



## BUILDING REGULATIONS Part L1 SAP ASSESSMENT

### DEVELOPMENT

**New Dwelling**  
**Rear of 189 Newark Road**  
**North Hykeham**  
**Lincoln**

### COMMISSIONED BY

**Adam Wilson**  
**Wilson Architects**  
**Think Tank**  
**Ruston Way**  
**Lincoln**

**Our Ref: 23-262**

Barlings kwa have been appointed by Adam Wilson to carry out a Standard Assessment Procedure (SAP) and Energy Performance Certificate (EPC) for the proposed New Dwelling to the rear of 189 Newark Road, North Hykeham, Lincoln.

The report demonstrates compliance within the regulations. Therefore, it is important that you read through all the information supplied and contact us to amend any information that is incorrect. If you do you decide to make changes to the details included in this assessment, then please let us know so we can check your dwelling is still compliant.

24 Fiskerton Road, Reepham, Lincoln, LN3 4EB 01522 797344

Registered in England Company No: 9094283  
Vat Registration Number: 247 4862 76

## Summary of Design SAP

The SAP assessment has been completed using the following elements within the dwelling.

ELEMENT	TARGET	DESCRIPTION
External Wall	0.18 U-VALUE W/M <sup>2</sup> K	100mm Brick, 5mm Cavity, 100mm Unilin Cavity Therm CT/PIR, 100mm Blockwork (conductivity 0.18) Dot & Dab, Plasterboard, Skim
Plane Roof	0.10 U-VALUE W/M <sup>2</sup> K	450mm Mineral Wool between and over joists, 12.5mm Plasterboard, 3mm Skim
Slope Floor	0.14 U-VALUE W/M <sup>2</sup> K	125mm Unilin ECO MA between Rafters, 50mm ECO MA under Rafters 12.5mm Plasterboard, 3mm Skim
Ground Floor	0.11 U-VALUE W/M <sup>2</sup> K	75mm Screed, Unilin Thin-R Plus XT/HYF, 150mm Concrete
Wall to Loft Space	0.14 U-VALUE W/M <sup>2</sup> K	
Windows & Roof Lights	1.0 U-VALUE W/M <sup>2</sup> K	
Doors	1.0 U-VALUE W/M <sup>2</sup> K	
Design Air Permeability Rate	1.0 m <sup>3</sup> /(h.m <sup>2</sup> )	Due to the very low design rate, we would recommend more than one air test, with the first one to be carried out as soon as the dwelling air barrier is complete.

Heating, Lighting, Ventilation & Hot Water		
Main Heating	Air Source Heat Pump with Radiators & Underfloor	<p>A <b>Mitsubishi Electric Ecodan 6KW</b> PUZ-WM60VAA has been include in this assessment.</p> <p><b>NOTE</b> if this unit is not suitable and an alternative is specified, please let us know so we can check if compliance is still achieved.</p> <p>The controls for the heating system should include <b>Time and temperature zone control</b> with <b>Radiators and Underfloor</b></p>
Hot Water	150 Ltr Cylinder	Heat loss per day of 1.86Kw/day with fully insulated primary pipework.
Baths	1 No Baths	
Showers	1 No Showers	Mixer showers with 10 litres per minute flow rate
Lighting		Lighting within the dwelling should have an efficiency not below 95 Lumens per Circuit Watt
Ventilation System	Mechanical ventilation with heat recovery	<p>A <b>Vent Axia Sentinel Kinetic FH 408167A</b> system has been included in the assessment.</p> <p><b>NOTE</b> if this unit is not suitable and an alternative is specified, please let us know so we can check if compliance is still achieved.</p> <p>This system has been located within the insulated envelope.</p>
Renewable Technologies	Photo-Voltaic Array	A 5.4Kwp PV Array has been included on the Southwest Roof Elevation.

### Assumptions Made

The following assumptions have been made within the SAP assessment:

- Main Heating/Domestic Hot Water.
- Heating Controls.
- Ventilation System.
- Number and type of Baths, Showers and flow rate.
- Lighting minimum efficacy at 95 l/w.
- Insulation to primary pipe work.
- Thermal bridging details.

## Planning Conditions

This dwelling is subject to the Central Lincolnshire Local Plan.

The separately attached Full SAP Calculations confirm that both the Space Heating Demand and total Energy Demands are below the requirements and that the inclusion of the 5.4Kwp PV array compensates for both the unregulated and regulated loads. See below table for details.

Space Heating Demand	19.70Kwh/m <sup>2</sup> /yr
Energy Demand Loads	5.4Kwp Photo-Voltaic Array
Regulated 27.12Kwh/m <sup>2</sup> /yr	
Unregulated 16.30Kwh/m <sup>2</sup> /yr	
<b>Total Demand 43.42Kwh/m<sup>2</sup>/yr</b>	<b>Generates 44.50Kwh/m<sup>2</sup>/yr</b>

## As-Built Stage

It is important that you agree with the design parameters and assumptions made, as changes to the design parameters during the construction of the dwelling may affect the overall As-Built SAP Assessment.

Any proposed changes could result in enhancements having to be made to bring the As-Built SAP back into compliance and may delay the issuing of a completion certificate from the building control body. Therefore, it is important that any changes are reported to us so we can model the overall effect on the assessment and relay any changes that may be required.

Upon completion of the works an As-Built SAP will be required, taking into account the As-Built construction and any changes or modifications on site. We will ask you to confirm in writing that the As-Built dwelling has been constructed as detailed.

We will require the following documentary evidence before we can formally issue the final Energy Performance Certificate.

- Photographic Evidence of thermal bridging details required throughout the whole project.
- Completed air pressure test certificate.
- Thermal Bridging Construction Details.
- The full postal address of the dwelling.
- A declaration that the construction conforms to the design stage SAP Assessment.

Without the above information we will not be able to issue the As-Built SAP Assessment and Energy Performance Certificate.

## Conclusion

We have been able to demonstrate that the proposed dwelling complies with the requirements of Approved Document L1 of the 2021 Building Regulations, based on the information supplied and the assumptions detailed in this report.

## On-Site Construction Details

**Default Construction, Hi-Therm and Unilin Details** have been included within this assessment, it is very important that these details are followed.

Please Note: Evidence will be required at completion of the development, therefore it is very important that these details are followed and any changes to our assumed details are noted in the process of the development on site to prevent problems at completion.

Photographs should be taken of the Heating/Lighting/Hot Water System/Ventilation System as well as the fabric construction. Using the thermal bridging sheet within this report will help highlight which areas require photographic evidence. All photographs are to be geotagged showing location, date and time for each image, plot number and detail reference to show which thermal bridge detail is being captured. All images are to be issued to Barlings kwa as soon as possible at each stage of the build, so we can update the assessment if they don't match the design specifications listed in this report – any changes to specification could cause issues with compliance.

## Thermal Bridging Details

# Thermal Bridging



Property Reference	23-262	Issued on Date	10/01/2024
Assessment Reference	23-262	Prop Type Ref	Detached Bungalow
Property	rear of 189, Newark Road, North Hykeham, Lincoln, Lincs, LN6 8		

SAP Rating	99 A	DER	-1.79	TER	10.54
Environmental	102 A	% DER < TER			116.98
CO <sub>2</sub> Emissions (t/year)	-0.22	DFEE	43.76	TFEE	52.77
Compliance Check	See BREL	% DFEE < TFEE			17.06
% DPER < TPER	91.88	DPER	4.62	TPER	56.92

Assessor Details	Mrs. Kerry Simpson	Assessor ID	Y750-0001
Client	23-262, Adam Wilson		

	Junction details	Source Type	Psi (W/mK)	Length (m)	Result	Reference
External wall	E2 Other lintels (including other steel lintels)	Independently assessed	0.060	13.88	0.83	hi therm
External wall	E3 Sill	Independently assessed	0.016	6.80	0.11	Unilin CTPIR
External wall	E4 Jamb	Independently assessed	0.018	26.81	0.48	Unilin CTPIR
External wall	E5 Ground floor (normal)	Independently assessed	0.058	44.38	2.57	Unilin CTPIR
External wall	E16 Corner (normal)	Independently assessed	0.042	14.40	0.60	Unilin CTPIR
External roof	R1 Head of roof window	Independently assessed	0.061	3.60	0.22	Unilin GEN R1
External roof	R2 Sill of roof window	Independently assessed	0.060	3.60	0.22	Unilin Gen R2
External roof	R3 Jamb of roof window	Independently assessed	0.056	9.60	0.54	Unilin Gen R3
External wall	E17 Corner (inverted – internal area greater than external area)	Independently assessed	-0.070	4.80	-0.34	Unilin CTPIR
External wall	E10 Eaves (insulation at ceiling level)	Independently assessed	0.055	15.66	0.86	Unilin CTPIR
External wall	E12 Gable (insulation at ceiling level)	Independently assessed	0.057	8.30	0.47	Unilin CTPIR
External wall	E11 Eaves (insulation at rafter level)	Independently assessed	0.052	12.12	0.63	Unilin CTPIR
External wall	E13 Gable (insulation at rafter level)	Independently assessed	0.063	11.97	0.75	Unilin CTPIR
External roof	R4 Ridge (vaulted ceiling)	Table K1 - Default	0.120	6.06	0.73	
External roof	R10 All other roof or room-in-roof junctions	Table K1 - Default	0.320	2.33	0.75	

Total:  W/mK:  
 Y-Value:  W/m²K:

# **BREL Compliance & Summary Report**

# Building Regulations England Part L (BREL) Compliance Report

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

Date: Wed 10 Jan 2024 15:09:12

Project Information			
Assessed By	William Simpson	Building Type	Bungalow, Detached
OCDEA Registration	EES/014130	Assessment Date	2024-01-10

