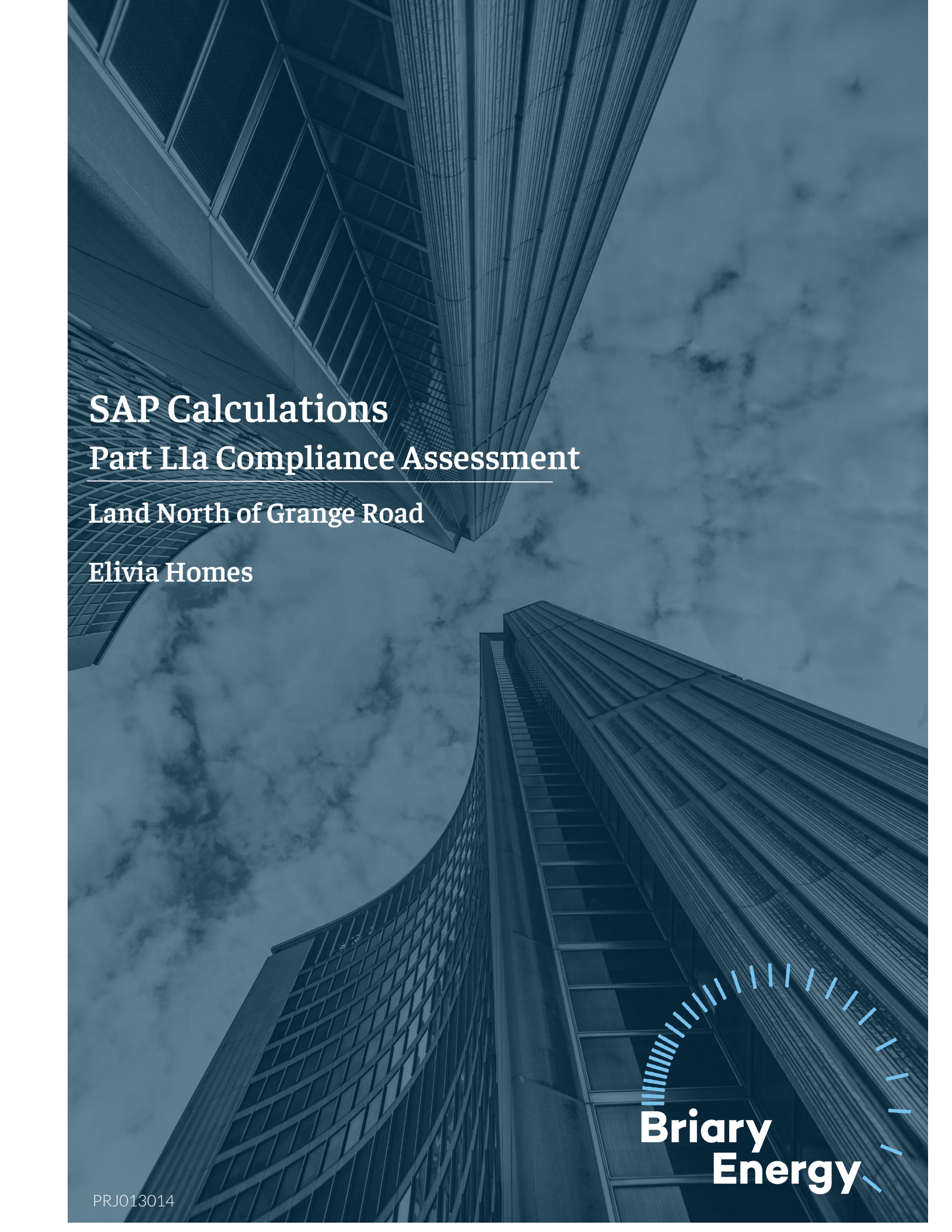




SAP Calculations

Part L1a Compliance Assessment

Land North of Grange Road

Elivia Homes



**Briary
Energy**

Part L1A Compliance Assessment

Summary

Briary Energy is an independent environmental consultancy with considerable experience in the renewable energy industry. We are a focused team of professionals committed to securing success for our clients. Our service combines the personal commitment of our staff with the best of modern practices and resources. We provide independent advice within all aspects of Part L of planning for the development industry including the energy sector.

Briary Energy take an integrated approach to the areas of renewables and other low-carbon energy technologies, offering services from Energy Feasibility Studies, Energy Consumption statements, Overheating Assessments, SAP and SBEM Calculations, Pressure Testing and Daylight Calculations.

This project comprises of 89 plots, where compliance will be sought under the Part L1A 2013 Regs using SAP 2012. The Standard Assessment Procedure (SAP) is the methodology used by the Government to assess and compare the energy and environmental performance of dwellings.

Its purpose is to provide accurate and reliable assessments of dwelling energy performances that are needed to underpin energy and environmental policy initiatives.

Project Status	
All Plots Compliant	

Total Target Emission Rate:	1620.58
Total Dwelling Emission Rate:	1307.48

Total kg/year:	116,907
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Total CO ₂ from Appliances:	1400.7
Total CO ₂ from Cooking:	187.2
Net Site CO ₂ Emissions:	2895.2

Reduction In Site Emmisions 19.32

Specification

	Description	U Value W/m²K	Element	Specification
Floors	Flr - Ground	0.19	Floor	Screed 75mm, PIR (0.022) 75mm, Blockwork (0.57) 175mm
	Flr - Exposed over Drive Through	0.14	Floor	Chipboard 22mm, Mineral Wool/ Joist 245mm, Cement Particleboard 9mm
	Flr - Exposed Underside of Bay	0.14	Floor	Chipboard 22mm, Mineral Wool/ Joist 245mm, Cement Particleboard 9mm
Walls	Wl - Brick (Timber Frame)	0.21	Wall	Plaster Skim 3mm, Plasterboard 12.5mm, Low E Cavity 30mm, PIR Recticel Eurothane 80mm, Low E Cavity 30mm, OSB 9mm, Unventilated Cavity 50mm, Brickwork (Outer Leaf) 102.5mm
	Wl - Clad (Timber Frame)	0.21	Wall	Plaster Skim 3mm, Plasterboard 12.5mm, Low E Cavity 30mm, PIR Recticel Eurothane 80mm, Low E Cavity 30mm, OSB 9mm, Unventilated Cavity 50mm, Blockwork, medium (0.57) 100mm
	Wl - Brick (Cavity)	0.26	Wall	Plaster Skim 3mm, Plasterboard 12.5mm, Plaster Dabs 15mm, Blockwork (0.57) 100mm, Knauf - Dritherm 32 100mm, Brickwork (Outer Leaf) 102.5mm
	Wl - Corridor	0.32	Wall	Plasterboard 15mm, Plasterboard 15mm, Mineral Wool Batt (25kg/m3) 60mm, Unventilated Cavity 120mm, Mineral Wool Batt (25kg/m3) 60mm, Plasterboard 15mm, Plasterboard 15mm
Roofs	Rf - Ins Joist	0.08	Roof	Plaster Skim 3mm, Plasterboard 12.5mm, Mineral Wool Quilt (12kg/m3) 150mm, Mineral Wool Quilt (12kg/m3) 350mm
	Rf - Flat over Bay	0.17	Roof	Plaster Skim 3mm, Plasterboard 12.5mm, PIR Celotex 100mm, PIR Celotex 50mm
Openings	Solid Doors	U-Value 1.2	Frame Factor = 0.72 G-Value = 0.73	
	Half Glazed Doors	U-Value 1.4	Frame Factor = 0.72 G-Value = 0.73	
	Windows	U-Value 1.4	Frame Factor = 0.72 G-Value = 0.5	
Specifics	Airtightness m³/(hr.m²)	5.00	Mechanical Ventilation	Intermittent Fans
	Thermal Mass	Calculated Thermal Mass	Renewables	15.kW PV
	Heating Fuel	MainsGas		
	Lighting	Part L Compliant Lighting	Additional Notes:	

Construction Details

SAP Reference	Description	Source	Ψ
E2	Other Lintels	Approved Table K1	0.300
E3	Sill	Approved Table K1	0.040
E4	Jamb	Approved Table K1	0.050
E5	Ground Floor Normal	Approved Table K1	0.160
E6	Internal Floor	Approved Table K1	0.070
E10	Eaves At Ceiling	Approved Table K1	0.060
E12	Gable At Ceiling	Approved Table K1	0.240
E16	Corner Normal	Approved Table K1	0.090
E18	Party Wall	Approved Table K1	0.060
P1	Ground Floor with Party Wall	Default Table K1	0.160
P2	Internal Floor with Party Wall	Default Table K1	0.000
P4	Roof at Ceiling with Party Wall	Default Table K1	0.240
P8	Exposed Floor Inverted with Party Wall	Default Table K1	0.240

Plot Details

Plot	EPC Rating	DER/TER % Pass	DAP	WWHRS	PV	Weath Comp	Zoned Heating	Heating
12	B(85)	16.6	5	✓			✓	Ideal Logic Combi Esp1 30
13	B(85)	16.4	5	✓			✓	Ideal Logic Combi Esp1 30
14	B(85)	16.49	5	✓			✓	Ideal Logic Combi Esp1 30
15	B(85)	16.49	5	✓			✓	Ideal Logic Combi Esp1 30
17	B(85)	16.6	5	✓			✓	Ideal Logic Combi Esp1 30
18	B(85)	16.4	5	✓			✓	Ideal Logic Combi Esp1 30
19	B(85)	16.51	5	✓			✓	Ideal Logic Combi Esp1 30
48	B(85)	16.6	5	✓			✓	Ideal Logic Combi Esp1 30
53	B(85)	16.36	5	✓			✓	Ideal Logic Combi Esp1 30
54	B(86)	16.75	5	✓			✓	Ideal Logic Combi Esp1 30
55	B(85)	16.3	5	✓			✓	Ideal Logic Combi Esp1 30
56	B(85)	16.29	5	✓			✓	Ideal Logic Combi Esp1 30
57	B(86)	16.75	5	✓			✓	Ideal Logic Combi Esp1 30
58	B(85)	16.36	5	✓			✓	Ideal Logic Combi Esp1 30
70	B(85)	15.98	5	✓			✓	Ideal Logic Combi Esp1 30
71	B(86)	16.4	5	✓			✓	Ideal Logic Combi Esp1 30
72	B(85)	16.04	5	✓			✓	Ideal Logic Combi Esp1 30
78	B(85)	16.25	5	✓			✓	Ideal Logic Combi Esp1 30
16	B(85)	14.95	5	✓			✓	Ideal Logic Combi Esp1 30
45	B(85)	16.78	5	✓			✓	Ideal Logic Combi Esp1 30
46	B(86)	17.1	5	✓			✓	Ideal Logic Combi Esp1 30
47	B(85)	16.73	5	✓			✓	Ideal Logic Combi Esp1 30
49	B(85)	15.36	5	✓			✓	Ideal Logic Combi Esp1 30
51	B(85)	16.4	5	✓			✓	Ideal Logic Combi Esp1 30
52	B(85)	16.38	5	✓			✓	Ideal Logic Combi Esp1 30
77	B(85)	16.03	5	✓			✓	Ideal Logic Combi Esp1 30
50	B(85)	18.89	5	✓			✓	Ideal Logic Combi Esp1 30
26	B(86)	10.06	5	✓			✓	Ideal Logic System S18
31	B(86)	10.06	5	✓			✓	Ideal Logic System S18
32	B(86)	9.64	5	✓			✓	Ideal Logic System S18
34	B(86)	9.35	5	✓			✓	Ideal Logic System S18
35	B(86)	9.73	5	✓			✓	Ideal Logic System S18

Plot	EPC Rating	DER/TER % Pass	DAP	WWHRS	PV	Weath Comp	Zoned Heating	Heating
25	B(85)	15.76	5	✓			✓	Ideal Logic Combi Esp1 30
27	B(85)	15.76	5	✓			✓	Ideal Logic Combi Esp1 30
28	B(85)	15.76	5	✓			✓	Ideal Logic Combi Esp1 30
33	B(85)	15.44	5	✓			✓	Ideal Logic Combi Esp1 30
36	B(85)	15.6	5	✓			✓	Ideal Logic Combi Esp1 30
37	B(85)	15.76	5	✓			✓	Ideal Logic Combi Esp1 30
69	B(85)	15.44	5	✓			✓	Ideal Logic Combi Esp1 30
8	B(85)	15.14	5	✓			✓	Ideal Logic Combi Esp1 30
9	B(85)	15.14	5	✓			✓	Ideal Logic Combi Esp1 30
29	B(85)	15.62	5	✓			✓	Ideal Logic Combi Esp1 30
30	B(85)	15.76	5	✓			✓	Ideal Logic Combi Esp1 30
38	B(85)	15.76	5	✓			✓	Ideal Logic Combi Esp1 30
39	B(85)	15.62	5	✓			✓	Ideal Logic Combi Esp1 30
40	B(85)	15.76	5	✓			✓	Ideal Logic Combi Esp1 30
41	B(85)	15.62	5	✓			✓	Ideal Logic Combi Esp1 30
86	B(85)	15.84	5	✓			✓	Ideal Logic Combi Esp1 30
87	B(85)	15.93	5	✓			✓	Ideal Logic Combi Esp1 30
2	B(85)	15.27	5	✓			✓	Ideal Logic Combi Esp1 30
84	B(85)	15.87	5	✓			✓	Ideal Logic Combi Esp1 30
88	B(85)	15.87	5	✓			✓	Ideal Logic Combi Esp1 30
3	B(85)	13.95	5	✓			✓	Ideal Logic Combi Esp1 30
11	B(85)	13.95	5	✓			✓	Ideal Logic Combi Esp1 30
22	B(84)	15.39	5	✓			✓	Ideal Logic Combi Esp1 30
42	B(85)	14.4	5	✓			✓	Ideal Logic Combi Esp1 30
59	B(84)	14.59	5	✓			✓	Ideal Logic Combi Esp1 30
1	B(85)	13.32	5	✓			✓	Ideal Logic Combi Esp1 30
83	B(85)	13.31	5	✓			✓	Ideal Logic Combi Esp1 30
89	B(85)	14.49	5	✓			✓	Ideal Logic Combi Esp1 30
4	B(85)	14.44	5	✓			✓	Ideal Logic Combi Esp1 30
5	B(85)	14.45	5	✓			✓	Ideal Logic Combi Esp1 30
6	B(85)	14.88	5	✓			✓	Ideal Logic Combi Esp1 30
10	B(85)	14.44	5	✓			✓	Ideal Logic Combi Esp1 30
20	B(84)	15.5	5	✓			✓	Ideal Logic Combi Esp1 30
21	B(84)	15.5	5	✓			✓	Ideal Logic Combi Esp1 30

[illegible]

[illegible]

U-Value Calculation

Flr - Ground

U-Value (W/m²K)

Heat Capacity (kJ/[m²k])



0.19



75.6

Internal surface resistance R _{si} (m ² K/W)		0.17	
External surface resistance R _{se} (m ² K/W)		0.17	
No. of Layers	3	Direction of heat flow	Downwards
Total Thickness (mm)	325	Element Type	Floor

Layer	Description	Thickness (mm)	Conductivity (W/mK)	Resistance (mK/W)
Internal Surface				
Layer 1	Screed	75	1.150	0.065
Layer 2	PIR (0.022)	75	0.022	3.409
Layer 3	Blockwork (0.57)	175	0.570	0.307
<i>*Bridged Layer</i>				
External surface				

Calculations are based on BS EN ISO 6946, BS EN ISO 13370, BRE 443, BRE 497

U-Value Calculation

W1 - Brick (Timber Frame)

U-Value (W/m²K)

Heat Capacity (kJ/[m²k])



0.21



7.4

Internal surface resistance R _{si} (m ² K/W)		0.13	
External surface resistance R _{se} (m ² K/W)		0.04	
No. of Layers	8	Direction of heat flow	Horizontal
Total Thickness (mm)	317	Element Type	Wall

Layer	Description	Thickness (mm)	Conductivity (W/mK)	Resistance (mK/W)
Internal Surface				
Layer 1	Plaster Skim	3	0.180	0.017
Layer 2	Plasterboard	12.5	0.210	0.060
Layer 3	Low E Cavity <i>*Bridged Layer</i>	30	0.045	0.665
Layer 4	PIR Recticel Eurothane <i>*Bridged Layer</i>	80	0.022	3.636
Layer 5	Low E Cavity <i>*Bridged Layer</i>	30	0.045	0.665
Layer 6	OSB	9	0.130	0.069
Layer 7	Unventilated Cavity	50	0.313	0.160
Layer 8	Brickwork (Outer Leaf)	102.5	0.770	0.133
External surface				

Calculations are based on BS EN ISO 6946, BS EN ISO 13370, BRE 443, BRE 497

U-Value Calculation

W1 - Brick (Cavity)

U-Value (W/m²K)

Heat Capacity (kJ/[m²k])



0.26



104.7

Internal surface resistance R _{si} (m ² K/W)		0.13	
External surface resistance R _{se} (m ² K/W)		0.04	
No. of Layers	6	Direction of heat flow	Horizontal
Total Thickness (mm)	333	Element Type	Wall

Layer	Description	Thickness (mm)	Conductivity (W/mK)	Resistance (mK/W)
Internal Surface				
Layer 1	Plaster Skim	3	0.180	0.017
Layer 2	Plasterboard	12.5	0.210	0.060
Layer 3	Plaster Dabs	15	0.088	0.170
	<i>*Bridged Layer</i>			
Layer 4	Blockwork (0.57)	100	0.570	0.175
	<i>*Bridged Layer</i>			
Layer 5	Knauf - Dritherm 32	100	0.032	3.125
Layer 6	Brickwork (Outer Leaf)	102.5	0.770	0.133
External surface				

Calculations are based on BS EN ISO 6946, BS EN ISO 13370, BRE 443, BRE 497

U-Value Calculation

W1 - Clad (Timber Frame)

U-Value (W/m²K)

Heat Capacity (kJ/[m²k])



0.21



7.4

Internal surface resistance R _{si} (m ² K/W)		0.13	
External surface resistance R _{se} (m ² K/W)		0.04	
No. of Layers	8	Direction of heat flow	Horizontal
Total Thickness (mm)	315	Element Type	Wall

Layer	Description	Thickness (mm)	Conductivity (W/mK)	Resistance (mK/W)
Internal Surface				
Layer 1	Plaster Skim	3	0.180	0.017
Layer 2	Plasterboard	12.5	0.210	0.060
Layer 3	Low E Cavity <i>*Bridged Layer</i>	30	0.045	0.665
Layer 4	PIR Recticel Eurothane <i>*Bridged Layer</i>	80	0.022	3.636
Layer 5	Low E Cavity <i>*Bridged Layer</i>	30	0.045	0.665
Layer 6	OSB	9	0.130	0.069
Layer 7	Unventilated Cavity	50	0.313	0.160
Layer 8	Blockwork, medium (0.57) <i>*Bridged Layer</i>	100	0.570	0.175
External surface				

Calculations are based on BS EN ISO 6946, BS EN ISO 13370, BRE 443, BRE 497

U-Value Calculation

W1 - Corridor

U-Value (W/m²K)

Heat Capacity (kJ/[m²k])



0.32



13.44

Internal surface resistance R _{si} (m ² K/W)		0.13	
External surface resistance R _{se} (m ² K/W)		0.04	
No. of Layers	7	Direction of heat flow	Horizontal
Total Thickness (mm)	300	Element Type	Wall

Layer	Description	Thickness (mm)	Conductivity (W/mK)	Resistance (mK/W)
Internal Surface				
Layer 1	Plasterboard	15	0.210	0.071
Layer 2	Plasterboard	15	0.210	0.071
Layer 3	Mineral Wool Batt (25kg/m3)	60	0.038	1.579
	<i>*Bridged Layer</i>			
Layer 4	Unventilated Cavity	120	0.750	0.160
Layer 5	Mineral Wool Batt (25kg/m3)	60	0.038	1.579
	<i>*Bridged Layer</i>			
Layer 6	Plasterboard	15	0.210	0.071
Layer 7	Plasterboard	15	0.210	0.071
External surface				

Calculations are based on BS EN ISO 6946, BS EN ISO 13370, BRE 443, BRE 497

U-Value Calculation

Rf - Ins Joist

U-Value (W/m²K)

Heat Capacity (kJ/[m²k])



0.08



7.4

Internal surface resistance R _{si} (m ² K/W)		0.1	
External surface resistance R _{se} (m ² K/W)		0.04	
No. of Layers	4	Direction of heat flow	Upwards
Total Thickness (mm)	516	Element Type	Roof

Layer	Description	Thickness (mm)	Conductivity (W/mK)	Resistance (mK/W)
Internal Surface				
Layer 1	Plaster Skim	3	0.180	0.017
Layer 2	Plasterboard	12.5	0.210	0.060
Layer 3	Mineral Wool Quilt (12kg/m3)	150	0.040	3.750
	<i>*Bridged Layer</i>			
Layer 4	Mineral Wool Quilt (12kg/m3)	350	0.040	8.750
External surface				

Calculations are based on BS EN ISO 6946, BS EN ISO 13370, BRE 443, BRE 497

U-Value Calculation

Rf - Flat over Bay

U-Value (W/m²K)

Heat Capacity (kJ/[m²k])



0.17



7.4

Internal surface resistance R _{si} (m ² K/W)		0.1	
External surface resistance R _{se} (m ² K/W)		0.04	
No. of Layers	4	Direction of heat flow	Upwards
Total Thickness (mm)	166	Element Type	Roof

Layer	Description	Thickness (mm)	Conductivity (W/mK)	Resistance (mK/W)
Internal Surface				
Layer 1	Plaster Skim	3	0.180	0.017
Layer 2	Plasterboard	12.5	0.210	0.060
Layer 3	PIR Celotex	100	0.022	4.545
	<i>*Bridged Layer</i>			
Layer 4	PIR Celotex	50	0.022	2.273
External surface				

Calculations are based on BS EN ISO 6946, BS EN ISO 13370, BRE 443, BRE 497

U-Value Calculation

Rf - Joist over Side

U-Value (W/m²K)

Heat Capacity (kJ/[m²k])



0.08



7.4

Internal surface resistance R _{si} (m ² K/W)		0.1	
External surface resistance R _{se} (m ² K/W)		0.04	
No. of Layers	4	Direction of heat flow	Upwards
Total Thickness (mm)	516	Element Type	Roof

Layer	Description	Thickness (mm)	Conductivity (W/mK)	Resistance (mK/W)
Internal Surface				
Layer 1	Plaster Skim	3	0.180	0.017
Layer 2	Plasterboard	12.5	0.210	0.060
Layer 3	Mineral Wool Quilt (12kg/m3)	150	0.040	3.750
	<i>*Bridged Layer</i>			
Layer 4	Mineral Wool Quilt (12kg/m3)	350	0.040	8.750
External surface				

Calculations are based on BS EN ISO 6946, BS EN ISO 13370, BRE 443, BRE 497



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