elmhurst energy

SAP Report Submission for Building Regulations Compliance

Client: Imperial Homes Southern

Project: 22d Springvale Road
Winchester, SO23 7LZ

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

Report Issue Date: 28/11/2022

EXCELLENCE IN ENERGY ASSESSMENT

Summary for Input Data

Property Reference	sc100034 22 Springvale P4	**Issued on Date**	30/10/2023
Assessment Reference	002 As Built	**Prop Type Ref**	New dwelling Part L 2021
Property	22d Springvale Road, Winchester, SO23 7LZ		

SAP Rating	83 B	**DER**	3.90	**TER**	9.84
Environmental	97 A	**% DER < TER**			60.37
CO_2 Emissions (t/year)	0.33	**DFEE**	35.20	**TFEE**	35.55
Compliance Check	See BREL	**% DFEE < TFEE**			0.98
% DPER < TPER	20.89	**DPER**	40.59	**TPER**	51.31

Assessor Details	Mr. Mark Rogers	**Assessor ID**	A320-0001
Client	Imperial Homes, Imperial Homes		

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

Orientation	Southeast
Property Tenture	ND
Transaction Type	6
Terrain Type	Suburban
1.0 Property Type	Bungalow, Semi-Detached
2.0 Number of Storeys	2
3.0 Date Built	2022
4.0 Sheltered Sides	3
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:	21.15 m	55.83 m²	2.37 m
1st Storey:	19.49 m	41.07 m²	2.51 m

8.0 Living Area 14.37 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 Cavity Wall	Cavity Wall	Cavity wall; plasterboard on dabs or battens, lightweight aggregate block, filled cavity, any outside structure	0.18	110.00	76.98	61.57	0.00	None	15.41	Enter Gross Area
Dormers	Timber Frame	Other	0.18	0.00	6.62	6.62	0.00	None	0.00	Enter Gross Area
External Cedral Clad	Cavity Wall	Cavity wall; plasterboard on dabs or battens, lightweight aggregate block, filled cavity, any outside structure	0.17	110.00	0.99	0.99	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	45.58		None

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Wall Block	Dense block, plasterboard on dabs	75.00	70.72
Internal Stud Walls	Plasterboard on timber frame	9.00	125.14

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 Roof Space	External Plane Roof	Plasterboard, insulated at ceiling level	0.09	9.00	26.06	26.06	None	0.00	Enter Gross Area	0.00
Pitched Roof Skillings	External Slope Roof	Other	0.12	0.00	42.90	40.62	None	0.00	Enter Gross Area	2.28
Flat Roofs	External Flat Roof	Plasterboard, insulated flat roof	0.12	9.00	3.93	3.93	None	0.00	Enter Gross Area	0.00

Summary for Input Data

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10.2 Internal Ceilings

Description	Storey	Construction	Area (m²)
Internal Ceiling	Lowest occupied	Plasterboard ceiling, carpeted chipboard floor	55.83

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	55.83

11.2 Internal Floors

Description	Storey Index	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Floor		Plasterboard ceiling, carpeted chipboard floor	9.00	55.83

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 TG Door	Manufacturer	Half Glazed Door	Triple Low-E Soft 0.05			0.57		0.70	1.00
New Dwelling DG Window	Manufacturer	Window	Double Low-E Soft 0.05			0.71		0.70	1.20
New Dwell DG Roof Window	Manufacturer	Roof Window	Double Low-E Soft 0.05			0.64		0.70	1.20

13.0 Openings

Name	Opening Type	Location	Orientation	Area (m²)	Pitch
Front SE Door	New Dwelling TG Door	External Cavity Wall	South East	2.01	
Front SE Windows	New Dwelling DG Window	External Cavity Wall	South East	0.85	
Front SE Windows	New Dwelling DG Window	External Cavity Wall	South East	2.16	
Front SE Roof Win	New Dwell DG Roof Window	Pitched Roof Skillings	South East	0.76	40
Front SE Window	New Dwelling DG Window	External Cavity Wall	South East	2.74	
Side NE Door	New Dwelling TG Door	External Cavity Wall	North East	1.95	
Side NE Window	New Dwelling DG Window	External Cavity Wall	North East	0.94	
Rear NW Windows	New Dwelling DG Window	External Cavity Wall	North West	4.76	
Rear NW Roof Wins	New Dwell DG Roof Window	Pitched Roof Skillings	North West	1.52	40

