

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

Property Reference	086 - PRJ013014			Issued on Date	03/06/2025
Assessment Reference	086	Prop Type Ref	C		
Property	7 Moorman Road, Netley Abbey, SOUTHAMPTON, SO31 5JU				
SAP Rating	85 B	DER	14.26	TER	17.45
Environmental	88 B	% DER<TER	18.28		
CO ₂ Emissions (t/year)	1.14	DFEE	43.66	TFEE	50.38
General Requirements Compliance	Pass	% DFEE<TFEE	13.35		
Assessor Details	Mr. Christopher Nicholls, Briary Energy Limited, Tel: 0203 397 1373, chris@briaryenergy.co.uk			Assessor ID	4299-0004
Client					

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

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DWELLING AS BUILT

Semi-Detached House, total floor area 95 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) 17.45 kgCO₂/m²
Dwelling Carbon Dioxide Emission Rate (DER) 14.26 kgCO₂/m²OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE) 50.4 kWh/m²/yr
Dwelling Fabric Energy Efficiency (DFEE) 43.7 kWh/m²/yrOK

2 Fabric U-values

Element	Average	Highest	
External wall	0.21 (max. 0.30)	0.21 (max. 0.70)	OK
Party wall	0.00 (max. 0.20)	-	OK
Floor	0.18 (max. 0.25)	0.18 (max. 0.70)	OK
Roof	0.08 (max. 0.20)	0.08 (max. 0.35)	OK
Openings	1.37 (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: 3.55 (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 835 VUW 356/6-3 (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: Time and temperature zone control 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 South East: 3.61 m², No overhang
Windows facing South West: 0.72 m², No overhang
Windows facing North West: 7.24 m², No overhang
Air change rate: 4.68 ach
Blinds/curtains: Dark-coloured curtain or roller blind, closed 100% of daylight hours

10 Key features

Party wall U-value 0.00 W/m²K
Roof U-value 0.08 W/m²K
Air permeability 3.6 m³/m²h

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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	47.7200 (1b)	x 2.3700 (2b)	= 113.0964 (1b) - (3b)
First floor	47.7200 (1c)	x 2.6200 (2c)	= 125.0264 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	95.4400		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 238.1228 (5)

2. Ventilation rate

										main	secondary	other	total	m3 per hour			
										heating	heating						
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																4 * 10 =	40.0000 (7a)
Number of passive vents																0 * 10 =	0.0000 (7b)
Number of flueless gas fires																0 * 40 =	0.0000 (7c)
										Air changes per hour							
Infiltration due to chimneys, flues and fans										= (6a)+(6b)+(7a)+(7b)+(7c) =					40.0000 / (5) =	0.1680 (8)	
Pressure test															Yes		
Measured/design AP50															3.5500		
Infiltration rate															0.3455 (18)		
Number of sides sheltered															1 (19)		
Shelter factor										(20) = 1 - [0.075 x (19)] =					0.9250 (20)		
Infiltration rate adjusted to include shelter factor										(21) = (18) x (20) =					0.3196 (21)		
Wind speed	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec					
Wind factor	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)					
Adj infilt rate	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)					
	0.4075	0.3995	0.3915	0.3515	0.3435	0.3036	0.3036	0.2956	0.3196	0.3435	0.3595	0.3755 (22b)					
Effective ac	0.5830	0.5798	0.5766	0.5618	0.5590	0.5461	0.5461	0.5437	0.5511	0.5590	0.5646	0.5705 (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			2.0900	1.2000	2.5080		(26)
Windows (Uw = 1.40)			11.5800	1.3258	15.3390		(27)
Flr - Ground			47.7150	0.1800	8.5887	75.6000	3607.2540 (28a)
Wl - Brick (Timber Frame)	97.6560	13.6650	83.9910	0.2100	17.6381	7.4000	621.5334 (29a)
Rf - Ins Joist	47.7150		47.7150	0.0800	3.8172	7.4000	353.0910 (30)
Total net area of external elements Aum(A, m ²)			193.0810				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	47.8910		(33)
Party Wall			46.7690	0.0000	0.0000	7.4000	346.0906 (32)
Stud			74.4133			7.4000	550.6581 (32c)
Internal Floor			47.7150			7.4000	353.0910 (32d)
Internal Ceiling			47.7150			7.4000	353.0910 (32e)
Heat capacity Cm = Sum(A x k)							(28)...(30) + (32) + (32a)...(32e) = 6184.8091 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							64.8031 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							16.8602 (36)
Total fabric heat loss							(33) + (36) = 64.7512 (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	45.8131	45.5598	45.3115	44.1454	43.9272	42.9115	42.9115	42.7235	43.3028	43.9272	44.3686	44.8300 (38)
Heat transfer coeff	110.5643	110.3110	110.0628	108.8966	108.6784	107.6628	107.6628	107.4747	108.0540	108.6784	109.1198	109.5813 (39)
Average = Sum(39)m / 12 =												108.8956 (39)
HLP	1.1585	1.1558	1.1532	1.1410	1.1387	1.1281	1.1281	1.1261	1.1322	1.1387	1.1433	1.1482 (40)
HLP (average)												1.1410 (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												2.6931 (42)
Average daily hot water use (litres/day)												98.1614 (43)
Daily hot water use	Jan 107.9776	Feb 104.0511	Mar 100.1247	Apr 96.1982	May 92.2718	Jun 88.3453	Jul 88.3453	Aug 92.2718	Sep 96.1982	Oct 100.1247	Nov 104.0511	Dec 107.9776 (44)
Energy conte	160.1276	140.0487	144.5177	125.9940	120.8942	104.3225	96.6702	110.9304	112.2553	130.8227	142.8032	155.0751 (45)
Energy content (annual)										Total = Sum(45)m =		1544.4617 (45)
Distribution loss (46)m = 0.15 x (45)m												

Water storage loss:	24.0191	21.0073	21.6777	18.8991	18.1341	15.6484	14.5005	16.6396	16.8383	19.6234	21.4205	23.2613 (46)
Total storage loss												
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 (56)
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	0.6708	0.6086	0.6503	0.5454	0.5020	0.4147	0.3843	0.4606	0.4859	0.5887	0.6206	0.6496 (61)
WWHRS	160.7984	140.6573	145.1680	126.5394	121.3962	104.7373	97.0545	111.3910	112.7412	131.4114	143.4239	155.7247 (62)
Total of WWHRS savings	-52.8094	-46.4657	-47.4242	-39.0182	-36.2287	-29.8865	-25.2932	-30.6245	-31.5182	-38.9634	-45.1348	-51.0429 eq. (G10)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-474.4098
Output from w/h								Solar input (sum of months) = Sum(63)m =				
	107.9890	94.1916	97.7438	87.5212	85.1676	74.8508	71.7613	80.7666	81.2231	92.4480	98.2890	104.6817 (64)
Heat gains from water heating, kWh/month								Total per year (kWh/year) = Sum(64)m =				
	53.4101	46.7183	48.2147	42.0294	40.3228	34.7909	32.2389	36.9995	37.4464	43.6457	47.6372	51.7249 (65)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9039	0.8792	0.8391	0.7708	0.6730	0.5442	0.4158	0.4580	0.6440	0.8005	0.8793	0.9117 (94)
Useful gains	451.1669	499.7392	535.4326	551.9599	520.1451	415.5609	301.4642	305.8836	388.8751	426.2271	425.9493	431.0238 (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	1271.6016	1247.1159	1148.3023	981.4932	773.9266	527.8497	344.9810	360.6109	554.3292	812.8739	1056.5738	1263.0460 (97)
Month fracti	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 kWh	610.4034	502.2371	455.9750	309.2640	188.8135	0.0000	0.0000	0.0000	0.0000	287.6652	454.0496	619.0246 (98)
Space heating												3427.4324 (98)
Space heating per m2												35.9119 (99)
										(98) / (4) =		

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8c. Space cooling requirement

