elmhurst energy

SAP Report Submission for Building Regulations Compliance

Client: Vivid Design Studio

Project: Former Odeon, Plot 8, 92-96 London Road
North End, Portsmouth, Hampshire, PO2 0LZ

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

Report Issue Date: 16/05/2023

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: Tue 16 May 2023 08:45:13

Project Information			
Assessed By	Mark Rogers	Building Type	House, End-terrace
OCDEA Registration	EES/004179	Assessment Date	2023-05-16

Dwelling Details			
Assessment Type	As designed	Total Floor Area	111 m^2
Site Reference	sc100091 P8 Former Odeon	Plot Reference	001
Address	Plot 6 Former Odeon 92-96 London Road, Portsmouth, PO2 0LZ		

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	*9.94 $kgCO_2/m^2$*	
Dwelling carbon dioxide emission rate	4.11 $kgCO_2/m^2$	**OK**
1b Target primary energy rate and dwelling primary energy		
Target primary energy	*51.9 kWh_{PE}/m^2*	
Dwelling primary energy	43.12 kWh_{PE}/m^2	**OK**
1c Target fabric energy efficiency and dwelling fabric energy efficiency		
Target fabric energy efficiency	*33.2 kWh/m^2*	
Dwelling fabric energy efficiency	32.6 kWh/m^2	**OK**

2a Fabric U-values				
Element	***Maximum permitted average U-Value [W/m^2K]***	**Dwelling average U-Value [W/m^2K]**	**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*	0.1	Ground Floor (0.1)	**OK**
Roofs	*0.16*	0.12	Roof (2) (0.13)	**OK**
Windows, doors, and roof windows	*1.6*	1.2	Front South 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^2K]**
Exposed wall: Walls (1)	102.79	0.22
Exposed wall: Walls (2)	5.16	0.18
Exposed wall: Walls (3)	1.7	0.21
Party wall: Party Wall (1)	70.77	0 **(!)**
Ground floor: Ground Floor, Ground Floor	34.96	0.1 **(!)**
Exposed roof: Roof (1)	12.15	0.09 **(!)**
Exposed roof: Roof (2)	30.19	0.13
Exposed roof: Roof (3)	6	0.12

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	**Area [m^2]**	**Orientation**	**Frame factor**	**U-Value [W/m^2K]**
Front South Door, New Dwelling DG Door	2.06	South	N/A	1.2
Front South Windows, New Dwelling DG Window	3.18	South	0.7	1.2
Rear West Windows, New Dwelling DG Window	7.42	West	0.7	1.2
Rear West Window, New Dwelling DG Window	1.38	West	0.7	1.2

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 + Lint
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.061	AutoPSI Detail
External wall	E3: Sill	Calculated by person with suitable expertise	0.032 **(!)**	LABC Construction Detail
External wall	E3: Sill	Calculated by person with suitable expertise	0.046	AutoPSI Detail
External wall	E4: Jamb	Calculated by person with suitable expertise	0.034 **(!)**	LABC Construction Detail
External wall	E4: Jamb	Calculated by person with suitable expertise	0.062	AutoPSI Detail
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.062	LABC Construction Detail
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.002 **(!)**	LABC Construction Detail
External wall	E11: Eaves (insulation at rafter level)	Calculated by person with suitable expertise	0.007 **(!)**	LABC Construction Detail
External wall	E12: Gable (insulation at ceiling level)	Calculated by person with suitable expertise	0.058	LABC Construction Detail
External wall	E13: Gable (insulation at rafter level)	Calculated by person with suitable expertise	0.057	LABC Construction Detail
External wall	E14: Flat roof	SAP table default	0.16	
External wall	E16: Corner (normal)	Calculated by person with suitable expertise	0.053	LABC Construction Detail
External wall	E17: Corner (inverted - internal area greater than external area)	Calculated by person with suitable expertise	-0.096	LABC Construction Detail
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.044	LABC Construction Detail
Party wall	P1: Ground floor	Calculated by person with suitable expertise	0.06	AutoPSI Detail
Party wall	P2: Intermediate floor within a dwelling	SAP table default	0 **(!)**	
Party wall	P4: Roof (insulation at ceiling level)	Calculated by person with suitable expertise	0.043	LABC Construction Detail
Party wall	P5: Roof (insulation at rafter level)	Calculated by person with suitable expertise	0.043	LABC Construction Detail
Roof	R6: Flat ceiling	SAP table default	0.12	
Roof	R7: Flat ceiling (inverted)	SAP table default	0.12	
Roof	R9: Roof to wall (flat ceiling)	SAP table default	0.32	

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	4 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	233.7%	
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		
Minimum permitted light source efficacy	*75 lm/W*	
Lowest light source efficacy	120 lm/W	**OK**
External lights control	N/A	

8 Mechanical ventilation		
System type: Decentralised mechanical extract		
Maximum permitted specific fan power	*0.7 W/(l/s)*	
Specific fan power	0.14 W/(l/s)	**OK**
Minimum permitted heat recovery efficiency	*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:	Assessor ID:
Name:	Date:

b. Client Declaration

N/A

Predicted Energy Assessment

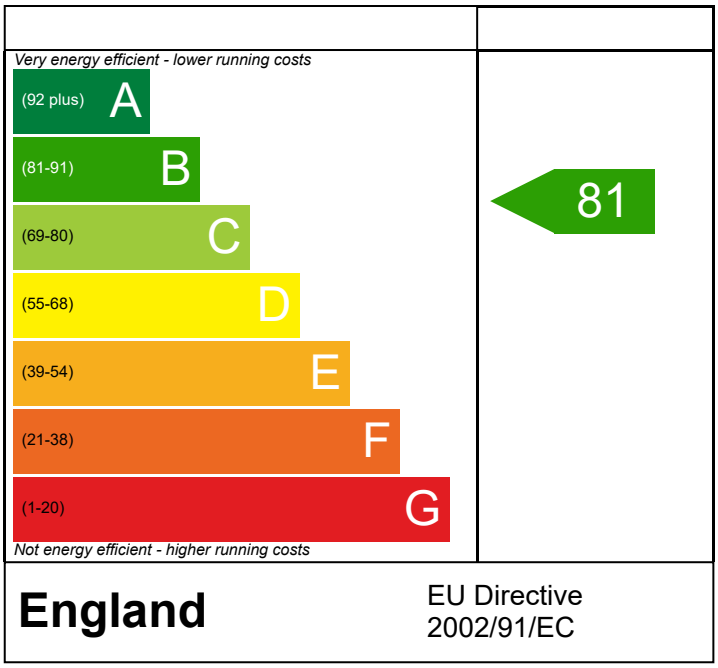
Former Odeon, Plot 6 , 92-96 London Road, Portsmouth, Hampshire, PO2 0LZ

Dwelling type:	House, End-Terrace
Date of assessment:	16/05/2023
Produced by:	Mark Rogers
Total floor area:	110.6 m²
DRRN:	8052-5556-7973

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.

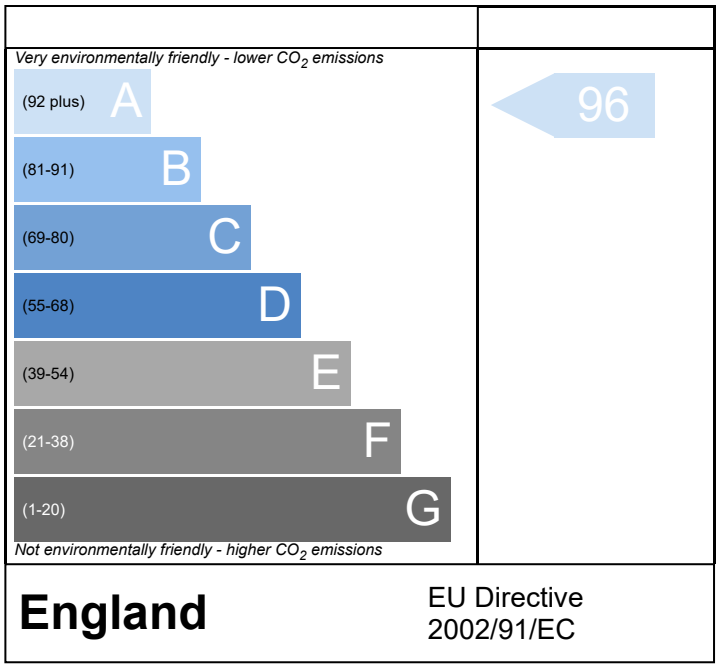
The energy performance has been assessed using the Government approved SAP 10 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO2) emissions.

Energy Efficiency Rating



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 (CO_2) Rating



The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO_2) emissions. The higher the rating the less impact it has on the environment.

Summary for Input Data

elmhurst energy

Property Reference	sc100091 P8 Former Odeon	**Issued on Date**	16/05/2023
Assessment Reference	001	**Prop Type Ref**	New Dwelling Part L 2021
Property	Former Odeon, Plot 6 , 92-96 London Road, Portsmouth, Hampshire, PO2 0LZ		

SAP Rating	81 B	**DER**	4.11	**TER**	9.94
Environmental	96 A	**% DER < TER**			58.65
CO_2 Emissions (t/year)	0.39	**DFEE**	32.57	**TFEE**	33.25
Compliance Check	See BREL	**% DFEE < TFEE**			2.04
% DPER < TPER	16.93	**DPER**	43.12	**TPER**	51.90

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	South
Property Tenture	ND
Transaction Type	6
Terrain Type	Suburban
1.0 Property Type	House, End-Terrace
2.0 Number of Storeys	3
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:	20.22 m	43.80 m²	2.39 m
1st Storey:	20.22 m	43.80 m²	2.76 m
2nd Storey:	16.28 m	23.00 m²	2.45 m

8.0 Living Area 19.95 m²

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area(m²)	Nett Area (m²)	Shelter Res	Shelter	Openings	Area Calculation Type
External Wall	Cavity Wall	Cavity wall; plasterboard on dabs or battens, lightweight aggregate block, filled cavity, any outside structure	0.22	110.00	115.45	102.79	0.00	None	12.66	Enter Gross Area
Dormer	Timber Frame	Other	0.18	0.00	6.54	5.16	0.00	None	1.38	Enter Gross Area
External Clad Wall	Cavity Wall	Cavity wall; plasterboard on dabs or battens, lightweight aggregate block, filled cavity, any outside structure	0.21	110.00	1.70	1.70	0.00	None	0.00	Enter Gross Area

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)	Shelter Res	Shelter
Party Wall	Filled Cavity with Edge Sealing	Single plasterboard on dabs on both sides, dense blocks, cavity or cavity fill	0.00	70.00	70.77		None

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Stud Walls	Plasterboard on timber frame	9.00	165.04

10.0 External Roofs

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area(m²)	Nett Area (m²)	Shelter Code	Shelter Factor	Calculation Type	Openings
Pitched Roofspace	External Plane Roof	Plasterboard, insulated at ceiling level	0.09	9.00	12.15	0.00	None	0.00	Enter Gross Area	0.00
Pitched Roof Skilling	External Slope Roof	Other	0.13	0.00	30.19	0.00	None	0.00	Enter Gross Area	0.00
Flat Roof	External Flat Roof	Plasterboard, insulated flat roof	0.12	9.00	6.00	0.00	None	0.00	Enter Gross Area	0.00

Summary for Input Data

elmhurst energy

10.2 Internal Ceilings

Description	Storey	Construction	Area (m²)
Ground Floor Ceiling	Lowest occupied	Plasterboard ceiling, carpeted chipboard floor	34.96
First Floor Ceiling	+1	Plasterboard ceiling, carpeted chipboard floor	35.97

11.0 Heat Loss Floors

Description	Type	Storey Index	Construction	U-Value (W/m²K)	Shelter Code	Shelter Factor	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Ground Floor - Solid	Lowest occupied	Suspended concrete floor, carpeted	0.10	None	0.00	75.00	34.96

11.2 Internal Floors

Description	Storey Index	Construction	Kappa (kJ/m²K)	Area (m²)
First Floor		Plasterboard ceiling, carpeted chipboard floor	9.00	43.80
Second Floor		Plasterboard ceiling, carpeted chipboard floor	9.00	43.80

