



Building Energy Performance Ltd

SAP Report Submission for Building Regulations Compliance

Client:

Project: Plot 8, Park Street
Coed Parc, Bridgend

Contact: Michael O'Donnell
Michael O'Donnell
michael@bepltd.co.uk

Report Issue Date: 01/08/2023



BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Designed)



Property Reference	plot8coedparc		Issued on Date	01/08/2023	
Assessment Reference	001	Prop Type Ref	Type B Det		
Property	Plot 8, Park Street, Coed Parc, Bridgend				
SAP Rating	86 B	DER	13.12	TER	13.70
Environmental	87 B	% DER<TER	4.20		
CO₂ Emissions (t/year)	2.35	FEE	44.53	TFEE	N/A
General Requirements Compliance	Pass	% DFEE<TFEE	N/A		
Assessor Details	Mr. Kevin O'Donnell, Building Energy Performance Limited, Tel: 029 2085 1111, kevin@bepltd.co.uk			Assessor ID	P634-0001
Client					

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

Criteria 1 – The DER must be no greater than the TER

1a TER and DER

Fuel for main heating	Mains gas		
Fuel factor	1.00 (mains gas)		
Target Carbon Dioxide Emission Rate (TER)	13.70	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	13.12	kgCO ₂ /m ²	Pass
	-0.58 (-4.2%)	kgCO ₂ /m ²	

Criteria 2 – Limits on design flexibility

Building Fabric

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.21)	0.29 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Floor	0.12 (max. 0.18)	0.12 (max. 0.70)	Pass
Roof	0.09 (max. 0.15)	0.23 (max. 0.35)	Pass
Openings	1.43 (max. 1.60)	1.60 (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	10.00 (design value)	
Maximum	10.0	Pass

Fixed Building Services

4 Heating efficiency

Main heating system	Boiler system with radiators or underfloor - Mains gas Data from database Ideal LOGIC COMBI ESP1 35 Combi boiler Efficiency: 89.6% SEDBUK2009 Minimum: 88.0%	Pass
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Secondary heating system

Room heaters - Wood Logs
Closed room heater
Efficiency: 65%
Minimum: 65%

Pass

5 Cylinder insulation

Hot water storage

No cylinder

6 Controls

Space heating controls

Time and temperature zone control

Pass

Hot water controls

No cylinder

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 overheating due to solar and other gains

9 Summertime temperature

Overheating risk (Severn (Wales))

Not significant

Pass

Based on:

Overshading

Average

Windows facing North East

1.89 m², No overhang

Windows facing South East

16.38 m², No overhang

Windows facing North West

14.20 m², No overhang

Air change rate

4.00 ach

Blinds/curtains

None

Criterion 4 – Building performance consistent with DER

Party Walls

Type

U-value

W/m²K

Pass

Air-pressure testing

3 Air permeability

Air permeability at 50 pascals

10.00 (design value)

Maximum

10.0

Pass

10 Key features

External wall U-value

0.15

W/m²K

External wall U-value

0.08

W/m²K

Roof U-value

0.11

W/m²K

Roof U-value

0.08

W/m²K

Floor U-value

0.12

W/m²K

Door U-value

1.00

W/m²K

Thermal bridging γ -value

0.025

W/m²K

Secondary heating (wood logs)

N/A

Secondary heating fuel:

wood logs

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This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

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

Orientation	North West
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	House, Detached
2.0 Number of Storeys	3
3.0 Date Built	2023
4.0 Sheltered Sides	3
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	39.00 m	80.18 m ²	2.60 m
1st Storey:	39.00 m	80.18 m ²	2.60 m
2nd Storey:	3.00 m	50.70 m ²	1.89 m

7.0 Living Area	15.64	m ²
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8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	285.31	kJ/m ² K

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)
External Wall 1	Cavity Wall	Cavity wall : plasterboard on dabs, dense block, filled cavity, any outside structure	0.15	150.00	234.00	201.22
Attic Wall	Timber Frame	Timber framed wall (one layer of plasterboard)	0.08	9.00	19.68	19.68
Dormer Wall	Timber Frame	Timber framed wall (one layer of plasterboard)	0.29	9.00	3.96	2.36

9.1 Party Walls

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)
		Dense plaster both sides. lightweight aggregate blocks, cavity or cavity fill		140.00	

9.2 Internal Walls

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Wall 1	Plasterboard on timber frame	9.00	200.34
Internal Wall 2	Dense block, plasterboard on dabs	75.00	183.24

10.0 External Roofs

SUMMARY FOR INPUT DATA

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Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)	Nett Area (m ²)
Sloping Ceiling	External Slope Roof	Plasterboard, insulated slope	0.11	9.00	21.32	19.34
Plane	External Plane Roof	Plasterboard, insulated at ceiling level	0.08	9.00	62.26	62.26
Dormer	External Flat Roof	Plasterboard, insulated flat roof	0.23	9.00	2.66	2.66

10.2 Internal Ceilings

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Ceiling 1	Plasterboard ceiling, carpeted chipboard floor	9.00	80.18
Internal Ceiling 2	Plasterboard ceiling, carpeted chipboard floor	9.00	50.72

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)
Heat Loss Floor 1	Ground Floor - Solid	Slab on ground, screed over insulation	0.12	110.00	80.18

11.2 Internal Floors

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Floor 1	Plasterboard ceiling, carpeted chipboard floor	18.00	80.18
Internal Floor 2	Plasterboard ceiling, carpeted chipboard floor	18.00	50.72

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m ² K)
Solid Door	Manufacturer	Solid Door							1.00
Roof Lights	Manufacturer	Roof Window	Double Low-E Soft 0.05			0.63		0.70	1.40
Windows	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.40
Glazed Door	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.60

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m ²)	Curtain Closed
Front	Solid Door	[1] External Wall 1	North West							1.91	
Front	Window	[1] External Wall 1	North West	None	0.00					12.60	
Front	Window	[3] Dormer Wall	North West	None	0.00					1.60	
Side	Window	[1] External Wall 1	North East	None	0.00					1.89	
Rear	Window	[1] External Wall 1	South East	None	0.00					7.14	
Rear	Roof Window	[1] Sloping Ceiling	South East	None						1.98	
Rear	Window	[1] External Wall 1	South East	None	0.00					9.24	

14.0 Conservatory

15.0 Draught Proofing

%

16.0 Draught Lobby

17.0 Thermal Bridging

17.1 List of Bridges

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)



Source Type	Bridge Type	Length	Psi	Imported	Reference:
Independently assessed	E2 Other lintels (including other steel lintels)	17.51	0.181	No	Catnic CG Lintel
Independently assessed	E3 Sill	0.60	0.027	No	CBA 214
Independently assessed	E4 Jamb	54.50	0.017	No	CBA 215
Independently assessed	E5 Ground floor (normal)	39.00	0.097	No	CBA 202
Independently assessed	E6 Intermediate floor within a dwelling	41.00	0.000	No	CBA 203
Table K1 - Approved	E11 Eaves (insulation at rafter level)	9.60	0.040	No	ACD
Table K1 - Approved	E13 Gable (insulation at rafter level)	30.80	0.040	No	ACD
Independently assessed	E16 Corner (normal)	41.60	0.055	No	CBA 216
Table K1 - Approved	E17 Corner (inverted – internal area greater than external area)	20.80	-0.090	No	
Table K1 - Default	R1 Head of roof window	2.60	0.080	No	ACD
Table K1 - Default	R2 Sill of roof window	2.60	0.060	No	ACD
Table K1 - Default	R3 Jamb of roof window	6.00	0.080	No	ACD

Y-value W/m²K

18.0 Pressure Testing

Yes
 Designed AP₅₀ m³/(h.m²) @ 50 Pa
 Property Tested ?
 As Built AP₅₀ m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather
 Cross ventilation possible
 Night Ventilation
 Air change rate

Mechanical Ventilation

Mechanical Ventilation System Present

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0	0	0	0
Number of open flues	0	0	0	0
Number of intermittent fans				7
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System

22.0 Lighting

Internal

Total number of light fittings
 Total number of L.E.L. fittings
 Percentage of L.E.L. fittings %

