

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Designed)



Property Reference	18117 Plot 110	Issued on Date	27/01/2019	
Assessment Reference	110	Prop Type Ref	Wilsford	
Property	110, Church Lane, Saxilby, Lincoln, LN1 2PE			
SAP Rating	84 B	DER	16.60	
Environmental	85 B	TER	16.68	
CO₂ Emissions (t/year)	1.99	% DER<TER	0.51	
General Requirements Compliance	Pass	DFEE	48.17	
		TFEE	56.96	
		% DFEE<TFEE	15.43	
Assessor Details	Mr. Robert Atherton, Low Carbon Box Limited, Tel: 07540977134, robert@lowcarbonbox.co.uk		Assessor ID	F291-0001
Client				

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

Criterion 1 – Achieving the TER and TFEE rate

1a TER and DER

Fuel for main heating	Mains gas		
Fuel factor	1.00 (mains gas)		
Target Carbon Dioxide Emission Rate (TER)	16.68	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	16.60	kgCO ₂ /m ²	Pass
	-0.08 (-0.5%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	56.96	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	48.17	kWh/m ² /yr	
	-8.8 (-15.4%)	kWh/m ² /yr	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.19 (max. 0.30)	0.19 (max. 0.70)	Pass
Floor	0.16 (max. 0.25)	0.16 (max. 0.70)	Pass
Roof	0.10 (max. 0.20)	0.10 (max. 0.35)	Pass
Openings	1.39 (max. 2.00)	1.50 (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	7.00 (design value)	
Maximum	10.0	Pass

Limiting System Efficiencies

4 Heating efficiency

Main heating system	Boiler system with radiators or underfloor - Mains gas Data from database Vaillant ecoFIT sustain 615 VU 156/6-3 (H-GB) Efficiency: 89.8% SEDBUK2009 Minimum: 88.0%	Pass
---------------------	---	------

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Designed)



Secondary heating system

None

5 Cylinder insulation

Hot water storage

Measured cylinder loss: 1.31 kWh/day
Permitted by DBSCG 2.10

Pass

Primary pipework insulated

Yes

Pass

6 Controls

Space heating controls

Time and temperature zone control

Pass

Hot water controls

Cylinderstat

Pass

Independent timer for DHW

Pass

Boiler interlock

Yes

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

0.0900 0.0900 0.1100

Maximum

0.7

Pass

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (East Pennines)

Not significant

Pass

Based on:

Overshading

Average

Windows facing North

10.24 m², No overhang

Windows facing East

1.43 m², No overhang

Windows facing South

10.86 m², No overhang

Windows facing West

1.43 m², No overhang

Air change rate

4.00 ach

Blinds/curtains

None

Criterion 4 – Building performance consistent with DER and DFEE rate

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals

7.00 (design value)

Maximum

10.0

Pass

10 Key features

Roof U-value

0.10

W/m²K

Door U-value

0.91

W/m²K

Thermal bridging y-value

0.037

W/m²K

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

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)



Property Reference	18117 Plot 110	Issued on Date	27/01/2019
Assessment Reference	110	Prop Type Ref	Wilsford
Property	110, Church Lane, Saxilby, Lincoln, LN1 2PE		

SAP Rating	84 B	DER	16.60	TER	16.68
Environmental	85 B	% DER<TER	0.51		
CO ₂ Emissions (t/year)	1.99	DFEE	48.17	TFEE	56.96
General Requirements Compliance	Pass	% DFEE<TFEE	15.43		

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

Client	
--------	--

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

Orientation	North
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	House, Detached
2.0 Number of Storeys	2
3.0 Date Built	2018
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:	35.43 m	64.28 m ²	2.38 m
1st Storey:	32.73 m	61.89 m ²	2.68 m

7.0 Living Area	21.96	m ²
-----------------	-------	----------------

8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	164.55	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	Cavity Wall	Other	0.19	72.24	172.04	144.02

9.2 Internal Walls

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Partition 1	Other	18.44	72.02
Internal Partition 2	Plasterboard on timber frame	9.00	155.68

10.0 External Roofs

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)	Nett Area (m ²)
External Roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.10	9.00	64.28	64.28

