

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

Property Reference	031 - PRJ013014	Issued on Date	02/05/2024
Assessment Reference	031	Prop Type Ref	A
Property	24 Deeble way, Netley Abbey, Southampton, SO31 5JP		

SAP Rating	86 B	DER	13.50	TER	16.07
Environmental	87 B	% DER<TER	15.97		
CO ₂ Emissions (t/year)	1.69	DFEE	49.22	TFEE	57.00
General Requirements Compliance	Pass	% DFEE<TFEE	13.66		

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	75.5700 (1b)	x 2.3700 (2b)	= 179.1009 (1b) - (3b)
First floor	75.5700 (1c)	x 2.7000 (2c)	= 204.0390 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	151.1400		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 383.1399 (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								6 * 10 =	60.0000 (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) =						60.0000 / (5) =		0.1566 (8)				
Pressure test									Yes				
Measured/design AP50									4.7700				
Infiltration rate									0.3951 (18)				
Number of sides sheltered									0 (19)				
Shelter factor									(20) = 1 - [0.075 x (19)] =	1.0000 (20)			
Infiltration rate adjusted to include shelter factor									(21) = (18) x (20) =	0.3951 (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	0.4840	0.4544	0.4445	0.4149	0.4149	0.4050	0.4050	0.3951	0.3951	0.4247	0.4247	0.4346	(22b)
Effective ac	0.6171	0.6032	0.5988	0.5861	0.5861	0.5820	0.5820	0.5781	0.5781	0.5902	0.5902	0.5944	(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			4.0700	1.2000	4.8840		(26)
Windows (Uw = 1.40)			27.7400	1.3258	36.7765		(27)
Floor - Ground			75.5700	0.1800	13.6026	75.6000	5713.0920 (28a)
W1 - Brick (Timber Frame)	159.2710	27.4700	131.8010	0.2100	27.6782	7.4000	975.3274 (29a)
W1 - Clad (Timber Frame)	26.0780	4.3440	21.7340	0.2100	4.5641	7.4000	160.8316 (29a)
Rf - Ins Joist	75.5700		75.5700	0.0800	6.0456	7.4000	559.2180 (30)
Total net area of external elements Aum, m ²			336.4850				(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		93.5511		(33)
Stud			127.7288			7.4000	945.1930 (32c)
Internal Floor			75.5700			7.4000	559.2180 (32d)
Internal Ceiling			75.5700			7.4000	559.2180 (32e)
Heat capacity Cm = Sum (A x k)							(28)...(30) + (32) + (32a)...(32e) = 9472.0980 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							62.6710 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							24.6966 (36)
Total fabric heat loss							(33) + (36) = 118.2477 (37)

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

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(38)m	Jan 78.0272	Feb 76.2694	Mar 75.7081	Apr 74.0983	May 74.0983	Jun 73.5863	Jul 73.5863	Aug 73.0867	Sep 73.0867	Oct 74.6225	Nov 74.6225	Dec 75.1591 (38)
Heat transfer coeff	196.2749	194.5170	193.9557	192.3459	192.3459	191.8340	191.8340	191.3344	191.3344	192.8702	192.8702	193.4068 (39)
Average = Sum(39)m / 12 =												192.9103 (39)
HLP	Jan 1.2986	Feb 1.2870	Mar 1.2833	Apr 1.2726	May 1.2726	Jun 1.2692	Jul 1.2692	Aug 1.2659	Sep 1.2659	Oct 1.2761	Nov 1.2761	Dec 1.2797 (40)
HLP (average)												1.2764 (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												2.9360 (42)
Average daily hot water use (litres/day)												103.9289 (43)
Daily hot water use	Jan 114.3218	Feb 110.1646	Mar 106.0075	Apr 101.8503	May 97.6932	Jun 93.5360	Jul 93.5360	Aug 97.6932	Sep 101.8503	Oct 106.0075	Nov 110.1646	Dec 114.3218 (44)
Energy conte	169.5359	148.2772	153.0088	133.3967	127.9974	110.4520	102.3500	117.4481	118.8508	138.5092	151.1936	164.1865 (45)
Energy content (annual)										Total = Sum(45)m =		1635.2061 (45)
Distribution loss (46)m = 0.15 x (45)m	25.4304	22.2416	22.9513	20.0095	19.1996	16.5678	15.3525	17.6172	17.8276	20.7764	22.6790	24.6280 (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	0.6671	0.6081	0.6530	0.5915	0.5627	0.4649	0.4308	0.5163	0.5270	0.5911	0.6201	0.6461 (61)
Total heat required for water heating calculated for each month	170.2030	148.8853	153.6618	133.9882	128.5601	110.9169	102.7808	117.9644	119.3778	139.1003	151.8137	164.8326 (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	170.2030	148.8853	153.6618	133.9882	128.5601	110.9169	102.7808	117.9644	119.3778	139.1003	151.8137	164.8326 (64)
RHI water heating demand										Total per year (kWh/year) = Sum(64)m =		1642.0849 (64)
Heat gains from water heating, kWh/month	56.5375	49.4542	51.0387	44.5023	42.6998	36.8415	34.1391	39.1806	39.6496	46.2021	50.4269	54.7535 (65)

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

Metabolic gains (Table 5), Watts	Jan 176.1572	Feb 176.1572	Mar 176.1572	Apr 176.1572	May 176.1572	Jun 176.1572	Jul 176.1572	Aug 176.1572	Sep 176.1572	Oct 176.1572	Nov 176.1572	Dec 176.1572 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	72.7264	64.5949	52.5321	39.7702	29.7287	25.0982	27.1195	35.2510	47.3138	60.0757	70.1172	74.7477 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	480.2386	485.2220	472.6640	445.9297	412.1823	380.4646	359.2752	354.2918	366.8497	393.5841	427.3315	459.0492 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	55.5517	55.5517	55.5517	55.5517	55.5517	55.5517	55.5517	55.5517	55.5517	55.5517	55.5517	55.5517 (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)	-117.4381	-117.4381	-117.4381	-117.4381	-117.4381	-117.4381	-117.4381	-117.4381	-117.4381	-117.4381	-117.4381	-117.4381 (71)
Water heating gains (Table 5)	75.9912	73.5926	68.6004	61.8087	57.3922	51.1688	45.8859	52.6621	55.0690	62.0996	70.0374	73.5934 (72)
Total internal gains	746.2269	740.6802	711.0672	664.7793	616.5739	574.0023	549.5513	559.4756	586.5032	633.0301	684.7568	724.6611 (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
East				11.5210	25.1733		0.7300	0.7200		0.7700	105.6375 (76)	
South				0.7190	56.5862		0.7300	0.7200		0.7700	14.8193 (78)	
West				15.5000	25.1733		0.7300	0.7200		0.7700	142.1215 (80)	

Solar gains	262.5783	432.8718	715.6711	1040.0413	1194.4773	1347.3158	1240.7897	1115.0429	872.7705	558.3244	325.4041	212.8723 (83)
Total gains	1008.8052	1173.5520	1426.7384	1704.8206	1811.0513	1921.3180	1790.3410	1674.5185	1459.2737	1191.3545	1010.1609	937.5334 (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	Jan 13.4054	Feb 13.5265	Mar 13.5657	Apr 13.6792	May 13.6792	Jun 13.7157	Jul 13.7157	Aug 13.7515	Sep 13.7515	Oct 13.6420	Nov 13.6420	Dec 13.6042
alpha	1.8937	1.9018	1.9044	1.9119	1.9119	1.9144	1.9144	1.9168	1.9168	1.9095	1.9095	1.9069
util living area	0.9121	0.8850	0.8238	0.7219	0.5977	0.4294	0.3208	0.3300	0.5463	0.7610	0.8758	0.9201 (86)
MIT	18.0353	18.3390	18.9872	19.7530	20.3706	20.7788	20.9152	20.9139	20.6314	19.8907	18.8887	18.0179 (87)
Th 2	19.8419	19.8510	19.8539	19.8623	19.8623	19.8650	19.8650	19.8676	19.8676	19.8596	19.8596	19.8568 (88)
util rest of house	0.9011	0.8710	0.8023	0.6878	0.5444	0.3524	0.2210	0.2247	0.4680	0.7201	0.8575	0.9099 (89)
MIT 2	16.0184	16.4462	17.3508	18.3989	19.2093	19.6913	19.8240	19.8274	19.5496	18.6164	17.2351	15.9988 (90)

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Living area fraction									fLA = Living area / (4) =		0.1190 (91)	
MIT	16.2585	16.6715	17.5456	18.5600	19.3475	19.8207	19.9539	19.9567	19.6784	18.7681	17.4319	16.2391 (92)
Temperature adjustment												-0.1500
adjusted MIT	16.1085	16.5215	17.3956	18.4100	19.1975	19.6707	19.8039	19.8067	19.5284	18.6181	17.2819	16.0891 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.8471	0.8128	0.7414	0.6352	0.5091	0.3381	0.2152	0.2186	0.4414	0.6637	0.7979	0.8582	(94)
Useful gains	854.5675	953.8157	1057.8513	1082.9602	921.9390	649.5634	385.3086	366.1269	644.0922	790.6807	806.0569	804.5817	(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	2042.9200	2027.1553	1880.5132	1598.4039	1172.8297	723.3495	403.5942	383.9569	770.7649	1218.5762	1635.9012	1989.9831	(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	884.1343	721.2843	612.0605	371.1195	186.6627	0.0000	0.0000	0.0000	0.0000	318.3543	597.4879	881.9387	(98)
RHI space heating demand												4573.0420	(98)
												4573	(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	75.5700 (1b)	x 2.3700 (2b)	= 179.1009 (1b) - (3b)
First floor	75.5700 (1c)	x 2.7000 (2c)	= 204.0390 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	151.1400		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 383.1399 (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					6 * 10 = 60.0000 (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)					60.0000 / (5) = 0.1566 (8)
Pressure test					Yes
Measured/design AP50					4.7700
Infiltration rate					0.3951 (18)
Number of sides sheltered					0 (19)
Shelter factor				(20) = 1 - [0.075 x (19)] =	1.0000 (20)
Infiltration rate adjusted to include shelter factor				(21) = (18) x (20) =	0.3951 (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	0.5038	0.4939	0.4840	0.4346	0.4247	0.3753	0.3753	0.3655	0.3951	0.4247	0.4445	0.4642 (22b)
Effective ac	0.6269	0.6220	0.6171	0.5944	0.5902	0.5704	0.5704	0.5668	0.5781	0.5902	0.5988	0.6078 (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			4.0700	1.2000	4.8840		(26)
Windows (Uw = 1.40)			27.7400	1.3258	36.7765		(27)
Flr - Ground			75.5700	0.1800	13.6026	75.6000	5713.0920 (28a)
Wl - Brick (Timber Frame)	159.2710	27.4700	131.8010	0.2100	27.6782	7.4000	975.3274 (29a)
Wl - Clad (Timber Frame)	26.0780	4.3440	21.7340	0.2100	4.5641	7.4000	160.8316 (29a)
Rf - Ins Joist	75.5700		75.5700	0.0800	6.0456	7.4000	559.2180 (30)
Total net area of external elements Aum(A, m ²)			336.4850				(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		93.5511		(33)
Stud			127.7288			7.4000	945.1930 (32c)
Internal Floor			75.5700			7.4000	559.2180 (32d)
Internal Ceiling			75.5700			7.4000	559.2180 (32e)
Heat capacity Cm = Sum(A x k)							(28)...(30) + (32) + (32a)...(32e) = 9472.0980 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							62.6710 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							24.6966 (36)
Total fabric heat loss							(33) + (36) = 118.2477 (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	79.2608	78.6378	78.0272	75.1591	74.6225	72.1245	72.1245	71.6619	73.0867	74.6225	75.7081	76.8430 (38)
Heat transfer coeff	197.5084	196.8855	196.2749	193.4068	192.8702	190.3722	190.3722	189.9096	191.3344	192.8702	193.9557	195.0906 (39)
Average = Sum(39)m / 12 =												193.4042 (39)

HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	1.3068	1.3027	1.2986	1.2797	1.2761	1.2596	1.2596	1.2565	1.2659	1.2761	1.2833	1.2908 (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												2.9360 (42)
Average daily hot water use (litres/day)												103.9289 (43)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use	114.3218	110.1646	106.0075	101.8503	97.6932	93.5360	93.5360	97.6932	101.8503	106.0075	110.1646	114.3218 (44)
Energy conte	169.5359	148.2772	153.0088	133.3967	127.9974	110.4520	102.3500	117.4481	118.8508	138.5092	151.1936	164.1865 (45)
Energy content (annual)												Total = Sum(45)m = 1635.2061 (45)
Distribution loss (46)m = 0.15 x (45)m												

	25.4304	22.2416	22.9513	20.0095	19.1996	16.5678	15.3525	17.6172	17.8276	20.7764	22.6790	24.6280 (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	0.6671	0.6081	0.6530	0.5915	0.5627	0.4649	0.4308	0.5163	0.5270	0.5911	0.6201	0.6461 (61)
Total heat required for water heating calculated for each month	170.2030	148.8853	153.6618	133.9882	128.5601	110.9169	102.7808	117.9644	119.3778	139.1003	151.8137	164.8326 (62)
WWHRS	-56.9147	-50.0797	-51.1117	-42.0391	-39.0269	-32.1901	-27.2342	-32.9775	-33.9437	-41.9712	-48.6318	-55.0138 eq.(G10)
Total of WWHRS savings												-511.1344
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63)
Output from w/h								Solar input	(sum of months) =	Sum(63)m =		0.0000 (63)
	113.2883	98.8056	102.5500	91.9491	89.5332	78.7268	75.5466	84.9870	85.4341	97.1291	103.1819	109.8188 (64)
								Total per year (kWh/year) =	Sum(64)m =			1130.9505 (64)
Heat gains from water heating, kWh/month	56.5375	49.4542	51.0387	44.5023	42.6998	36.8415	34.1391	39.1806	39.6496	46.2021	50.4269	54.7535 (65)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.8726	0.8353	0.7756	0.6850	0.5743	0.4440	0.3238	0.3631	0.5506	0.7368	0.8406	0.8829 (94)
Useful gains	830.5508	951.2628	1054.3016	1097.3408	1010.6496	773.6214	538.2878	551.4261	736.4480	812.9901	790.4319	789.4726 (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	2207.9518	2184.5725	2035.5388	1752.4888	1379.7919	926.8641	593.8338	622.8433	976.7383	1428.2252	1834.6019	2184.1060 (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	1024.7863	828.7841	730.0404	471.7065	274.6419	0.0000	0.0000	0.0000	0.0000	457.7350	751.8024	1037.6072 (98)
Space heating												5577.1038 (98)
Space heating per m2												36.9003 (99)
										(98) / (4) =		

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												6183.0419	(211)	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Space heating requirement	1024.7863	828.7841	730.0404	471.7065	274.6419	0.0000	0.0000	0.0000	0.0000	457.7350	751.8024	1037.6072	(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)	1136.1267	918.8294	809.3575	522.9562	304.4810	0.0000	0.0000	0.0000	0.0000	507.4667	833.4838	1150.3406	(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	113.2883	98.8056	102.5500	91.9491	89.5332	78.7268	75.5466	84.9870	85.4341	97.1291	103.1819	109.8188	(64)	
Efficiency of water heater	88.6068	88.4973	88.2369	87.6183	86.3647	76.4000	76.4000	76.4000	76.4000	87.4354	88.2757	76.4000	(216)	
(217)m	88.6068	88.4973	88.2369	87.6183	86.3647	76.4000	76.4000	76.4000	76.4000	87.4354	88.2757	88.6671	(217)	
Fuel for water heating, kWh/month	127.8551	111.6481	116.2212	104.9429	103.6687	103.0455	98.8830	111.2395	111.8247	111.0867	116.8860	123.8551	(219)	
Water heating fuel used												1341.1566	(219)	
Annual totals kWh/year														
Space heating fuel - main system												6183.0419	(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)													513.7484	(232)
Total delivered energy for all uses													8112.9469	(238)

10a. Fuel costs - using Table 12 prices

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	6183.0419	3.4800	215.1699 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1341.1566	3.4800	46.6723 (247)
Pumps and fans for heating	75.0000	13.1900	9.8925 (249)
Energy for lighting	513.7484	13.1900	67.7634 (250)
Additional standing charges			120.0000 (251)
Total energy cost			459.4980 (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] = 0.9839 (257)
SAP value	86.2741
SAP rating (Section 12)	86 (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	6183.0419	0.2160	1335.5371 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1341.1566	0.2160	289.6898 (264)
Space and water heating			1625.2269 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	513.7484	0.5190	266.6354 (268)
Total kg/year			1930.7873 (272)
CO2 emissions per m2			12.7700 (273)
EI value			86.8091
EI rating			87 (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	$3.48 / 0.8411 = 4.138$, stars = 5
Water heating environmental impact	$0.216 / 0.8411 = 0.2568$, 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	75.5700 (1b)	x 2.3700 (2b)	= 179.1009 (1b) - (3b)
First floor	75.5700 (1c)	x 2.7000 (2c)	= 204.0390 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	151.1400		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 383.1399 (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					6 * 10 = 60.0000 (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)					60.0000 / (5) = 0.1566 (8)
Pressure test					Yes
Measured/design AP50					4.7700
Infiltration rate					0.3951 (18)
Number of sides sheltered					0 (19)
Shelter factor				(20) = 1 - [0.075 x (19)] =	1.0000 (20)
Infiltration rate adjusted to include shelter factor				(21) = (18) x (20) =	0.3951 (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	0.4840	0.4544	0.4445	0.4149	0.4149	0.4050	0.4050	0.3951	0.3951	0.4247	0.4247	0.4346 (22b)
Effective ac	0.6171	0.6032	0.5988	0.5861	0.5861	0.5820	0.5820	0.5781	0.5781	0.5902	0.5902	0.5944 (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			4.0700	1.2000	4.8840		(26)
Windows (Uw = 1.40)			27.7400	1.3258	36.7765		(27)
Flr - Ground			75.5700	0.1800	13.6026	75.6000	5713.0920 (28a)
Wl - Brick (Timber Frame)	159.2710	27.4700	131.8010	0.2100	27.6782	7.4000	975.3274 (29a)
Wl - Clad (Timber Frame)	26.0780	4.3440	21.7340	0.2100	4.5641	7.4000	160.8316 (29a)
Rf - Ins Joist	75.5700		75.5700	0.0800	6.0456	7.4000	559.2180 (30)
Total net area of external elements Aum(A, m ²)			336.4850				(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		93.5511		(33)
Stud			127.7288			7.4000	945.1930 (32c)
Internal Floor			75.5700			7.4000	559.2180 (32d)
Internal Ceiling			75.5700			7.4000	559.2180 (32e)
Heat capacity Cm = Sum(A x k)							(28)...(30) + (32) + (32a)...(32e) = 9472.0980 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							62.6710 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							24.6966 (36)
Total fabric heat loss							(33) + (36) = 118.2477 (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	78.0272	76.2694	75.7081	74.0983	74.0983	73.5863	73.5863	73.0867	73.0867	74.6225	74.6225	75.1591 (38)
Heat transfer coeff	196.2749	194.5170	193.9557	192.3459	192.3459	191.8340	191.8340	191.3344	191.3344	192.8702	192.8702	193.4068 (39)
Average = Sum(39)m / 12 =												192.9103 (39)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.2986	1.2870	1.2833	1.2726	1.2726	1.2692	1.2692	1.2659	1.2659	1.2761	1.2761	1.2797 (40)
HLP (average)												1.2764 (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												2.9360 (42)
Average daily hot water use (litres/day)												103.9289 (43)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use	114.3218	110.1646	106.0075	101.8503	97.6932	93.5360	93.5360	97.6932	101.8503	106.0075	110.1646	114.3218 (44)
Energy conte	169.5359	148.2772	153.0088	133.3967	127.9974	110.4520	102.3500	117.4481	118.8508	138.5092	151.1936	164.1865 (45)
Energy content (annual)												Total = Sum(45)m = 1635.2061 (45)
Distribution loss (46)m = 0.15 x (45)m												

	25.4304	22.2416	22.9513	20.0095	19.1996	16.5678	15.3525	17.6172	17.8276	20.7764	22.6790	24.6280 (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	0.6671	0.6081	0.6530	0.5915	0.5627	0.4649	0.4308	0.5163	0.5270	0.5911	0.6201	0.6461 (61)
Total heat required for water heating calculated for each month	170.2030	148.8853	153.6618	133.9882	128.5601	110.9169	102.7808	117.9644	119.3778	139.1003	151.8137	164.8326 (62)
WWHRS	-56.9147	-50.0797	-51.1117	-42.0391	-39.0269	-32.1901	-27.2342	-32.9775	-33.9437	-41.9712	-48.6318	-55.0138 eq.(G10)
Total of WWHRS savings												-511.1344
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63)
Output from w/h								Solar input (sum of months) = Sum(63)m =				0.0000 (63)
	113.2883	98.8056	102.5500	91.9491	89.5332	78.7268	75.5466	84.9870	85.4341	97.1291	103.1819	109.8188 (64)
								Total per year (kWh/year) = Sum(64)m =				1130.9505 (64)
Heat gains from water heating, kWh/month	56.5375	49.4542	51.0387	44.5023	42.6998	36.8415	34.1391	39.1806	39.6496	46.2021	50.4269	54.7535 (65)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.8471	0.8128	0.7414	0.6352	0.5091	0.3381	0.2152	0.2186	0.4414	0.6637	0.7979	0.8582 (94)
Useful gains	854.5675	953.8157	1057.8513	1082.9602	921.9390	649.5634	385.3086	366.1269	644.0922	790.6807	806.0569	804.5817 (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												
	2042.9200	2027.1553	1880.5132	1598.4039	1172.8297	723.3495	403.5942	383.9569	770.7649	1218.5762	1635.9012	1989.9831 (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												
	884.1343	721.2843	612.0605	371.1195	186.6627	0.0000	0.0000	0.0000	0.0000	318.3543	597.4879	881.9387 (98)
Space heating												4573.0420 (98)
Space heating per m2												30.2570 (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													5069.8913 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	884.1343	721.2843	612.0605	371.1195	186.6627	0.0000	0.0000	0.0000	0.0000	318.3543	597.4879	881.9387	(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)	980.1932	799.6500	678.5593	411.4407	206.9431	0.0000	0.0000	0.0000	0.0000	352.9426	662.4034	977.7591	(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	113.2883	98.8056	102.5500	91.9491	89.5332	78.7268	75.5466	84.9870	85.4341	97.1291	103.1819	109.8188	(64)
Efficiency of water heater (217)m	88.3867	88.2788	87.9210	87.0769	85.2106	76.4000	76.4000	76.4000	76.4000	86.5455	87.8629	88.4313	(217)
Fuel for water heating, kWh/month	128.1735	111.9244	116.6388	105.5953	105.0728	103.0455	98.8830	111.2395	111.8247	112.2289	117.4352	124.1855	(219)
Water heating fuel used												1346.2473	(219)
Annual totals kWh/year													
Space heating fuel - main system												5069.8913	(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)												513.7484	(232)
Total delivered energy for all uses												7004.8870	(238)

10a. Fuel costs - using BEDF prices (540)

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	5069.8913	7.6100	385.8187 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1346.2473	7.6100	102.4494 (247)
Pumps and fans for heating	75.0000	31.0800	23.3100 (249)
Energy for lighting	513.7484	31.0800	159.6730 (250)
Additional standing charges			105.0000 (251)
Total energy cost			776.2511 (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	5069.8913	0.2160	1095.0965 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1346.2473	0.2160	290.7894 (264)
Space and water heating			1385.8859 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	513.7484	0.5190	266.6354 (268)
Total kg/year			1691.4463 (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	5069.8913	1.2200	6185.2674 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1346.2473	1.2200	1642.4217 (264)
Space and water heating			7827.6891 (265)
Pumps and fans	75.0000	3.0700	230.2500 (267)
Energy for lighting	513.7484	3.0700	1577.2075 (268)
Primary energy kWh/year			9635.1466 (272)
Primary energy kWh/m2/year			63.7498 (273)

SAP 2012 EPC IMPROVEMENTS

Current energy efficiency rating:
Current environmental impact rating:

B 86
B 87

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	+ 6.8	-£ 605	-1010 kg (59.7%)
Measures omitted - SAP change or cost saving too small:			
N Solar water heating	+ 0.6	-£ 47	-153 kg (9.0%)

Recommended measures	Typical annual savings	Energy efficiency	Environmental impact
Solar photovoltaic panels	£605 6.68 kg/m ²	A 93	A 93
Total Savings	£605 6.68 kg/m ²		
Potential energy efficiency rating:		A 93	
Potential environmental impact rating:			A 93

Fuel prices for cost data on this page from database revision number 540 TEST (28 Mar 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	£183	£183	£0
Mains gas	£593	£593	£0
Space heating	£514	£514	£0
Water heating	£102	£102	£0
Lighting	£160	£160	£0
Generated (PV)	-£0	-£605	£605
Total cost of fuels	£776	£171	£605
Total cost of uses	£776	£171	£605
Delivered energy	46 kWh/m ²	33 kWh/m ²	13 kWh/m ²
Carbon dioxide emissions	1.7 tonnes	0.7 tonnes	1.0 tonnes
CO2 emissions per m ²	11 kg/m ²	5 kg/m ²	7 kg/m ²
Primary energy	64 kWh/m ²	24 kWh/m ²	40 kWh/m ²

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	75.5700 (1b)	x 2.3700 (2b)	= 179.1009 (1b) - (3b)
First floor	75.5700 (1c)	x 2.7000 (2c)	= 204.0390 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	151.1400		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 383.1399 (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																6 * 10 =	60.0000 (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) =					60.0000 / (5) =	0.1566 (8)	
Pressure test															Yes		
Measured/design AP50																4.7700	
Infiltration rate																0.3951 (18)	
Number of sides sheltered																0 (19)	
Shelter factor										(20) = 1 - [0.075 x (19)] =						1.0000 (20)	
Infiltration rate adjusted to include shelter factor										(21) = (18) x (20) =						0.3951 (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)				
	0.5038	0.4939	0.4840	0.4346	0.4247	0.3753	0.3753	0.3655	0.3951	0.4247	0.4445	0.4642	(22b)				
Effective ac	0.6269	0.6220	0.6171	0.5944	0.5902	0.5704	0.5704	0.5668	0.5781	0.5902	0.5988	0.6078	(25)				

3. Heat losses and heat loss parameter

Element	Gross m2	Openings m2	NetArea m2	U-value W/m2K	A x U W/K	K-value kJ/m2K	A x K kJ/K					
Solid Door			4.0700	1.2000	4.8840			(26)				
Windows (Uw = 1.40)			27.7400	1.3258	36.7765			(27)				
Flr - Ground			75.5700	0.1800	13.6026	75.6000	5713.0920	(28a)				
Wl - Brick (Timber Frame)	159.2710	27.4700	131.8010	0.2100	27.6782	7.4000	975.3274	(29a)				
Wl - Clad (Timber Frame)	26.0780	4.3440	21.7340	0.2100	4.5641	7.4000	160.8316	(29a)				
Rf - Ins Joist	75.5700		75.5700	0.0800	6.0456	7.4000	559.2180	(30)				
Total net area of external elements Aum(A, m2)			336.4850					(31)				
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		93.5511			(33)				
Stud			127.7288			7.4000	945.1930	(32c)				
Internal Floor			75.5700			7.4000	559.2180	(32d)				
Internal Ceiling			75.5700			7.4000	559.2180	(32e)				
Heat capacity Cm = Sum(A x k)								(28)...(30) + (32) + (32a)...(32e) = 9472.0980 (34)				
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K								62.6710 (35)				
Thermal bridges (Sum(L x Psi) calculated using Appendix K)								24.6966 (36)				
Total fabric heat loss						(33) + (36) =		118.2477 (37)				
Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)												
(38)m	79.2608	78.6378	78.0272	75.1591	74.6225	72.1245	72.1245	71.6619	73.0867	74.6225	75.7081	76.8430 (38)
Heat transfer coeff	197.5084	196.8855	196.2749	193.4068	192.8702	190.3722	190.3722	189.9096	191.3344	192.8702	193.9557	195.0906 (39)
Average = Sum(39)m / 12 =												193.4042 (39)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.3068	1.3027	1.2986	1.2797	1.2761	1.2596	1.2596	1.2565	1.2659	1.2761	1.2833	1.2908 (40)
HLP (average)												1.2796 (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												2.9360 (42)
Average daily hot water use (litres/day)												103.9289 (43)
Daily hot water use	Jan 114.3218	Feb 110.1646	Mar 106.0075	Apr 101.8503	May 97.6932	Jun 93.5360	Jul 93.5360	Aug 97.6932	Sep 101.8503	Oct 106.0075	Nov 110.1646	Dec 114.3218 (44)
Energy conte	169.5359	148.2772	153.0088	133.3967	127.9974	110.4520	102.3500	117.4481	118.8508	138.5092	151.1936	164.1865 (45)
Energy content (annual)												Total = Sum(45)m = 1635.2061 (45)
Distribution loss (46)m = 0.15 x (45)m												

	25.4304	22.2416	22.9513	20.0095	19.1996	16.5678	15.3525	17.6172	17.8276	20.7764	22.6790	24.6280 (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	0.6671	0.6081	0.6530	0.5915	0.5627	0.4649	0.4308	0.5163	0.5270	0.5911	0.6201	0.6461 (61)
Total heat required for water heating calculated for each month	170.2030	148.8853	153.6618	133.9882	128.5601	110.9169	102.7808	117.9644	119.3778	139.1003	151.8137	164.8326 (62)
WWHRS	-56.9147	-50.0797	-51.1117	-42.0391	-39.0269	-32.1901	-27.2342	-32.9775	-33.9437	-41.9712	-48.6318	-55.0138 eq. (G10)
Total of WWHRS savings												-511.1344
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63)
Output from w/h								Solar input (sum of months) = Sum(63)m =				0.0000 (63)
	113.2883	98.8056	102.5500	91.9491	89.5332	78.7268	75.5466	84.9870	85.4341	97.1291	103.1819	109.8188 (64)
								Total per year (kWh/year) = Sum(64)m =				1130.9505 (64)
Heat gains from water heating, kWh/month	56.5375	49.4542	51.0387	44.5023	42.6998	36.8415	34.1391	39.1806	39.6496	46.2021	50.4269	54.7535 (65)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.8726	0.8353	0.7756	0.6850	0.5743	0.4440	0.3238	0.3631	0.5506	0.7368	0.8406	0.8829 (94)
Useful gains	830.5508	951.2628	1054.3016	1097.3408	1010.6496	773.6214	538.2878	551.4261	736.4480	812.9901	790.4319	789.4726 (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												
	2207.9518	2184.5725	2035.5388	1752.4888	1379.7919	926.8641	593.8338	622.8433	976.7383	1428.2252	1834.6019	2184.1060 (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												
	1024.7863	828.7841	730.0404	471.7065	274.6419	0.0000	0.0000	0.0000	0.0000	457.7350	751.8024	1037.6072 (98)
Space heating												5577.1038 (98)
Space heating per m2												36.9003 (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													6183.0419 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	1024.7863	828.7841	730.0404	471.7065	274.6419	0.0000	0.0000	0.0000	0.0000	457.7350	751.8024	1037.6072	(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)	1136.1267	918.8294	809.3575	522.9562	304.4810	0.0000	0.0000	0.0000	0.0000	507.4667	833.4838	1150.3406	(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	113.2883	98.8056	102.5500	91.9491	89.5332	78.7268	75.5466	84.9870	85.4341	97.1291	103.1819	109.8188	(64)
Efficiency of water heater (217)m	88.6068	88.4973	88.2369	87.6183	86.3647	76.4000	76.4000	76.4000	76.4000	87.4354	88.2757	88.6671	(217)
Fuel for water heating, kWh/month	127.8551	111.6481	116.2212	104.9429	103.6687	103.0455	98.8830	111.2395	111.8247	111.0867	116.8860	123.8551	(219)
Water heating fuel used												1341.1566	(219)
Annual totals kWh/year													
Space heating fuel - main system												6183.0419	(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)													513.7484 (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												6385.7075	(238)

10a. Fuel costs - using Table 12 prices

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	6183.0419	3.4800	215.1699 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1341.1566	3.4800	46.6723 (247)
Pumps and fans for heating	75.0000	13.1900	9.8925 (249)
Energy for lighting	513.7484	13.1900	67.7634 (250)
Additional standing charges			120.0000 (251)
Energy saving/generation technologies			
PV Unit	-1727.2394	13.1900	-227.8229 (252)
Total energy cost			231.6751 (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] =	0.4961 (257)
SAP value		93.0795
SAP rating (Section 12)		93 (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	6183.0419	0.2160	1335.5371 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1341.1566	0.2160	289.6898 (264)
Space and water heating			1625.2269 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	513.7484	0.5190	266.6354 (268)
Energy saving/generation technologies			
PV Unit	-1727.2394	0.5190	-896.4372 (269)
Total kg/year			1034.3500 (272)
CO2 emissions per m2			6.8400 (273)
EI value			92.9335
EI rating			93 (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	75.5700 (1b)	x 2.3700 (2b)	= 179.1009 (1b) - (3b)
First floor	75.5700 (1c)	x 2.7000 (2c)	= 204.0390 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	151.1400		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 383.1399 (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																6 * 10 =	60.0000 (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) =										60.0000 / (5) =							0.1566 (8)
Pressure test										Yes							
Measured/design AP50																	4.7700
Infiltration rate																	0.3951 (18)
Number of sides sheltered																	0 (19)
Shelter factor										(20) = 1 - [0.075 x (19)] =							1.0000 (20)
Infiltration rate adjusted to include shelter factor										(21) = (18) x (20) =							0.3951 (21)
Wind speed	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec					
	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	0.4840	0.4544	0.4445	0.4149	0.4149	0.4050	0.4050	0.3951	0.3951	0.4247	0.4247	0.4346	(22b)				
Effective ac	0.6171	0.6032	0.5988	0.5861	0.5861	0.5820	0.5820	0.5781	0.5781	0.5902	0.5902	0.5944	(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			4.0700	1.2000	4.8840		(26)
Windows (Uw = 1.40)			27.7400	1.3258	36.7765		(27)
Flr - Ground			75.5700	0.1800	13.6026	75.6000	5713.0920 (28a)
Wl - Brick (Timber Frame)	159.2710	27.4700	131.8010	0.2100	27.6782	7.4000	975.3274 (29a)
Wl - Clad (Timber Frame)	26.0780	4.3440	21.7340	0.2100	4.5641	7.4000	160.8316 (29a)
Rf - Ins Joist	75.5700		75.5700	0.0800	6.0456	7.4000	559.2180 (30)
Total net area of external elements Aum(A, m ²)			336.4850				(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		93.5511		(33)
Stud			127.7288			7.4000	945.1930 (32c)
Internal Floor			75.5700			7.4000	559.2180 (32d)
Internal Ceiling			75.5700			7.4000	559.2180 (32e)
Heat capacity Cm = Sum(A x k)							(28)...(30) + (32) + (32a)...(32e) = 9472.0980 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							62.6710 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							24.6966 (36)
Total fabric heat loss							(33) + (36) = 118.2477 (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	78.0272	76.2694	75.7081	74.0983	74.0983	73.5863	73.5863	73.0867	73.0867	74.6225	74.6225	75.1591 (38)
Heat transfer coeff	196.2749	194.5170	193.9557	192.3459	192.3459	191.8340	191.8340	191.3344	191.3344	192.8702	192.8702	193.4068 (39)
Average = Sum(39)m / 12 =												192.9103 (39)
HLP	Jan 1.2986	Feb 1.2870	Mar 1.2833	Apr 1.2726	May 1.2726	Jun 1.2692	Jul 1.2692	Aug 1.2659	Sep 1.2659	Oct 1.2761	Nov 1.2761	Dec 1.2797 (40)
HLP (average)												1.2764 (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												2.9360 (42)
Average daily hot water use (litres/day)												103.9289 (43)
Daily hot water use	Jan 114.3218	Feb 110.1646	Mar 106.0075	Apr 101.8503	May 97.6932	Jun 93.5360	Jul 93.5360	Aug 97.6932	Sep 101.8503	Oct 106.0075	Nov 110.1646	Dec 114.3218 (44)
Energy conte	169.5359	148.2772	153.0088	133.3967	127.9974	110.4520	102.3500	117.4481	118.8508	138.5092	151.1936	164.1865 (45)
Energy content (annual)												Total = Sum(45)m = 1635.2061 (45)
Distribution loss (46)m = 0.15 x (45)m												