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	7.59	0.05	0.05	Keystone Hi Therm + Lintels	No
E2 Other lintels (including other steel lintels)	Independently assessed	1.82	0.10	0.10	Zero Carbon Hub	No
E3 Sill	Independently assessed	6.64	0.02	0.02	LABC Construction Detail	No
E3 Sill	Independently assessed	1.82	0.06	0.06	Zero Carbon Hub	No
E4 Jamb	Independently assessed	20.10	0.02	0.02	LABC Construction Detail	No
E4 Jamb	Independently assessed	2.40	0.06	0.06	Zero Carbon Hub	No
E5 Ground floor (normal)	Independently assessed	21.15	0.07	0.07	LABC Construction Detail	No
E6 Intermediate floor within a dwelling	Independently assessed	21.15	0.00	0.00	LABC Construction Detail	No
E11 Eaves (insulation at rafter level)	Independently assessed	10.90	0.00	0.00	LABC Construction Detail	No
E12 Gable (insulation at ceiling level)	Independently assessed	4.80	0.05	0.05	LABC Construction Detail	No
E13 Gable (insulation at rafter level)	Independently assessed	7.00	0.06	0.06	LABC Construction Detail	No
E14 Flat roof	Table K1 - Default	5.52	0.16	0.16		No
E16 Corner (normal)	Independently assessed	5.76	0.06	0.06	LABC Construction Detail	No
E18 Party wall between dwellings	Independently assessed	5.76	0.09	0.09	LABC Construction Detail	No
P1 Party wall - Ground floor	Table K1 - Default	10.30	0.32	0.32		No
P2 Party wall - Intermediate floor within a dwelling	Table K1 - Default	10.30	0.00	0.00		No
P4 Party wall - Roof (insulation at ceiling level)	Independently assessed	4.80	0.20	0.20	LABC Construction Detail	No
P5 Party wall - Roof (insulation at rafter level)	Table K1 - Default	7.00	0.48	0.48		No
R1 Head of roof window	Table K1 - Default	2.34	0.24	0.24		No
R2 Sill of roof window	Table K1 - Default	2.34	0.24	0.24		No
R3 Jamb of roof window	Independently assessed	5.88	0.04	0.04	LABC Construction Detail	No
R6 Flat ceiling	Table K1 - Default	10.90	0.12	0.12		No
R7 Flat ceiling (inverted)	Table K1 - Default	1.74	0.12	0.12		No
R9 Roof to wall (flat ceiling)	Table K1 - Default	1.74	0.32	0.32		No

Y-value	0.00	W/m²K

18.0 Pressure Testing	Yes	
Designed AP_{50}	4.50	m³/(h.m²) @ 50 Pa
Property Tested?	Yes	
Test Method	Blower Door	
As Built AP_{50}	3.68	m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

Mechanical Ventilation

Mechanical Ventilation System Present	No	

20.0 Fans, Open Fireplaces, Flues

Summary for Input Data

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21.0 Fixed Cooling System	No

22.0 Lighting

No Fixed Lighting	No

Name	Efficacy	Power	Capacity	Count
Low energy Lighting	75.00	15	1125	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
Cold Water Source	From mains
Bath Count	1
Immersion Only Heating Hot Water	No

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

Summary for Input Data

Independent Time Control	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	200.00	L
Loss	1.30	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	£45	B 85	A 97
	£3,500 - £5,500	£195	B 90	A 98
			0	0

Building Regulations England Part L (BREL) Compliance Report

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

Date: Sun 29 Oct 2023 08:34:23

Project Information			
Assessed By	Mark Rogers	Building Type	Bungalow, Semi-detached
OCDEA Registration	EES/004179	Assessment Date	2023-10-29

Dwelling Details			
Assessment Type	As built	Total Floor Area	97 m^2
Site Reference	sc100034 22 Springvale P4	Plot Reference	002 As Built
Address	22d Springvale Road, Winchester, SO23 7LZ		

Client Details	
Name	Imperial Homes
Company	Imperial Homes Southern
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	*9.84 $kgCO_2/m^2$*	
Dwelling carbon dioxide emission rate	3.9 $kgCO_2/m^2$	OK
1b Target primary energy rate and dwelling primary energy		
Target primary energy	*51.31 kWh_{PE}/m^2*	
Dwelling primary energy	40.59 kWh_{PE}/m^2	OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency		
Target fabric energy efficiency	*35.5 kWh/m^2*	
Dwelling fabric energy efficiency	35.2 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*	0.18	Walls (1) (0.18)	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*	0.11	Roof (2) (0.12)	OK
Windows, doors, and roof windows	*1.6*	1.16	Front SE Windows (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)	61.57	0.18
Exposed wall: Walls (2)	6.62	0.18
Exposed wall: Walls (3)	0.99	0.17
Party wall: Party Wall (1)	45.58	0 (!)
Ground floor: Ground Floor, Ground Floor	55.83	0.1 (!)
Exposed roof: Roof (1)	26.06	0.09 (!)
Exposed roof: Roof (2)	40.62	0.12
Exposed roof: Roof (3)	3.93	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 SE Door, New Dwelling TG Door	2.01	South East	N/A	1 (!)
Front SE Windows, New Dwelling DG Window	0.85	South East	0.7	1.2
Front SE Windows, New Dwelling DG Window	2.16	South East	0.7	1.2
Front SE Roof Win, New Dwell DG Roof Window	0.76	South East	0.7	1.2
Front SE Window, New Dwelling DG Window	2.74	South East	0.7	1.2

