

ENERGY STATEMENT

PROPOSED DWELING AT 1 THE DRIVE, BLACKMORE END .

James Turner

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Appendix 1: Sap 2021 Compliance Report

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EXECUTIVE SUMMARY:

1 This Energy Statement has been prepared by J E Turner to support the planning application of the site located on the land at 1 The Drive, Blackmore End, AL4 8LE

2 The proposed development is for a detached 4-bedroom family home

3 The primary purpose of this document is to demonstrate how the proposed strategy complies with Building Regulations Part L: 2021 conservation of fuel and power and North Hertfordshire local policies.

4 J E Turner have undertaken a review of the relevant policies and worked with the design team to determine and agree the approach set out within this document to comply with the relevant policies.

5 This report additionally illustrates how the scheme follows the Energy Hierarchy and sets passive and efficiency improvements before the application of any Low or Zero Carbon (LZC) sources.

6 Part L1 2021 edition compliant SAP calculations have been produced using the approved SAP 2021 software, to determine the energy and CO2 emissions for the proposed development.

7 To reduce the energy demand and achieve compliance with the fabric energy efficiency criteria of the Building Regulations the following passive design measures have been incorporated into the strategy:

Building fabric improved over the Building Regulation minimum U values.

Air permeability reduced compared to Building Regulation minimum values.

Enhanced construction details to be used, reducing losses associated with thermal bridging.

Solar control glazing with low solar gain transmittance (G-value) to reduce risk of overheating.

Efficient central mechanical ventilation systems with heat recovery to provide improved air quality whilst minimising waste heat.

Encouraged use of natural light through optimised window design to minimise the need for artificial lighting.

Low energy lighting to be used throughout to supplement natural light when required.

Energy display devices and associated metering to be provided to tenants to increase awareness of energy consumption.

- 8 The Dwelling Fabric Energy Efficiencies (DFEE) and have been assessed to ensure compliance with this criterion of the building regulations. With the incorporation of the above demand reduction measures the property achieves an 3% improvement over the target DFEE, therefore satisfying the fabric first requirement.
- 9 With the incorporation of an Air Source Heat Pump (ASHP), 3.8Kw solar photovoltaic panels, solar i boost system and 10kw solar battery, the scheme offers an 82% reduction in carbon emissions over the Part L 2021 target emissions Dwelling Emissions Rating over Target Emissions Rating
- 10 The 2021 Edition of the Part L Building Regulations has additional compliance criteria to limit the dwelling primary energy consumption referred to as the Primary Energy Rate (PER). The property will achieve an 66% improvement in the Dwelling Primary Energy Rating over the Target Primary Energy Rating.
- 11 The anticipated savings have demonstrated a significant improvement over the minimum standards required by the Building Regulations, as such, is deemed to satisfy the Councils desire to minimise the impact of carbon emissions on the environment associated with the construction and operation of the development

Introduction:

In May 2019, the UK Government declared a climate emergency and proposed amendments to the Climate Change Act 2008, following recommendations made by the Committee on Climate Change.

North Hertfordshire Local Plan (2011-2031) – Policy D1

National guidance states that planning should achieve high quality and inclusive design for all development. Development proposals should consider the potential for minimising their impact on the environment both during construction and throughout the life of the development whilst creating development that responds to and enhances its surroundings. It is also recognised that good quality design is essential for health and well-being.

Planning permission will be granted provided that development proposals:

- a. Respond positively to the site's local context.
- b. Take all reasonable opportunities, consistent with the nature and scale of the scheme, to:
 - i. create or enhance public realm.
 - ii. optimise the potential of the site by incorporating Sustainable Drainage Systems (SuDS).
 - iii. reduce energy consumption and waste.
 - iv. retain existing vegetation and propose appropriate new planting.
 - v. maximise accessibility, legibility, and physical and social connectivity both internally and with neighbouring areas.
 - vi. future proof for changes in technology and lifestyle.
 - vii. design-out opportunities for crime and anti-social behaviour; and
 - viii. minimise the visual impact of street furniture and parking provision.
- c. Have regard to the Design SPD, and any other relevant guidance.
- d. For residential schemes, meet or exceed the nationally described space standards and optional water efficiency standards.

Summary of Policy Targets

Aim to reduce carbon emissions associated with the site over the new Building Regulation Part L 2021 requirements, enforced on 15th June 2022.

Aim to reduce the primary energy consumption associated with the site over the new Building Regulation Part L 2021 requirements, enforced on 15th June 2022.

Background and legislation

In June 2019, parliament passed legislation requiring the government to reduce the UK's net emissions of greenhouse gases (GhG) by 100% relative to 1990 levels by 2050.

In November 2020, the ten-point plan for a green industrial revolution was published. The plan sets out the approach government will take to build back better, support green jobs, and accelerate our path to net zero.

On 21st May 2019, North Herts Council (NHDC) passed a climate emergency motion.

The declaration asserted the Council's commitment toward climate action beyond current government targets and international agreements. In July 2023 the Council declared an ecological emergency identifying biodiversity and nature recovery as a strategic priority for planning. The ecological emergency motion includes a pledge to identify appropriate areas for habitat restoration, biodiversity net gain and to reduce loss/harm of existing habitats.

The Climate Strategy: 2022 – 2027 outlines the Council's key objectives toward tackling climate change:

Achieve Carbon Neutrality for the Council's own operations by 2030;
Ensure all Council operations and services are resilient to the impacts of climate change.
Achieve a Net Zero Carbon District by 2040; and
Become a District that is resilient to unavoidable impacts of climate change.

The Sustainability SPD identifies:

The main sustainable construction requirements under both 'mitigation' to climate change (i.e. ways of reducing greenhouse gas emissions – mainly CO₂) and adaptation to predicted climate change.

The design and energy-saving/efficiency measures that can result in a development minimising greenhouse gas emissions and energy use and waste.
It aims to create places that are amenable to biodiversity and adaptable to a changing climate (including through the integration of green infrastructure).

Guidance on renewable and low-carbon energy solutions, for reduced reliance on fossil fuels and finite energy sources, and for efficient use of national grid energy.

Potential solutions to water shortages and efficiencies requirements.

Energy Hierarchy- Fabric First

The North Hertfordshire climate change and sustainability section within the local plan, seeks a 'fabric first' approach to reducing the carbon footprint associated with the built environment. This is achieved through buildings using less energy by improving u-values, airtightness, and lighting efficiency etc.

This is the first step to consider in reducing a building's carbon emissions before the efficient delivery of power, heat or renewables are considered by a design-team. The following details the demand reduction measures that have been incorporated into the scheme.

The building fabric is a key parameter that effects the energy required to maintain comfortable internal conditions. Fabric performance is centred around the U-value of the building elements that form the buildings thermal envelope.

The tables below summarise the proposed fabric performance and the proposed thermal bridging psi values for the site.

Building Fabric

A highly insulated building with low U values and good levels of air tightness will help to limit heat losses through the fabric of the building. Thermal bridges should be covered as a minimum by Accredited Construction Details and wherever possible by Enhanced Accredited Construction Details and manufacturers Constructive Details to enable losses through thermal bridging to be kept to a minimum.

Following energy efficiency measures, including the much better than minimum standard U values for the fabric of the building as below:

	Approved Document L Limiting fabric U Values	Proposed U values
External wall	0.26 W/m ² .k	0.18 W/m ² .k
Roof	0.16 W/m ² .k	0.11 W/m ² .k
Floor	0.18 W/m ² .k	0.11 W/m ² .k
Windows	1.60 W/m ² .k	1.20 W/m ² .k
Glazed doors	1.60 W/m ² .K	1.20 W/m ² .K
Doors	1.60 W/m ² .k	0.80W/m ² .k
Air permeability	8.0m ³ /hr/m ²	5.01m ³ /hr/m ²

Solar Gain

Careful positioning of glazed openings in the external fabric of the building can lead to increases in solar gain, which will contribute to lower energy consumption and reduced Co2 emissions. Good daylight factors will also reduce energy consumption from artificial lighting. Openable windows/glazed doors, allowing a through flow a clean fresh air will also help to prevent summer overheating. If appropriate, internal shading (blinds, curtains etc) and external shading (shutters, sun shades etc) can also be used to limit summer overheating.

The most glazed elevation featuring the large sliding doors is Easterly facing and benefits from shading through the existing established tree canopies.

An efficient MVHR unit is also proposed. This will improve internal air quality and provide an energy efficient mitigation to excess moisture from wet rooms, whilst providing heat to living spaces

Low Energy Lighting

All lighting for the property should be low energy and bulbs should have a minimum of 80 lamp lumens per circuit watt. Fittings should also have more than 400 lumens per fitting. External low energy lighting, should be on PIR detectors to limit operation times.

Air Permeability

The Designed air permeability has been set at 5.01m³/hr/m²

Space Heating and hot water

It is proposed that the heating and hot water for the dwelling will be provided by an Air Source Heat Pump. A 14Kw Mitsubishi Ecodan has been allowed for in the calculations, but an appropriately sized make and model should be used following room by room heat loss calculations by an MCS accredited heat pump installer.

Ventilation Strategy

The property will be provided with an Mechanical Ventilation and Heat Recovery unit (MVHR) providing supply air to all habitable rooms and extracting from WC's Bathrooms and utility rooms.

Energy Hierarchy- Low and zero carbon technologies

Following the demand reduction associated with the fabric first improvements, the energy hierarchy now seeks for low carbon technology to be assessed and selected for the scheme based on project viability.

A feasibility study has been undertaken for the site to establish which low carbon technologies would be suitable for the site. The findings of this have demonstrated that the following could be utilised as part of the final strategy and will be confirmed as part of the detailed design:

Low carbon community energy scheme.

Air source heat pumps.

Photovoltaic panels.

Solar thermal panels.

There is no low carbon community energy scheme in the vicinity of the site and therefore this is not technically viable for this development.

Air Source Heat Pump (ASHP) are devices that transfer heat energy from a source to a heat sink through a working fluid.

The working fluid is subjected to compression and evaporation to achieve this heat transfer via the heat pump.

Unit efficiency ratings are calculated from the unit's Coefficient of Performance (COP).

This is a measure of the unit's heat delivery for each unit of electricity used to operate the pump.

ASHPs operate on a closed loop system where the heat energy is either absorbed or rejected to the atmosphere via an evaporator depending upon if the conditioned space is being heated or cooled.

The plant for these systems typically contains an indoor heat pump and outdoor evaporator in heating mode.

It is proposed that an ASHP is used to provide both the heating and hot water for this property.

Solar photovoltaic panels work by using sun light shining on a cell made from layers of semi-conducting material, creating an electrical current flow. This electrical current can then be used, in conjunction with an inverter, to supply electricity to the property with surplus energy being fed back to the local electrical grid.

PVs do not need direct sunlight in order to operate however the stronger the light levels are the more electricity is produced so it is proposed that they are positioned in a non-shaded location preferably south facing.

It is proposed that a 3.8 Kw of solar PV array is installed on the South East elevation roof. This system will also be connected to a solar i boost immersion to assist in hot water production and also to 10Kw of solar batteries to provide electricity when the panels are not producing at nighttime.

Solar Hot Water (SHW) absorbs solar heat energy to generate hot water. DHW generation systems typically accounts for 50% of the annual hot water demand. Solar thermal systems consist of solar collectors, typically on a building roof, filled with liquid which is then pumped to a storage vessel, i.e. hot water tanks where it is used to heat the contents of the tank via an incident coil. The tank is normally a dual cylinder where a secondary coil, supplied from a separate heat source (typically a boiler/ASHP), provides additional heating to the cylinder during periods of little solar radiation. There are two main types of collectors; either flat plate collectors which are simply a dark plate in an insulated box with a transparent cover or evacuated tube collectors which are more efficient, more effective in differing weather conditions but more expensive.

It is not proposed that SHW is not included in this building's energy strategy. The use of a solar i boost in conjunction with the solar PV panels will exceed that available from any SHW system, and the two solutions are not economically compatible.

Water Efficiency

In line with Sustainable SPD guidelines for Bronze standard a water efficiency of better than 110 litres/person/day will be utilised in this property as per the methodology of Part G of current building regulations.

Energy Rating

In line with Bronze standards for a minor residential schemes, the proposed building will achieve better than an EPC C rating. It is anticipated that the building will achieve an A Rating.

Percentage Reduction from Sap Calculations

From the Sap calculations carried out on the property, the table below gives the percentage reductions in the metrics used for Sap 10 Building Regulations compliance.

Metric	Target	Achieved	Percentage Reduction
DER v TER	8.45 kgCo2/yr/m2	1.50 kgCo2/yr/m2	82.25%
DPER v TPER	44.90 kWh/m2/yr	15.11 kWh/m2/yr	66.36%
DFEE v TFEE	43.25 kWh/m2/yr	41.89 kWh/m2/yr	3.16%

Post Completion Monitoring

Following the completion of the project, as built Sap calculations and the EPC will need to be issued.

The as built Sap calculations will be used for the compilation of the BREL Report as required by Part L of Building Regulations and will show that the measures contained in this energy statement have been adhered to.

It is also a requirement that once the property is occupied, post completion monitoring is carried out.

In the case of this proposed building, which has the benefits of an air source heat pump, it would be appropriate for a SMETS 2 smart meter to be installed for the homeowner to monitor electricity usage.

A comprehensive guide to the workings of the heat pump, MVHR and installed appliances should also be provided to the occupier to ensure that all system can be run at peak efficiency. This information would normally be included in the Home User Guide.

Appendix 1:

Building Regulations England Part L (BREL) Compliance Report

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

Date: Mon 03 Mar 2025 15:09:32

Project Information			
Assessed By	James Turner	Building Type	House, Detached
OCDEA Registration	EES/003630	Assessment Date	2025-03-03

Dwelling Details			
Assessment Type	As designed	Total Floor Area	267 m ²
Site Reference	7358-0001-KW-578	Plot Reference	Proposed
Address	Proposed dwelling 1 The Drive, Blackmore End, AL4 8LE		

Client Details	
Name	Luke Kenton
Company	K W Architectural Design
Address	Lainswood House, Barnards Close, Chearsley, HP18 0BY

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	8.45 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	1.5 kgCO ₂ /m ²		OK
1b Target primary energy rate and dwelling primary energy			
Target primary energy	44.9 kWh _{PE} /m ²		
Dwelling primary energy	15.11 kWh _{PE} /m ²		OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	43.3 kWh/m ²		
Dwelling fabric energy efficiency	41.9 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 (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	Heat Loss Floor 1 (0.11)	OK
Roofs	0.16	0.11	Roof (1) (0.13)	OK
Windows, doors, and roof windows	1.6	1.16	Opening 3 (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 ²]	U-Value [W/m ² K]
Exposed wall: Walls (1)	201.711	0.18
Ground floor: Heat Loss Floor 1, Heat Loss Floor 1	133.38	0.11
Exposed roof: Roof (1)	2.88	0.13
Exposed roof: Roof (2)	111.45	0.11
Exposed roof: Roof (3)	23.82	0.12

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]
Opening 1, Entrance door	3.78	North East	N/A	0.8 (!)
Opening 2, Entrance door	1.974	South West	N/A	0.8 (!)
Opening 3, sliding/folding doors	7.0875	South East	0.7	1.2
Opening 3, sliding/folding doors	7.0875	South East	0.7	1.2
Opening 4, Windows	1.5	South West	0.7	1.2
Opening 4, Windows	1.5	South West	0.7	1.2
Opening 5, Windows	2.16	North West	0.7	1.2
Opening 5, Windows	2.16	North West	0.7	1.2
Opening 5, Windows	1.5	North West	0.7	1.2
Opening 6, Windows	2.16	South East	0.7	1.2
Opening 6, Windows	2.16	South East	0.7	1.2
Opening 6, Windows	1.5	South East	0.7	1.2

Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
Opening 7, Windows	4.68	North East	0.7	1.2
Opening 7, Windows	4.68	North East	0.7	1.2
Opening 7, Windows	4.68	North East	0.7	1.2
Opening 7, Windows	4.68	North East	0.7	1.2
Opening 8, Fixed glazing	5.1	North East	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	0.024 (!)	MHF-150-E2-02
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.202	Kingspan K106 detail
External wall	E3: Sill	Calculated by person with suitable expertise	0.023 (!)	MHF-150-E3-01
External wall	E4: Jamb	Calculated by person with suitable expertise	0.018 (!)	MHF-150-E4-01
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.073	MHF-150-E5-04
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.001 (!)	MHF-150-E6-01
External wall	E13: Gable (insulation at rafter level)	Calculated by person with suitable expertise	0.038 (!)	MHF-150-E13-01
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.069	MHF-150-E10-01
External wall	E14: Flat roof	Calculated by person with suitable expertise	0.152	ROI detail 1.20
External wall	E16: Corner (normal)	Calculated by person with suitable expertise	0.036 (!)	MHF-150-E16-01
External wall	E17: Corner (inverted - internal area greater than external area)	Calculated by person with suitable expertise	-0.062	MHF-150-E17-01
Roof	R4: Ridge (vaulted ceiling)	SAP table default	0.12	
Roof	R6: Flat ceiling	Calculated by person with suitable expertise	0.02 (!)	ROI detail 1.13.2

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	5.01 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	373.8%
Emitter type	Both radiators and underfloor
Flow temperature	35°C
System type	Heat Pump
Manufacturer	Mitsubishi Electric Europe B.V.
Model	Ecodan 14.0 kW
Commissioning	
Secondary heating system: Closed room heater	
Fuel	Wood logs
Efficiency	65.0%
Commissioning	

5 Hot water

Cylinder/store - type: Cylinder

Capacity	300 litres
Declared heat loss	2.26 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: Cylinder thermostat and HW separately timed		
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: Balanced whole-house mechanical ventilation with heat recovery		
Maximum permitted specific fan power	1.5 W/(l/s)	
Specific fan power	0.9 W/(l/s)	OK
Minimum permitted heat recovery efficiency	73%	
Heat recovery efficiency	91%	OK
Manufacturer/Model	Sentinel Kinetic Plus BS	
Commissioning		
9 Local generation		
Technology type: Photovoltaic system (1)		
Peak power	3.8 kWp	
Orientation	South East	
Pitch	45°	
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	7358-0001-KW-578		Issued on Date	03/03/2025
Assessment Reference	Proposed	Prop Type Ref		
Property	Proposed dwelling, 1 The Drive, Blackmore End, Herts, AL4 8LE			

SAP Rating	93 A	DER	1.50	TER	8.45
Environmental	98 A	% DER < TER			82.25
CO ₂ Emissions (t/year)	0.32	DFEE	41.89	TFEE	43.25
Compliance Check	See BREL	% DFEE < TFEE			3.16
% DPER < TPER	66.36	DPER	15.11	TPER	44.90

Assessor Details	Mr. James Turner	Assessor ID	7358-0001
Client	603, Luke Kenton		

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

Orientation	Northeast	
Property Tenture	ND	
Transaction Type	6	
Terrain Type	Suburban	
1.0 Property Type	House, Detached	
2.0 Number of Storeys	2	
3.0 Date Built	2025	
4.0 Sheltered Sides	0	
5.0 Sunlight/Shade	Average or unknown	
6.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	205.06	kJ/m²K

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

7.0 Measurements	Ground floor:	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
	1st Storey:	51.00 m	133.38 m²	2.41 m
		51.00 m	133.38 m²	2.85 m

8.0 Living Area	56.84	m²
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9.0 External Walls	Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area(m²)	Nett Area (m²)	Shelter Res	Shelter	Openings	Area Calculation Type
	Brick wall	Cavity Wall	Other	0.18	113.60	260.10	201.71	0.00	None	58.39	Enter Gross Area

9.2 Internal Walls	Description	Construction	Kappa (kJ/m²K)	Area (m²)
	Internal Wall 1	Plasterboard on timber frame	9.00	209.22
	Internal Wall 2	Dense block, plasterboard on dabs	75.00	212.24

10.0 External Roofs	Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area(m²)	Nett Area (m²)	Shelter Code	Shelter Factor	Calculation Type	Openings
	Bay windows	External Flat Roof	Other	0.13	0.00	2.88	2.88	None	0.00	Enter Gross Area	0.00
	Main roof	External Plane Roof	Other	0.11	12.17	111.45	111.45	None	0.00	Enter Gross Area	0.00
	Vaulted	External Slope Roof	Other	0.12	12.17	23.82	23.82	None	0.00	Enter Gross Area	0.00

10.2 Internal Ceilings	Description	Storey	Construction	Area (m²)
	Internal Ceiling 1	Lowest occupied	Plasterboard ceiling, carpeted chipboard floor	133.38

11.0 Heat Loss Floors	Description	Type	Storey Index	Construction	U-Value (W/m²K)	Shelter Code	Shelter Factor	Kappa (kJ/m²K)	Area (m²)
	Heat Loss Floor 1	Ground Floor - Solid	Lowest occupied	Other	0.11	None	0.00	65.52	133.38

Summary for Input Data

11.2 Internal Floors

Description	Storey Index	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Floor 1		Plasterboard ceiling, carpeted chipboard floor	9.00	133.38

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Entrance door	Manufacturer	Solid Door				0.63			0.80
sliding/folding doors	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.20
Windows	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.20
Fixed glazing	Manufacturer	Window	Triple Low-E Soft 0.05			0.57		0.70	1.20

13.0 Openings

Name	Opening Type	Location	Orientation	Area (m²)	Pitch
Opening 1	Entrance door	Brick wall	North East	3.78	
Opening 2	Entrance door	Brick wall	South West	1.97	
Opening 3	sliding/folding doors	Brick wall	South East	14.18	
Opening 4	Windows	Brick wall	South West	3.00	
Opening 5	Windows	Brick wall	North West	5.82	
Opening 6	Windows	Brick wall	South East	5.82	
Opening 7	Windows	Brick wall	North East	18.72	
Opening 8	Fixed glazing	Brick wall	North East	5.10	

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	6.75	0.02	0.02 MHF-150-E2-02	No
E2 Other lintels (including other steel lintels)	Independently assessed	30.54	0.20	0.20 Kingspan K106 detail	No
E3 Sill	Independently assessed	27.80	0.02	0.02 MHF-150-E3-01	No
E4 Jamb	Independently assessed	45.60	0.02	0.02 MHF-150-E4-01	No
E5 Ground floor (normal)	Independently assessed	51.00	0.07	0.07 MHF-150-E5-04	No
E6 Intermediate floor within a dwelling	Independently assessed	51.00	0.00	0.00 MHF-150-E6-01	No
E13 Gable (insulation at rafter level)	Independently assessed	4.20	0.04	0.04 MHF-150-E13-01	No
E10 Eaves (insulation at ceiling level)	Independently assessed	47.78	0.07	0.07 MHF-150-E10-01	No
E14 Flat roof	Independently assessed	6.80	0.15	0.15 ROI detail 1.20	No
E16 Corner (normal)	Independently assessed	51.00	0.04	0.04 MHF-150-E16-01	No
E17 Corner (inverted – internal area greater than external area)	Independently assessed	30.60	-0.06	-0.06 MHF-150-E17-01	No
R4 Ridge (vaulted ceiling)	Table K1 - Default	6.40	0.12	0.12	No
R6 Flat ceiling	Independently assessed	12.80	0.02	0.02 ROI detail 1.13.2	No

Y-value W/m²K

19.0 Mechanical Ventilation

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	Yes
Mechanical Ventilation data Type	Database
Type	Balanced mechanical ventilation with heat recovery
MV Reference Number	500289
Configuration	6
Manufacturer SFP	0.90
Duct Type	Rigid
MVHR Efficiency	91.00
Wet Rooms	6
SFP from Installer Commissioning Certificate	No
MVHR System Location	Inside heated envelope (installed exclusively)
Duct Installation Specification	Level 1

20.0 Fans, Open Fireplaces, Flues

Number of open chimneys	0
Number of open flues	0
Number of chimneys/flues attached to closed fire	0
Number of flues attached to solid fuel boiler	0

Summary for Input Data

Number of flues attached to other heater	0
Number of blocked chimneys	0
Number of intermittent extract fans	0
Number of passive vents	0
Number of flueless gas fires	0

21.0 Fixed Cooling System	No
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22.0 Pressure Testing	Yes	
Designed AP ₅₀	5.01	m ² /(h.m ²) @ 50 Pa
Test Method	Blower Door	

22.0 Lighting	No				
No Fixed Lighting	No				
	Name	Efficacy	Power	Capacity	Count
	Low energy Lighting	80.00	8.00	640.00	48

24.0 Main Heating 1	Database	
Description	Air Source heat pump	
Percentage of Heat	100.00	%
Database Ref. No.	105057	
Fuel Type	Electricity	
In Winter	373.82	
In Summer	167.79	
Model Name	Ecodan 14.0 kW	
Manufacturer	Mitsubishi Electric Europe B.V.	
System Type	Heat Pump	
Controls SAP Code	2207	
PCDF Controls	0	
Is MHS Pumped	Pump in heated space	
Heating Pump Age	2013 or later	
Heat Emitter	Radiators and Underfloor	
Underfloor Heating	Yes - Pipes in thin screed	
Flow Temperature	Enter value	
Flow Temperature Value	35.00	

25.0 Main Heating 2	None
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26.0 Heat Networks	None
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27.0 Secondary Heating	SAP table	
SAP Code	633	
Heating System Description	Solid fuel Closed room heater	
Fuel Type	Wood Logs	
SHS efficiency	60.00	%
HETAS Approved System	Yes	

28.0 Water Heating	Main Heating 1
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

Summary for Input Data

Solar Panel	No
Water use <= 125 litres/person/day	Yes
Cold Water Source	From mains
Bath Count	2
Immersion Only Heating Hot Water	Yes

28.1 Showers

Description	Shower Type	Flow Rate [l/min]	Rated Power [kW]	Connected	Connected To
Family bathroom	Combi boiler or unvented hot water system	9.00		No	
Ensuite 1	Combi boiler or unvented hot water system	9.00		No	
Ensuite 2	Combi boiler or unvented hot water system	9.00		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	300.00	L
Loss	2.26	kWh/day
Pipes insulation	Fully insulated primary pipework	
In Airing Cupboard	No	

31.0 Thermal Store

None

32.0 Photovoltaic Unit

0 Photovoltaic Unit	One Dwelling
Export Capable Meter?	Yes
Connected To Dwelling	Yes
Diverter	Yes
Battery Capacity [kWh]	10.00

PV Cells kWp	Orientation	Elevation	Overshading	FGHRS	MCS Certificate	Overshading Factor	MCS Certificate Reference	Panel Manufacturer
3.80	South East	45°	None Or Little		No	1.00		

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

Typical Cost	Typical savings per year	Ratings after improvement	
		SAP rating	Environmental Impact
£4,000 - £6,000	£94	A 94	A 99
		0	0
		0	0

Appendix 2:



Proposed dwelling at 1 The Drive, Blackmore End

James Turner

J E TURNER, 36 WEST LANE CLOSE, KEESTON, SA62 6EW

SAP Calculation Design Stage Summary

The Design Stage SAP calculation(s) which we have issued for the project below are based upon the following specifications as detailed within the drawings and specifications provided and any subsequent correspondence with you and your design team.

It is important that you adhere to the specification outlined below, as any deviation from these design parameters during the construction will more than likely have an immediate impact on the calculated SAP result(s).

If changes are to be made, subsequent enhancements may be required elsewhere within the specification in order to maintain overall Part L compliance. We would therefore urge you to contact us in a timely manner with details of any potential changes before they are adopted, so that we may model the overall effect on the SAP Assessment and advise you further.

In the event that the Design Stage specifications are altered without consultation, J E Turner shall accept no liability for any subsequent failure to comply with Part L1 of the Building Regulation upon completion of the project.

Please note that under current regulations, photographic evidence of all thermal bridge junctions is required at as built stage. Photographs should have time and date stamp, have geo location data and should be taken throughout the build process. It is advised that several photographs be taken of each junction for each plot. Failure to provide sufficient detailed photographs may result in a failure to comply with Part L1 of the Building Regulation upon completion of the project.

It is assumed that Part O - over heating calculations have already been carried out, either by the Simplified Method or by Dynamic Thermal Modelling.

Job Description	
Address:	1 The Drive, Blackmore End, Herts, AL4 8LE
Client Details:	K W Architectural Design
Reference Number:	7358-0001-KW-578
Date:	03/03/2025
Number of units:	1
Part L version	2021 Edition

Build Specifications

Thermal element	Target U value	Description
Ground floor	0.11W/m2.K	140mm Kingspan K103 on block and beam floor 65mm screed over
External wall main	0.18W/m2.K	Brick outer skin, 90mm Kingspan K106 cavity insulation in 100mm cavity, Fibolite 7.3N block inner skin with lambda value better than 0.28W/m.K, with plasterboard on dabs
Pitched roof-rafter	0.12W/m2.k	150mm Kingspan K107 between rafters, 50mm Kingspan below
Pitched roof-ceiling	0.11W/m2.K	150mm loft roll 40 between joists, 200mm loft roll over
Flat roof-bay window	0.12W/m2.K	150 Kingspan over ceiling joists/firrings,
Internal floors		Timber floor joists chipboard floor
Partition 1		Medium dense block with plasterboard on dabs
Partition 2		Plasterboard on timber studwork
Entrance doors	0.8 W/m2.K	Composite solid entrance door
Glazed doors	1.2 W/m2.K	Double/triple glazed, BFRC datasheet if possible
Windows	1.2 W/m2.K	Double/triple glazed, BFRC datasheet if possible
Roof Lights		
Roof Lantern		
Air tightness target	5.01	Air tightness testing is required for each property. Poor detailing and workmanship could result in a poor level of air tightness and result in an overall failure to show compliance to Approved Document L

Space and Hot water Controls	
Type of Space Heating:	Air Source Heat Pump
Make and Model:	Mitsubishi 14 Kw allowed for in calculations. Please get an appropriate heat pump that has been sized properly by an installer based on a room by room heat loss calculation. As soon as the make and model is known, please let me know. Some heat pump makes and models may require some solar PV panels to pass the sap calculations Bath and all showers from hot water cylinder, max flow rate of shower 9 litres/minute
Heating Flow Temperature:	35 degrees
Fuel:	Electricity
Heat emitters:	Underfloor heating and radiators
Heating Control:	Time and temperature zone control
Secondary Heating system	Wood burning stove
Hot Water cylinder	
Capacity of cylinder in litres:	300 litre with cylinder stat, independent time control, in heated space with fully insulated primary pipework
Declared heat loss in Kwh/day:	300 L – 2.25Kwh/day,
Ventilation	
Type:	MVHR unit with level 1 rigid ducting
Make and Model:	Vent Axia Sentinel Kenetic Plus BS
Number of wet rooms:	Bathrooms, WCs, Kitchen and utility
Lighting	
Power of light bulbs	8W
Efficacy of bulbs	80
Alternative Low or Zero Carbon Technologies	
Technology Type:	3.8 Kw solar PV located on Southwest elevation roof. Little or no over shading. Solar I boost/eddi system to assist with hot water, 10Kw solar battery capacity
System details and meters:	Export capable meter (Smets 2 smart meter) Connected to dwelling electricity meter Please check with local electricity board that this is appropriate
Thermal Bridging	
Lintels:	Insulated open backed lintels with no base plate Independent steels for large openings.
Accredited Construction Details:	Building alliance recognised construction details for hybrid fill cavity.