

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

Property Reference	076 - PRJ013014			Issued on Date	27/05/2025
Assessment Reference	076	Prop Type Ref	1BFA		
Property	Flat 4, Hawker House, Paulet Close, Netley Abbey, SOUTHAMPTON, SO31 5JW				
SAP Rating	82 B	DER	4.70	TER	21.45
Environmental	97 A	% DER<TER	78.09		
CO ₂ Emissions (t/year)	0.00	DFEE	49.69	TFEE	56.50
General Requirements Compliance	Pass	% DFEE<TFEE	12.05		
Assessor Details	Mr. Christopher Nicholls, Briary Energy Limited, Tel: 0203 397 1373, chris@briaryenergy.co.uk			Assessor ID	U903-0001
Client					

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REGULATIONS COMPLIANCE REPORT - Approved Document L1A, 2013 Edition, England

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DWELLING AS BUILT

Top-floor flat, total floor area 54 m²

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:Mains gas
Fuel factor:1.00 (mains gas)
Target Carbon Dioxide Emission Rate (TER) 21.45 kgCO₂/m²
Dwelling Carbon Dioxide Emission Rate (DER) 4.70 kgCO₂/m²OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)56.5 kWh/m²/yr
Dwelling Fabric Energy Efficiency (DFEE)49.7 kWh/m²/yrOK

2 Fabric U-values

Element	Average	Highest	
External wall	0.23 (max. 0.30)	0.32 (max. 0.70)	OK
Floor	0.14 (max. 0.25)	0.14 (max. 0.70)	OK
Roof	0.08 (max. 0.20)	0.08 (max. 0.35)	OK
Openings	1.36 (max. 2.00)	1.40 (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: 3.56 (measured in this dwelling)
Maximum 10.0 OK

4 Heating efficiency

Main heating system: Boiler system with radiators or underfloor - Mains gas
Data from database
Vaillant ecoFIT sustain 830 VUW 306/6-3 (H-GB)
Combi boiler
Efficiency: 89.3% SEDBUK2009
Minimum: 88.0% OK

Secondary heating system: None

5 Cylinder insulation

Hot water storage No cylinder

6 Controls

Space heating controls: Programmer, room thermostat and TRVs OK

Hot water controls: No cylinder

Boiler interlock Yes OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings:100%
Minimum 75% OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (Southern England): Slight OK

Based on:

Overshading: Average
Windows facing North East: 3.36 m², No overhang
Windows facing South East: 2.72 m², No overhang
Windows facing North West: 0.72 m², No overhang
Air change rate: 5.27 ach
Blinds/curtains: Dark-coloured curtain or roller blind, closed 100% of daylight hours

10 Key features

Roof U-value 0.08 W/m²K
Air permeability 3.6 m³/m²h
Photovoltaic array 2.00 kW

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CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE 09 Jan 2014

SAP 2012 WORKSHEET FOR New Build (As Built) (Version 9.92, January 2014)
CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE 09 Jan 2014

1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	53.5700 (1b)	x 2.3400 (2b)	= 125.3538 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	53.5700		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 125.3538 (5)

2. Ventilation rate

	main heating	secondary heating	other	total	m ³ per hour
Number of chimneys	0	+	0	=	0 * 40 = 0.0000 (6a)
Number of open flues	0	+	0	=	0 * 20 = 0.0000 (6b)
Number of intermittent fans					2 * 10 = 20.0000 (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)+(7a)+(7b)+(7c) =				Air changes per hour
Pressure test					20.0000 / (5) = 0.1595 (8)
Measured/design AP50					Yes
Infiltration rate					3.5600
Number of sides sheltered					0.3375 (18)
					0 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] =				1.0000 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) =				0.3375 (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												
	0.4304	0.4219	0.4135	0.3713	0.3629	0.3207	0.3207	0.3122	0.3375	0.3629	0.3797	0.3966 (22b)
Effective ac	0.5926	0.5890	0.5855	0.5689	0.5658	0.5514	0.5514	0.5487	0.5570	0.5658	0.5721	0.5787 (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
Solid Door			1.6800	1.2000	2.0160		(26)
Windows (Uw = 1.40)			6.8100	1.3258	9.0152		(27)
Flr - Exposed Underside of Bay			1.9180	0.1400	0.2685	13.2000	25.3176 (28b)
Wl - Clad (Timber Frame)	56.5350	6.8070	49.7280	0.2100	10.4429	7.4000	367.9872 (29a)
Wl - Corridor	15.3120	1.6760	13.6360	0.3200	4.3635	13.4400	183.2678 (29a)
Rf - Ins Joist	53.5710		53.5710	0.0800	4.2857	7.4000	396.4254 (30)
Total net area of external elements Aum(A, m ²)			127.3330				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	30.3918		(33)
Party Floor			51.6530			20.1600	1041.3245 (32d)
Stud			90.3110			7.4000	668.3016 (32c)
Heat capacity Cm = Sum(A x k)						(28)...(30) + (32) + (32a)...(32e) =	2682.6241 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							50.0770 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							13.4306 (36)
Total fabric heat loss						(33) + (36) =	43.8224 (37)

Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(38)m	24.5144	24.3656	24.2198	23.5349	23.4068	22.8102	22.8102	22.6998	23.0400	23.4068	23.6660	23.9370 (38)
Heat transfer coeff	68.3367	68.1880	68.0422	67.3573	67.2291	66.6326	66.6326	66.5221	66.8624	67.2291	67.4884	67.7594 (39)
Average = Sum(39)m / 12 =												67.3567 (39)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.2757	1.2729	1.2702	1.2574	1.2550	1.2438	1.2438	1.2418	1.2481	1.2550	1.2598	1.2649 (40)
HLP (average)												1.2574 (40)
Days in month	31	28	31	30	31	30	31	31	30	31	30	31 (41)

4. Water heating energy requirements (kWh/year)

Assumed occupancy												1.7954 (42)
Average daily hot water use (litres/day)												76.8396 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	84.5236	81.4500	78.3764	75.3028	72.2292	69.1556	69.1556	72.2292	75.3028	78.3764	81.4500	84.5236 (44)
Energy conte	125.3460	109.6284	113.1267	98.6266	94.6346	81.6624	75.6723	86.8350	87.8721	102.4065	111.7847	121.3909 (45)
Energy content (annual)										Total = Sum(45)m =		1208.9861 (45)
Distribution loss (46)m = 0.15 x (45)m												
	18.8019	16.4443	16.9690	14.7940	14.1952	12.2494	11.3508	13.0253	13.1808	15.3610	16.7677	18.2086 (46)
Water storage loss:												

