

SUSTAINABILITY & ENERGY STATEMENT

Proposed new dwelling at:

9 Priory Road, Bristol, BS8 1TU

Statement and Part L1 calculations prepared by:

Mike Andrews

Energy Saving Experts Ltd

1/ Introduction

The aim of this Energy Statement is to demonstrate compliance with the requirements of Bristol Development Framework Core Strategy - Policies BCS 13-16 as applicable. In respect of each of the issues in BCS 13-16, this Sustainability Statement sets out what possible measures have been explored, which measures have been adopted and integrated into the design and, where relevant, why it was not feasible to incorporate certain measures into the proposed development.

The proposed is a new HMO dwelling to the rear of 9 Priory Road.

This Statement and calculations have been completed in line with Part L 2021 and the requirements of the BCS as above.

Please refer to the Application drawings submitted with the planning application.

2/ Building Regulations

No Building Regulations submission has been made in respect of the proposed development.

Important Notice:

This Statement and accompanying SAP calculations are for the purpose of a Planning Application ONLY and must not be used for Building Regulations purposes. We accept no responsibility for errors arising if these calculations and statement content is used for Building Regulations compliance.

Part L Calculation – Methodology

The building was assessed using SAP to establish a baseline energy use and CO2 emissions, the Notional Building, and to determine the same for the Proposed Building. The Proposed must be lower than the Notional to demonstrate a pass. In addition, to satisfy BCS requirements, normally a minimum of 20% additional CO2 savings should be met through on-site renewables.

SAP was also used to calculate the additional 20% reduction from on-site renewables.

3/ BSC13 – Climate Change

Requires the development to both mitigate and adapt to climate change.

Renewables

For this scheme, for electricity generation a 2.4Kw solar PV array is proposed.

EV charging

For the proposed there is off-street parking available to the site, in common with similar sites in the same location. An electric vehicle charging point is proposed for this scheme. In addition, there is an external secure cycle store.

Ventilation

The ventilation strategy for the building is natural ventilation via openable windows and trickle vents. The SAP report indicates there is no overheating risk in summer.

Heat Network

The proposed site is outside of the city heat networks.

Urban Heat Island

In terms of green space and reducing urban heat islands, the proposed site externally will be landscaped to provide a private garden for the occupants.

CO2 emissions in the building will improve upon the minimum requirements of the Building Regulations.

4/ Bristol Development Framework Core Strategy

BSC14 – Sustainable Energy

Provides criteria for assessing new renewable energy schemes. Requires new development to minimise its energy requirements and then incorporate an element of renewable energy to reduce its CO2 emissions by a further 20%.

The following hierarchy has been adopted.

1. Minimising energy requirements.
2. Incorporating renewable energy sources.
3. Incorporating low-carbon energy sources

Orientation

The proposed building is orientated on a North/South axis, making use of the existing site, with the higher area of heat loss walls to the South.

Thermal Elements

The external walls, roof and ground floor will all be insulated to exceed current Regulations. Roofs to achieve 0.11/0.12 W/mk

External walls to achieve 0.14 W/mk

Ground floor to achieve 0.13 W/mk

Windows will have a u value of 1.2, Rooflights 1.1, and external doors 1.2.

Daylight

There is adequate daylight in the building from the new windows.

Solar Shading

Additional solar shading is not required to avoid risk of overheating in summer.

Thermal Bridges

The thermal bridges at junctions will be designed to minimise heat losses and an Approved Construction Details followed during the construction process.

Air Tightness

Air testing for this building is required under Building Regs and a target of 5.0 has been set.

Selection of heating systems

Heating and cooling systems are selected in accordance with the heat hierarchy set out in policy BCS14.

Combined heat and power

CHP requires substantial demand for heat and appropriate demand for power to be viable and in this building this would not be so.

District Heating

Policy BCS14 requires that within Heat Priority Areas (as identified in the Core Strategy), major developments connect to existing heat networks where available. Where a network is not available major developments within Heat Priority Areas should incorporate infrastructure to connect to district heating networks in the future where feasible.

The proposed is not within any of the existing or planned city centre district heating networks although it is within the heat priority area.

Mechanical & Electrical Services

Electricity will be used for all heating and hot water needs. The proposed Heating is from a ASHP to both underfloor heating and radiators.

The heating and hot water will include control systems appropriate to each system, including time and temperature zoned heating controls.

The bathrooms and utility will be provided with local extract fans and will have a maximum SFP of 0.3 W/l/s.

Lighting is 100% LED low.

See Appendix 1 – Standard Template for Energy Strategies for further details of energy and co2 emissions reduction.

Renewable Energy

Solar Photovoltaic

A solar PV array is proposed. A system of 6 x 400W panels, mounted on the flat roof. External shading is unlikely. The total array size would be 6 x 400W panels, measuring approximately 9.6m².

Solar Thermal

Solar thermal is possible; however, a solar PV would have a wider benefit from the limited roof space than solar thermal, and the hot water demand is low. Therefore, solar thermal is not proposed.

Heat Pumps

An ASHP is the proposed method of heating the property.

Biomass

This has been ruled out mainly because of the fuel the storage considerations, there is no space available for large stores of bio fuel or for the plant. The heat demand from a biomass boiler would not be constant.

Wind

A wind turbine would not be appropriate for this building to due to the possible turbulence experienced in an urban environment, and the lack of an appropriate average annual wind speed.

Allowable Solutions

There are no further technologies considered to contribute from allowable solutions.

5/ BSC15 – Sustainable Design and Construction

Requires all development to engage with issues around sustainable design and construction.

Waste and recycling

The proposed will have internal/external waste & recycling provision.

If required, there will be a Construction Site Waste Management plan followed during construction work, and recycling of materials identified and reused where possible. There is no demolition proposed.

A policy of monitoring and diverting from landfill will be adopted throughout the construction period. There is adequate site space to store materials before disposal.

Water

Internal water use will be reduced by low flush W/C's, and low flow rate taps and showers to achieve no more than 110 ltrs per person per day.

Materials

All new Materials will be Green Guide Rated.

Green Infrastructure

Biodiversity. It is unlikely that there is any significant ecological value to the existing site, however, a survey has not been undertaken.

Surface water run-off will be managed by appropriately designed rainwater attenuation, yet to be designed.

A small Green roof is proposed on the ground floor.

ICT

The building will have a high-speed broadband access and enable provision of Next Generation broadband.

Sustainability Standards

There are no additional standards sought.

6/ BSC16 – Flood Risk and Water Management

Principally addresses the issues around development in a flood risk area but also require all development to include water management measures to reduce surface water run-off.

According to the Gov.uk website there is a very low risk of flooding from surface water and rivers.

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19/04/24



Attachments:

SAP Worksheets for proposed and notional, and proposed with renewables (For DER CO2 emissions and kWh figures only – NOT to be used for Building Regs compliance)

Summary Table

1.1.1. No district Heat connection

The summary table should be supported by a written explanation of the measures proposed and a full set of calculations as set out under "Detailed Measures" below. Where relevant, the proposed measures should also be shown on the application drawings.

	Regulated Energy Demand (MWhr/yr)	Regulated CO2 emissions (tonnes/yr)	CO2 saved (tonnes/yr)	% CO2 reduction
Baseline Part L TER	4.33	1.161		
Proposed scheme after energy efficiency measures	3.28	.984	177	15.2%
Residual Emissions Proposed scheme after energy efficiency measures and CHP (if using)	n/a	n/a	n/a	n/a
Proposed scheme after on site renewables	2.47	.377	607	61.6%
Total CO2 reduction beyond Part TER				67.5%

1.2.1 Residential energy efficiency table

Notional Building TER without PV (kg/CO2/m2)	Emissions for the proposed building with energy efficiency alone (kg/CO2/m2)
9.28	3.87

1.2.3 Energy efficiency measures

Provide a summary table of U values taken from the SAP /SBEM calculations:

Part L Values (2021)		
Element or System	Dwellings New	Proposed New
Wall	0.18	0.14
Roof	0.15	0.11/0.12
Floor	0.18	0.13
Windows /Doors	1.4	1.2
Permeability	8.0	5.0

Provide a description of the proposed heating system unless it is CHP, connection to district heating or renewable.

The proposed model of heat pump is to be confirmed however, input in this calc is a Vaillant Arotherm 8kW

1.2.5 On-site renewables

Set out what renewable energy sources have been incorporated into the proposed development and the resulting estimated annual yield (kWh).

This can include emission savings from the use of renewable fuels to power CHP.

Renewable electricity – enter the total installed capacity (kW)	2.4 kWp
Renewable electricity – enter the estimated annual yield (kWh) from renewable measures generating electricity. (Where available apply recognised standard methodologies such as the Microgeneration Certification Scheme (MCS) methodology for Solar PV)	1201 kWh
Renewable heat – enter the total installed capacity (kW)	8kW
Renewable heat – enter the estimated annual yield (kWh) from renewable measures generating heat	1452kWh

1.2.6 Allowable solutions

Where the full requirements of policy BCS14 cannot feasibly delivered on-site, and an alternative approach has been agreed with the planning authority, set out any further savings that will be achieved together with a description of the agreed allowable solution.

Additional saving on residual emissions from allowable solutions (kgCO2 pa)	n/a
Total savings on residual emissions from renewables and allowable solutions (%)	n/a

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19/04/24

SAP reports for the proposed, and proposed with renewables (For DER/TER CO2 emissions and kWh figures only – For planning purposes only, NOT to be used for Building Regs compliance)

Summary for Input Data

Property Reference	5957-SUST-105W-PRIORY ROAD			Issued on Date	19/04/2024
Assessment Reference	00001_WITH PV	Prop Type Ref	5957-SUST-105W-PRIORY ROAD		
Property	Rear of , 9 , Priory Road, Bristol, , BS8 1TU				

SAP Rating	87 B	DER	3.02	TER	9.28
Environmental	97 A	% DER < TER			67.46
CO ₂ Emissions (t/year)	0.3	DFEE	33.64	TFEE	39.81
Compliance Check	See BREL	% DFEE < TFEE			15.51
% DPER < TPER	36.31	DPER	30.89	TPER	48.50

Assessor Details		Assessor ID	N388-0001
Client	105 West Architects Ltd, 105 West Architects Ltd		

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

Orientation	South
Property Tenure	ND
Transaction Type	6
Terrain Type	Suburban
1.0 Property Type	House, Detached
2.0 Number of Storeys	2
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	Yes
Smart gas meter fitted	Yes

7.0 Measurements		Heat Loss Perimeter	Internal Floor Area	Average Storey Height
	Ground floor:	39.40 m	69.09 m ²	2.40 m
	1st Storey:	37.20 m	56.01 m ²	2.54 m

8.0 Living Area	18.32	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
External Wall 1	Cavity Wall	Other	0.14	181.80	181.50	165.87	0.00	None	15.63	Enter Gross Area

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Wall 1	Plasterboard on timber frame	9.00	102.60
Internal Wall 2	Dense block, dense plaster	100.00	115.39

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
External Roof 1	External Slope	Plasterboard, insulated slope	0.11	9.00	53.90	51.56	None	0.00	Enter Gross Area	2.34
External Roof 2	Roof External Flat Roof	Other	0.12	20.30	20.50	20.50	None	0.00	Enter Gross Area	0.00

Description	Storey	Construction	Area (m ²)
Internal Ceiling 1	Lowest occupied	Plasterboard ceiling, carpeted chipboard floor	56.01

Description	Type	Storey Index	Construction	U-Value (W/m ² K)	Shelter Code	Shelter Factor	Kappa (kJ/m ² K)	Area (m ²)
Heatloss Floor 1	Ground Floor - Solid	Lowest occupied	Other	0.13	None	0.00	117.00	60.10

Description	Storey Index	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Floor 1		Plasterboard ceiling, carpeted chipboard floor	9.00	56.01

Summary for Input Data

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Glazed door and window	Manufacturer	Window	Double Low-E Hard 0.2			0.72		0.70	1.20
Roof window	Manufacturer	Roof Window	Double Low-E Hard 0.2			0.72		0.70	1.10

13.0 Openings

Name	Opening Type	Location	Orientation	Area (m²)	Pitch
ED1	Glazed door and window	External Wall 1	South	2.02	
ED2	Glazed door and window	External Wall 1	West	3.82	
W1-5	Glazed door and window	External Wall 1	South	4.48	
W6	Glazed door and window	External Wall 1	South	1.32	
W7	Glazed door and window	External Wall 1	West	2.56	
W8	Glazed door and window	External Wall 1	West	1.43	
RW1-2	Roof window	External Roof 1	North	1.17	38
RW3-4	Roof window	External Roof 1	South	1.17	42

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	Independently assessed	10.46	0.03	0.03 RCD	Yes
E3 Sill	Independently assessed	10.46	0.03	0.03 RCD	Yes
E4 Jamb	Independently assessed	28.10	0.02	0.02 RCD	Yes
E5 Ground floor (normal)	Independently assessed	39.40	0.04	0.04 RCD	Yes
E6 Intermediate floor within a dwelling	Independently assessed	37.20	0.00	0.00 RCD	Yes
E16 Corner (normal)	Independently assessed	23.38	0.03	0.03 RCD	No
R1 Head of roof window	Table K1 - Default	2.60	0.24	0.24	Yes
R2 Sill of roof window	Table K1 - Default	2.60	0.24	0.24	Yes
R3 Jamb of roof window	Table K1 - Default	7.20	0.24	0.24	Yes
E11 Eaves (insulation at rafter level)	Independently assessed	19.24	0.02	0.02 RCD	No
E13 Gable (insulation at rafter level)	Independently assessed	10.39	0.04	0.04 RCD	No
E14 Flat roof	Table K1 - Default	18.63	0.16	0.16	No
E17 Corner (inverted – internal area greater than external area)	Independently assessed	4.00	-0.00	-0.00 RCD	No
R4 Ridge (vaulted ceiling)	Table K1 - Default	11.45	0.12	0.12	No
R7 Flat ceiling (inverted)	Table K1 - Default	3.67	0.12	0.12	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 1	80.00	8	640	20

24.0 Main Heating 1

Description

Percentage of Heat %

Database Ref. No.

Fuel Type

In Winter

In Summer

Model Name

Manufacturer

System Type

Summary for Input Data

Controls SAP Code	2207
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	45.00

25.0 Main Heating 2	None
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26.0 Heat Networks	None
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28.0 Water Heating	
Water Heating	Independent
SAP Code	909
Fuel Type	Electricity
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	0

28.1 Showers	Description	Shower Type	Flow Rate [l/min]	Rated Power [kW]	Connected	Connected To
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28.3 Waste Water Heat Recovery System

29.0 Hot Water Cylinder	None
In Airing Cupboard	No

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

PV Cells kWp	Orientation	Elevation	Overshading	FGHRS	MCS Certificate	Overshading Factor	MCS Certificate Reference	Panel Manufacturer
2.40	Horizontal	Horizontal	Modest		No	0.80		

34.0 Small-scale Hydro	None
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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	Environmental Impact
£4,000 - £6,000	£64	SAP rating	
		B 88	A 97
		0	0
		0	0

Overview Report

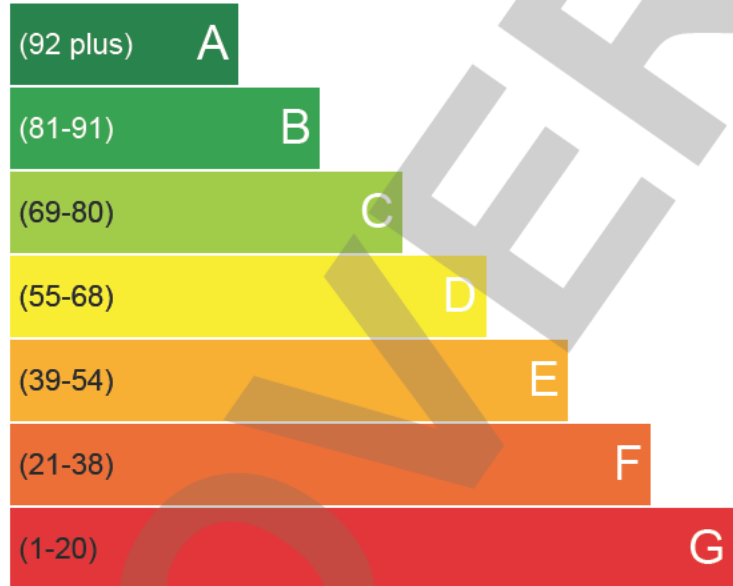
Dwelling Address	Rear of , 9 , Priory Road, Bristol, , BS8 1TU
Report Date	19/04/2024
Property Type	House, Detached
Floor Area [m ²]	125

This document is not an Energy Performance Certificate (EPC) as required by the Energy Performance of Buildings Regulations 2015.

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 if all the recommended 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



Least energy efficient - higher running costs

CURRENT

87

POTENTIAL

88

Breakdown of property's energy performance

Each feature is assessed as one of the following:

Very Poor	Poor	Average	Good	Very Good
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Feature	Description	Energy Performance
Walls	Average thermal transmittance 0.14 W/m ² K	Very Good
Roof	Average thermal transmittance 0.11 W/m ² K	Very Good
Floor	Average thermal transmittance 0.13 W/m ² K	Very Good
Windows	High performance glazing	Very Good
Main heating	Air source heat pump, radiators and underfloor heating	Good
Main heating controls	Time and temperature zone controls	Very Good
Secondary heating	None	
Hot water	Electric instantaneous at point of use	Very Poor
Lighting	Good lighting efficiency	Good
Air tightness	Air permeability [50] = 5.0 l/h.m ² (assumed)	Good

Primary Energy use

The primary energy use for this property per year is 25 kilowatt hour (kWh) per square metre

Estimated CO₂ emissions of the dwelling

The estimated 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 CO₂ emissions for this dwellings is: **0.3** per year

Overview Report

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 would need to be installed. Having these measures installed individually or in any other order may give a different result 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	£64			 B 88
Photovoltaic		 88	£497	 G 0

Estimated energy use and potential savings

Estimated energy cost for this property over a year

£497

Over a year you could save

£64

The estimated cost and savings show how much the household would spend on the 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	
Assessor's accreditation number	
Email Address	

Accreditation scheme contact details

Accreditation scheme	
Telephone	
Email Address	

Assessment details

Related party disclosure	
Date of assessment	19/04 24
Date of certificate	1
Type of assessment	SAP, new dwelling