

BUILDING REGULATION COMPLIANCE

Calculation Type: New Build (As Designed)



Property Reference	17102 Plot 190	Issued on Date	07/02/2018
Survey Reference	190	Prop Type Ref	2B4P end G12
Property	190, Graven Hill, Bicester, OX26		

SAP Rating	85 B	DER	14.74	TER	18.06
Environmental	88 B	% DER<TER	18.40		
CO ₂ Emissions (t/year)	1.05	DFEE	38.46	TFEE	50.43
General Requirements Compliance	Pass	% DFEE<TFEE	23.73		

Surveyor	Robert Atherton, Tel: 01858 441502	Surveyor ID	F291-0001
Client	Sylva Group, Sylva		

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)	18.06	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	14.74	kgCO ₂ /m ²	Pass
	-3.32 (-18.4%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	50.43	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	38.46	kWh/m ² /yr	
	-11.9 (-23.6%)	kWh/m ² /yr	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.13 (max. 0.30)	0.15 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Floor	0.11 (max. 0.25)	0.11 (max. 0.70)	Pass
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	Pass
Openings	1.40 (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	3.00 (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 Worcester Greenstar 25Si Compact ErP Combi boiler Efficiency: 89.8% SEDBUK2009 Minimum: 88.0%	Pass
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Secondary heating system

None

5 Cylinder insulation

Hot water storage

No cylinder

6 Controls

Space heating controls

Programmer, room thermostat and TRVs 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

Continuous supply and extract system

Specific fan power

0.57

Maximum

1.5 Pass

MVHR efficiency

94 %

Minimum

70 % Pass

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (Thames Valley)

Medium Pass

Based on:

Overshading

Average

Windows facing North

4.67 m², No overhang

Windows facing South

9.58 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

3.00 (design value)

Maximum

10.0 Pass

10 Key features

External wall U-value

0.13 W/m²K

Party wall U-value

0.00 W/m²K

Floor U-value

0.11 W/m²K

Air permeability

3.0 m³/m²h

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Orientation	North
Property Tenure	Owner-occupied
Transaction Type	New dwelling
1.0 Property Type	House, End-Terrace
2.0 Number of Storeys	2
3.0 Date Built	2017
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:	20.64 m	40.24 m ²	2.35 m
1st Storey:	20.64 m	40.24 m ²	2.64 m

7.0 Living Area m²

8.0 Thermal Mass Parameter
 Thermal Mass
 kJ/m²K

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	Timber Frame	Timber framed wall (one layer of plasterboard)	0.13	9.00	102.99	86.70
Above party wall	Timber Frame	Timber framed wall (one layer of plasterboard)	0.15	9.00	1.35	1.35

9.1 Party Walls

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)
Party Wall 1	Filled Cavity with Edge Sealing	Double plasterboard on both sides, twin timber f rame with/without sheathing board	0.00	20.00	43.46

9.2 Internal Walls

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Wall 1	Plasterboard on timber frame	9.00	138.25

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)
Ceiling roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.13	9.00	40.24	40.24

10.2 Internal Ceilings

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Ceiling 1	Plasterboard ceiling, carpeted chipboard floor	9.00	40.24

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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	Slab on ground, screed over insulation	0.11	110.00	40.24

11.2 Internal Floors

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Floor 1	Plasterboard ceiling, carpeted chipboard floor	18.00	40.24

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	Solar Trans	Frame Type	Frame Factor	U Value (W/m ² K)
Windows	Manufacturer	Window	Double Low-E Soft	0.05		0.63		0.70	1.40
Solid door	Manufacturer	Solid Door							1.40
Rooflights	Manufacturer	Roof Window	Double Low-E Soft	0.05		0.63		0.70	1.40
HG door	Manufacturer	Half Glazed Door	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 (m ²)	Curtain Closed
Front door	Solid Door	[1] External Wall 1	North							2.04	
Fr win	Window	[1] External Wall 1	North	None	0.00					4.67	
Rear win	Window	[1] External Wall 1	South	None	0.00					9.58	

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
Independently assessed	E2 Other lintels (including other steel lintels)	9.87	0.094	No
Table K1 - Approved	E3 Sill	9.87	0.040	No
Table K1 - Approved	E4 Jamb	21.30	0.050	No
Independently assessed	E5 Ground floor (normal)	20.64	0.110	No
Independently assessed	E6 Intermediate floor within a dwelling	20.64	0.016	No
Table K1 - Approved	E10 Eaves (insulation at ceiling level)	11.66	0.060	No
Independently assessed	E12 Gable (insulation at ceiling level)	17.96	0.045	No
Independently assessed	E16 Corner (normal)	9.98	0.053	No
Independently assessed	E18 Party wall between dwellings	9.98	0.028	No
Independently assessed	P1 Party wall - Ground floor	8.98	0.120	No
Table K1 - Default	P2 Party wall - Intermediate floor within a dwelling	8.98	0.000	No

Y-value W/m²K

18.0 Pressure Testing

Designed q50

Designed q50 m³/m²/hr @ 50 Pa

Property Tested ?

