9.62	0.00	0.00 Recognised Construction Detail	No
P4 Party wall - Roof (insulation at ceiling level)	Independently assessed	9.62	0.10	0.10 Recognised Construction Detail	No

Y-value W/m²K

18.0 Pressure Testing

Designed AP₅₀ m³/(h.m²) @ 50 Pa

Test Method

19.0 Mechanical Ventilation

Mechanical Ventilation

Mechanical Ventilation System Present

Approved Installation

Mechanical Ventilation data Type

Type

MV Reference Number

Configuration

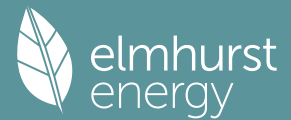
Duct Type

Wet Rooms

19.1 Mechanical extract ventilation - Decentralised

SFP	Fan/Room Type	Count
0.15	In Room Fan Kitchen	1
0.11	In Room Fan Other Wet Room	2
0.00	In Duct Fan Kitchen	0
0.00	In Duct Fan Other Wet Room	0
0.11	Through Wall Fan Kitchen	0
0.09	Through Wall Fan Other Wet Room	0

Summary for Input Data



20.0 Fans, Open Fireplaces, Flues

21.0 Fixed Cooling System

22.0 Lighting

No Fixed Lighting

Name	Efficacy	Power	Capacity	Count
Low energy Lighting	75.00	15	1125	36

24.0 Main Heating 1

Description

Electric Air Source Heat Pump

Percentage of Heat %

Database Ref. No.

Fuel Type

In Winter

In Summer

Model Name

Manufacturer

System Type

Controls SAP Code

PCDF Controls

Is MHS Pumped

Heating Pump Age

Heat Emitter

Flow Temperature

Flow Temperature Value

25.0 Main Heating 2

26.0 Heat Networks

Heat Source	Fuel Type	Heating Use	Efficiency	Percentage Of Heat	Heat	Heat Power Ratio	Electrical	Fuel Factor	Efficiency type
Heat source 1									
Heat source 2									
Heat source 3									
Heat source 4									
Heat source 5									

28.0 Water Heating

Water Heating

SAP Code

Flue Gas Heat Recovery System

Waste Water Heat Recovery Instantaneous System 1

Waste Water Heat Recovery Instantaneous System 2

Waste Water Heat Recovery Storage System

Solar Panel

Water use <= 125 litres/person/day

Cold Water Source

Bath Count

Immersion Only Heating Hot Water

28.1 Showers

Description	Shower Type	Flow Rate [l/min]	Rated Power [kW]	Connected	Connected To
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28.3 Waste Water Heat Recovery System

29.0 Hot Water Cylinder

Cylinder Stat

Summary for Input Data



Cylinder In Heated Space	Yes	
Independent Time Control	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	180.00	L
Loss	1.20	kWh/day
Pipes insulation	Fully insulated primary pipework	
In Airing Cupboard	No	

31.0 Thermal Store

Recommendations

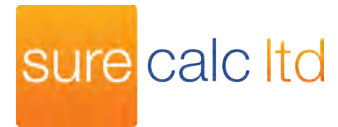
Lower cost measures

None

Further measures to achieve even higher standards

	Typical Cost	Typical savings per year	Ratings after improvement	
			SAP rating	Environmental Impact
	£4,000 - £6,000	£46	B 86	A 97
	£3,500 - £5,500	£200	B 91	A 98
			0	0

U-VALUE CALCULATOR REPORT



Property Reference	sc121771	Issued on Date	13/10/2023
Assessment Reference	001	Prop Type Ref	New Dwelling Part L 2021
Project	Oxlease House , Plot 14, Cupernham Lane, Romsey, Hampshire, SO51 7AL		
Calculation Type	New Build (As Designed)		

SAP Rating	89 B	DER	12.01	TER	23.79
Environmental	90 B	% DER<TER	49.52		
CO ₂ Emissions (t/year)	1.06	DFEE	39.26	TFEE	50.44
General Requirements Compliance	Pass	% DFEE<TFEE	22.16		

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

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	0.2000	0.2000	100.00
Layer 2	Earthwool Loft Roll 44				
	Main construction	100	0.0440	2.2727	100.00
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 3	Earthwool Loft Roll 44				
	Main construction	200	0.0440	4.5455	100.00
	Corrections - Air Gap: Level 0, Fasteners: None or plastic				
Layer 4	Earthwool Loft Roll 44				
	Main construction	200	0.0440	4.5455	93.67
	Main construction	200	0.1300	1.5385	6.33
	Corrections - Air Gap: Level 0, Fasteners: None or plastic				
Layer 5	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1000	

Total resistance: Upper limit = 11.513 m² K/W Lower limit = 11.262 m² K/W Average = 11.388 m² K/W
 Total correction = 0.0034 m² K/W U-value (unrounded) = 0.09 W/m² K

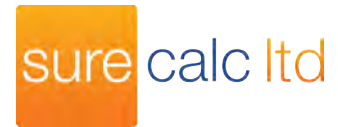
Unheated space: None

Total thickness: 513 mm

U-value: 0.09 W/m² K

Kappa: n/a

U-VALUE CALCULATOR REPORT



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General Requirements Compliance	Pass	% DFEE<TFEE	22.16		

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 000001 - Vivid Cavity Wall 125 Knauf Supafil 34

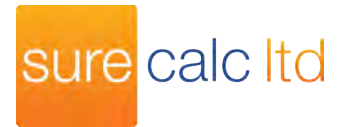
Wall Type: Standard Wall

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	125	0.0340	3.6765	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	Masterblock Masterlite Ultra				
	Main construction	100	0.2700	0.3704	93.43
	Main construction	100	0.8803	0.1136	6.57
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 = 4.541 m² K/W Lower limit = 4.510 m² K/W Average = 4.525 m² K/W
 Total correction = 0.0018 m² K/W U-value (unrounded) = 0.22 W/m² K

Unheated space:	None		
Total thickness:	355 mm	U-value:	0.22 W/m ² K
		Kappa:	n/a

U-VALUE CALCULATOR REPORT



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General Requirements Compliance	Pass	% DFEE<TFEE	22.16		

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 - Ground Floor Beam and Block

Floor Type: Suspended Floor

Area = 55.45 m², Perimeter = 22.27 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 = 0.150 m

U-value of walls above ground: U_w = 0.220 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	Blockwork, dense				
	Main construction	100	1.5900	0.0629	90.91
	Main construction	100	1.0000	0.1000	9.09
Layer 2	Mannok Therm Floor				
	Main construction	150	0.0220	6.8182	100.00
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 3	Screed				
	Main construction	75	1.1500	0.0652	100.00
Int surface				0.1700	

Total resistance: Upper limit = 7.290 m² K/W Lower limit = 7.288 m² K/W Average = 7.289 m² K/W

Total correction = 0.0087 m² K/W

U-value (unrounded) = 0.12 W/m² K

Unheated space: None

Total thickness: 325 mm

U-value: 0.12 W/m² K

Kappa: n/a