Dwelling Details			
Assessment Type	As designed	Total Floor Area	100 m <sup>2</sup>
Site Reference	23-262	Plot Reference	23-262
Address	rear of 189 Newark Road, North Hykeham, Lincoln, LN6 8		

Client Details	
Name	Adam Wilson
Company	Wilson Architects
Address	Think Tank, Ruston Way, Lincoln, LN6 7FL

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	10.54 kgCO <sub>2</sub> /m <sup>2</sup>		
Dwelling carbon dioxide emission rate	-1.79 kgCO <sub>2</sub> /m <sup>2</sup>		OK
1b Target primary energy rate and dwelling primary energy			
Target primary energy	56.92 kWh <sub>PE</sub> /m <sup>2</sup>		
Dwelling primary energy	4.62 kWh <sub>PE</sub> /m <sup>2</sup>		OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	52.8 kWh/m <sup>2</sup>		
Dwelling fabric energy efficiency	43.8 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	0.17	Walls (1) (0.18)	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	Ground Floor (0.11)	OK
Roofs	0.16	0.12	Roof (2) (0.14)	OK
Windows, doors, and roof windows	1.6	1	S/E (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)	91.512	0.18
Sheltered wall: Walls (2)	10.17	0.13 (!)
Ground floor: Ground Floor, Ground Floor	99.9	0.11
Exposed roof: Roof (1)	56.28	0.1 (!)
Exposed roof: Roof (2)	42.7	0.14

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]
S/E, Door	2.1	South East	N/A	1 (!)
S/E, Glazing	1.62	South East	0.7	1 (!)
S/E, Glazing	1.62	South East	0.7	1 (!)
S/E, Glazing	1.62	South East	0.7	1 (!)
N/E, Glazing	0.735	North East	0.7	1 (!)
N/E, Glazing	0.735	North East	0.7	1 (!)
S/E, Roof Windows	1.08	South East	0.7	1 (!)
S/E, Roof Windows	1.08	South East	0.7	1 (!)
S/W, Glazing	1.62	South West	0.7	1 (!)
S/W, Roof Windows	1.08	South West	0.7	1 (!)
S/W, Roof Windows	1.08	South West	0.7	1 (!)
N/W above patio door, Glazing	2.35	North West	0.7	1 (!)



Name	Area [m <sup>2</sup> ]	Orientation	Frame factor	U-Value [W/m <sup>2</sup> K]
N/W, Glazing	7.098	North West	0.7	1 (!)
N/W, Glazing	5.67	North West	0.7	1 (!)

### 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	0.06	hi therm
External wall	E3: Sill	Calculated by person with suitable expertise	0.016 (!)	Unilin CTPIR
External wall	E4: Jamb	Calculated by person with suitable expertise	0.018 (!)	Unilin CTPIR
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.058	Unilin CTPIR
External wall	E16: Corner (normal)	Calculated by person with suitable expertise	0.042	Unilin CTPIR
Roof	R1: Head of roof window	Calculated by person with suitable expertise	0.061	Unilin GEN R1
Roof	R2: Sill of roof window	Calculated by person with suitable expertise	0.06	Unilin Gen R2
Roof	R3: Jamb of roof window	Calculated by person with suitable expertise	0.056	Unilin Gen R3
External wall	E17: Corner (inverted - internal area greater than external area)	Calculated by person with suitable expertise	-0.07	Unilin CTPIR
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.055	Unilin CTPIR
External wall	E12: Gable (insulation at ceiling level)	Calculated by person with suitable expertise	0.057	Unilin CTPIR
External wall	E11: Eaves (insulation at rafter level)	Calculated by person with suitable expertise	0.052	Unilin CTPIR
External wall	E13: Gable (insulation at rafter level)	Calculated by person with suitable expertise	0.063	Unilin CTPIR
Roof	R4: Ridge (vaulted ceiling)	SAP table default	0.12	
Roof	R10: All other roof or room-in-roof junctions	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	1 m <sup>3</sup> /hm <sup>2</sup> , Design value (!)	OK
Air permeability test certificate reference		

### 4 Space heating

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

Efficiency	343.8%
Emitter type	Both radiator type and underfloor
Flow temperature	35°C
System type	Heat Pump
Manufacturer	Mitsubishi Electric Europe B.V.
Model	Ecodan 6.0 kW
Commissioning	
<b>Secondary heating system: N/A</b>	
Fuel	N/A
Efficiency	N/A
Commissioning	

### 5 Hot water

Cylinder/store - type: Cylinder

Capacity	150 litres
Declared heat loss	1.86 kWh/day
Primary pipework insulated	Yes
Manufacturer	
Model	
Commissioning	

