

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

Property Reference	045 - PRJ013014	Issued on Date	09/05/2024
Assessment Reference	045	Prop Type Ref	3B
Property	7 Rashleigh Drive, Netley Abbey, Southampton, SO31 5JY		

SAP Rating	85 B	DER	14.40	TER	17.61
Environmental	88 B	% DER<TER	18.24		
CO ₂ Emissions (t/year)	1.13	DFEE	44.39	TTEE	50.66
General Requirements Compliance	Pass	% DFEE<TFEE	12.38		

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	47.1500 (1b)	x 2.3700 (2b)	= 111.7455 (1b) - (3b)
First floor	47.1500 (1c)	x 2.6200 (2c)	= 123.5330 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	94.3000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 235.2785 (5)

2. Ventilation rate

	main heating		secondary heating		other		total	m3 per hour				
Number of chimneys	0	+	0	+	0	=	0 * 40 =	0.0000 (6a)				
Number of open flues	0	+	0	+	0	=	0 * 20 =	0.0000 (6b)				
Number of intermittent fans							3 * 10 =	30.0000 (7a)				
Number of passive vents							0 * 10 =	0.0000 (7b)				
Number of flueless gas fires							0 * 40 =	0.0000 (7c)				
Air changes per hour												
Infiltration due to chimneys, flues and fans	= (6a)+(6b)+(7a)+(7b)+(7c) =						30.0000 / (5) =	0.1275 (8)				
Pressure test							Yes					
Measured/design AP50							4.6200					
Infiltration rate							0.3585 (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) =	0.3316 (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	0.4062	0.3814	0.3731	0.3482	0.3482	0.3399	0.3399	0.3316	0.3316	0.3565	0.3565	0.3648 (22b)
Effective ac	0.5825	0.5727	0.5696	0.5606	0.5606	0.5578	0.5578	0.5550	0.5550	0.5635	0.5635	0.5665 (25)

3. Heat losses and heat loss parameter

Element	Gross m ²	Openings m ²	NetArea m ²	U-value W/m ² K	A x U W/K	K-value kJ/m ² K	A x K kJ/K
Solid Door			2.0900	1.2000	2.5080		(26)
Windows (Uw = 1.40)			11.2600	1.3258	14.9413		(27)
Fir - Ground			47.1480	0.1800	8.4866	75.6000	3564.3888 (28a)
Wl - Brick (Timber Frame)	97.1030	13.3520	83.7510	0.2100	17.5877	7.4000	619.7574 (29a)
Rf - Ins Joist	47.1480		47.1480	0.0800	3.7718	7.4000	348.8952 (30)
Total net area of external elements Aum(A, m ²)			191.4070				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	47.2955		(33)
Party Wall			46.2040	0.0000	0.0000	7.4000	341.9096 (32)
Stud			76.8070			7.4000	568.3715 (32c)
Internal Floor			47.1480			7.4000	348.8952 (32d)
Internal Ceiling			47.1480			7.4000	348.8952 (32e)
Heat capacity Cm = Sum (A x k)							(28)...(30) + (32) + (32a)...(32e) = 6141.1129 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							65.1231 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							16.4201 (36)
Total fabric heat loss							(33) + (36) = 63.7156 (37)

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

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(38)m	Jan 45.2274	Feb 44.4670	Mar 44.2242	Apr 43.5278	May 43.5278	Jun 43.3063	Jul 43.3063	Aug 43.0902	Sep 43.0902	Oct 43.7546	Nov 43.7546	Dec 43.9867	(38)
Heat transfer coeff	108.9430	108.1826	107.9398	107.2433	107.2433	107.0219	107.0219	106.8057	106.8057	107.4701	107.4701	107.7023	(39)
Average = Sum(39) / 12 =												107.4875	(39)
HLP	Jan 1.1553	Feb 1.1472	Mar 1.1446	Apr 1.1373	May 1.1373	Jun 1.1349	Jul 1.1349	Aug 1.1326	Sep 1.1326	Oct 1.1397	Nov 1.1397	Dec 1.1421	(40)
HLP (average)												1.1398	(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													2.6801	(42)
Average daily hot water use (litres/day)													97.8530	(43)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Daily hot water use														
	107.6383	103.7242	99.8100	95.8959	91.9818	88.0677	88.0677	91.9818	95.8959	99.8100	103.7242	107.6383	(44)	
Energy conte	159.6245	139.6086	144.0635	125.5981	120.5144	103.9947	96.3664	110.5819	111.9025	130.4116	142.3545	154.5878	(45)	
Energy content (annual)										Total = Sum	(45)m =	1539.6084	(45)	
Distribution loss (46)m = 0.15 x (45)m	23.9437	20.9413	21.6095	18.8397	18.0772	15.5992	14.4550	16.5873	16.7854	19.5617	21.3532	23.1882	(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	0.6708	0.6086	0.6471	0.5420	0.4988	0.4121	0.3819	0.4577	0.4829	0.5857	0.6205	0.6497	(61)	
Total heat required for water heating calculated for each month	160.2953	140.2171	144.7106	126.1401	121.0132	104.4069	96.7483	111.0396	112.3854	130.9974	142.9750	155.2374	(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	160.2953	140.2171	144.7106	126.1401	121.0132	104.4069	96.7483	111.0396	112.3854	130.9974	142.9750	155.2374	(64)	
								Total per year (kWh/year) = Sum(64)m =				1546.1663	(64)	
RHI water heating demand												1546	(64)	
Heat gains from water heating, kWh/month	53.2428	46.5720	48.0629	41.8969	40.1957	34.6813	32.1373	36.8829	37.3283	43.5083	47.4880	51.5628	(65)	

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

Metabolic gains (Table 5), Watts	Jan 160.8075	Feb 160.8075	Mar 160.8075	Apr 160.8075	May 160.8075	Jun 160.8075	Jul 160.8075	Aug 160.8075	Sep 160.8075	Oct 160.8075	Nov 160.8075	Dec 160.8075	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	60.7305	53.9403	43.8672	33.2103	24.8251	20.9584	22.6463	29.4365	39.5096	50.1665	58.5517	62.4184	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	368.3136	372.1356	362.5044	342.0008	316.1186	291.7931	275.5421	271.7202	281.3513	301.8550	327.7371	352.0627	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	53.7609	53.7609	53.7609	53.7609	53.7609	53.7609	53.7609	53.7609	53.7609	53.7609	53.7609	53.7609	(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)	-107.2050	-107.2050	-107.2050	-107.2050	-107.2050	-107.2050	-107.2050	-107.2050	-107.2050	-107.2050	-107.2050	-107.2050	(71)
Water heating gains (Table 5)	71.5630	69.3036	64.6007	58.1901	54.0265	48.1684	43.1953	49.5738	51.8449	58.4789	65.9556	69.3049	(72)
Total internal gains	610.9705	605.7429	581.3357	543.7646	505.3336	471.2833	451.7471	461.0938	483.0692	520.8637	562.6078	594.1494	(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					7.7170	13.4684	0.7300		0.7200	0.7700		37.8576	
South					3.5460	56.5862	0.7300		0.7200	0.7700		73.0866 (74)	
Solar gains	110.9443	163.8369	240.5391	328.3741	375.0389	425.8368	390.8111	349.8360	283.6464	200.9973	132.9688	93.0712 (83)	
Total gains	721.9148	769.5797	821.8748	872.1387	880.3726	897.1200	842.5581	810.9298	766.7156	721.8610	695.5766	687.2205 (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	15.6583	15.7684	15.8039	15.9065	15.9065	15.9394	15.9394	15.9717	15.9717	15.8729	15.8729	15.8387	
alpha	2.0439	2.0512	2.0536	2.0604	2.0604	2.0626	2.0626	2.0648	2.0648	2.0582	2.0582	2.0559	
util living area													
	0.8888	0.8719	0.8337	0.7654	0.6602	0.4990	0.3756	0.3774	0.5809	0.7552	0.8512	0.8952 (86)	
MIT	18.5479	18.7414	19.1967	19.7911	20.3588	20.7632	20.9114	20.9136	20.6568	20.0610	19.2682	18.5416 (87)	
Th 2	19.9559	19.9625	19.9645	19.9705	19.9705	19.9724	19.9724	19.9743	19.9743	19.9686	19.9686	19.9666 (88)	
util rest of house													
	0.8762	0.8575	0.8142	0.7358	0.6118	0.4225	0.2725	0.2706	0.5077	0.7164	0.8314	0.8832 (89)	
MIT 2	16.7571	17.0328	17.6778	18.5093	19.2756	19.7731	19.9246	19.9293	19.6628	18.8936	17.7906	16.7530 (90)	
Living area fraction													
									fLA = Living area / (4) =			0.1592 (91)	

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MIT	17.0422	17.3048	17.9195	18.7133	19.4480	19.9307	20.0816	20.0860	19.8210	19.0795	18.0258	17.0377 (92)
Temperature adjustment												-0.1500
adjusted MIT	16.8922	17.1548	17.7695	18.5633	19.2980	19.7807	19.9316	19.9360	19.6710	18.9295	17.8758	16.8877 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.8247	0.8048	0.7607	0.6866	0.5753	0.4069	0.2681	0.2663	0.4832	0.6686	0.7780	0.8328 (94)	
Useful gains	595.3609	619.3784	625.2370	598.7928	506.4853	365.0131	225.8546	215.9300	370.4435	482.6307	541.1686	572.3081 (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													
	1219.3075	1195.9320	1086.9044	907.6351	664.6949	415.3240	238.8348	228.1325	445.4899	712.4682	975.3803	1194.1677 (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													
	464.2162	387.4440	343.4806	222.3665	117.7079	0.0000	0.0000	0.0000	0.0000	170.9991	312.6324	462.6636 (98)	
Space heating												2481.5104 (98)	
RHI space heating demand												2482 (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	47.1500 (1b)	x 2.3700 (2b)	= 111.7455 (1b) - (3b)
First floor	47.1500 (1c)	x 2.6200 (2c)	= 123.5330 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	94.3000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 235.2785 (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					3 * 10 = 30.0000 (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) =					30.0000 / (5) = 0.1275 (8)
Pressure test					Yes
Measured/design AP50					4.6200
Infiltration rate					0.3585 (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) =	0.3316 (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	0.4228	0.4145	0.4062	0.3648	0.3565	0.3150	0.3150	0.3067	0.3316	0.3565	0.3731	0.3897 (22b)
Effective ac	0.5894	0.5859	0.5825	0.5665	0.5635	0.5496	0.5496	0.5470	0.5550	0.5635	0.5696	0.5759 (25)

3. Heat losses and heat loss parameter

Element	Gross m ²	Openings m ²	NetArea m ²	U-value W/m ² K	A x U W/K	K-value kJ/m ² K	A x K kJ/K
Solid Door			2.0900	1.2000	2.5080		(26)
Windows (Uw = 1.40)			11.2600	1.3258	14.9413		(27)
Flr - Ground			47.1480	0.1800	8.4866	75.6000	3564.3888 (28a)
Wl - Brick (Timber Frame)	97.1030	13.3520	83.7510	0.2100	17.5877	7.4000	619.7574 (29a)
Rf - Ins Joist	47.1480		47.1480	0.0800	3.7718	7.4000	348.8952 (30)
Total net area of external elements Aum(A, m ²)			191.4070				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	47.2955		(33)
Party Wall			46.2040	0.0000	0.0000	7.4000	341.9096 (32)
Stud			76.8070			7.4000	568.3715 (32c)
Internal Floor			47.1480			7.4000	348.8952 (32d)
Internal Ceiling			47.1480			7.4000	348.8952 (32e)

Heat capacity Cm = Sum(A x k) (28)...(30) + (32) + (32a)...(32e) = 6141.1129 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m²K 65.1231 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K) 16.4201 (36)
Total fabric heat loss (33) + (36) = 63.7156 (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	45.7611	45.4916	45.2274	43.9867	43.7546	42.6739	42.6739	42.4738	43.0902	43.7546	44.2242	44.7151 (38)
Heat transfer coeff	109.4767	109.2072	108.9430	107.7023	107.4701	106.3895	106.3895	106.1894	106.8057	107.4701	107.9398	108.4307 (39)
Average = Sum(39)m / 12 =												107.7012 (39)
HLP	1.1609	1.1581	1.1553	1.1421	1.1397	1.1282	1.1282	1.1261	1.1326	1.1397	1.1446	1.1498 (40)
HLP (average)												1.1421 (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												2.6801 (42)
Average daily hot water use (litres/day)												97.8530 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	107.6383	103.7242	99.8100	95.8959	91.9818	88.0677	88.0677	91.9818	95.8959	99.8100	103.7242	107.6383 (44)
Energy conte	159.6245	139.6086	144.0635	125.5981	120.5144	103.9947	96.3664	110.5819	111.9025	130.4116	142.3545	154.5878 (45)
Energy content (annual)												Total = Sum(45)m = 1539.6084 (45)
Distribution loss (46)m = 0.15 x (45)m												

	23.9437	20.9413	21.6095	18.8397	18.0772	15.5992	14.4550	16.5873	16.7854	19.5617	21.3532	23.1882 (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	0.6708	0.6086	0.6471	0.5420	0.4988	0.4121	0.3819	0.4577	0.4829	0.5857	0.6205	0.6497 (61)	
Total heat required for water heating calculated for each month	160.2953	140.2171	144.7106	126.1401	121.0132	104.4069	96.7483	111.0396	112.3854	130.9974	142.9750	155.2374 (62)	
WWHRS	-52.5899	-46.2724	-47.2270	-38.8566	-36.0790	-29.7633	-25.1894	-30.4986	-31.3885	-38.8026	-44.9478	-50.8306 eq. (G10)	
Total of WWHRS savings												-472.4457	
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)
	107.7054	93.9447	97.4836	87.2835	84.9342	74.6436	71.5589	80.5409	80.9970	92.1948	98.0272	104.4068 (64)	
								Total per year (kWh/year) = Sum(64)m =					1073.7206 (64)
Heat gains from water heating, kWh/month													
	53.2428	46.5720	48.0629	41.8969	40.1957	34.6813	32.1373	36.8829	37.3283	43.5083	47.4880	51.5628 (65)	

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CALCULATION OF ENERGY RATINGS 09 Jan 2014

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												3352.7423 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Space heating requirement	539.2430	444.4197	405.8020	277.3638	170.2286	0.0000	0.0000	0.0000	0.0000	245.2375	395.0197	546.8593 (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)	597.8304	492.7048	449.8913	307.4986	188.7235	0.0000	0.0000	0.0000	0.0000	271.8820	437.9376	606.2742 (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	107.7054	93.9447	97.4836	87.2835	84.9342	74.6436	71.5589	80.5409	80.9970	92.1948	98.0272	104.4068 (64)
Efficiency of water heater (217)m	87.5667	87.4438	87.1509	86.4617	85.0844	76.4000	76.4000	76.4000	76.4000	85.9578	87.0730	76.4000 (216)
Fuel for water heating, kWh/month	122.9980	107.4344	111.8562	100.9504	99.8235	97.7010	93.6635	105.4201	106.0170	107.2559	112.5805	119.1022 (219)
Water heating fuel used												1284.8026 (219)
Annual totals kWh/year												
Space heating fuel - main system												3352.7423 (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)												429.0080 (232)
Total delivered energy for all uses												5141.5529 (238)

10a. Fuel costs - using Table 12 prices

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	3352.7423	3.4800	116.6754 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1284.8026	3.4800	44.7111 (247)
Pumps and fans for heating	75.0000	13.1900	9.8925 (249)
Energy for lighting	429.0080	13.1900	56.5862 (250)
Additional standing charges			120.0000 (251)
Total energy cost			347.8652 (255)

11a. SAP rating - Individual heating systems

Energy cost deflator (Table 12):		0.4200 (256)
Energy cost factor (ECF)	$[(255) \times (256)] / [(4) + 45.0] =$	1.0488 (257)
SAP value		85.3687
SAP rating (Section 12)		85 (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	3352.7423	0.2160	724.1923 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1284.8026	0.2160	277.5174 (264)
Space and water heating			1001.7097 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	429.0080	0.5190	222.6552 (268)
Total kg/year			1263.2899 (272)
CO2 emissions per m2			13.4000 (273)
EI value			87.8478
EI rating			88 (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	$3.48 / 0.8333 = 4.176$, stars = 5
Water heating environmental impact	$0.216 / 0.8333 = 0.2592$, 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	47.1500 (1b)	x 2.3700 (2b)	= 111.7455 (1b) - (3b)
First floor	47.1500 (1c)	x 2.6200 (2c)	= 123.5330 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	94.3000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 235.2785 (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					3 * 10 = 30.0000 (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) =					30.0000 / (5) = 0.1275 (8)
Pressure test					Yes
Measured/design AP50					4.6200
Infiltration rate					0.3585 (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) =	0.3316 (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	0.4062	0.3814	0.3731	0.3482	0.3482	0.3399	0.3399	0.3316	0.3316	0.3565	0.3565	0.3648 (22b)
Effective ac	0.5825	0.5727	0.5696	0.5606	0.5606	0.5578	0.5578	0.5550	0.5550	0.5635	0.5635	0.5665 (25)

3. Heat losses and heat loss parameter

Element	Gross m ²	Openings m ²	NetArea m ²	U-value W/m ² K	A x U W/K	K-value kJ/m ² K	A x K kJ/K
Solid Door			2.0900	1.2000	2.5080		(26)
Windows (Uw = 1.40)			11.2600	1.3258	14.9413		(27)
Flr - Ground			47.1480	0.1800	8.4866	75.6000	3564.3888 (28a)
Wl - Brick (Timber Frame)	97.1030	13.3520	83.7510	0.2100	17.5877	7.4000	619.7574 (29a)
Rf - Ins Joist	47.1480		47.1480	0.0800	3.7718	7.4000	348.8952 (30)
Total net area of external elements Aum(A, m ²)			191.4070				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	47.2955		(33)
Party Wall			46.2040	0.0000	0.0000	7.4000	341.9096 (32)
Stud			76.8070			7.4000	568.3715 (32c)
Internal Floor			47.1480			7.4000	348.8952 (32d)
Internal Ceiling			47.1480			7.4000	348.8952 (32e)
Heat capacity Cm = Sum(A x k)							(28)...(30) + (32) + (32a)...(32e) = 6141.1129 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							65.1231 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							16.4201 (36)
Total fabric heat loss							(33) + (36) = 63.7156 (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	45.2274	44.4670	44.2242	43.5278	43.5278	43.3063	43.3063	43.0902	43.0902	43.7546	43.7546	43.9867 (38)
Heat transfer coeff	108.9430	108.1826	107.9398	107.2433	107.2433	107.0219	107.0219	106.8057	106.8057	107.4701	107.4701	107.7023 (39)
Average = Sum(39)m / 12 =												107.4875 (39)
HLP	1.1553	1.1472	1.1446	1.1373	1.1373	1.1349	1.1349	1.1326	1.1326	1.1397	1.1397	1.1421 (40)
HLP (average)												1.1398 (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												2.6801 (42)
Average daily hot water use (litres/day)												97.8530 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	107.6383	103.7242	99.8100	95.8959	91.9818	88.0677	88.0677	91.9818	95.8959	99.8100	103.7242	107.6383 (44)
Energy conte	159.6245	139.6086	144.0635	125.5981	120.5144	103.9947	96.3664	110.5819	111.9025	130.4116	142.3545	154.5878 (45)
Energy content (annual)												Total = Sum(45)m = 1539.6084 (45)
Distribution loss (46)m = 0.15 x (45)m												

Water storage loss:	23.9437	20.9413	21.6095	18.8397	18.0772	15.5992	14.4550	16.5873	16.7854	19.5617	21.3532	23.1882 (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	0.6708	0.6086	0.6471	0.5420	0.4988	0.4121	0.3819	0.4577	0.4829	0.5857	0.6205	0.6497 (61)
Total heat required for water heating calculated for each month	160.2953	140.2171	144.7106	126.1401	121.0132	104.4069	96.7483	111.0396	112.3854	130.9974	142.9750	155.2374 (62)
WWHRS	-52.5899	-46.2724	-47.2270	-38.8566	-36.0790	-29.7633	-25.1894	-30.4986	-31.3885	-38.8026	-44.9478	-50.8306 eq. (G10)
Total of WWHRS savings												-472.4457
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)
	107.7054	93.9447	97.4836	87.2835	84.9342	74.6436	71.5589	80.5409	80.9970	92.1948	98.0272	104.4068 (64)
								Total per year (kWh/year) = Sum(64)m =				1073.7206 (64)
Heat gains from water heating, kWh/month	53.2428	46.5720	48.0629	41.8969	40.1957	34.6813	32.1373	36.8829	37.3283	43.5083	47.4880	51.5628 (65)

Metabolic gains (Table 5), Watts												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(66)m	160.8075	160.8075	160.8075	160.8075	160.8075	160.8075	160.8075	160.8075	160.8075	160.8075	160.8075	160.8075 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	60.7305	53.9403	43.8672	33.2103	24.8251	20.9584	22.6463	29.4365	39.5096	50.1665	58.5517	62.4184 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	368.3136	372.1356	362.5044	342.0008	316.1186	291.7931	275.5421	271.7202	281.3513	301.8550	327.7371	352.0627 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	53.7609	53.7609	53.7609	53.7609	53.7609	53.7609	53.7609	53.7609	53.7609	53.7609	53.7609	53.7609 (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)	-107.2050	-107.2050	-107.2050	-107.2050	-107.2050	-107.2050	-107.2050	-107.2050	-107.2050	-107.2050	-107.2050	-107.2050 (71)
Water heating gains (Table 5)	71.5630	69.3036	64.6007	58.1901	54.0265	48.1684	43.1953	49.5738	51.8449	58.4789	65.9556	69.3049 (72)
Total internal gains	610.9705	605.7429	581.3357	543.7646	505.3336	471.2833	451.7471	461.0938	483.0692	520.8637	562.6078	594.1494 (73)

[Jan					Area	Solar flux		g	FF	Access		Gains
					m2	Table 6a	Table 6b	Specific data	Specific data	factor	W	
						W/m2		or Table 6b	or Table 6c	Table 6d		
North					7.7170	13.4684		0.7300	0.7200	0.7700	37.8576	(78)
South					3.5460	56.5862		0.7300	0.7200	0.7700	73.0866	(74)

Solar gains	110.9443	163.8369	240.5391	328.3741	375.0389	425.8368	390.8111	349.8360	283.6464	200.9973	132.9688	93.0712 (83)
Total gains	721.9148	769.5797	821.8748	872.1387	880.3726	897.1200	842.5581	810.9298	766.7156	721.8610	695.5766	687.2205 (84)

Temperature during heating periods in the living area from Table 9, Th1 (C)												21.0000 (85)
Utilisation factor for gains for living area, n _{l,m} (see Table 9a)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
tau	15.6583	15.7684	15.8039	15.9065	15.9065	15.9394	15.9394	15.9717	15.9717	15.8729	15.8729	15.8387
alpha	2.0439	2.0512	2.0536	2.0604	2.0604	2.0626	2.0626	2.0648	2.0648	2.0582	2.0582	2.0559
util living area												
	0.8888	0.8719	0.8337	0.7654	0.6602	0.4990	0.3756	0.3774	0.5809	0.7552	0.8512	0.8952 (86)
MIT	18.5479	18.7414	19.1967	19.7911	20.3588	20.7632	20.9114	20.9136	20.6568	20.0610	19.2682	18.5416 (87)
Th 2	19.9559	19.9625	19.9645	19.9705	19.9705	19.9724	19.9724	19.9743	19.9743	19.9686	19.9686	19.9666 (88)
util rest of house												
	0.8762	0.8575	0.8142	0.7358	0.6118	0.4225	0.2725	0.2706	0.5077	0.7164	0.8314	0.8832 (89)
MIT 2	16.7571	17.0328	17.6778	18.5093	19.2756	19.7731	19.9246	19.9293	19.6628	18.8936	17.7906	16.7530 (90)
Living area fraction												
MIT	17.0422	17.3048	17.9195	18.7133	19.4480	19.9307	20.0816	20.0860	19.8210	19.0795	18.0258	17.0377 (92)
Temperature adjustment												
adjusted MIT	16.8922	17.1548	17.7695	18.5633	19.2980	19.7807	19.9316	19.9360	19.6710	18.9295	17.8758	16.8877 (93)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.8247	0.8048	0.7607	0.6866	0.5753	0.4069	0.2681	0.2663	0.4832	0.6686	0.7780	0.8328 (94)
Useful gains	595.3609	619.3784	625.2370	598.7928	506.4853	365.0131	225.8546	215.9300	370.4435	482.6307	541.1686	572.3081 (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	1219.3075	1195.9320	1086.9044	907.6351	664.6949	415.3240	238.8348	228.1325	445.4899	712.4682	975.3803	1194.1677 (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	464.2162	387.4440	343.4806	222.3665	117.7079	0.0000	0.0000	0.0000	0.0000	170.9991	312.6324	462.6636 (98)
Space heating												2481.5104 (98)
Space heating per m2												26.3151 (99)
										(98) / (4) =		

Regs Region: England
Elmhurst Energy Systems
SAP2012 Calculator (Design
System) version 4.14r19

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

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

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												2751.1201 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Space heating requirement	464.2162	387.4440	343.4806	222.3665	117.7079	0.0000	0.0000	0.0000	0.0000	170.9991	312.6324	462.6636 (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)	514.6521	429.5388	380.7989	246.5260	130.4966	0.0000	0.0000	0.0000	0.0000	189.5777	346.5991	512.9308 (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	107.7054	93.9447	97.4836	87.2835	84.9342	74.6436	71.5589	80.5409	80.9970	92.1948	98.0272	104.4068 (64)
Efficiency of water heater (217)m	87.2327	87.1287	86.7365	85.8300	83.8518	76.4000	76.4000	76.4000	76.4000	84.8324	86.4716	76.4000 (216)
Fuel for water heating, kWh/month	123.4691	107.8229	112.3905	101.6935	101.2908	97.7010	93.6635	105.4201	106.0170	108.6787	113.3635	119.5998 (219)
Water heating fuel used												1291.1105 (219)
Annual totals kWh/year												
Space heating fuel - main system												2751.1201 (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)												429.0080 (232)
Total delivered energy for all uses												4546.2386 (238)

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

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	2751.1201	7.6100	209.3602 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1291.1105	7.6100	98.2535 (247)
Pumps and fans for heating	75.0000	31.0800	23.3100 (249)
Energy for lighting	429.0080	31.0800	133.3357 (250)
Additional standing charges			105.0000 (251)
Total energy cost			569.2594 (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	2751.1201	0.2160	594.2419 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1291.1105	0.2160	278.8799 (264)
Space and water heating			873.1218 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	429.0080	0.5190	222.6552 (268)
Total kg/year			1134.7020 (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	2751.1201	1.2200	3356.3666 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1291.1105	1.2200	1575.1548 (264)
Space and water heating			4931.5214 (265)
Pumps and fans	75.0000	3.0700	230.2500 (267)
Energy for lighting	429.0080	3.0700	1317.0546 (268)
Primary energy kWh/year			6478.8260 (272)
Primary energy kWh/m2/year			68.7044 (273)

SAP 2012 EPC IMPROVEMENTS

Current energy efficiency rating: B 85
Current environmental impact rating: B 88

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
F	Already installed
G	Not considered
H	Not considered
I	Not considered
J	Not considered
K	Not considered
M	Not considered
N	Solar water heating
O	SAP increase too small
P	Not considered
R	Not considered
S	Not considered
T	Not considered
U	Solar photovoltaic panels
A2	Recommended
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
L2	Not applicable
Q3	Not considered
O3	Not considered

Recommended measures:	SAP change	Cost change	CO2 change
U Solar photovoltaic panels	+ 9.6	-£ 605	-1010 kg (89.0%)

Measures omitted - SAP change or cost saving too small:

N Solar water heating	+ 0.9	-£ 46	-148 kg (13.0%)
-----------------------	-------	-------	-----------------

Recommended measures	Typical annual savings	Energy efficiency	Environmental impact
Solar photovoltaic panels	£605 10.71 kg/m²	A 95	A 96
Total Savings	£605 10.71 kg/m²		
Potential energy efficiency rating:		A 95	
Potential environmental impact rating:			A 96

Fuel prices for cost data on this page from database revision number 542 TEST (30 Apr 2024)
Recommendation texts revision number 4.9c (22 Feb 2014)

Typical heating and lighting costs of this home (per year, Southern England):

	Current	Potential	Saving
Electricity	£157	£157	£0
Mains gas	£413	£413	£0
Space heating	£338	£338	£0
Water heating	£98	£98	£0
Lighting	£133	£133	£0
Generated (PV)	-£0	-£605	£605
Total cost of fuels	£570	-£35	£605
Total cost of uses	£569	-£36	£605
Delivered energy	48 kWh/m²	28 kWh/m²	21 kWh/m²
Carbon dioxide emissions	1.1 tonnes	0.1 tonnes	1.0 tonnes
CO2 emissions per m²	12 kg/m²	1 kg/m²	11 kg/m²
Primary energy	69 kWh/m²	5 kWh/m²	63 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

1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	47.1500 (1b)	x 2.3700 (2b)	= 111.7455 (1b) - (3b)
First floor	47.1500 (1c)	x 2.6200 (2c)	= 123.5330 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	94.3000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 235.2785 (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					3 * 10 = 30.0000 (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) =					30.0000 / (5) = 0.1275 (8)
Pressure test					Yes
Measured/design AP50					4.6200
Infiltration rate					0.3585 (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) =	0.3316 (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	0.4228	0.4145	0.4062	0.3648	0.3565	0.3150	0.3150	0.3067	0.3316	0.3565	0.3731	0.3897 (22b)
Effective ac	0.5894	0.5859	0.5825	0.5665	0.5635	0.5496	0.5496	0.5470	0.5550	0.5635	0.5696	0.5759 (25)

3. Heat losses and heat loss parameter

Element	Gross m ²	Openings m ²	NetArea m ²	U-value W/m ² K	A x U W/K	K-value kJ/m ² K	A x K kJ/K
Solid Door			2.0900	1.2000	2.5080		(26)
Windows (Uw = 1.40)			11.2600	1.3258	14.9413		(27)
Flr - Ground			47.1480	0.1800	8.4866	75.6000	3564.3888 (28a)
Wl - Brick (Timber Frame)	97.1030	13.3520	83.7510	0.2100	17.5877	7.4000	619.7574 (29a)
Rf - Ins Joist	47.1480		47.1480	0.0800	3.7718	7.4000	348.8952 (30)
Total net area of external elements Aum(A, m ²)			191.4070				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	47.2955		(33)
Party Wall			46.2040	0.0000	0.0000	7.4000	341.9096 (32)
Stud			76.8070			7.4000	568.3715 (32c)
Internal Floor			47.1480			7.4000	348.8952 (32d)
Internal Ceiling			47.1480			7.4000	348.8952 (32e)

Heat capacity Cm = Sum(A x k) (28)...(30) + (32) + (32a)...(32e) = 6141.1129 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m²K 65.1231 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K) 16.4201 (36)
Total fabric heat loss (33) + (36) = 63.7156 (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	45.7611	45.4916	45.2274	43.9867	43.7546	42.6739	42.6739	42.4738	43.0902	43.7546	44.2242	44.7151 (38)
Heat transfer coeff	109.4767	109.2072	108.9430	107.7023	107.4701	106.3895	106.3895	106.1894	106.8057	107.4701	107.9398	108.4307 (39)
Average = Sum(39)m / 12 =												107.7012 (39)
HLP	1.1609	1.1581	1.1553	1.1421	1.1397	1.1282	1.1282	1.1261	1.1326	1.1397	1.1446	1.1498 (40)
HLP (average)												1.1421 (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												2.6801 (42)
Average daily hot water use (litres/day)												97.8530 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	107.6383	103.7242	99.8100	95.8959	91.9818	88.0677	88.0677	91.9818	95.8959	99.8100	103.7242	107.6383 (44)
Energy conte	159.6245	139.6086	144.0635	125.5981	120.5144	103.9947	96.3664	110.5819	111.9025	130.4116	142.3545	154.5878 (45)
Energy content (annual)												Total = Sum(45)m = 1539.6084 (45)
Distribution loss (46)m = 0.15 x (45)m												

Water storage loss:	23.9437	20.9413	21.6095	18.8397	18.0772	15.5992	14.4550	16.5873	16.7854	19.5617	21.3532	23.1882 (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	0.6708	0.6086	0.6471	0.5420	0.4988	0.4121	0.3819	0.4577	0.4829	0.5857	0.6205	0.6497 (61)
Total heat required for water heating calculated for each month	160.2953	140.2171	144.7106	126.1401	121.0132	104.4069	96.7483	111.0396	112.3854	130.9974	142.9750	155.2374 (62)
WWHRS	-52.5899	-46.2724	-47.2270	-38.8566	-36.0790	-29.7633	-25.1894	-30.4986	-31.3885	-38.8026	-44.9478	-50.8306 eq. (G10)
Total of WWHRS savings												-472.4457
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)
	107.7054	93.9447	97.4836	87.2835	84.9342	74.6436	71.5589	80.5409	80.9970	92.1948	98.0272	104.4068 (64)
								Total per year (kWh/year) = Sum(64)m =				1073.7206 (64)
Heat gains from water heating, kWh/month	53.2428	46.5720	48.0629	41.8969	40.1957	34.6813	32.1373	36.8829	37.3283	43.5083	47.4880	51.5628 (65)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF ENERGY RATINGS FOR IMPROVED DWELLING 09 Jan 2014

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													3352.7423 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	539.2430	444.4197	405.8020	277.3638	170.2286	0.0000	0.0000	0.0000	0.0000	245.2375	395.0197	546.8593	(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)	597.8304	492.7048	449.8913	307.4986	188.7235	0.0000	0.0000	0.0000	0.0000	271.8820	437.9376	606.2742	(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	107.7054	93.9447	97.4836	87.2835	84.9342	74.6436	71.5589	80.5409	80.9970	92.1948	98.0272	104.4068	(64)
Efficiency of water heater (217)m	87.5667	87.4438	87.1509	86.4617	85.0844	76.4000	76.4000	76.4000	76.4000	85.9578	87.0730	76.4000	(216)
Fuel for water heating, kWh/month	122.9980	107.4344	111.8562	100.9504	99.8235	97.7010	93.6635	105.4201	106.0170	107.2559	112.5805	119.1022	(219)
Water heating fuel used												1284.8026	(219)
Annual totals kWh/year													
Space heating fuel - main system												3352.7423	(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)												429.0080	(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												3414.3135	(238)

10a. Fuel costs - using Table 12 prices

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	3352.7423	3.4800	116.6754 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1284.8026	3.4800	44.7111 (247)
Pumps and fans for heating	75.0000	13.1900	9.8925 (249)
Energy for lighting	429.0080	13.1900	56.5862 (250)
Additional standing charges			120.0000 (251)
Energy saving/generation technologies			
PV Unit	-1727.2394	13.1900	-227.8229 (252)
Total energy cost			120.0423 (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] =	0.3619 (257)
SAP value		94.9510
SAP rating (Section 12)		95 (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	3352.7423	0.2160	724.1923 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1284.8026	0.2160	277.5174 (264)
Space and water heating			1001.7097 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	429.0080	0.5190	222.6552 (268)
Energy saving/generation technologies			
PV Unit	-1727.2394	0.5190	-896.4372 (269)
Total kg/year			366.8526 (272)
CO2 emissions per m2			3.8900 (273)
EI value			96.4711
EI rating			96 (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	47.1500 (1b)	x 2.3700 (2b)	= 111.7455 (1b) - (3b)
First floor	47.1500 (1c)	x 2.6200 (2c)	= 123.5330 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	94.3000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 235.2785 (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					3 * 10 = 30.0000 (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) =					30.0000 / (5) = 0.1275 (8)
Pressure test					Yes
Measured/design AP50					4.6200
Infiltration rate					0.3585 (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) =	0.3316 (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	0.4062	0.3814	0.3731	0.3482	0.3482	0.3399	0.3399	0.3316	0.3316	0.3565	0.3565	0.3648 (22b)
Effective ac	0.5825	0.5727	0.5696	0.5606	0.5606	0.5578	0.5578	0.5550	0.5550	0.5635	0.5635	0.5665 (25)

3. Heat losses and heat loss parameter

Element	Gross m ²	Openings m ²	NetArea m ²	U-value W/m ² K	A x U W/K	K-value kJ/m ² K	A x K kJ/K
Solid Door			2.0900	1.2000	2.5080		(26)
Windows (Uw = 1.40)			11.2600	1.3258	14.9413		(27)
Flr - Ground			47.1480	0.1800	8.4866	75.6000	3564.3888 (28a)
Wl - Brick (Timber Frame)	97.1030	13.3520	83.7510	0.2100	17.5877	7.4000	619.7574 (29a)
Rf - Ins Joist	47.1480		47.1480	0.0800	3.7718	7.4000	348.8952 (30)
Total net area of external elements Aum(A, m ²)			191.4070				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	47.2955		(33)
Party Wall			46.2040	0.0000	0.0000	7.4000	341.9096 (32)
Stud			76.8070			7.4000	568.3715 (32c)
Internal Floor			47.1480			7.4000	348.8952 (32d)
Internal Ceiling			47.1480			7.4000	348.8952 (32e)

Heat capacity Cm = Sum(A x k)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m²K
Thermal bridges (Sum(L x Psi) calculated using Appendix K)
Total fabric heat loss

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	45.2274	44.4670	44.2242	43.5278	43.5278	43.3063	43.3063	43.0902	43.0902	43.7546	43.7546	43.9867 (38)
Heat transfer coeff	108.9430	108.1826	107.9398	107.2433	107.2433	107.0219	107.0219	106.8057	106.8057	107.4701	107.4701	107.7023 (39)
Average = Sum(39)m / 12 =												107.4875 (39)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.1553	1.1472	1.1446	1.1373	1.1373	1.1349	1.1349	1.1326	1.1326	1.1397	1.1397	1.1421 (40)
HLP (average)												1.1398 (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												2.6801 (42)
Average daily hot water use (litres/day)												97.8530 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	107.6383	103.7242	99.8100	95.8959	91.9818	88.0677	88.0677	91.9818	95.8959	99.8100	103.7242	107.6383 (44)
Energy conte	159.6245	139.6086	144.0635	125.5981	120.5144	103.9947	96.3664	110.5819	111.9025	130.4116	142.3545	154.5878 (45)
Energy content (annual)												Total = Sum(45)m = 1539.6084 (45)
Distribution loss (46)m = 0.15 x (45)m												

Water storage loss:	23.9437	20.9413	21.6095	18.8397	18.0772	15.5992	14.4550	16.5873	16.7854	19.5617	21.3532	23.1882 (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	0.6708	0.6086	0.6471	0.5420	0.4988	0.4121	0.3819	0.4577	0.4829	0.5857	0.6205	0.6497 (61)
Total heat required for water heating calculated for each month												
	160.2953	140.2171	144.7106	126.1401	121.0132	104.4069	96.7483	111.0396	112.3854	130.9974	142.9750	155.2374 (62)
WWHRS	-52.5899	-46.2724	-47.2270	-38.8566	-36.0790	-29.7633	-25.1894	-30.4986	-31.3885	-38.8026	-44.9478	-50.8306 eq. (G10)
Total of WWHRS savings												-472.4457
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												
	107.7054	93.9447	97.4836	87.2835	84.9342	74.6436	71.5589	80.5409	80.9970	92.1948	98.0272	104.4068 (64)
								Total per year (kWh/year) =	Sum(64)m =			1073.7206 (64)
Heat gains from water heating, kWh/month												
	53.2428	46.5720	48.0629	41.8969	40.1957	34.6813	32.1373	36.8829	37.3283	43.5083	47.4880	51.5628 (65)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

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

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													2751.1201 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	464.2162	387.4440	343.4806	222.3665	117.7079	0.0000	0.0000	0.0000	0.0000	170.9991	312.6324	462.6636	(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)	514.6521	429.5388	380.7989	246.5260	130.4966	0.0000	0.0000	0.0000	0.0000	189.5777	346.5991	512.9308	(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	107.7054	93.9447	97.4836	87.2835	84.9342	74.6436	71.5589	80.5409	80.9970	92.1948	98.0272	104.4068	(64)
Efficiency of water heater (217)m	87.2327	87.1287	86.7365	85.8300	83.8518	76.4000	76.4000	76.4000	76.4000	84.8324	86.4716	76.4000	(216)
Fuel for water heating, kWh/month	123.4691	107.8229	112.3905	101.6935	101.2908	97.7010	93.6635	105.4201	106.0170	108.6787	113.3635	119.5998	(219)
Water heating fuel used												1291.1105	(219)
Annual totals kWh/year													
Space heating fuel - main system												2751.1201	(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)												429.0080	(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												2599.7927	(238)

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

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	2751.1201	7.6100	209.3602 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1291.1105	7.6100	98.2535 (247)
Pumps and fans for heating	75.0000	31.0800	23.3100 (249)
Energy for lighting	429.0080	31.0800	133.3357 (250)
Additional standing charges			105.0000 (251)
Energy saving/generation technologies			
PV Unit	-1946.4459	31.0800	-604.9554 (252)
Total energy cost			-35.6960 (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	2751.1201	0.2160	594.2419 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1291.1105	0.2160	278.8799 (264)
Space and water heating			873.1218 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	429.0080	0.5190	222.6552 (268)
Energy saving/generation technologies			
PV Unit	-1946.4459	0.5190	-1010.2054 (269)
Total kg/year			124.4965 (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	2751.1201	1.2200	3356.3666 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1291.1105	1.2200	1575.1548 (264)
Space and water heating			4931.5214 (265)
Pumps and fans	75.0000	3.0700	230.2500 (267)
Energy for lighting	429.0080	3.0700	1317.0546 (268)
Energy saving/generation technologies			
PV Unit	-1946.4459	3.0700	-5975.5890 (269)
Primary energy kWh/year			503.2370 (272)
Primary energy kWh/m2/year			5.3366 (273)

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Built)

Property Reference	045 - PRJ013014	Issued on Date	09/05/2024
Assessment Reference	045	Prop Type Ref	3B
Property	7 Rashleigh Drive, Netley Abbey, Southampton, SO31 5JY		
SAP Rating	85 B	DER	14.40
Environmental	88 B	TER	17.61
CO ₂ Emissions (t/year)	1.13	% DER<TER	18.24
General Requirements Compliance	Pass	DfEE	44.39
		TfEE	50.66
		% DfEE<TfEE	12.38
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)	17.61	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	14.40	kgCO ₂ /m ²	Pass
	-3.21 (-18.2%)	kgCO ₂ /m ²	

1b TfEE and DfEE

Target Fabric Energy Efficiency (TfEE)	50.66	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DfEE)	44.39	kWh/m ² /yr	
	-6.3 (-12.4%)	kWh/m ² /yr	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.21 (max. 0.30)	0.21 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Floor	0.18 (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	4.62 (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

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

7.72 m², No overhang

Windows facing South

3.55 m², No overhang

Air change rate

4.65 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

4.62 (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