10.2 Internal Ceilings

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Ceiling 1	Plasterboard ceiling, carpeted chipboard floor	9.00	61.89

11.0 Heat Loss Floors

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)



Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Ground Floor - Solid	Suspended concrete floor, carpeted	0.16	75.00	64.28

11.2 Internal Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Floor 1	Plasterboard ceiling, carpeted chipboard floor	18.00	61.89

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Front Door	Manufacturer	Solid Door							1.20
Windows	Manufacturer	Window	Double Low-E Soft 0.05			0.71		0.70	1.40
HG Door	Manufacturer	Half Glazed Door	Double Low-E Soft 0.05			0.63		0.70	1.50
Garage door	Manufacturer	Door to Corridor							0.91

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] External Wall	North							2.15	
Front Windows	Window	[1] External Wall	North	None	0.00					10.24	
Rear Windows	Window	[1] External Wall	South	None	0.00					10.86	
HG door	Half Glazed Door	[1] External Wall	South							1.91	
Side win 1	Window	[1] External Wall	West	None	0.00					1.43	
Side win 2	Window	[1] External Wall	East	None	0.00					1.43	

14.0 Conservatory

15.0 Draught Proofing

 %

16.0 Draught Lobby

17.0 Thermal Bridging

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported	Reference:
Independently assessed	E1 Steel lintel with perforated steel base plate	19.05	0.224	No	Knauf
Independently assessed	E3 Sill	19.05	0.021	No	CBA-314
Independently assessed	E4 Jamb	46.80	0.017	No	CBA-315
Independently assessed	E5 Ground floor (normal)	35.43	0.067	No	CD0022
Independently assessed	E6 Intermediate floor within a dwelling	32.73	0.000	No	CD0029
Independently assessed	E10 Eaves (insulation at ceiling level)	21.18	0.046	No	Knauf
Table K1 - Default	E24 Eaves (insulation at ceiling level - inverted)	4.14	0.240	No	
Independently assessed	E12 Gable (insulation at ceiling level)	17.79	0.052	No	Knauf
Independently assessed	E16 Corner (normal)	34.82	0.046	No	CBA-316
Table K1 - Approved	E17 Corner (inverted – internal area greater than external area)	14.58	-0.090	No	ACD

Y-value W/m²K

18.0 Pressure Testing

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

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)



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	500426
Duct Type	Flexible

19.1 Mechanical extract ventilation - Decentralised

SFP	Fan/Room Type	Count
0.09	Through Wall Fan Kitchen	2
0.09	Through Wall Fan Other Wet Room	2
0.11	In Room Fan Other Wet Room	1

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				1
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	12	
Total number of L.E.L. fittings	12	
Percentage of L.E.L. fittings	100.00	%

External

External lights fitted	Yes
Light and motion sensor	Yes

23.0 Electricity Tariff

Standard

24.0 Main Heating 1

Description	Database System	
Percentage of Heat	100	%
Database Ref. No.	18403	
Fuel Type	Mains gas	
Main Heating	BGB	
SAP Code	102	
In Winter	90.8	
In Summer	80.1	
Controls	CBI Time and temperature zone control	
PCDF Controls	0	

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)



Delayed Start Stat	No
Sap Code	2110
Flue Type	Balanced
Fan Assisted Flue	Yes
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

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
Loss	1.31
Pipes insulation	Fully insulated primary pipework

L
kWh/day

31.0 Thermal Store	None
---------------------------	------

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	£43	B 86	
	Typical Cost	Typical savings per year	Ratings after improvement	
			SAP rating	Environmental Impact
Solar photovoltaic panels, 2.5 kWp	£5,000 - £8,000	£308	A 93	

ASSESSMENT NOTES

Calculation Type: New Build (As Designed)



Property Reference	18117 Plot 110	Issued on Date	27/01/2019
Assessment Reference	110	Prop Type Ref	Wilsford
Property	110, Church Lane, Saxilby, Lincoln, LN1 2PE		

SAP Rating	84 B	DER	16.60	TER	16.68
Environmental	85 B	% DER<TER	0.51		
CO ₂ Emissions (t/year)	1.99	DFEE	48.17	TFEE	56.96
General Requirements Compliance	Pass	% DFEE<TFEE	15.43		

