

Building Regulations England Part L (BREL) Compliance Report

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

Date: Tue 19 Dec 2023 16:28:45

Project Information			
Assessed By	Neil Stallard	Building Type	House, Detached
OCDEA Registration	EES/009044	Assessment Date	2023-12-19

Dwelling Details			
Assessment Type	As designed	Total Floor Area	164 m ²
Site Reference	plot 2	Plot Reference	plot 2
Address	Tye Barn Cottage Plot 1 Barking Tye, Ipswich, IP6 8LP		

Client Details	
Name	Ian Smillie
Company	Ian Smillie Architectrue
Address	85, Camden Road, Ipswich, IP3 8JN

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	8.88 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	1.69 kgCO ₂ /m ²		OK
1b Target primary energy rate and dwelling primary energy			
Target primary energy	46.48 kWh _{PE} /m ²		
Dwelling primary energy	15.92 kWh _{PE} /m ²		OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	40.4 kWh/m ²		
Dwelling fabric energy efficiency	40.3 kWh/m ²		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.18	Walls (2) (0.2)	OK
Party walls	0.2	N/A	N/A	N/A
Curtain walls	1.6	N/A	N/A	N/A
Floors	0.18	0.11	slab (0.11)	OK
Roofs	0.16	0.12	Roof (2) (0.15)	OK
Windows, doors, and roof windows	1.6	1.3	east (1.3)	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 ²]	U-Value [W/m ² K]	
Exposed wall: Walls (1)	170.535	0.18	
Exposed wall: Walls (2)	2.4	0.2	
Ground floor: slab, slab	81.9	0.11	
Exposed roof: Roof (1)	67.2	0.11	
Exposed roof: Roof (2)	14.7	0.15	

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
north, solid door	1.89	North	N/A	1.2
east, hg doors	1.89	East	N/A	1.3
north, windows	1.8225	North	0.7	1.3
north, windows	1.8225	North	0.7	1.3
north, windows	0.81	North	0.7	1.3
north, windows	1.62	North	0.7	1.3
north, windows	1.62	North	0.7	1.3
north, windows	0.36	North	0.7	1.3
north, windows	0.36	North	0.7	1.3
south, windows	6.3	South	0.7	1.3
south, windows	9.6	South	0.7	1.3
south, windows	9.6	South	0.7	1.3

Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
south, windows	1.62	South	0.7	1.3
south, windows	4.2	South	0.7	1.3
east, hg doors	1.89	East	N/A	1.3
east, windows	1.44	East	0.7	1.3
east, windows	1.44	East	0.7	1.3
east, windows	0.54	East	0.7	1.3
east, windows	0.81	East	0.7	1.3
west, windows	0.36	West	0.7	1.3
west, windows	0.81	West	0.7	1.3

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	E1: Steel lintel with perforated steel base plate	Government-approved scheme	0.21	
External wall	E3: Sill	Government-approved scheme	0.03 (!)	
External wall	E4: Jamb	Government-approved scheme	0.05	
External wall	E5: Ground floor (normal)	Government-approved scheme	0.05	
External wall	E6: Intermediate floor within a dwelling	Government-approved scheme	0.002 (!)	
External wall	E16: Corner (normal)	Government-approved scheme	0.09	
External wall	E11: Eaves (insulation at rafter level)	Government-approved scheme	0.04	
External wall	E10: Eaves (insulation at ceiling level)	Government-approved scheme	0.06	

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

Maximum permitted air permeability at 50Pa	8 m ³ /hm ²	
Dwelling air permeability at 50Pa	3 m ³ /hm ² , Design value (!)	OK
Air permeability test certificate reference		

4 Space heating

Main heating system 1: Heat pump with radiators or underfloor heating - Electricity

Efficiency	246.9%
Emitter type	Both radiators and underfloor
Flow temperature	55°C
System type	Heat Pump
Manufacturer	Grant Engineering (UK) Ltd
Model	AERONA3
Commissioning	
Secondary heating system: N/A	
Fuel	Wood logs
Efficiency	80.0%
Commissioning	

5 Hot water

Cylinder/store - type: Cylinder

Capacity	150 litres
Declared heat loss	1.99 kWh/day
Primary pipework insulated	Yes
Manufacturer	
Model	
Commissioning	
Waste water heat recovery system 1 - type: N/A	
Efficiency	
Manufacturer	
Model	

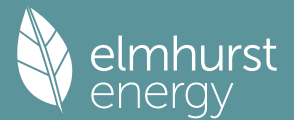
6 Controls

Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services

Function	
Ecodesign class	
Manufacturer	
Model	

Water heating - 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		
System type: 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: Photovoltaic system (1)		
Peak power	1.4 kWp	
Orientation	South	
Pitch	45°	
Overshading	0.8 (overshading factor calculated according to MCS)	
Manufacturer	south	
MCS certificate		
Technology type: Photovoltaic system (2)		
Peak power	2.1 kWp	
Orientation	East	
Pitch	45°	
Overshading	0.8 (overshading factor calculated according to MCS)	
Manufacturer		
MCS certificate		
Technology type: Photovoltaic system (3)		
Peak power	2.1 kWp	
Orientation	West	
Pitch	45°	
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

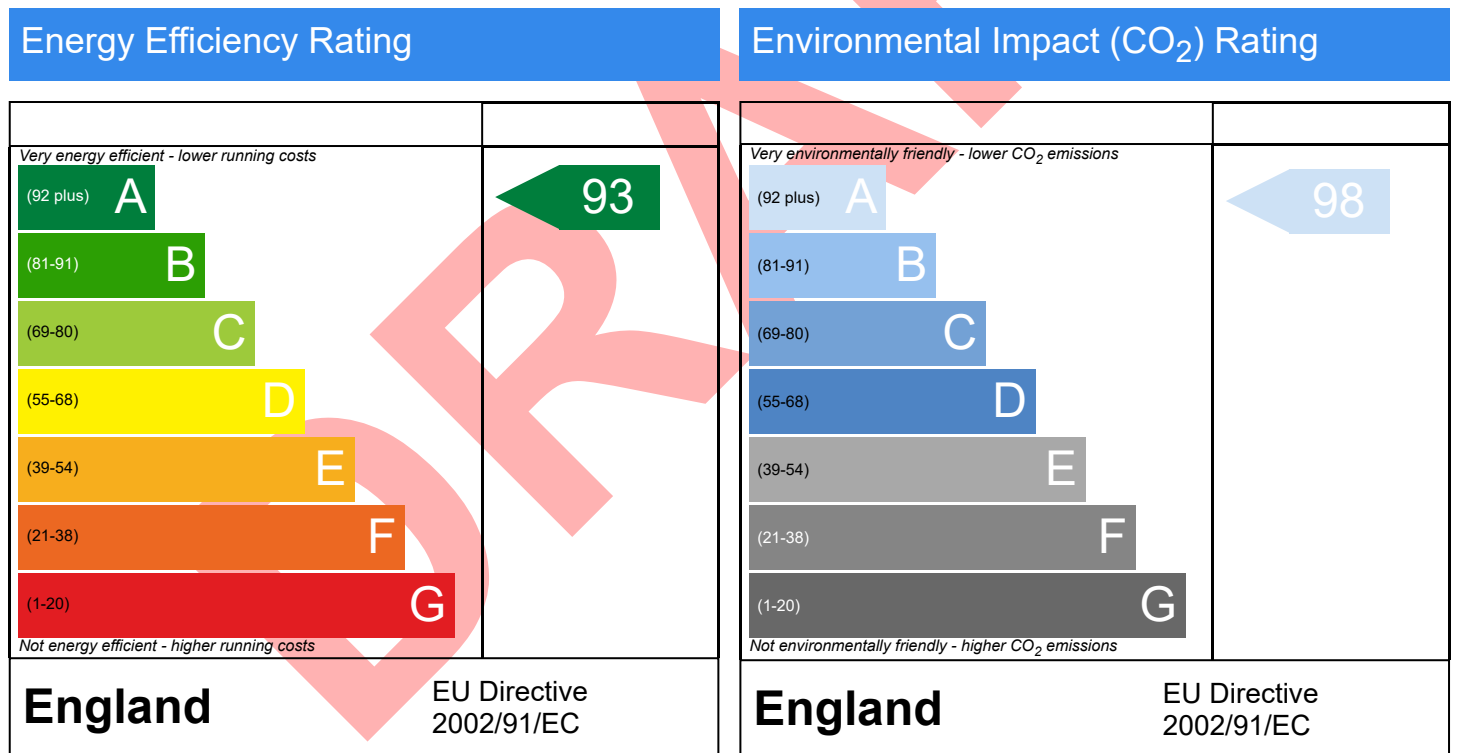


Plot 1, Tye Barn Cottage, Barking Tye, Ipswich, Suffolk, IP6 8LP

Dwelling type: House, Detached
 Date of assessment: 19/12/2023
 Produced by: Neil Stallard
 Total floor area: 163.8 m²
 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 (CO₂) 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 (CO₂) emissions. The higher the rating the less impact it has on the environment.

Summary for Input Data



Property Reference	plot 2	Issued on Date	19/12/2023
Assessment Reference	plot 2	Prop Type Ref	as designed 191223
Property	Plot 1, Tye Barn Cottage, Barking Tye, Ipswich, Suffolk, IP6 8LP		

SAP Rating	93 A	DER	1.69	TER	8.88
Environmental	98 A	% DER < TER			80.97
CO ₂ Emissions (t/year)	0.2	DFEE	40.33	TFEE	40.41
Compliance Check	See BREL	% DFEE < TFEE			0.19
% DPER < TPER	65.74	DPER	15.92	TPER	46.48

Assessor Details	Mr. Neil Stallard	Assessor ID	F053-0001
Client	IS, Ian Smillie		

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

Orientation	North
Property Tenure	1
Transaction Type	6
Terrain Type	Rural
1.0 Property Type	House, Detached
2.0 Number of Storeys	2
3.0 Date Built	2023
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
	Ground floor:	43.40 m	81.90 m ²	2.40 m
	1st Storey:	43.40 m	81.90 m ²	2.70 m

8.0 Living Area	21.60	m ²
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Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area(m ²)	Nett Area (m ²)	Shelter Res	Shelter	Openings	Area Calculation Type
main wall	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.18	60.00	221.34	170.54	0.00	None	50.81	Enter Gross Area
dormer cheeks	Timber Frame	Timber framed wall (one layer of plasterboard)	0.20	9.00	2.40	2.40	0.00	None	0.00	Enter Gross Area

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Wall 1	Plasterboard on timber frame	9.00	130.23

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area(m ²)	Nett Area (m ²)	Shelter Code	Shelter Factor	Calculation Type	Openings
loft	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	67.20	67.20	None	0.00	Enter Gross Area	0.00
vaulted areas	External Slope Roof	Plasterboard, insulated slope	0.15	9.00	14.70	14.70	None	0.00	Enter Gross Area	0.00

Description	Type	Storey Index	Construction	U-Value (W/m ² K)	Shelter Code	Shelter Factor	Kappa (kJ/m ² K)	Area (m ²)
slab	Ground Floor - Solid	Lowest occupied	Suspended concrete floor, carpeted	0.11	None	0.00	75.00	81.90

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m ² K)
windows	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30
hg doors	Manufacturer	Half Glazed Door	Double Low-E Soft 0.05			0.63		0.70	1.30
solid door	Manufacturer	Solid Door							1.20

Summary for Input Data



13.0 Openings

Name	Opening Type	Location	Orientation	Area (m ²)	Pitch
north	solid door	main wall	North	1.89	
east	hg doors	main wall	East	1.89	
north	windows	main wall	North	8.42	
south	windows	main wall	South	31.32	
east	hg doors	main wall	East	1.89	
east	windows	main wall	East	4.23	
west	windows	main wall	West	1.17	

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
E1 Steel lintel with perforated steel base plate	Gov Approved Scheme	28.60	0.21	0.21	Yes
E3 Sill	Gov Approved Scheme	25.90	0.03	0.03	Yes
E4 Jamb	Gov Approved Scheme	63.00	0.05	0.05	Yes
E5 Ground floor (normal)	Gov Approved Scheme	43.40	0.05	0.05	Yes
E6 Intermediate floor within a dwelling	Gov Approved Scheme	43.40	0.00	0.00	Yes
E16 Corner (normal)	Gov Approved Scheme	20.40	0.09	0.09	Yes
E11 Eaves (insulation at rafter level)	Gov Approved Scheme	25.50	0.04	0.04	No
E10 Eaves (insulation at ceiling level)	Gov Approved Scheme	15.60	0.06	0.06	No

Y-value W/m²K

18.0 Pressure Testing

Designed AP₅₀ m³/(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	80.00	5	400	100

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

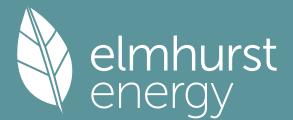
Flow Temperature

Flow Temperature Value

25.0 Main Heating 2

26.0 Heat Networks

Summary for Input Data



27.0 Secondary Heating

Secondary Heating	Manufacturer	
SAP Code	0	
SHS efficiency	80.00	%
HETAS Approved System	Yes	
Test Method	BS EN 613	
Manufacturer	generic	
Model Name	log burner	

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
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	No	
Cylinder In Heated Space	No	
Independent Time Control	No	
Insulation Type	Measured Loss	
Cylinder Volume	150.00	L
Loss	1.99	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	Yes
Battery Capacity [kWh]	12.00

PV Cells kWp	Orientation	Elevation	Overshading	FGHRS	MCS Certificate	Overshading Factor	MCS Certificate Reference	Panel Manufacturer
1.40	South	45°			Yes	0.80		south
2.10	East	45°			Yes	0.80		
2.10	West	45°			Yes	0.80		

34.0 Small-scale Hydro

None

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

Thermal Bridging



Property Reference	plot 2	Issued on Date	19/12/2023
Assessment Reference	plot 2	Prop Type Ref	Detached House
Property	Plot 1, Tye Barn Cottage, Barking Tye, Ipswich, Suffolk, IP6 8LP		

SAP Rating	93 A	DER	1.69	TER	8.88
Environmental	98 A	% DER < TER			80.97
CO ₂ Emissions (t/year)	0.2	DFEE	40.33	TFEE	40.41
Compliance Check	See BREL	% DFEE < TFEE			0.19
% DPER < TPER	65.74	DPER	15.92	TPER	46.48

Assessor Details	Mr. Neil Stallard	Assessor ID	F053-0001
Client	IS, Ian Smillie		

	Junction details	Source Type	Psi (W/mK)	Length (m)	Result	Reference
External wall	E1 Steel lintel with perforated steel base plate	Gov Approved Scheme	0.210	28.60	6.01	
External wall	E3 Sill	Gov Approved Scheme	0.030	25.90	0.78	
External wall	E4 Jamb	Gov Approved Scheme	0.050	63.00	3.15	
External wall	E5 Ground floor (normal)	Gov Approved Scheme	0.050	43.40	2.17	
External wall	E6 Intermediate floor within a dwelling	Gov Approved Scheme	0.002	43.40	0.09	
External wall	E16 Corner (normal)	Gov Approved Scheme	0.090	20.40	1.84	
External wall	E11 Eaves (insulation at rafter level)	Gov Approved Scheme	0.040	25.50	1.02	
External wall	E10 Eaves (insulation at ceiling level)	Gov Approved Scheme	0.060	15.60	0.94	

Total: 265.80 W/mK:
 Y-Value: 0.04 W/m²K:

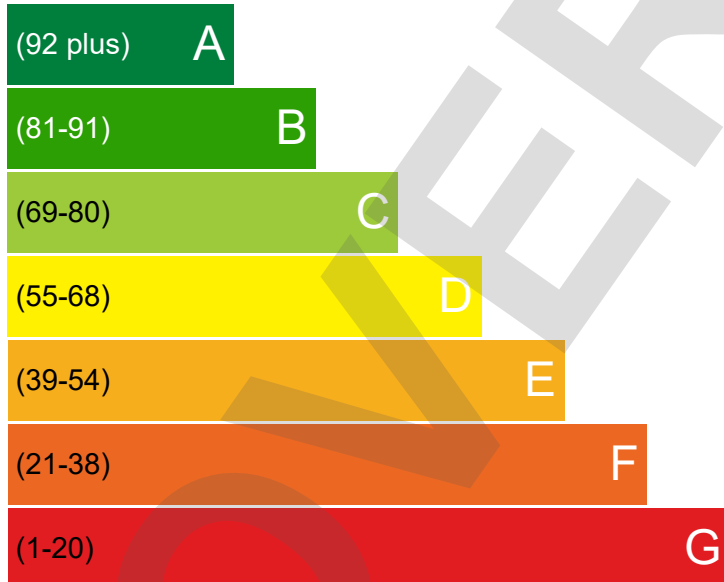
Dwelling Address	Plot 1, Tye Barn Cottage, Barking Tye, Ipswich, Suffolk, IP6 8LP
Report Date	19/12/2023
Property Type	House, Detached
Floor Area [m ²]	164

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



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 0.18 W/m ² K	Very Good
Roof	Average thermal transmittance 0.12 W/m ² K	Very Good
Floor	Average thermal transmittance 0.11 W/m ² K	Very Good
Windows	High performance glazing	Good
Main heating	Air source heat pump, radiators and underfloor, electric	Average
Main heating controls	Time and temperature zone control	Very Good
Secondary heating	Room heaters, wood logs	
Hot water	From main system, no cylinder thermostat	Very Poor
Lighting	Good lighting efficiency	Good
Air tightness	Air permeability [AP50] = 3.0 m ³ /h.m ² (assumed)	Good

Primary Energy use

The primary energy use for this property per year is 11 kilowatt hour (kWh) per square metre

Estimated CO₂ 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: **0.2** per year

With the recommended measures the potential CO emissions could be: **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
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Estimated energy use and potential savings

Estimated energy cost for this property over a year

£225

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. Neil Stallard
Assessor's accreditation number	
Email Address	

Accreditation scheme contact details

Accreditation scheme	
Telephone	
Email Address	

Assessment details

Related party disclosure	
Date of assessment	19/12/2023
Date of certificate	19/12/2023
Type of assessment	SAP, new dwelling

OVERVIEW