



Designed SAP Calculation

Rear of 190 Henley Road, Caversham
Carbon Emissions Calculation - Part L1A

29th September 2021

The Beacon,
Dafen Business Park,
Llanelli,
Carmarthenshire,
SA14 8LQ
0845 094 1593
llanelli@melinconsultants.co.uk

Park House,
10 Park Street,
Bristol,
BS1 5HX
0845 094 1279
bristol@melinconsultants.co.uk

4th Floor,
Rex House,
4-12 Regent Street, London,
SW1Y 4RG.
0845 094 1847
london@melinconsultants.co.uk

www.melinconsultants.co.uk

Melin Consultants are accredited to provide a range of calculation, assessment and testing services.

They are members of CIBSE Low Carbon Consultants.

Melin Consultants fully check all work prior to completion and a robust audit trail exists to demonstrate accountability.

All information within this document is based on evidence provided in the form of drawings and specifications.

CPD (Continual Professional Development) records are kept and all technical staff are required to complete a minimum 20 hours per year in training activities.

Low Carbon Consultants have the expertise and necessary qualifications to offer advice in a professional capacity on matters relating to Part L of the Building Regulations and sustainability within the construction sector.

This document contains the following information:

1. U Values used
2. DER and TER, DFEE and TFEE comparison
3. Building Regulations Reports and Predicted Energy Assessment
4. Overview

Project Ref: 709279

Report Date: 29/09/2021

Report author: Gideon Griffiths

Function: Technical Consultant

Authorised by: Darren Baker

Function: Senior Consultant

1. U Values

The table below outlines the Part L1A threshold or 'back-stop' U values alongside the proposed dwelling U values that have been used to run the calculation.

Building Element	Part L1A Threshold U Value	Proposed U Values*
Wall	0.30	0.18
Floor	0.25	0.11
Roof	0.20	0.16
Window	1.8	1.2

*Please note that these U Values are based on the element's component parts listed in section 3 of this report. If the element construction changes the U value may also change.

2. DER-TER and DFEE-TFEE Comparison

The table below highlights the proposed dwelling emission rate and the target dwelling emission rate.

	Result
DER (Dwelling Emission Rate)	14.54
TER (Target Emission Rate)	25.33
Overall Result	Pass

	Result
DFEE (Dwelling Fabric Emission Rate)	46.9
TFEE (Target Fabric Emission Rate)	56.8
Overall Result	Pass

As outlined in the tables above Criterion 1 of Part L1A has been achieved.

Appendix 1: SAP Calculation Outputs

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.5.49
 Printed on 29 September 2021 at 16:46:46

Project Information:

Assessed By: Gideon Griffiths (STRO030315) **Building Type:** Detached House

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 119.74m²

Site Reference : 709279

Plot Reference: 709279

Address : Rear of 190 Henley Road, Caversham

Client Details:

Name: Mr P Coldwell

Address :

This report covers items included within the SAP calculations.

It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Electricity

Fuel factor: 1.55 (electricity)

Target Carbon Dioxide Emission Rate (TER) 25.33 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER) 14.54 kg/m² **OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE) 56.8 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE) 46.9 kWh/m² **OK**

2 Fabric U-values

Element	Average	Highest	
External wall	0.18 (max. 0.30)	0.18 (max. 0.70)	OK
Floor	0.11 (max. 0.25)	0.11 (max. 0.70)	OK
Roof	0.16 (max. 0.20)	0.20 (max. 0.35)	OK
Openings	1.20 (max. 2.00)	1.20 (max. 3.30)	OK

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals 5.00 (design value)
 Maximum 10.0 **OK**

4 Heating efficiency

Main Heating system: Heat pumps with radiators or underfloor heating - electric
 Air source heat pump with flow temperature <= 35°C

Secondary heating system: None

5 Cylinder insulation

Hot water Storage: Measured cylinder loss: 3.39 kWh/day
 Permitted by DBSCG: 4.14 kWh/day **OK**
 Primary pipework insulated: Yes **OK**

6 Controls

Space heating controls TTZC by plumbing and electrical services **OK**
 Hot water controls: Cylinderstat **OK**
 Independent timer for DHW **OK**

Regulations Compliance Report

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (South West England):	Not significant	OK
--	-----------------	----

Based on:

Overshading:	Average or unknown	
Windows facing: North East	7m ²	
Windows facing: South East	2.86m ²	
Windows facing: North West	0.5m ²	
Windows facing: South West	9.5m ²	
Roof windows facing: North East	0.46m ²	
Roof windows facing: South East	0.47m ²	
Roof windows facing: South West	2.5m ²	
Ventilation rate:	8.00	

10 Key features

Floors U-value	0.11 W/m ² K	
Photovoltaic array		

Predicted Energy Assessment



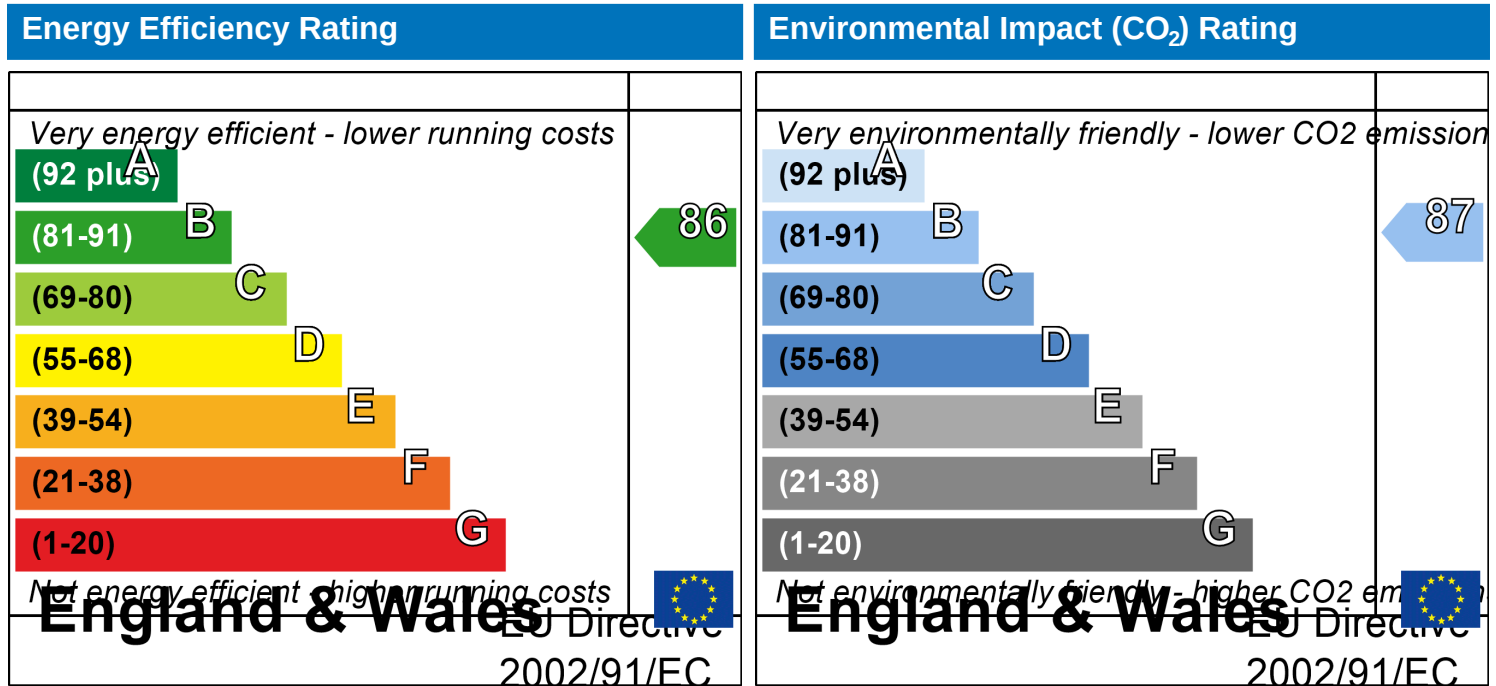
Rear of 190 Henley Road
Caversham

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

Detached House
29 September 2021
Gideon Griffiths
119.74 m²

This is a Predicted Energy Assessment for a property which is not yet complete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, an Energy Performance Certificate is required providing information about the energy performance of the completed property.

Energy performance has been assessed using the SAP 2012 methodology and is rated in terms of the energy use per square metre of floor area, energy efficiency based on fuel costs and environmental impact based on carbon dioxide (CO₂) emissions.



The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.

The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO₂) emissions. The higher the rating the less impact it has on the environment.

SAP Input

Property Details: 709279

Address: Rear of 190 Henley Road, Caversham
Located in: England
Region: South West England
UPRN:
Date of assessment: 29 September 2021
Date of certificate: 29 September 2021
Assessment type: New dwelling design stage
Transaction type: New dwelling
Tenure type: Unknown
Related party disclosure: No related party
Thermal Mass Parameter: Calculated 82.92
Water use <= 125 litres/person/day: True
PCDF Version: 482

Property description:

Dwelling type: House
Detachment: Detached
Year Completed: 2021
Floor Location: **Floor area:** **Storey height:**
 Floor 0 44.02 m² 2.86 m
 Floor 1 37.86 m² 2.9 m
 Floor 2 37.86 m² 1.8 m
Living area: 11.84 m² (fraction 0.099)
Front of dwelling faces: North East

Opening types:

Name:	Source:	Type:	Glazing:	Argon:	Frame:
NE	Manufacturer	Half glazed	double-glazed	No	PVC-U
NW	Manufacturer	Half glazed	double-glazed	No	PVC-U
NE	Manufacturer	Windows	double-glazed	No	PVC-U
SE	Manufacturer	Windows	double-glazed	No	PVC-U
NW	Manufacturer	Windows	double-glazed	No	PVC-U
SW	Manufacturer	Windows	double-glazed	No	PVC-U
NE	Manufacturer	Roof Windows	double-glazed	No	PVC-U
SE	Manufacturer	Roof Windows	double-glazed	No	PVC-U
SW	Manufacturer	Roof Windows	double-glazed	No	PVC-U

Name:	Gap:	Frame Factor:	g-value:	U-value:	Area:	No. of Openings:
NE	mm	0.7	0.76	1.2	1.8	1
NW	mm	0.7	0.76	1.2	1.92	1
NE	16mm or more	0.7	0.76	1.2	7	1
SE	16mm or more	0.7	0.76	1.2	2.86	1
NW	16mm or more	0.7	0.76	1.2	0.5	1
SW	16mm or more	0.7	0.76	1.2	9.5	1
NE	16mm or more	0.7	0.76	1.2	0.46	1
SE	16mm or more	0.7	0.76	1.2	0.47	1
SW	16mm or more	0.7	0.76	1.2	2.5	1

Name:	Type-Name:	Location:	Orient:	Width:	Height:
NE		External walls	North East	0	0
NW		External walls	North West	0	0
NE		External walls	North East	0	0
SE		External walls	South East	0	0
NW		External walls	North West	0	0
SW		External walls	South West	0	0

SAP Input

NE	Sloped	North East	0	0
SE	Sloped	South East	0	0
SW	Sloped	South West	0	0

Overshading: Average or unknown

Opaque Elements:

Type:	Gross area:	Openings:	Net area:	U-value:	Ru value:	Curtain wall:	Kappa:
<u>External Elements</u>							
External walls	204.81	23.58	181.23	0.18	0	False	9
Sloped	25.4	3.43	21.97	0.2	0		9
Plane	22.2	0	22.2	0.13	0		9
GF	44.02			0.11			110
<u>Internal Elements</u>							
Internal walls	112.65						9
FF	37.86						9
SF	37.86						9
FF	37.86						18
SF	37.86						18
<u>Party Elements</u>							

Thermal bridges:

Thermal bridges:		User-defined (individual PSI-values) Y-Value = 0.0674					
		Length	Psi-value				
	[Approved]	17.6	0.3	E2	Other lintels (including other steel lintels)		
	[Approved]	13.06	0.04	E3	Sill		
	[Approved]	36	0.05	E4	Jamb		
	[Approved]	29.92	0.16	E5	Ground floor (normal)		
	[Approved]	50.74	0.07	E6	Intermediate floor within a dwelling		
	[Approved]	12.1	0.04	E11	Eaves (insulation at rafter level)		
	[Approved]	20.56	0.04	E13	Gable (insulation at rafter level)		
	[Approved]	46.38	0.09	E16	Corner (normal)		
	[Approved]	16.14	-0.09	E17	Corner (inverted internal area greater than external area)		

Ventilation:

Pressure test:	Yes (As designed)
Ventilation:	Natural ventilation (extract fans)
Number of chimneys:	0
Number of open flues:	0
Number of fans:	5
Number of passive stacks:	0
Number of sides sheltered:	2
Pressure test:	5

Main heating system:

Main heating system:	Heat pumps with radiators or underfloor heating
	Electric heat pumps
	Fuel: Electricity
	Info Source: SAP Tables
	SAP Table: 214
	Air source heat pump with flow temperature <= 35°C
	Underfloor heating and radiators, pipes in screed above insulation
	Central heating pump : 2013 or later
	Design flow temperature: Unknown
	Open
	Boiler interlock: Yes

SAP Input

Main heating Control:

Main heating Control: Time and temperature zone control by suitable arrangement of plumbing and electrical services
Control code: 2207

Secondary heating system:

Secondary heating system: None

Water heating:

Water heating: From main heating system
Water code: 901
Fuel :Electricity
Hot water cylinder
Cylinder volume: 545 litres
Cylinder insulation: Factory 100 mm
Primary pipework insulation: True
Cylinderstat: True
Cylinder in heated space: True
Solar panel: False

Others:

Electricity tariff: Standard Tariff
In Smoke Control Area: Unknown
Conservatory: No conservatory
Low energy lights: 100%
Terrain type: Low rise urban / suburban
EPC language: English
Wind turbine: No
Photovoltaics: Photovoltaic 1
Installed Peak power: 0.5
Tilt of collector: 30°
Overshading: None or very little
Collector Orientation: South East
Photovoltaic 2
Installed Peak power: 0.5
Tilt of collector: 30°
Overshading: None or very little
Collector Orientation: South West
Photovoltaic 3
Installed Peak power: 0.5
Tilt of collector: 30°
Overshading: None or very little
Collector Orientation: North East
Photovoltaic 4
Installed Peak power: 0.5
Tilt of collector: 30°
Overshading: None or very little
Collector Orientation: North West
Assess Zero Carbon Home: No

Overview

Rear of 190 Henley Road, Caversham



Building Element	Construction	U Value
Wall	Timber Frame, 120mm Recticel	0.18
Floor	150mm Recticel	0.11
Roof	Various build ups	0.16
Window	As per U Value given	1.2
Door	As per U Value given	1.2
System		Efficiency/Details
Primary heating	Air Source Heat Pump feeding underfloor heating and radiators	170%
Water Heating	545L cylinder from main heating system	
Heating controls	Time and temperature zone control	
Ventilation	Natural throughout	
Renewables	Estimated 0.5kWp on each orientation, will need schedule from quote to accurately input	
Others		
	A design air permeability of $5\text{m}^3/(\text{h.m}^2)$ at 50Pa has been allowed for.	
Thermal Bridging	Accredited Construction Details (ACD's) have been adopted.	
Lighting	100% L.E.L fittings have been allowed for.	

Upon completion, to enable Melin to issue the as built SAP and EPC please provide/confirm the following (please allow 5 working days from Melin receiving the information below to complete the as built SAP and EPC):

I confirm that the building has been built in accordance with the specification provided.

Confirm exact make and model of boiler.

Confirm full postal address.

Provide manufacture literature of windows, external doors and roof lights confirming unit u-values and g-values.

To enable the as-built SAP reports and EPCs to be issued please ensure that this form is signed and dated below

Client/contractor Signature:

Date: