

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Designed)



Property Reference	18117 Plot 114	Issued on Date	27/01/2019	
Assessment Reference	114	Prop Type Ref	Westhorpe	
Property	114, Church Lane, Saxilby, Lincoln, LN1 2PE			
SAP Rating	85 B	DER	15.87	
Environmental	84 B	TER	15.86	
CO₂ Emissions (t/year)	2.92	% DER<TER	-0.05	
General Requirements Compliance	Fail	DFEE	54.40	
		TFEE	61.88	
		% DFEE<TFEE	12.10	
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)	15.86	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	15.87	kgCO ₂ /m ²	
Excess emissions	0.01 (0.1%)	kgCO ₂ /m ²	Fail

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	61.88	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	54.40	kWh/m ² /yr	
	-7.5 (-12.1%)	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)	0.22 (max. 0.70)	Pass
Floor	0.18 (max. 0.25)	0.21 (max. 0.70)	Pass
Roof	0.12 (max. 0.20)	0.16 (max. 0.35)	Pass
Openings	1.39 (max. 2.00)	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	4.90 (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
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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

18.66 m², No overhang

Windows facing East

5.75 m², No overhang

Windows facing South

5.68 m², No overhang

Windows facing West

4.90 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

4.90 (design value)

Maximum

10.0

Pass

10 Key features

Roof U-value

0.11

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.

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

Orientation	South
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:	41.47 m	83.62 m ²	2.38 m
1st Storey:	51.41 m	111.54 m ²	2.56 m

7.0 Living Area	22.04	m ²
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8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	203.71	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	222.42	181.69
Dormer walls	Timber Frame	Timber framed wall (one layer of plasterboard)	0.22	9.00	0.88	0.88

9.2 Internal Walls

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Partition 1	Other	132.15	107.34
Internal Partition 2	Plasterboard on timber frame	9.00	176.30

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 1	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	101.03	101.03
Sloping roof	External Slope Roof	Plasterboard, insulated slope	0.16	9.00	15.10	14.16
Bay roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.16	9.00	4.14	4.14

10.2 Internal Ceilings

SUMMARY FOR INPUT DATA

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Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Ceiling 1	Plasterboard ceiling, carpeted chipboard floor	9.00	79.62

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)
Ground Floor	Ground Floor - Solid	Suspended concrete floor, carpeted	0.17	75.00	83.62
Exposed floor	Exposed Floor - Timber	Timber exposed floor, insulation between joists	0.21	20.00	31.92

11.2 Internal Floors

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Floor 1	Plasterboard ceiling, carpeted chipboard floor	18.00	79.62

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)
Front Door	Manufacturer	Solid Door							1.20
Windows	Manufacturer	Window	Double Low-E Soft 0.1			0.71		0.70	1.40
HG Door	Manufacturer	Half Glazed Door	Double Low-E Soft 0.1			0.71		0.70	1.50
Garage door	Manufacturer	Door to Corridor							1.60
Rooflights	Manufacturer	Roof Window	Double Low-E Soft 0.05			0.63		0.70	1.35
Front HG door	Manufacturer	Half Glazed Door	Double Low-E Soft 0.05			0.63		0.70	1.20

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 Door	Solid Door	[1] External Wall	South							1.95	
Front Windows	Window	[1] External Wall	South	None	0.00					5.68	
Rear windows	Window	[1] External Wall	North	None	0.00					18.66	
Garage door	Door to Corridor	[1] External Wall	South							1.88	
west win	Window	[1] External Wall	West	None	0.00					4.90	
Rooflights	Roof Window	[2] Sloping roof	West	None						0.94	
Front door 2	Half Glazed Door	[1] External Wall	West							1.91	
east win	Window	[1] External Wall	East	None	0.00					5.75	

14.0 Conservatory

15.0 Draught Proofing

%

16.0 Draught Lobby

17.0 Thermal Bridging

17.1 List of Bridges

SUMMARY FOR INPUT DATA

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Source Type	Bridge Type	Length	Psi	Imported	Reference:
Independently assessed	E1 Steel lintel with perforated steel base plate	28.21	0.358	No	CBA-312
Independently assessed	E3 Sill	28.21	0.020	No	CBA-314
Independently assessed	E4 Jamb	64.53	0.016	No	CBA-315
Independently assessed	E5 Ground floor (normal)	41.47	0.094	No	CBA-301
Table K1 - Default	E20 Exposed floor (normal)	17.41	0.320	No	
Table K1 - Default	E21 Exposed floor (inverted)	5.25	0.320	No	
Independently assessed	E6 Intermediate floor within a dwelling	34.00	0.000	No	CBA-303
Table K1 - Approved	E10 Eaves (insulation at ceiling level)	28.03	0.060	No	ACD
Table K1 - Default	E24 Eaves (insulation at ceiling level - inverted)	3.68	0.240	No	
Independently assessed	E11 Eaves (insulation at rafter level)	10.34	0.007	No	
Independently assessed	E12 Gable (insulation at ceiling level)	17.11	0.077	No	CBA-310
Table K1 - Approved	E13 Gable (insulation at rafter level)	2.76	0.040	No	
Independently assessed	E16 Corner (normal)	25.15	0.051	No	CBA-316
Table K1 - Approved	E17 Corner (inverted – internal area greater than external area)	7.45	-0.090	No	ACD
Table K1 - Default	R1 Head of roof window	1.20	0.080	No	
Table K1 - Default	R2 Sill of roof window	1.20	0.060	No	
Table K1 - Default	R3 Jamb of roof window	3.12	0.080	No	
Table K1 - Default	R6 Flat ceiling	12.16	0.060	No	
Table K1 - Default	R7 Flat ceiling (inverted)	1.82	0.040	No	
Table K1 - Default	R9 Roof to wall (flat ceiling)	4.34	0.040	No	