As Built q50 m³/m²/hr @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather

Cross ventilation possible

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Night Ventilation
 Air change rate

Mechanical Ventilation

Mechanical Ventilation System Present
 Approved Installation
 Mechanical Ventilation data Type
 Type
 MV Reference Number
 Configuration
 MVHR Duct Insulated
 Manufacturer SFP
 Duct Type
 MVHR Efficiency
 Wet Rooms

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

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

Description
 Percentage of Heat %
 Database Ref. No.
 Fuel Type
 Main Heating
 SAP Code
 In Winter
 In Summer
 Controls
 PCDF Controls
 Delayed Start Stat
 Sap Code
 Flue Type
 Fan Assisted Flue
 Is MHS Pumped

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Heat Emitter	<input type="text" value="Radiators"/>
Flow Temperature	<input type="text" value="Normal (> 45°C)"/>
Combi boiler type	<input type="text" value="Standard Combi"/>
Combi keep hot type	<input type="text" value="Gas/Oil, time clock"/>
25.0 Main Heating 2	<input type="text" value="None"/>
Community Heating	<input type="text" value="None"/>
28.0 Water Heating	<input type="text" value="HWP From main heating 1"/>
Water Heating	<input type="text" value="Main Heating 1"/>
Flue Gas Heat Recovery System	<input type="text" value="No"/>
Waste Water Heat Recovery Instantaneous System 1	<input type="text" value="No"/>
Waste Water Heat Recovery Instantaneous System 2	<input type="text" value="No"/>
Waste Water Heat Recovery Storage System	<input type="text" value="No"/>
Solar Panel	<input type="text" value="No"/>
Water use <= 125 litres/person/day	<input type="text" value="Yes"/>
SAP Code	<input type="text" value="901"/>
29.0 Hot Water Cylinder	<input type="text" value="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	£32	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	£297	A 97	

SURVEY NOTES

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SURVEY NOTES - Last time updated on: 07.02.2018					

U-VALUE CALCULATOR REPORT



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Building Elements

Floor 000008 - Floor - suspended beam-and-block floor

Floor Type: Suspended Floor

Area = 40.24 m², Perimeter = 20.64 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	0.3000	0.3333	86.30
	Main construction	100	1.3500	0.0741	13.70
Layer 2	Xtratherm XT/UF Under Floor Board				
	Main construction	150	0.0220	6.8182	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 = 7.520 m² K/W Lower limit = 7.449 m² K/W Average = 7.484 m² K/W

Total correction = 0.0083 m² K/W

U-value (unrounded) = 0.11 W/m² K

Unheated space: None

Total thickness: 325 mm

U-value: 0.11 W/m² K

Kappa: n/a

THERMAL BRIDGING

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Surveyor	Robert Atherton, Tel: 01858 441502	Surveyor ID	F291-0001
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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	0.094	9.87	0.93	
External wall	E3 Sill	Table K1 - Approved	0.040	9.87	0.39	
External wall	E4 Jamb	Table K1 - Approved	0.050	21.30	1.07	
External wall	E5 Ground floor (normal)	Independently assessed	0.110	20.64	2.27	
External wall	E6 Intermediate floor within a dwelling	Independently assessed	0.016	20.64	0.33	
External wall	E10 Eaves (insulation at ceiling level)	Table K1 - Approved	0.060	11.66	0.70	
External wall	E12 Gable (insulation at ceiling level)	Independently assessed	0.045	17.96	0.81	
External wall	E16 Corner (normal)	Independently assessed	0.053	9.98	0.53	002410v1
External wall	E18 Party wall between dwellings	Independently assessed	0.028	9.98	0.28	002412v1
Party wall	P1 Party wall - Ground floor	Independently assessed	0.120	8.98	1.08	
Party wall	P2 Party wall - Intermediate floor within a dwelling	Table K1 - Default	0.000	8.98	0.00	

Total: **8.38** W/mK:
Y-Value: **0.045** W/m²K: