

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

Property Reference	062 - PRJ013014	Issued on Date	25/02/2025
Assessment Reference	062	Prop Type Ref	F
Property	6 Paulet Close, Netley Abbey, SO31 5JW		

SAP Rating	82 B	DER	20.53	TER	22.02
Environmental	84 B	% DER<TER	6.76		
CO ₂ Emissions (t/year)	1.24	DFEE	55.97	TFEE	66.56
General Requirements Compliance	Pass	% DFEE<TFEE	15.92		

Assessor Details	Mr. Christopher Nicholls, Briary Energy Limited, Tel: 0203 397 1373, chris@briaryenergy.co.uk	Assessor ID	U903-0001
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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	6.5400 (1b)	x 1.7700 (2b)	= 11.5758 (1b) - (3b)
First floor	65.7800 (1c)	x 2.3400 (2c)	= 153.9252 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	72.3200		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 165.5010 (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								2 * 10 =	20.0000 (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) =							20.0000 / (5) =	0.1208 (8)			
Pressure test								Yes				
Measured/design AP50									3.3800			
Infiltration rate									0.2898 (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) =	0.2681 (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	0.3284	0.3083	0.3016	0.2815	0.2815	0.2748	0.2748	0.2681	0.2681	0.2882	0.2882	0.2949 (22b)
Effective ac	0.5539	0.5475	0.5455	0.5396	0.5396	0.5378	0.5378	0.5359	0.5359	0.5415	0.5415	0.5435 (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			2.1100	1.2000	2.5320		(26)
Windows (Uw = 1.40)			8.2600	1.3258	10.9508		(27)
Floor - Ground			6.5400	0.2000	1.3080		(28a)
Floor - Exposed Drive Through			59.2400	0.1400	8.2936	75.6000	494.4240 (28b)
W1 - Brick (Timber Frame)	64.8130	8.2640	56.5490	0.2100	11.8753	7.4000	418.4626 (29a)
W1 - Brick (Cavity)	23.9890	2.1060	21.8830	0.2100	4.5954	104.7000	2291.1501 (29a)
RF - Ins Joist	65.7800		65.7800	0.0800	5.2624	7.4000	486.7720 (30)
Total net area of external elements Aum(A, m ²)			220.3620				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	44.8175		(33)
Party Wall			30.4800	0.0000	0.0000	7.4000	225.5520 (32)
Stud			147.0092			7.4000	1087.8680 (32c)
Internal Floor			6.5360			7.4000	48.3664 (32d)
Internal Ceiling			6.5360			7.4000	48.3664 (32e)
Heat capacity Cm = Sum (A x k)							(28)...(30) + (32) + (32a)...(32e) = 5882.9295 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							81.3458 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							22.3712 (36)
Total fabric heat loss							(33) + (36) = 67.1887 (37)

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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	30.2533	29.9036	29.7920	29.4718	29.4718	29.3699	29.3699	29.2706	29.2706	29.5761	29.5761	29.6828	(38)
Heat transfer coeff	97.4419	97.0923	96.9806	96.6605	96.6605	96.5586	96.5586	96.4593	96.4593	96.7647	96.7647	96.8715	(39)
Average = Sum(39)m / 12 =												96.7727	(39)
HLP	1.3474	1.3425	1.3410	1.3366	1.3366	1.3352	1.3352	1.3338	1.3338	1.3380	1.3380	1.3395	(40)
HLP (average)												1.3381	(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													2.3011	(42)	
Average daily hot water use (litres/day)													88.8513	(43)	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
Daily hot water use	97.7364	94.1823	90.6283	87.0742	83.5202	79.9661	79.9661	83.5202	87.0742	90.6283	94.1823	97.7364	(44)		
Energy content	144.9402	126.7657	130.8108	114.0440	109.4280	94.4280	87.5014	100.4092	101.6084	118.4148	129.2590	140.3669	(45)		
Energy content (annual)										Total = Sum (45)m =			1397.9763	(45)	
Distribution loss (46)m = 0.15 x (45)m	21.7410	19.0148	19.6216	17.1066	16.4142	14.1642	13.1252	15.0614	15.2413	17.7622	19.3888	21.0550	(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	0.6375	0.5373	0.5335	0.4469	0.4113	0.3398	0.3149	0.3774	0.3981	0.4829	0.5478	0.6174	(61)		
Total heat required for water heating calculated for each month	145.5777	127.3029	131.3443	114.4909	109.8392	94.7678	87.8163	100.7866	102.0065	118.8977	129.8068	140.9842	(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	145.5777	127.3029	131.3443	114.4909	109.8392	94.7678	87.8163	100.7866	102.0065	118.8977	129.8068	140.9842	(64)		
								Total per year (kWh/year) = Sum (64)m =						1403.6209	(64)
RHI water heating demand												1404	(64)		
Heat gains from water heating, kWh/month	48.3520	42.2839	43.6280	38.0314	36.4876	31.4823	29.1729	33.4804	33.8843	39.4936	43.1156	46.8263	(65)		

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

Metabolic gains (Table 5), Watts													
(66)m	138.0663	138.0663	138.0663	138.0663	138.0663	138.0663	138.0663	138.0663	138.0663	138.0663	138.0663	138.0663	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	50.3633	44.7322	36.3787	27.5410	20.5872	17.3806	18.7803	24.4114	32.7649	41.6026	48.5564	51.7630	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	302.4628	305.6014	297.6922	280.8544	259.5998	239.6234	226.2779	223.1393	231.0485	247.8863	269.1410	289.1173	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	51.1077	51.1077	51.1077	51.1077	51.1077	51.1077	51.1077	51.1077	51.1077	51.1077	51.1077	51.1077	(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)	-92.0442	-92.0442	-92.0442	-92.0442	-92.0442	-92.0442	-92.0442	-92.0442	-92.0442	-92.0442	-92.0442	-92.0442	(71)
Water heating gains (Table 5)	64.9892	62.9225	58.6397	52.8213	49.0425	43.7254	39.2109	45.0005	47.0616	53.0829	59.8827	62.9386	(72)
Total internal gains	517.9452	513.3859	492.8405	461.3466	429.3593	400.8592	384.3990	392.6811	411.0048	442.7016	477.7099	503.9488	(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	3.2730				45.0642		0.5000		0.7200		0.7700		36.7971 (77)	
Southwest	0.7190				45.0642		0.5000		0.7200		0.7700		8.0834 (79)	
Northwest	4.2720				14.6130		0.5000		0.7200		0.7700		15.5743 (81)	
Solar gains	60.4548	92.2201	140.8105	196.9270	225.9790	256.3332	235.3984	210.5107	168.1045	114.9515	73.1490	50.2386	(83)	
Total gains	578.3999	605.6061	633.6510	658.2736	655.3384	657.1923	619.7974	603.1918	579.1093	557.6531	550.8589	554.1874	(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)														
tau	16.7705	16.8309	16.8502	16.9061	16.9061	16.9239	16.9239	16.9413	16.9413	16.8878	16.8878	16.8692		
alpha	2.1180	2.1221	2.1233	2.1271	2.1271	2.1283	2.1283	2.1294	2.1294	2.1259	2.1259	2.1246		
util living area	0.9131	0.9019	0.8738	0.8209	0.7305	0.5784	0.4448	0.4433	0.6502	0.8057	0.8838	0.9179	(86)	
MIT	18.5127	18.6695	19.0937	19.6688	20.2611	20.7085	20.8886	20.8929	20.6002	19.9824	19.2016	18.5029	(87)	
Th 2	19.8039	19.8077	19.8089	19.8123	19.8123	19.8134	19.8134	19.8145	19.8145	19.8112	19.8112	19.8100	(88)	
util rest of house														

