

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

Property Reference	035 - PRJ013014	Issued on Date	09/10/2024
Assessment Reference	035	Prop Type Ref	A
Property	37 Deeble Way, Netley Abbey, Southampton, SO31 5JP		

SAP Rating	86 B	DER	13.34	TER	15.90
Environmental	87 B	% DER<TER	16.08		
CO ₂ Emissions (t/year)	1.67	DFEE	48.19	TFEE	55.95
General Requirements Compliance	Pass	% DFEE<TFEE	13.87		

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								4.4600				
Infiltration rate								0.3796	(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) =	0.3796 (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	0.4650	0.4365	0.4271	0.3986	0.3986	0.3891	0.3891	0.3796	0.3796	0.4081	0.4081	0.4176 (22b)
Effective ac	0.6081	0.5953	0.5912	0.5794	0.5794	0.5757	0.5757	0.5720	0.5720	0.5833	0.5833	0.5872 (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)
Fir - 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, 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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CALCULATION OF HEAT DEMAND 09 Jan 2014

(38)m	Jan 76.8881	Feb 75.2654	Mar 74.7473	Apr 73.2613	May 73.2613	Jun 72.7888	Jul 72.7888	Aug 72.3276	Sep 72.3276	Oct 73.7453	Nov 73.7453	Dec 74.2406 (38)
Heat transfer coeff	195.1357	193.5131	192.9950	191.5090	191.5090	191.0364	191.0364	190.5753	190.5753	191.9929	191.9929	192.4883 (39)
Average = Sum(39)m / 12 =												192.0299 (39)
HLP	Jan 1.2911	Feb 1.2804	Mar 1.2769	Apr 1.2671	May 1.2671	Jun 1.2640	Jul 1.2640	Aug 1.2609	Sep 1.2609	Oct 1.2703	Nov 1.2703	Dec 1.2736 (40)
HLP (average)												1.2705 (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	
Northeast				0.7190	14.6130		0.7300	0.7200	0.7700		3.8270 (75)	
Southeast				15.5000	45.0642		0.7300	0.7200	0.7700		254.4203 (77)	
Northwest				11.5210	14.6130		0.7300	0.7200	0.7700		61.3224 (81)	
Solar gains	319.5697	482.4081	723.8726	993.4299	1125.9351	1271.0438	1169.6087	1055.8920	857.4509	597.5984	385.5827	266.2652 (83)
Total gains	1065.7967	1223.0883	1434.9399	1658.2093	1742.5090	1845.0461	1719.1599	1615.3675	1443.9540	1230.6285	1070.3394	990.9262 (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 13.4836	Feb 13.5967	Mar 13.6332	Apr 13.7390	May 13.7390	Jun 13.7730	Jul 13.7730	Aug 13.8063	Sep 13.8063	Oct 13.7043	Nov 13.7043	Dec 13.6691
alpha	1.8989	1.9064	1.9089	1.9159	1.9159	1.9182	1.9182	1.9204	1.9204	1.9136	1.9136	1.9113
util living area	0.9042	0.8776	0.8219	0.7294	0.6098	0.4414	0.3309	0.3391	0.5489	0.7511	0.8649	0.9128 (86)
MIT	18.1123	18.4024	19.0056	19.7324	20.3497	20.7688	20.9110	20.9101	20.6299	19.9244	18.9576	18.0900 (87)
Th 2	19.8478	19.8563	19.8590	19.8667	19.8667	19.8692	19.8692	19.8716	19.8716	19.8642	19.8642	19.8616 (88)
util rest of house	0.8924	0.8630	0.8003	0.6958	0.5568	0.3635	0.2289	0.2319	0.4708	0.7096	0.8454	0.9018 (89)
MIT 2	16.1272	16.5352	17.3777	18.3753	19.1890	19.6864	19.8257	19.8293	19.5515	18.6610	17.3305	16.1008 (90)

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CALCULATION OF HEAT DEMAND 09 Jan 2014

Living area fraction									fLA = Living area / (4) =		0.1190 (91)	
MIT	16.3635	16.7575	17.5715	18.5368	19.3271	19.8153	19.9549	19.9579	19.6798	18.8114	17.5242	16.3376 (92)
Temperature adjustment												-0.1500
adjusted MIT	16.2135	16.6075	17.4215	18.3868	19.1771	19.6653	19.8049	19.8079	19.5298	18.6614	17.3742	16.1876 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.8370	0.8041	0.7397	0.6425	0.5199	0.3481	0.2227	0.2253	0.4439	0.6543	0.7853	0.8485	(94)
Useful gains	892.1062	983.4615	1061.4172	1065.4750	905.9834	642.3281	382.8495	364.0062	640.9453	805.1951	840.4869	840.8284	(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	2051.5568	2033.3362	1876.1939	1587.0061	1163.8254	719.3013	402.1069	382.6608	767.9850	1221.3473	1646.1872	1999.4883	(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	862.6313	705.5158	606.1939	375.5024	191.8345	0.0000	0.0000	0.0000	0.0000	309.6172	580.1042	862.0430	(98)
RHI space heating demand												4493.4422	(98)
												4493	(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	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					4.4600
Infiltration rate					0.3796 (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) =	0.3796 (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	0.4840	0.4745	0.4650	0.4176	0.4081	0.3606	0.3606	0.3511	0.3796	0.4081	0.4271	0.4460 (22b)
Effective ac	0.6171	0.6126	0.6081	0.5872	0.5833	0.5650	0.5650	0.5616	0.5720	0.5833	0.5912	0.5995 (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	78.0267	77.4517	76.8881	74.2406	73.7453	71.4394	71.4394	71.0124	72.3276	73.7453	74.7473	75.7949 (38)
Heat transfer coeff	196.2744	195.6994	195.1357	192.4883	191.9929	189.6871	189.6871	189.2601	190.5753	191.9929	192.9950	194.0426 (39)
Average = Sum(39)m / 12 =												192.4859 (39)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.2986	1.2948	1.2911	1.2736	1.2703	1.2550	1.2550	1.2522	1.2609	1.2703	1.2769	1.2839 (40)
HLP (average)												1.2736 (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	148.8553	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	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)
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	0.8640	0.8257	0.7719	0.6903	0.5846	0.4550	0.3333	0.3710	0.5505	0.7264	0.8296	0.8747 (94)
Useful gains	867.6636	988.2675	1064.9965	1082.1666	991.3095	762.2403	532.9488	546.3683	735.2508	834.8263	826.9889	825.3128 (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												
	2214.9072	2192.1598	2032.6726	1740.9517	1368.4069	920.8832	590.9614	620.0153	974.0804	1433.6402	1844.6399	2191.7206 (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												
	1002.3492	809.0157	719.9510	474.3252	280.5604	0.0000	0.0000	0.0000	0.0000	445.5176	732.7087	1016.6074 (98)
Space heating												5481.0353 (98)
Space heating per m2												36.2646 (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												6076.5358	(211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	1002.3492	809.0157	719.9510	474.3252	280.5604	0.0000	0.0000	0.0000	0.0000	445.5176	732.7087	1016.6074	(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)	1111.2519	896.9131	798.1719	525.8595	311.0426	0.0000	0.0000	0.0000	0.0000	493.9219	812.3157	1127.0592	(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	88.5753	88.4609	88.2134	87.6299	86.4235	76.4000	76.4000	76.4000	76.4000	87.3751	88.2327	88.6391	(216)
(217)m	88.5753	88.4609	88.2134	87.6299	86.4235	76.4000	76.4000	76.4000	76.4000	87.3751	88.2327	88.6391	(217)
Fuel for water heating, kWh/month	127.9005	111.6940	116.2523	104.9290	103.5982	103.0455	98.8830	111.2395	111.8247	111.1634	116.9430	123.8943	(219)
Water heating fuel used												1341.3674	(219)
Annual totals kWh/year													
Space heating fuel - main system												6076.5358	(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												8006.6516	(238)

