

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

Property Reference	030 - PRJ013014	Issued on Date	28/03/2024
Assessment Reference	030	Prop Type Ref	C
Property	22 Deeble Way, Netley Abbey, Southampton, SO31 5JP		

SAP Rating	85 B	DER	14.38	TER	17.40
Environmental	88 B	% DER<TER	17.35		
CO ₂ Emissions (t/year)	1.15	DFEE	44.35	TFEE	50.23
General Requirements Compliance	Pass	% DFEE<TFEE	11.71		

Assessor Details	Mr. Christopher Nicholls, Briary Energy Limited, Tel: 0203 397 1373, chris@briaryenergy.co.uk	Assessor ID	4299-0004
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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	47.7200 (1b)	x 2.3700 (2b)	= 113.0964 (1b) - (3b)
First floor	47.7200 (1c)	x 2.6200 (2c)	= 125.0264 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	95.4400		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 238.1228 (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							4 * 10 = 40.0000 (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) =					40.0000 / (5) =	0.1680 (8)					
Pressure test						Yes						
Measured/design AP50							4.5000					
Infiltration rate							0.3930 (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) =	0.3635 (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	0.4453	0.4180	0.4089	0.3817	0.3817	0.3726	0.3726	0.3635	0.3635	0.3908	0.3908	0.3999 (22b)
Effective ac	0.5991	0.5874	0.5836	0.5728	0.5728	0.5694	0.5694	0.5661	0.5661	0.5764	0.5764	0.5799 (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)			11.5800	1.3258	15.3390		(27)
Fir - Ground			47.7150	0.1800	8.5887	75.6000	3607.2540 (28a)
Wl - Brick (Timber Frame)	97.6560	13.6650	83.9910	0.2100	17.6381	7.4000	621.5334 (29a)
Rf - Ins Joist	47.7150		47.7150	0.0800	3.8172	7.4000	353.0910 (30)
Total net area of external elements Aum(A, m ²)			193.0810				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	47.8910		(33)
Party Wall			46.7690	0.0000	0.0000	7.4000	346.0906 (32)
Stud			74.4133			7.4000	550.6581 (32c)
Internal Floor			47.7150			7.4000	353.0910 (32d)
Internal Ceiling			47.7150			7.4000	353.0910 (32e)
Heat capacity Cm = Sum (A x k)							(28)...(30) + (32) + (32a)...(32e) = 6184.8091 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							64.8031 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							16.8602 (36)
Total fabric heat loss							(33) + (36) = 64.7512 (37)

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

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF HEAT DEMAND 09 Jan 2014

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(38)m	47.0811	46.1563	45.8610	45.0141	45.0141	44.7448	44.7448	44.4820	44.4820	45.2899	45.2899	45.5722	(38)
Heat transfer coeff	111.8323	110.9075	110.6122	109.7653	109.7653	109.4960	109.4960	109.2332	109.2332	110.0412	110.0412	110.3235	(39)
Average = Sum(39)m / 12 =												110.0622	(39)
HLP	1.1718	1.1621	1.1590	1.1501	1.1501	1.1473	1.1473	1.1445	1.1445	1.1530	1.1530	1.1559	(40)
HLP (average)												1.1532	(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													2.6931	(42)
Average daily hot water use (litres/day)													98.1614	(43)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Daily hot water use	107.9776	104.0511	100.1247	96.1982	92.2718	88.3453	88.3453	92.2718	96.1982	100.1247	104.0511	107.9776	(44)	
Energy conte	160.1276	140.0487	144.5177	125.9940	120.8942	104.3225	96.6702	110.9304	112.2553	130.8227	142.8032	155.0751	(45)	
Energy content (annual)											Total = Sum(45)m =		1544.4617	(45)
Distribution loss (46)m = 0.15 x (45)m	24.0191	21.0073	21.6777	18.8991	18.1341	15.6484	14.5005	16.6396	16.8383	19.6234	21.4205	23.2613	(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	0.6503	0.5454	0.5020	0.4147	0.3843	0.4606	0.4859	0.5887	0.6206	0.6496	(61)	
Total heat required for water heating calculated for each month	160.7984	140.6573	145.1680	126.5394	121.3962	104.7373	97.0545	111.3910	112.7412	131.4114	143.4239	155.7247	(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	160.7984	140.6573	145.1680	126.5394	121.3962	104.7373	97.0545	111.3910	112.7412	131.4114	143.4239	155.7247	(64)	
	Total per year (kWh/year) = Sum(64)m =												1551.0434	(64)
RHI water heating demand	1551													(64)
Heat gains from water heating, kWh/month	53.4101	46.7183	48.2147	42.0294	40.3228	34.7909	32.2389	36.9995	37.4464	43.6457	47.6372	51.7249	(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	161.5868	161.5868	161.5868	161.5868	161.5868	161.5868	161.5868	161.5868	161.5868	161.5868	161.5868	161.5868	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	61.0062	54.1851	44.0663	33.3610	24.9378	21.0535	22.7491	29.5701	39.6889	50.3942	58.8175	62.7017	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	371.2510	375.1034	365.3954	344.7283	318.6397	294.1202	277.7396	273.8872	283.5951	304.2623	330.3508	354.8704	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	53.8518	53.8518	53.8518	53.8518	53.8518	53.8518	53.8518	53.8518	53.8518	53.8518	53.8518	53.8518	(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)	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	(71)
Water heating gains (Table 5)	71.7878	69.5213	64.8047	58.3741	54.1974	48.3207	43.3319	49.7305	52.0089	58.6636	66.1628	69.5227	(72)
Total internal gains	614.7590	609.5239	584.9805	547.1775	508.4889	474.2085	454.5346	463.9018	486.0070	524.0342	566.0452	597.8088	(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				0.7190	13.4684		0.7300	0.7200		0.7700		3.5272 (74)	
East				3.6130	25.1733		0.7300	0.7200		0.7700		33.1281 (76)	
West				7.2440	25.1733		0.7300	0.7200		0.7700		66.4212 (80)	
Solar gains	103.0764	171.4643	287.0389	422.2167	488.8084	553.1542	508.7104	454.3190	351.8351	222.1981	128.0723	83.3488	(83)
Total gains	717.8355	780.9883	872.0194	969.3942	997.2973	1027.3627	963.2449	918.2208	837.8420	746.2322	694.1175	681.1576	(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	15.3623	15.4904	15.5318	15.6516	15.6516	15.6901	15.6901	15.7278	15.7278	15.6124	15.6124	15.5724	
alpha	2.0242	2.0327	2.0355	2.0434	2.0434	2.0460	2.0460	2.0485	2.0485	2.0408	2.0408	2.0382	
util living area													
	0.8922	0.8719	0.8234	0.7390	0.6235	0.4591	0.3419	0.3463	0.5560	0.7503	0.8548	0.8988	(86)
MIT	18.4823	18.7052	19.2189	19.8601	20.4175	20.7937	20.9240	20.9248	20.6787	20.0575	19.2234	18.4785	(87)
Th 2	19.9427	19.9505	19.9530	19.9601	19.9601	19.9624	19.9624	19.9646	19.9646	19.9578	19.9578	19.9554	(88)
util rest of house													
	0.8798	0.8574	0.8030	0.7076	0.5738	0.3849	0.2451	0.2454	0.4827	0.7110	0.8352	0.8870	(89)
MIT 2	16.6622	16.9791	17.7032	18.5930	19.3367	19.7919	19.9223	19.9263	19.6766	18.8827	17.7254	16.6621	(90)

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CALCULATION OF HEAT DEMAND 09 Jan 2014

Living area fraction									fLA = Living area / (4) =	0.1539 (91)		
MIT	16.9424	17.2448	17.9365	18.7880	19.5031	19.9461	20.0765	20.0800	19.8309	19.0635	17.9560	16.9417 (92)
Temperature adjustment												-0.1500
adjusted MIT	16.7924	17.0948	17.7865	18.6380	19.3531	19.7961	19.9265	19.9300	19.6809	18.9135	17.8060	16.7917 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.8278	0.8039	0.7489	0.6600	0.5410	0.3721	0.2415	0.2418	0.4602	0.6627	0.7810	0.8363	(94)
Useful gains	594.2551	627.8148	653.0371	639.8143	539.5533	382.2498	232.6694	222.0714	385.5711	494.5235	542.0944	569.6853	(95)
Ext temp.	5.7000	6.1000	7.7000	10.1000	13.1000	15.9000	17.7000	17.8000	15.5000	12.3000	8.8000	5.8000	(96)
Heat loss rate W													
Month fracti	1240.4836	1219.4068	1115.6912	937.1810	686.3694	426.6106	243.7877	232.6673	456.6913	727.7578	991.0283	1212.6441	(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	480.7941	397.5499	344.2147	214.1040	109.2312	0.0000	0.0000	0.0000	0.0000	173.5263	323.2324	478.3613	(98)
RHI space heating demand												2521.0138	(98)
												2521	(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	47.7200 (1b)	x 2.3700 (2b)	= 113.0964 (1b) - (3b)
First floor	47.7200 (1c)	x 2.6200 (2c)	= 125.0264 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	95.4400		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 238.1228 (5)

2. Ventilation rate

										main	secondary	other	total	m3 per hour			
										heating	heating						
Number of chimneys										0	+	0	+	0	=	0 * 40 =	0.0000 (6a)
Number of open flues										0	+	0	+	0	=	0 * 20 =	0.0000 (6b)
Number of intermittent fans																4 * 10 =	40.0000 (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) =					40.0000	/ (5) =	0.1680 (8)
Pressure test										Yes							
Measured/design AP50										4.5000							
Infiltration rate										0.3930 (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) =					0.3635 (21)		
Wind speed	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec					
Wind factor	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000	(22)				
Adj infilt rate	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750	(22a)				
	0.4635	0.4544	0.4453	0.3999	0.3908	0.3453	0.3453	0.3362	0.3635	0.3908	0.4089	0.4271	(22b)				
Effective ac	0.6074	0.6032	0.5991	0.5799	0.5764	0.5596	0.5596	0.5565	0.5661	0.5764	0.5836	0.5912	(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)			11.5800	1.3258	15.3390		(27)
Flr - Ground			47.7150	0.1800	8.5887	75.6000	3607.2540 (28a)
Wl - Brick (Timber Frame)	97.6560	13.6650	83.9910	0.2100	17.6381	7.4000	621.5334 (29a)
Rf - Ins Joist	47.7150		47.7150	0.0800	3.8172	7.4000	353.0910 (30)
Total net area of external elements Aum(A, m ²)			193.0810				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	47.8910		(33)
Party Wall			46.7690	0.0000	0.0000	7.4000	346.0906 (32)
Stud			74.4133			7.4000	550.6581 (32c)
Internal Floor			47.7150			7.4000	353.0910 (32d)
Internal Ceiling			47.7150			7.4000	353.0910 (32e)

Heat capacity Cm = Sum(A x k) (28)...(30) + (32) + (32a)...(32e) = 6184.8091 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m²K 64.8031 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K) 16.8602 (36)
Total fabric heat loss (33) + (36) = 64.7512 (37)

Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)	Jan 47.7300	Feb 47.4023	Mar 47.0811	Apr 45.5722	May 45.2899	Jun 43.9758	Jul 43.9758	Aug 43.7324	Sep 44.4820	Oct 45.2899	Nov 45.8610	Dec 46.4581 (38)
Heat transfer coeff	112.4813	112.1535	111.8323	110.3235	110.0412	108.7270	108.7270	108.4836	109.2332	110.0412	110.6122	111.2093 (39)
Average = Sum(39)m / 12 =												110.3221 (39)
HLP	Jan 1.1786	Feb 1.1751	Mar 1.1718	Apr 1.1559	May 1.1530	Jun 1.1392	Jul 1.1392	Aug 1.1367	Sep 1.1445	Oct 1.1530	Nov 1.1590	Dec 1.1652 (40)
HLP (average)												1.1559 (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												2.6931 (42)
Average daily hot water use (litres/day)												98.1614 (43)
Daily hot water use	Jan 107.9776	Feb 104.0511	Mar 100.1247	Apr 96.1982	May 92.2718	Jun 88.3453	Jul 88.3453	Aug 92.2718	Sep 96.1982	Oct 100.1247	Nov 104.0511	Dec 107.9776 (44)
Energy conte	160.1276	140.0487	144.5177	125.9940	120.8942	104.3225	96.6702	110.9304	112.2553	130.8227	142.8032	155.0751 (45)
Energy content (annual)										Total = Sum(45)m =		1544.4617 (45)
Distribution loss (46)m = 0.15 x (45)m												

Water storage loss:	24.0191	21.0073	21.6777	18.8991	18.1341	15.6484	14.5005	16.6396	16.8383	19.6234	21.4205	23.2613 (46)
Total storage loss												
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 (56)
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	0.6708	0.6086	0.6503	0.5454	0.5020	0.4147	0.3843	0.4606	0.4859	0.5887	0.6206	0.6496 (61)
WWHRS	160.7984	140.6573	145.1680	126.5394	121.3962	104.7373	97.0545	111.3910	112.7412	131.4114	143.4239	155.7247 (62)
Total of WWHRS savings	-52.8094	-46.4657	-47.4242	-39.0182	-36.2287	-29.8865	-25.2932	-30.6245	-31.5182	-38.9634	-45.1348	-51.0429 eq. (G10)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-474.4098
Output from w/h								Solar input (sum of months) = Sum(63)m =				
	107.9890	94.1916	97.7438	87.5212	85.1676	74.8508	71.7613	80.7666	81.2231	92.4480	98.2890	104.6817 (64)
Heat gains from water heating, kWh/month								Total per year (kWh/year) = Sum(64)m =				
	53.4101	46.7183	48.2147	42.0294	40.3228	34.7909	32.2389	36.9995	37.4464	43.6457	47.6372	51.7249 (65)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.8521	0.8257	0.7801	0.7057	0.6057	0.4765	0.3519	0.3859	0.5644	0.7315	0.8215	0.8611 (94)
Useful gains	592.3617	633.1363	658.6290	653.8878	590.7744	454.1085	320.2223	329.4821	444.7251	519.8512	547.3753	571.7602 (95)
Ext temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000 (96)
Heat loss rate W	1343.3282	1315.0273	1210.3531	1030.1553	806.6472	544.3411	352.9345	370.3128	578.6363	856.7977	1115.0161	1331.9598 (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	558.7191	458.2307	410.4828	270.9126	160.6094	0.0000	0.0000	0.0000	0.0000	250.6882	408.7014	565.5885 (98)
Space heating												3083.9327 (98)
Space heating per m2												32.3128 (99)
										(98) / (4) =		

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF ENERGY RATINGS 09 Jan 2014

8c. Space cooling requirement

Not applicable

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

Fraction of space heat from secondary/supplementary system (Table 11)												0.0000	(201)
Fraction of space heat from main system(s)												1.0000	(202)
Efficiency of main space heating system 1 (in %)												90.2000	(206)
Efficiency of secondary/supplementary heating system, %												0.0000	(208)
Space heating requirement												3418.9941	(211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	558.7191	458.2307	410.4828	270.9126	160.6094	0.0000	0.0000	0.0000	0.0000	250.6882	408.7014	565.5885	(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)	619.4225	508.0163	455.0807	300.3466	178.0592	0.0000	0.0000	0.0000	0.0000	277.9249	453.1057	627.0382	(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	107.9890	94.1916	97.7438	87.5212	85.1676	74.8508	71.7613	80.7666	81.2231	92.4480	98.2890	104.6817	(64)
Efficiency of water heater	87.6360	87.5050	87.1717	86.3898	84.8868	76.4000	76.4000	76.4000	76.4000	86.0141	87.1482	87.7253	(216)
(217)m	87.6360	87.5050	87.1717	86.3898	84.8868	76.4000	76.4000	76.4000	76.4000	86.0141	87.1482	87.7253	(217)
Fuel for water heating, kWh/month	123.2244	107.6414	112.1279	101.3097	100.3308	97.9723	93.9284	105.7154	106.3129	107.4800	112.7837	119.3291	(219)
Water heating fuel used												1288.1558	(219)
Annual totals kWh/year													
Space heating fuel - main system												3418.9941	(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)												430.9551	(232)
Total delivered energy for all uses												5213.1050	(238)

10a. Fuel costs - using Table 12 prices

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	3418.9941	3.4800	118.9810 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1288.1558	3.4800	44.8278 (247)
Pumps and fans for heating	75.0000	13.1900	9.8925 (249)
Energy for lighting	430.9551	13.1900	56.8430 (250)
Additional standing charges			120.0000 (251)
Total energy cost			350.5443 (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] = 1.0483 (257)
SAP value	85.3757
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	3418.9941	0.2160	738.5027 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1288.1558	0.2160	278.2417 (264)
Space and water heating			1016.7444 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	430.9551	0.5190	223.6657 (268)
Total kg/year			1279.3351 (272)
CO2 emissions per m2			13.4000 (273)
EI value			87.7933
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	$3.48 / 0.8334 = 4.176$, stars = 5
Water heating environmental impact	$0.216 / 0.8334 = 0.2592$, 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	47.7200 (1b)	x 2.3700 (2b)	= 113.0964 (1b) - (3b)
First floor	47.7200 (1c)	x 2.6200 (2c)	= 125.0264 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	95.4400		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 238.1228 (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					4 * 10 = 40.0000 (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) =				40.0000 / (5) = 0.1680 (8)
Pressure test					Yes
Measured/design AP50					4.5000
Infiltration rate					0.3930 (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) =				0.3635 (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	0.4453	0.4180	0.4089	0.3817	0.3817	0.3726	0.3726	0.3635	0.3635	0.3908	0.3908	0.3999 (22b)
Effective ac	0.5991	0.5874	0.5836	0.5728	0.5728	0.5694	0.5694	0.5661	0.5661	0.5764	0.5764	0.5799 (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)			11.5800	1.3258	15.3390		(27)
Flr - Ground			47.7150	0.1800	8.5887	75.6000	3607.2540 (28a)
Wl - Brick (Timber Frame)	97.6560	13.6650	83.9910	0.2100	17.6381	7.4000	621.5334 (29a)
Rf - Ins Joist	47.7150		47.7150	0.0800	3.8172	7.4000	353.0910 (30)
Total net area of external elements Aum(A, m ²)			193.0810				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	47.8910		(33)
Party Wall			46.7690	0.0000	0.0000	7.4000	346.0906 (32)
Stud			74.4133			7.4000	550.6581 (32c)
Internal Floor			47.7150			7.4000	353.0910 (32d)
Internal Ceiling			47.7150			7.4000	353.0910 (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	47.0811	46.1563	45.8610	45.0141	45.0141	44.7448	44.7448	44.4820	44.4820	45.2899	45.2899	45.5722 (38)
Heat transfer coeff	111.8323	110.9075	110.6122	109.7653	109.7653	109.4960	109.4960	109.2332	109.2332	110.0412	110.0412	110.3235 (39)
Average = Sum(39)m / 12 =												110.0622 (39)
HLP	1.1718	1.1621	1.1590	1.1501	1.1501	1.1473	1.1473	1.1445	1.1445	1.1530	1.1530	1.1559 (40)
HLP (average)												1.1532 (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												2.6931 (42)
Average daily hot water use (litres/day)												98.1614 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Energy conte	107.9776	104.0511	100.1247	96.1982	92.2718	88.3453	88.3453	92.2718	96.1982	100.1247	104.0511	107.9776 (44)
Energy content (annual)	160.1276	140.0487	144.5177	125.9940	120.8942	104.3225	96.6702	110.9304	112.2553	130.8227	142.8032	155.0751 (45)
Distribution loss (46)m = 0.15 x (45)m												1544.4617 (45)