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MIT 2	0.9007	0.8879	0.8546	0.7905	0.6768	0.4835	0.3078	0.3020	0.5634	0.7647	0.8639	0.9060 (89)
Living area fraction	17.5992	17.7548	18.1702	18.7271	19.2799	19.6574	19.7789	19.7829	19.5810	19.0324	18.2826	17.5946 (90)
MIT	17.9171	18.0731	18.4916	19.0548	19.6214	20.0232	20.1651	20.1692	fLA = Living area / (4) =			0.3480 (91)
Temperature adjustment									19.9357	19.3631	18.6025	17.9107 (92)
adjusted MIT	17.7671	17.9231	18.3416	18.9048	19.4714	19.8732	20.0151	20.0192	19.7857	19.2131	18.4525	-0.1500
												17.7607 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.8730	0.8593	0.8248	0.7624	0.6588	0.4889	0.3332	0.3286	0.5610	0.7395	0.8348	0.8791 (94)	
Useful gains	504.9632	520.3801	522.6307	501.8879	431.7682	321.2803	206.5335	198.2351	324.8572	412.3887	459.8392	487.1625 (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	1175.8436	1147.9352	1032.0276	851.0774	615.8587	383.6496	223.5464	214.0637	413.3970	668.9413	934.0208	1158.6520 (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	499.1350	421.7170	378.9913	251.4164	136.9633	0.0000	0.0000	0.0000	0.0000	190.8751	341.4108	499.5882 (98)	
RHI space heating demand												2720.0970 (98)	
												2720 (98)	

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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	6.5400 (1b)	x 1.7700 (2b)	= 11.5758 (1b) - (3b)
First floor	65.7800 (1c)	x 2.3400 (2c)	= 153.9252 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	72.3200		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 165.5010 (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)					20.0000 / (5) = 0.1208 (8)
Pressure test					Yes
Measured/design AP50					3.3800
Infiltration rate					0.2898 (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)	=	0.2681 (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	0.3418	0.3351	0.3284	0.2949	0.2882	0.2547	0.2547	0.2480	0.2681	0.2882	0.3016	0.3150 (22b)
Effective ac	0.5584	0.5562	0.5539	0.5435	0.5415	0.5324	0.5324	0.5308	0.5359	0.5415	0.5455	0.5496 (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			2.1100	1.2000	2.5320		(26)
Windows (Uw = 1.40)			8.2600	1.3258	10.9508		(27)
Flr - Ground			6.5400	0.2000	1.3080	75.6000	494.4240 (28a)
Flr - Exposed Drive Through			59.2400	0.1400	8.2936	13.2000	781.9680 (28b)
Wl - Brick (Timber Frame)	64.8130	8.2640	56.5490	0.2100	11.8753	7.4000	418.4626 (29a)
Wl - Brick (Cavity)	23.9890	2.1060	21.8830	0.2100	4.5954	104.7000	2291.1501 (29a)
Rf - Ins Joist	65.7800		65.7800	0.0800	5.2624	7.4000	486.7720 (30)
Total net area of external elements Aum(A, m ²)			220.3620				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	44.8175		(33)
Party Wall			30.4800	0.0000	0.0000	7.4000	225.5520 (32)
Stud			147.0092			7.4000	1087.8680 (32c)
Internal Floor			6.5360			7.4000	48.3664 (32d)
Internal Ceiling			6.5360			7.4000	48.3664 (32e)
Heat capacity Cm = Sum(A x k)							(28)...(30) + (32) + (32a)...(32e) = 5882.9295 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							81.3458 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							22.3712 (36)
Total fabric heat loss							(33) + (36) = 67.1887 (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	30.4986	30.3747	30.2533	29.6828	29.5761	29.0792	29.0792	28.9872	29.2706	29.5761	29.7920	30.0177 (38)
Heat transfer coeff	97.6873	97.5634	97.4419	96.8715	96.7647	96.2679	96.2679	96.1759	96.4593	96.7647	96.9806	97.2064 (39)
Average = Sum(39)m / 12 =												96.8710 (39)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.3508	1.3491	1.3474	1.3395	1.3380	1.3311	1.3311	1.3299	1.3338	1.3380	1.3410	1.3441 (40)
HLP (average)												1.3395 (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												2.3011 (42)
Average daily hot water use (litres/day)												88.8513 (43)
Daily hot water use	97.7364	94.1823	90.6283	87.0742	83.5202	79.9661	79.9661	83.5202	87.0742	90.6283	94.1823	97.7364 (44)
Energy conte	144.9402	126.7657	130.8108	114.0440	109.4280	94.4280	87.5014	100.4092	101.6084	118.4148	129.2590	140.3669 (45)

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Energy content (annual)	Total = Sum(45)m = 1397.9763 (45)										
Distribution loss (46)m = 0.15 x (45)m											
21.7410	19.0148	19.6216	17.1066	16.4142	14.1642	13.1252	15.0614	15.2413	17.7622	19.3888	21.0550 (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	0.6375	0.5373	0.5335	0.4469	0.4113	0.3398	0.3149	0.3774	0.3981	0.4829	0.5478 (61)
Total heat required for water heating calculated for each month											
145.5777	127.3029	131.3443	114.4909	109.8392	94.7678	87.8163	100.7866	102.0065	118.8977	129.8068	140.9842 (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 (63)
Solar input (sum of months) = Sum(63)m =	0.0000 (63)										
Output from w/h											
145.5777	127.3029	131.3443	114.4909	109.8392	94.7678	87.8163	100.7866	102.0065	118.8977	129.8068	140.9842 (64)
Total per year (kWh/year) = Sum(64)m =	1403.6209 (64)										
Heat gains from water heating, kWh/month											
48.3520	42.2839	43.6280	38.0314	36.4876	31.4823	29.1729	33.4804	33.8843	39.4936	43.1156	46.8263 (65)

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

Metabolic gains (Table 5), Watts	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(66)m	138.0663	138.0663	138.0663	138.0663	138.0663	138.0663	138.0663	138.0663	138.0663	138.0663	138.0663	138.0663	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	50.3633	44.7322	36.3787	27.5410	20.5872	17.3806	18.7803	24.4114	32.7649	41.6026	48.5564	51.7630	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	302.4628	305.6014	297.6922	280.8544	259.5998	239.6234	226.2779	223.1393	231.0485	247.8863	269.1410	289.1173	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	51.1077	51.1077	51.1077	51.1077	51.1077	51.1077	51.1077	51.1077	51.1077	51.1077	51.1077	51.1077	(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)	-92.0442	-92.0442	-92.0442	-92.0442	-92.0442	-92.0442	-92.0442	-92.0442	-92.0442	-92.0442	-92.0442	-92.0442	(71)
Water heating gains (Table 5)	64.9892	62.9225	58.6397	52.8213	49.0425	43.7254	39.2109	45.0005	47.0616	53.0829	59.8827	62.9386	(72)
Total internal gains	517.9452	513.3859	492.8405	461.3466	429.3593	400.8592	384.3990	392.6811	411.0048	442.7016	477.7099	503.9488	(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				3.2730	36.7938	0.5000	0.7200	0.7700		30.0439 (77)		
Southwest				0.7190	36.7938	0.5000	0.7200	0.7700		6.5999 (79)		
Northwest				4.2720	11.2829	0.5000	0.7200	0.7700		12.0251 (81)		
Solar gains	48.6690	86.8955	129.5037	178.2445	215.8803	221.4588	210.5387	181.3692	146.2108	98.8987	59.0216	41.1798 (83)
Total gains	566.6142	600.2815	622.3442	639.5911	645.2396	622.3180	594.9378	574.0503	557.2156	541.6003	536.7315	545.1287 (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	16.7283	16.7496	16.7705	16.8692	16.8878	16.9750	16.9750	16.9912	16.9413	16.8878	16.8502	16.8111
alpha	2.1152	2.1166	2.1180	2.1246	2.1259	2.1317	2.1317	2.1327	2.1294	2.1259	2.1233	2.1207
util living area	0.9276	0.9151	0.8932	0.8523	0.7842	0.6773	0.5602	0.5889	0.7386	0.8554	0.9097	0.9328 (86)
MIT	18.1466	18.3626	18.7857	19.3754	19.9788	20.4942	20.7653	20.7287	20.3404	19.5922	18.7736	18.0911 (87)
Th 2	19.8013	19.8026	19.8039	19.8100	19.8112	19.8165	19.8165	19.8175	19.8145	19.8112	19.8089	19.8064 (88)
util rest of house	0.9179	0.9036	0.8777	0.8285	0.7438	0.6054	0.4492	0.4823	0.6768	0.8276	0.8956	0.9238 (89)
MIT 2	17.2359	17.4490	17.8659	18.4446	19.0207	19.4905	19.7063	19.6828	19.3624	18.6625	17.8620	17.1849 (90)
Living area fraction	17.5529	17.7670	18.1860	18.7685	19.3541	19.8398	20.0749	20.0468	fLA = Living area / (4) =	19.7028	18.9861	18.1793 (91)
MIT	17.5529	17.7670	18.1860	18.7685	19.3541	19.8398	20.0749	20.0468	19.7028	18.9861	18.1793	17.5003 (92)
Temperature adjustment												-0.1500
adjusted MIT	17.4029	17.6170	18.0360	18.6185	19.2041	19.6898	19.9249	19.8968	19.5528	18.8361	18.0293	17.3503 (93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
0.8920	0.8761	0.8484	0.7989	0.7193	0.5965	0.4606	0.4904	0.6606	0.7989	0.8678	0.8988	0.8988	(94)
Useful gains	505.4480	525.8998	528.0060	510.9556	464.0993	371.2216	274.0229	281.5177	368.1070	432.7018	465.7941	489.9692	(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	1279.9829	1240.7114	1124.0930	941.4495	726.1368	489.9829	320.0815	336.3096	525.9727	796.9625	1059.9263	1278.2946	(97)
Month fracti	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 kWh	576.2540	480.3534	443.4887	309.9556	194.9559	0.0000	0.0000	0.0000	0.0000	271.0100	427.7752	586.5141	(98)
Space heating												3290.3068	(98)
Space heating per m2												(98) / (4) =	45.4965 (99)

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												3647.7903	(211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	576.2540	480.3534	443.4887	309.9556	194.9559	0.0000	0.0000	0.0000	0.0000	271.0100	427.7752	586.5141	(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)	638.8625	532.5425	491.6727	343.6315	216.1374	0.0000	0.0000	0.0000	0.0000	300.4545	474.2518	650.2373	(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	145.5777	127.3029	131.3443	114.4909	109.8392	94.7678	87.8163	100.7866	102.0065	118.8977	129.8068	140.9842	(64)
Efficiency of water heater (217)m	87.0296	86.9112	86.6248	86.0094	84.6874	76.4000	76.4000	76.4000	76.4000	85.4911	86.5601	76.4000	(216)
Fuel for water heating, kWh/month	167.2737	146.4747	151.6243	133.1144	129.6996	124.0416	114.9428	131.9196	133.5164	139.0761	149.9615	161.7731	(217)
Water heating fuel used												1683.4179	(219)
Annual totals kWh/year													
Space heating fuel - main system												3647.7903	(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)												355.7724	(232)
Total delivered energy for all uses												5761.9805	(238)

10a. Fuel costs - using Table 12 prices

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	3647.7903	3.4800	126.9431 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1683.4179	3.4800	58.5829 (247)
Pumps and fans for heating	75.0000	13.1900	9.8925 (249)
Energy for lighting	355.7724	13.1900	46.9264 (250)
Additional standing charges			120.0000 (251)
Total energy cost			362.3449 (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] = 1.2972 (257)
SAP value	81.9044
SAP rating (Section 12)	82 (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	3647.7903	0.2160	787.9227 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1683.4179	0.2160	363.6183 (264)
Space and water heating			1151.5410 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	355.7724	0.5190	184.6459 (268)
Total kg/year			1375.1118 (272)
CO2 emissions per m2			19.0100 (273)
EI value			84.2938
EI rating			84 (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	$3.48 / 0.8301 = 4.193$, stars = 4
Water heating environmental impact	$0.216 / 0.8301 = 0.2602$, stars = 4

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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	6.5400 (1b)	x 1.7700 (2b)	= 11.5758 (1b) - (3b)
First floor	65.7800 (1c)	x 2.3400 (2c)	= 153.9252 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	72.3200		(3a)+(3b)+(3c)+(3d)+(3e)...(3n) = 165.5010 (5)
Dwelling volume			

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					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) =					20.0000 / (5) = 0.1208 (8)
Pressure test					Yes
Measured/design AP50					3.3800
Infiltration rate					0.2898 (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) =	0.2681 (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												
Effective ac	0.3284	0.3083	0.3016	0.2815	0.2815	0.2748	0.2748	0.2681	0.2681	0.2882	0.2882	0.2949 (22b)
	0.5539	0.5475	0.5455	0.5396	0.5396	0.5378	0.5378	0.5359	0.5359	0.5415	0.5415	0.5435 (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			2.1100	1.2000	2.5320		(26)
Windows (Uw = 1.40)			8.2600	1.3258	10.9508		(27)
Flr - Ground			6.5400	0.2000	1.3080	75.6000	494.4240 (28a)
Flr - Exposed Drive Through			59.2400	0.1400	8.2936	13.2000	781.9680 (28b)
Wl - Brick (Timber Frame)	64.8130	8.2640	56.5490	0.2100	11.8753	7.4000	418.4626 (29a)
Wl - Brick (Cavity)	23.9890	2.1060	21.8830	0.2100	4.5954	104.7000	2291.1501 (29a)
Rf - Ins Joist	65.7800		65.7800	0.0800	5.2624	7.4000	486.7720 (30)
Total net area of external elements Aum(A, m ²)			220.3620				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	44.8175		(33)
Party Wall			30.4800	0.0000	0.0000	7.4000	225.5520 (32)
Stud			147.0092			7.4000	1087.8680 (32c)
Internal Floor			6.5360			7.4000	48.3664 (32d)
Internal Ceiling			6.5360			7.4000	48.3664 (32e)
Heat capacity Cm = Sum(A x k)							(28)...(30) + (32) + (32a)...(32e) = 5882.9295 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							81.3458 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							22.3712 (36)
Total fabric heat loss							(33) + (36) = 67.1887 (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	30.2533	29.9036	29.7920	29.4718	29.4718	29.3699	29.3699	29.2706	29.2706	29.5761	29.5761	29.6828 (38)
Heat transfer coeff	97.4419	97.0923	96.9806	96.6605	96.6605	96.5586	96.5586	96.4593	96.4593	96.7647	96.7647	96.8715 (39)
Average = Sum(39)m / 12 =												96.7727 (39)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.3474	1.3425	1.3410	1.3366	1.3366	1.3352	1.3352	1.3338	1.3338	1.3380	1.3380	1.3395 (40)
HLP (average)												1.3381 (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	2.3011 (42)
Average daily hot water use (litres/day)	88.8513 (43)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use	97.7364	94.1823	90.6283	87.0742	83.5202	79.9661	79.9661	83.5202	87.0742	90.6283	94.1823	97.7364 (44)
Energy conte	144.9402	126.7657	130.8108	114.0440	109.4280	94.4280	87.5014	100.4092	101.6084	118.4148	129.2590	140.3669 (45)

FULL SAP CALCULATION PRINTOUT

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

Energy content (annual)	Total = Sum(45)m = 1397.9763 (45)										
Distribution loss (46)m = 0.15 x (45)m											
21.7410	19.0148	19.6216	17.1066	16.4142	14.1642	13.1252	15.0614	15.2413	17.7622	19.3888	21.0550 (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	0.6375	0.5373	0.5335	0.4469	0.4113	0.3398	0.3149	0.3774	0.3981	0.4829	0.5478 (61)
Total heat required for water heating calculated for each month											
145.5777	127.3029	131.3443	114.4909	109.8392	94.7678	87.8163	100.7866	102.0065	118.8977	129.8068	140.9842 (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 (63)
Solar input (sum of months) = Sum(63)m =	0.0000 (63)										
Output from w/h											
145.5777	127.3029	131.3443	114.4909	109.8392	94.7678	87.8163	100.7866	102.0065	118.8977	129.8068	140.9842 (64)
Total per year (kWh/year) = Sum(64)m =	1403.6209 (64)										
Heat gains from water heating, kWh/month											
48.3520	42.2839	43.6280	38.0314	36.4876	31.4823	29.1729	33.4804	33.8843	39.4936	43.1156	46.8263 (65)

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

Metabolic gains (Table 5), Watts	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(66)m	138.0663	138.0663	138.0663	138.0663	138.0663	138.0663	138.0663	138.0663	138.0663	138.0663	138.0663	138.0663	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	50.3633	44.7322	36.3787	27.5410	20.5872	17.3806	18.7803	24.4114	32.7649	41.6026	48.5564	51.7630	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	302.4628	305.6014	297.6922	280.8544	259.5998	239.6234	226.2779	223.1393	231.0485	247.8863	269.1410	289.1173	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	51.1077	51.1077	51.1077	51.1077	51.1077	51.1077	51.1077	51.1077	51.1077	51.1077	51.1077	51.1077	(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)	-92.0442	-92.0442	-92.0442	-92.0442	-92.0442	-92.0442	-92.0442	-92.0442	-92.0442	-92.0442	-92.0442	-92.0442	(71)
Water heating gains (Table 5)	64.9892	62.9225	58.6397	52.8213	49.0425	43.7254	39.2109	45.0005	47.0616	53.0829	59.8827	62.9386	(72)
Total internal gains	517.9452	513.3859	492.8405	461.3466	429.3593	400.8592	384.3990	392.6811	411.0048	442.7016	477.7099	503.9488	(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					3.2730	45.0642	0.5000	0.7200	0.7700		36.7971 (77)	
Southwest					0.7190	45.0642	0.5000	0.7200	0.7700		8.0834 (79)	
Northwest					4.2720	14.6130	0.5000	0.7200	0.7700		15.5743 (81)	
Solar gains	60.4548	92.2201	140.8105	196.9270	225.9790	256.3332	235.3984	210.5107	168.1045	114.9515	73.1490	50.2386 (83)
Total gains	578.3999	605.6061	633.6510	658.2736	655.3384	657.1923	619.7974	603.1918	579.1093	557.6531	550.8589	554.1874 (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	16.7705	16.8309	16.8502	16.9061	16.9061	16.9239	16.9239	16.9413	16.9413	16.8878	16.8878	16.8692	
alpha	2.1180	2.1221	2.1233	2.1271	2.1271	2.1283	2.1283	2.1294	2.1294	2.1259	2.1259	2.1246	
util living area	0.9131	0.9019	0.8738	0.8209	0.7305	0.5784	0.4448	0.4433	0.6502	0.8057	0.8838	0.9179 (86)	
MIT	18.5127	18.6695	19.0937	19.6688	20.2611	20.7085	20.8886	20.8929	20.6002	19.9824	19.2016	18.5029 (87)	
Th 2	19.8039	19.8077	19.8089	19.8123	19.8123	19.8134	19.8134	19.8145	19.8145	19.8112	19.8112	19.8100 (88)	
util rest of house	0.9007	0.8879	0.8546	0.7905	0.6768	0.4835	0.3078	0.3020	0.5634	0.7647	0.8639	0.9060 (89)	
MIT 2	17.5992	17.7548	18.1702	18.7271	19.2799	19.6574	19.7789	19.7829	19.5810	19.0324	18.2826	17.5946 (90)	
Living area fraction	17.9171	18.0731	18.4916	19.0548	19.6214	20.0232	20.1651	20.1692	fLA = Living area / (4) =				0.3480 (91)
MIT	17.9171	18.0731	18.4916	19.0548	19.6214	20.0232	20.1651	20.1692	19.9357	19.3631	18.6025	17.9107 (92)	
Temperature adjustment												-0.1500	
adjusted MIT	17.7671	17.9231	18.3416	18.9048	19.4714	19.8732	20.0151	20.0192	19.7857	19.2131	18.4525	17.7607 (93)	

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.8730	0.8593	0.8248	0.7624	0.6588	0.4889	0.3332	0.3286	0.5610	0.7395	0.8348	0.8791	(94)
Useful gains	504.9632	520.3801	522.6307	501.8879	431.7682	321.2803	206.5335	198.2351	324.8572	412.3887	459.8392	487.1625	(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	1175.8436	1147.9352	1032.0276	851.0774	615.8587	383.6496	223.5464	214.0637	413.3970	668.9413	934.0208	1158.6520	(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	499.1350	421.7170	378.9913	251.4164	136.9633	0.0000	0.0000	0.0000	0.0000	190.8751	341.4108	499.5882	(98)
Space heating												2720.0970	(98)
Space heating per m2												37.6120	(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													3015.6286	(211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Space heating requirement	499.1350	421.7170	378.9913	251.4164	136.9633	0.0000	0.0000	0.0000	0.0000	190.8751	341.4108	499.5882	(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)	553.3648	467.5355	420.1677	278.7322	151.8441	0.0000	0.0000	0.0000	0.0000	211.6132	378.5042	553.8671	(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	145.5777	127.3029	131.3443	114.4909	109.8392	94.7678	87.8163	100.7866	102.0065	118.8977	129.8068	140.9842	(64)	
Efficiency of water heater (217)m	86.6652	86.5740	86.1931	85.3748	83.4885	76.4000	76.4000	76.4000	76.4000	84.3520	85.9246	86.7512	(216)	
Fuel for water heating, kWh/month	167.9770	147.0451	152.3838	134.1038	131.5621	124.0416	114.9428	131.9196	133.5164	140.9543	151.0706	162.5155	(219)	
Water heating fuel used													1692.0328	(219)
Annual totals kWh/year														
Space heating fuel - main system													3015.6286	(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)													355.7724	(232)
Total delivered energy for all uses													5138.4338	(238)

10a. Fuel costs - using BEDF prices (554)

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	3015.6286	5.9600	179.7315 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1692.0328	5.9600	100.8452 (247)
Pumps and fans for heating	75.0000	25.0500	18.7875 (249)
Energy for lighting	355.7724	25.0500	89.1210 (250)
Additional standing charges			112.0000 (251)
Total energy cost			500.4851 (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	3015.6286	0.2160	651.3758 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1692.0328	0.2160	365.4791 (264)
Space and water heating			1016.8549 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	355.7724	0.5190	184.6459 (268)
Total kg/year			1240.4257 (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	3015.6286	1.2200	3679.0669 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1692.0328	1.2200	2064.2800 (264)
Space and water heating			5743.3470 (265)
Pumps and fans	75.0000	3.0700	230.2500 (267)
Energy for lighting	355.7724	3.0700	1092.2212 (268)
Primary energy kWh/year			7065.8182 (272)
Primary energy kWh/m2/year			97.7021 (273)

SAP 2012 EPC IMPROVEMENTS

Current energy efficiency rating:
Current environmental impact rating:

B 82
B 84

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	Not applicable
O	Not considered
P	Not considered
R	Not considered
S	Not considered
T	Not considered
U Solar photovoltaic panels	Not applicable
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
(none)			

Recommended measures	Typical annual savings	Energy efficiency	Environmental impact
(none)			
Total Savings	£0	0.00 kg/m²	
Potential energy efficiency rating:		B 82	
Potential environmental impact rating:			B 84

Fuel prices for cost data on this page from database revision number 554 TEST (31 Oct 2024)
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	£108	£108	£0
Mains gas	£393	£393	£0
Space heating	£311	£311	£0
Water heating	£101	£101	£0
Lighting	£89	£89	£0
Total cost of fuels	£501	£501	£0
Total cost of uses	£501	£501	£0
Delivered energy	71 kWh/m²	71 kWh/m²	0 kWh/m²
Carbon dioxide emissions	1.2 tonnes	1.2 tonnes	0.0 tonnes
CO2 emissions per m²	17 kg/m²	17 kg/m²	0 kg/m²
Primary energy	98 kWh/m²	98 kWh/m²	0 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

No improvements selected / applicable

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

No improvements selected / applicable

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Built)

Property Reference	062 - PRJ013014			Issued on Date	25/02/2025
Assessment Reference	062	Prop Type Ref	F		
Property	6 Paulet Close, Netley Abbey, SO31 5JW				
SAP Rating	82 B	DER	20.53	TER	22.02
Environmental	84 B	% DER<TER	6.76		
CO ₂ Emissions (t/year)	1.24	DFEE	55.97	TFEE	66.56
General Requirements Compliance	Pass	% DFEE<TFEE	15.92		
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)	22.02	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	20.53	kgCO ₂ /m ²	Pass
	-1.49 (-6.8%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	66.56	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	55.97	kWh/m ² /yr	
	-10.6 (-15.9%)	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	0.15 (max. 0.25)	0.20 (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	3.38 (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

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 South East

3.27 m², No overhang

Windows facing South West

0.72 m², No overhang

Windows facing North West

4.27 m², No overhang

Air change rate

5.05 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

3.38 (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

3.4 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.