10a. Fuel costs - using Table 12 prices

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	6076.5358	3.4800	211.4634 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1341.3674	3.4800	46.6796 (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			455.7989 (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] = 0.9760 (257)
SAP value	86.3846
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	6076.5358	0.2160	1312.5317 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1341.3674	0.2160	289.7354 (264)
Space and water heating			1602.2671 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	513.7484	0.5190	266.6354 (268)
Total kg/year			1907.8275 (272)
CO2 emissions per m2			12.6200 (273)
EI value			86.9660
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	$3.48 / 0.8410 = 4.138$, stars = 5
Water heating environmental impact	$0.216 / 0.8410 = 0.2568$, 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	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					4.4600
Infiltration rate					0.3796 (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) =				0.3796 (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	0.4650	0.4365	0.4271	0.3986	0.3986	0.3891	0.3891	0.3796	0.3796	0.4081	0.4081	0.4176 (22b)
Effective ac	0.6081	0.5953	0.5912	0.5794	0.5794	0.5757	0.5757	0.5720	0.5720	0.5833	0.5833	0.5872 (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	76.8881	75.2654	74.7473	73.2613	73.2613	72.7888	72.7888	72.3276	72.3276	73.7453	73.7453	74.2406 (38)
Heat transfer coeff	195.1357	193.5131	192.9950	191.5090	191.5090	191.0364	191.0364	190.5753	190.5753	191.9929	191.9929	192.4883 (39)
Average = Sum(39)m / 12 =												192.0299 (39)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.2911	1.2804	1.2769	1.2671	1.2671	1.2640	1.2640	1.2609	1.2609	1.2703	1.2703	1.2736 (40)
HLP (average)												1.2705 (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	0.8370	0.8041	0.7397	0.6425	0.5199	0.3481	0.2227	0.2253	0.4439	0.6543	0.7853	0.8485 (94)
Useful gains	892.1062	983.4615	1061.4172	1065.4750	905.9834	642.3281	382.8495	364.0062	640.9453	805.1951	840.4869	840.8284 (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	2051.5568	2033.3362	1876.1939	1587.0061	1163.8254	719.3013	402.1069	382.6608	767.9850	1221.3473	1646.1872	1999.4883 (97)
Month fracti	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000 (97a)
Space heating kWh	862.6313	705.5158	606.1939	375.5024	191.8345	0.0000	0.0000	0.0000	0.0000	309.6172	580.1042	862.0430 (98)
Space heating												4493.4422 (98)
Space heating per m2										(98) / (4) =		29.7303 (99)

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													4981.6432 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	862.6313	705.5158	606.1939	375.5024	191.8345	0.0000	0.0000	0.0000	0.0000	309.6172	580.1042	862.0430	(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)	956.3540	782.1683	672.0553	416.2997	212.6768	0.0000	0.0000	0.0000	0.0000	343.2564	643.1310	955.7018	(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	88.3475	88.2420	87.9026	87.1051	85.2973	76.4000	76.4000	76.4000	76.4000	86.4703	87.8050	88.3958	(216)
Fuel for water heating, kWh/month	128.2303	111.9711	116.6632	105.5610	104.9660	103.0455	98.8830	111.2395	111.8247	112.3266	117.5126	124.2353	(219)
Water heating fuel used												1346.4590	(219)
Annual totals kWh/year													
Space heating fuel - main system												4981.6432	(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													6916.8506 (238)

10a. Fuel costs - using BEDF prices (542)

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	4981.6432	7.6100	379.1031 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1346.4590	7.6100	102.4655 (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			769.5516 (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	4981.6432	0.2160	1076.0349 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1346.4590	0.2160	290.8351 (264)
Space and water heating			1366.8701 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	513.7484	0.5190	266.6354 (268)
Total kg/year			1672.4305 (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	4981.6432	1.2200	6077.6048 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1346.4590	1.2200	1642.6800 (264)
Space and water heating			7720.2847 (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			9527.7422 (272)
Primary energy kWh/m2/year			63.0392 (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 (60.4%)
Measures omitted - SAP change or cost saving too small:			
N Solar water heating	+ 0.6	-£ 47	-153 kg (9.1%)