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

Client	
--------	--

ASSESSMENT NOTES - Last time updated on: 27.01.2019

U-VALUE CALCULATOR REPORT



Property Reference	18117 Plot 110		Issued on Date	27/01/2019
Assessment Reference	110	Prop Type Ref	Wilsford	
Project	110, Church Lane, Saxilby, Lincoln, LN1 2PE			
Calculation Type	New Build (As Designed)			

SAP Rating	84 B	DER	16.60	TER	16.68
Environmental	85 B	% DER<TER	0.51		
CO ₂ Emissions (t/year)	1.99	DFEE	48.17	TREE	56.96
General Requirements Compliance	Pass	% DFEE<TFEE	15.43		

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

Building Elements

Floor 000001 - Floor - b&b

Floor Type: Suspended Floor

Area = 64.28 m², Perimeter = 35.43 m, Wall thickness = 300.00 mm, Soil: Clay

Depth of underfloor space below ground: 0.200 m Floor wind shielding: Average (suburban)

Floor height above ground: h = 0.000 m

U-value of walls above ground: U_w = 1.500 m

Ventilation openings per perimeter length: e = 0.0015 %

Mean wind speed: v = 5.000 m/s

Resistance on solum: R_g = 0.000 m²K/W

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.1700	
Layer 1	AAC (600 kg/m ³)/ concrete				
	Main construction	100	0.1800	0.5556	86.30
	Main construction	100	1.3500	0.0741	13.70
Layer 2	Jabfloor 100				
	Main construction	150	0.0360	4.1667	100.00
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 3	Screed				
	Main construction	75	1.1500	0.0652	100.00
Int surface				0.1700	

Total resistance: Upper limit = 5.056 m² K/W Lower limit = 4.866 m² K/W Average = 4.961 m² K/W

Total correction = 0.0071 m² K/W

U-value (unrounded) = 0.16 W/m² K

Unheated space: None

Total thickness:	325 mm	U-value: 0.16 W/m ² K	Kappa: n/a
------------------	--------	----------------------------------	------------

THERMAL BRIDGING

Calculation Type: New Build (As Designed)



Property Reference	18117 Plot 110		Issued on Date	27/01/2019	
Assessment Reference	110	Prop Type Ref	Wilsford		
Property	110, Church Lane, Saxilby, Lincoln, LN1 2PE				
SAP Rating	84 B	DER	16.60	TER	16.68
Environmental	85 B	% DER<TER	0.51		
CO ₂ Emissions (t/year)	1.99	DFEE	48.17	TFEE	56.96
General Requirements Compliance	Pass	% DFEE<TFEE	15.43		
Assessor Details	Mr. Robert Atherton, Low Carbon Box Limited, Tel: 07540977134, robert@lowcarbonbox.co.uk			Assessor ID	F291-0001
Client					

	Junction detail	Source Type	Psi (W/mK)	Length (m)	Result	Reference
External wall	E1 Steel lintel with perforated steel base plate	Independently assessed	0.224	19.05	4.27	Knauf
External wall	E3 Sill	Independently assessed	0.021	19.05	0.40	CBA-314
External wall	E4 Jamb	Independently assessed	0.017	46.80	0.80	CBA-315
External wall	E5 Ground floor (normal)	Independently assessed	0.067	35.43	2.37	CD0022
External wall	E6 Intermediate floor within a dwelling	Independently assessed	0.000	32.73	0.00	CD0029
External wall	E10 Eaves (insulation at ceiling level)	Independently assessed	0.046	21.18	0.97	Knauf
External wall	E24 Eaves (insulation at ceiling level - inverted)	Table K1 - Default	0.240	4.14	0.99	
External wall	E12 Gable (insulation at ceiling level)	Independently assessed	0.052	17.79	0.93	Knauf
External wall	E16 Corner (normal)	Independently assessed	0.046	34.82	1.60	CBA-316
External wall	E17 Corner (inverted – internal area greater than external area)	Table K1 - Approved	-0.090	14.58	-1.31	ACD

Total: **11.02** W/mK:
 Y-Value: **0.037** W/m²K: