



As Built SAP Calculation

26a Prospect Street, Caversham, Reading, RG4 8JG
Carbon Emissions Calculation - Part L
Rev A

For

McClure Fisher Family Pension Scheme 2011
20th February 2025

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

The Department Store
19 Bellefields Road
London
SW9 9UH
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 Comparison
3. Overview
4. Explanation of SAP

Appendix 1. SAP Calculation outputs

Project Ref: 204736 – Rev A

Report Date: 20/02/2025

Report author: David Anslow

Function: Technical Consultant

Authorised by: Darren Baker

Function: Senior Consultant

1. U Values

The table below outlines the Part L threshold for new or retained elements and limiting U values where elements do not require improvement alongside the dwelling U values that have been used to run the calculation.

Building Element	Threshold u-value	Limiting u-value	Proposed u-Values*
Retained Wall	0.30	0.70	0.30
Retained Floor	0.25	0.70	0.09
Retained Roof	0.16	0.35	0.16
Window	1.40	3.30	1.40
½ Glazed Door	1.40	3.30	2.85
Solid door	1.40	3.80	1.40

*Please note that these U Values are based on the element's component parts listed in section 4 of this report.

As outlined in the tables above, the u-values are in accordance with Part L Building Regulations requirements for conversions (Table 4.2 & Table 4.3), therefore the dwelling is compliant.

2. DER Comparison

	DER (kgCO ₂ /yr/m ²)	Reduction (kgCO ₂ /yr/m ²)	Reduction (%)
Baseline dwelling compliant with Building Regulations 2021	16.02		
As built dwelling	12.63	3.39	21.16%

The table above confirms the as built dwelling reduces CO₂ emissions by greater than 20% over a Part L compliant baseline dwelling.

3. Overview

Construction

Building Element	Construction	U Value
Wall	Existing wall upgraded with 57.5mm Kingspan K118 insulated plasterboard (40+12.5mm) on timber battens	0.30
Floor	Existing slab upgraded with YBS SuperQuilt, 50mm timber joists & 22mm chipboard	0.09
Roof	Existing slope roof upgraded with 70mm Kingspan K107 between rafters and 72.5mm Kingspan K118 insulated plasterboard below (60+12.5mm).	0.16
	Existing flat roof upgraded with 110mm Kingspan Thermaroom TR26 above timber decking.	0.18
Window	Double glazed units – BFRC certificate provided	1.3 (g-value 0.44)
½ glazed door	Existing double glazed door retained – SAP default used	
Solid door	U-value provided	1.4

Heating and Hot Water

System		Efficiency/Details
Primary heating	Electric storage heaters	
Additional heating	None	
Water Heating	Electric instantaneous point of use and electric shower	
Heating controls	Automatic charge control	
Ventilation	Natural	
Renewables	None	

Others

Others		
Air permeability	An air permeability of 7.14m ³ /(h.m ²) at 50Pa has been measured.	
Thermal Bridging	Default PSI values have been adopted. A Default ψ value of 0.2 has therefore been used.	
Lighting	100% L.E.L fittings have been used.	Power = 6W Efficacy = 108 lm/W

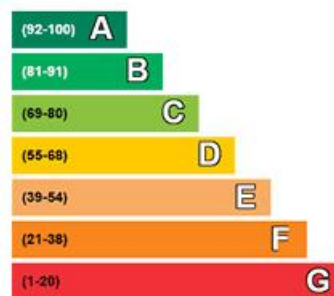
4. SAP Explanation

3.1 What is a SAP?

SAP stands for 'Standard Assessment Procedure' and is the only, official government approved system for assessing the energy and carbon emissions rating for new dwellings.

A SAP rating is a way of comparing energy performance of different dwellings – it results in a figure between 1 and 100+ (100 representing zero energy cost and anything over means you are exporting energy). The higher the SAP rating, the lower the fuel costs and the lower the associated emissions of carbon dioxide.

The SAP Calculations establish an energy cost based on the construction of the home, its heating system, internal lighting and any renewable technologies installed. It does **not** include energy used for cooking or appliances; this would be unregulated energy.



3.2 How is the SAP calculated?

The SAP Assessor will work from provided plans and construction details, together with a full HVAC (heating, ventilation and (where applicable) air conditioning) specification.

The assessor will scale off these plans either electronically or by hand to create a model of the dwelling(s) in SAP software. Once the site form is established, the heating, lighting and ventilation systems are added – specific products will be chosen from manufacturer databases where they are known.

All thermal elements (walls, floors, roofs and openings) are added in detail together with all calculations for thermal junctions. Any renewable technologies and cooling are also added.

Once complete, a SAP calculation is capable of producing a raft of detailed reporting outputs, from site form, heat losses and energy demand to seasonal variations, CO₂ emissions and renewables contributions amongst others.

3.3 Carbon Emissions

The headline emissions target is achieved using the DER/TER figures. CO₂ emissions are measured by comparing a Target Emission Rate (TER) against the predicted Dwelling Emission Rate (DER).

This target rate is set within the SAP calculations by reference to a notional dwelling of the same size and shape, using a set of baseline values.

3.4 Fabric Energy Efficiency

Fabric Energy Efficiency (FEE) is assessed using DFEE/TFEE figures. As with emissions the target is set within SAP using a set of baseline values depending on the size of the property.

It is a measure of the energy demand in units of kilowatt-hours per m² per year. How well a dwelling retains the heat it produces will have an impact on its CO₂ emissions as well as being assessed separately to gauge compliance.

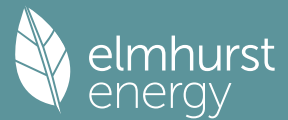
3.5 Primary Energy Rating

The Primary Energy Rating is assessed using the DPER/TPER figures. It considers how much energy in kilowatt hours is required to provide heating and hot water to a newly built dwelling. It will also include energy used by lighting, ventilation, cooling systems and showers.

A notional specification will be used to set the target rate again using a set of baseline values as per the FEE and emissions.

Appendix 1: SAP Calculation Outputs

Full SAP Calculation Printout



Property Reference	204736			Issued on Date	20/02/2025
Assessment Reference	204736	Prop Type Ref	204736		
Property	26a Prospect Street, Caversham, Reading, RG4 8JG				
SAP Rating	45 E	DER	12.63	TER	
Environmental	89 B	% DER < TER			N/A
CO ₂ Emissions (t/year)	1.19	DFEE	61.70	TFEE	
Compliance Check	See BREL	% DFEE < TFEE			
% DPER < TPER		DPER	130.05	TPER	
Assessor Details	Mr. David Anslow			Assessor ID	AV54-0001
Client	STL, Shaun Tanner Architecture & Planning				

SAP 10 WORKSHEET FOR Conversion (As Built) (Version 10.2, February 2022)
CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE

1. Overall dwelling characteristics

	Area (m ²)	Storey height (m)	Volume (m ³)
Main dwelling			
Ground floor	3.1800 (1b)	x 3.0100 (2b)	= 9.5718 (1b) - (3b)
First floor	50.1700 (1c)	x 2.5000 (2c)	= 125.4250 (1c) - (3c)
Second floor	50.1700 (1d)	x 2.4100 (2d)	= 120.9097 (1d) - (3d)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	103.5200		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n) =	255.9065 (5)

2. Ventilation rate

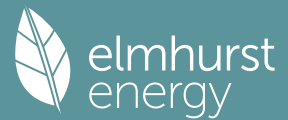
	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
Number of blocked chimneys	0 * 20 = 0.0000 (6f)
Number of intermittent extract fans	3 * 10 = 30.0000 (7a)
Number of passive vents	0 * 10 = 0.0000 (7b)
Number of flueless gas fires	0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) =	30.0000 / (5) = 0.1172 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	7.1400 (17)
Infiltration rate	0.4742 (18)
Number of sides sheltered	0 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] = 1.0000 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) = 0.4742 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000 (22)
Wind factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750 (22a)
Adj infilt rate	0.6046	0.5928	0.5809	0.5217	0.5098	0.4505	0.4505	0.4387	0.4742	0.5098	0.5335	0.5572 (22b)
Effective ac	0.6828	0.6757	0.6687	0.6361	0.6299	0.6015	0.6015	0.5962	0.6124	0.6299	0.6423	0.6552 (25)

3. Heat losses and heat loss parameter

Element	Gross m ²	Openings m ²	NetArea m ²	U-value W/m ² K	A x U W/K	K-value kJ/m ² K	A x K kJ/K
Main dwelling							
Solid Door			2.0400	1.4000	2.8560		(26)
!/2 Glazed door			1.7400	2.8500	4.9590		(26a)
Window			10.5600	1.2357	13.0494		(27)
Ground Floor			3.1800	0.0900	0.2862	20.0000	63.6000 (28a)
External Wall - upgraded	114.2200	13.1000	101.1200	0.3000	30.3360	9.0000	910.0800 (29a)
Dormer walls	2.7700	1.2400	1.5300	0.3000	0.4590	9.0000	13.7700 (29a)
Slope Roof	33.0200		33.0200	0.1600	5.2832	9.0000	297.1800 (30)
Plane Roof	26.2200		26.2200	0.1600	4.1952	9.0000	235.9800 (30)
Flat Roof	1.7500		1.7500	0.1800	0.3150	9.0000	15.7500 (30)
Total net area of external elements Aum(A, m ²)			181.1600				(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		61.7390		(33)
Main dwelling							
Party Wall			36.4700	0.0000	0.0000	180.0000	6564.6000 (32)
Party Floor			47.8000			30.0000	1434.0000 (32d)
Internal Wall			151.2400			100.0000	15124.0000 (32c)
Internal Floor 1			2.3700			18.0000	42.6600 (32d)
Internal Floor 2			48.6500			18.0000	875.7000 (32d)
Internal Ceiling 1			2.3700			9.0000	21.3300 (32e)

Full SAP Calculation Printout



Internal Ceiling 2	48.6500	9.0000	437.8500 (32e)
Heat capacity Cm = Sum(A x k)	(28)...(30) + (32) + (32a)...(32e) =		
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K	26036.5000 (34)		
Thermal bridges (Default value 0.200 * total exposed area)	251.5118 (35)		
Point Thermal bridges	36.2320 (36)		
Total fabric heat loss	(36a) = 0.0000		
	(33) + (36) + (36a) = 97.9710 (37)		
Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)			
(38)m	Jan	Feb	Mar
Heat transfer coeff	57.6616	57.0622	56.4746
Average = Sum(39)m / 12 =	155.6327	155.0332	154.4456
	Apr	May	Jun
	53.7148	53.1985	50.7948
	Jul	Aug	Sep
	50.7948	50.3496	51.7206
	Oct	Nov	Dec
	53.1985	54.2430	55.3351 (38)
	151.1695	152.2141	153.3061 (39)
	151.6834		
HLP	Jan	Feb	Mar
HLP (average)	1.5034	1.4976	1.4919
Days in mont	31	28	31
	Apr	May	Jun
	1.4653	1.4603	1.4371
	Jul	Aug	Sep
	1.4371	1.4328	1.4460
	Oct	Nov	Dec
	1.4603	1.4704	1.4809 (40)
	31	30	1.4653

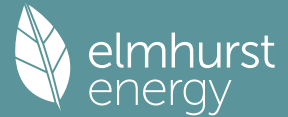
4. Water heating energy requirements (kWh/year)												
Assumed occupancy												2.7698 (42)
Hot water usage for mixer showers												0.0000 (42a)
Hot water usage for baths												0.0000 (42b)
Hot water usage for other uses												42.9956 (42c)
Average daily hot water use (litres/day)												39.0869 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Energy conte	42.9956	41.4321	39.8687	38.3052	36.7417	35.1782	35.1782	36.7417	38.3052	39.8687	41.4321	42.9956 (44)
Energy content (annual)	68.0945	58.9988	61.2767	52.4379	49.4614	43.2557	42.5450	45.4939	47.2341	54.1014	59.0277	67.3207 (45)
Distribution loss (46)m = 0.15 x (45)m												649.2479
Water storage loss:												0.0000 (46)
Total storage loss:												0.0000 (56)
If cylinder contains dedicated solar storage												0.0000 (57)
Primary loss												0.0000 (59)
Combi loss												0.0000 (61)
Total heat required for water heating calculated for each month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
WWHRS	57.8804	50.1490	52.0852	44.5722	42.0422	36.7674	36.1633	38.6698	40.1490	45.9862	50.1735	57.2226 (62)
PV diverter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63a)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63b)
FGHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63c)
Output from w/h	57.8804	50.1490	52.0852	44.5722	42.0422	36.7674	36.1633	38.6698	40.1490	45.9862	50.1735	57.2226 (64)
12Total per year (kWh/year)												551.8607 (64)
Electric shower(s)	72.7025	64.7786	70.7357	67.5022	68.7689	65.5988	67.7854	68.7689	67.5022	70.7357	69.4056	72.7025 (64a)
Heat gains from water heating, kWh/month	32.6457	28.7319	30.7052	28.0186	27.7028	25.5916	25.9872	26.8597	26.9128	29.1805	29.8948	32.4813 (65)

5. Internal gains (see Table 5 and 5a)												
Metabolic gains (Table 5), Watts	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(66)m	138.4905	138.4905	138.4905	138.4905	138.4905	138.4905	138.4905	138.4905	138.4905	138.4905	138.4905	138.4905 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	151.8955	168.1701	151.8955	156.9587	151.8955	156.9587	151.8955	151.8955	156.9587	151.8955	156.9587	151.8955 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	261.8959	264.6136	257.7652	243.1857	224.7818	207.4846	195.9291	193.2114	200.0598	214.6393	233.0433	250.3404 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	36.8490	36.8490	36.8490	36.8490	36.8490	36.8490	36.8490	36.8490	36.8490	36.8490	36.8490	36.8490 (69)
Pumps, fans	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (70)
Losses e.g. evaporation (negative values) (Table 5)	-110.7924	-110.7924	-110.7924	-110.7924	-110.7924	-110.7924	-110.7924	-110.7924	-110.7924	-110.7924	-110.7924	-110.7924 (71)
Water heating gains (Table 5)	43.8787	42.7558	41.2704	38.9147	37.2349	35.5438	34.9290	36.1017	37.3789	39.2211	41.5205	43.6576 (72)
Total internal gains	522.2173	540.0866	515.4783	503.6063	478.4593	464.5343	447.3008	445.7558	458.9446	470.3031	496.0697	510.4407 (73)

6. Solar gains												
[Jan]	Area	Solar flux	g	FF	Access	Gains						
	m2	Table 6a	Specific data	Specific data	factor	W						
		W/m2	or Table 6b	or Table 6c	Table 6d							
North	4.5500	10.6334	0.4400	0.0000	0.7700	16.3918 (74)						
Northeast	0.6800	11.2829	0.4400	0.0000	0.7700	2.5994 (75)						
South	4.6500	46.7521	0.4400	0.0000	0.7700	73.6541 (78)						
Northwest	0.6800	11.2829	0.4400	0.0000	0.7700	2.5994 (81)						
Solar gains	95.2448	162.5344	225.9526	290.4781	338.2368	342.3315	327.2576	290.0477	247.7443	180.3285	114.0681	81.5546 (83)
Total gains	617.4620	702.6210	741.4309	794.0844	816.6961	806.8659	774.5584	735.8035	706.6889	650.6315	610.1378	591.9953 (84)

7. Mean internal temperature (heating season)												
Temperature during heating periods in the living area from Table 9, Th1 (C)												21.0000 (85)

Full SAP Calculation Printout



Utilisation factor for gains for living area, nil,m (see Table 9a)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
tau	46.4707	46.6504	46.8279	47.6799	47.8427	48.6157	48.6157	48.7617	48.3151	47.8427	47.5144	47.1759
alpha	4.0980	4.1100	4.1219	4.1787	4.1895	4.2410	4.2410	4.2508	4.2210	4.1895	4.1676	4.1451
util living area	0.9979	0.9961	0.9930	0.9827	0.9542	0.8696	0.7357	0.7778	0.9262	0.9853	0.9960	0.9983 (86)
MIT	20.0509	20.1231	20.2366	20.4111	20.5785	20.7270	20.7919	20.7824	20.6763	20.4596	20.2345	20.0493 (87)
Th 2	19.6849	19.6893	19.6936	19.7136	19.7174	19.7350	19.7350	19.7383	19.7282	19.7174	19.7098	19.7018 (88)
util rest of house	0.9971	0.9946	0.9901	0.9745	0.9284	0.7864	0.5722	0.6262	0.8722	0.9768	0.9942	0.9976 (89)
MIT 2	18.5686	18.6646	18.8134	19.0524	19.2630	19.4456	19.4990	19.4971	19.3893	19.1183	18.8252	18.5811 (90)
Living area fraction									FLA = Living area / (4) =			0.1677 (91)
MIT	18.8172	18.9092	19.0521	19.2802	19.4836	19.6605	19.7158	19.7126	19.6051	19.3432	19.0615	18.8273 (92)
Temperature adjustment												0.4000
adjusted MIT	19.2172	19.3092	19.4521	19.6802	19.8836	20.0605	20.1158	20.1126	20.0051	19.7432	19.4615	19.2273 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9968	0.9941	0.9894	0.9742	0.9325	0.8119	0.6277	0.6781	0.8869	0.9770	0.9938	0.9973 (94)
Useful gains	615.4680	698.4596	733.5792	773.6335	761.5832	655.1102	486.1995	498.9597	626.7389	635.6736	606.3524	590.4190 (95)
Ext temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000 (96)
Heat loss rate W	2321.5981	2233.9073	2000.3947	1635.2111	1237.1139	812.3306	523.0276	550.6623	883.9416	1382.1804	1881.5982	2303.7746 (97)
Space heating kWh	1269.3608	1031.8209	942.5107	620.3359	353.7949	0.0000	0.0000	0.0000	0.0000	555.4010	918.1770	1274.7365 (98a)
Space heating requirement - total per year (kWh/year)												6966.1376
Solar heating kWh	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (98b)
Solar heating contribution - total per year (kWh/year)												0.0000
Space heating kWh	1269.3608	1031.8209	942.5107	620.3359	353.7949	0.0000	0.0000	0.0000	0.0000	555.4010	918.1770	1274.7365 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												6966.1376
Space heating per m2										(98c) / (4) =		67.2927 (99)

9a. Energy requirements - Individual heating systems, including micro-CHP

Fraction of space heat from secondary/supplementary system (Table 11)												0.0000 (201)
Fraction of space heat from main system(s)												1.0000 (202)
Efficiency of main space heating system 1 (in %)												100.0000 (206)
Efficiency of main space heating system 2 (in %)												0.0000 (207)
Efficiency of secondary/supplementary heating system, %												0.0000 (208)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Space heating requirement	1269.3608	1031.8209	942.5107	620.3359	353.7949	0.0000	0.0000	0.0000	0.0000	555.4010	918.1770	1274.7365 (98)
Space heating efficiency (main heating system 1)	100.0000	100.0000	100.0000	100.0000	100.0000	0.0000	0.0000	0.0000	0.0000	100.0000	100.0000	100.0000 (210)
Space heating fuel (main heating system)	1269.3608	1031.8209	942.5107	620.3359	353.7949	0.0000	0.0000	0.0000	0.0000	555.4010	918.1770	1274.7365 (211)
Space heating efficiency (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (212)
Space heating fuel (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (213)
Space heating fuel (secondary)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (215)
Water heating												
Water heating requirement	57.8804	50.1490	52.0852	44.5722	42.0422	36.7674	36.1633	38.6698	40.1490	45.9862	50.1735	57.2226 (64)
Efficiency of water heater (217)m	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000 (216)
Fuel for water heating, kWh/month	57.8804	50.1490	52.0852	44.5722	42.0422	36.7674	36.1633	38.6698	40.1490	45.9862	50.1735	57.2226 (219)
Space cooling fuel requirement (221)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (221)
Pumps and Fa	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (231)
Lighting	34.6344	27.7850	25.0173	18.3287	14.1576	11.5669	12.9151	16.7875	21.8053	28.6097	32.3146	35.5969 (232)
Electricity generated by PVs (Appendix M) (negative quantity) (233a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (233a)
Electricity generated by wind turbines (Appendix M) (negative quantity) (234a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (234a)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity) (235a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (235a)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation) (235c)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (235c)
Electricity generated by PVs (Appendix M) (negative quantity) (233b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (233b)
Electricity generated by wind turbines (Appendix M) (negative quantity) (234b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (234b)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity) (235b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (235b)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation) (235d)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (235d)
Annual totals kWh/year												
Space heating fuel - main system 1												6966.1376 (211)
Space heating fuel - main system 2												0.0000 (213)
Space heating fuel - secondary												0.0000 (215)
Efficiency of water heater												100.0000
Water heating fuel used												551.8607 (219)
Space cooling fuel												0.0000 (221)
Electricity for pumps and fans:												
Total electricity for the above, kWh/year												0.0000 (231)
Electricity for lighting (calculated in Appendix L)												279.5191 (232)
Energy saving/generation technologies (Appendices M ,N and Q)												
PV generation												0.0000 (233)
Wind generation												0.0000 (234)
Hydro-electric generation (Appendix N)												0.0000 (235a)
Electricity generated - Micro CHP (Appendix N)												0.0000 (235)
Appendix Q - special features												
Energy saved or generated												-0.0000 (236)
Energy used												0.0000 (237)

Full SAP Calculation Printout



Total delivered energy for all uses

8624.5044 (238)

12a. Carbon dioxide emissions - Individual heating systems including micro-CHP

	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year	
Space heating - main system 1	6966.1376	0.1541	1073.5716	(261)
Total CO2 associated with community systems			0.0000	(373)
Water heating (other fuel)	551.8607	0.1416	78.1638	(264)
Energy for instantaneous electric shower(s)	826.9870	0.1391	115.0522	(264a)
Space and water heating			1151.7353	(265)
Pumps, fans and electric keep-hot	0.0000	0.0000	0.0000	(267)
Energy for lighting	279.5191	0.1443	40.3432	(268)
Total CO2, kg/year			1307.1308	(272)
EPC Dwelling Carbon Dioxide Emission Rate (DER)			12.6300	(273)

13a. Primary energy - Individual heating systems including micro-CHP

	Energy kWh/year	Primary energy factor kg CO2/kWh	Primary energy kWh/year	
Space heating - main system 1	6966.1376	1.5706	10940.7905	(275)
Total CO2 associated with community systems			0.0000	(473)
Water heating (other fuel)	551.8607	1.5238	840.9005	(278)
Energy for instantaneous electric shower(s)	826.9870	1.5143	1252.3347	(278a)
Space and water heating			11781.6910	(279)
Pumps, fans and electric keep-hot	0.0000	0.0000	0.0000	(281)
Energy for lighting	279.5191	1.5338	428.7357	(282)
Total Primary energy kWh/year			13462.7614	(286)
Dwelling Primary energy Rate (DPER)			130.0500	(287)

SAP 10 WORKSHEET FOR Conversion (As Built) (Version 10.2, February 2022) CALCULATION OF FABRIC ENERGY EFFICIENCY

1. Overall dwelling characteristics

	Area (m2)	Storey height (m)	Volume (m3)	
Main dwelling				
Ground floor	3.1800 (1b)	x 3.0100 (2b)	= 9.5718	(1b) - (3b)
First floor	50.1700 (1c)	x 2.5000 (2c)	= 125.4250	(1c) - (3c)
Second floor	50.1700 (1d)	x 2.4100 (2d)	= 120.9097	(1d) - (3d)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	103.5200			(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 255.9065	(5)

2. Ventilation rate

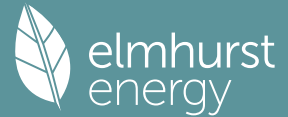
	m3 per hour	
Number of open chimneys	0 * 80 =	0.0000 (6a)
Number of open flues	0 * 20 =	0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 =	0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 =	0.0000 (6d)
Number of flues attached to other heater	0 * 35 =	0.0000 (6e)
Number of blocked chimneys	0 * 20 =	0.0000 (6f)
Number of intermittent extract fans	4 * 10 =	40.0000 (7a)
Number of passive vents	0 * 10 =	0.0000 (7b)
Number of flueless gas fires	0 * 40 =	0.0000 (7c)
Infiltration due to chimneys, flues and fans	= (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) =	40.0000 / (5) = 0.1563 (8)
Pressure test		Yes
Pressure Test Method		Blower Door
Measured/design AP50		7.1400 (17)
Infiltration rate		0.5133 (18)
Number of sides sheltered		0 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] =	1.0000 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) =	0.5133 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Wind speed	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000	(22)
Wind factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750	(22a)
Adj infilt rate	0.6545	0.6416	0.6288	0.5646	0.5518	0.4876	0.4876	0.4748	0.5133	0.5518	0.5775	0.6031	(22b)
If exhaust air heat pump using Appendix N, (23b) = (23a) x Fmv (equation (N5)), otherwise (23b) = (23a)												0.0000	(23b)
If balanced with heat recovery: efficiency in % allowing for in-use factor (from Table 4h) =												0.0000	(23c)
Effective ac	0.7142	0.7058	0.6977	0.6594	0.6522	0.6189	0.6189	0.6127	0.6317	0.6522	0.6667	0.6819	(25)

3. Heat losses and heat loss parameter

Element	Gross m2	Openings m2	NetArea m2	U-value W/m2K	A x U W/K	K-value kJ/m2K	A x K kJ/K	
Main dwelling								
Solid Door			2.0400	1.4000	2.8560			(26)
1/2 Glazed door			1.7400	2.8500	4.9590			(26a)
Window			10.5600	1.2357	13.0494			(27)
Ground Floor			3.1800	0.0900	0.2862	20.0000	63.6000	(28a)

Full SAP Calculation Printout



External Wall - upgraded	114.2200	13.1000	101.1200	0.3000	30.3360	9.0000	910.0800 (29a)
Dormer walls	2.7700	1.2400	1.5300	0.3000	0.4590	9.0000	13.7700 (29a)
Slope Roof	33.0200		33.0200	0.1600	5.2832	9.0000	297.1800 (30)
Plane Roof	26.2200		26.2200	0.1600	4.1952	9.0000	235.9800 (30)
Flat Roof	1.7500		1.7500	0.1800	0.3150	9.0000	15.7500 (30)
Total net area of external elements Aum(A, m2)			181.1600				(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		61.7390		(33)
Main dwelling							
Party Wall			36.4700	0.0000	0.0000	180.0000	6564.6000 (32)
Party Floor			47.8000			30.0000	1434.0000 (32d)
Internal Wall			151.2400			100.0000	15124.0000 (32c)
Internal Floor 1			2.3700			18.0000	42.6600 (32d)
Internal Floor 2			48.6500			18.0000	875.7000 (32d)
Internal Ceiling 1			2.3700			9.0000	21.3300 (32e)
Internal Ceiling 2			48.6500			9.0000	437.8500 (32e)

Heat capacity Cm = Sum(A x k) (28)...(30) + (32) + (32a)...(32e) = 26036.5000 (34)
 Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K 251.5118 (35)
 Thermal bridges (Default value 0.200 * total exposed area) 36.2320 (36)
 Point Thermal bridges (36a) = 0.0000
 Total fabric heat loss (33) + (36) + (36a) = 97.9710 (37)

Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)												
(38)m	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Heat transfer coeff	60.3105	59.6082	58.9198	55.6864	55.0815	52.2653	52.2653	51.7438	53.3501	55.0815	56.3053	57.5847 (38)
Average = Sum(39)m / 12 =	158.2815	157.5792	156.8908	153.6575	153.0525	150.2364	150.2364	149.7149	151.3211	153.0525	154.2763	155.5558 (39)
												153.6546
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	1.5290	1.5222	1.5156	1.4843	1.4785	1.4513	1.4513	1.4462	1.4618	1.4785	1.4903	1.5027 (40)
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

4. Water heating energy requirements (kWh/year)

Assumed occupancy												2.7698 (42)
Hot water usage for mixer showers												
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(42a)
Hot water usage for baths												
30.5095	30.0564	29.4183	28.2418	27.3609	26.3841	25.8564	26.4900	27.1799	28.2252	29.4259	30.4064	(42b)
Hot water usage for other uses												
42.9956	41.4321	39.8687	38.3052	36.7417	35.1782	35.1782	36.7417	38.3052	39.8687	41.4321	42.9956	(42c)
Average daily hot water use (litres/day)												67.3740 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
73.5051	71.4885	69.2870	66.5470	64.1026	61.5623	61.0347	63.2317	65.4851	68.0938	70.8580	73.4020	(44)
Energy conte	116.4141	101.7987	106.4915	91.0995	86.2944	75.6980	73.8161	78.2941	80.7497	92.4027	100.9502	114.9298 (45)
Energy content (annual)												
Distribution loss (46)m = 0.15 x (45)m												1118.9390
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(46)
Water storage loss:												
Total storage loss												
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(56)
If cylinder contains dedicated solar storage												
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(57)
Primary loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(59)
Combi loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(61)
Total heat required for water heating calculated for each month												
98.9520	86.5289	90.5178	77.4346	73.3503	64.3433	62.7437	66.5500	68.6372	78.5423	85.8077	97.6903	(62)
WWHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63a)
PV diverter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63b)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63c)
FGHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63d)
Output from w/h	98.9520	86.5289	90.5178	77.4346	73.3503	64.3433	62.7437	66.5500	68.6372	78.5423	85.8077	(64)
												951.0981 (64)
12Total per year (kWh/year)												951 (64)
Electric shower(s)												
56.5872	50.4197	55.0563	52.5396	53.5255	51.0581	52.7600	53.5255	52.5396	55.0563	54.0211	56.5872	(64a)
												643.6761 (64a)
Heat gains from water heating, kWh/month												
38.8848	34.2371	36.3935	32.4935	31.7189	28.8504	28.8759	30.0189	30.2942	33.3997	34.9572	38.5694	(65)

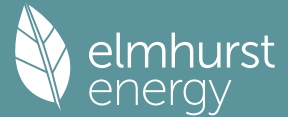
5. Internal gains (see Table 5 and 5a)

Metabolic gains (Table 5), Watts												
(66)m	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
138.4905	138.4905	138.4905	138.4905	138.4905	138.4905	138.4905	138.4905	138.4905	138.4905	138.4905	138.4905	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5												
151.8955	168.1701	151.8955	156.9587	151.8955	156.9587	151.8955	151.8955	151.8955	156.9587	151.8955	156.9587	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5												
261.8959	264.6136	257.7652	243.1857	224.7818	207.4846	195.9291	193.2114	200.0598	214.6393	233.0433	250.3404	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5												
36.8490	36.8490	36.8490	36.8490	36.8490	36.8490	36.8490	36.8490	36.8490	36.8490	36.8490	36.8490	(69)
Pumps, fans	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(70)
Losses e.g. evaporation (negative values) (Table 5)												
-110.7924	-110.7924	-110.7924	-110.7924	-110.7924	-110.7924	-110.7924	-110.7924	-110.7924	-110.7924	-110.7924	-110.7924	(71)
Water heating gains (Table 5)												
52.2645	50.9481	48.9160	45.1299	42.6330	40.0699	38.8117	40.3479	42.0753	44.8920	48.5517	51.8406	(72)
Total internal gains												
530.6032	548.2789	523.1239	509.8215	483.8574	469.0604	451.1835	450.0021	463.6410	475.9740	503.1008	518.6236	(73)

6. Solar gains

[Jan]	Area	Solar flux	g	FF	Access	Gains
	m2	Table 6a	Specific data	Specific data	factor	W
		W/m2	or Table 6b	or Table 6c	Table 6d	
North	4.5500	10.6334	0.4400	0.0000	0.7700	16.3918 (74)

Full SAP Calculation Printout



Northeast		0.6800	11.2829	0.4400	0.0000	0.7700	2.5994 (75)
South		4.6500	46.7521	0.4400	0.0000	0.7700	73.6541 (78)
Northwest		0.6800	11.2829	0.4400	0.0000	0.7700	2.5994 (81)

Solar gains	95.2448	162.5344	225.9526	290.4781	338.2368	342.3315	327.2576	290.0477	247.7443	180.3285	114.0681	81.5546 (83)
Total gains	625.8479	710.8134	749.0765	800.2996	822.0942	811.3920	778.4411	740.0498	711.3853	656.3025	617.1689	600.1782 (84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)												21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
tau	45.6930	45.8967	46.0981	47.0681	47.2541	48.1399	48.1399	48.3076	47.7948	47.2541	46.8793	46.4937
alpha	4.0462	4.0598	4.0732	4.1379	4.1503	4.2093	4.2093	4.2205	4.1863	4.1503	4.1253	4.0996
util living area	0.9978	0.9959	0.9927	0.9824	0.9540	0.8698	0.7369	0.7783	0.9259	0.9850	0.9958	0.9981 (86)
MIT	19.0531	19.2341	19.5199	19.9573	20.3783	20.7501	20.9146	20.8898	20.6240	20.0805	19.5150	19.0488 (87)
Th 2	19.6658	19.6709	19.6758	19.6993	19.7037	19.7242	19.7242	19.7281	19.7163	19.7037	19.6948	19.6855 (88)
util rest of house	0.9969	0.9944	0.9897	0.9741	0.9279	0.7862	0.5723	0.6258	0.8715	0.9763	0.9940	0.9975 (89)
MIT 2	17.9221	18.1061	18.3944	18.8443	19.2542	19.5953	19.7009	19.6937	19.4921	18.9716	18.4041	17.9320 (90)
Living area fraction	fLA = Living area / (4) =											0.1677 (91)
MIT	18.1118	18.2953	18.5832	19.0310	19.4427	19.7890	19.9044	19.8943	19.6819	19.1576	18.5904	18.1193 (92)
Temperature adjustment	0.0000											
adjusted MIT	18.1118	18.2953	18.5832	19.0310	19.4427	19.7890	19.9044	19.8943	19.6819	19.1576	18.5904	18.1193 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9955	0.9920	0.9861	0.9680	0.9208	0.7915	0.5993	0.6496	0.8696	0.9708	0.9916	0.9962 (94)
Useful gains	623.0110	705.1095	738.6634	774.6771	756.9961	642.2475	466.4959	480.7431	618.6133	637.1497	611.9669	597.9211 (95)
Ext temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000 (96)
Heat loss rate W	2186.1488	2110.8130	1895.7376	1556.6980	1185.0376	779.5738	496.4478	523.1479	844.6610	1309.7591	1772.6934	2165.2291 (97)
Space heating kWh	1162.9745	944.6328	860.8633	563.0550	318.4628	0.0000	0.0000	0.0000	0.0000	500.4214	835.7231	1166.0771 (98a)
Space heating requirement - total per year (kWh/year)	6352.2100											
Solar heating kWh	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (98b)
Solar heating contribution - total per year (kWh/year)	0.0000											
Space heating kWh	1162.9745	944.6328	860.8633	563.0550	318.4628	0.0000	0.0000	0.0000	0.0000	500.4214	835.7231	1166.0771 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)	6352.2100											
Space heating per m2	(98c) / (4) = 61.3622 (99)											

8c. Space cooling requirement

Calculated for June, July and August. See Table 10b

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Ext. temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000
Heat loss rate W												
	0.0000	0.0000	0.0000	0.0000	0.0000	1412.2219	1111.7491	1137.8330	0.0000	0.0000	0.0000	0.0000 (100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.5842	0.6804	0.6446	0.0000	0.0000	0.0000	0.0000 (101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	825.0353	756.4675	733.4941	0.0000	0.0000	0.0000	0.0000 (102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	872.9514	837.8975	796.1913	0.0000	0.0000	0.0000	0.0000 (103)
Space cooling kWh												
	0.0000	0.0000	0.0000	0.0000	0.0000	34.4995	60.5840	46.6468	0.0000	0.0000	0.0000	0.0000 (104)
Cooled fraction	fc = cooled area / (4) =											
Intermittency factor (Table 10b)												1.0000 (105)
	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500 (106)
Space cooling kWh												
	0.0000	0.0000	0.0000	0.0000	0.0000	8.6249	15.1460	11.6617	0.0000	0.0000	0.0000	0.0000 (107)
Space cooling requirement	35.4326 (107)											
Energy for space heating	61.3622 (99)											
Energy for space cooling	0.3423 (108)											
Total	61.7044 (109)											
Fabric Energy Efficiency (DFEE)	61.7 (109)											

Summary for Input Data

Property Reference	204736	Issued on Date	20/02/2025
Assessment Reference	204736	Prop Type Ref	204736
Property	26a Prospect Street, Caversham, Reading, RG4 8JG		

SAP Rating	45 E	DER	12.63	TER	
Environmental	89 B	% DER < TER			N/A
CO ₂ Emissions (t/year)	1.19	DFEE	61.70	TFEE	
Compliance Check	See BREL	% DFEE < TFEE			
% DPER < TPER		DPER	130.05	TPER	

Assessor Details	Mr. David Anslow	Assessor ID	AV54-0001
Client	STL, Shaun Tanner Architecture & Planning		

SUMMARY FOR INPUT DATA FOR: Conversion (As Built)

Orientation	North	
Property Tenture	ND	
Transaction Type	6	
Terrain Type	Urban	
1.0 Property Type	Flat, Mid-Terrace	
Position of Flat	Top-floor flat	
Which Floor	2	
2.0 Number of Storeys	3	
3.0 Date Built	2024	
4.0 Sheltered Sides	0	
5.0 Sunlight/Shade	Average or unknown	
6.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	251.51	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:	8.60 m	3.18 m ²	3.01 m
	2nd Storey:	29.15 m	50.17 m ²	2.50 m
		29.15 m	50.17 m ²	2.41 m

8.0 Living Area	17.36	m ²
-----------------	-------	----------------

9.0 External Walls	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 - upgraded	Solid Wall	Solid wall : plasterboard on dabs, insulation, any outside structure	0.30	9.00	114.22	101.12	0.00	None	13.10	Enter Gross Area
	Dormer walls	Timber Frame	Timber framed wall (one layer of plasterboard)	0.30	9.00	2.77	1.53	0.00	None	1.24	Enter Gross Area

9.1 Party Walls	Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)	Shelter Res	Shelter
	Party Wall	Solid Wall	Dense plaster both sides, dense blocks, cavity or cavity fill	0.00	180.00	36.47		None

9.2 Internal Walls	Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
	Internal Wall	Dense block, dense plaster	100.00	151.24

10.0 External Roofs	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
	Slope Roof	External Slope Roof	Plasterboard, insulated slope	0.16	9.00	33.02	33.02	None	0.00	Enter Gross Area	0.00
	Plane Roof	External Slope Roof	Plasterboard, insulated slope	0.16	9.00	26.22	26.22	None	0.00	Enter Gross Area	0.00

Summary for Input Data

Flat Roof	External Flat Roof	Plasterboard, insulated flat roof	0.18	9.00	1.75	1.75	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	2.37
Internal Ceiling 2	+1	Plasterboard ceiling, carpeted chipboard floor	48.65

11.0 Heat Loss Floors

Description	Type	Storey Index	Construction	U-Value (W/m²K)	Shelter Code	Shelter Factor	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Ground Floor - Timber	Lowest occupied	Suspended timber, insulation between joists	0.09	None	0.00	20.00	3.18

11.1 Party Floors

Description	Storey Index	Construction	Kappa (kJ/m²K)	Area (m²)
Party Floor	+1	Timber I-joists, carpeted	20.00	47.80

11.2 Internal Floors

Description	Storey Index	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Floor 1		Plasterboard ceiling, carpeted chipboard floor	9.00	2.37
Internal Floor 2		Plasterboard ceiling, carpeted chipboard floor	9.00	48.65

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Solid Door	Manufacturer	Solid Door				0.00			1.40
!/2 Glazed door	SAP table	Half Glazed Door	Double glazed	≥ 16 mm	Air Filled	0.76	PVC	0.70	2.85
Window	BFRC, BSI or CERTASS data	Window	Double glazed			0.44			1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Area (m²)	Pitch
Front Door	Solid Door	External Wall - upgraded	North	2.04	
N	Window	External Wall - upgraded	North	4.55	
NE	Window	External Wall - upgraded	North East	0.68	
NW	Window	External Wall - upgraded	North West	0.68	
Rear Door	!/2 Glazed door	External Wall - upgraded	South	1.74	
S	Window	External Wall - upgraded	South	3.41	
S Dormer	Window	Dormer walls	South	1.24	

14.0 Conservatory

15.0 Draught Proofing

%

16.0 Draught Lobby

17.0 Thermal Bridging

Y-value

W/m²K

19.0 Mechanical Ventilation

Mechanical Ventilation

Mechanical Ventilation System Present

20.0 Fans, Open Fireplaces, Flues

Number of open chimneys

Number of open flues

Number of chimneys/flues attached to closed fire

Number of flues attached to solid fuel boiler

Number of flues attached to other heater

Number of blocked chimneys

Number of intermittent extract fans

Number of passive vents

Number of flueless gas fires

21.0 Fixed Cooling System

22.0 Pressure Testing

Designed AP₅₀

m³/(h.m²) @ 50 Pa

Property Tested?

Test Method

Summary for Input Data

As Built AP₅₀ m³/(h.m²) @ 50 Pa

22.0 Lighting

No Fixed Lighting

Name	Efficacy	Power	Capacity	Count
Lighting	108.00	6.00	648.00	10

24.0 Main Heating 1

SAP table

Percentage of Heat %

Fuel Type

SAP Code

In Winter

In Summer

Controls SAP Code

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	None									
Heat source 2	None									
Heat source 3	None									
Heat source 4	None									
Heat source 5	None									

27.0 Secondary Heating

28.0 Water Heating

Water Heating

SAP Code

Fuel Type

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

28.1 Showers

Description	Shower Type	Flow Rate [l/min]	Rated Power [kW]	Connected	Connected To
Shower	Instantaneous electric shower		9.30	No	

28.3 Waste Water Heat Recovery System

29.0 Hot Water Cylinder

In Airing Cupboard

34.0 Small-scale Hydro

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Recommendations

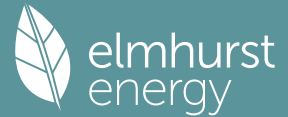
Lower cost measures

None

Further measures to achieve even higher standards

Typical Cost	Typical savings per year	Ratings after improvement	
		SAP rating	Environmental Impact
		0	0
		0	0
		0	0

Full SAP Calculation Printout



Property Reference	204736			Issued on Date	20/02/2025
Assessment Reference	204736 - Baseline	Prop Type Ref	204736		
Property	26a, Prospect Street, Reading, RG4 8JG				
SAP Rating	33 F	DER	16.02	TER	
Environmental	85 B	% DER < TER			N/A
CO ₂ Emissions (t/year)	1.47	DFEE	78.06	TFEE	
Compliance Check	See BREL	% DFEE < TFEE			
% DPER < TPER		DPER	164.78	TPER	
Assessor Details	Mr. David Anslow			Assessor ID	AV54-0001
Client	STL, Shaun Tanner Architecture & Planning				

SAP 10 WORKSHEET FOR Conversion (As Designed) (Version 10.2, February 2022)
CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE

1. Overall dwelling characteristics

	Area (m ²)	Storey height (m)	Volume (m ³)
Main dwelling			
Ground floor	3.1800 (1b)	x 3.0100 (2b)	= 9.5718 (1b) - (3b)
First floor	50.1700 (1c)	x 2.5000 (2c)	= 125.4250 (1c) - (3c)
Second floor	50.1700 (1d)	x 2.4100 (2d)	= 120.9097 (1d) - (3d)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	103.5200		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n) =	255.9065 (5)

2. Ventilation rate

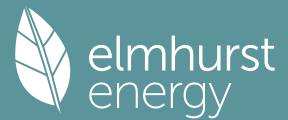
	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
Number of blocked chimneys	0 * 20 = 0.0000 (6f)
Number of intermittent extract fans	3 * 10 = 30.0000 (7a)
Number of passive vents	0 * 10 = 0.0000 (7b)
Number of flueless gas fires	0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) =	30.0000 / (5) = 0.1172 (8)
Pressure test	No
Pressure Test Method	Blower Door
Measured/design AP50	15.0000 (17)
Infiltration rate	0.8672 (18)
Number of sides sheltered	0 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] = 1.0000 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) = 0.8672 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000 (22)
Wind factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750 (22a)
Adj infilt rate	1.1057	1.0840	1.0624	0.9540	0.9323	0.8239	0.8239	0.8022	0.8672	0.9323	0.9756	1.0190 (22b)
Effective ac	1.1057	1.0840	1.0624	0.9550	0.9346	0.8394	0.8394	0.8218	0.8760	0.9346	0.9759	1.0190 (25)

3. Heat losses and heat loss parameter

Element	Gross m ²	Openings m ²	NetArea m ²	U-value W/m ² K	A x U W/K	K-value kJ/m ² K	A x K kJ/K
Main dwelling							
Solid Door			2.0400	1.4000	2.8560		(26)
!/2 Glazed door			1.7400	2.8500	4.9590		(26a)
Window			10.5600	1.3258	14.0000		(27)
Ground Floor			3.1800	0.2500	0.7950	20.0000	63.6000 (28a)
External Wall - upgraded	114.2200	13.1000	101.1200	0.3000	30.3360	9.0000	910.0800 (29a)
Dormer walls	2.7700	1.2400	1.5300	0.3000	0.4590	9.0000	13.7700 (29a)
Slope Roof	33.0200		33.0200	0.1600	5.2832	9.0000	297.1800 (30)
Plane Roof	26.2200		26.2200	0.1600	4.1952	9.0000	235.9800 (30)
Flat Roof	1.7500		1.7500	0.1600	0.2800	9.0000	15.7500 (30)
Total net area of external elements Aum(A, m ²)			181.1600				(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		63.1634		(33)
Main dwelling							
Party Wall			36.4700	0.0000	0.0000	180.0000	6564.6000 (32)
Party Floor			47.8000			30.0000	1434.0000 (32d)
Internal Wall			151.2400			100.0000	15124.0000 (32c)
Internal Floor 1			2.3700			18.0000	42.6600 (32d)
Internal Floor 2			48.6500			18.0000	875.7000 (32d)
Internal Ceiling 1			2.3700			9.0000	21.3300 (32e)

Full SAP Calculation Printout



Internal Ceiling 2	48.6500	9.0000	437.8500 (32e)
Heat capacity Cm = Sum(A x k)	(28)...(30) + (32) + (32a)...(32e) =		
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K	26036.5000 (34)		
Thermal bridges (Default value 0.200 * total exposed area)	251.5118 (35)		
Point Thermal bridges	36.2320 (36)		
Total fabric heat loss	(36a) = 0.0000		
	(33) + (36) + (36a) = 99.3954 (37)		
Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)			
(38)m	Jan	Feb	Mar
Heat transfer coeff	93.3770	91.5461	89.7152
Average = Sum(39)m / 12 =	180.0455	178.3187	170.2803
	Jun	Jul	Aug
	70.8849	70.8849	69.3963
	Sep	Oct	Nov
	73.9812	78.9233	82.4165
	Dec	86.0533 (38)	
	185.4487 (39)	179.9581	
HLP	Jan	Feb	Mar
HLP (average)	1.8622	1.8445	1.8268
Days in mont	31	28	31
	Apr	May	Jun
	1.7392	1.7226	1.6449
	Jul	Aug	Sep
	1.6449	1.6305	1.6748
	Oct	Nov	Dec
	1.7226	1.7563	1.7914 (40)
	31	30	1.7384
			31

4. Water heating energy requirements (kWh/year)

Assumed occupancy												2.7698 (42)
Hot water usage for mixer showers	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (42a)
Hot water usage for baths	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (42b)
Hot water usage for other uses	45.2585	43.6128	41.9670	40.3212	38.6755	37.0297	37.0297	38.6755	40.3212	41.9670	43.6128	45.2585 (42c)
Average daily hot water use (litres/day)												41.1441 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Energy content (annual)	45.2585	43.6128	41.9670	40.3212	38.6755	37.0297	37.0297	38.6755	40.3212	41.9670	43.6128	45.2585 (44)
Distribution loss (46)m = 0.15 x (45)m	71.6785	62.1040	64.5017	55.1978	52.0646	45.5324	44.7842	47.8883	49.7201	56.9488	62.1344	70.8639 (45)
	Total = Sum(45)m =											683.4189
Water storage loss:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (46)
Total storage loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (56)
If cylinder contains dedicated solar storage	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (57)
Primary loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (59)
Combi loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (61)
Total heat required for water heating calculated for each month	60.9267	52.7884	54.8265	46.9181	44.2549	38.7025	38.0666	40.7051	42.2621	48.4065	52.8142	60.2344 (62)
WWHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63a)
PV diverter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63b)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63c)
FGHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63d)
Output from w/h	60.9267	52.7884	54.8265	46.9181	44.2549	38.7025	38.0666	40.7051	42.2621	48.4065	52.8142	60.2344 (64)
12Total per year (kWh/year)	Total per year (kWh/year) = Sum(64)m =											580.9060 (64)
Electric shower(s)	72.7025	64.7786	70.7357	67.5022	68.7689	65.5988	67.7854	68.7689	67.5022	70.7357	69.4056	72.7025 (64a)
	Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =											826.9870 (64a)
Heat gains from water heating, kWh/month	33.4073	29.3917	31.3905	28.6051	28.2560	26.0753	26.4630	27.3685	27.4411	29.7856	30.5550	33.2342 (65)

5. Internal gains (see Table 5 and 5a)

Metabolic gains (Table 5), Watts	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(66)m	138.4905	138.4905	138.4905	138.4905	138.4905	138.4905	138.4905	138.4905	138.4905	138.4905	138.4905	138.4905 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	151.8955	168.1701	151.8955	156.9587	151.8955	156.9587	151.8955	151.8955	156.9587	151.8955	156.9587	151.8955 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	261.8959	264.6136	257.7652	243.1857	224.7818	207.4846	195.9291	193.2114	200.0598	214.6393	233.0433	250.3404 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	36.8490	36.8490	36.8490	36.8490	36.8490	36.8490	36.8490	36.8490	36.8490	36.8490	36.8490	36.8490 (69)
Pumps, fans	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (70)
Losses e.g. evaporation (negative values) (Table 5)	-110.7924	-110.7924	-110.7924	-110.7924	-110.7924	-110.7924	-110.7924	-110.7924	-110.7924	-110.7924	-110.7924	-110.7924 (71)
Water heating gains (Table 5)	44.9023	43.7377	42.1916	39.7293	37.9784	36.2157	35.5686	36.7856	38.1126	40.0343	42.4374	44.6697 (72)
Total internal gains	523.2409	541.0685	516.3995	504.4209	479.2029	465.2062	447.9403	446.4397	459.6783	471.1163	496.9866	511.4527 (73)

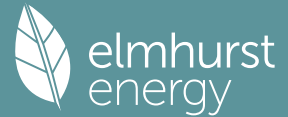
6. Solar gains

[Jan]	Area m2	Solar flux Table 6a W/m2	g Specific data or Table 6b	FF Specific data or Table 6c	Access factor Table 6d	Gains W
North	4.5500	10.6334	0.4400	0.0000	0.7700	16.3918 (74)
Northeast	0.6800	11.2829	0.4400	0.0000	0.7700	2.5994 (75)
South	4.6500	46.7521	0.4400	0.0000	0.7700	73.6541 (78)
Northwest	0.6800	11.2829	0.4400	0.0000	0.7700	2.5994 (81)
Solar gains	95.2448	162.5344	225.9526	290.4781	338.2368	342.3315
Total gains	618.4857	703.6029	742.3520	794.8989	817.4396	807.5378
						775.1979
						736.4874
						707.4227
						651.4448
						611.0547
						81.5546 (83)
						593.0073 (84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)	21.0000 (85)
---	--------------

Full SAP Calculation Printout



Utilisation factor for gains for living area, nil,m (see Table 9a)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
tau	37.5176	37.8774	38.2441	40.1696	40.5586	42.4733	42.4733	42.8478	41.7148	40.5586	39.7794	38.9993
alpha	3.5012	3.5252	3.5496	3.6780	3.7039	3.8316	3.8316	3.8565	3.7810	3.7039	3.6520	3.6000
util living area	0.9975	0.9957	0.9929	0.9843	0.9617	0.8926	0.7793	0.8145	0.9390	0.9864	0.9957	0.9979 (86)
MIT	19.8387	19.9212	20.0555	20.2788	20.4745	20.6672	20.7519	20.7410	20.6039	20.3476	20.0848	19.8625 (87)
Th 2	19.4268	19.4390	19.4513	19.5128	19.5247	19.5806	19.5806	19.5910	19.5589	19.5247	19.5008	19.4760 (88)
util rest of house	0.9965	0.9941	0.9899	0.9764	0.9378	0.8120	0.6035	0.6561	0.8882	0.9781	0.9938	0.9972 (89)
MIT 2	18.0785	18.1942	18.3762	18.7124	18.9671	19.2392	19.3133	19.3177	19.1540	18.8110	18.4557	18.1501 (90)
Living area fraction									FLA = Living area / (4) =			0.1677 (91)
MIT	18.3737	18.4838	18.6578	18.9751	19.2198	19.4787	19.5546	19.5564	19.3972	19.0687	18.7289	18.4373 (92)
Temperature adjustment												0.7000
adjusted MIT	19.0737	19.1838	19.3578	19.6751	19.9198	20.1787	20.2546	20.2564	20.0972	19.7687	19.4289	19.1373 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9963	0.9937	0.9897	0.9775	0.9457	0.8520	0.6984	0.7424	0.9114	0.9798	0.9937	0.9969 (94)
Useful gains	616.1765	699.1931	734.6721	776.9967	773.0137	688.0445	541.4279	546.7942	644.7704	638.3006	607.1868	591.1924 (95)
Ext temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000 (96)
Heat loss rate W	2847.9537	2727.3746	2431.5505	1940.0079	1465.7510	949.9387	622.2991	650.9208	1039.7705	1634.9492	2241.5362	2770.1012 (97)
Space heating kWh	1660.4422	1362.9380	1262.4776	837.3681	515.3965	0.0000	0.0000	0.0000	0.0000	741.5066	1176.7316	1621.1082 (98a)
Space heating requirement - total per year (kWh/year)												9177.9687
Solar heating kWh	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (98b)
Solar heating contribution - total per year (kWh/year)												0.0000
Space heating kWh	1660.4422	1362.9380	1262.4776	837.3681	515.3965	0.0000	0.0000	0.0000	0.0000	741.5066	1176.7316	1621.1082 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												9177.9687
Space heating per m2										(98c) / (4) =		88.6589 (99)

9a. Energy requirements - Individual heating systems, including micro-CHP

Fraction of space heat from secondary/supplementary system (Table 11)												0.0000 (201)
Fraction of space heat from main system(s)												1.0000 (202)
Efficiency of main space heating system 1 (in %)												100.0000 (206)
Efficiency of main space heating system 2 (in %)												0.0000 (207)
Efficiency of secondary/supplementary heating system, %												0.0000 (208)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Space heating requirement	1660.4422	1362.9380	1262.4776	837.3681	515.3965	0.0000	0.0000	0.0000	0.0000	741.5066	1176.7316	1621.1082 (98)
Space heating efficiency (main heating system 1)	100.0000	100.0000	100.0000	100.0000	100.0000	0.0000	0.0000	0.0000	0.0000	100.0000	100.0000	100.0000 (210)
Space heating fuel (main heating system)	1660.4422	1362.9380	1262.4776	837.3681	515.3965	0.0000	0.0000	0.0000	0.0000	741.5066	1176.7316	1621.1082 (211)
Space heating efficiency (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (212)
Space heating fuel (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (213)
Space heating fuel (secondary)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (215)
Water heating												
Water heating requirement	60.9267	52.7884	54.8265	46.9181	44.2549	38.7025	38.0666	40.7051	42.2621	48.4065	52.8142	60.2344 (64)
Efficiency of water heater (217)m	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000 (216)
Fuel for water heating, kWh/month	60.9267	52.7884	54.8265	46.9181	44.2549	38.7025	38.0666	40.7051	42.2621	48.4065	52.8142	60.2344 (219)
Space cooling fuel requirement (221)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (221)
Pumps and Fa	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (231)
Lighting	41.5002	33.2930	29.9767	21.9622	16.9642	13.8599	15.4753	20.1154	26.1279	34.2813	38.7206	42.6536 (232)
Electricity generated by PVs (Appendix M) (negative quantity) (233a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (233a)
Electricity generated by wind turbines (Appendix M) (negative quantity) (234a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (234a)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity) (235a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (235a)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation) (235c)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (235c)
Electricity generated by PVs (Appendix M) (negative quantity) (233b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (233b)
Electricity generated by wind turbines (Appendix M) (negative quantity) (234b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (234b)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity) (235b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (235b)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation) (235d)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (235d)
Annual totals kWh/year												
Space heating fuel - main system 1												9177.9687 (211)
Space heating fuel - main system 2												0.0000 (213)
Space heating fuel - secondary												0.0000 (215)
Efficiency of water heater												100.0000
Water heating fuel used												580.9060 (219)
Space cooling fuel												0.0000 (221)
Electricity for pumps and fans:												
Total electricity for the above, kWh/year												0.0000 (231)
Electricity for lighting (calculated in Appendix L)												334.9303 (232)
Energy saving/generation technologies (Appendices M ,N and Q)												
PV generation												0.0000 (233)
Wind generation												0.0000 (234)
Hydro-electric generation (Appendix N)												0.0000 (235a)
Electricity generated - Micro CHP (Appendix N)												0.0000 (235)
Appendix Q - special features												
Energy saved or generated												-0.0000 (236)
Energy used												0.0000 (237)

Full SAP Calculation Printout



Total delivered energy for all uses

10920.7921 (238)

12a. Carbon dioxide emissions - Individual heating systems including micro-CHP

	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year
Space heating - main system 1	9177.9687	0.1539	1412.4292 (261)
Total CO2 associated with community systems			0.0000 (373)
Water heating (other fuel)	580.9060	0.1416	82.2777 (264)
Energy for instantaneous electric shower(s)	826.9870	0.1391	115.0522 (264a)
Space and water heating			1494.7069 (265)
Pumps, fans and electric keep-hot	0.0000	0.0000	0.0000 (267)
Energy for lighting	334.9303	0.1443	48.3408 (268)
Total CO2, kg/year			1658.0998 (272)
EPC Dwelling Carbon Dioxide Emission Rate (DER)			16.0200 (273)

13a. Primary energy - Individual heating systems including micro-CHP

	Energy kWh/year	Primary energy factor kg CO2/kWh	Primary energy kWh/year
Space heating - main system 1	9177.9687	1.5698	14407.1524 (275)
Total CO2 associated with community systems			0.0000 (473)
Water heating (other fuel)	580.9060	1.5238	885.1584 (278)
Energy for instantaneous electric shower(s)	826.9870	1.5143	1252.3347 (278a)
Space and water heating			15292.3108 (279)
Pumps, fans and electric keep-hot	0.0000	0.0000	0.0000 (281)
Energy for lighting	334.9303	1.5338	513.7273 (282)
Total Primary energy kWh/year			17058.3729 (286)
Dwelling Primary energy Rate (DPER)			164.7800 (287)

Summary for Input Data

Property Reference	204736	Issued on Date	20/02/2025
Assessment Reference	204736 - Baseline	Prop Type Ref	204736
Property	26a, Prospect Street, Reading, RG4 8JG		

SAP Rating	33 F	DER	16.02	TER	
Environmental	85 B	% DER < TER			N/A
CO ₂ Emissions (t/year)	1.47	DFEE	78.06	TFEE	
Compliance Check	See BREL	% DFEE < TFEE			
% DPER < TPER		DPER	164.78	TPER	

Assessor Details	Mr. David Anslow	Assessor ID	AV54-0001
Client	STL, Shaun Tanner Architecture & Planning		

SUMMARY FOR INPUT DATA FOR: Conversion (As Designed)

Orientation	North	
Property Tenture	ND	
Transaction Type	6	
Terrain Type	Urban	
1.0 Property Type	Flat, Mid-Terrace	
Position of Flat	Top-floor flat	
Which Floor	2	
2.0 Number of Storeys	3	
3.0 Date Built	2024	
4.0 Sheltered Sides	0	
5.0 Sunlight/Shade	Average or unknown	
6.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	251.51	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:	8.60 m	3.18 m ²	3.01 m
	2nd Storey:	29.15 m	50.17 m ²	2.50 m
		29.15 m	50.17 m ²	2.41 m

8.0 Living Area	17.36	m ²
-----------------	-------	----------------

9.0 External Walls	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 - upgraded	Solid Wall	Solid wall : plasterboard on dabs, insulation, any outside structure	0.30	9.00	114.22	101.12	0.00	None	13.10	Enter Gross Area
	Dormer walls	Timber Frame	Timber framed wall (one layer of plasterboard)	0.30	9.00	2.77	1.53	0.00	None	1.24	Enter Gross Area

9.1 Party Walls	Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)	Shelter Res	Shelter
	Party Wall	Solid Wall	Dense plaster both sides, dense blocks, cavity or cavity fill	0.00	180.00	36.47		None

9.2 Internal Walls	Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
	Internal Wall	Dense block, dense plaster	100.00	151.24

10.0 External Roofs	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
	Slope Roof	External Slope Roof	Plasterboard, insulated slope	0.16	9.00	33.02	33.02	None	0.00	Enter Gross Area	0.00
	Plane Roof	External Slope Roof	Plasterboard, insulated slope	0.16	9.00	26.22	26.22	None	0.00	Enter Gross Area	0.00

Summary for Input Data

Flat Roof	External Flat Roof	Plasterboard, insulated flat roof	0.16	9.00	1.75	1.75	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	2.37
Internal Ceiling 2	+1	Plasterboard ceiling, carpeted chipboard floor	48.65

11.0 Heat Loss Floors

Description	Type	Storey Index	Construction	U-Value (W/m²K)	Shelter Code	Shelter Factor	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Ground Floor - Timber	Lowest occupied	Suspended timber, insulation between joists	0.25	None	0.00	20.00	3.18

11.1 Party Floors

Description	Storey Index	Construction	Kappa (kJ/m²K)	Area (m²)
Party Floor	+1	Timber I-joists, carpeted	20.00	47.80

11.2 Internal Floors

Description	Storey Index	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Floor 1		Plasterboard ceiling, carpeted chipboard floor	9.00	2.37
Internal Floor 2		Plasterboard ceiling, carpeted chipboard floor	9.00	48.65

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Solid Door	Manufacturer	Solid Door				0.00			1.40
!/2 Glazed door	SAP table	Half Glazed Door	Double glazed	≥ 16 mm	Air Filled	0.76	PVC	0.70	2.85
Window	BFRC, BSI or CERTASS data	Window	Double glazed			0.44			1.40

13.0 Openings

Name	Opening Type	Location	Orientation	Area (m²)	Pitch
Front Door	Solid Door	External Wall - upgraded	North	2.04	
N	Window	External Wall - upgraded	North	4.55	
NE	Window	External Wall - upgraded	North East	0.68	
NW	Window	External Wall - upgraded	North West	0.68	
Rear Door	!/2 Glazed door	External Wall - upgraded	South	1.74	
S	Window	External Wall - upgraded	South	3.41	
S Dormer	Window	Dormer walls	South	1.24	

14.0 Conservatory

15.0 Draught Proofing

%

16.0 Draught Lobby

17.0 Thermal Bridging

Y-value W/m²K

19.0 Mechanical Ventilation

Mechanical Ventilation

Mechanical Ventilation System Present

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
Number of flues attached to other heater	0
Number of blocked chimneys	0
Number of intermittent extract fans	3
Number of passive vents	0
Number of flueless gas fires	0

21.0 Fixed Cooling System

22.0 Pressure Testing

Test Method

22.0 Lighting

No Fixed Lighting

Summary for Input Data

	Name	Efficacy	Power	Capacity	Count						
	Lighting	75.00	5.00	375.00	10						
24.0 Main Heating 1											
	SAP table										
Percentage of Heat	100.00				%						
Fuel Type	Electricity										
SAP Code	403										
In Winter	100.00										
In Summer	100.00										
Controls SAP Code	2401										
25.0 Main Heating 2											
	None										
26.0 Heat Networks											
	None										
	Heat Source	Fuel Type	Heating Use	Efficiency	Percentage Of Heat	Heat	Heat Power Ratio	Electrical	Fuel Factor	Efficiency type	
Heat source 1	None										
Heat source 2	None										
Heat source 3	None										
Heat source 4	None										
Heat source 5	None										
27.0 Secondary Heating											
	None										
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	No										
Cold Water Source	From mains										
Bath Count	0										
28.1 Showers											
Description	Shower Type	Flow Rate [l/min]	Rated Power [kW]	Connected	Connected To						
Shower	Instantaneous electric shower		9.30	No							
28.3 Waste Water Heat Recovery System											
29.0 Hot Water Cylinder											
	None										
In Airing Cupboard	No										
34.0 Small-scale Hydro											
	None										
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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			
								0			
								0			
								0			