<b>Waste water heat recovery system 1</b> - type: N/A		
Efficiency		
Manufacturer		
Model		
<b>6 Controls</b>		
<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: Cylinder thermostat and HW separately timed		
Manufacturer		
Model		
<b>7 Lighting</b>		
<i>Minimum permitted light source efficacy</i>	75 lm/W	
Lowest light source efficacy	95 lm/W	OK
External lights control	N/A	
<b>8 Mechanical ventilation</b>		
<b>System type:</b> Balanced whole-house mechanical ventilation with heat recovery		
<i>Maximum permitted specific fan power</i>	1.5 W/(l/s)	
Specific fan power	0.54 W/(l/s)	OK
<i>Minimum permitted heat recovery efficiency</i>	73%	
Heat recovery efficiency	88%	OK
Manufacturer/Model	Sentinel Kinetic FH, 408167A	
Commissioning		
<b>9 Local generation</b>		
Technology type: <b>Photovoltaic system (1)</b>		
Peak power	5.4 kWp	
Orientation	South West	
Pitch	30°	
Overshading	None or very little	
Manufacturer		
MCS certificate		
<b>10 Heat networks</b>		
N/A		
<b>11 Supporting documentary evidence</b>		
N/A		
<b>12 Declarations</b>		
<b>a. Assessor Declaration</b>		
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>b. Client Declaration</b>		
N/A		

# Summary for Input Data



Property Reference	23-262	Issued on Date	10/01/2024
Assessment Reference	23-262	Prop Type Ref	Bungalow
Property	rear of 189, Newark Road, North Hykeham, Lincoln, Lincs, LN6 8		

SAP Rating	99 A	DER	-1.79	TER	10.54
Environmental	102 A	% DER < TER			116.98
CO <sub>2</sub> Emissions (t/year)	-0.22	DFEE	43.76	TFEE	52.77
Compliance Check	See BREL	% DFEE < TFEE			17.06
% DPER < TPER	91.88	DPER	4.62	TPER	56.92

Assessor Details	Mrs. Kerry Simpson	Assessor ID	Y750-0001
Client	23-262, Adam Wilson		

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

Orientation	Southeast
Property Tenure	ND
Transaction Type	6
Terrain Type	Urban
1.0 Property Type	Bungalow, Detached
2.0 Number of Storeys	1
3.0 Date Built	2024
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown
6.0 Thermal Mass Parameter	Precise calculation

7.0 Electricity Tariff	Standard
Smart electricity meter fitted	No
Smart gas meter fitted	No

7.0 Measurements	Ground floor:	Heat Loss Perimeter 44.38 m	Internal Floor Area 99.90 m <sup>2</sup>	Average Storey Height 2.89 m
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8.0 Living Area	43.63	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	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.18	60.00	116.68	91.51	0.00	None	25.17	Enter Gross Area
wall to loft space	Timber Frame	Timber framed wall (one layer of plasterboard)	0.14	9.00	10.17	10.17	0.50	Room In Roof	0.00	Enter Gross Area

Description	Construction	Kappa (kJ/m <sup>2</sup> K)	Area (m <sup>2</sup> )
Internal Wall 1	Plasterboard on timber frame	9.00	162.19

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
Plane Roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.10	9.00	56.28	56.28	None	0.00	Enter Gross Area	0.00
Slope Roof	External Slope Roof	Plasterboard, insulated slope	0.14	9.00	47.02	42.70	None	0.00	Enter Gross Area	4.32

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> )
Ground Floor	Ground Floor - Solid	Lowest occupied	Slab on ground, screed over insulation	0.11	None	0.00	110.00	99.90

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m <sup>2</sup> K)
Glazing	Manufacturer	Window	Triple Low-E Hard 0.2			0.64		0.70	1.00
Door	Manufacturer	Solid Door							1.00
Roof Windows	Manufacturer	Roof Window	Triple Low-E Hard 0.2			0.64		0.70	1.00

### 13.0 Openings

# Summary for Input Data

Name	Opening Type	Location	Orientation	Area (m <sup>2</sup> )	Pitch
S/E	Door	External Wall	South East	2.10	
S/E	Glazing	External Wall	South East	4.86	
N/E	Glazing	External Wall	North East	1.47	
S/E	Roof Windows	Slope Roof	South East	2.16	30
S/W	Glazing	External Wall	South West	1.62	
S/W	Roof Windows	Slope Roof	South West	2.16	30
N/W above patio door	Glazing	External Wall	North West	2.35	
N/W	Glazing	External Wall	North West	12.77	

## 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	13.88	0.06	0.06 hi therm	Yes
E3 Sill	Independently assessed	6.80	0.02	0.02 Unilin CTPIR	No
E4 Jamb	Independently assessed	26.81	0.02	0.02 Unilin CTPIR	No
E5 Ground floor (normal)	Independently assessed	44.38	0.06	0.06 Unilin CTPIR	Yes
E16 Corner (normal)	Independently assessed	14.40	0.04	0.04 Unilin CTPIR	No
R1 Head of roof window	Independently assessed	3.60	0.06	0.06 Unilin GEN R1	Yes
R2 Sill of roof window	Independently assessed	3.60	0.06	0.06 Unilin Gen R2	Yes
R3 Jamb of roof window	Independently assessed	9.60	0.06	0.06 Unilin Gen R3	Yes
E17 Corner (inverted – internal area greater than external area)	Independently assessed	4.80	-0.07	-0.07 Unilin CTPIR	No
E10 Eaves (insulation at ceiling level)	Independently assessed	15.66	0.06	0.06 Unilin CTPIR	No
E12 Gable (insulation at ceiling level)	Independently assessed	8.30	0.06	0.06 Unilin CTPIR	No
E11 Eaves (insulation at rafter level)	Independently assessed	12.12	0.05	0.05 Unilin CTPIR	No
E13 Gable (insulation at rafter level)	Independently assessed	11.97	0.06	0.06 Unilin CTPIR	No
R4 Ridge (vaulted ceiling)	Table K1 - Default	6.06	0.12	0.12	No
R10 All other roof or room-in-roof junctions	Table K1 - Default	2.33	0.32	0.32	No

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

## 18.0 Pressure Testing

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

Test Method

## 19.0 Mechanical Ventilation

### Mechanical Ventilation

Mechanical Ventilation System Present

Approved Installation

Mechanical Ventilation data Type

Type

MV Reference Number

Configuration

Manufacturer SFP

Duct Type

MVHR Efficiency

Wet Rooms

SFP from Installer Commissioning Certificate

MVHR System Location

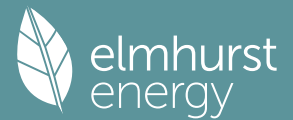
Duct Installation Specification

### 19.1 Mechanical extract ventilation - Decentralised

SFP	Fan/Room Type	Count
0.13	In Room Fan Kitchen	1
0.11	In Room Fan Other Wet Room	2
0.00	In Duct Fan Kitchen	0
0.00	In Duct Fan Other Wet Room	0
0.10	Through Wall Fan Kitchen	0
0.10	Through Wall Fan Other Wet Room	0

## 20.0 Fans, Open Fireplaces, Flues

# Summary for Input Data



**21.0 Fixed Cooling System**

**22.0 Lighting**

No Fixed Lighting

Name	Efficacy	Power	Capacity	Count
Lighting 1	95.00	5	475	40

**24.0 Main Heating 1**

Database

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**

Heat Source	Fuel Type	Heating Use	Efficiency	Percentage Of Heat	Heat	Heat Power Ratio	Electrical	Fuel Factor	Efficiency type
Heat source 1									
Heat source 2									
Heat source 3									
Heat source 4									
Heat source 5									

**28.0 Water Heating**

Water Heating

SAP Code

Flue Gas Heat Recovery System

Waste Water Heat Recovery Instantaneous System 1

Waste Water Heat Recovery Instantaneous System 2

Waste Water Heat Recovery Storage System

Solar Panel

Water use <= 125 litres/person/day

Cold Water Source

Bath Count

Immersion Only Heating Hot Water

**28.1 Showers**

Description	Shower Type	Flow Rate [l/min]	Rated Power [kW]	Connected	Connected To

**28.3 Waste Water Heat Recovery System**

**29.0 Hot Water Cylinder**

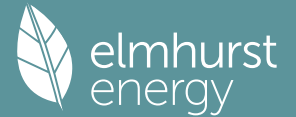
Hot Water Cylinder

Cylinder Stat

Cylinder In Heated Space

Independent Time Control

# Summary for Input Data



Insulation Type	Measured Loss	
Cylinder Volume	150.00	L
Loss	1.86	kWh/day
Pipes insulation	Fully insulated primary pipework	
In Airing Cupboard	No	

**31.0 Thermal Store**

**32.0 Photovoltaic Unit**

Export Capable Meter?

Connected To Dwelling

Diverter

Battery Capacity [kWh]

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

**34.0 Small-scale Hydro**

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

Typical Cost	Typical savings per year	Ratings after improvement	
		SAP rating	Environmental Impact
£4,000 - £6,000	£63	A 101	A 102
		0	0
		0	0

# U-Value Calculations

# U-VALUE CALCULATOR REPORT

Property Reference	23-262	Issued on Date	05/01/2024
Assessment Reference		Prop Type Ref	
Project			
Calculation Type	New Build (As Designed)		

SAP Rating		DER		TER	
Environmental		% DER<TER			
CO <sub>2</sub> Emissions (t/year)		DFEE		TFEE	
General Requirements Compliance		% DFEE<TFEE			

Assessor Details	Mr. William Simpson, Barlings Kwa Limited, Tel: 01522797344, william@barlingskwa.co.uk	Assessor ID	H077-0001
Client			

## Building Elements

### Wall Cavity Walls

#### Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m <sup>2</sup> K)	Resistance (m <sup>2</sup> K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	<b>Brick, outer leaf</b>				
	Main construction	100	0.7700	0.1299	82.81
	Main construction	100	0.9407	0.1063	17.19
Layer 2	<b>CavityTherm 5mm cavity</b>				
	Main construction	5	0.0455	0.1100	100.00
	Corrections - Cavity Unventilated, Emissivity: Normal				
Layer 3	<b>Cavity Therm CT/PIR</b>				
	Main construction	100	0.0210	4.7619	100.00
	Corrections - Air Gap: Level 1, Fasteners: Wall ties, Cross sectional area: 12.50 mm <sup>2</sup> , Lambda: 17.000 W/m.K, per m <sup>2</sup> : 2.500				
Layer 4	<b>Blockwork, light</b>				
	Main construction	100	0.1800	0.5556	93.43
	Main construction	100	0.8803	0.1136	6.57
Layer 5	<b>airspace/plaster dabs</b>				
	Main construction	15	0.0882	0.1700	80.00
	Main construction	15	0.0882	0.1700	20.00
	Corrections - Cavity Unventilated, Emissivity: Normal				
Layer 6	<b>Plasterboard, standard</b>				
	Main construction	12.5	0.2100	0.0595	100.00
Layer 7	<b>Plaster, standard</b>				
	Main construction	3	0.4000	0.0075	100.00
Int surface				0.1300	

Total resistance: Upper limit = 5.929 m<sup>2</sup> K/W Lower limit = 5.847 m<sup>2</sup> K/W Average = 5.888 m<sup>2</sup> K/W  
 Total correction = 0.0093 m<sup>2</sup> K/W U-value (unrounded) = 0.18 W/m<sup>2</sup> K

Unheated space: None

Total thickness: 336 mm

U-value: 0.18 W/m<sup>2</sup> K

Kappa: n/a



# U-VALUE CALCULATOR REPORT

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Assessment Reference		Prop Type Ref	
Project			
Calculation Type	New Build (As Designed)		

SAP Rating		DER		TER	
Environmental		% DER<TER			
CO <sub>2</sub> Emissions (t/year)		DFEE		TFEE	
General Requirements Compliance		% DFEE<TFEE			

Assessor Details	Mr. William Simpson, Barlings Kwa Limited, Tel: 01522797344, william@barlingskwa.co.uk	Assessor ID	H077-0001
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Client	
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## Building Elements

### Roof Cold Roof

#### Roof Type: Pitched Roof, insulated flat ceiling

Layer	Description	Thickness (mm)	Conductivity (W/m <sup>2</sup> K)	Resistance (m <sup>2</sup> K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	<b>Mineral wool</b>				
	Main construction	200	0.0400	5.0000	100.00
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 2	<b>Mineral wool</b>				
	Main construction	150	0.0400	3.7500	100.00
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 3	<b>Mineral wool</b>				
	Main construction	100	0.0400	2.5000	91.67
	Main construction	100	0.1300	0.7692	8.33
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 4	<b>Plasterboard, standard</b>				
	Main construction	12.5	0.2100	0.0595	100.00
Layer 5	<b>Plaster, standard</b>				
	Main construction	3	0.4000	0.0075	100.00
Int surface				0.1000	

Total resistance: Upper limit = 11.290 m<sup>2</sup> K/W Lower limit = 11.062 m<sup>2</sup> K/W Average = 11.176 m<sup>2</sup> K/W  
 Total correction = 0.0065 m<sup>2</sup> K/W U-value (unrounded) = 0.1 W/m<sup>2</sup> K

Unheated space:	None
Total thickness:	466 mm
U-value:	0.10 W/m <sup>2</sup> K
Kappa:	n/a

# U-VALUE CALCULATOR REPORT

Property Reference	23-262	Issued on Date	05/01/2024
Assessment Reference		Prop Type Ref	
Project			
Calculation Type	New Build (As Designed)		

SAP Rating		DER		TER	
Environmental		% DER<TER			
CO <sub>2</sub> Emissions (t/year)		DFEE		TFEE	
General Requirements Compliance		% DFEE<TFEE			

Assessor Details	Mr. William Simpson, Barlings Kwa Limited, Tel: 01522797344, william@barlingskwa.co.uk	Assessor ID	H077-0001
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Client	
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## Building Elements

### Roof Slope Roof

#### Roof Type: Pitched Roof, insulated sloping ceiling

Layer	Description	Thickness (mm)	Conductivity (W/m <sup>2</sup> K)	Resistance (m <sup>2</sup> K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	<b>ECO MA(ROOFS)</b>				
	Main construction	125	0.0200	6.2500	91.67
	Main construction	125	0.1300	0.9615	8.33
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 2	<b>ECO MA(ROOFS) 50mm</b>				
	Main construction	50	0.0230	2.1739	100.00
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 3	<b>Plasterboard, standard</b>				
	Main construction	12.5	0.2100	0.0595	100.00
Layer 4	<b>Plaster, standard</b>				
	Main construction	3	0.4000	0.0075	100.00
Int surface				0.1000	

Total resistance: Upper limit = 7.626 m<sup>2</sup> K/W Lower limit = 6.667 m<sup>2</sup> K/W Average = 7.146 m<sup>2</sup> K/W  
 Total correction = 0.0045 m<sup>2</sup> K/W U-value (unrounded) = 0.14 W/m<sup>2</sup> K

Unheated space:	None
<b>Total thickness: 191 mm</b>	<b>U-value: 0.14 W/m<sup>2</sup> K</b>
	<b>Kappa: n/a</b>

# U-VALUE CALCULATOR REPORT

Property Reference	23-262	Issued on Date	05/01/2024
Assessment Reference		Prop Type Ref	
Project			
Calculation Type	New Build (As Designed)		

SAP Rating		DER		TER	
Environmental		% DER<TER			
CO <sub>2</sub> Emissions (t/year)		DFEE		TFEE	
General Requirements Compliance		% DFEE<TFEE			

Assessor Details	Mr. William Simpson, Barlings Kwa Limited, Tel: 01522797344, william@barlingskwa.co.uk	Assessor ID	H077-0001
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Client	
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## Building Elements

### Floor Ground Floor

Floor Type: Slab On Ground Floor  
 Area = 99.90 m<sup>2</sup>, Perimeter = 44.38 m, Wall thickness = 335.00 mm, Soil: Unknown  
 Horizontal edge insulation: none  
 Vertical edge insulation: Width D = 225.0 mm, Thickness dn = 25.0 mm, Lambda = 0.022

Layer	Description	Thickness (mm)	Conductivity (W/m <sup>2</sup> K)	Resistance (m <sup>2</sup> K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	<b>Concrete, medium density</b>				
	Main construction	150	1.3500	0.1111	100.00
Layer 2	<b>Thin-R Plus XT/HYF</b>				
	Main construction	150	0.0210	7.1429	100.00
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 3	<b>Screed</b>				
	Main construction	75	1.1500	0.0652	100.00
Int surface				0.1700	

Total resistance: Upper limit = 7.319 m<sup>2</sup> K/W Lower limit = 7.319 m<sup>2</sup> K/W Average = 7.319 m<sup>2</sup> K/W  
 Total correction = 0.0095 m<sup>2</sup> K/W U-value (unrounded) = 0.11 W/m<sup>2</sup> K

Unheated space: None
Total thickness: 375 mm U-value: 0.11 W/m <sup>2</sup> K Kappa: n/a

# Overview Report & Predicted EPC

# Overview Report

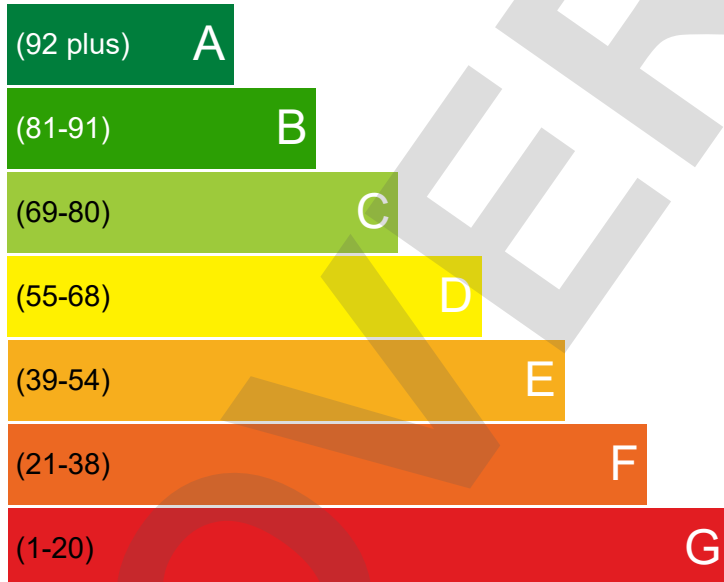
Dwelling Address	rear of 189, Newark Road, North Hykeham, Lincoln, Lincs, LN6 8
Report Date	10/01/2024
Property Type	Bungalow, Detached
Floor Area [m <sup>2</sup> ]	100

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 0.17 W/m <sup>2</sup> K	Very Good
Roof	Average thermal transmittance 0.12 W/m <sup>2</sup> K	Very Good
Floor	Average thermal transmittance 0.11 W/m <sup>2</sup> K	Very Good
Windows	High performance glazing	Very Good
Main heating	Air source heat pump, radiators and underfloor, electric	Very Good
Main heating controls	Time and temperature zone control	Very Good
Secondary heating	None	
Hot water	From main system	Average
Lighting	Excellent lighting efficiency	Very Good
Air tightness	Air permeability [AP50] = 1.0 m <sup>3</sup> /h.m <sup>2</sup> (assumed)	Very Good

## Primary Energy use

The primary energy use for this property per year is 2 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: **-0.2** 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	£63	 2	£63	 A 101
Photovoltaic		 -101	£73	 G 0

## Estimated energy use and potential savings

Estimated energy cost for this property over a year

**£73**

Over a year you could save

**£63**

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	Mrs. Kerry Simpson
Assessor's accreditation number	EES/014130
Email Address	william@barlingskwa.co.uk

## Accreditation scheme contact details

Accreditation scheme	Elmhurst Energy Systems Ltd
Telephone	01522 797344
Email Address	william@barlingskwa.co.uk

## Assessment details

Related party disclosure	No related party
Date of assessment	10/01/2024
Date of certificate	10/01/2024
Type of assessment	SAP, new dwelling



# Predicted Energy Assessment



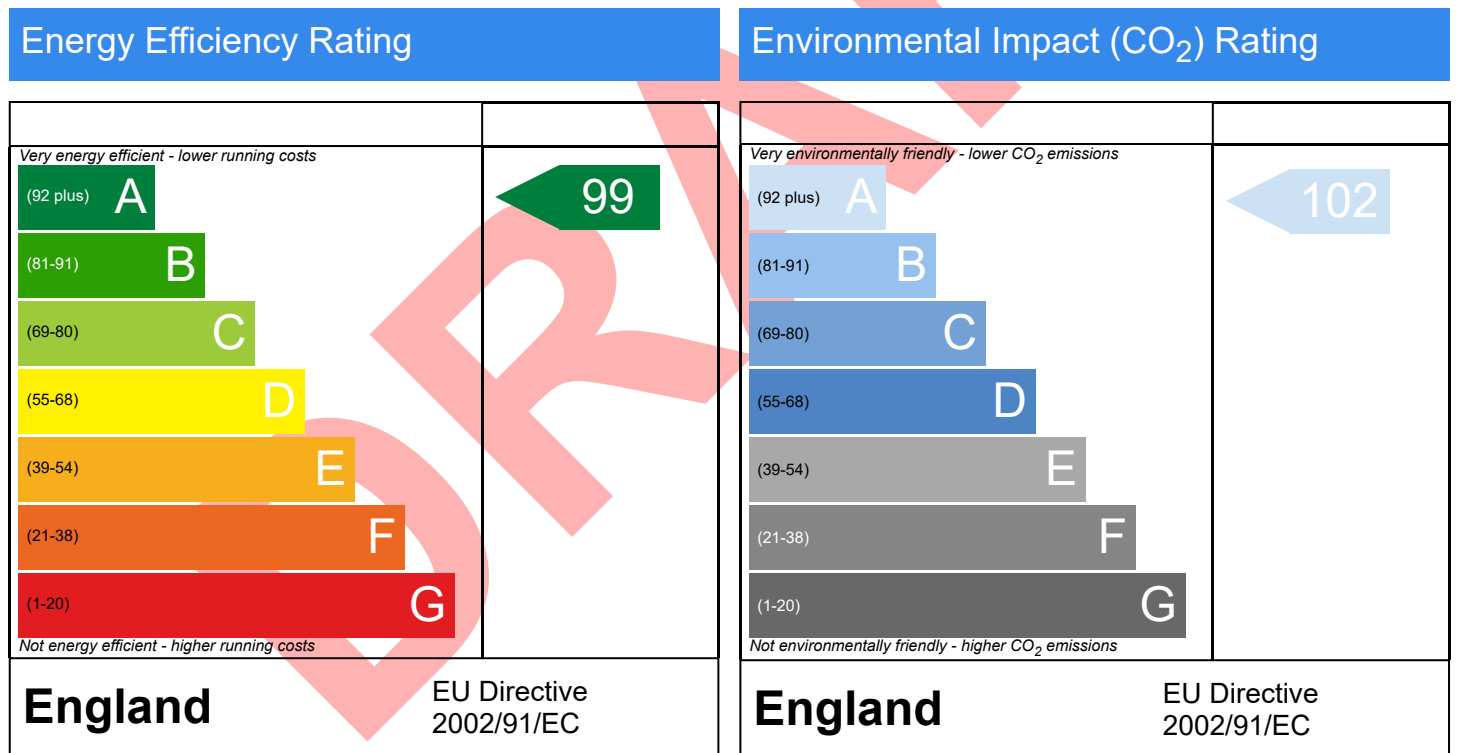
rear of 189, Newark Road, North Hykeham, Lincoln,  
Lincs, LN6 8

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

Bungalow, Detached  
10/01/2024  
Kerry Simpson  
99.9 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.