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	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	1.20
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 (m²)	Pitch
Front South Door	New Dwelling DG Door	External Wall	South	2.06	
Front South Windows	New Dwelling DG Window	External Wall	South	3.18	
Rear West Windows	New Dwelling DG Window	External Wall	West	7.42	
Rear West Window	New Dwelling DG Window	Dormer	West	1.38	

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

Bridge Type	Source Type	Length	Psi	Adjusted	Reference:	Imported
E2 Other lintels (including other steel lintels)	Independently assessed	8.10	0.05	0.05	IG or Keystone Hi Therm + Lint	No
E2 Other lintels (including other steel lintels)	Independently assessed	1.14	0.06	0.06	AutoPSI Detail	No
E3 Sill	Independently assessed	7.15	0.03	0.03	LABC Construction Detail	No
E3 Sill	Independently assessed	1.14	0.05	0.05	AutoPSI Detail	No
E4 Jamb	Independently assessed	17.40	0.03	0.03	LABC Construction Detail	No
E4 Jamb	Independently assessed	2.40	0.06	0.06	AutoPSI Detail	No
E5 Ground floor (normal)	Independently assessed	10.44	0.06	0.06	LABC Construction Detail	No
E6 Intermediate floor within a dwelling	Independently assessed	15.62	0.00	0.00	LABC Construction Detail	No
E11 Eaves (insulation at rafter level)	Independently assessed	9.00	0.01	0.01	LABC Construction Detail	No
E12 Gable (insulation at ceiling level)	Independently assessed	3.00	0.06	0.06	LABC Construction Detail	No
E13 Gable (insulation at rafter level)	Independently assessed	9.00	0.06	0.06	LABC Construction Detail	No
E14 Flat roof	Table K1 - Default	3.00	0.16	0.16		No
E16 Corner (normal)	Independently assessed	12.69	0.05	0.05	LABC Construction Detail	No
E17 Corner (inverted – internal area greater than external area)	Independently assessed	2.39	-0.10	-0.10	LABC Construction Detail	No
E18 Party wall between dwellings	Independently assessed	10.30	0.04	0.04	LABC Construction Detail	No
P1 Party wall - Ground floor	Independently assessed	10.32	0.06	0.06	AutoPSI Detail	No
P2 Party wall - Intermediate floor within a dwelling	Table K1 - Default	10.32	0.00	0.00		No
P4 Party wall - Roof (insulation at ceiling level)	Independently assessed	3.00	0.04	0.04	LABC Construction Detail	No
P5 Party wall - Roof (insulation at rafter level)	Independently assessed	9.00	0.04	0.04	LABC Construction Detail	No
R6 Flat ceiling	Table K1 - Default	6.77	0.12	0.12		No
R7 Flat ceiling (inverted)	Table K1 - Default	1.36	0.12	0.12		No
R9 Roof to wall (flat ceiling)	Table K1 - Default	1.36	0.32	0.32		No

Y-value	0.00	W/m²K

18.0 Pressure Testing	Yes	
Designed AP_{50}	4.00	m³/(h.m²) @ 50 Pa
Test Method	Blower Door	

19.0 Mechanical Ventilation

Mechanical Ventilation

Mechanical Ventilation System Present	Yes	
Approved Installation	No	
Mechanical Ventilation data Type	Database	
Type	Mechanical extract ventilation - decentralised	
MV Reference Number	500769	
Configuration	1	
Duct Type	Flexible	

Summary for Input Data

elmhurst energy

Wet Rooms	0

19.1 Mechanical extract ventilation - Decentralised

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

20.0 Fans, Open Fireplaces, Flues

21.0 Fixed Cooling System	No

22.0 Lighting

No Fixed Lighting	No

Name	Efficacy	Power	Capacity	Count
Low energy Lighting	120.00	5	600	36

24.0 Main Heating 1	Database	
Description	Air Source Heat Pump	
Percentage of Heat	100.00	%
Database Ref. No.	106465	
Fuel Type	Electricity	
In Winter	0.00	
In Summer	0.00	
Model Name	EDLA04EV3	
Manufacturer	Daikin Europe NV	
System Type	Heat Pump	
Controls SAP Code	2207	
PCDF Controls	0	
Is MHS Pumped	Pump in heated space	
Heating Pump Age	2013 or later	
Heat Emitter	Radiators	
Flow Temperature	Enter value	
Flow Temperature Value	55.00	
25.0 Main Heating 2	None	
26.0 Heat Networks	None	

	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	Main Heating 1
SAP Code	901
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

Summary for Input Data

Cold Water Source	From mains	
Bath Count	1	
Immersion Only Heating Hot Water	Yes	

28.1 Showers

Description	Shower Type	Flow Rate [l/min]	Rated Power [kW]	Connected	Connected To

28.3 Waste Water Heat Recovery System

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	180.00	L
Loss	1.20	kWh/day
Pipes insulation	Fully insulated primary pipework	
In Airing Cupboard	No	

31.0 Thermal Store	None
34.0 Small-scale Hydro	None

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

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	£76	B 83	A 97
	£3,500 - £5,500	£179	B 89	A 98
			0	0

Thermal Bridging

elmhurst energy

Property Reference	sc100091 P8 Former Odeon	**Issued on Date**	16/05/2023
Assessment Reference	001	**Prop Type Ref**	End-Terrace House
Property	Former Odeon, Plot 6 , 92-96 London Road, Portsmouth, Hampshire, PO2 0LZ		

SAP Rating	81 B	**DER**	4.11	**TER**	9.94
Environmental	96 A	**% DER < TER**			58.65
CO_2 Emissions (t/year)	0.39	**DFEE**	32.57	**TFEE**	33.25
Compliance Check	See BREL	**% DFEE < TFEE**			2.04
% DPER < TPER	16.93	**DPER**	43.12	**TPER**	51.90

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

	Junction details	Source Type	Psi (W/mK)	Length (m)	Result	Reference
External wall	E2 Other lintels (including other steel lintels)	Independently assessed	0.050	8.10	0.41	IG or Keystone Hi Therm + Lint
External wall	E2 Other lintels (including other steel lintels)	Independently assessed	0.061	1.14	0.07	AutoPSI Detail
External wall	E3 Sill	Independently assessed	0.032	7.15	0.23	LABC Construction Detail
External wall	E3 Sill	Independently assessed	0.046	1.14	0.05	AutoPSI Detail
External wall	E4 Jamb	Independently assessed	0.034	17.40	0.59	LABC Construction Detail
External wall	E4 Jamb	Independently assessed	0.062	2.40	0.15	AutoPSI Detail
External wall	E5 Ground floor (normal)	Independently assessed	0.062	10.44	0.65	LABC Construction Detail
External wall	E6 Intermediate floor within a dwelling	Independently assessed	0.002	15.62	0.03	LABC Construction Detail
External wall	E11 Eaves (insulation at rafter level)	Independently assessed	0.007	9.00	0.06	LABC Construction Detail
External wall	E12 Gable (insulation at ceiling level)	Independently assessed	0.058	3.00	0.17	LABC Construction Detail
External wall	E13 Gable (insulation at rafter level)	Independently assessed	0.057	9.00	0.51	LABC Construction Detail
External wall	E14 Flat roof	Table K1 - Default	0.160	3.00	0.48	
External wall	E16 Corner (normal)	Independently assessed	0.053	12.69	0.67	LABC Construction Detail
External wall	E17 Corner (inverted – internal area greater than external area)	Independently assessed	-0.096	2.39	-0.23	LABC Construction Detail
External wall	E18 Party wall between dwellings	Independently assessed	0.044	10.30	0.45	LABC Construction Detail
Party wall	P1 Party wall - Ground floor	Independently assessed	0.060	10.32	0.62	AutoPSI Detail
Party wall	P2 Party wall - Intermediate floor within a dwelling	Table K1 - Default	0.000	10.32	0.00	
Party wall	P4 Party wall - Roof (insulation at ceiling level)	Independently assessed	0.043	3.00	0.13	LABC Construction Detail
Party wall	P5 Party wall - Roof (insulation at rafter level)	Independently assessed	0.043	9.00	0.39	LABC Construction Detail
External roof	R6 Flat ceiling	Table K1 - Default	0.120	6.77	0.81	
External roof	R7 Flat ceiling (inverted)	Table K1 - Default	0.120	1.36	0.16	
External roof	R9 Roof to wall (flat ceiling)	Table K1 - Default	0.320	1.36	0.44	

Total: 154.90 W/mK:

Thermal Bridging

Y-Value: 0.00 W/m²K:

U-VALUE CALCULATOR REPORT

Property Reference	sc121688	**Issued on Date**	16/05/2023
Assessment Reference	001	**Prop Type Ref**	New Dwelling Part L 2021
Project	Former Odeon, Plot 8, 92-96 London Road, North End, Portsmouth, Hampshire, PO2 0LZ		
Calculation Type	New Build (As Designed)		

SAP Rating	87 B	**DER**	13.78	**TER**	23.50
Environmental	88 B	**% DER<TER**	41.35		
CO_2 Emissions (t/year)	1.27	**DFEE**	38.58	**TFEE**	48.70
General Requirements Compliance	Pass	**% DFEE<TFEE**	20.77		

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/m²K)	Resistance (m²K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	**Loft Space**				
	Main construction	0	0.0600	0.0600	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	**Mineral wool**				
	Main construction	250	0.0440	5.6818	100.00
	Corrections - Air Gap: Level 0, Fasteners: None or plastic				
Layer 4	**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 5	**Plasterboard, standard**				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1000	

Total resistance: **Upper limit =** 11.395 m² K/W **Lower limit =** 11.146 m² K/W **Average =** 11.270 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**

Regs Region: England
Elmhurst Energy Systems SAP2012 Calculator (Design System) version 4.14r19

U-VALUE CALCULATOR REPORT

Property Reference	sc121688	**Issued on Date**	16/05/2023
Assessment Reference	001	**Prop Type Ref**	New Dwelling Part L 2021
Project	Former Odeon, Plot 8, 92-96 London Road, North End, Portsmouth, Hampshire, PO2 0LZ		
Calculation Type	New Build (As Designed)		

SAP Rating	87 B	**DER**	13.78	**TER**	23.50
Environmental	88 B	**% DER<TER**	41.35		
CO_2 Emissions (t/year)	1.27	**DFEE**	38.58	**TFEE**	48.70
General Requirements Compliance	Pass	**% DFEE<TFEE**	20.77		

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 000004 - vivid skilling

Roof Type: Pitched Roof, insulated sloping ceiling

Layer	Description	Thickness (mm)	Conductivity (W/m²K)	Resistance (m²K/W)	Fraction (%)	Density (kg/m³)	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	87.33		
	Main construction	25	0.1563	0.1600	12.67		
	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	30	0.0624	0.4806	92.17		
	Main construction	30	0.1300	0.2308	7.83		
	Corrections - Cavity Unventilated, Emissivity: Low Emissivity (BR443)						
Layer 5	**Thermapitch TP10**						
	Main construction	120	0.0220	5.4545	92.17		
	Main construction	120	0.1300	0.9231	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 =** 8.187 m² K/W **Lower limit =** 7.321 m² K/W **Average =** 7.754 m² K/W

Total correction = 0.0037 m² K/W **U-value (unrounded) =** 0.13 W/m² K

Unheated space: None

Total thickness: 253 mm **U-value: 0.13 W/m² K** **Kappa: 0.00 kJ/m² K**

U-VALUE CALCULATOR REPORT

Property Reference	sc121688	**Issued on Date**	16/05/2023
Assessment Reference	001	**Prop Type Ref**	New Dwelling Part L 2021
Project	Former Odeon, Plot 8, 92-96 London Road, North End, Portsmouth, Hampshire, PO2 0LZ		
Calculation Type	New Build (As Designed)		

SAP Rating	87 B	**DER**	13.78	**TER**	23.50
Environmental	88 B	**% DER<TER**	41.35		
CO_2 Emissions (t/year)	1.27	**DFEE**	38.58	**TFEE**	48.70
General Requirements Compliance	Pass	**% DFEE<TFEE**	20.77		

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 000008 - Flat roof hybrid warm deck

Roof Type: Flat Roof standard (no precipitation)

Layer	Description	Thickness (mm)	Conductivity (W/m²K)	Resistance (m²K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	**EPDM**				
	Main construction	1.5	0.0300	0.0500	100.00
Layer 2	**Plywood**				
	Main construction	18	0.1300	0.1385	100.00
Layer 3	**Celotex XR4000**				
	Main construction	120	0.0220	5.4545	100.00
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 4	**Plywood**				
	Main construction	18	0.1300	0.1385	100.00
Layer 5	**Celotex GA4000**				
	Main construction	70	0.0220	3.1818	87.50
	Main construction	70	0.1300	0.5385	12.50
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 6	**Standard cavity**				
	Main construction	80	0.1763	0.4538	87.50
	Main construction	80	0.1300	0.6154	12.50
	Corrections - Cavity Unventilated, Emissivity: Normal				
Layer 7	**Plasterboard, standard**				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1000	

Total resistance: **Upper limit =** 9.202 m² K/W **Lower limit =** 8.422 m² K/W **Average =** 8.812 m² K/W

Total correction = 0.0043 m² K/W **U-value (unrounded) =** 0.12 W/m² K

Unheated space: None

Total thickness: 320 mm **U-value: 0.12 W/m² K** **Kappa: n/a**

U-VALUE CALCULATOR REPORT

Property Reference	sc121688	**Issued on Date**	16/05/2023
Assessment Reference	001	**Prop Type Ref**	New Dwelling Part L 2021
Project	Former Odeon, Plot 8, 92-96 London Road, North End, Portsmouth, Hampshire, PO2 0LZ		
Calculation Type	New Build (As Designed)		

SAP Rating	87 B	**DER**	13.78	**TER**	23.50
Environmental	88 B	**% DER<TER**	41.35		
CO_2 Emissions (t/year)	1.27	**DFEE**	38.58	**TFEE**	48.70
General Requirements Compliance	Pass	**% DFEE<TFEE**	20.77		

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/m²K)	Resistance (m²K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	**Brick/Stone**				
	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 mm², Lambda: 17.000 W/m.K, per m²: 2.500				
Layer 3	**Thermalite Hi-Strength 7**				
	Main construction	100	0.1900	0.5263	93.43
	Main construction	100	0.8803	0.1136	6.57
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
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 =** 4.685 m² K/W **Lower limit =** 4.612 m² K/W **Average =** 4.649 m² K/W

Total correction = 0.0017 m² K/W **U-value (unrounded) =** 0.22 W/m² K

Unheated space: None

Total thickness: 355 mm **U-value: 0.22 W/m² K** **Kappa: n/a**

U-VALUE CALCULATOR REPORT

Property Reference	sc121688	**Issued on Date**	16/05/2023
Assessment Reference	001	**Prop Type Ref**	New Dwelling Part L 2021
Project	Former Odeon, Plot 8, 92-96 London Road, North End, Portsmouth, Hampshire, PO2 0LZ		
Calculation Type	New Build (As Designed)		

SAP Rating	87 B	**DER**	13.78	**TER**	23.50
Environmental	88 B	**% DER<TER**	41.35		
CO_2 Emissions (t/year)	1.27	**DFEE**	38.58	**TFEE**	48.70
General Requirements Compliance	Pass	**% DFEE<TFEE**	20.77		

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 - TF Dormer

Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m²K)	Resistance (m²K/W)	Fraction (%)	Density (kg/m³)	Heat Cap. (J/kgK)
Ext surface				0.0400			
Layer 1	**Single Ply Membrane**						
	Main construction	1.5	0.1600	0.0094	100.00		
Layer 2	**Plywood**						
	Main construction	18	0.1300	0.1385	100.00		
Layer 3	**Celotex XR4000**						
	Main construction	150	0.0220	6.8182	87.50	30	1400
	Main construction	150	0.1300	1.1538	12.50	30	1400
	Corrections - Air Gap: Level 1, Fasteners: None or plastic						
Layer 4	**Kooltherm K18 Insulated Plasterboard (32.5mm)**						
	Main construction	32.5	0.0361	0.9000	100.00		
	Corrections - Air Gap: Level 1, Fasteners: None or plastic						
Int surface				0.1300			

Total resistance: **Upper limit =** 6.189 m² K/W **Lower limit =** 5.443 m² K/W **Average =** 5.816 m² K/W

Total correction = 0.0055 m² K/W **U-value (unrounded) =** 0.18 W/m² K

Unheated space: None

Total thickness: 202 mm **U-value: 0.18 W/m² K** **Kappa: 0.00 kJ/m² K**

U-VALUE CALCULATOR REPORT

Property Reference	sc121688	**Issued on Date**	16/05/2023
Assessment Reference	001	**Prop Type Ref**	New Dwelling Part L 2021
Project	Former Odeon, Plot 8, 92-96 London Road, North End, Portsmouth, Hampshire, PO2 0LZ		
Calculation Type	New Build (As Designed)		

SAP Rating	87 B	**DER**	13.78	**TER**	23.50
Environmental	88 B	**% DER<TER**	41.35		
CO_2 Emissions (t/year)	1.27	**DFEE**	38.58	**TFEE**	48.70
General Requirements Compliance	Pass	**% DFEE<TFEE**	20.77		

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 - Vivid Cavity Wall 125 Knauf Supafil 34

Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m²K)	Resistance (m²K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	**Hardie Plank**				
	Main construction	11	0.6000	0.0183	100.00
Layer 2	**airspace/timber battens**				
	Main construction	22	0.1222	0.1800	91.45
	Main construction	22	0.1243	0.1770	8.55
	Corrections - Cavity Unventilated, Emissivity: Normal				
Layer 3	**Blockwork, medium**				
	Main construction	100	0.5700	0.1754	93.43
	Main construction	100	0.8803	0.1136	6.57
Layer 4	**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 mm², Lambda: 17.000 W/m.K, per m²: 2.500				
Layer 5	**Thermalite Hi-Strength 7**				
	Main construction	100	0.1900	0.5263	93.43
	Main construction	100	0.8803	0.1136	6.57
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 6	**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 7	**Plasterboard, standard**				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1300	

Total resistance: **Upper limit =** 4.926 m² K/W **Lower limit =** 4.852 m² K/W **Average =** 4.889 m² K/W

Total correction = 0.0016 m² K/W **U-value (unrounded) =** 0.21 W/m² K

Unheated space: None

Total thickness: 386 mm **U-value: 0.21 W/m² K** **Kappa: n/a**

Regs Region: England
Elmhurst Energy Systems SAP2012 Calculator (Design System) version 4.14r19

U-VALUE CALCULATOR REPORT

Property Reference	sc121688	Issued on Date	16/05/2023
Assessment Reference	001	Prop Type Ref	New Dwelling Part L 2021
Project	Former Odeon, Plot 8, 92-96 London Road, North End, Portsmouth, Hampshire, PO2 0LZ		
Calculation Type	New Build (As Designed)		

SAP Rating	87 B	DER	13.78	TER	23.50
Environmental	88 B	% DER<TER	41.35		
CO_2 Emissions (t/year)	1.27	DFEE	38.58	TFEE	48.70
General Requirements Compliance	Pass	% DFEE<TFEE	20.77		

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 = 34.96 m², Perimeter = 17.98 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:Uw = 0.200 m
Ventilation openings per perimeter length:e = 0.0015 %
Mean wind speed:v = 5.000 m/s
Resistance on solum:Rg = 0.000 m²K/W

Layer	Description	Thickness (mm)	Conductivity (W/m²K)	Resistance (m²K/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	**Kingspan Kooltherm K103**				
	Main construction	150	0.0180	8.3333	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 =** 9.342 m² K/W **Lower limit =** 9.170 m² K/W **Average =** 9.256 m² K/W

Total correction = 0.0081 m² K/W **U-value (unrounded) =** 0.1 W/m² K

Unheated space: None

Total thickness: 315 mm **U-value: 0.10 W/m² K** **Kappa: n/a**