

# Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Array SAP 10 program, Array

Date: Mon 26 Feb 2024 16:09:52

Project Information			
Assessed By	James Blackburn	Building Type	House, Detached
OCDEA Registration	EES/019233	Assessment Date	2024-02-26

Dwelling Details			
Assessment Type	As designed	Total Floor Area	476 m <sup>2</sup>
Site Reference	Hazeldown	Plot Reference	Hazeldown with PV
Address	Hazeldown Church Lane, Chilcomb, SO21 1HR		

Client Details	
Name	Mr A Forboyce
Company	c/o Pro Vision
Address	The Lodge , Highcroft Road, Winchester, SQ22 5GU

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate			
Fuel for main heating system	Electricity		
Target carbon dioxide emission rate	6.19 kgCO <sub>2</sub> /m <sup>2</sup>		
Dwelling carbon dioxide emission rate	1.82 kgCO <sub>2</sub> /m <sup>2</sup>		OK
1b Target primary energy rate and dwelling primary energy			
Target primary energy	32.7 kWh <sub>PE</sub> /m <sup>2</sup>		
Dwelling primary energy	19.93 kWh <sub>PE</sub> /m <sup>2</sup>		OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	31.8 kWh/m <sup>2</sup>		
Dwelling fabric energy efficiency	28.6 kWh/m <sup>2</sup>		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m <sup>2</sup> K]	Dwelling average U-Value [W/m <sup>2</sup> K]	Element with highest individual U-Value	
External walls	0.26	0.15	Walls (1) (0.15)	OK
Party walls	0.2	N/A	N/A	N/A
Curtain walls	1.6	N/A	N/A	N/A
Floors	0.18	0.13	Heatloss Floor 1 (0.13)	OK
Roofs	0.16	0.11	Roof (1) (0.11)	OK
Windows, doors, and roof windows	1.6	0.81	door (1)	OK
Rooflights	2.2	N/A	N/A	N/A

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))			
Name	Net area [m <sup>2</sup> ]	U-Value [W/m <sup>2</sup> K]	
Exposed wall: Walls (1)	197.92	0.15	
Exposed wall: Walls (2)	109	0.15	
Basement floor: Heatloss Floor 1, Heatloss Floor 1	161.28	0.13	
Exposed roof: Roof (1)	161.28	0.11	

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m <sup>2</sup> ]	Orientation	Frame factor	U-Value [W/m <sup>2</sup> K]
door, Solid door	2.1	West	N/A	1 (!)
west , window	13.2	West	0.7	0.8 (!)
East , window	12.44	East	0.7	0.8 (!)
North, window	4.62	North	0.7	0.8 (!)
South, window	14.52	South	0.7	0.8 (!)

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part 1 - Main Dwelling: Thermal bridging calculated from linear thermal transmittances for each junction				
Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.03 (!)	

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E3: Sill	Calculated by person with suitable expertise	0.03 (!)	
External wall	E4: Jamb	Calculated by person with suitable expertise	0.06	
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.04	

### 3 Air permeability (better than typically expected values are flagged with a subsequent (!))

Maximum permitted air permeability at 50Pa	8 m <sup>3</sup> /hm <sup>2</sup>	
Dwelling air permeability at 50Pa	5 m <sup>3</sup> /hm <sup>2</sup> , Design value	OK
Air permeability test certificate reference		

### 4 Space heating

<b>Main heating system 1:</b> Heat pump with radiators or underfloor heating - Electricity	
Efficiency	278.6%
Emitter type	Underfloor
Flow temperature	45°C
System type	Heat Pump
Manufacturer	Vaillant Group UK Ltd
Model	aroTHERM 10kW
Commissioning	
<b>Secondary heating system:</b> Closed room heater	
Fuel	Wood logs
Efficiency	60.0%
Commissioning	

### 5 Hot water

<b>Cylinder/store</b> - type: Cylinder	
Capacity	150 litres
Declared heat loss	1.8 kWh/day
Primary pipework insulated	Yes
Manufacturer	
Model	
Commissioning	
<b>Waste water heat recovery system 1</b> - type: N/A	
Efficiency	
Manufacturer	
Model	