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 542 TEST (30 Apr 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	£587	£587	£0
Space heating	£507	£507	£0
Water heating	£102	£102	£0
Lighting	£160	£160	£0
Generated (PV)	-£0	-£605	£605
Total cost of fuels	£770	£165	£605
Total cost of uses	£769	£164	£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	4 kg/m ²	7 kg/m ²
Primary energy	63 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 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					4.4600
Infiltration rate					0.3796 (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) =	0.3796 (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	0.4840	0.4745	0.4650	0.4176	0.4081	0.3606	0.3606	0.3511	0.3796	0.4081	0.4271	0.4460 (22b)
Effective ac	0.6171	0.6126	0.6081	0.5872	0.5833	0.5650	0.5650	0.5616	0.5720	0.5833	0.5912	0.5995 (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	78.0267	77.4517	76.8881	74.2406	73.7453	71.4394	71.4394	71.0124	72.3276	73.7453	74.7473	75.7949 (38)
Heat transfer coeff	196.2744	195.6994	195.1357	192.4883	191.9929	189.6871	189.6871	189.2601	190.5753	191.9929	192.9950	194.0426 (39)
Average = Sum(39)m / 12 =												192.4859 (39)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.2986	1.2948	1.2911	1.2736	1.2703	1.2550	1.2550	1.2522	1.2609	1.2703	1.2769	1.2839 (40)
HLP (average)												1.2736 (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	0.8640	0.8257	0.7719	0.6903	0.5846	0.4550	0.3333	0.3710	0.5505	0.7264	0.8296	0.8747 (94)
Useful gains	867.6636	988.2675	1064.9965	1082.1666	991.3095	762.2403	532.9488	546.3683	735.2508	834.8263	826.9889	825.3128 (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	2214.9072	2192.1598	2032.6726	1740.9517	1368.4069	920.8832	590.9614	620.0153	974.0804	1433.6402	1844.6399	2191.7206 (97)
Month fracti	1.0000	1.0000		1.0000	1.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000 (97a)
Space heating kWh	1002.3492	809.0157	719.9510	474.3252	280.5604	0.0000	0.0000	0.0000	0.0000	445.5176	732.7087	1016.6074 (98)
Space heating												5481.0353 (99)
Space heating per m2												36.2646 (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													6076.5358 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	1002.3492	809.0157	719.9510	474.3252	280.5604	0.0000	0.0000	0.0000	0.0000	445.5176	732.7087	1016.6074	(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)	1111.2519	896.9131	798.1719	525.8595	311.0426	0.0000	0.0000	0.0000	0.0000	493.9219	812.3157	1127.0592	(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	88.5753	88.4609	88.2134	87.6299	86.4235	76.4000	76.4000	76.4000	76.4000	87.3751	88.2327	88.6391	(217)
Fuel for water heating, kWh/month	127.9005	111.6940	116.2523	104.9290	103.5982	103.0455	98.8830	111.2395	111.8247	111.1634	116.9430	123.8943	(219)
Water heating fuel used												1341.3674	(219)
Annual totals kWh/year													
Space heating fuel - main system												6076.5358	(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												6279.4122	(238)

10a. Fuel costs - using Table 12 prices

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	6076.5358	3.4800	211.4634 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1341.3674	3.4800	46.6796 (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			227.9761 (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] =	0.4882 (257)
SAP value		93.1900
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	6076.5358	0.2160	1312.5317 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1341.3674	0.2160	289.7354 (264)
Space and water heating			1602.2671 (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			1011.3903 (272)
CO2 emissions per m2			6.6900 (273)
EI value			93.0903
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 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					4.4600
Infiltration rate					0.3796 (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) =	0.3796 (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	0.4650	0.4365	0.4271	0.3986	0.3986	0.3891	0.3891	0.3796	0.3796	0.4081	0.4081	0.4176 (22b)
Effective ac	0.6081	0.5953	0.5912	0.5794	0.5794	0.5757	0.5757	0.5720	0.5720	0.5833	0.5833	0.5872 (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	76.8881	75.2654	74.7473	73.2613	73.2613	72.7888	72.7888	72.3276	72.3276	73.7453	73.7453	74.2406 (38)
Heat transfer coeff	195.1357	193.5131	192.9950	191.5090	191.5090	191.0364	191.0364	190.5753	190.5753	191.9929	191.9929	192.4883 (39)
Average = Sum(39)m / 12 =												192.0299 (39)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.2911	1.2804	1.2769	1.2671	1.2671	1.2640	1.2640	1.2609	1.2609	1.2703	1.2703	1.2736 (40)
HLP (average)												1.2705 (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	148.8553	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)

Metabolic gains (Table 5), Watts												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(66)m	176.1572	176.1572	176.1572	176.1572	176.1572	176.1572	176.1572	176.1572	176.1572	176.1572	176.1572	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	616.5730	574.0023	549.5513	559.4756	586.5032	633.0301	684.7568	724.6611 (73)

[Jan	Area m ²	Solar flux Table 6a W/m ²	g Specific data or Table 6b	FF Specific data or Table 6c	Access factor Table 6d	Gains W
Northeast	0.7190	14.6130	0.7300	0.7200	0.7700	3.8270 (75)
Southeast	15.5000	45.0642	0.7300	0.7200	0.7700	254.4203 (77)
Northwest	11.5210	14.6130	0.7300	0.7200	0.7700	61.3224 (81)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.8370	0.8041	0.7397	0.6425	0.5199	0.3481	0.2227	0.2253	0.4439	0.6543	0.7853	0.8485 (94)
Useful gains	892.1062	983.4615	1061.4172	1065.4750	905.9834	642.3281	382.8495	364.0062	640.9453	805.1951	840.4869	840.8284 (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												
	2051.5568	2033.3362	1876.1939	1587.0061	1163.8254	719.3013	402.1069	382.6608	767.9850	1221.3473	1646.1872	1999.4883 (97)
Month fracti	1.0000		1.0000	1.0000	1.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000 (97a)
Space heating kWh												
	862.6313	705.5158	606.1939	375.5024	191.8345	0.0000	0.0000	0.0000	0.0000	309.6172	580.1042	862.0430 (98)
Space heating												4493.4422 (98)
Space heating per m2												(98) / (4) = 29.7303 (99)

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													4981.6432 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	862.6313	705.5158	606.1939	375.5024	191.8345	0.0000	0.0000	0.0000	0.0000	309.6172	580.1042	862.0430	(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)	956.3540	782.1683	672.0553	416.2997	212.6768	0.0000	0.0000	0.0000	0.0000	343.2564	643.1310	955.7018	(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	88.3475	88.2420	87.9026	87.1051	85.2973	76.4000	76.4000	76.4000	76.4000	86.4703	87.8050	76.4000	(216)
Fuel for water heating, kWh/month	128.2303	111.9711	116.6632	105.5610	104.9660	103.0455	98.8830	111.2395	111.8247	112.3266	117.5126	124.2353	(219)
Water heating fuel used												1346.4590	(219)
Annual totals kWh/year													
Space heating fuel - main system												4981.6432	(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												4970.4047	(238)

10a. Fuel costs - using BEDF prices (542)

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	4981.6432	7.6100	379.1031 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1346.4590	7.6100	102.4655 (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			164.5962 (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	4981.6432	0.2160	1076.0349 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1346.4590	0.2160	290.8351 (264)
Space and water heating			1366.8701 (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			662.2250 (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	4981.6432	1.2200	6077.6048 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1346.4590	1.2200	1642.6800 (264)
Space and water heating			7720.2847 (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			3552.1532 (272)
Primary energy kWh/m2/year			23.5024 (273)

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Built)

Property Reference	035 - PRJ013014	Issued on Date	09/10/2024
Assessment Reference	035	Prop Type Ref	A
Property	37 Deeble Way, Netley Abbey, Southampton, SO31 5JP		
SAP Rating	86 B	DER	13.34
Environmental	87 B	TER	15.90
CO ₂ Emissions (t/year)	1.67	% DER<TER	16.08
General Requirements Compliance	Pass	DFEE	48.19
		TFEE	55.95
		% DFEE<TFEE	13.87
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)	15.90	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	13.34	kgCO ₂ /m ²	Pass
	-2.56 (-16.1%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	55.95	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	48.19	kWh/m ² /yr	
	-7.8 (-13.9%)	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
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	4.46 (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 North East

0.72 m², No overhang

Windows facing South East

15.50 m², No overhang

Windows facing North West

11.52 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

4.46 (measured in this dwelling)

Maximum

10.0

Pass

10 Key features

Roof U-value

0.08

W/m²K

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