Not applicable

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

3799.8142 (211)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	610.4034	502.2371	455.9750	309.2640	188.8135	0.0000	0.0000	0.0000	0.0000	287.6652	454.0496	619.0246	(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)	676.7222	556.8039	505.5155	342.8647	209.3276	0.0000	0.0000	0.0000	0.0000	318.9193	503.3810	686.2800	(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	107.9890	94.1916	97.7438	87.5212	85.1676	74.8508	71.7613	80.7666	81.2231	92.4480	98.2890	104.6817	(64)
Efficiency of water heater (217)m	87.8156	87.6983	87.4128	86.7439	85.4046	76.4000	76.4000	76.4000	76.4000	86.4042	87.3910	87.9033	(216)
Fuel for water heating, kWh/month	122.9724	107.4041	111.8186	100.8961	99.7224	97.9723	93.9284	105.7154	106.3129	106.9948	112.4704	119.0873	(219)
Water heating fuel used												1285.2950	(219)
Annual totals kWh/year													
Space heating fuel - main system												3799.8142	(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)												430.9551	(232)
Total delivered energy for all uses												5591.0643	(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	3799.8142	0.2160	820.7599	(261)
Space heating - secondary	0.0000	0.0000	0.0000	(263)
Water heating (other fuel)	1285.2950	0.2160	277.6237	(264)
Space and water heating			1098.3836	(265)
Pumps and fans	75.0000	0.5190	38.9250	(267)
Energy for lighting	430.9551	0.5190	223.6657	(268)
Total CO2, kg/year			1360.9743	(272)
Dwelling Carbon Dioxide Emission Rate (DER)			14.2600	(273)

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

DER		14.2600	ZC1
Total Floor Area	TFA	95.4400	
Assumed number of occupants	N	2.6931	
CO2 emission factor in Table 12 for electricity displaced from grid	EF	0.5190	
CO2 emissions from appliances, equation (L14)		15.4439	ZC2
CO2 emissions from cooking, equation (L16)		1.9241	ZC3
Total CO2 emissions		31.6280	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		31.6280	ZC8

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1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	47.7200 (1b)	x 2.3700 (2b)	= 113.0964 (1b) - (3b)
First floor	47.7200 (1c)	x 2.6200 (2c)	= 125.0264 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	95.4400		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 238.1228 (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					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)+(7a)+(7b)+(7c)					30.0000 / (5) = 0.1260 (8)
Pressure test					Yes
Measured/design AP50					5.0000
Infiltration rate					0.3760 (18)
Number of sides sheltered					1 (19)
Shelter factor				(20) = 1 - [0.075 x (19)] =	0.9250 (20)
Infiltration rate adjusted to include shelter factor				(21) = (18) x (20) =	0.3478 (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	0.4434	0.4347	0.4260	0.3826	0.3739	0.3304	0.3304	0.3217	0.3478	0.3739	0.3913	0.4086 (22b)
Effective ac	0.5983	0.5945	0.5908	0.5732	0.5699	0.5546	0.5546	0.5517	0.5605	0.5699	0.5765	0.5835 (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			2.0900	1.0000	2.0900		(26)
TER Opening Type (Uw = 1.40)			11.5800	1.3258	15.3390		(27)
Flr - Ground			47.7150	0.1300	6.2030		(28a)
Wl - Brick (Timber Frame)	97.6560	13.6650	83.9910	0.1800	15.1184		(29a)
Rf - Ins Joist	47.7150		47.7150	0.1300	6.2030		(30)
Total net area of external elements Aum(A, m ²)			193.0810				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	44.9533		(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)							9.7397 (36)
Total fabric heat loss						(33) + (36) =	54.6930 (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	47.0158	46.7158	46.4218	45.0406	44.7822	43.5793	43.5793	43.3565	44.0426	44.7822	45.3050	45.8515 (38)
Heat transfer coeff	101.7088	101.4088	101.1148	99.7336	99.4752	98.2723	98.2723	98.0495	98.7356	99.4752	99.9980	100.5445 (39)
Average = Sum(39)m / 12 =												99.7324 (39)

HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	1.0657	1.0625	1.0595	1.0450	1.0423	1.0297	1.0297	1.0273	1.0345	1.0423	1.0478	1.0535 (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												2.6931 (42)
Average daily hot water use (litres/day)												98.1614 (43)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use	107.9776	104.0511	100.1247	96.1982	92.2718	88.3453	88.3453	92.2718	96.1982	100.1247	104.0511	107.9776 (44)
Energy conte	160.1276	140.0487	144.5177	125.9940	120.8942	104.3225	96.6702	110.9304	112.2553	130.8227	142.8032	155.0751 (45)
Energy content (annual)										Total = Sum(45)m =		1544.4617 (45)
Distribution loss (46)m = 0.15 x (45)m	24.0191	21.0073	21.6777	18.8991	18.1341	15.6484	14.5005	16.6396	16.8383	19.6234	21.4205	23.2613 (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												

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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	50.9589	46.0274	50.9589	47.4402	47.0207	43.5675	45.0198	47.0207	47.4402	50.9589	49.3151	50.9589 (61)
Solar input	211.0865	186.0761	195.4766	173.4342	167.9149	147.8901	141.6900	157.9511	159.6955	181.7816	192.1183	206.0340 (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	211.0865	186.0761	195.4766	173.4342	167.9149	147.8901	141.6900	157.9511	159.6955	181.7816	192.1183	206.0340 (64)
	65.9822	58.0730	60.7919	53.7531	51.9525	45.5791	43.3978	48.6395	49.1849	56.2383	59.8108	64.3022 (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	134.6557	134.6557	134.6557	134.6557	134.6557	134.6557	134.6557	134.6557	134.6557	134.6557	134.6557	134.6557	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	24.5554	21.8099	17.7370	13.4280	10.0376	8.4742	9.1567	11.9022	15.9751	20.2840	23.6744	25.2379	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	248.7382	251.3193	244.8149	230.9680	213.4886	197.0605	186.0855	183.5044	190.0087	203.8557	221.3351	237.7632	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	36.4656	36.4656	36.4656	36.4656	36.4656	36.4656	36.4656	36.4656	36.4656	36.4656	36.4656	36.4656	(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)	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	(71)
Water heating gains (Table 5)	88.6857	86.4182	81.7095	74.6570	69.8286	63.3044	58.3304	65.3757	68.3124	75.5891	83.0706	86.4277	(72)
Total internal gains	428.3760	425.9441	410.6581	385.4497	359.7516	335.2357	319.9692	327.1790	340.6929	366.1255	394.4768	415.8254	(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		
Southeast				3.6130	36.7938	0.6300	0.7000	0.7700		40.6270 (77)		
Southwest				0.7190	36.7938	0.6300	0.7000	0.7700		8.0849 (79)		
Northwest				7.2440	11.2829	0.6300	0.7000	0.7700		24.9789 (81)		
Solar gains	73.6908	133.8196	205.1361	291.1130	359.7874	372.0165	352.4917	298.9901	234.5525	153.8413	89.7755	62.0863 (83)
Total gains	502.0668	559.7637	615.7942	676.5627	719.5390	707.2522	672.4609	626.1691	575.2455	519.9668	484.2523	477.9117 (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	65.1642	65.3570	65.5471	66.4548	66.6274	67.4430	67.4430	67.5962	67.1265	66.6274	66.2791	65.9188	
alpha	5.3443	5.3571	5.3698	5.4303	5.4418	5.4962	5.4962	5.5064	5.4751	5.4418	5.4186	5.3946	
util living area	0.9990	0.9979	0.9945	0.9806	0.9294	0.7924	0.6215	0.6828	0.9074	0.9881	0.9978	0.9992 (86)	
MIT	19.8037	19.9259	20.1458	20.4549	20.7427	20.9311	20.9855	20.9764	20.8399	20.4773	20.0908	19.7864 (87)	
Th 2	20.0290	20.0315	20.0341	20.0460	20.0482	20.0587	20.0587	20.0606	20.0547	20.0482	20.0437	20.0390 (88)	
util rest of house	0.9986	0.9971	0.9924	0.9725	0.8985	0.7104	0.4995	0.5615	0.8546	0.9818	0.9970	0.9989 (89)	
MIT 2	18.4212	18.6016	18.9242	19.3794	19.7778	20.0086	20.0528	20.0498	19.9129	19.4170	18.8518	18.4031 (90)	
Living area fraction									fLA =	Living area / (4) =			0.1539 (91)
MIT	18.6340	18.8055	19.1122	19.5449	19.9263	20.1506	20.1963	20.1924	20.0555	19.5802	19.0425	18.6160 (92)	
Temperature adjustment												0.0000	
adjusted MIT	18.6340	18.8055	19.1122	19.5449	19.9263	20.1506	20.1963	20.1924	20.0555	19.5802	19.0425	18.6160 (93)	

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9978	0.9957	0.9895	0.9668	0.8936	0.7193	0.5182	0.5797	0.8547	0.9773	0.9955	0.9983 (94)
Useful gains	500.9609	557.3649	609.3453	654.0744	642.9822	508.7409	348.4583	362.9780	491.6609	508.1740	482.0828	477.1053 (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	1457.8918	1410.1382	1275.2817	1061.6559	818.3139	545.4671	353.4204	371.8426	588.0249	893.3089	1194.2303	1449.4483 (97)
Month fracti	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 kWh	711.9566	573.0637	495.4567	293.4587	130.4468	0.0000	0.0000	0.0000	0.0000	286.5403	512.7462	723.4232 (98)
Space heating												3727.0921 (98)
Space heating per m2										(98) / (4) =		39.0517 (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												3990.4627 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Space heating requirement	711.9566	573.0637	495.4567	293.4587	130.4468	0.0000	0.0000	0.0000	0.0000	286.5403	512.7462	723.4232 (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)	762.2662	613.5585	530.4675	314.1956	139.6647	0.0000	0.0000	0.0000	0.0000	306.7883	548.9788	774.5430 (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	211.0865	186.0761	195.4766	173.4342	167.9149	147.8901	141.6900	157.9511	159.6955	181.7816	192.1183	206.0340 (64)
Efficiency of water heater (217)m	87.8725	87.6963	87.2937	86.3648	84.4239	80.3000	80.3000	80.3000	80.3000	86.1920	87.4036	80.3000 (216)
Fuel for water heating, kWh/month	240.2192	212.1823	223.9298	200.8158	198.8950	184.1720	176.4508	196.7013	198.8736	210.9032	219.8059	234.2683 (219)
Water heating fuel used												2497.2171 (219)
Annual totals kWh/year												
Space heating fuel - main system												3990.4627 (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)												433.6560 (232)
Total delivered energy for all uses												6996.3358 (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	3990.4627	0.2160	861.9399 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	2497.2171	0.2160	539.3989 (264)
Space and water heating			1401.3388 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	433.6560	0.5190	225.0675 (268)
Total CO2, kg/m2/year			1665.3313 (272)
Emissions per m2 for space and water heating			14.6829 (272a)
Fuel factor (mains gas)			1.0000
Emissions per m2 for lighting			2.3582 (272b)
Emissions per m2 for pumps and fans			0.4078 (272c)
Target Carbon Dioxide Emission Rate (TER) = (14.6829 * 1.00) + 2.3582 + 0.4078, rounded to 2 d.p.			17.4500 (273)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

Property Reference	086 - PRJ013014	Issued on Date	03/06/2025
Assessment Reference	086	Prop Type Ref	C
Property	7 Moorman Road, Netley Abbey, SOUTHAMPTON, SO31 5JU		

SAP Rating	85 B	DER	14.26	TER	17.45
Environmental	88 B	% DER<TER	18.28		
CO ₂ Emissions (t/year)	1.14	DFEE	43.66	TTEE	50.38
General Requirements Compliance	Pass	% DFEE<TFEE	13.35		

Assessor Details	Mr. Christopher Nicholls, Briary Energy Limited, Tel: 0203 397 1373, chris@briaryenergy.co.uk	Assessor ID	4299-0004
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Client	
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CALCULATION OF HEAT DEMAND 09 Jan 2014

SAP 2012 WORKSHEET FOR New Build (As Built) (Version 9.92, January 2014)
CALCULATION OF HEAT DEMAND 09 Jan 2014

1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	47.7200 (1b)	x 2.3700 (2b)	= 113.0964 (1b) - (3b)
First floor	47.7200 (1c)	x 2.6200 (2c)	= 125.0264 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	95.4400		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 238.1228 (5)

2. Ventilation rate

	main heating		secondary heating	other		total	m3 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							4 * 10 = 40.0000 (7a)					
Number of passive vents							0 * 10 = 0.0000 (7b)					
Number of flueless gas fires							0 * 40 = 0.0000 (7c)					
							Air changes per hour					
Infiltration due to chimneys, flues and fans	= (6a)+(6b)+(7a)+(7b)+(7c) =					40.0000 / (5) =	0.1680 (8)					
Pressure test						Yes						
Measured/design AP50							3.5500					
Infiltration rate							0.3455 (18)					
Number of sides sheltered							1 (19)					
Shelter factor						(20) = 1 - [0.075 x (19)] =	0.9250 (20)					
Infiltration rate adjusted to include shelter factor						(21) = (18) x (20) =	0.3196 (21)					
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	4.9000	4.6000	4.5000	4.2000	4.2000	4.1000	4.1000	4.0000	4.0000	4.3000	4.3000	4.4000 (22)
Wind factor	1.2250	1.1500	1.1250	1.0500	1.0500	1.0250	1.0250	1.0000	1.0000	1.0750	1.0750	1.1000 (22a)
Adj infiltr rate	0.3915	0.3675	0.3595	0.3355	0.3355	0.3276	0.3276	0.3196	0.3196	0.3435	0.3435	0.3515 (22b)
Effective ac	0.5766	0.5675	0.5646	0.5563	0.5563	0.5536	0.5536	0.5511	0.5511	0.5590	0.5590	0.5618 (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			2.0900	1.2000	2.5080		(26)
Windows (Uw = 1.40)			11.5800	1.3258	15.3390		(27)
Floor - Ground			47.7150	0.1800	8.5887	75.6000	3607.2540 (28a)
W1 - Brick (Timber Frame)	97.6560	13.6650	83.9910	0.2100	17.6381	7.4000	621.5334 (29a)
Rf - Ins Joist	47.7150		47.7150	0.0800	3.8172	7.4000	353.0910 (30)
Total net area of external elements Aum(A, m ²)			193.0810				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	47.8910		(33)
Party Wall			46.7690	0.0000	0.0000	7.4000	346.0906 (32)
Stud			74.4133			7.4000	550.6581 (32c)
Internal Floor			47.7150			7.4000	353.0910 (32d)
Internal Ceiling			47.7150			7.4000	353.0910 (32e)
Heat capacity Cm = Sum (A x k)							(28)...(30) + (32) + (32a)...(32e) = 6184.8091 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							64.8031 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							16.8602 (36)
Total fabric heat loss							(33) + (36) = 64.7512 (37)

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

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF HEAT DEMAND 09 Jan 2014

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(38)m	45.3115	44.5968	44.3686	43.7140	43.7140	43.5059	43.5059	43.3028	43.3028	43.9272	43.9272	44.1454	(38)
Heat transfer coeff	110.0628	109.3480	109.1198	108.4653	108.4653	108.2571	108.2571	108.0540	108.0540	108.6784	108.6784	108.8966	(39)
Average = Sum(39)m / 12 =												108.6947	(39)
HLP	1.1532	1.1457	1.1433	1.1365	1.1365	1.1343	1.1343	1.1322	1.1322	1.1387	1.1387	1.1410	(40)
HLP (average)												1.1389	(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												2.6931	(42)	
Average daily hot water use (litres/day)												98.1614	(43)	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Daily hot water use	107.9776	104.0511	100.1247	96.1982	92.2718	88.3453	88.3453	92.2718	96.1982	100.1247	104.0511	107.9776	(44)	
Energy conte	160.1276	140.0487	144.5177	125.9940	120.8942	104.3225	96.6702	110.9304	112.2553	130.8227	142.8032	155.0751	(45)	
Energy content (annual)											Total = Sum(45)m =	1544.4617	(45)	
Distribution loss (46)m = 0.15 x (45)m	24.0191	21.0073	21.6777	18.8991	18.1341	15.6484	14.5005	16.6396	16.8383	19.6234	21.4205	23.2613	(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)	
Combi loss	0.6708	0.6086	0.6503	0.5454	0.5020	0.4147	0.3843	0.4606	0.4859	0.5887	0.6206	0.6496	(61)	
Total heat required for water heating calculated for each month	160.7984	140.6573	145.1680	126.5394	121.3962	104.7373	97.0545	111.3910	112.7412	131.4114	143.4239	155.7247	(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)	
								Solar input (sum of months) = Sum(63)m =					0.0000	(63)
Output from w/h	160.7984	140.6573	145.1680	126.5394	121.3962	104.7373	97.0545	111.3910	112.7412	131.4114	143.4239	155.7247	(64)	
								Total per year (kWh/year) = Sum(64)m =					1551.0434	(64)
RHI water heating demand														
Heat gains from water heating, kWh/month	53.4101	46.7183	48.2147	42.0294	40.3228	34.7909	32.2389	36.9995	37.4464	43.6457	47.6372	51.7249	(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	161.5868	161.5868	161.5868	161.5868	161.5868	161.5868	161.5868	161.5868	161.5868	161.5868	161.5868	161.5868	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	61.0062	54.1851	44.0663	33.3610	24.9378	21.0535	22.7491	29.5701	39.6889	50.3942	58.8175	62.7017	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	371.2510	375.1034	365.3954	344.7283	318.6397	294.1202	277.7396	273.8872	283.5951	304.2623	330.3508	354.8704	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	53.8518	53.8518	53.8518	53.8518	53.8518	53.8518	53.8518	53.8518	53.8518	53.8518	53.8518	53.8518	(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)	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	(71)
Water heating gains (Table 5)	71.7878	69.5213	64.8047	58.3741	54.1974	48.3207	43.3319	49.7305	52.0089	58.6636	66.1628	69.5227	(72)
Total internal gains	614.7590	609.5239	584.9805	547.1775	508.4889	474.2085	454.5346	463.9018	486.0070	524.0342	566.0452	597.8088	(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				
Southeast				3.6130	45.0642	0.7300	0.7200	0.7700	59.3045 (77)				
Southwest				0.7190	45.0642	0.7300	0.7200	0.7700	11.8018 (79)				
Northwest				7.2440	14.6130	0.7300	0.7200	0.7700	38.5574 (81)				
Solar gains	109.6638	170.3310	267.7061	385.7471	451.0863	515.3550	471.8432	415.9931	323.6364	214.5471	133.3448	90.7124	(83)
Total gains	724.4228	779.8549	852.6866	932.9245	959.5752	989.5635	926.3778	879.8949	809.6434	738.5812	699.3900	688.5212	(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	15.6093	15.7113	15.7442	15.8392	15.8392	15.8696	15.8696	15.8995	15.8995	15.8081	15.8081	15.7765	
alpha	2.0406	2.0474	2.0496	2.0559	2.0559	2.0580	2.0580	2.0600	2.0600	2.0539	2.0539	2.0518	
util living area	0.8896	0.8710	0.8272	0.7484	0.6340	0.4687	0.3504	0.3560	0.5652	0.7512	0.8520	0.8963 (86)	
MIT	18.5352	18.7398	19.2234	19.8437	20.4064	20.7889	20.9219	20.9222	20.6729	20.0676	19.2578	18.5251 (87)	
Th 2	19.9576	19.9637	19.9656	19.9712	19.9712	19.9729	19.9729	19.9747	19.9747	19.9693	19.9693	19.9675 (88)	
util rest of house	0.8771	0.8566	0.8072	0.7178	0.5850	0.3945	0.2526	0.2539	0.4924	0.7122	0.8323	0.8844 (89)	
MIT 2	16.7413	17.0323	17.7155	18.5786	19.3322	19.7971	19.9312	19.9344	19.6793	18.9028	17.7777	16.7316 (90)	

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF HEAT DEMAND 09 Jan 2014

Living area fraction									fLA = Living area / (4) =	0.1539 (91)		
MIT	17.0174	17.2951	17.9476	18.7733	19.4976	19.9497	20.0837	20.0865	19.8322	19.0821	18.0056	17.0076 (92)
Temperature adjustment												-0.1500
adjusted MIT	16.8674	17.1451	17.7976	18.6233	19.3476	19.7997	19.9337	19.9365	19.6822	18.9321	17.8556	16.8576 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.8254	0.8035	0.7535	0.6697	0.5512	0.3809	0.2487	0.2499	0.4690	0.6643	0.7785	0.8338	(94)
Useful gains	597.9441	626.6138	642.4857	624.7856	528.8872	376.8929	230.3574	219.8537	379.7177	490.6419	544.4623	574.0944	(95)
Ext temp.	5.7000	6.1000	7.7000	10.1000	13.1000	15.9000	17.7000	17.8000	15.5000	12.3000	8.8000	5.8000	(96)
Heat loss rate W													
Month fracti	1229.1200	1207.7632	1101.8500	924.4824	677.6455	422.1748	241.8087	230.8552	451.9071	720.7684	984.1436	1204.1377	(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	469.5949	390.5324	341.7671	215.7817	110.6762	0.0000	0.0000	0.0000	0.0000	171.2141	316.5705	468.7522	(98)
RHI space heating demand												2484.8891	(98)
												2485	(98)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF ENERGY RATINGS 09 Jan 2014

SAP 2012 WORKSHEET FOR New Build (As Built) (Version 9.92, January 2014)
CALCULATION OF ENERGY RATINGS 09 Jan 2014

1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	47.7200 (1b)	x 2.3700 (2b)	= 113.0964 (1b) - (3b)
First floor	47.7200 (1c)	x 2.6200 (2c)	= 125.0264 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	95.4400		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 238.1228 (5)

2. Ventilation rate

										main	secondary	other	total	m3 per hour			
										heating	heating						
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																4 * 10 =	40.0000 (7a)
Number of passive vents																0 * 10 =	0.0000 (7b)
Number of flueless gas fires																0 * 40 =	0.0000 (7c)
										Air changes per hour							
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(7a)+(7b)+(7c) =										40.0000 / (5) =							0.1680 (8)
Pressure test										Yes							
Measured/design AP50																	3.5500
Infiltration rate																	0.3455 (18)
Number of sides sheltered																	1 (19)
Shelter factor										(20) = 1 - [0.075 x (19)] =							0.9250 (20)
Infiltration rate adjusted to include shelter factor										(21) = (18) x (20) =							0.3196 (21)
Wind speed	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec					
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	(22)				
Adj infilt rate													(22a)				
	0.4075	0.3995	0.3915	0.3515	0.3435	0.3036	0.3036	0.2956	0.3196	0.3435	0.3595	0.3755	(22b)				
Effective ac	0.5830	0.5798	0.5766	0.5618	0.5590	0.5461	0.5461	0.5437	0.5511	0.5590	0.5646	0.5705	(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			2.0900	1.2000	2.5080		(26)
Windows (Uw = 1.40)			11.5800	1.3258	15.3390		(27)
Flr - Ground			47.7150	0.1800	8.5887	75.6000	3607.2540 (28a)
Wl - Brick (Timber Frame)	97.6560	13.6650	83.9910	0.2100	17.6381	7.4000	621.5334 (29a)
Rf - Ins Joist	47.7150		47.7150	0.0800	3.8172	7.4000	353.0910 (30)
Total net area of external elements Aum(A, m ²)			193.0810				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	47.8910		(33)
Party Wall			46.7690	0.0000	0.0000	7.4000	346.0906 (32)
Stud			74.4133			7.4000	550.6581 (32c)
Internal Floor			47.7150			7.4000	353.0910 (32d)
Internal Ceiling			47.7150			7.4000	353.0910 (32e)

Heat capacity Cm = Sum(A x k)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m²K
Thermal bridges (Sum(L x Psi) calculated using Appendix K)
Total fabric heat loss
(28)...(30) + (32) + (32a)...(32e) = 6184.8091 (34)
64.8031 (35)
16.8602 (36)
(33) + (36) = 64.7512 (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	45.8131	45.5598	45.3115	44.1454	43.9272	42.9115	42.9115	42.7235	43.3028	43.9272	44.3686	44.8300 (38)
Heat transfer coeff	110.5643	110.3110	110.0628	108.8966	108.6784	107.6628	107.6628	107.4747	108.0540	108.6784	109.1198	109.5813 (39)
Average = Sum(39)m / 12 =												108.8956 (39)
HLP	Jan 1.1585	Feb 1.1558	Mar 1.1532	Apr 1.1410	May 1.1387	Jun 1.1281	Jul 1.1281	Aug 1.1261	Sep 1.1322	Oct 1.1387	Nov 1.1433	Dec 1.1482 (40)
HLP (average)												1.1410 (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												2.6931 (42)
Average daily hot water use (litres/day)												98.1614 (43)
Daily hot water use	Jan 107.9776	Feb 104.0511	Mar 100.1247	Apr 96.1982	May 92.2718	Jun 88.3453	Jul 88.3453	Aug 92.2718	Sep 96.1982	Oct 100.1247	Nov 104.0511	Dec 107.9776 (44)
Energy conte	160.1276	140.0487	144.5177	125.9940	120.8942	104.3225	96.6702	110.9304	112.2553	130.8227	142.8032	155.0751 (45)
Energy content (annual)										Total = Sum(45)m =		1544.4617 (45)
Distribution loss (46)m = 0.15 x (45)m												

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FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF ENERGY RATINGS 09 Jan 2014

8c. Space cooling requirement

Not applicable

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													3362.8412 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	545.3911	448.3310	405.2218	271.5794	162.2611	0.0000	0.0000	0.0000	0.0000	246.7647	400.0533	553.6803	(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)	604.6464	497.0410	449.2481	301.0858	179.8904	0.0000	0.0000	0.0000	0.0000	273.5750	443.5181	613.8363	(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	107.9890	94.1916	97.7438	87.5212	85.1676	74.8508	71.7613	80.7666	81.2231	92.4480	98.2890	104.6817	(64)
Efficiency of water heater	87.5852	87.4573	87.1411	86.3965	84.9202	76.4000	76.4000	76.4000	76.4000	85.9680	87.0971	87.6817	(216)
(217)m	123.2958	107.7001	112.1672	101.3018	100.2913	97.9723	93.9284	105.7154	106.3129	107.5377	112.8499	119.3883	(217)
Fuel for water heating, kWh/month													
Water heating fuel used												1288.4611	(219)
Annual totals kWh/year													
Space heating fuel - main system												3362.8412	(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)												430.9551	(232)
Total delivered energy for all uses												5157.2573	(238)

10a. Fuel costs - using Table 12 prices

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year	
Space heating - main system 1	3362.8412	3.4800	117.0269	(240)
Space heating - secondary	0.0000	0.0000	0.0000	(242)
Water heating (other fuel)	1288.4611	3.4800	44.8384	(247)
Pumps and fans for heating	75.0000	13.1900	9.8925	(249)
Energy for lighting	430.9551	13.1900	56.8430	(250)
Additional standing charges			120.0000	(251)
Total energy cost			348.6008	(255)

11a. SAP rating - Individual heating systems

Energy cost deflator (Table 12):			0.4200	(256)
Energy cost factor (ECF)	$[(255) \times (256)] / [(4) + 45.0] =$		1.0425	(257)
SAP value			85.4568	
SAP rating (Section 12)			85	(258)
SAP band			B	

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	3362.8412	0.2160	726.3737	(261)
Space heating - secondary	0.0000	0.0000	0.0000	(263)
Water heating (other fuel)	1288.4611	0.2160	278.3076	(264)
Space and water heating			1004.6813	(265)
Pumps and fans	75.0000	0.5190	38.9250	(267)
Energy for lighting	430.9551	0.5190	223.6657	(268)
Total kg/year			1267.2720	(272)
CO2 emissions per m2			13.2800	(273)
EI value			87.9084	
EI rating			88	(274)
EI band			B	

Calculation of stars for heating and DHW

Main heating energy efficiency	$3.48 \times (1 + 0.29 \times 0.00) / 0.9020 = 3.858$, stars = 4
Main heating environmental impact	$0.216 \times (1 + 0.29 \times 0.00) / 0.9020 = 0.2395$, stars = 4
Water heating energy efficiency	$3.48 / 0.8332 = 4.177$, stars = 5
Water heating environmental impact	$0.216 / 0.8332 = 0.2592$, stars = 5

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF ENERGY RATINGS 09 Jan 2014

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY 09 Jan 2014

SAP 2012 WORKSHEET FOR New Build (As Built) (Version 9.92, January 2014)
CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY 09 Jan 2014

1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	47.7200 (1b)	x 2.3700 (2b)	= 113.0964 (1b) - (3b)
First floor	47.7200 (1c)	x 2.6200 (2c)	= 125.0264 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	95.4400		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 238.1228 (5)

2. Ventilation rate

	main heating	secondary heating	other	total	m3 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					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)+(7a)+(7b)+(7c) =				40.0000 / (5) = 0.1680 (8)
Pressure test					Yes
Measured/design AP50					3.5500
Infiltration rate					0.3455 (18)
Number of sides sheltered					1 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] =				0.9250 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) =				0.3196 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	4.9000	4.6000	4.5000	4.2000	4.2000	4.1000	4.1000	4.0000	4.0000	4.3000	4.3000	4.4000 (22)
Wind factor	1.2250	1.1500	1.1250	1.0500	1.0500	1.0250	1.0250	1.0000	1.0000	1.0750	1.0750	1.1000 (22a)
Adj infilt rate	0.3915	0.3675	0.3595	0.3355	0.3355	0.3276	0.3276	0.3196	0.3196	0.3435	0.3435	0.3515 (22b)
Effective ac	0.5766	0.5675	0.5646	0.5563	0.5563	0.5536	0.5536	0.5511	0.5511	0.5590	0.5590	0.5618 (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			2.0900	1.2000	2.5080		(26)
Windows (Uw = 1.40)			11.5800	1.3258	15.3390		(27)
Flr - Ground			47.7150	0.1800	8.5887	75.6000	3607.2540 (28a)
Wl - Brick (Timber Frame)	97.6560	13.6650	83.9910	0.2100	17.6381	7.4000	621.5334 (29a)
Rf - Ins Joist	47.7150		47.7150	0.0800	3.8172	7.4000	353.0910 (30)
Total net area of external elements Aum(A, m ²)			193.0810				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	47.8910		(33)
Party Wall			46.7690	0.0000	0.0000	7.4000	346.0906 (32)
Stud			74.4133			7.4000	550.6581 (32c)
Internal Floor			47.7150			7.4000	353.0910 (32d)
Internal Ceiling			47.7150			7.4000	353.0910 (32e)

Heat capacity Cm = Sum(A x k) (28)...(30) + (32) + (32a)...(32e) = 6184.8091 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m²K 64.8031 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K) 16.8602 (36)
Total fabric heat loss (33) + (36) = 64.7512 (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	45.3115	44.5968	44.3686	43.7140	43.7140	43.5059	43.5059	43.3028	43.3028	43.9272	43.9272	44.1454 (38)
Heat transfer coeff	110.0628	109.3480	109.1198	108.4653	108.4653	108.2571	108.2571	108.0540	108.0540	108.6784	108.6784	108.8966 (39)
Average = Sum(39)m / 12 =												108.6947 (39)
HLP	1.1532	1.1457	1.1433	1.1365	1.1365	1.1343	1.1343	1.1322	1.1322	1.1387	1.1387	1.1410 (40)
HLP (average)												1.1389 (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												2.6931 (42)
Average daily hot water use (litres/day)												98.1614 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	107.9776	104.0511	100.1247	96.1982	92.2718	88.3453	88.3453	92.2718	96.1982	100.1247	104.0511	107.9776 (44)
Energy conte	160.1276	140.0487	144.5177	125.9940	120.8942	104.3225	96.6702	110.9304	112.2553	130.8227	142.8032	155.0751 (45)
Energy content (annual)										Total = Sum(45)m =		1544.4617 (45)
Distribution loss (46)m = 0.15 x (45)m												

Water storage loss:	24.0191	21.0073	21.6777	18.8991	18.1341	15.6484	14.5005	16.6396	16.8383	19.6234	21.4205	23.2613 (46)
Total storage loss												
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 (56)
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	0.6708	0.6086	0.6503	0.5454	0.5020	0.4147	0.3843	0.4606	0.4859	0.5887	0.6206	0.6496 (61)
WWHRS	160.7984	140.6573	145.1680	126.5394	121.3962	104.7373	97.0545	111.3910	112.7412	131.4114	143.4239	155.7247 (62)
Total of WWHRS savings	-52.8094	-46.4657	-47.4242	-39.0182	-36.2287	-29.8865	-25.2932	-30.6245	-31.5182	-38.9634	-45.1348	-51.0429 eq. (G10)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-474.4098
Output from w/h								Solar input (sum of months) = Sum(63)m =				
	107.9890	94.1916	97.7438	87.5212	85.1676	74.8508	71.7613	80.7666	81.2231	92.4480	98.2890	104.6817 (64)
Heat gains from water heating, kWh/month								Total per year (kWh/year) = Sum(64)m =				
	53.4101	46.7183	48.2147	42.0294	40.3228	34.7909	32.2389	36.9995	37.4464	43.6457	47.6372	51.7249 (65)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.8254	0.8035	0.7535	0.6697	0.5512	0.3809	0.2487	0.2499	0.4690	0.6643	0.7785	0.8338 (94)
Useful gains	597.9441	626.6138	642.4857	624.7856	528.8872	376.8929	230.3574	219.8537	379.7177	490.6419	544.4623	574.0944 (95)
Ext temp.	5.7000	6.1000	7.7000	10.1000	13.1000	15.9000	17.7000	17.8000	15.5000	12.3000	8.8000	5.8000 (96)
Heat loss rate W	1229.1200	1207.7632	1101.8500	924.4824	677.6455	422.1748	241.8087	230.8552	451.9071	720.7684	984.1436	1204.1377 (97)
Month fracti	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000 (97a)
Space heating kWh	469.5949	390.5324	341.7671	215.7817	110.6762	0.0000	0.0000	0.0000	0.0000	171.2141	316.5705	468.7522 (98)
Space heating												2484.8891 (98)
Space heating per m2												26.0361 (99)
										(98) / (4) =		

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY 09 Jan 2014

8c. Space cooling requirement

Not applicable

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													2754.8659 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	469.5949	390.5324	341.7671	215.7817	110.6762	0.0000	0.0000	0.0000	0.0000	171.2141	316.5705	468.7522	(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)	520.6152	432.9627	378.8992	239.2259	122.7009	0.0000	0.0000	0.0000	0.0000	189.8161	350.9651	519.6810	(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	107.9890	94.1916	97.7438	87.5212	85.1676	74.8508	71.7613	80.7666	81.2231	92.4480	98.2890	104.6817	(64)
Efficiency of water heater (217)m	87.2533	87.1414	86.7166	85.7315	83.6307	76.4000	76.4000	76.4000	76.4000	84.8275	86.4983	87.3207	(217)
Fuel for water heating, kWh/month	123.7649	108.0906	112.7164	102.0876	101.8376	97.9723	93.9284	105.7154	106.3129	108.9835	113.6311	119.8819	(219)
Water heating fuel used												1294.9225	(219)
Annual totals kWh/year													
Space heating fuel - main system												2754.8659	(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)													430.9551 (232)
Total delivered energy for all uses													4555.7435 (238)

10a. Fuel costs - using BEDF prices (572)

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	2754.8659	5.7300	157.8538 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1294.9225	5.7300	74.1991 (247)
Pumps and fans for heating	75.0000	24.1800	18.1350 (249)
Energy for lighting	430.9551	24.1800	104.2049 (250)
Additional standing charges			114.0000 (251)
Total energy cost			468.3928 (255)

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	2754.8659	0.2160	595.0510 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1294.9225	0.2160	279.7033 (264)
Space and water heating			874.7543 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	430.9551	0.5190	223.6657 (268)
Total kg/year			1137.3450 (272)

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	2754.8659	1.2200	3360.9364 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1294.9225	1.2200	1579.8054 (264)
Space and water heating			4940.7419 (265)
Pumps and fans	75.0000	3.0700	230.2500 (267)
Energy for lighting	430.9551	3.0700	1323.0321 (268)
Primary energy kWh/year			6494.0240 (272)
Primary energy kWh/m2/year			68.0430 (273)

SAP 2012 EPC IMPROVEMENTS

Current energy efficiency rating: B 85
Current environmental impact rating: B 88

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY 09 Jan 2014

(For testing purposes):

A	Not considered
B	Not considered
C	Not considered
D	Not considered
E Low energy lighting	Already installed
F	Not considered
G	Not considered
H	Not considered
I	Not considered
J	Not considered
K	Not considered
M	Not considered
N Solar water heating	SAP increase too small
O	Not considered
P	Not considered
R	Not considered
S	Not considered
T	Not considered
U Solar photovoltaic panels	Recommended
A2	Not considered
A3	Not considered
T2	Not considered
W	Not considered
X	Not considered
Y	Not considered
J2	Not considered
Q2	Not considered
Z1	Not considered
Z2	Not considered
Z3	Not considered
Z4	Not considered
Z5	Not considered
V2 Wind turbine	Not applicable
L2	Not considered
Q3	Not considered
O3	Not considered

Recommended measures:	SAP change	Cost change	CO2 change
U Solar photovoltaic panels	+ 9.5	-£ 471	-1010 kg (88.8%)
Measures omitted - SAP change or cost saving too small:			
N Solar water heating	+ 0.9	-£ 34	-148 kg (13.0%)

Recommended measures	Typical annual savings	Energy efficiency	Environmental impact
Solar photovoltaic panels	£471 10.58 kg/m²	A 95	A 96
Total Savings	£471 10.58 kg/m²		
Potential energy efficiency rating:		A 95	
Potential environmental impact rating:			A 96

Fuel prices for cost data on this page from database revision number 572 TEST (30 May 2025)
Recommendation texts revision number 4.9c (22 Feb 2014)

Typical heating and lighting costs of this home (per year, Southern England):

	Current	Potential	Saving
Electricity	£122	£122	£0
Mains gas	£346	£346	£0
Space heating	£290	£290	£0
Water heating	£74	£74	£0
Lighting	£104	£104	£0
Generated (PV)	-£0	-£471	£471
Total cost of fuels	£468	-£3	£471
Total cost of uses	£468	-£3	£471
Delivered energy	48 kWh/m²	27 kWh/m²	20 kWh/m²
Carbon dioxide emissions	1.1 tonnes	0.1 tonnes	1.0 tonnes
CO2 emissions per m²	12 kg/m²	1 kg/m²	11 kg/m²
Primary energy	68 kWh/m²	5 kWh/m²	63 kWh/m²

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF ENERGY RATINGS FOR IMPROVED DWELLING 09 Jan 2014

SAP 2012 WORKSHEET FOR New Build (As Built) (Version 9.92, January 2014)
CALCULATION OF ENERGY RATINGS FOR IMPROVED DWELLING 09 Jan 2014

1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	47.7200 (1b)	x 2.3700 (2b)	= 113.0964 (1b) - (3b)
First floor	47.7200 (1c)	x 2.6200 (2c)	= 125.0264 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	95.4400		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 238.1228 (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					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)+(7a)+(7b)+(7c) =					40.0000 / (5) = 0.1680 (8)
Pressure test					Yes
Measured/design AP50					3.5500
Infiltration rate					0.3455 (18)
Number of sides sheltered					1 (19)
Shelter factor				(20) = 1 - [0.075 x (19)] =	0.9250 (20)
Infiltration rate adjusted to include shelter factor				(21) = (18) x (20) =	0.3196 (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	0.4075	0.3995	0.3915	0.3515	0.3435	0.3036	0.3036	0.2956	0.3196	0.3435	0.3595	0.3755 (22b)
Effective ac	0.5830	0.5798	0.5766	0.5618	0.5590	0.5461	0.5461	0.5437	0.5511	0.5590	0.5646	0.5705 (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			2.0900	1.2000	2.5080		(26)
Windows (Uw = 1.40)			11.5800	1.3258	15.3390		(27)
Flr - Ground			47.7150	0.1800	8.5887	75.6000	3607.2540 (28a)
Wl - Brick (Timber Frame)	97.6560	13.6650	83.9910	0.2100	17.6381	7.4000	621.5334 (29a)
Rf - Ins Joist	47.7150		47.7150	0.0800	3.8172	7.4000	353.0910 (30)
Total net area of external elements Aum(A, m ²)			193.0810				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	47.8910		(33)
Party Wall			46.7690	0.0000	0.0000	7.4000	346.0906 (32)
Stud			74.4133			7.4000	550.6581 (32c)
Internal Floor			47.7150			7.4000	353.0910 (32d)
Internal Ceiling			47.7150			7.4000	353.0910 (32e)

Heat capacity Cm = Sum(A x k)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m²K
Thermal bridges (Sum(L x Psi) calculated using Appendix K)
Total fabric heat loss

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	45.8131	45.5598	45.3115	44.1454	43.9272	42.9115	42.9115	42.7235	43.3028	43.9272	44.3686	44.8300 (38)
Heat transfer coeff	110.5643	110.3110	110.0628	108.8966	108.6784	107.6628	107.6628	107.4747	108.0540	108.6784	109.1198	109.5813 (39)
Average = Sum(39)m / 12 =												108.8956 (39)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.1585	1.1558	1.1532	1.1410	1.1387	1.1281	1.1281	1.1261	1.1322	1.1387	1.1433	1.1482 (40)
HLP (average)												1.1410 (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												2.6931 (42)
Average daily hot water use (litres/day)												98.1614 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Energy conte	107.9776	104.0511	100.1247	96.1982	92.2718	88.3453	88.3453	92.2718	96.1982	100.1247	104.0511	107.9776 (44)
Energy content (annual)	160.1276	140.0487	144.5177	125.9940	120.8942	104.3225	96.6702	110.9304	112.2553	130.8227	142.8032	155.0751 (45)
Distribution loss (46)m = 0.15 x (45)m												1544.4617 (45)

Water storage loss:	24.0191	21.0073	21.6777	18.8991	18.1341	15.6484	14.5005	16.6396	16.8383	19.6234	21.4205	23.2613 (46)
Total storage loss												
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 (56)
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	0.6708	0.6086	0.6503	0.5454	0.5020	0.4147	0.3843	0.4606	0.4859	0.5887	0.6206	0.6496 (61)
WWHRS	160.7984	140.6573	145.1680	126.5394	121.3962	104.7373	97.0545	111.3910	112.7412	131.4114	143.4239	155.7247 (62)
Total of WWHRS savings	-52.8094	-46.4657	-47.4242	-39.0182	-36.2287	-29.8865	-25.2932	-30.6245	-31.5182	-38.9634	-45.1348	-51.0429 eq. (G10)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-474.4098
Output from w/h								Solar input (sum of months) = Sum(63)m =				
	107.9890	94.1916	97.7438	87.5212	85.1676	74.8508	71.7613	80.7666	81.2231	92.4480	98.2890	104.6817 (64)
								Total per year (kWh/year) = Sum(64)m =				
Heat gains from water heating, kWh/month	53.4101	46.7183	48.2147	42.0294	40.3228	34.7909	32.2389	36.9995	37.4464	43.6457	47.6372	51.7249 (65)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.8497	0.8245	0.7833	0.7141	0.6161	0.4866	0.3614	0.3961	0.5718	0.7317	0.8189	0.8587 (94)
Useful gains	596.9776	634.0372	649.7185	638.5021	577.4524	446.5324	316.0698	324.8790	437.7592	517.6063	551.1354	576.8856 (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	1330.0301	1301.1964	1194.3714	1015.6958	795.5454	538.6238	349.7587	366.9480	572.4266	849.2793	1106.7651	1321.0796 (97)
Month fracti	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 kWh	545.3911	448.3310	405.2218	271.5794	162.2611	0.0000	0.0000	0.0000	0.0000	246.7647	400.0533	553.6803 (98)
Space heating												3033.2827 (98)
Space heating per m2												31.7821 (99)
										(98) / (4) =		

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF ENERGY RATINGS FOR IMPROVED DWELLING 09 Jan 2014

8c. Space cooling requirement

Not applicable

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													3362.8412	(211)
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
Space heating requirement	545.3911	448.3310	405.2218	271.5794	162.2611	0.0000	0.0000	0.0000	0.0000	246.7647	400.0533	553.6803	(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)	604.6464	497.0410	449.2481	301.0858	179.8904	0.0000	0.0000	0.0000	0.0000	273.5750	443.5181	613.8363	(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														
Water heating requirement	107.9890	94.1916	97.7438	87.5212	85.1676	74.8508	71.7613	80.7666	81.2231	92.4480	98.2890	104.6817	(64)	
Efficiency of water heater (217)m	87.5852	87.4573	87.1411	86.3965	84.9202	76.4000	76.4000	76.4000	76.4000	85.9680	87.0971	87.6817	(216)	
Fuel for water heating, kWh/month	123.2958	107.7001	112.1672	101.3018	100.2913	97.9723	93.9284	105.7154	106.3129	107.5377	112.8499	119.3883	(219)	
Water heating fuel used												1288.4611	(219)	
Annual totals kWh/year														
Space heating fuel - main system												3362.8412	(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)												430.9551	(232)	
Energy saving/generation technologies (Appendices M ,N and Q)														
PV Unit 0 (0.80 * 2.50 * 1080 * 0.80) =										-1727.2394		-1727.2394	(233)	
Total delivered energy for all uses												3430.0179	(238)	

10a. Fuel costs - using Table 12 prices

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	3362.8412	3.4800	117.0269 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1288.4611	3.4800	44.8384 (247)
Pumps and fans for heating	75.0000	13.1900	9.8925 (249)
Energy for lighting	430.9551	13.1900	56.8430 (250)
Additional standing charges			120.0000 (251)
Energy saving/generation technologies			
PV Unit	-1727.2394	13.1900	-227.8229 (252)
Total energy cost			120.7779 (255)

11a. SAP rating - Individual heating systems

Energy cost deflator (Table 12):		0.4200 (256)
Energy cost factor (ECF)	[(255) x (256)] / [(4) + 45.0] =	0.3612 (257)
SAP value		94.9613
SAP rating (Section 12)		95 (258)
SAP band		A

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	3362.8412	0.2160	726.3737 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1288.4611	0.2160	278.3076 (264)
Space and water heating			1004.6813 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	430.9551	0.5190	223.6657 (268)
Energy saving/generation technologies			
PV Unit	-1727.2394	0.5190	-896.4372 (269)
Total kg/year			370.8347 (272)
CO2 emissions per m2			3.8900 (273)
EI value			96.4617
EI rating			96 (274)
EI band			A

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF ENERGY RATINGS FOR IMPROVED DWELLING 09 Jan 2014

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY FOR IMPROVED DWELLING 09 Jan 2014

SAP 2012 WORKSHEET FOR New Build (As Built) (Version 9.92, January 2014)
CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY FOR IMPROVED DWELLING 09 Jan 2014

1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	47.7200 (1b)	x 2.3700 (2b)	= 113.0964 (1b) - (3b)
First floor	47.7200 (1c)	x 2.6200 (2c)	= 125.0264 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	95.4400		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 238.1228 (5)

2. Ventilation rate

	main heating	secondary heating	other	total	m3 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					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)+(7a)+(7b)+(7c) =					40.0000 / (5) = 0.1680 (8)
Pressure test					Yes
Measured/design AP50					3.5500
Infiltration rate					0.3455 (18)
Number of sides sheltered					1 (19)
Shelter factor				(20) = 1 - [0.075 x (19)] =	0.9250 (20)
Infiltration rate adjusted to include shelter factor				(21) = (18) x (20) =	0.3196 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	4.9000	4.6000	4.5000	4.2000	4.2000	4.1000	4.1000	4.0000	4.0000	4.3000	4.3000	4.4000 (22)
Wind factor	1.2250	1.1500	1.1250	1.0500	1.0500	1.0250	1.0250	1.0000	1.0000	1.0750	1.0750	1.1000 (22a)
Adj infilt rate	0.3915	0.3675	0.3595	0.3355	0.3355	0.3276	0.3276	0.3196	0.3196	0.3435	0.3435	0.3515 (22b)
Effective ac	0.5766	0.5675	0.5646	0.5563	0.5563	0.5536	0.5536	0.5511	0.5511	0.5590	0.5590	0.5618 (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			2.0900	1.2000	2.5080		(26)
Windows (Uw = 1.40)			11.5800	1.3258	15.3390		(27)
Flr - Ground			47.7150	0.1800	8.5887	75.6000	3607.2540 (28a)
Wl - Brick (Timber Frame)	97.6560	13.6650	83.9910	0.2100	17.6381	7.4000	621.5334 (29a)
Rf - Ins Joist	47.7150		47.7150	0.0800	3.8172	7.4000	353.0910 (30)
Total net area of external elements Aum(A, m ²)			193.0810				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	47.8910		(33)
Party Wall			46.7690	0.0000	0.0000	7.4000	346.0906 (32)
Stud			74.4133			7.4000	550.6581 (32c)
Internal Floor			47.7150			7.4000	353.0910 (32d)
Internal Ceiling			47.7150			7.4000	353.0910 (32e)

Heat capacity Cm = Sum(A x k)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m²K
Thermal bridges (Sum(L x Psi) calculated using Appendix K)
Total fabric heat loss

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)
45.3115	44.5968	44.3686	43.7140	43.7140	43.5059	43.5059	43.3028	43.3028	43.9272	43.9272	44.1454	(38)
Heat transfer coeff												
110.0628	109.3480	109.1198	108.4653	108.4653	108.2571	108.2571	108.0540	108.0540	108.6784	108.6784	108.8966	(39)
Average = Sum(39)m / 12 =												(39)
108.6947												(39)
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.1532	1.1457	1.1433	1.1365	1.1365	1.1343	1.1343	1.1322	1.1322	1.1387	1.1387	1.1410	(40)
HLP (average)												(40)
1.1389												(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												2.6931 (42)
Average daily hot water use (litres/day)												98.1614 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
107.9776	104.0511	100.1247	96.1982	92.2718	88.3453	88.3453	92.2718	96.1982	100.1247	104.0511	107.9776	(44)
Energy conte	160.1276	140.0487	144.5177	125.9940	120.8942	104.3225	96.6702	110.9304	112.2553	130.8227	142.8032	155.0751 (45)
Energy content (annual)										Total = Sum(45)m =		1544.4617 (45)
Distribution loss (46)m = 0.15 x (45)m												

	24.0191	21.0073	21.6777	18.8991	18.1341	15.6484	14.5005	16.6396	16.8383	19.6234	21.4205	23.2613 (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)
Combi loss	0.6708	0.6086	0.6503	0.5454	0.5020	0.4147	0.3843	0.4606	0.4859	0.5887	0.6206	0.6496 (61)
Total heat required for water heating calculated for each month												
WWHRS	160.7984	140.6573	145.1680	126.5394	121.3962	104.7373	97.0545	111.3910	112.7412	131.4114	143.4239	155.7247 (62)
Total of WWHRS savings	-52.8094	-46.4657	-47.4242	-39.0182	-36.2287	-29.8865	-25.2932	-30.6245	-31.5182	-38.9634	-45.1348	-51.0429 eq. (G10)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-474.4098
Output from w/h								Solar input	(sum of months) =	Sum(63)m =		0.0000 (63)
	107.9890	94.1916	97.7438	87.5212	85.1676	74.8508	71.7613	80.7666	81.2231	92.4480	98.2890	104.6817 (64)
								Total per year	(kWh/year) =	Sum(64)m =		1076.6336 (64)
Heat gains from water heating, kWh/month												
	53.4101	46.7183	48.2147	42.0294	40.3228	34.7909	32.2389	36.9995	37.4464	43.6457	47.6372	51.7249 (65)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.8254	0.8035	0.7535	0.6697	0.5512	0.3809	0.2487	0.2499	0.4690	0.6643	0.7785	0.8338 (94)
Useful gains	597.9441	626.6138	642.4857	624.7856	528.8872	376.8929	230.3574	219.8537	379.7177	490.6419	544.4623	574.0944 (95)
Ext temp.	5.7000	6.1000	7.7000	10.1000	13.1000	15.9000	17.7000	17.8000	15.5000	12.3000	8.8000	5.8000 (96)
Heat loss rate W	1229.1200	1207.7632	1101.8500	924.4824	677.6455	422.1748	241.8087	230.8552	451.9071	720.7684	984.1436	1204.1377 (97)
Month fracti	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000 (97a)
Space heating kWh	469.5949	390.5324	341.7671	215.7817	110.6762	0.0000	0.0000	0.0000	0.0000	171.2141	316.5705	468.7522 (98)
Space heating												2484.8891 (98)
Space heating per m2												26.0361 (99)
										(98) / (4) =		

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY FOR IMPROVED DWELLING 09 Jan 2014

8c. Space cooling requirement

Not applicable

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													2754.8659	(211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Space heating requirement	469.5949	390.5324	341.7671	215.7817	110.6762	0.0000	0.0000	0.0000	0.0000	171.2141	316.5705	468.7522	(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)	520.6152	432.9627	378.8992	239.2259	122.7009	0.0000	0.0000	0.0000	0.0000	189.8161	350.9651	519.6810	(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	107.9890	94.1916	97.7438	87.5212	85.1676	74.8508	71.7613	80.7666	81.2231	92.4480	98.2890	104.6817	(64)	
Efficiency of water heater (217)m	87.2533	87.1414	86.7166	85.7315	83.6307	76.4000	76.4000	76.4000	76.4000	84.8275	86.4983	76.4000	(216)	
Fuel for water heating, kWh/month	123.7649	108.0906	112.7164	102.0876	101.8376	97.9723	93.9284	105.7154	106.3129	108.9835	113.6311	119.8819	(219)	
Water heating fuel used												1294.9225	(219)	
Annual totals kWh/year														
Space heating fuel - main system												2754.8659	(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)													430.9551	(232)
Energy saving/generation technologies (Appendices M ,N and Q)														
PV Unit 0 (0.80 * 2.50 * 1217 * 0.80) =										-1946.4459			-1946.4459	(233)
Total delivered energy for all uses													2609.2976	(238)

10a. Fuel costs - using BEDF prices (572)

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	2754.8659	5.7300	157.8538 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1294.9225	5.7300	74.1991 (247)
Pumps and fans for heating	75.0000	24.1800	18.1350 (249)
Energy for lighting	430.9551	24.1800	104.2049 (250)
Additional standing charges			114.0000 (251)
Energy saving/generation technologies			
PV Unit	-1946.4459	24.1800	-470.6506 (252)
Total energy cost			-2.2578 (255)

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	2754.8659	0.2160	595.0510 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1294.9225	0.2160	279.7033 (264)
Space and water heating			874.7543 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	430.9551	0.5190	223.6657 (268)
Energy saving/generation technologies			
PV Unit	-1946.4459	0.5190	-1010.2054 (269)
Total kg/year			127.1396 (272)

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	2754.8659	1.2200	3360.9364 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1294.9225	1.2200	1579.8054 (264)
Space and water heating			4940.7419 (265)
Pumps and fans	75.0000	3.0700	230.2500 (267)
Energy for lighting	430.9551	3.0700	1323.0321 (268)
Energy saving/generation technologies			
PV Unit	-1946.4459	3.0700	-5975.5890 (269)
Primary energy kWh/year			518.4350 (272)
Primary energy kWh/m2/year			5.4321 (273)

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Built)

Property Reference	086 - PRJ013014			Issued on Date	03/06/2025
Assessment Reference	086	Prop Type Ref	C		
Property	7 Moorman Road, Netley Abbey, SOUTHAMPTON, SO31 5JU				
SAP Rating	85 B	DER	14.26	TER	17.45
Environmental	88 B	% DER<TER	18.28		
CO ₂ Emissions (t/year)	1.14	DFEE	43.66	TFEE	50.38
General Requirements Compliance	Pass	% DFEE<TFEE	13.35		
Assessor Details	Mr. Christopher Nicholls, Briary Energy Limited, Tel: 0203 397 1373, chris@briaryenergy.co.uk			Assessor ID	4299-0004
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)	17.45	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	14.26	kgCO ₂ /m ²	Pass
	-3.19 (-18.3%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	50.38	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	43.66	kWh/m ² /yr	
	-6.7 (-13.3%)	kWh/m ² /yr	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.21 (max. 0.30)	0.21 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Floor	0.18 (max. 0.25)	0.18 (max. 0.70)	Pass
Roof	0.08 (max. 0.20)	0.08 (max. 0.35)	Pass
Openings	1.37 (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	3.55 (measured in this dwelling)	
Maximum	10.0	Pass

Limiting System Efficiencies

4 Heating efficiency

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Built)

Main heating system

Boiler system with radiators or underfloor - Mains gas
Data from database
Vaillant ecoFIT sustain 835 VUW 356/6-3 (H-GB)
Combi boiler
Efficiency: 89.3% SEDBUK2009
Minimum: 88.0%

Pass

Secondary heating system

None

5 Cylinder insulation

Hot water storage

No cylinder

6 Controls

Space heating controls

Time and temperature zone control

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 South East

3.61 m², No overhang

Windows facing South West

0.72 m², No overhang

Windows facing North West

7.24 m², No overhang

Air change rate

4.68 ach

Blinds/curtains

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

Criterion 4 – Building performance consistent with DER and DFEE rate

Party Walls

Type

U-value

Filled Cavity with Edge Sealing

0.00 W/m²K

Pass

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals

3.55 (measured in this dwelling)

Maximum

10.0

Pass

10 Key features

Party wall U-value

0.00 W/m²K

Roof U-value

0.08 W/m²K

Air permeability

3.6 m³/m²h

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