### 6 Controls

<b>Main heating 1</b> - type: Time and temperature zone control by device in PCDB	
Function	
Ecodesign class	
Manufacturer	
Model	
<b>Water heating</b> - type: Cylinder thermostat and HW separately timed	
Manufacturer	
Model	

### 7 Lighting

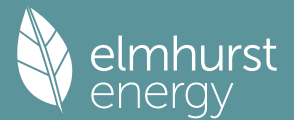
Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	110 lm/W	OK
External lights control	N/A	

### 8 Mechanical ventilation

<b>System type:</b> N/A		
Maximum permitted specific fan power	N/A	
Specific fan power	N/A	N/A
Minimum permitted heat recovery efficiency	N/A	
Heat recovery efficiency	N/A	N/A
Manufacturer/Model		
Commissioning		

9 Local generation	
Technology type: <b>Photovoltaic system (1)</b>	
Peak power	3.8 kWp
Orientation	West
Pitch	30°
Overshading	0.8 (overshading factor calculated according to MCS)
Manufacturer	
MCS certificate	
10 Heat networks	
N/A	
11 Supporting documentary evidence	
N/A	
12 Declarations	
a. Assessor Declaration	
This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.	
Signed:	Assessor ID:
Name:	Date:
b. Client Declaration	
N/A	

# Predicted Energy Assessment



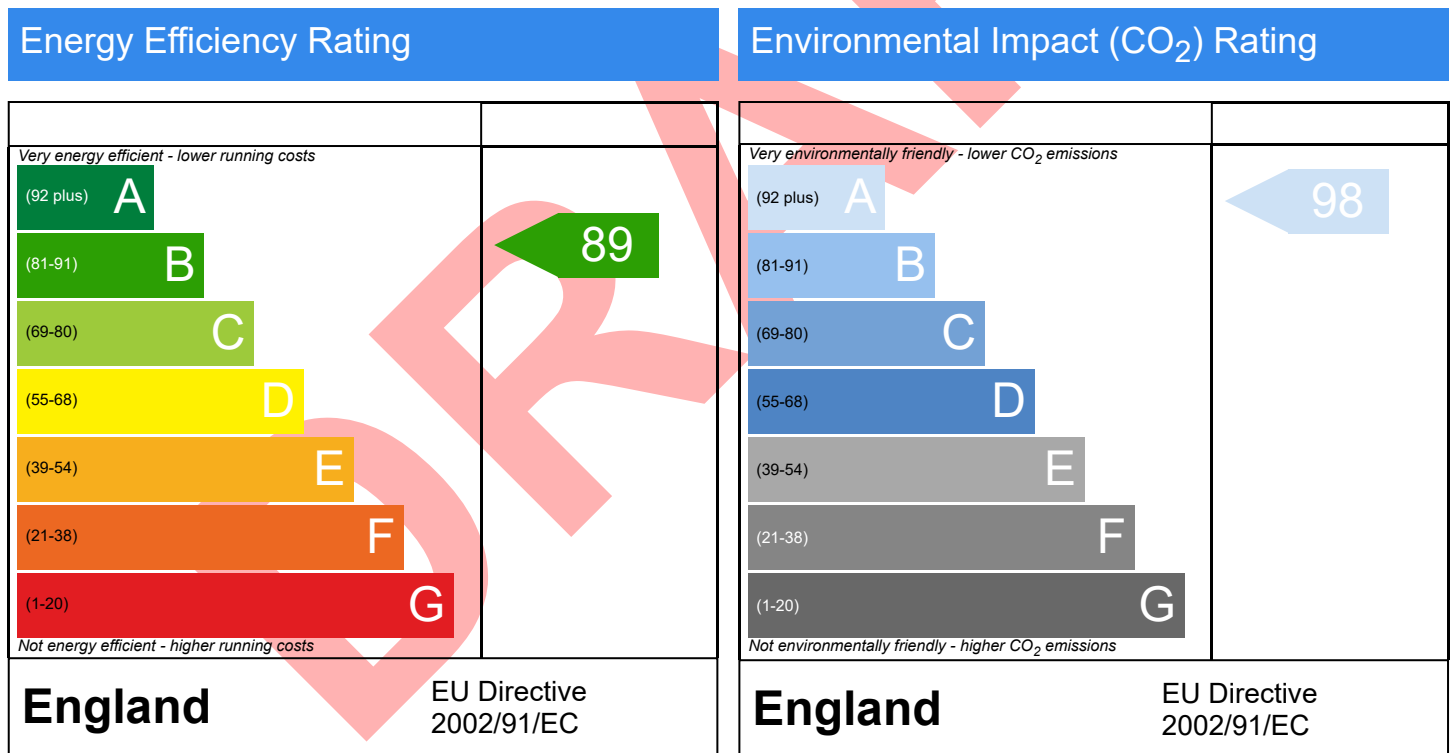
Hazeldown, Church Lane , Chilcomb, Hampshire, SO21 1HR

Dwelling type:  
Date of assessment:  
Produced by:  
Total floor area:  
DRRN:

House, Detached  
26/02/2024  
James Blackburn  
476.36 m<sup>2</sup>

This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

The energy performance has been assessed using the Government approved SAP 10 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO<sub>2</sub>) emissions.



The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.

The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO<sub>2</sub>) emissions. The higher the rating the less impact it has on the environment.

# Summary for Input Data



Property Reference	Hazeldown	Issued on Date	26/02/2024
Assessment Reference	Hazeldown with PV	Prop Type Ref	Hazeldown
Property	Hazeldown, Church Lane , Chilcomb, Hampshire, SO21 1HR		

SAP Rating	89 B	DER	1.82	TER	6.19
Environmental	98 A	% DER < TER			70.60
CO <sub>2</sub> Emissions (t/year)	0.7	DFEE	28.57	TFEE	31.79
Compliance Check	See BREL	% DFEE < TFEE			10.14
% DPER < TPER	39.06	DPER	19.93	TPER	32.70

Assessor Details	Mr. James Blackburn	Assessor ID	G932-0001
Client	Hazeldown, Mr A Forboyce		

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

Orientation	West
Property Tenture	1
Transaction Type	6
Terrain Type	Suburban
1.0 Property Type	House, Detached
2.0 Number of Storeys	3
3.0 Date Built	2024
4.0 Sheltered Sides	0
5.0 Sunlight/Shade	Average or unknown
6.0 Thermal Mass Parameter	Precise calculation

7.0 Electricity Tariff	Standard
Smart electricity meter fitted	Yes
Smart gas meter fitted	Yes

7.0 Measurements	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Basement:	50.80 m	153.80 m <sup>2</sup>	2.20 m
Ground floor:	50.80 m	161.28 m <sup>2</sup>	2.56 m
1st Storey:	50.80 m	161.28 m <sup>2</sup>	2.26 m

8.0 Living Area	78.20	m <sup>2</sup>
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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> )	Shelter Res	Shelter	Openings	Area Calculation Type
External Wall 1	Cavity Wall	Cavity wall; plasterboard on dabs or battens, lightweight aggregate block, filled cavity, any outside structure	0.15	110.00	244.80	197.92	0.00	None	46.88	Enter Gross Area	
Basement wall	Cavity Wall	Cavity wall : dense plaster, AAC block, filled cavity, any outside structure	0.15	70.00	109.00	109.00	0.00	None	0.00	Enter Gross Area	

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	436.40	

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> )	Shelter Code	Shelter Factor	Calculation Type	Openings
External Roof 1	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	161.28	161.28	None	0.00	Enter Gross Area	0.00	

10.2 Internal Ceilings	Description	Storey	Construction	Area (m <sup>2</sup> )
Internal Ceiling 1	Lowest occupied	Plasterboard ceiling, carpeted chipboard floor	161.28	

11.0 Heat Loss Floors	Description	Type	Storey Index	Construction	U-Value (W/m <sup>2</sup> K)	Shelter Code	Shelter Factor	Kappa (kJ/m <sup>2</sup> K)	Area (m <sup>2</sup> )
Heatloss Floor 1	Basement Floor	Lowest occupied	Slab on ground, screed over insulation	0.13	None	0.00	110.00	161.28	

## 12.0 Opening Types

# Summary for Input Data



Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Solid door window	Manufacturer Manufacturer	Solid Door Window	Triple Low-E Soft 0.05			0.57		0.70	1.00 0.80

## 13.0 Openings

Name	Opening Type	Location	Orientation	Area (m²)	Pitch
door	Solid door	External Wall 1	West	2.10	
west window	Window	External Wall 1	West	13.20	
East window	Window	External Wall 1	East	12.44	
North window	Window	External Wall 1	North	4.62	
South window	Window	External Wall 1	South	14.52	

## 14.0 Conservatory

## 15.0 Draught Proofing

 %

## 16.0 Draught Lobby

## 17.0 Thermal Bridging

### 17.1 List of Bridges

Bridge Type	Source Type	Length	Psi	Adjusted Reference:	Imported
E2 Other lintels (including other steel lintels)	Independently assessed	28.00	0.03	0.03	No
E3 Sill	Independently assessed	21.13	0.03	0.03	No
E4 Jamb	Independently assessed	71.96	0.06	0.06	No
E5 Ground floor (normal)	Independently assessed	50.80	0.04	0.04	No

Y-value  W/m²K

## 18.0 Pressure Testing

Designed AP<sub>50</sub>  m²/(h.m²) @ 50 Pa

Test Method

## 19.0 Mechanical Ventilation

### Mechanical Ventilation

Mechanical Ventilation System Present

## 20.0 Fans, Open Fireplaces, Flues

## 21.0 Fixed Cooling System

## 22.0 Lighting

No Fixed Lighting

Name	Efficacy	Power	Capacity	Count
Lighting 1	110.00	9	990	20

## 24.0 Main Heating 1

Percentage of Heat  %

Database Ref. No.

Fuel Type

In Winter

In Summer

Model Name

Manufacturer

System Type

Controls SAP Code

Is MHS Pumped

Heating Pump Age

Heat Emitter

Underfloor Heating

Flow Temperature

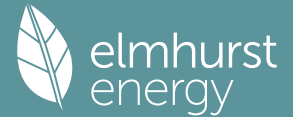
Flow Temperature Value

## 25.0 Main Heating 2

## 26.0 Heat Networks

## 27.0 Secondary Heating

# Summary for Input Data



Secondary Heating	SAP table	
SAP Code	633	
SHS efficiency	60.00	%
HETAS Approved System	No	

## 28.0 Water Heating

Water Heating	Main Heating 1
SAP Code	901
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	No
Cold Water Source	From mains
Bath Count	1
Immersion Only Heating Hot Water	No

## 28.3 Waste Water Heat Recovery System

## 29.0 Hot Water Cylinder

Hot Water Cylinder	Hot Water Cylinder	
Cylinder Stat	Yes	
Cylinder In Heated Space	Yes	
Independent Time Control	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	150.00	L
Loss	1.80	kWh/day
Pipes insulation	Fully insulated primary pipework	
In Airing Cupboard	No	

## 31.0 Thermal Store

None

## 32.0 Photovoltaic Unit

One Dwelling	
Export Capable Meter?	Yes
Connected To Dwelling	Yes
Diverter	No
Battery Capacity [kWh]	0.00

PV Cells kWp	Orientation	Elevation	Overshading	FGHRS	MCS Certificate	Overshading Factor	MCS Certificate Reference	Panel Manufacturer
3.80	West	30°			Yes	0.80		