External

External lights fitted

23.0 Electricity Tariff

24.0 Main Heating 1

Percentage of Heat %
 Database Ref. No.
 Fuel Type
 Main Heating

SUMMARY FOR INPUT DATA

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SAP Code	104
In Winter	90.5
In Summer	87.3
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
Heat Emitter	Radiators and Underfloor
Underfloor Heating	Yes - Pipes in thin screed
Flow Temperature	Normal (> 45°C)
Combi boiler type	Standard Combi
Combi keep hot type	None

25.0 Main Heating 2

Community Heating	None	
27.0 Secondary Heating	RWM	
Secondary Heating	SAP table	
Description	Wood Logs RWM Closed room heater	
SHS efficiency	65.00	%
SAP Code	633	
HETAS Approved System	Yes	
Smoke Control Area	Unknown	

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

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 photovoltaic panels, 2.5 kWp	£3,500 - £5,500	£670	B 91

THERMAL BRIDGING

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	Junction detail	Source Type	Psi (W/mK)	Length (m)	Result	Reference
External wall	E2 Other lintels (including other steel lintels)	Independently assessed	0.181	17.51	3.17	Catnic CG Lintel
External wall	E3 Sill	Independently assessed	0.027	0.60	0.02	CBA 214
External wall	E4 Jamb	Independently assessed	0.017	54.50	0.93	CBA 215
External wall	E5 Ground floor (normal)	Independently assessed	0.097	39.00	3.78	CBA 202
External wall	E6 Intermediate floor within a dwelling	Independently assessed	0.000	41.00	0.00	CBA 203
External wall	E11 Eaves (insulation at rafter level)	Table K1 - Approved	0.040	9.60	0.38	ACD
External wall	E13 Gable (insulation at rafter level)	Table K1 - Approved	0.040	30.80	1.23	ACD
External wall	E16 Corner (normal)	Independently assessed	0.055	41.60	2.29	CBA 216
External wall	E17 Corner (inverted – internal area greater than external area)	Table K1 - Approved	-0.090	20.80	-1.87	
External roof	R1 Head of roof window	Table K1 - Default	0.080	2.60	0.21	ACD
External roof	R2 Sill of roof window	Table K1 - Default	0.060	2.60	0.16	ACD
External roof	R3 Jamb of roof window	Table K1 - Default	0.080	6.00	0.48	ACD

Total: **10.77** W/mK:
 Y-Value: **0.025** W/m²K:

U-VALUE CALCULATOR REPORT



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Client					
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Building Elements

Roof 000004

Roof Type: Pitched Roof, insulated sloping ceiling

U-VALUE CALCULATOR REPORT



Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.1000	
Layer 1	Slate				
	Main construction	6	2.2000	0.0000	100.00
Layer 2	airspace/timber battens				
	Main construction	22	0.0000	0.0000	89.63
	Main construction	22	0.1375	0.0000	10.37
	Corrections - Cavity Ventilated, Emissivity: Normal				
Layer 3	Breather membrane				
	Main construction	1	0.0000	0.0000	100.00
Layer 4	Standard cavity				
	Main construction	50	0.0000	0.0000	91.00
	Main construction	50	0.1300	0.0000	9.00
	Corrections - Cavity Ventilated, Emissivity: Normal				
Layer 5	Kingspan K107				
	Main construction	150	0.0180	8.3333	91.00
	Main construction	150	0.1300	1.1538	9.00
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 6	Kingspan K107				
	Main construction	50	0.0180	2.7778	100.00
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 7	Polythene, 500 gauge				
	Main construction	1	0.0000	0.0000	100.00
Layer 8	airspace/timber battens				
	Main construction	22	0.1222	0.1800	89.63
	Main construction	22	0.1375	0.1600	10.37
	Corrections - Cavity Unventilated, Emissivity: Normal				
Layer 9	Gyproc Wallboard (12.5mm)				
	Main construction	12.5	0.1900	0.0658	100.00
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 10	Plaster, standard				
	Main construction	3	0.4000	0.0075	100.00
Int surface				0.1000	

Total resistance: **Upper limit =** 10.077 m² K/W **Lower limit =** 8.571 m² K/W **Average =** 9.324 m² K/W
Total correction = 0.0042 m² K/W **U-value (unrounded) =** 0.11 W/m² K

Unheated space: None

Total thickness: 318 mm

U-value: 0.11 W/m² K

Kappa: n/a

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Building Elements

Wall 000001

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	Standard cavity				
	Main construction	50	0.0752	0.6651	100.00
	Corrections - Cavity Unventilated, Emissivity: Normal				
Layer 3	Kingspan K108				
	Main construction	100	0.0180	5.5556	100.00
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 4	Blockwork, medium				
	Main construction	100	0.5700	0.1754	93.43
	Main construction	100	0.8803	0.1136	6.57
Layer 5	airspace/plaster dabs				
	Main construction	15	0.0882	0.1700	80.00
	Main construction	15	0.0882	0.1700	20.00
	Corrections - Cavity Unventilated, Emissivity: Normal				
Layer 6	Gyproc Wallboard (12.5mm)				
	Main construction	12.5	0.1900	0.0658	100.00
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 7	Plaster, standard				
	Main construction	3	0.4000	0.0075	100.00
Int surface				0.1300	

Total resistance: Upper limit = 6.934 m² K/W Lower limit = 6.931 m² K/W Average = 6.932 m² K/W
 Total correction = 0.0064 m² K/W U-value (unrounded) = 0.15 W/m² K

Unheated space: None
Total thickness: 383 mm U-value: 0.15 W/m ² K Kappa: n/a

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Building Elements

Wall 000007

Wall Type: Timber framed Wall with I-beams

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	Softwood, dry				
	Main construction	22	0.1300	0.1692	100.00
Layer 2	airspace/timber battens				
	Main construction	25	0.1923	0.1300	89.63
	Main construction	25	0.1389	0.1800	10.37
	Corrections - Cavity Unventilated, Emissivity: Normal				
Layer 3	Plywood				
	Main construction	12	0.1300	0.0923	100.00
Layer 4	Polythene,1000 gauge				
	Main construction	1	0.0000	0.0000	100.00
Layer 5	Celotex GA4000				
	Main construction	100	0.0220	4.5455	85.00
	Main construction	100	0.1300	0.7692	15.00
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 6	Gyproc Wallboard (12.5mm)				
	Main construction	12.5	0.1900	0.0658	100.00
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 7	Plaster, standard				
	Main construction	3	0.4000	0.0075	100.00
Int surface				0.1300	

Total resistance:	Upper limit = 3.699 m ² K/W	Lower limit = 3.256 m ² K/W	Average = 3.478 m ² K/W
	Total correction = 0.0057 m ² K/W	U-value (unrounded) = 0.29 W/m ² K	

Unheated space:	None
Total thickness:	176 mm
U-value:	0.29 W/m ² K
Kappa:	n/a

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Building Elements

Floor 000006

Floor Type: Slab On Ground Floor

Area = 80.18 m², Perimeter = 39.00 m, Wall thickness = 275.00 mm, Soil: Unknown

Horizontal edge insulation: none

Vertical edge insulation: Width D = 75.0 mm, Thickness dn = 30.0 mm, Lambda = 0.022

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	Polythene,1000 gauge				
	Main construction	1	0.0000	0.0000	100.00
Layer 2	Concrete, reinforced (2% steel)				
	Main construction	150	2.5000	0.0600	100.00
Layer 3	Thermafloor TF70 zero ODP				
	Main construction	150	0.0220	6.8182	100.00
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 4	Polythene, 500 gauge				
	Main construction	1	0.0000	0.0000	100.00
Layer 5	Screed				
	Main construction	75	1.1500	0.0652	100.00
Int surface				0.1700	

Total resistance: Upper limit = 6.943 m² K/W Lower limit = 6.943 m² K/W Average = 6.943 m² K/W

Total correction = 0.0096 m² K/W

U-value (unrounded) = 0.12 W/m² K

Unheated space: None

Total thickness: 377 mm

U-value: 0.12 W/m² K

Kappa: n/a