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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)
Combi loss	1.2184	1.0269	1.0196	0.8541	0.7861	0.6495	0.6018	0.7213	0.7610	0.9230	1.0471	1.1799 (61)
Total heat required for water heating calculated for each month	126.5644	110.6553	114.1463	99.4807	95.4206	82.3119	76.2741	87.5563	88.6331	103.3295	112.8317	122.5708 (62)
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 (63)
Output from w/h	126.5644	110.6553	114.1463	99.4807	95.4206	82.3119	76.2741	87.5563	88.6331	103.3295	112.8317	122.5708 (64)
Heat gains from water heating, kWh/month	41.9821	36.7082	37.8695	33.0069	31.6625	27.3151	25.3115	29.0530	29.4077	34.2809	37.4302	40.6575 (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	89.7676	89.7676	89.7676	89.7676	89.7676	89.7676	89.7676	89.7676	89.7676	89.7676	89.7676	89.7676 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	15.1952	13.4962	10.9759	8.3095	6.2114	5.2439	5.6663	7.3652	9.8856	12.5520	14.6501	15.6175 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	156.4931	158.1170	154.0248	145.3130	134.3159	123.9802	117.0753	115.4514	119.5436	128.2554	139.2525	149.5882 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	31.9768	31.9768	31.9768	31.9768	31.9768	31.9768	31.9768	31.9768	31.9768	31.9768	31.9768	31.9768 (69)
Pumps, fans	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000 (70)
Losses e.g. evaporation (negative values) (Table 5)	-71.8141	-71.8141	-71.8141	-71.8141	-71.8141	-71.8141	-71.8141	-71.8141	-71.8141	-71.8141	-71.8141	-71.8141 (71)
Water heating gains (Table 5)	56.4276	54.6252	50.8999	45.8429	42.5571	37.9377	34.0208	39.0497	40.8440	46.0765	51.9863	54.6471 (72)
Total internal gains	281.0462	279.1688	268.8309	252.3956	236.0147	220.0921	209.6927	214.7966	223.2035	239.8142	258.8192	272.7831 (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
Northeast			3.3640		11.2829	0.5000		0.7200		0.7700		9.4692 (75)
Southeast			2.7240		36.7938	0.5000		0.7200		0.7700		25.0045 (77)
Northwest			0.7190		11.2829	0.5000		0.7200		0.7700		2.0239 (81)
Solar gains	36.4976	65.9864	100.4256	141.4285	173.9252	179.4913	170.2090	144.9218	114.4605	75.6631	44.4109	30.7845 (83)
Total gains	317.5438	345.1552	369.2565	393.8241	409.9400	399.5834	379.9017	359.7184	337.6640	315.4773	303.2301	303.5676 (84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Thl (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	10.9044	10.9282	10.9516	11.0630	11.0841	11.1833	11.1833	11.2019	11.1449	11.0841	11.0415	10.9973
alpha	1.7270	1.7285	1.7301	1.7375	1.7389	1.7456	1.7456	1.7468	1.7430	1.7389	1.7361	1.7332
util living area	0.9183	0.9031	0.8773	0.8309	0.7588	0.6563	0.5516	0.5837	0.7295	0.8449	0.9002	0.9237 (86)
MIT	17.2521	17.5271	18.0684	18.8271	19.5989	20.2632	20.6248	20.5686	20.0374	19.0705	18.0412	17.1937 (87)
Th 2	19.8600	19.8621	19.8643	19.8744	19.8763	19.8851	19.8851	19.8867	19.8817	19.8763	19.8724	19.8685 (88)
util rest of house	0.9097	0.8928	0.8634	0.8096	0.7236	0.5951	0.4566	0.4929	0.6776	0.8213	0.8879	0.9157 (89)
MIT 2	16.4436	16.7163	17.2518	18.0019	18.7476	19.3719	19.6812	19.6412	19.1754	18.2504	17.2355	16.3915 (90)
Living area fraction	16.8677	17.1416	17.6801	18.4348	19.1941	19.8395	20.1762	20.1277	19.6276	18.6806	17.6581	16.8123 (92)
Temperature adjustment	16.7177	16.9916	17.5301	18.2848	19.0441	19.6895	20.0262	19.9777	19.4776	18.5306	17.5081	-0.1500
adjusted MIT												16.6623 (93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Useful gains	0.8770	0.8577	0.8260	0.7719	0.6923	0.5828	0.4700	0.5012	0.6552	0.7850	0.8531	0.8842 (94)
Ext temp.	278.4739	296.0498	305.0023	303.9779	283.8023	232.8650	178.5555	180.3066	221.2467	247.6424	258.6712	268.4057 (95)
Heat loss rate W	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)
Month fracti	848.5848	824.5049	750.5142	632.1319	493.7386	339.1240	228.2933	237.9959	359.5568	533.1660	702.4281	844.4366 (97)
Space heating kWh	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000	1.0000 (97a)
Space heating per m2	424.1625	355.1218	331.4609	236.2709	156.1926	0.0000	0.0000	0.0000	0.0000	212.4296	319.5050	428.5670 (98)
												2463.7102 (98)
												45.9905 (99)

8c. Space cooling requirement

Not applicable

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CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE 09 Jan 2014

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 %)													90.2000 (206)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
Space heating requirement													2731.3860 (211)
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Space heating requirement	424.1625	355.1218	331.4609	236.2709	156.1926	0.0000	0.0000	0.0000	0.0000	212.4296	319.5050	428.5670 (98)	
Space heating efficiency (main heating system 1)	90.2000	90.2000	90.2000	90.2000	90.2000	0.0000	0.0000	0.0000	0.0000	90.2000	90.2000	90.2000 (210)	
Space heating fuel (main heating system)	470.2467	393.7049	367.4732	261.9411	173.1625	0.0000	0.0000	0.0000	0.0000	235.5095	354.2184	475.1297 (211)	
Water heating requirement	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 requirement	126.5644	110.6553	114.1463	99.4807	95.4206	82.3119	76.2741	87.5563	88.6331	103.3295	112.8317	122.5708 (64)	
Efficiency of water heater (217)m	86.5458	86.4276	86.1457	85.5433	84.3246	76.2000	76.2000	76.2000	76.2000	85.0845	86.0729	76.2000 (216)	
Fuel for water heating, kWh/month	146.2398	128.0323	132.5038	116.2928	113.1587	108.0208	100.0972	114.9033	116.3163	121.4434	131.0886	141.4403 (219)	
Water heating fuel used												1469.5374 (219)	
Annual totals kWh/year													
Space heating fuel - main system												2731.3860 (211)	
Space heating fuel - secondary												0.0000 (215)	
Electricity for pumps and fans:													
central heating pump												30.0000 (230c)	
main heating flue fan												45.0000 (230e)	
Total electricity for the above, kWh/year												75.0000 (231)	
Electricity for lighting (calculated in Appendix L)												268.3521 (232)	
Energy saving/generation technologies (Appendices M, N and Q)													
PV Unit 0 (0.80 * 2.00 * 1004 * 1.00) =												-1606.3939 (233)	
Total delivered energy for all uses												2937.8815 (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	2731.3860	0.2160	589.9794 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1469.5374	0.2160	317.4201 (264)
Space and water heating			907.3995 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	268.3521	0.5190	139.2747 (268)
Energy saving/generation technologies			
PV Unit	-1606.3939	0.5190	-833.7184 (269)
Total CO2, kg/year			251.8807 (272)
Dwelling Carbon Dioxide Emission Rate (DER)			4.7000 (273)

16 CO2 EMISSIONS ASSOCIATED WITH APPLIANCES AND COOKING AND SITE-WIDE ELECTRICITY GENERATION TECHNOLOGIES

DER		4.7000 ZC1
Total Floor Area	TFA	53.5700
Assumed number of occupants	N	1.7954
CO2 emission factor in Table 12 for electricity displaced from grid	EF	0.5190
CO2 emissions from appliances, equation (L14)		17.3109 ZC2
CO2 emissions from cooking, equation (L16)		3.0257 ZC3
Total CO2 emissions		25.0366 ZC4
Residual CO2 emissions offset from biofuel CHP		0.0000 ZC5
Additional allowable electricity generation, kWh/m²/year		0.0000 ZC6
Resulting CO2 emissions offset from additional allowable electricity generation		0.0000 ZC7
Net CO2 emissions		25.0366 ZC8

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CALCULATION OF TARGET EMISSIONS 09 Jan 2014

SAP 2012 WORKSHEET FOR New Build (As Built) (Version 9.92, January 2014)
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1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	53.5700 (1b)	x 2.3400 (2b)	= 125.3538 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	53.5700		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 125.3538 (5)

2. Ventilation rate

	main heating	secondary heating	other	total	m ³ per hour
Number of chimneys	0	0	0	0 * 40 =	0.0000 (6a)
Number of open flues	0	0	0	0 * 20 =	0.0000 (6b)
Number of intermittent fans				2 * 10 =	20.0000 (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)+(7a)+(7b)+(7c) =				Air changes per hour
Pressure test					20.0000 / (5) = 0.1595 (8)
Measured/design AP50					Yes
Infiltration rate					5.0000
Number of sides sheltered					0.4095 (18)
					0 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] =				1.0000 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) =				0.4095 (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												
	0.5222	0.5119	0.5017	0.4505	0.4403	0.3891	0.3891	0.3788	0.4095	0.4403	0.4607	0.4812 (22b)
Effective ac	0.6363	0.6310	0.6258	0.6015	0.5969	0.5757	0.5757	0.5718	0.5839	0.5969	0.6061	0.6158 (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
TER Opaque door			1.6800	1.0000	1.6800		(26)
TER Opening Type (Uw = 1.40)			6.8100	1.3258	9.0152		(27)
F1r - Exposed Underside of Bay			1.9180	0.1300	0.2493		(28b)
W1 - Clad (Timber Frame)	56.5350	6.8070	49.7280	0.1800	8.9510		(29a)
W1 - Corridor	15.3120	1.6760	13.6360	0.1800	2.4545		(29a)
RF - Ins Joist	53.5710		53.5710	0.1300	6.9642		(30)
Total net area of external elements Aum(A, m ²)			127.3330				(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		29.3142		(33)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							250.0000 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							7.9994 (36)
Total fabric heat loss						(33) + (36) =	37.3136 (37)

Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)												
(38)m	26.3230	26.1040	25.8894	24.8811	24.6925	23.8143	23.8143	23.6517	24.1526	24.6925	25.0741	25.4731 (38)
Heat transfer coeff	63.6367	63.4177	63.2030	62.1948	62.0061	61.1280	61.1280	60.9654	61.4662	62.0061	62.3878	62.7867 (39)
Average = Sum(39)m / 12 =												62.1939 (39)
HLP	1.1879	1.1838	1.1798	1.1610	1.1575	1.1411	1.1411	1.1381	1.1474	1.1575	1.1646	1.1720 (40)
HLP (average)												1.1610 (40)
Days in month	31	28	31	30	31	30	31	31	30	31	30	31 (41)

4. Water heating energy requirements (kWh/year)

Assumed occupancy												1.7954 (42)
Average daily hot water use (litres/day)												76.8396 (43)
Daily hot water use	84.5236	81.4500	78.3764	75.3028	72.2292	69.1556	69.1556	72.2292	75.3028	78.3764	81.4500	84.5236 (44)
Energy conte	125.3460	109.6284	113.1267	98.6266	94.6346	81.6624	75.6723	86.8350	87.8721	102.4065	111.7847	121.3909 (45)
Energy content (annual)										Total = Sum(45)m =		1208.9861 (45)
Distribution loss (46)m = 0.15 x (45)m												
	18.8019	16.4443	16.9690	14.7940	14.1952	12.2494	11.3508	13.0253	13.1808	15.3610	16.7677	18.2086 (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												

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF TARGET EMISSIONS 09 Jan 2014

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 (57)
Total heat required for water heating calculated for each month	43.0723	37.4893	39.9397	37.1356	36.8072	34.1042	35.2410	36.8072	37.1356	39.9397	40.1671	43.0723 (61)
Solar input	168.4183	147.1177	153.0664	135.7622	131.4418	115.7666	110.9132	123.6422	125.0077	142.3462	151.9518	164.4632 (62)
Output from w/h	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63)
Heat gains from water heating, kWh/month	168.4183	147.1177	153.0664	135.7622	131.4418	115.7666	110.9132	123.6422	125.0077	142.3462	151.9518	164.4632 (64)
	52.4456	45.8238	47.5996	42.0773	40.6678	35.6788	33.9713	38.0744	38.5014	44.0351	47.2102	51.1305 (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	89.7676	89.7676	89.7676	89.7676	89.7676	89.7676	89.7676	89.7676	89.7676	89.7676	89.7676	89.7676	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	15.2904	13.5808	11.0446	8.3615	6.2503	5.2768	5.7017	7.4113	9.9475	12.6306	14.7418	15.7153	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	156.4931	158.1170	154.0248	145.3130	134.3159	123.9802	117.0753	115.4514	119.5436	128.2554	139.2525	149.5882	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	31.9768	31.9768	31.9768	31.9768	31.9768	31.9768	31.9768	31.9768	31.9768	31.9768	31.9768	31.9768	(69)
Pumps, fans	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	(70)
Losses e.g. evaporation (negative values) (Table 5)	-71.8141	-71.8141	-71.8141	-71.8141	-71.8141	-71.8141	-71.8141	-71.8141	-71.8141	-71.8141	-71.8141	-71.8141	(71)
Water heating gains (Table 5)	70.4914	68.1901	63.9779	58.4406	54.6610	49.5539	45.6603	51.1753	53.4741	59.1869	65.5697	68.7238	(72)
Total internal gains	295.2052	292.8182	281.9776	265.0454	248.1575	231.7411	221.3676	226.9684	235.8955	253.0032	272.4943	286.9577	(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	

Northeast				3.3640	11.2829		0.6300	0.7000	0.7700		11.5998 (75)	
Southeast				2.7240	36.7938		0.6300	0.7000	0.7700		30.6305 (77)	
Northwest				0.7190	11.2829		0.6300	0.7000	0.7700		2.4793 (81)	

Solar gains	44.7095	80.8334	123.0214	173.2500	213.0584	219.8769	208.5060	177.5292	140.2142	92.6873	54.4034	37.7110 (83)
Total gains	339.9147	373.6516	404.9990	438.2953	461.2159	451.6180	429.8737	404.4976	376.1097	345.6905	326.8976	324.6686 (84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Thl (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	58.4590	58.6609	58.8601	59.8143	59.9963	60.8582	60.8582	61.0205	60.5233	59.9963	59.6293	59.2504	
alpha	4.8973	4.9107	4.9240	4.9876	4.9998	5.0572	5.0572	5.0680	5.0349	4.9998	4.9753	4.9500	
util living area	0.9974	0.9954	0.9899	0.9707	0.9112	0.7698	0.6025	0.6560	0.8801	0.9790	0.9951	0.9980	(86)
MIT	19.7400	19.8690	20.1011	20.4277	20.7262	20.9235	20.9825	20.9735	20.8367	20.4635	20.0525	19.7239	(87)
Th 2	19.9297	19.9330	19.9362	19.9513	19.9542	19.9674	19.9674	19.9699	19.9623	19.9542	19.9484	19.9424	(88)
util rest of house	0.9966	0.9939	0.9862	0.9588	0.8735	0.6804	0.4728	0.5270	0.8159	0.9682	0.9931	0.9973	(89)
MIT 2	18.2571	18.4477	18.7874	19.2669	19.6748	19.9138	19.9607	19.9584	19.8250	19.3251	18.7270	18.2427	(90)
Living area fraction	19.0349	19.1933	19.4765	19.8758	20.2263	20.4434	20.4967	20.4909	20.3557	19.9222	19.4223	19.0196	(91)
MIT	19.0349	19.1933	19.4765	19.8758	20.2263	20.4434	20.4967	20.4909	20.3557	19.9222	19.4223	19.0196	(92)
Temperature adjustment												0.0000	
adjusted MIT	19.0349	19.1933	19.4765	19.8758	20.2263	20.4434	20.4967	20.4909	20.3557	19.9222	19.4223	19.0196	(93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Useful gains	0.9956	0.9924	0.9841	0.9578	0.8847	0.7243	0.5413	0.5950	0.8434	0.9678	0.9918	0.9964	(94)
Ext temp.	338.4054	370.8072	398.5492	419.7783	408.0286	327.1276	232.6770	240.6942	317.2017	334.5495	324.2134	323.5141	(95)
Heat loss rate W	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)
Month fracti	937.6828	906.4451	820.1541	682.6349	528.6855	357.1974	238.1950	249.4028	384.5130	578.0359	768.7615	930.4769	(97)
Space heating kWh	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000	(97a)
Space heating	445.8624	359.9487	313.6740	189.2567	89.7688	0.0000	0.0000	0.0000	0.0000	181.1539	320.0747	451.5803	(98)
Space heating per m2												2351.3195	(98)
												43.8925	(99)

8c. Space cooling requirement

Not applicable

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF TARGET EMISSIONS 09 Jan 2014

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 %)												93.4000 (206)
Efficiency of secondary/supplementary heating system, %												0.0000 (208)
Space heating requirement												2517.4727 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Space heating requirement	445.8624	359.9487	313.6740	189.2567	89.7688	0.0000	0.0000	0.0000	0.0000	181.1539	320.0747	451.5803 (98)
Space heating efficiency (main heating system 1)	93.4000	93.4000	93.4000	93.4000	93.4000	0.0000	0.0000	0.0000	0.0000	93.4000	93.4000	93.4000 (210)
Space heating fuel (main heating system)	477.3688	385.3840	335.8394	202.6303	96.1122	0.0000	0.0000	0.0000	0.0000	193.9549	342.6924	483.4907 (211)
Water heating requirement	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 requirement	168.4183	147.1177	153.0664	135.7622	131.4418	115.7666	110.9132	123.6422	125.0077	142.3462	151.9518	164.4632 (64)
Efficiency of water heater (217)m	87.3865	87.2172	86.8188	85.8876	84.1136	80.3000	80.3000	80.3000	80.3000	85.6592	86.8822	80.3000 (216)
Fuel for water heating, kWh/month	192.7280	168.6797	176.3056	158.0696	156.2669	144.1676	138.1235	153.9754	155.6759	166.1774	174.8941	188.0372 (219)
Water heating fuel used												1973.1009 (219)
Annual totals kWh/year												
Space heating fuel - main system												2517.4727 (211)
Space heating fuel - secondary												0.0000 (215)
Electricity for pumps and fans:												
central heating pump												30.0000 (230c)
main heating flue fan												45.0000 (230e)
Total electricity for the above, kWh/year												75.0000 (231)
Electricity for lighting (calculated in Appendix L)												270.0326 (232)
Total delivered energy for all uses												4835.6062 (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	2517.4727	0.2160	543.7741 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1973.1009	0.2160	426.1898 (264)
Space and water heating			969.9639 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	270.0326	0.5190	140.1469 (268)
Total CO2, kg/m2/year			1149.0358 (272)
Emissions per m2 for space and water heating			18.1065 (272a)
Fuel factor (mains gas)			1.0000
Emissions per m2 for lighting			2.6161 (272b)
Emissions per m2 for pumps and fans			0.7266 (272c)
Target Carbon Dioxide Emission Rate (TER) = (18.1065 * 1.00) + 2.6161 + 0.7266, rounded to 2 d.p.			21.4500 (273)

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Built)

Property Reference	076 - PRJ013014	Issued on Date	27/05/2025
Assessment Reference	076	Prop Type Ref	1BFA
Property	Flat 4, Hawker House, Paulet Close, Netley Abbey, SOUTHAMPTON, SO31 5JW		
SAP Rating	82 B	DER	4.70
Environmental	97 A	TER	21.45
CO ₂ Emissions (t/year)	0.00	% DER<TER	78.09
General Requirements Compliance	Pass	DFEE	49.69
		TFEE	56.50
		% DFEE<TFEE	12.05
Assessor Details	Mr. Christopher Nicholls, Briary Energy Limited, Tel: 0203 397 1373, chris@briaryenergy.co.uk		Assessor ID
			U903-0001
Client			

SUMMARY FOR INPUT DATA FOR New Build (As Built)

Criterion 1 – Achieving the TER and TFEE rate

1a TER and DER

Fuel for main heating	Mains gas		
Fuel factor	1.00 (mains gas)		
Target Carbon Dioxide Emission Rate (TER)	21.45	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	4.70	kgCO ₂ /m ²	Pass
	-16.75 (-78.1%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	56.50	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	49.69	kWh/m ² /yr	
	-6.8 (-12.0%)	kWh/m ² /yr	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.23 (max. 0.30)	0.32 (max. 0.70)	Pass
Floor	0.14 (max. 0.25)	0.14 (max. 0.70)	Pass
Roof	0.08 (max. 0.20)	0.08 (max. 0.35)	Pass
Openings	1.36 (max. 2.00)	1.40 (max. 3.30)	Pass

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.56 (measured in this dwelling)	
Maximum	10.0	Pass

Limiting System Efficiencies

4 Heating efficiency

Main heating system	Boiler system with radiators or underfloor - Mains gas Data from database Vaillant ecoFIT sustain 830 VUW 306/6-3 (H-GB) Combi boiler Efficiency: 89.3% SEDBUK2009 Minimum: 88.0%	Pass
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BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Built)

Secondary heating system

None

5 Cylinder insulation

Hot water storage

No cylinder

6 Controls

Space heating controls

Programmer, room thermostat and TRVs

Pass

Hot water controls

No cylinder

Boiler interlock

Yes

Pass

7 Low energy lights

Percentage of fixed lights with low-energy fittings

100

%

Minimum

75

%

Pass

8 Mechanical ventilation

Not applicable

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (Southern England)

Slight

Pass

Based on:

Overshading

Average

Windows facing North East

3.36 m², No overhang

Windows facing South East

2.72 m², No overhang

Windows facing North West

0.72 m², No overhang

Air change rate

5.27 ach

Blinds/curtains

Dark-coloured curtain or roller blind, closed 100% of daylight hours

Criterion 4 – Building performance consistent with DER and DFEE rate

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals

3.56 (measured in this dwelling)

Maximum

10.0

Pass

10 Key features

Roof U-value

0.08

W/m²K

Air permeability

3.6

m³/m²h

Photovoltaic array

2.00

kW

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.