

# Building Regulations England Part L (BREL) Compliance Report

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

Date: Wed 12 Mar 2025 11:29:24

Project Information			
Assessed By	Sebastian Ingham	Building Type	House, Semi-detached
OCDEA Registration	EES/022597	Assessment Date	2025-03-12

Dwelling Details			
Assessment Type	As designed	Total Floor Area	80 m <sup>2</sup>
Site Reference	Plot 09	Plot Reference	As Designed
Address	Plot 09 Lowans Hill, Redditch		

Client Details	
Name	-
Company	-
Address	-, -, -

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	Mains gas	
Target carbon dioxide emission rate	12.44 kgCO <sub>2</sub> /m <sup>2</sup>	
Dwelling carbon dioxide emission rate	12.04 kgCO <sub>2</sub> /m <sup>2</sup>	OK
1b Target primary energy rate and dwelling primary energy		
Target primary energy	65.08 kWh <sub>PE</sub> /m <sup>2</sup>	
Dwelling primary energy	62.98 kWh <sub>PE</sub> /m <sup>2</sup>	OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency		
Target fabric energy efficiency	39.8 kWh/m <sup>2</sup>	
Dwelling fabric energy efficiency	37.4 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	0.18	Walls (1) (0.18)	OK
Party walls	0.2	0	Party Wall (1) (0)	N/A
Curtain walls	1.6	0	N/A	N/A
Floors	0.18	0.12	Heat Loss Floor - over entranc (0.23)	OK
Roofs	0.16	0.11	Roof (1) (0.11)	OK
Windows, doors, and roof windows	1.6	1.2	NW windows (1.2)	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)	79.58	0.18
Party wall: Party Wall (1)	39.52	0 (!)
Ground floor: Heat Loss Floor - ground, Heat Loss Floor - ground	37.47	0.11
Upper floor: Heat Loss Floor - over entranc, Heat Loss Floor - over entranc	1.7	0.23
Exposed roof: Roof (1)	40.87	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]
NW windows, Windows	2.25	North West	0.7	1.2
NW windows, Windows	3.3	North West	0.7	1.2
NW door, Doors	1.89	North West	N/A	1.2
SE windows, Windows	2.25	South East	0.7	1.2
SE windows, Windows	1.21	South East	0.7	1.2
SE windows, Windows	4.84	South East	0.7	1.2
SW windows, Windows	1	South West	0.7	1.2
SW windows, Windows	0.64	South West	0.7	1.2

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))
Building part 1: 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	0.084	
External wall	E3: Sill	Calculated by person with suitable expertise	0.034 (!)	
External wall	E4: Jamb	Calculated by person with suitable expertise	0.043	
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.021 (!)	
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.08	
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.044	
External wall	E12: Gable (insulation at ceiling level)	Calculated by person with suitable expertise	0.051	
External wall	E16: Corner (normal)	Calculated by person with suitable expertise	0.03 (!)	
External wall	E17: Corner (inverted - internal area greater than external area)	Calculated by person with suitable expertise	-0.015 (!)	
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.079	
Party wall	P1: Ground floor	Calculated by person with suitable expertise	0.04	
Party wall	P2: Intermediate floor within a dwelling	SAP table default	0 (!)	
Party wall	P4: Roof (insulation at ceiling level)	Calculated by person with suitable expertise	0.044	
External wall	E20: Exposed floor (normal)	SAP table default	0.32	
External wall	E21: Exposed floor (inverted)	SAP table default	0.32	

### 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	5.01 m <sup>3</sup> /hm <sup>2</sup> , Design value	OK
Air permeability test certificate reference		

### 4 Space heating

#### Main heating system 1: Boiler with radiators or underfloor heating - Mains gas

Efficiency	88.7%
Emitter type	Radiators
Flow temperature	45°C
System type	Combi boiler
Manufacturer	Bosch Thermotechnology Ltd
Model	Greenstar 4000
Commissioning	

#### Secondary heating system: N/A

Fuel	N/A
Efficiency	N/A
Commissioning	

### 5 Hot water

#### Cylinder/store - type: N/A

Capacity	N/A
Declared heat loss	N/A
Primary pipework insulated	N/A
Manufacturer	
Model	
Commissioning	