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
 Night Ventilation
 Air change rate

Mechanical Ventilation

Mechanical Ventilation System Present
 Approved Installation
 Mechanical Ventilation data Type
 Type
 MV Reference Number
 Duct Type

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	3
0.11	In Room Fan Other Wet Room	1

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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	25	
Total number of L.E.L. fittings	25	
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

	Database	
Description	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	
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	No

SUMMARY FOR INPUT DATA

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Storage System	
Solar Panel	No
Water use <= 125 litres/person/day	Yes
SAP Code	901
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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
<hr/>	
31.0 Thermal Store	None
<hr/>	

L
kWh/day

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	£5,000 - £8,000	£308	B 91	

ASSESSMENT NOTES

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ASSESSMENT NOTES - Last time updated on: 27.01.2019

U-VALUE CALCULATOR REPORT



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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 (%)	Density (kg/m ³)	Heat Cap. (J/kgK)
Ext surface				0.0400			
Layer 1	Brick, outer leaf						
	Main construction	102.5	0.7700	0.1331	82.81	1300	840
	Main construction	102.5	0.9407	0.1090	17.19	1300	840
Layer 2	Earthwool Dritherm 34 Super						
	Main construction	150	0.0340	4.4118	100.00		
	Corrections - Air Gap: Level 0, Fasteners: None or plastic						
Layer 3	Aglite 7.3N						
	Main construction	100	0.3100	0.3226	93.43	1050	840
	Main construction	100	0.8803	0.1136	6.57	1050	840
Layer 4	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 5	Gyproc Wallboard (12.5mm)						
	Main construction	12.5	0.1900	0.0658	100.00	800	840
	Corrections - Air Gap: Level 1, Fasteners: None or plastic						
Int surface				0.1300			

Total resistance: Upper limit = 5.255 m² K/W Lower limit = 5.234 m² K/W Average = 5.244 m² K/W
 Total correction = 0.0000 m² K/W U-value (unrounded) = 0.19 W/m² K

Unheated space:	None		
Total thickness:	380 mm	U-value: 0.19 W/m² K	Kappa: 72.24 kJ/m² K

THERMAL BRIDGING

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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	28.21	10.10	CBA-312
External wall	E3 Sill	Independently assessed	0.020	28.21	0.56	CBA-314
External wall	E4 Jamb	Independently assessed	0.016	64.53	1.03	CBA-315
External wall	E5 Ground floor (normal)	Independently assessed	0.094	41.47	3.90	CBA-301
External wall	E20 Exposed floor (normal)	Table K1 - Default	0.320	17.41	5.57	
External wall	E21 Exposed floor (inverted)	Table K1 - Default	0.320	5.25	1.68	
External wall	E6 Intermediate floor within a dwelling	Independently assessed	0.000	34.00	0.00	CBA-303
External wall	E10 Eaves (insulation at ceiling level)	Table K1 - Approved	0.060	28.03	1.68	ACD
External wall	E24 Eaves (insulation at ceiling level - inverted)	Table K1 - Default	0.240	3.68	0.88	
External wall	E11 Eaves (insulation at rafter level)	Independently assessed	0.007	10.34	0.07	
External wall	E12 Gable (insulation at ceiling level)	Independently assessed	0.077	17.11	1.32	CBA-310
External wall	E13 Gable (insulation at rafter level)	Table K1 - Approved	0.040	2.76	0.11	
External wall	E16 Corner (normal)	Independently assessed	0.051	25.15	1.28	CBA-316
External wall	E17 Corner (inverted – internal area greater than external area)	Table K1 - Approved	-0.090	7.45	-0.67	ACD
External roof	R1 Head of roof window	Table K1 - Default	0.080	1.20	0.10	
External roof	R2 Sill of roof window	Table K1 - Default	0.060	1.20	0.07	
External roof	R3 Jamb of roof window	Table K1 - Default	0.080	3.12	0.25	
External roof	R6 Flat ceiling	Table K1 - Default	0.060	12.16	0.73	
External roof	R7 Flat ceiling (inverted)	Table K1 - Default	0.040	1.82	0.07	
External roof	R9 Roof to wall (flat ceiling)	Table K1 - Default	0.040	4.34	0.17	

Total: **28.92** W/mK:
 Y-Value: **0.063** W/m²K: