

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

Property Reference	007 - PRJ013014	Issued on Date	02/05/2024
Assessment Reference	007	Prop Type Ref	F2
Property	8 Rashleigh Drive, Netley Abbey, Southampton, SO31 5JY		

SAP Rating	81 B	DER	21.32	TER	22.73
Environmental	84 B	% DER<TER	6.19		
CO ₂ Emissions (t/year)	1.27	DFEE	60.52	TFEE	71.00
General Requirements Compliance	Pass	% DFEE<TFEE	14.76		

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	5.6600 (1b)	x 2.1200 (2b)	= 11.9992 (1b) - (3b)
First floor	66.0100 (1c)	x 2.3400 (2c)	= 154.4634 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	71.6700		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 166.4626 (5)

2. Ventilation rate

	main heating	secondary heating	other	total	m ³ per hour
Number of chimneys	0	+	0	=	0 * 40 = 0.0000 (6a)
Number of open flues	0	+	0	=	0 * 20 = 0.0000 (6b)
Number of intermittent fans					2 * 10 = 20.0000 (7a)
Number of passive vents					0 * 10 = 0.0000 (7b)
Number of flueless gas fires					0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(7a)+(7b)+(7c) =					20.0000 / (5) = 0.1201 (8)
Pressure test					Yes
Measured/design AP50					4.6100
Infiltration rate					0.3506 (18)
Number of sides sheltered					1 (19)
Shelter factor					(20) = 1 - [0.075 x (19)] = 0.9250 (20)
Infiltration rate adjusted to include shelter factor					(21) = (18) x (20) = 0.3243 (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	0.3973	0.3730	0.3649	0.3406	0.3406	0.3325	0.3325	0.3243	0.3243	0.3487	0.3487	0.3568 (22b)
Effective ac	0.5789	0.5696	0.5666	0.5580	0.5580	0.5553	0.5553	0.5526	0.5526	0.5608	0.5608	0.5636 (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			3.7800	1.2000	4.5480		(26)
Windows (Uw = 1.40)			10.7700	1.3258	14.2917		(27)
Floor - Ground			5.6600	0.2100	1.1886		(28a)
Floor - Exposed Drive Through			60.3500	0.1400	8.4490	75.6000	427.8960 (28b)
W1 - Brick (Timber Frame)	37.4920	4.8050	32.6870	0.2100	6.8643	7.4000	241.8838 (29a)
W1 - Brick (Cavity)	34.1000	3.7830	30.3170	0.2600	7.8824	104.7000	3174.1899 (29a)
W1 - Clad (Timber Frame)	27.5000	5.9680	21.5320	0.2100	4.5217	7.4000	159.3368 (29a)
RF - Ins Joist	66.0140		66.0140	0.0800	5.2811	7.4000	488.5036 (30)
Total net area of external elements Aum, m ²			231.1300				(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		53.0268		(33)
Party Wall			14.2980	0.0000	0.0000	7.4000	105.8052 (32)
Stud			147.2341			7.4000	1089.5325 (32c)
Internal Floor			5.6640			7.4000	41.9136 (32d)
Internal Ceiling			5.6640			7.4000	41.9136 (32e)
Heat capacity Cm = Sum (A x k)							(28)...(30) + (32) + (32a)...(32e) = 6567.5950 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							91.6366 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							23.0034 (36)

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Total fabric heat loss	(33) + (36) =											76.0302 (37)
Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)												
(38)m	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Heat transfer coeff	31.8024	31.2877	31.1234	30.6520	30.6520	30.5021	30.5021	30.3558	30.3558	30.8055	30.8055	30.9626 (38)
Average = Sum(39)m / 12 =	107.8326	107.3179	107.1536	106.6822	106.6822	106.5323	106.5323	106.3860	106.3860	106.8357	106.8357	106.9928 (39)
	106.8475 (39)											
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	1.5046	1.4974	1.4951	1.4885	1.4885	1.4864	1.4864	1.4844	1.4844	1.4907	1.4907	1.4929 (40)
Days in month												1.4908 (40)
	31	28	31	30	31	30	31	31	30	31	30	31 (41)

4. Water heating energy requirements (kWh/year)

Assumed occupancy												2.2860 (42)
Average daily hot water use (litres/day)												88.4919 (43)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use	97.3411	93.8014	90.2618	86.7221	83.1824	79.6427	79.6427	83.1824	86.7221	90.2618	93.8014	97.3411 (44)
Energy content (annual)	144.3541	126.2530	130.2818	113.5828	108.9854	94.0461	87.1476	100.0031	101.1975	117.9359	128.7362	139.7992 (45)
Distribution loss (46)m = 0.15 x (45)m	21.6531	18.9379	19.5423	17.0374	16.3478	14.1069	13.0721	15.0005	15.1796	17.6904	19.3104	20.9699 (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												
Combi loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (57)
Total heat required for water heating calculated for each month	0.6323	0.5329	0.5292	0.4433	0.4080	0.3371	0.3123	0.3743	0.3949	0.4790	0.5434	0.6124 (61)
Solar input	144.9864	126.7859	130.8110	114.0261	109.3934	94.3832	87.4599	100.3774	101.5924	118.4149	129.2796	140.4116 (62)
Solar input (sum of months) = Sum(63)m =	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	144.9864	126.7859	130.8110	114.0261	109.3934	94.3832	87.4599	100.3774	101.5924	118.4149	129.2796	140.4116 (64)
RHI water heating demand												1397.9217 (64)
Heat gains from water heating, kWh/month	48.1558	42.1124	43.4510	37.8771	36.3396	31.3546	29.0546	33.3446	33.7469	39.3334	42.9406	46.6363 (65)

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

Metabolic gains (Table 5), Watts	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(66)m	137.1586	137.1586	137.1586	137.1586	137.1586	137.1586	137.1586	137.1586	137.1586	137.1586	137.1586	137.1586 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	47.0984	41.8323	34.0203	25.7556	19.2526	16.2539	17.5629	22.8289	30.6409	38.9056	45.4086	48.4074 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	300.2432	303.3587	295.5076	278.7933	257.6947	237.8649	224.6173	221.5017	229.3529	246.0671	267.1658	286.9956 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	51.0018	51.0018	51.0018	51.0018	51.0018	51.0018	51.0018	51.0018	51.0018	51.0018	51.0018	51.0018 (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)	-91.4390	-91.4390	-91.4390	-91.4390	-91.4390	-91.4390	-91.4390	-91.4390	-91.4390	-91.4390	-91.4390	-91.4390 (71)
Water heating gains (Table 5)	64.7256	62.6672	58.4019	52.6071	48.8436	43.5481	39.0519	44.8180	46.8707	52.8675	59.6398	62.6832 (72)
Total internal gains	511.7884	507.5796	487.6511	456.8774	425.5122	397.3881	380.9535	388.8700	406.5858	437.5616	471.9356	497.8076 (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			
North				5.9680	13.4684	0.7300	0.7200	0.7700	29.2775 (74)			
South				4.8050	56.5862	0.7300	0.7200	0.7700	99.0359 (78)			
Solar gains	128.3134	185.7518	262.3909	341.4346	376.8846	422.1560	389.6676	358.1419	303.5304	224.9327	153.0053	108.1314 (83)
Total gains	640.1018	693.3314	750.0421	798.3120	802.3968	819.5442	770.6211	747.0119	710.1162	662.4943	624.9409	605.9390 (84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)												21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
tau	16.9182	16.9993	17.0254	17.1006	17.1006	17.1247	17.1247	17.1482	17.1482	17.0760	17.0760	17.0510
alpha	2.1279	2.1333	2.1350	2.1400	2.1400	2.1416	2.1416	2.1432	2.1432	2.1384	2.1384	2.1367
util living area	0.9139	0.8972	0.8611	0.7978	0.6981	0.5352	0.4057	0.4054	0.6139	0.7872	0.8800	0.9203 (86)
MIT	18.5251	18.7241	19.1833	19.7712	20.3397	20.7552	20.9090	20.9121	20.6510	20.0476	19.2409	18.5068 (87)
Th 2	19.6841	19.6895	19.6912	19.6961	19.6961	19.6977	19.6977	19.6992	19.6992	19.6945	19.6945	19.6929 (88)
util rest of house												

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MIT 2	0.9002	0.8810	0.8382	0.7614	0.6358	0.4318	0.2632	0.2583	0.5164	0.7390	0.8572	0.9074 (89)
Living area fraction	17.5186	17.7151	18.1613	18.7245	19.2440	19.5792	19.6744	19.6780	19.5121	18.9932	18.2279	17.5077 (90)
MIT	17.8721	18.0694	18.5202	19.0921	19.6288	19.9922	20.1080	20.1114	fLA = Living area / (4) =			0.3512 (91)
Temperature adjustment									19.9120	19.3635	18.5836	17.8586 (92)
adjusted MIT	17.7221	17.9194	18.3702	18.9421	19.4788	19.8422	19.9580	19.9614	19.7620	19.2135	18.4336	-0.1500
												17.7086 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.8733	0.8528	0.8093	0.7363	0.6239	0.4444	0.2939	0.2903	0.5218	0.7176	0.8291	0.8813 (94)	
Useful gains	558.9957	591.3019	607.0086	587.8202	500.6249	364.2370	226.5163	216.8810	370.5155	475.3911	518.1649	534.0273 (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	1296.3756	1268.4374	1143.3514	943.2930	680.5075	419.9705	240.5493	229.9418	453.4208	738.6076	1029.2166	1274.1363 (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	548.6106	455.0351	399.0390	255.9404	133.8326	0.0000	0.0000	0.0000	0.0000	195.8331	367.9573	550.6411 (98)	
Space heating												2906.8892 (98)	
RHI space heating demand												2907 (98)	

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Calculation Type: New Build (As Built)

CALCULATION OF ENERGY RATINGS 09 Jan 2014

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

1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	5.6600 (1b)	x 2.1200 (2b)	= 11.9992 (1b) - (3b)
First floor	66.0100 (1c)	x 2.3400 (2c)	= 154.4634 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	71.6700		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 166.4626 (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					2 * 10 = 20.0000 (7a)
Number of passive vents					0 * 10 = 0.0000 (7b)
Number of flueless gas fires					0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(7a)+(7b)+(7c)					20.0000 / (5) = 0.1201 (8)
Pressure test					Yes
Measured/design AP50					4.6100
Infiltration rate					0.3506 (18)
Number of sides sheltered					1 (19)
Shelter factor				(20) = 1 - [0.075 x (19)] =	0.9250 (20)
Infiltration rate adjusted to include shelter factor				(21) = (18) x (20) =	0.3243 (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	0.4135	0.4054	0.3973	0.3568	0.3487	0.3081	0.3081	0.3000	0.3243	0.3487	0.3649	0.3811 (22b)
Effective ac	0.5855	0.5822	0.5789	0.5636	0.5608	0.5475	0.5475	0.5450	0.5526	0.5608	0.5666	0.5726 (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			3.7800	1.2000	4.5480		(26)
Windows (Uw = 1.40)			10.7700	1.3258	14.2917		(27)
Floor - Ground			5.6600	0.2100	1.1886	75.6000	427.8960 (28a)
Floor - Exposed Drive Through			60.3500	0.1400	8.4490	13.2000	796.6200 (28b)
W1 - Brick (Timber Frame)	37.4920	4.8050	32.6870	0.2100	6.8643	7.4000	241.8838 (29a)
W1 - Brick (Cavity)	34.1000	3.7830	30.3170	0.2600	7.8824	104.7000	3174.1899 (29a)
W1 - Clad (Timber Frame)	27.5000	5.9680	21.5320	0.2100	4.5217	7.4000	159.3368 (29a)
Rf - Ins Joist	66.0140		66.0140	0.0800	5.2811	7.4000	488.5036 (30)
Total net area of external elements Aum(A, m ²)			231.1300				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	53.0268		(33)
Party Wall			14.2980	0.0000	0.0000	7.4000	105.8052 (32)
Stud			147.2341			7.4000	1089.5325 (32c)
Internal Floor			5.6640			7.4000	41.9136 (32d)
Internal Ceiling			5.6640			7.4000	41.9136 (32e)
Heat capacity Cm = Sum(A x k)						(28)...(30) + (32) + (32a)...(32e) =	6567.5950 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							91.6366 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							23.0034 (36)
Total fabric heat loss						(33) + (36) =	76.0302 (37)

Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)												
(38)m	Jan 32.1636	Feb 31.9812	Mar 31.8024	Apr 30.9626	May 30.8055	Jun 30.0741	Jul 30.0741	Aug 29.9387	Sep 30.3558	Oct 30.8055	Nov 31.1234	Dec 31.4557 (38)
Heat transfer coeff	108.1938	108.0114	107.8326	106.9928	106.8357	106.1043	106.1043	105.9689	106.3860	106.8357	107.1536	107.4859 (39)
Average = Sum(39)m / 12 =												106.9921 (39)
HLP	Jan 1.5096	Feb 1.5071	Mar 1.5046	Apr 1.4929	May 1.4907	Jun 1.4805	Jul 1.4805	Aug 1.4786	Sep 1.4844	Oct 1.4907	Nov 1.4951	Dec 1.4997 (40)
HLP (average)												1.4928 (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												2.2860 (42)
Average daily hot water use (litres/day)												88.4919 (43)
Daily hot water use	Jan 97.3411	Feb 93.8014	Mar 90.2618	Apr 86.7221	May 83.1824	Jun 79.6427	Jul 79.6427	Aug 83.1824	Sep 86.7221	Oct 90.2618	Nov 93.8014	Dec 97.3411 (44)

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Energy conte	144.3541	126.2530	130.2818	113.5828	108.9854	94.0461	87.1476	100.0031	101.1975	117.9359	128.7362	139.7992 (45)
Energy content (annual)	Total = Sum (45)m =											1392.3227 (45)
Distribution loss (46)m = 0.15 x (45)m												
	21.6531	18.9379	19.5423	17.0374	16.3478	14.1069	13.0721	15.0005	15.1796	17.6904	19.3104	20.9699 (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	0.6323	0.5329	0.5292	0.4433	0.4080	0.3371	0.3123	0.3743	0.3949	0.4790	0.5434	0.6124 (61)
Total heat required for water heating calculated for each month												
Solar input	144.9864	126.7859	130.8110	114.0261	109.3934	94.3832	87.4599	100.3774	101.5924	118.4149	129.2796	140.4116 (62)
	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	144.9864	126.7859	130.8110	114.0261	109.3934	94.3832	87.4599	100.3774	101.5924	118.4149	129.2796	140.4116 (64)
	Total per year (kWh/year) = Sum (64)m =											1397.9217 (64)
Heat gains from water heating, kWh/month												
	48.1558	42.1124	43.4510	37.8771	36.3396	31.3546	29.0546	33.3446	33.7469	39.3334	42.9406	46.6363 (65)

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

Metabolic gains (Table 5), Watts	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(66)m	137.1586	137.1586	137.1586	137.1586	137.1586	137.1586	137.1586	137.1586	137.1586	137.1586	137.1586	137.1586 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	47.0984	41.8323	34.0203	25.7556	19.2526	16.2539	17.5629	22.8289	30.6409	38.9056	45.4086	48.4074 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	300.2432	303.3587	295.5076	278.7933	257.6947	237.8649	224.6173	221.5017	229.3529	246.0671	267.1658	286.9956 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	51.0018	51.0018	51.0018	51.0018	51.0018	51.0018	51.0018	51.0018	51.0018	51.0018	51.0018	51.0018 (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)	-91.4390	-91.4390	-91.4390	-91.4390	-91.4390	-91.4390	-91.4390	-91.4390	-91.4390	-91.4390	-91.4390	-91.4390 (71)
Water heating gains (Table 5)	64.7256	62.6672	58.4019	52.6071	48.8436	43.5481	39.0519	44.8180	46.8707	52.8675	59.6398	62.6832 (72)
Total internal gains	511.7884	507.5796	487.6511	456.8774	425.5122	397.3881	380.9535	388.8700	406.5858	437.5616	471.9356	497.8076 (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	
North					5.9680	10.6334	0.7300		0.7200		0.7700		23.1148	
South					4.8050	46.7521	0.7300		0.7200		0.7700		81.8244 (78)	
Solar gains	104.9391	178.1807	245.7630	313.4978	363.4609	367.3496	351.3711	312.3731	268.5661	197.1222	125.5048	89.9734 (83)		
Total gains	616.7276	685.7604	733.4141	770.3752	788.9732	764.7377	732.3246	701.2431	675.1520	634.6838	597.4404	587.7810 (84)		

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Thl (C)												21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
tau	16.8617	16.8902	16.9182	17.0510	17.0760	17.1938	17.1938	17.2157	17.1482	17.0760	17.0254	16.9728
alpha	2.1241	2.1260	2.1279	2.1367	2.1384	2.1463	2.1463	2.1477	2.1432	2.1384	2.1350	2.1315
util living area	0.9304	0.9114	0.8830	0.8338	0.7558	0.6408	0.5214	0.5528	0.7099	0.8435	0.9097	0.9365 (86)
MIT	18.1389	18.4130	18.8711	19.4783	20.0725	20.5573	20.8008	20.7660	20.4040	19.6559	18.7947	18.0778 (87)
Th 2	19.6803	19.6822	19.6841	19.6929	19.6945	19.7022	19.7022	19.7036	19.6992	19.6945	19.6912	19.6877 (88)
util rest of house	0.9200	0.8981	0.8645	0.8051	0.7080	0.5593	0.4011	0.4359	0.6383	0.8108	0.8939	0.9269 (89)
MIT 2	17.1356	17.4046	17.8535	18.4457	19.0045	19.4359	19.6192	19.5995	19.3138	18.6275	17.7908	17.0807 (90)
Living area fraction	17.4879	17.7588	18.2109	18.8084	19.3796	19.8297	20.0342	20.0092	19.6967	18.9887	18.1434	17.4309 (92)
MIT	17.4879	17.7588	18.2109	18.8084	19.3796	19.8297	20.0342	20.0092	19.6967	18.9887	18.1434	17.4309 (92)
Temperature adjustment	17.3379	17.6088	18.0609	18.6584	19.2296	19.6797	19.8842	19.8592	19.5467	18.8387	17.9934	-0.1500
adjusted MIT	17.3379	17.6088	18.0609	18.6584	19.2296	19.6797	19.8842	19.8592	19.5467	18.8387	17.9934	17.2809 (93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Useful gains	0.8950	0.8708	0.8356	0.7773	0.6880	0.5577	0.4198	0.4516	0.6284	0.7840	0.8669	0.9030 (94)
Ext temp.	551.9736	597.1641	612.8195	598.7787	542.7751	426.4588	307.3972	316.6490	424.2976	497.5817	517.8995	530.7653 (95)
Heat loss rate W	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)
Month fracti	1410.6234	1372.6916	1246.6416	1044.0748	804.4290	538.9797	348.4662	366.5642	579.4479	880.1837	1167.2618	1406.0133 (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	638.8355	521.1545	471.5637	320.6132	194.6705	0.0000	0.0000	0.0000	0.0000	284.6559	467.5408	651.1845 (98)
Space heating per m ²	(98) / (4) =											49.5356 (99)

