

# BUILDING REGULATION COMPLIANCE

## Calculation Type: New Build (As Designed)



Property Reference	17102 Plot 189		Issued on Date	07/02/2018	
Survey Reference	189	Prop Type Ref	2B4P mid G12		
Property	189, Graven Hill, Bicester, OX26				
SAP Rating	86 B	DER	13.43	TER	16.68
Environmental	89 B	% DER<TER	19.50		
CO <sub>2</sub> Emissions (t/year)	0.96	DFEE	33.75	TFEE	43.22
General Requirements Compliance	Pass	% DFEE<TFEE	21.92		
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)	16.68	kgCO <sub>2</sub> /m <sup>2</sup>	
Dwelling Carbon Dioxide Emission Rate (DER)	13.43	kgCO <sub>2</sub> /m <sup>2</sup>	Pass
	-3.25 (-19.5%)	kgCO <sub>2</sub> /m <sup>2</sup>	

##### 1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	43.22	kWh/m <sup>2</sup> /yr	
Dwelling Fabric Energy Efficiency (DFEE)	33.75	kWh/m <sup>2</sup> /yr	
	-9.4 (-21.8%)	kWh/m <sup>2</sup> /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 m<sup>2</sup>, No overhang

Windows facing South

9.58 m<sup>2</sup>, 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/m<sup>2</sup>K

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/m<sup>2</sup>K

Party wall U-value

0.00

W/m<sup>2</sup>K

Floor U-value

0.11

W/m<sup>2</sup>K

Air permeability

3.0

m<sup>3</sup>/m<sup>2</sup>h

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

Orientation	North
Property Tenure	Owner-occupied
Transaction Type	New dwelling
1.0 Property Type	House, Mid-Terrace
2.0 Number of Storeys	2
3.0 Date Built	2017
4.0 Sheltered Sides	4
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 <sup>2</sup>	2.35 m
1st Storey:	11.66 m	40.24 m <sup>2</sup>	2.64 m

7.0 Living Area  m<sup>2</sup>

8.0 Thermal Mass Parameter  
Thermal Mass   
 kJ/m<sup>2</sup>K

#### 9.0 External Walls

Description	Type	Construction	U-Value (W/m <sup>2</sup> K)	Kappa (kJ/m <sup>2</sup> K)	Gross Area (m <sup>2</sup> )	Nett Area (m <sup>2</sup> )
External Wall 1	Timber Frame	Timber framed wall (one layer of plasterboard)	0.13	9.00	58.18	41.89
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 <sup>2</sup> K)	Kappa (kJ/m <sup>2</sup> K)	Area (m <sup>2</sup> )
Party Wall 1	Filled Cavity with Edge Sealing	Double plasterboard on both sides, twin timber frame with/without sheathing board	0.00	20.00	88.27

#### 9.2 Internal Walls

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

#### 10.0 External Roofs

Description	Type	Construction	U-Value (W/m <sup>2</sup> K)	Kappa (kJ/m <sup>2</sup> K)	Gross Area (m <sup>2</sup> )	Nett Area (m <sup>2</sup> )
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 <sup>2</sup> K)	Area (m <sup>2</sup> )
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 <sup>2</sup> K)	Kappa (kJ/m <sup>2</sup> K)	Area (m <sup>2</sup> )
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 <sup>2</sup> K)	Area (m <sup>2</sup> )
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 <sup>2</sup> 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 <sup>2</sup> )	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	11.66	0.016	No
Independently assessed	E10 Eaves (insulation at ceiling level)	11.66	0.038	No
Independently assessed	E18 Party wall between dwellings	19.96	0.028	No
Independently assessed	P1 Party wall - Ground floor	8.96	0.120	No
Table K1 - Default	P2 Party wall - Intermediate floor within a dwelling	17.96	0.000	No
Independently assessed	P4 Party wall - Roof (insulation at ceiling level)	17.96	0.039	No

Y-value  W/m<sup>2</sup>K

### 18.0 Pressure Testing

Designed q50  m<sup>3</sup>/m<sup>2</sup>/hr @ 50 Pa

Property Tested ?

As Built q50  m<sup>3</sup>/m<sup>2</sup>/hr @ 50 Pa

### 19.0 Mechanical Ventilation

#### Summer Overheating

Windows open in hot weather

Cross ventilation possible

Night Ventilation

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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

Heat Emitter

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Flow Temperature	Normal (> 45°C)
Combi boiler type	Standard Combi
Combi keep hot type	Gas/Oil, time clock
<b>25.0 Main Heating 2</b>	None
Community Heating	None
<b>28.0 Water Heating</b>	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
<b>29.0 Hot Water Cylinder</b>	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 87	
	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 98	

# SURVEY NOTES

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<b>SURVEY NOTES - Last time updated on: 07.02.2018</b>					

# 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 m<sup>2</sup>, 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<sub>w</sub> = 1.500 m  
 Ventilation openings per perimeter length: e = 0.0015 %  
 Mean wind speed: v = 5.000 m/s  
 Resistance on solum: R<sub>g</sub> = 0.000 m<sup>2</sup>K/W

Layer	Description	Thickness (mm)	Conductivity (W/m <sup>2</sup> K)	Resistance (m <sup>2</sup> K/W)	Fraction (%)
Ext surface				0.1700	
Layer 1	AAC (600 kg/m <sup>3</sup> )/ 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 m<sup>2</sup> K/W Lower limit = 7.449 m<sup>2</sup> K/W Average = 7.484 m<sup>2</sup> K/W  
 Total correction = 0.0083 m<sup>2</sup> K/W U-value (unrounded) = 0.11 W/m<sup>2</sup> K

Unheated space:	None		
Total thickness:	325 mm	U-value: 0.11 W/m <sup>2</sup> K	Kappa: n/a



# THERMAL BRIDGING

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CO <sub>2</sub> Emissions (t/year)	0.96	DFEE	33.75	TFEE	43.22
General Requirements Compliance	Pass	% DFEE<TFEE	21.92		

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

	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	11.66	0.19	
External wall	E10 Eaves (insulation at ceiling level)	Independently assessed	0.038	11.66	0.44	
External wall	E18 Party wall between dwellings	Independently assessed	0.028	19.96	0.56	
Party wall	P1 Party wall - Ground floor	Independently assessed	0.120	8.96	1.08	
Party wall	P2 Party wall - Intermediate floor within a dwelling	Table K1 - Default	0.000	17.96	0.00	
Party wall	P4 Party wall - Roof (insulation at ceiling level)	Independently assessed	0.039	17.96	0.70	

Total:  W/mK:  
 Y-Value:  W/m<sup>2</sup>K: