

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

Property Reference	032 - PRJ013014	Issued on Date	02/05/2024
Assessment Reference	032	Prop Type Ref	A
Property	26 Deeble way, Netley Abbey, Southampton, SO31 5JP		

SAP Rating	86 B	DER	13.38	TER	15.85
Environmental	87 B	% DER<TER	15.57		
CO ₂ Emissions (t/year)	1.68	DFEE	48.34	TFEE	55.71
General Requirements Compliance	Pass	% DFEE<TFEE	13.23		

Assessor Details	Mr. Christopher Nicholls, Briary Energy Limited, Tel: 0203 397 1373, chris@briaryenergy.co.uk	Assessor ID	U903-0001
------------------	---	-------------	-----------

Client	
--------	--

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	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					4.8000
Infiltration rate					0.3966 (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) = 0.3966 (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	0.4858	0.4561	0.4462	0.4164	0.4164	0.4065	0.4065	0.3966	0.3966	0.4263	0.4263	0.4363 (22b)
Effective ac	0.6180	0.6040	0.5995	0.5867	0.5867	0.5826	0.5826	0.5786	0.5786	0.5909	0.5909	0.5952 (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)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF HEAT DEMAND 09 Jan 2014

(38)m	Jan 78.1399	Feb 76.3686	Mar 75.8031	Apr 74.1810	May 74.1810	Jun 73.6652	Jul 73.6652	Aug 73.1618	Sep 73.1618	Oct 74.7093	Nov 74.7093	Dec 75.2500 (38)
Heat transfer coeff	196.3875	194.6163	194.0508	192.4287	192.4287	191.9129	191.9129	191.4095	191.4095	192.9569	192.9569	193.4976 (39)
Average = Sum(39)m / 12 =												192.9973 (39)
HLP	Jan 1.2994	Feb 1.2877	Mar 1.2839	Apr 1.2732	May 1.2732	Jun 1.2698	Jul 1.2698	Aug 1.2664	Sep 1.2664	Oct 1.2767	Nov 1.2767	Dec 1.2803 (40)
HLP (average)												1.2769 (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					11.5210	14.6130		0.7300	0.7200	0.7700		61.3224 (75)				
Southeast					0.7190	45.0642		0.7300	0.7200	0.7700		11.8018 (77)				
Southwest					15.5000	45.0642		0.7300	0.7200	0.7700		254.4203 (79)				
Solar gains					327.5445	492.8352	735.4403	1003.1284	1132.2528	1276.1114	1175.0742	1064.1834	868.9554	609.3224	394.8588	273.1317 (83)
Total gains					1073.7715	1233.5154	1446.5076	1667.9077	1748.8267	1850.1137	1724.6255	1623.6589	1455.4586	1242.3525	1079.6156	997.7928 (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 13.3977	Feb 13.5196	Mar 13.5590	Apr 13.6733	May 13.6733	Jun 13.7101	Jul 13.7101	Aug 13.7461	Sep 13.7461	Oct 13.6359	Nov 13.6359	Dec 13.5978
alpha	1.8932	1.9013	1.9039	1.9116	1.9116	1.9140	1.9140	1.9164	1.9164	1.9091	1.9091	1.9065
util living area	0.9035	0.8765	0.8207	0.7286	0.6097	0.4417	0.3311	0.3387	0.5473	0.7492	0.8636	0.9121 (86)
MIT	18.1050	18.3986	19.0029	19.7296	20.3464	20.7670	20.9102	20.9097	20.6300	19.9248	18.9562	18.0848 (87)
Th 2	19.8413	19.8505	19.8535	19.8619	19.8619	19.8646	19.8646	19.8672	19.8672	19.8591	19.8591	19.8563 (88)
util rest of house	0.8916	0.8618	0.7989	0.6948	0.5565	0.3635	0.2287	0.2312	0.4690	0.7074	0.8440	0.9011 (89)
MIT 2	16.1152	16.5282	17.3716	18.3688	19.1816	19.6808	19.8209	19.8249	19.5479	18.6585	17.3267	16.0921 (90)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF HEAT DEMAND 09 Jan 2014

Living area fraction									fLA = Living area / (4) =		0.1190 (91)	
MIT	16.3520	16.7508	17.5658	18.5308	19.3203	19.8101	19.9506	19.9540	19.6767	18.8092	17.5206	16.3293 (92)
Temperature adjustment												-0.1500
adjusted MIT	16.2020	16.6008	17.4158	18.3808	19.1703	19.6601	19.8006	19.8040	19.5267	18.6592	17.3706	16.1793 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.8358	0.8026	0.7381	0.6415	0.5196	0.3481	0.2225	0.2247	0.4422	0.6522	0.7836	0.8474	(94)
Useful gains	897.5062	989.9793	1067.7172	1069.8848	908.6296	644.0155	383.7227	364.8613	643.6059	810.2281	845.9903	845.5642	(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	2062.4677	2043.6263	1885.3492	1593.4644	1168.0911	721.6171	403.1283	383.5874	770.7503	1227.0520	1653.7613	2008.3732	(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	866.7314	708.0508	608.3182	376.9773	193.0393	0.0000	0.0000	0.0000	0.0000	310.1170	581.5951	865.1299	(98)
RHI space heating demand												4509.9590	(98)
												4510	(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					4.8000
Infiltration rate					0.3966 (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) =	0.3966 (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	0.5057	0.4958	0.4858	0.4363	0.4263	0.3768	0.3768	0.3669	0.3966	0.4263	0.4462	0.4660 (22b)
Effective ac	0.6278	0.6229	0.6180	0.5952	0.5909	0.5710	0.5710	0.5673	0.5786	0.5909	0.5995	0.6086 (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	79.3828	78.7551	78.1399	75.2500	74.7093	72.1923	72.1923	71.7262	73.1618	74.7093	75.8031	76.9466 (38)
Heat transfer coeff	197.6305	197.0028	196.3875	193.4976	192.9569	190.4399	190.4399	189.9738	191.4095	192.9569	194.0508	195.1943 (39)
Average = Sum(39)m / 12 =												193.4950 (39)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.3076	1.3034	1.2994	1.2803	1.2767	1.2600	1.2600	1.2569	1.2664	1.2767	1.2839	1.2915 (40)
HLP (average)												1.2802 (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)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.8630	0.8242	0.7704	0.6891	0.5840	0.4547	0.3329	0.3700	0.5487	0.7245	0.8283	0.8739 (94)
Useful gains	872.4736	995.1243	1071.8486	1087.2030	994.5515	764.1449	534.2621	547.9548	738.8294	840.3772	832.1539	829.5914 (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												
	2227.1085	2204.6600	2043.9555	1748.7202	1373.7949	923.6264	592.5677	621.7438	977.8813	1440.4026	1853.3732	2202.1926 (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												
	1007.8484	812.8080	723.2475	476.2924	282.1571	0.0000	0.0000	0.0000	0.0000	446.4189	735.2779	1021.2153 (98)
Space heating												5505.2655 (99)
Space heating per m2												36.4249 (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													6103.3985 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	1007.8484	812.8080	723.2475	476.2924	282.1571	0.0000	0.0000	0.0000	0.0000	446.4189	735.2779	1021.2153	(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)	1117.3485	901.1175	801.8265	528.0403	312.8127	0.0000	0.0000	0.0000	0.0000	494.9212	815.1640	1132.1678	(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	88.5832	88.4680	88.2211	87.6385	86.4390	76.4000	76.4000	76.4000	76.4000	87.3796	88.2386	88.6453	(216)
Fuel for water heating, kWh/month	127.8892	111.6851	116.2420	104.9186	103.5796	103.0455	98.8830	111.2395	111.8247	111.1576	116.9351	123.8856	(219)
Water heating fuel used												1341.2857	(219)
Annual totals kWh/year													
Space heating fuel - main system												6103.3985	(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												8033.4326	(238)

10a. Fuel costs - using Table 12 prices

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	6103.3985	3.4800	212.3983 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1341.2857	3.4800	46.6767 (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			456.7309 (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] =	0.9780 (257)
SAP value		86.3568
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	6103.3985	0.2160	1318.3341 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1341.2857	0.2160	289.7177 (264)
Space and water heating			1608.0518 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	513.7484	0.5190	266.6354 (268)
Total kg/year			1913.6122 (272)
CO2 emissions per m2			12.6600 (273)
EI value			86.9265
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	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					4.8000
Infiltration rate					0.3966 (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) =	0.3966 (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	0.4858	0.4561	0.4462	0.4164	0.4164	0.4065	0.4065	0.3966	0.3966	0.4263	0.4263	0.4363 (22b)
Effective ac	0.6180	0.6040	0.5995	0.5867	0.5867	0.5826	0.5826	0.5786	0.5786	0.5909	0.5909	0.5952 (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	78.1399	76.3686	75.8031	74.1810	74.1810	73.6652	73.6652	73.1618	73.1618	74.7093	74.7093	75.2500 (38)
Heat transfer coeff	196.3875	194.6163	194.0508	192.4287	192.4287	191.9129	191.9129	191.4095	191.4095	192.9569	192.9569	193.4976 (39)
Average = Sum(39)m / 12 =												192.9973 (39)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.2994	1.2877	1.2839	1.2732	1.2732	1.2698	1.2698	1.2664	1.2664	1.2767	1.2767	1.2803 (40)
HLP (average)												1.2769 (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												

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	0.8358	0.8026	0.7381	0.6415	0.5196	0.3481	0.2225	0.2247	0.4422	0.6522	0.7836	0.8474 (94)
Useful gains	897.5062	989.9793	1067.7172	1069.8848	908.6296	644.0155	383.7227	364.8613	643.6059	810.2281	845.9903	845.5642 (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	2062.4677	2043.6263	1885.3492	1593.4644	1168.0911	721.6171	403.1283	383.5874	770.7503	1227.0520	1653.7613	2008.3732 (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	866.7314	708.0508	608.3182	376.9773	193.0393	0.0000	0.0000	0.0000	0.0000	310.1170	581.5951	865.1299 (98)
Space heating												4509.9590 (98)
Space heating per m2												29.8396 (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													4999.9545 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	866.7314	708.0508	608.3182	376.9773	193.0393	0.0000	0.0000	0.0000	0.0000	310.1170	581.5951	865.1299	(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)	960.8996	784.9787	674.4105	417.9349	214.0125	0.0000	0.0000	0.0000	0.0000	343.8104	644.7839	959.1241	(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	88.3551	88.2480	87.9093	87.1145	85.3171	76.4000	76.4000	76.4000	76.4000	86.4747	87.8101	88.4014	(216)
Fuel for water heating, kWh/month	128.2193	111.9635	116.6543	105.5497	104.9416	103.0455	98.8830	111.2395	111.8247	112.3209	117.5058	124.2274	(219)
Water heating fuel used												1346.3754	(219)
Annual totals kWh/year													
Space heating fuel - main system												4999.9545	(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												6935.0783	(238)

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

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	4999.9545	7.6100	380.4965 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1346.3754	7.6100	102.4592 (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			770.9387 (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	4999.9545	0.2160	1079.9902 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1346.3754	0.2160	290.8171 (264)
Space and water heating			1370.8073 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	513.7484	0.5190	266.6354 (268)
Total kg/year			1676.3677 (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	4999.9545	1.2200	6099.9445 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1346.3754	1.2200	1642.5780 (264)
Space and water heating			7742.5225 (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			9549.9800 (272)
Primary energy kWh/m2/year			63.1863 (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 (60.3%)
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 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	£588	£588	£0
Space heating	£509	£509	£0
Water heating	£102	£102	£0
Lighting	£160	£160	£0
Generated (PV)	-£0	-£605	£605
Total cost of fuels	£771	£166	£605
Total cost of uses	£771	£166	£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	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					4.8000
Infiltration rate					0.3966 (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) =	0.3966 (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	0.5057	0.4958	0.4858	0.4363	0.4263	0.3768	0.3768	0.3669	0.3966	0.4263	0.4462	0.4660 (22b)
Effective ac	0.6278	0.6229	0.6180	0.5952	0.5909	0.5710	0.5710	0.5673	0.5786	0.5909	0.5995	0.6086 (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	79.3828	78.7551	78.1399	75.2500	74.7093	72.1923	72.1923	71.7262	73.1618	74.7093	75.8031	76.9466 (38)
Heat transfer coeff	197.6305	197.0028	196.3875	193.4976	192.9569	190.4399	190.4399	189.9738	191.4095	192.9569	194.0508	195.1943 (39)
Average = Sum(39)m / 12 =												193.4950 (39)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.3076	1.3034	1.2994	1.2803	1.2767	1.2600	1.2600	1.2569	1.2664	1.2767	1.2839	1.2915 (40)
HLP (average)												1.2802 (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	0.8630	0.8242	0.7704	0.6891	0.5840	0.4547	0.3329	0.3700	0.5487	0.7245	0.8283	0.8739 (94)
Useful gains	872.4736	995.1243	1071.8486	1087.2030	994.5515	764.1449	534.2621	547.9548	738.8294	840.3772	832.1539	829.5914 (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												
	2227.1085	2204.6600	2043.9555	1748.7202	1373.7949	923.6264	592.5677	621.7438	977.8813	1440.4026	1853.3732	2202.1926 (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												
	1007.8484	812.8080	723.2475	476.2924	282.1571	0.0000	0.0000	0.0000	0.0000	446.4189	735.2779	1021.2153 (98)
Space heating												5505.2655 (99)
Space heating per m2												36.4249 (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													6103.3985 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	1007.8484	812.8080	723.2475	476.2924	282.1571	0.0000	0.0000	0.0000	0.0000	446.4189	735.2779	1021.2153	(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)	1117.3485	901.1175	801.8265	528.0403	312.8127	0.0000	0.0000	0.0000	0.0000	494.9212	815.1640	1132.1678	(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	88.5832	88.4680	88.2211	87.6385	86.4390	76.4000	76.4000	76.4000	76.4000	87.3796	88.2386	88.6453	(216)
Fuel for water heating, kWh/month	127.8892	111.6851	116.2420	104.9186	103.5796	103.0455	98.8830	111.2395	111.8247	111.1576	116.9351	123.8856	(219)
Water heating fuel used												1341.2857	(219)
Annual totals kWh/year													
Space heating fuel - main system												6103.3985	(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												6306.1932	(238)

10a. Fuel costs - using Table 12 prices

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	6103.3985	3.4800	212.3983 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1341.2857	3.4800	46.6767 (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			228.9080 (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] =	0.4902 (257)
SAP value		93.1622
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	6103.3985	0.2160	1318.3341 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1341.2857	0.2160	289.7177 (264)
Space and water heating			1608.0518 (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			1017.1749 (272)
CO2 emissions per m2			6.7300 (273)
EI value			93.0508
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					4.8000
Infiltration rate					0.3966 (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) =	0.3966 (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	0.4858	0.4561	0.4462	0.4164	0.4164	0.4065	0.4065	0.3966	0.3966	0.4263	0.4263	0.4363 (22b)
Effective ac	0.6180	0.6040	0.5995	0.5867	0.5867	0.5826	0.5826	0.5786	0.5786	0.5909	0.5909	0.5952 (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	78.1399	76.3686	75.8031	74.1810	74.1810	73.6652	73.6652	73.1618	73.1618	74.7093	74.7093	75.2500 (38)
Heat transfer coeff	196.3875	194.6163	194.0508	192.4287	192.4287	191.9129	191.9129	191.4095	191.4095	192.9569	192.9569	193.4976 (39)
Average = Sum(39)m / 12 =												192.9973 (39)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.2994	1.2877	1.2839	1.2732	1.2732	1.2698	1.2698	1.2664	1.2664	1.2767	1.2767	1.2803 (40)
HLP (average)												1.2769 (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)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.8358	0.8026	0.7381	0.6415	0.5196	0.3481	0.2225	0.2247	0.4422	0.6522	0.7836	0.8474 (94)
Useful gains	897.5062	989.9793	1067.7172	1069.8848	908.6296	644.0155	383.7227	364.8613	643.6059	810.2281	845.9903	845.5642 (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	2062.4677	2043.6263	1885.3492	1593.4644	1168.0911	721.6171	403.1283	383.5874	770.7503	1227.0520	1653.7613	2008.3732 (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	866.7314	708.0508	608.3182	376.9773	193.0393	0.0000	0.0000	0.0000	0.0000	310.1170	581.5951	865.1299 (98)
Space heating												4509.9590 (98)
Space heating per m2												29.8396 (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													4999.9545 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	866.7314	708.0508	608.3182	376.9773	193.0393	0.0000	0.0000	0.0000	0.0000	310.1170	581.5951	865.1299	(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)	960.8996	784.9787	674.4105	417.9349	214.0125	0.0000	0.0000	0.0000	0.0000	343.8104	644.7839	959.1241	(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	88.3551	88.2480	87.9093	87.1145	85.3171	76.4000	76.4000	76.4000	76.4000	86.4747	87.8101	76.4000	(216)
Fuel for water heating, kWh/month	128.2193	111.9635	116.6543	105.5497	104.9416	103.0455	98.8830	111.2395	111.8247	112.3209	117.5058	124.2274	(219)
Water heating fuel used												1346.3754	(219)
Annual totals kWh/year													
Space heating fuel - main system												4999.9545	(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												4988.6324	(238)

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

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	4999.9545	7.6100	380.4965 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1346.3754	7.6100	102.4592 (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			165.9833 (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	4999.9545	0.2160	1079.9902 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1346.3754	0.2160	290.8171 (264)
Space and water heating			1370.8073 (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			666.1622 (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	4999.9545	1.2200	6099.9445 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1346.3754	1.2200	1642.5780 (264)
Space and water heating			7742.5225 (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			3574.3909 (272)
Primary energy kWh/m2/year			23.6495 (273)

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Built)

Property Reference	032 - PRJ013014	Issued on Date	02/05/2024
Assessment Reference	032	Prop Type Ref	A
Property	26 Deeble way, Netley Abbey, Southampton, SO31 5JP		
SAP Rating	86 B	DER	13.38
Environmental	87 B	TER	15.85
CO ₂ Emissions (t/year)	1.68	% DER<TER	15.57
General Requirements Compliance	Pass	DFEE	48.34
		TFEE	55.71
		% DFEE<TFEE	13.23
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)	15.85	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	13.38	kgCO ₂ /m ²	Pass
	-2.47 (-15.6%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	55.71	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	48.34	kWh/m ² /yr	
	-7.4 (-13.3%)	kWh/m ² /yr	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.21 (max. 0.30)	0.21 (max. 0.70)	Pass
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	4.80 (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
---------------------	--	------

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

11.52 m², No overhang

Windows facing South East

0.72 m², No overhang

Windows facing South 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

4.80 (measured in this dwelling)

Maximum

10.0

Pass

10 Key features

Roof U-value

0.08

W/m²K