Name	Area [m^2]	Orientation	Frame factor	U-Value [W/m^2K]
Side NE Door, New Dwelling TG Door	1.95	North East	N/A	1 (!)
Side NE Window, New Dwelling DG Window	0.94	North East	0.7	1.2
Rear NW Windows, New Dwelling DG Window	4.76	North West	0.7	1.2
Rear NW Roof Wins, New Dwell DG Roof Window	1.52	North 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	Keystone Hi Therm + Lintels
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.1	Zero Carbon Hub
External wall	E3: Sill	Calculated by person with suitable expertise	0.021 (!)	LABC Construction Detail
External wall	E3: Sill	Calculated by person with suitable expertise	0.06	Zero Carbon Hub
External wall	E4: Jamb	Calculated by person with suitable expertise	0.017 (!)	LABC Construction Detail
External wall	E4: Jamb	Calculated by person with suitable expertise	0.06	Zero Carbon Hub
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.066	LABC Construction Detail
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.001 (!)	LABC Construction Detail
External wall	E11: Eaves (insulation at rafter level)	Calculated by person with suitable expertise	0.001 (!)	LABC Construction Detail
External wall	E12: Gable (insulation at ceiling level)	Calculated by person with suitable expertise	0.052	LABC Construction Detail
External wall	E13: Gable (insulation at rafter level)	Calculated by person with suitable expertise	0.056	LABC Construction Detail
External wall	E14: Flat roof	SAP table default	0.16	
External wall	E16: Corner (normal)	Calculated by person with suitable expertise	0.057	LABC Construction Detail
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.087	LABC Construction Detail
Party wall	P1: Ground floor	SAP table default	0.32	
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	0.2	LABC Construction Detail
Party wall	P5: Roof (insulation at rafter level)	SAP table default	0.48	
Roof	R1: Head of roof window	SAP table default	0.24	
Roof	R2: Sill of roof window	SAP table default	0.24	
Roof	R3: Jamb of roof window	Calculated by person with suitable expertise	0.045	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	3.68 m^3/hm^2, Measured value (!)	OK
Air permeability test certificate reference		

4 Space heating	
Main heating system 1: Heat pump with radiators or underfloor heating - Electricity	
Efficiency	233.9%
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	200 litres
Declared heat loss	1.3 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	75 lm/W	OK
External lights control	N/A	

8 Mechanical ventilation		
System type: N/A		
Maximum permitted specific fan power	*N/A*	
Specific fan power	N/A	**N/A**
Minimum permitted heat recovery efficiency	*N/A*	
Heat recovery efficiency	N/A	**N/A**
Manufacturer/Model		
Commissioning		

9 Local generation
N/A

10 Heat networks
N/A

11 Supporting documentary evidence

Documentary evidence identified in 11.1 and 11.2 is needed to confirm the data values used for any calculations undertaken, manufacturer declarations made, and tests performed as reflected in this "As built" BREL Compliance Report are correct.

11.1 SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required.

11.2 Indicative photographic evidence of key stages during construction (guidance within Approved Document L, Volume 1 – Appendix B) that confirms the products identified in this BREL Compliance Report are used in this dwelling, and workmanship is of sufficient quality to support the calculated values claimed in 2a to 2d.

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 and construction information submitted for this dwelling for the purpose of carrying out the assessment, and that the supporting documentary evidence (identified in 11.1 and 11.2) pursuant to Part L of the Building Regulations 2010 (as amended) has been reviewed in the course of preparing this BREL Compliance Report.

Signed: [redacted]	Assessor ID: [redacted]
Name: Mark Rogers	Date: 29.10.23

b. Client Declaration

This declaration by the client is confirmation that the dwelling has been constructed and completed according to the specifications set out in this BREL Compliance Report, and that photographic evidence of key stages, as described in 11.2, has been provided to the Assessor for this dwelling.

Sign[redacted]	Organisation: VIVID DESIGN STUDIO LTD
Name: PHILIP DUDLEY.	Date: 30/10/2023.