



Designed SAP Calculation

Carbon Emissions Calculation - Part L1a

Crawford John, Upper Warren Avenue, Caversham, Reading, RG4 7EB

17th August 2022

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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, DPER and TPER comparison
3. Building Regulations Reports and Predicted Energy Assessment
4. Overview

Project Ref: 709352

Report Date: 17/08/22

Report author: Kyle Jones

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	0.26	0.20
Floor	0.18	0.11
Roof	0.16	0.14/0.13
Window/Rooflight/Door	1.40	1.20/1.00

*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, DFEE-TFEE and DPER-TPER Comparison

The table below highlights the proposed dwelling emission rate and the target dwelling emission rate, the proposed dwelling fabric energy efficiency and target fabric energy efficiency, the proposed dwelling primary energy rating and target primary energy rating:

	Result
DER (Dwelling Emission Rate)	4.53
TER (Target Emission Rate)	8.68
Overall Result	Pass

	Result
DFEE (Dwelling Fabric Energy Efficiency)	48.90
TFEE (Target Fabric Energy Efficiency)	49.20
Overall Result	Pass

	Result
DPER (Dwelling Primary Energy Rating)	47.42
TPER (Target Primary Energy Rating)	47.43
Overall Result	Pass

As outlined in the tables above Criterion 1 of Part L1a has been achieved.

SAP Report 709352

Development at Crawford John, Upper
Warren Avenue



Appendix 1: SAP Calculation Outputs

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Stroma SAP 10.2 SAP 10 program, 10.2

Date: Wed 17 Aug 2022 13:24:52

Project Information			
Assessed By	Kyle Jones	Building Type	House, Detached
OCDEA Registration	STRO037434	Assessment Date	2022-08-16

Dwelling Details			
Assessment Type	As designed	Total Floor Area	447 m ²
Site Reference	709352	Plot Reference	709352
Address	Crawfordjohn, Upper Warren Avenue, Caversham, READING, RG4 7EB		

Client Details	
Name	John Otken
Company	Not Provided
Address	Crawford John, Upper Warren Avenue, Caversham, READING, RG4 7EB

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	8.68 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	4.53 kgCO ₂ /m ²		OK

1b Target primary energy rate and dwelling primary energy			
Target primary energy	47.43 kWh _{PE} /m ²		
Dwelling primary energy	47.42 kWh _{PE} /m ²		OK

1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	49.2 kWh/m ²		
Dwelling fabric energy efficiency	48.9 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	0.2	External walls (0.2)	OK
Party walls	0.2	N/A	N/A	N/A
Curtain walls	1.6	N/A	N/A	N/A
Floors	0.18	0.11	Not Provided (0.11)	OK
Roofs	0.16	0.13	Flat ceiling (0.14)	OK
Windows, doors, and roof windows	1.6	1.19	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: External walls	285.29	0.2	
Ground floor: Not Provided	257.05	0.11	
Exposed roof: Sloped ceiling	208.85	0.13	
Exposed roof: Flat ceiling	55.33	0.14	

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]
1, Doors	2.63	South	0.7	1 (!)
2, Doors	2.14	East	0.7	1 (!)
3, Windows (1)	29.59	South	0.7	1.2
4, Windows (1)	6.06	East	0.7	1.2
5, Windows (1)	5.23	West	0.7	1.2
6, Windows (1)	52.31	North	0.7	1.2
7, Roof windows (1)	0.75	East	0.7	1.2
8, Roof windows (1)	1.44	North	0.7	1.2
9, Roof windows (1)	0.43	West	0.7	1.2

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)	Not government-approved scheme	0.3	Not Provided
External wall	E3: Sill	Not government-approved scheme	0.04	Not Provided
External wall	E4: Jamb	Not government-approved scheme	0.05	Not Provided
External wall	E5: Ground floor (normal)	Not government-approved scheme	0.16	Not Provided
External wall	E6: Intermediate floor within a dwelling	Not government-approved scheme	0.07	Not Provided
External wall	E11: Eaves (insulation at rafter level)	Not government-approved scheme	0.04	Not Provided
External wall	E14: Flat roof	Not government-approved scheme	0.08	Not Provided
External wall	E16: Corner (normal)	Not government-approved scheme	0.09	Not Provided
External wall	E17: Corner (inverted - internal area greater than external area)	Not government-approved scheme	-0.09	Not Provided
Roof	R1: Head of roof window	Not government-approved scheme	0.08	Not Provided
Roof	R2: Sill of roof window	Not government-approved scheme	0.08	Not Provided
Roof	R3: Jamb of roof window	Not government-approved scheme	0.08	Not Provided
Roof	R6: Flat ceiling	Not government-approved scheme	0.06	Not Provided

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	4.3 m ³ /hm ² , Design value	OK
Air permeability test certificate reference	Not Provided	

4 Space heating

Main heating system 1: Heat pump with radiators or underfloor heating - Electricity		
Efficiency	226.7%	
Emitter type	Both radiators and underfloor	
Flow temperature	35°C	
System type		
Manufacturer		
Model		
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	1.95 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	75 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	0.45 W/(l/s)	OK
Minimum permitted heat recovery efficiency	73%	
Heat recovery efficiency	94%	OK
Manufacturer/Model		
Commissioning	Not Provided / Not Provided	
9 Local generation		
Technology type: Photovoltaic system (1)		
Peak power	2.8 kWp	
Orientation	East	
Pitch	30°	
Overshading	None or very little	
Manufacturer	Not Provided	
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		

Overview

Development at Crawford John, Upper
Warren Avenue, Caversham, Reading,
RG4 7EB



Building Element	Construction	U Value
Main Floor	Ground floor – Solid slab, 150mm Celotex GA4000	0.11
Main Wall	Full fill cavity wall – 150mm Celotex CWS internally lined	0.20
Main Roof	Green flat roof – 150mm Celotex XR4000	0.14
	Sloped roof – 100mm Celotex XR4000 between rafters and 70mm Celotex GA4000 below	0.13
Window	Double glazed, argon-filled, wood frame	1.20
Door	Double glazed, argon-filled, wood frame	1.00
System		Efficiency/Details
Primary heating	ASHP – Viesmann Vitocal 200-A feeding underfloor heating and radiators (tbc)	272%
Additional heating	Log burner	65%
Water Heating	From main system, 300L cylinder, thermal store (tbc)	
Heating controls	Time and temperature zone control	
Ventilation	MVHR – Vent Axia Kinetic Plus E (tbc)	
Renewables	2.8 kWp, East facing	
Others		
	A design air permeability of 4.3 m ³ /(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.	