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8c. Space cooling requirement

Not applicable

9a. Energy requirements - Individual heating systems, including micro-CHP

Fraction of space heat from secondary/supplementary system (Table 11)													0.0000 (201)
Fraction of space heat from main system(s)													1.0000 (202)
Efficiency of main space heating system 1 (in %)													90.2000 (206)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
Space heating requirement													3935.9407 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	638.8355	521.1545	471.5637	320.6132	194.6705	0.0000	0.0000	0.0000	0.0000	284.6559	467.5408	651.1845	(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)	708.2433	577.7766	522.7979	355.4470	215.8210	0.0000	0.0000	0.0000	0.0000	315.5830	518.3380	721.9340	(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	144.9864	126.7859	130.8110	114.0261	109.3934	94.3832	87.4599	100.3774	101.5924	118.4149	129.2796	140.4116	(64)
Efficiency of water heater (217)m	87.2837	87.1208	86.7954	86.1191	84.6960	76.4000	76.4000	76.4000	76.4000	85.6547	86.8037	87.3998	(216)
Fuel for water heating, kWh/month	166.1093	145.5289	150.7118	132.4052	129.1600	123.5382	114.4763	131.3841	132.9743	138.2468	148.9334	160.6544	(219)
Water heating fuel used												1674.1227	(219)
Annual totals kWh/year													
Space heating fuel - main system												3935.9407	(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)												332.7087	(232)
Total delivered energy for all uses												6017.7720	(238)

10a. Fuel costs - using Table 12 prices

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	3935.9407	3.4800	136.9707 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1674.1227	3.4800	58.2595 (247)
Pumps and fans for heating	75.0000	13.1900	9.8925 (249)
Energy for lighting	332.7087	13.1900	43.8843 (250)
Additional standing charges			120.0000 (251)
Total energy cost			369.0070 (255)

11a. SAP rating - Individual heating systems

Energy cost deflator (Table 12):		0.4200 (256)
Energy cost factor (ECF)	[(255) x (256)] / [(4) + 45.0] =	1.3284 (257)
SAP value		81.4690
SAP rating (Section 12)		81 (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	3935.9407	0.2160	850.1632 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1674.1227	0.2160	361.6105 (264)
Space and water heating			1211.7737 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	332.7087	0.5190	172.6758 (268)
Total kg/year			1423.3745 (272)
CO2 emissions per m2			19.8600 (273)
EI value			83.6520
EI rating			84 (274)
EI band			B

Calculation of stars for heating and DHW

Main heating energy efficiency	$3.48 \times (1 + 0.29 \times 0.00) / 0.9020 = 3.858$, stars = 4
Main heating environmental impact	$0.216 \times (1 + 0.29 \times 0.00) / 0.9020 = 0.2395$, stars = 4
Water heating energy efficiency	$3.48 / 0.8312 = 4.187$, stars = 4
Water heating environmental impact	$0.216 / 0.8312 = 0.2599$, stars = 4

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FULL SAP CALCULATION PRINTOUT

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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	5.6600 (1b)	x 2.1200 (2b)	= 11.9992 (1b) - (3b)
First floor	66.0100 (1c)	x 2.3400 (2c)	= 154.4634 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	71.6700		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 166.4626 (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					2 * 10 = 20.0000 (7a)
Number of passive vents					0 * 10 = 0.0000 (7b)
Number of flueless gas fires					0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(7a)+(7b)+(7c)					20.0000 / (5) = 0.1201 (8)
Pressure test					Yes
Measured/design AP50					4.6100
Infiltration rate					0.3506 (18)
Number of sides sheltered					1 (19)
Shelter factor				(20) = 1 - [0.075 x (19)] =	0.9250 (20)
Infiltration rate adjusted to include shelter factor				(21) = (18) x (20) =	0.3243 (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	0.3973	0.3730	0.3649	0.3406	0.3406	0.3325	0.3325	0.3243	0.3243	0.3487	0.3487	0.3568 (22b)
Effective ac	0.5789	0.5696	0.5666	0.5580	0.5580	0.5553	0.5553	0.5526	0.5526	0.5608	0.5608	0.5636 (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			3.7800	1.2000	4.5480		(26)
Windows (Uw = 1.40)			10.7700	1.3258	14.2917		(27)
Floor - Ground			5.6600	0.2100	1.1886	75.6000	427.8960 (28a)
Floor - Exposed Drive Through			60.3500	0.1400	8.4490	13.2000	796.6200 (28b)
W1 - Brick (Timber Frame)	37.4920	4.8050	32.6870	0.2100	6.8643	7.4000	241.8838 (29a)
W1 - Brick (Cavity)	34.1000	3.7830	30.3170	0.2600	7.8824	104.7000	3174.1899 (29a)
W1 - Clad (Timber Frame)	27.5000	5.9680	21.5320	0.2100	4.5217	7.4000	159.3368 (29a)
Rf - Ins Joist	66.0140		66.0140	0.0800	5.2811	7.4000	488.5036 (30)
Total net area of external elements Aum(A, m ²)			231.1300				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	53.0268		(33)
Party Wall			14.2980	0.0000	0.0000	7.4000	105.8052 (32)
Stud			147.2341			7.4000	1089.5325 (32c)
Internal Floor			5.6640			7.4000	41.9136 (32d)
Internal Ceiling			5.6640			7.4000	41.9136 (32e)
Heat capacity Cm = Sum(A x k)						(28)...(30) + (32) + (32a)...(32e) =	6567.5950 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							91.6366 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							23.0034 (36)
Total fabric heat loss						(33) + (36) =	76.0302 (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	31.8024	31.2877	31.1234	30.6520	30.6520	30.5021	30.5021	30.3558	30.3558	30.8055	30.8055	30.9626 (38)
Heat transfer coeff	107.8326	107.3179	107.1536	106.6822	106.6822	106.5323	106.5323	106.3860	106.3860	106.8357	106.8357	106.9928 (39)
Average = Sum(39)m / 12 =												106.8475 (39)
HLP	1.5046	1.4974	1.4951	1.4885	1.4885	1.4864	1.4864	1.4844	1.4844	1.4907	1.4907	1.4929 (40)
HLP (average)												1.4908 (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												2.2860 (42)
Average daily hot water use (litres/day)												88.4919 (43)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use	97.3411	93.8014	90.2618	86.7221	83.1824	79.6427	79.6427	83.1824	86.7221	90.2618	93.8014	97.3411 (44)

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

Energy conte	144.3541	126.2530	130.2818	113.5828	108.9854	94.0461	87.1476	100.0031	101.1975	117.9359	128.7362	139.7992 (45)
Energy content (annual)										Total = Sum (45)m =		1392.3227 (45)
Distribution loss (46)m = 0.15 x (45)m												
	21.6531	18.9379	19.5423	17.0374	16.3478	14.1069	13.0721	15.0005	15.1796	17.6904	19.3104	20.9699 (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	0.6323	0.5329	0.5292	0.4433	0.4080	0.3371	0.3123	0.3743	0.3949	0.4790	0.5434	0.6124 (61)
Total heat required for water heating calculated for each month												
	144.9864	126.7859	130.8110	114.0261	109.3934	94.3832	87.4599	100.3774	101.5924	118.4149	129.2796	140.4116 (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												
	144.9864	126.7859	130.8110	114.0261	109.3934	94.3832	87.4599	100.3774	101.5924	118.4149	129.2796	140.4116 (64)
								Total per year (kWh/year) = Sum (64)m =				1397.9217 (64)
Heat gains from water heating, kWh/month												
	48.1558	42.1124	43.4510	37.8771	36.3396	31.3546	29.0546	33.3446	33.7469	39.3334	42.9406	46.6363 (65)

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

Metabolic gains (Table 5), Watts												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(66)m	137.1586	137.1586	137.1586	137.1586	137.1586	137.1586	137.1586	137.1586	137.1586	137.1586	137.1586	137.1586 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5												
	47.0984	41.8323	34.0203	25.7556	19.2526	16.2539	17.5629	22.8289	30.6409	38.9056	45.4086	48.4074 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5												
	300.2432	303.3587	295.5076	278.7933	257.6947	237.8649	224.6173	221.5017	229.3529	246.0671	267.1658	286.9956 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5												
	51.0018	51.0018	51.0018	51.0018	51.0018	51.0018	51.0018	51.0018	51.0018	51.0018	51.0018	51.0018 (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)												
	-91.4390	-91.4390	-91.4390	-91.4390	-91.4390	-91.4390	-91.4390	-91.4390	-91.4390	-91.4390	-91.4390	-91.4390 (71)
Water heating gains (Table 5)												
	64.7256	62.6672	58.4019	52.6071	48.8436	43.5481	39.0519	44.8180	46.8707	52.8675	59.6398	62.6832 (72)
Total internal gains												
	511.7884	507.5796	487.6511	456.8774	425.5122	397.3881	380.9535	388.8700	406.5858	437.5616	471.9356	497.8076 (73)

6. Solar gains

[Jan]												Gains	
	Area				Solar flux		g		FF		Access		W
	m2				Table 6a		or Table 6b		or Table 6c		factor		
					W/m2						Table 6d		
North	5.9680				13.4684		0.7300		0.7200		0.7700		29.2775
South	4.8050				56.5862		0.7300		0.7200		0.7700		99.0359 (74)
Solar gains	128.3134	185.7518	262.3909	341.4346	376.8846	422.1560	389.6676	358.1419	303.5304	224.9327	153.0053	108.1314	(83)
Total gains	640.1018	693.3314	750.0421	798.3120	802.3968	819.5442	770.6211	747.0119	710.1162	662.4943	624.9409	605.9390	(84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)												21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
tau	16.9182	16.9993	17.0254	17.1006	17.1006	17.1247	17.1247	17.1482	17.1482	17.0760	17.0760	17.0510
alpha	2.1279	2.1333	2.1350	2.1400	2.1400	2.1416	2.1416	2.1432	2.1432	2.1384	2.1384	2.1367
util living area												
	0.9139	0.8972	0.8611	0.7978	0.6981	0.5352	0.4057	0.4054	0.6139	0.7872	0.8800	0.9203 (86)
MIT	18.5251	18.7241	19.1833	19.7712	20.3397	20.7552	20.9090	20.9121	20.6510	20.0476	19.2409	18.5068 (87)
Th 2	19.6841	19.6895	19.6912	19.6961	19.6961	19.6977	19.6977	19.6992	19.6992	19.6945	19.6945	19.6929 (88)
util rest of house												
	0.9002	0.8810	0.8382	0.7614	0.6358	0.4318	0.2632	0.2583	0.5164	0.7390	0.8572	0.9074 (89)
MIT 2	17.5186	17.7151	18.1613	18.7245	19.2440	19.5792	19.6744	19.6780	19.5121	18.9932	18.2279	17.5077 (90)
Living area fraction												
	17.8721	18.0694	18.5202	19.0921	19.6288	19.9922	20.1080	20.1114	19.9120	19.3635	18.5836	17.8586 (92)
MIT												
Temperature adjustment												-0.1500
adjusted MIT	17.7221	17.9194	18.3702	18.9421	19.4788	19.8422	19.9580	19.9614	19.7620	19.2135	18.4336	17.7086 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.8733	0.8528	0.8093	0.7363	0.6239	0.4444	0.2939	0.2903	0.5218	0.7176	0.8291	0.8813 (94)
Useful gains	558.9957	591.3019	607.0086	587.8202	500.6249	364.2370	226.5163	216.8810	370.5155	475.3911	518.1649	534.0273 (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												
	1296.3756	1268.4374	1143.3514	943.2930	680.5075	419.9705	240.5493	229.9418	453.4208	738.6076	1029.2166	1274.1363 (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												
	548.6106	455.0351	399.0390	255.9404	133.8326	0.0000	0.0000	0.0000	0.0000	195.8331	367.9573	550.6411 (98)
Space heating												2906.8892 (98)
Space heating per m2										(98) / (4) =		40.5594 (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													3222.7153	(211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Space heating requirement	548.6106	455.0351	399.0390	255.9404	133.8326	0.0000	0.0000	0.0000	0.0000	195.8331	367.9573	550.6411	(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)	608.2157	504.4735	442.3936	283.7477	148.3732	0.0000	0.0000	0.0000	0.0000	217.1099	407.9349	610.4669	(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	144.9864	126.7859	130.8110	114.0261	109.3934	94.3832	87.4599	100.3774	101.5924	118.4149	129.2796	140.4116	(64)	
Efficiency of water heater (217)m	86.9182	86.7841	86.3493	85.4433	83.4228	76.4000	76.4000	76.4000	76.4000	84.4518	86.1540	87.0068	(216)	
Fuel for water heating, kWh/month	166.8079	146.0935	151.4904	133.4523	131.1313	123.5382	114.4763	131.3841	132.9743	140.2159	150.0565	161.3801	(219)	
Water heating fuel used												1683.0008	(219)	
Annual totals kWh/year														
Space heating fuel - main system													3222.7153	(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)													332.7087	(232)
Total delivered energy for all uses													5313.4248	(238)

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

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	3222.7153	7.6100	245.2486 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1683.0008	7.6100	128.0764 (247)
Pumps and fans for heating	75.0000	31.0800	23.3100 (249)
Energy for lighting	332.7087	31.0800	103.4059 (250)
Additional standing charges			105.0000 (251)
Total energy cost			605.0409 (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	3222.7153	0.2160	696.1065 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1683.0008	0.2160	363.5282 (264)
Space and water heating			1059.6347 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	332.7087	0.5190	172.6758 (268)
Total kg/year			1271.2355 (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	3222.7153	1.2200	3931.7127 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1683.0008	1.2200	2053.2610 (264)
Space and water heating			5984.9737 (265)
Pumps and fans	75.0000	3.0700	230.2500 (267)
Energy for lighting	332.7087	3.0700	1021.4157 (268)
Primary energy kWh/year			7236.6394 (272)
Primary energy kWh/m2/year			100.9717 (273)

SAP 2012 EPC IMPROVEMENTS

Current energy efficiency rating:
Current environmental impact rating:

B 81
B 84

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

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

(For testing purposes):

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

Recommended measures:	SAP change	Cost change	CO2 change
(none)			

Recommended measures	Typical annual savings	Energy efficiency	Environmental impact
(none)			
Total Savings	£0	0.00 kg/m²	
Potential energy efficiency rating:		B 81	
Potential environmental impact rating:			B 84

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	£127	£127	£0
Mains gas	£478	£478	£0
Space heating	£374	£374	£0
Water heating	£128	£128	£0
Lighting	£103	£103	£0
Total cost of fuels	£605	£605	£0
Total cost of uses	£605	£605	£0
Delivered energy	74 kWh/m²	74 kWh/m²	0 kWh/m²
Carbon dioxide emissions	1.3 tonnes	1.3 tonnes	0.0 tonnes
CO2 emissions per m²	18 kg/m²	18 kg/m²	0 kg/m²
Primary energy	101 kWh/m²	101 kWh/m²	0 kWh/m²

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF ENERGY RATINGS FOR IMPROVED DWELLING 09 Jan 2014

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

No improvements selected / applicable

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

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

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

No improvements selected / applicable

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Built)

Property Reference	007 - PRJ013014	Issued on Date	02/05/2024
Assessment Reference	007	Prop Type Ref	F2
Property	8 Rashleigh Drive, Netley Abbey, Southampton, SO31 5JY		
SAP Rating	81 B	DER	21.32
Environmental	84 B	TER	22.73
CO ₂ Emissions (t/year)	1.27	% DER<TER	6.19
General Requirements Compliance	Pass	DFEE	60.52
		TFEE	71.00
		% DFEE<TFEE	14.76
Assessor Details	Mr. Christopher Nicholls, Briary Energy Limited, Tel: 0203 397 1373, chris@briaryenergy.co.uk		Assessor ID
			U903-0001
Client			

SUMMARY FOR INPUT DATA FOR New Build (As Built)

Criterion 1 – Achieving the TER and TFEE rate

1a TER and DER

Fuel for main heating	Mains gas		
Fuel factor	1.00 (mains gas)		
Target Carbon Dioxide Emission Rate (TER)	22.73	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	21.32	kgCO ₂ /m ²	Pass
	-1.41 (-6.2%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	71.00	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	60.52	kWh/m ² /yr	
	-10.5 (-14.8%)	kWh/m ² /yr	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.23 (max. 0.30)	0.26 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Floor	0.15 (max. 0.25)	0.21 (max. 0.70)	Pass
Roof	0.08 (max. 0.20)	0.08 (max. 0.35)	Pass
Openings	1.35 (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	4.61 (measured in this dwelling)	
Maximum	10.0	Pass

Limiting System Efficiencies

4 Heating efficiency

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Built)

Main heating system

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

Pass

Secondary heating system

None

5 Cylinder insulation

Hot water storage

No cylinder

6 Controls

Space heating controls

Programmer, room thermostat and TRVs

Pass

Hot water controls

No cylinder

Boiler interlock

Yes

Pass

7 Low energy lights

Percentage of fixed lights with low-energy fittings

100

%

Minimum

75

%

Pass

8 Mechanical ventilation

Not applicable

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (Southern England)

Slight

Pass

Based on:

Overshading

Average

Windows facing North

5.97 m², No overhang

Windows facing South

4.81 m², No overhang

Air change rate

5.05 ach

Blinds/curtains

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

Criterion 4 – Building performance consistent with DER and DFEE rate

Party Walls

Type

U-value

Filled Cavity with Edge Sealing

0.00

W/m²K

Pass

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals

4.61 (measured in this dwelling)

Maximum

10.0

Pass

10 Key features

Party wall U-value

0.00

W/m²K

Roof U-value

0.08

W/m²K