BASIC COMPLIANCE REPORT
Calculation Type: New Build (As Designed)

LOW CARBON BOX

Property Reference	22211 Plot 04	**Issued on Date**	15/12/2022
Assessment Reference	B	**Prop Type Ref**	House Type B h
Property	Plot 04, Station Road, Haddenham, ELY, CB6		

SAP Rating	92 A	**DER**	9.44	**TER**	25.30
Environmental	93 A	**% DER<TER**	62.69		
CO_2 Emissions (t/year)	0.64	**DFEE**	45.80	**TFEE**	50.58
General Requirements Compliance	Pass	**% DFEE<TFEE**	9.46		

Assessor Details	Mr. Robert Atherton, Low Carbon Box Limited, Tel: 07540977134, robert@lowcarbonbox.co.uk	**Assessor ID**	F291-0001
Client			

SUMARY FOR INPUT DATA FOR New Build (As Designed)

Criterion 1 – Achieving the TER and TFEE rate

1a TER and DER

Fuel for main heating	Electricity		
Fuel factor	1.55 (electricity)		
Target Carbon Dioxide Emission Rate (TER)	25.30	$kgCO_2/m^2$	
Dwelling Carbon Dioxide Emission Rate (DER)	9.44	$kgCO_2/m^2$	Pass
	-15.86 (-62.7%)	$kgCO_2/m^2$	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	50.58	$kWh/m^2/yr$	
Dwelling Fabric Energy Efficiency (DFEE)	45.80	$kWh/m^2/yr$	
	-4.8 (-9.5%)	$kWh/m^2/yr$	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.23 (max. 0.30)	0.23 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Floor	0.15 (max. 0.25)	0.15 (max. 0.70)	Pass
Roof	0.11 (max. 0.20)	0.11 (max. 0.35)	Pass
Openings	1.34 (max. 2.00)	1.40 (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	5.50 (design value)	
Maximum	10.0	Pass

Limiting System Efficiencies

4 Heating efficiency

Main heating system	Heat pump with radiators or underfloor - Electric Mitsubishi Electric Ecodan 5.0 kW PUZ-WM50VHA	
Secondary heating system	None	

5 Cylinder insulation

Hot water storage	Measured cylinder loss: 1.23 kWh/day Permitted by DBSCG 2.03	Pass
Primary pipework insulated	Yes	Pass

6 Controls

Space heating controls	Programmer, TRVs and bypass	Pass
Hot water controls	Cylinderstat	Pass
	Independent timer for DHW	Pass

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100	%	
Minimum	75	%	Pass

8 Mechanical ventilation

Continuous extract system (decentralised)		
Specific fan power	0.1600 0.1600	
Maximum	0.7	Pass

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (East Anglia)	Slight	Pass

Based on:

Overshading	Average
Windows facing North East	1.20 m², No overhang
Windows facing South East	5.57 m², No overhang
Windows facing North West	2.98 m², No overhang
Air change rate	4.00 ach
Blinds/curtains	None

Criterion 4 – Building performance consistent with DER and DFEE rate

Party Walls

Type	U-value		
Filled Cavity with Edge Sealing	0.00	W/m²K	Pass

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals	5.50 (design value)	
Maximum	10.0	Pass

10 Key features

Party wall U-value	0.00	W/m²K
Roof U-value	0.11	W/m²K
Photovoltaic array	1.20	kW

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	South East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	House, Semi-Detached
2.0 Number of Storeys	2
3.0 Date Built	2022
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	19.33 m	46.59 m²	2.34 m
1st Storey:	19.33 m	46.59 m²	2.67 m

7.0 Living Area	17.88	m²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	195.33	kJ/m²K

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
Cavity wall	Cavity Wall	Other	0.23	96.43	96.84	82.81

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Party Wall 1	Filled Cavity with Edge Sealing	Single plasterboard on both sides, dense cellular blocks, cavity	0.00	70.00	45.99

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Partitions LW	Plasterboard on timber frame	9.00	156.13

10.0 External Roofs

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
Ceiling	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	46.59	46.59

10.2 Internal Ceilings

SUMMARY FOR INPUT DATA
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LOW CARBON BOX

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Ceiling 1	Plasterboard ceiling, carpeted chipboard floor	9.00	46.59

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Ground floor	Ground Floor - Solid	Suspended concrete floor, carpeted	0.15	75.00	46.59

11.2 Internal Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Floor 1	Plasterboard ceiling, carpeted chipboard floor	18.00	46.59

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Front / Utility Door	Manufacturer	Solid Door							1.20
Windows	Manufacturer	Window	Double Low-E Soft 0.05			0.70		0.70	1.40
Glazed Sidelight	Manufacturer	Window	Double Low-E Soft 0.05			0.70		0.70	1.30
Opaque panels	Manufacturer	Window	Double Low-E Soft 0.05			0.30		0.70	1.30
HG door	Manufacturer	Half Glazed Door	Double Low-E Soft 0.05			0.70		0.70	1.20
Rooflight	Manufacturer	Roof Window	Double Low-E Soft 0.05			0.63		0.70	1.40

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Solid Door	[1] Cavity wall	South East							2.14	
Front Windows	Window	[1] Cavity wall	South East	None	0.00					5.57	
Rear win	Window	[1] Cavity wall	North West	None	0.00					2.98	
Side win	Window	[1] Cavity wall	North East	None	0.00					1.20	
Rear	Half Glazed Door	[1] Cavity wall	North West							2.14	

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

Source Type	Bridge Type	Length	Psi	Imported
Independently assessed	E1 Steel lintel with perforated steel base plate	10.43	0.358	No
Independently assessed	E3 Sill	8.39	0.015	No
Independently assessed	E4 Jamb	26.70	0.010	No
Independently assessed	E5 Ground floor (normal)	19.33	0.094	No
Independently assessed	E6 Intermediate floor within a dwelling	19.33	0.000	No
Table K1 - Approved	E10 Eaves (insulation at ceiling level)	10.15	0.060	No
Independently assessed	E12 Gable (insulation at ceiling level)	9.18	0.084	No
Independently assessed	E16 Corner (normal)	10.02	0.062	No
Independently assessed	E18 Party wall between dwellings	10.02	-0.003	No
Table K1 - Default	P1 Party wall - Ground floor	9.18	0.160	No
Table K1 - Default	P2 Party wall - Intermediate floor within a dwelling	9.18	0.000	No
Independently assessed	P4 Party wall - Roof (insulation at ceiling level)	9.18	0.041	No

Y-value 0.051 W/m²K

18.0 Pressure Testing Yes

Designed AP_{50}	5.50	$m^3/(h.m^2)$ @ 50 Pa
Property Tested ?		
As Built AP_{50}		$m^3/(h.m^2)$ @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows half open
Cross ventilation possible	Yes
Night Ventilation	No
Air change rate	4.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	No
Mechanical Ventilation data Type	Database
Type	Mechanical extract ventilation - decentralised
MV Reference Number	500229
Duct Type	Rigid

19.1 Mechanical extract ventilation - Decentralised

SFP	Fan/Room Type	Count
0.16	Through Wall Fan Kitchen	1
0.16	Through Wall Fan Other Wet Room	2

20.0 Fans, Open Fireplaces, Flues

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

21.0 Fixed Cooling System	No	

22.0 Lighting

Internal

Total number of light fittings	16	
Total number of L.E.L. fittings	16	
Percentage of L.E.L. fittings	100.00	%

External

External lights fitted	No	

23.0 Electricity Tariff	Standard	

24.0 Main Heating 1	Database	
Description	ASHP	
Percentage of Heat	100	%
Database Ref. No.	104568	
Fuel Type	Electricity	
Main Heating	PET	
SAP Code	224	

In Winter	0.0	
In Summer	0.0	
Controls	CHG Programmer, TRVs and bypass	
PCDF Controls	0	
Sap Code	2206	
Is MHS Pumped	Pump in heated space	
Heat Emitter	Radiators	
Flow Temperature	Normal (> 45°C)	
25.0 Main Heating 2	None	
Community Heating	None	
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	
Immersion Only Heating Hot Water	No	
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	170.00	L
Loss	1.23	kWh/day
Pipes insulation	Fully insulated primary pipework	
31.0 Thermal Store	None	
32.0 Photovoltaic Unit	One Dwelling	

PV Cells kWp	Orientation	Elevation	Overshading	Connected to Dwelling
1.20	South East	30°	None Or Little	Yes

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 water heating	£4,000 - £6,000	£60	A 94	

ASSESSMENT NOTES
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ASSESSMENT NOTES - Last time updated on: 15.12.2022

THERMAL BRIDGING
Calculation Type: New Build (As Designed)

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	Junction detail	Source Type	Psi (W/mK)	Length (m)	Result	Reference
External wall	E1 Steel lintel with perforated steel base plate	Independently assessed	0.358	10.43	3.73	
External wall	E3 Sill	Independently assessed	0.015	8.39	0.13	
External wall	E4 Jamb	Independently assessed	0.010	26.70	0.27	
External wall	E5 Ground floor (normal)	Independently assessed	0.094	19.33	1.82	
External wall	E6 Intermediate floor within a dwelling	Independently assessed	0.000	19.33	0.00	
External wall	E10 Eaves (insulation at ceiling level)	Table K1 - Approved	0.060	10.15	0.61	
External wall	E12 Gable (insulation at ceiling level)	Independently assessed	0.084	9.18	0.77	
External wall	E16 Corner (normal)	Independently assessed	0.062	10.02	0.62	
External wall	E18 Party wall between dwellings	Independently assessed	-0.003	10.02	-0.03	
Party wall	P1 Party wall - Ground floor	Table K1 - Default	0.160	9.18	1.47	
Party wall	P2 Party wall - Intermediate floor within a dwelling	Table K1 - Default	0.000	9.18	0.00	
Party wall	P4 Party wall - Roof (insulation at ceiling level)	Independently assessed	0.041	9.18	0.38	

Total: 9.76 **W/mK:**

Y-Value: 0.051 **W/m²K:**