#### Waste water heat recovery system 1 - type: N/A

Efficiency	
Manufacturer	
Model	

6 Controls		
<b>Main heating 1</b> - type: Time and temperature zone control by arrangement of plumbing and electrical services		
Function		
Ecodesign class		
Manufacturer		
Model		
<b>Water heating</b> - type: N/A		
Manufacturer		
Model		
7 Lighting		
Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	80 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	2.34 kWp	
Orientation	South West	
Pitch	30°	
Overshading	None or very little	
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		

# Summary for Input Data



Property Reference	Plot 09	Issued on Date	12/03/2025
Assessment Reference	As Designed	Prop Type Ref	Type 01
Property	Plot 09, Lowans Hill, Redditch		

SAP Rating	93 A	DER	12.04	TER	12.44
Environmental	90 B	% DER < TER			3.22
CO <sub>2</sub> Emissions (t/year)	0.89	DFEE	37.45	TFEE	39.79
Compliance Check	See BREL	% DFEE < TFEE			5.88
% DPER < TPER	3.22	DPER	62.98	TPER	65.08

Assessor Details	Mr. Sebastian Ingham	Assessor ID	T245-0001
Client			

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

Orientation	Northwest
Property Tenture	ND
Transaction Type	6
Terrain Type	Suburban
1.0 Property Type	House, Semi-Detached
Which Floor	0
2.0 Number of Storeys	2
3.0 Date Built	2024
3.0 Property Age Band	L
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown
6.0 Thermal Mass Parameter	Precise calculation
Thermal Mass	86.96 kJ/m <sup>2</sup> K
7.0 Electricity Tariff	Standard
Smart electricity meter fitted	No
Smart gas meter fitted	No

7.0 Measurements		Heat Loss Perimeter	Internal Floor Area	Average Storey Height
	Ground floor:	18.40 m	39.17 m <sup>2</sup>	2.47 m
	1st Storey:	18.40 m	40.87 m <sup>2</sup>	2.80 m

8.0 Living Area	34.00 m <sup>2</sup>
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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	Timber Frame	Timber framed wall (one layer of plasterboard)	0.18	9.00	96.96	79.58	0.00	None	17.38	Enter Gross Area

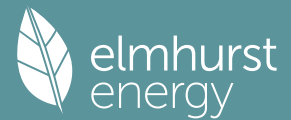
Description	Type	Construction	U-Value (W/m <sup>2</sup> K)	Kappa (kJ/m <sup>2</sup> K)	Area (m <sup>2</sup> )	Shelter Res	Shelter
Party Wall	Filled Cavity with Edge Sealing	Double plasterboard on both sides, twin timber f rame with/without sheathing board	0.00	20.00	39.52	0.00	None

Description	Construction	Kappa (kJ/m <sup>2</sup> K)	Area (m <sup>2</sup> )
Internal Wall	Plasterboard on timber frame	9.00	131.58

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	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	40.87	40.87	None	0.00	Enter Gross Area	0.00

Description	Storey	Construction	Area (m <sup>2</sup> )
Internal Ceiling	Lowest occupied	Plasterboard ceiling, carpeted chipboard floor	39.17

# Summary for Input Data



## 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> )
Heat Loss Floor - ground	Ground Floor - Solid	Lowest occupied	Suspended concrete floor, carpeted	0.11	None	0.00	75.00	37.47
Heat Loss Floor - over entrance	Exposed Floor - Timber	+1	Timber exposed floor, insulation between joists	0.23	None	0.00	20.00	1.70

## 11.2 Internal Floors

Description	Storey Index	Construction	Kappa (kJ/m <sup>2</sup> K)	Area (m <sup>2</sup> )
Internal Floor		Plasterboard ceiling, carpeted chipboard floor	9.00	39.17

## 12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m <sup>2</sup> K)
Windows	Manufacturer	Window	Double glazed			0.76		0.70	1.20
Doors	Manufacturer	Solid Door				0.00			1.20

## 13.0 Openings

Name	Opening Type	Location	Orientation	Area (m <sup>2</sup> )	Pitch
NW windows	Windows	External Wall	North West	5.55	0
NW door	Doors	External Wall	North West	1.89	0
SE windows	Windows	External Wall	South East	8.30	0
SW windows	Windows	External Wall	South West	1.64	0

## 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	11.20	0.08	0.08	Yes
E3 Sill	Independently assessed	10.30	0.03	0.03	Yes
E4 Jamb	Independently assessed	23.40	0.04	0.04	Yes
E5 Ground floor (normal)	Independently assessed	18.40	0.02	0.02	Yes
E6 Intermediate floor within a dwelling	Independently assessed	18.40	0.08	0.08	Yes
E10 Eaves (insulation at ceiling level)	Independently assessed	7.50	0.04	0.04	No
E12 Gable (insulation at ceiling level)	Independently assessed	10.90	0.05	0.05	No
E16 Corner (normal)	Independently assessed	13.01	0.03	0.03	No
E17 Corner (inverted – internal area greater than external area)	Independently assessed	2.47	-0.01	-0.01	No
E18 Party wall between dwellings	Independently assessed	10.54	0.08	0.08	No
P1 Party wall - Ground floor	Independently assessed	7.50	0.04	0.04	No
P2 Party wall - Intermediate floor within a dwelling	Table K1 - Default	7.50	0.00	0.00	No
P4 Party wall - Roof (insulation at ceiling level)	Independently assessed	7.50	0.04	0.04	No
E20 Exposed floor (normal)	Table K1 - Default	2.70	0.32	0.32	No
E21 Exposed floor (inverted)	Table K1 - Default	2.70	0.32	0.32	No

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

## 19.0 Mechanical Ventilation

### Mechanical Ventilation

Mechanical Ventilation System Present

## 20.0 Fans, Open Fireplaces, Flues

Number of open chimneys

Number of open flues

Number of chimneys/flues attached to closed fire

Number of flues attached to solid fuel boiler

Number of flues attached to other heater

Number of blocked chimneys

Number of intermittent extract fans

Number of passive vents

Number of flueless gas fires

## 21.0 Fixed Cooling System

## 22.0 Pressure Testing

Designed AP<sub>50</sub>  m<sup>3</sup>/(h.m<sup>2</sup>) @ 50 Pa

Property Tested?

Test Method

# Summary for Input Data

## 22.0 Lighting

No Fixed Lighting	No				
	<b>Name</b>	<b>Efficacy</b>	<b>Power</b>	<b>Capacity</b>	<b>Count</b>
	Low energy Lighting	80.00	10.00	800.00	20

## 24.0 Main Heating 1

Database	Database				
Percentage of Heat	100.00				%
Database Ref. No.	18907				
Fuel Type	Mains gas				
SAP Code	104				
In Winter	88.70				
In Summer	87.60				
Model Name	Greenstar 4000				
Manufacturer	Bosch Thermotechnology Ltd				
System Type	Combi boiler				
Controls SAP Code	2110				
PCDF Controls	0				
Delayed Start Stat	Yes				
Burner Control	Modulating				
Boiler Compensator	0				
HETAS approved System	No				
Flue Type	Balanced				
Fan Assisted Flue	Yes				
Is MHS Pumped	Pump in heated space				
Heating Pump Age	2013 or later				
Heat Emitter	Radiators				
Flow Temperature	Enter value				
Flow Temperature Value	45.00				
Boiler Interlock	Yes				
Combi boiler type	Standard Combi				

## 25.0 Main Heating 2

None

## 26.0 Heat Networks

None

## 27.0 Secondary Heating

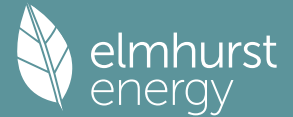
None

## 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	Yes			
Summer Immersion	No			
Cold Water Source	From mains			
Bath Count	1			
Baths connected to WWHRS	0			
Supplementary Immersion	No			
Immersion Only Heating Hot Water	No			

## 28.1 Showers

# Summary for Input Data



Description	Shower Type	Flow Rate [l/min]	Rated Power [kW]	Connected	Connected To
shower	Combi boiler or unvented hot water system	9.00		No	

## 28.3 Waste Water Heat Recovery System

### 29.0 Hot Water Cylinder

Cylinder Stat	None				
Cylinder In Heated Space	No				
Independent Time Control	No				
Insulation Type	None				
Insulation Thickness	0				
Cylinder Volume	0.00			L	
Loss	0.00			kWh/day	
In Airing Cupboard	No				

### 31.0 Thermal Store

Thermal Store Pipework	None				
	within a single casing				

### 32.0 Photovoltaic Unit

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

PV Cells kWp	Orientation	Elevation	Overshading	FGHRS	MCS Certificate	Overshading Factor	MCS Certificate Reference	Panel Manufacturer
2.34	South West	30°	None Or Little	No	No	1.00		

### 34.0 Small-scale Hydro

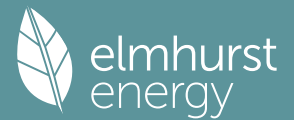
Electricity Generated	None				
Apportioned	0.00			kWh/Year	
Connected to dwelling's electricity meter	0.00				
Electricity Generation	Yes				
	Annual				

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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### Recommendations

- Lower cost measures
  - None
- Further measures to achieve even higher standards
  - None

# Predicted Energy Assessment

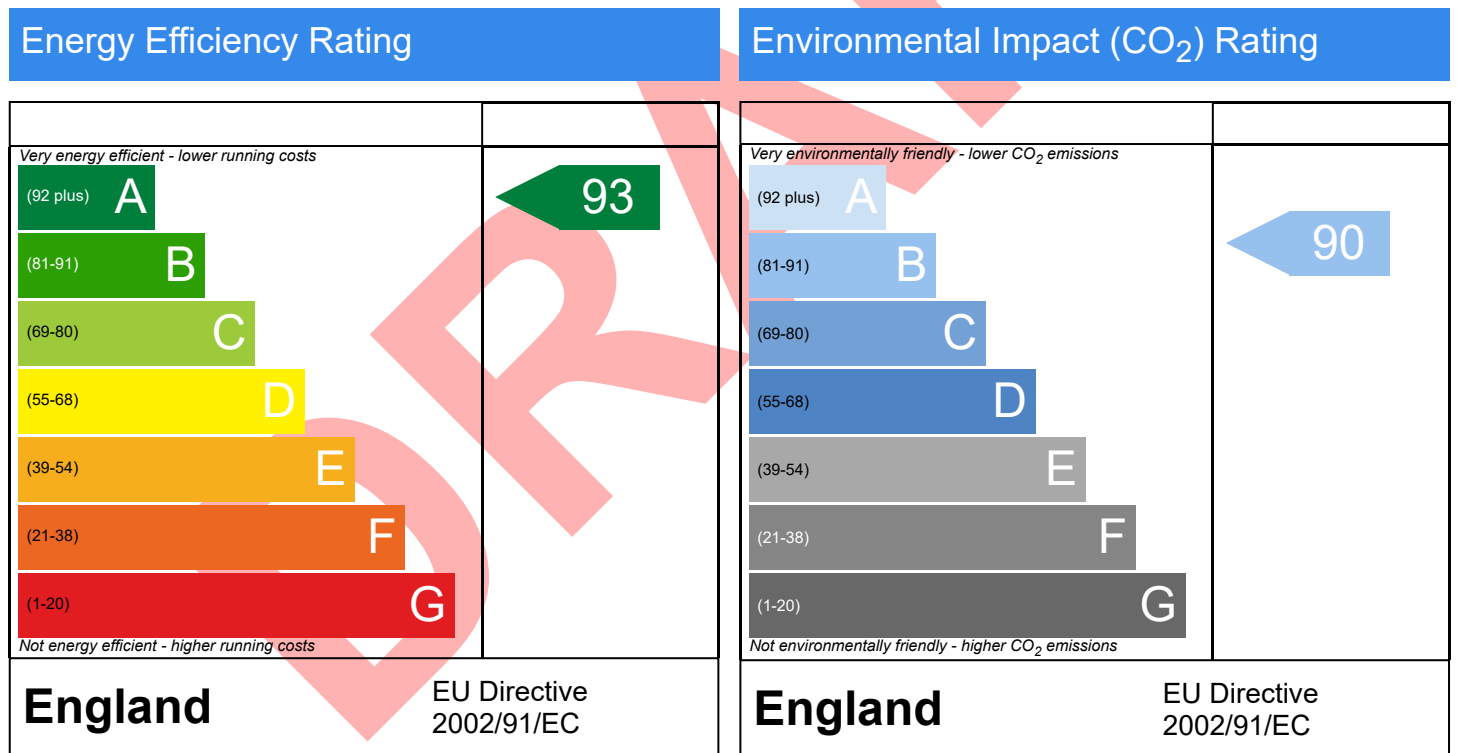


Plot 09, Lowans Hill, Redditch

Dwelling type: House, Semi-Detached  
 Date of assessment: 12/03/2025  
 Produced by: Sebastian Ingham  
 Total floor area: 80.04 m<sup>2</sup>  
 DRRN:

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.