Water storage loss:	25.4304	22.2416	22.9513	20.0095	19.1996	16.5678	15.3525	17.6172	17.8276	20.7764	22.6790	24.6280 (46)
Total storage loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (56)
If cylinder contains dedicated solar storage	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (57)
Combi loss	0.6671	0.6081	0.6530	0.5915	0.5627	0.4649	0.4308	0.5163	0.5270	0.5911	0.6201	0.6461 (61)
Total heat required for water heating calculated for each month	170.2030	148.8853	153.6618	133.9882	128.5601	110.9169	102.7808	117.9644	119.3778	139.1003	151.8137	164.8326 (62)
WWHRS	-56.9147	-50.0797	-51.1117	-42.0391	-39.0269	-32.1901	-27.2342	-32.9775	-33.9437	-41.9712	-48.6318	-55.0138 eq. (G10)
Total of WWHRS savings												-511.1344
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63)
Output from w/h								Solar input	(sum of months) =	Sum(63)m =		0.0000 (63)
	113.2883	98.8056	102.5500	91.9491	89.5332	78.7268	75.5466	84.9870	85.4341	97.1291	103.1819	109.8188 (64)
								Total per year (kWh/year) =	Sum(64)m =			1130.9505 (64)
Heat gains from water heating, kWh/month	56.5375	49.4542	51.0387	44.5023	42.6998	36.8415	34.1391	39.1806	39.6496	46.2021	50.4269	54.7535 (65)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.8471	0.8128	0.7414	0.6352	0.5091	0.3381	0.2152	0.2186	0.4414	0.6637	0.7979	0.8582 (94)
Useful gains	854.5675	953.8157	1057.8513	1082.9602	921.9390	649.5634	385.3086	366.1269	644.0922	790.6807	806.0569	804.5817 (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												
	2042.9200	2027.1553	1880.5132	1598.4039	1172.8297	723.3495	403.5942	383.9569	770.7649	1218.5762	1635.9012	1989.9831 (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												
	884.1343	721.2843	612.0605	371.1195	186.6627	0.0000	0.0000	0.0000	0.0000	318.3543	597.4879	881.9387 (98)
Space heating												4573.0420 (98)
Space heating per m2												30.2570 (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													5069.8913	(211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Space heating requirement	884.1343	721.2843	612.0605	371.1195	186.6627	0.0000	0.0000	0.0000	0.0000	318.3543	597.4879	881.9387	(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)	980.1932	799.6500	678.5593	411.4407	206.9431	0.0000	0.0000	0.0000	0.0000	352.9426	662.4034	977.7591	(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	113.2883	98.8056	102.5500	91.9491	89.5332	78.7268	75.5466	84.9870	85.4341	97.1291	103.1819	109.8188	(64)	
Efficiency of water heater (217)m	88.3867	88.2788	87.9210	87.0769	85.2106	76.4000	76.4000	76.4000	76.4000	86.5455	87.8629	76.4000	(216)	
Fuel for water heating, kWh/month	128.1735	111.9244	116.6388	105.5953	105.0728	103.0455	98.8830	111.2395	111.8247	112.2289	117.4352	124.1855	(219)	
Water heating fuel used												1346.2473	(219)	
Annual totals kWh/year														
Space heating fuel - main system												5069.8913	(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)													513.7484	(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													5058.4410	(238)

10a. Fuel costs - using BEDF prices (540)

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year	
Space heating - main system 1	5069.8913	7.6100	385.8187	(240)
Space heating - secondary	0.0000	0.0000	0.0000	(242)
Water heating (other fuel)	1346.2473	7.6100	102.4494	(247)
Pumps and fans for heating	75.0000	31.0800	23.3100	(249)
Energy for lighting	513.7484	31.0800	159.6730	(250)
Additional standing charges			105.0000	(251)
Energy saving/generation technologies				
PV Unit	-1946.4459	31.0800	-604.9554	(252)
Total energy cost			171.2957	(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	5069.8913	0.2160	1095.0965	(261)
Space heating - secondary	0.0000	0.0000	0.0000	(263)
Water heating (other fuel)	1346.2473	0.2160	290.7894	(264)
Space and water heating			1385.8859	(265)
Pumps and fans	75.0000	0.5190	38.9250	(267)
Energy for lighting	513.7484	0.5190	266.6354	(268)
Energy saving/generation technologies				
PV Unit	-1946.4459	0.5190	-1010.2054	(269)
Total kg/year			681.2409	(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	5069.8913	1.2200	6185.2674	(261)
Space heating - secondary	0.0000	0.0000	0.0000	(263)
Water heating (other fuel)	1346.2473	1.2200	1642.4217	(264)
Space and water heating			7827.6891	(265)
Pumps and fans	75.0000	3.0700	230.2500	(267)
Energy for lighting	513.7484	3.0700	1577.2075	(268)
Energy saving/generation technologies				
PV Unit	-1946.4459	3.0700	-5975.5890	(269)
Primary energy kWh/year			3659.5575	(272)
Primary energy kWh/m2/year			24.2130	(273)

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Built)

Property Reference	031 - PRJ013014	Issued on Date	02/05/2024
Assessment Reference	031	Prop Type Ref	A
Property	24 Deeble way, Netley Abbey, Southampton, SO31 5JP		
SAP Rating	86 B	DER	13.50
Environmental	87 B	TER	16.07
CO ₂ Emissions (t/year)	1.69	% DER<TER	15.97
General Requirements Compliance	Pass	DFEE	49.22
		TFEE	57.00
		% DFEE<TFEE	13.66
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)	16.07	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	13.50	kgCO ₂ /m ²	Pass
	-2.57 (-16.0%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	57.00	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	49.22	kWh/m ² /yr	
	-7.8 (-13.7%)	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
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	4.77 (measured in this dwelling)	
Maximum	10.0	Pass

Limiting System Efficiencies

4 Heating efficiency

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

Calculation Type: New Build (As Built)

Secondary heating system

None

5 Cylinder insulation

Hot water storage

No cylinder

6 Controls

Space heating controls

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 East

11.52 m², No overhang

Windows facing South

0.72 m², No overhang

Windows facing West

15.50 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

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals

4.77 (measured in this dwelling)

Maximum

10.0

Pass

10 Key features

Roof U-value

0.08

W/m²K