## 34.0 Small-scale Hydro

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
		B 90	A 98
		0	0
		0	0

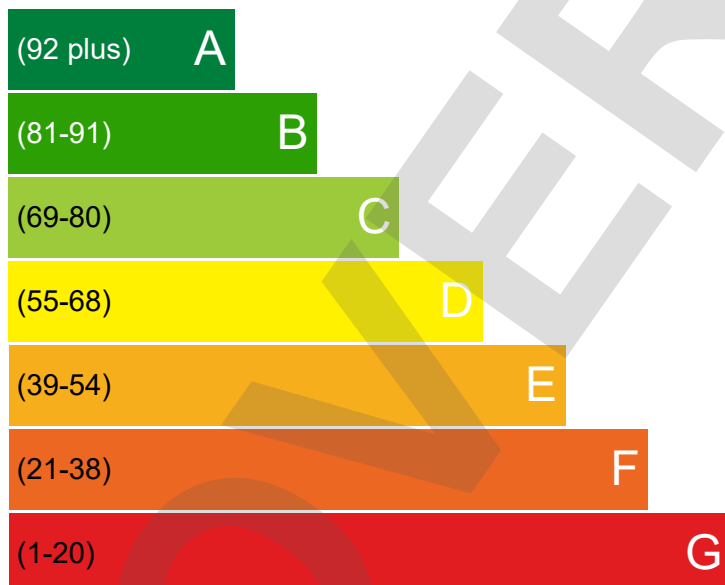
Dwelling Address	Hazeldown, Church Lane , Chilcomb, Hampshire, SO21 1HR
Report Date	26/02/2024
Property Type	House, Detached
Floor Area [m <sup>2</sup> ]	476

This document is not an Energy Performance Certificate (EPC) as required by the Energy Performance of Buildings Regulations

## Energy Rating

The current energy rating represents the overall energy efficiency of the dwelling. The potential energy rating is the overall energy rating of the dwelling after all of the recommend measures provided on the next page have been installed. A higher score represents a more energy efficient dwelling with lower fuel bills.

Most energy efficient - lower running costs



CURRENT

POTENTIAL

89

89

Least energy efficient - higher running costs



## Breakdown of property's energy performance

Each feature is assessed as one of the following:



Feature	Description	Energy Performance
Walls	Average thermal transmittance 0.15 W/m <sup>2</sup> K	Very Good
Roof	Average thermal transmittance 0.11 W/m <sup>2</sup> K	Very Good
Floor	Average thermal transmittance 0.13 W/m <sup>2</sup> K	Very Good
Windows	High performance glazing	Very Good
Main heating	Air source heat pump, underfloor, electric	Average
Main heating controls	Time and temperature zone control	Very Good
Secondary heating	Room heaters, wood logs	
Hot water	From main system	Average
Lighting	Excellent lighting efficiency	Very Good
Air tightness	Air permeability [AP50] = 5.0 m <sup>3</sup> /h.m <sup>2</sup> (assumed)	Good

## Primary Energy use

The primary energy use for this property per year is 17 kilowatt hour (kWh) per square metre

## Estimated CO<sub>2</sub> emissions of the dwelling





The estimated CO rating provides an indication of the dwelling's impact on the environment in terms of carbon dioxide emissions; the higher the rating the less impact it has on the environment.

The estimated CO emissions for this dwellings is: **0.7** per year

With the recommended measures the potential CO emissions could be: **0.0** per year

## Recommendations

The recommended measures provided below will help to improve the energy efficiency of the dwelling. To reach the dwelling's potential energy rating all of the recommended measures shown below would need to be installed. Having these measures installed individually or in any other order may give a different result when compared with the cumulative potential rating.

Recommended measure	Typical Yearly Saving	Potential Rating after measure installed	Cumulative savings (per year)	Cumulative Potential Rating
Solar water heating			£92	
Photovoltaic			£1374	

## Estimated energy use and potential savings

Estimated energy cost for this property over a year

**£1283**

Over a year you could save

**£0**

The estimated cost and savings show how much the average household would spend in this property for heating, lighting and hot water. It is not based on how energy is used by the people living at the property.

## Contacting the assessor and the accreditation scheme

## Assessor contact details

Assessor name	Mr. James Blackburn
Assessor's accreditation number	
Email Address	

## Accreditation scheme contact details

Accreditation scheme	
Telephone	
Email Address	

## Assessment details

Related party disclosure	
Date of assessment	26/02/2024
Date of certificate	26/02/2024
Type of assessment	SAP, new dwelling