Water storage loss:	24.0191	21.0073	21.6777	18.8991	18.1341	15.6484	14.5005	16.6396	16.8383	19.6234	21.4205	23.2613 (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	0.6503	0.5454	0.5020	0.4147	0.3843	0.4606	0.4859	0.5887	0.6206	0.6496 (61)	
Total heat required for water heating calculated for each month													
	160.7984	140.6573	145.1680	126.5394	121.3962	104.7373	97.0545	111.3910	112.7412	131.4114	143.4239	155.7247 (62)	
WWHRS	-52.8094	-46.4657	-47.4242	-39.0182	-36.2287	-29.8865	-25.2932	-30.6245	-31.5182	-38.9634	-45.1348	-51.0429 eq. (G10)	
Total of WWHRS savings												-474.4098	
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	107.9890	94.1916	97.7438	87.5212	85.1676	74.8508	71.7613	80.7666	81.2231	92.4480	98.2890	104.6817 (64)	
								Total per year	(kWh/year) = Sum(64)m =				1076.6336 (64)
Heat gains from water heating, kWh/month													
	53.4101	46.7183	48.2147	42.0294	40.3228	34.7909	32.2389	36.9995	37.4464	43.6457	47.6372	51.7249 (65)	

Metabolic gains (Table 5), Watts												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(66)m	161.5868	161.5868	161.5868	161.5868	161.5868	161.5868	161.5868	161.5868	161.5868	161.5868	161.5868	161.5868 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	61.0062	54.1851	44.0663	33.3610	24.9378	21.0535	22.7491	29.5701	39.6889	50.3942	58.8175	62.7017 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	371.2510	375.1034	365.3954	344.7283	318.6397	294.1202	277.7396	273.8872	283.5951	304.2623	330.3508	354.8704 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	53.8518	53.8518	53.8518	53.8518	53.8518	53.8518	53.8518	53.8518	53.8518	53.8518	53.8518	53.8518 (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)	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245	-107.7245 (71)
Water heating gains (Table 5)	71.7878	69.5213	64.8047	58.3741	54.1974	48.3207	43.3319	49.7305	52.0089	58.6636	66.1628	69.5227 (72)
Total internal gains	614.7590	609.5239	584.9805	547.1775	508.4889	474.2085	454.5346	463.9018	486.0070	524.0342	566.0452	597.8088 (73)

[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	0.7190	13.4684	0.7300	0.7200	0.7700	3.5272 (74)
East	3.6130	25.1733	0.7300	0.7200	0.7700	33.1281 (76)
West	7.2440	25.1733	0.7300	0.7200	0.7700	66.4212 (80)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.8278	0.8039	0.7489	0.6600	0.5410	0.3721	0.2415	0.2418	0.4602	0.6627	0.7810	0.8363 (94)
Useful gains	594.2551	627.8148	653.0371	639.8143	539.5533	382.2498	232.6694	222.0714	385.5711	494.5235	542.0944	569.6853 (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												
	1240.4836	1219.4068	1115.6912	937.1810	686.3694	426.6106	243.7877	232.6673	456.6913	727.7578	991.0283	1212.6441 (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												
	480.7941	397.5499	344.2147	214.1040	109.2312	0.0000	0.0000	0.0000	0.0000	173.5263	323.2324	478.3613 (98)
Space heating												
												2521.0138 (98)
Space heating per m2												
											(98) / (4) =	26.4146 (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													2794.9156 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	480.7941	397.5499	344.2147	214.1040	109.2312	0.0000	0.0000	0.0000	0.0000	173.5263	323.2324	478.3613	(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)	533.0311	440.7426	381.6127	237.3659	121.0989	0.0000	0.0000	0.0000	0.0000	192.3795	358.3508	530.3341	(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	107.9890	94.1916	97.7438	87.5212	85.1676	74.8508	71.7613	80.7666	81.2231	92.4480	98.2890	104.6817	(64)
Efficiency of water heater (217)m	87.3076	87.1836	86.7351	85.7079	83.5855	76.4000	76.4000	76.4000	76.4000	84.8715	86.5545	87.3666	(216)
Fuel for water heating, kWh/month	123.6879	108.0383	112.6923	102.1157	101.8928	97.9723	93.9284	105.7154	106.3129	108.9270	113.5574	119.8189	(219)
Water heating fuel used												1294.6592	(219)
Annual totals kWh/year													
Space heating fuel - main system												2794.9156	(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)													430.9551 (232)
Total delivered energy for all uses													4595.5299 (238)

10a. Fuel costs - using BEDF prices (538)

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	2794.9156	7.6100	212.6931 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1294.6592	7.6100	98.5236 (247)
Pumps and fans for heating	75.0000	31.0800	23.3100 (249)
Energy for lighting	430.9551	31.0800	133.9408 (250)
Additional standing charges			105.0000 (251)
Total energy cost			573.4675 (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	2794.9156	0.2160	603.7018 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1294.6592	0.2160	279.6464 (264)
Space and water heating			883.3482 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	430.9551	0.5190	223.6657 (268)
Total kg/year			1145.9388 (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	2794.9156	1.2200	3409.7970 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1294.6592	1.2200	1579.4843 (264)
Space and water heating			4989.2812 (265)
Pumps and fans	75.0000	3.0700	230.2500 (267)
Energy for lighting	430.9551	3.0700	1323.0321 (268)
Primary energy kWh/year			6542.5634 (272)
Primary energy kWh/m2/year			68.5516 (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	Already installed
F	Not considered
G	Not considered
H	Not considered
I	Not considered
J	Not considered
K	Not considered
M	Not considered
N Solar water heating	SAP increase too small
O	Not considered
P	Not considered
R	Not considered
S	Not considered
T	Not considered
U Solar photovoltaic panels	Recommended
A2	Not considered
A3	Not considered
T2	Not considered
W	Not considered
X	Not considered
Y	Not considered
J2	Not considered
Q2	Not considered
Z1	Not considered
Z2	Not considered
Z3	Not considered
Z4	Not considered
Z5	Not considered
V2 Wind turbine	Not applicable
L2	Not considered
Q3	Not considered
O3	Not considered

Recommended measures:	SAP change	Cost change	CO2 change
U Solar photovoltaic panels	+ 9.5	-£ 605	-1010 kg (88.2%)

Measures omitted - SAP change or cost saving too small:	SAP change	Cost change	CO2 change
N Solar water heating	+ 0.9	-£ 46	-148 kg (12.9%)

Recommended measures	Typical annual savings		Energy efficiency	Environmental impact
Solar photovoltaic panels	£605	10.58 kg/m²	A 95	A 96
Total Savings	£605	10.58 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 538 TEST (29 Feb 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	£416	£416	£0
Space heating	£341	£341	£0
Water heating	£99	£99	£0
Lighting	£134	£134	£0
Generated (PV)	-£0	-£605	£605
Total cost of fuels	£573	-£32	£605
Total cost of uses	£574	-£31	£605
Delivered energy	48 kWh/m²	28 kWh/m²	20 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	6 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	47.7200 (1b)	x 2.3700 (2b)	= 113.0964 (1b) - (3b)
First floor	47.7200 (1c)	x 2.6200 (2c)	= 125.0264 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	95.4400		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 238.1228 (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					4 * 10 = 40.0000 (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) =					40.0000 / (5) = 0.1680 (8)
Pressure test					Yes
Measured/design AP50					4.5000
Infiltration rate					0.3930 (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) =	0.3635 (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	0.4635	0.4544	0.4453	0.3999	0.3908	0.3453	0.3453	0.3362	0.3635	0.3908	0.4089	0.4271 (22b)
Effective ac	0.6074	0.6032	0.5991	0.5799	0.5764	0.5596	0.5596	0.5565	0.5661	0.5764	0.5836	0.5912 (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)			11.5800	1.3258	15.3390		(27)
Flr - Ground			47.7150	0.1800	8.5887	75.6000	3607.2540 (28a)
Wl - Brick (Timber Frame)	97.6560	13.6650	83.9910	0.2100	17.6381	7.4000	621.5334 (29a)
Rf - Ins Joist	47.7150		47.7150	0.0800	3.8172	7.4000	353.0910 (30)
Total net area of external elements Aum(A, m ²)			193.0810				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	47.8910		(33)
Party Wall			46.7690	0.0000	0.0000	7.4000	346.0906 (32)
Stud			74.4133			7.4000	550.6581 (32c)
Internal Floor			47.7150			7.4000	353.0910 (32d)
Internal Ceiling			47.7150			7.4000	353.0910 (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	47.7300	47.4023	47.0811	45.5722	45.2899	43.9758	43.9758	43.7324	44.4820	45.2899	45.8610	46.4581 (38)
Heat transfer coeff	112.4813	112.1535	111.8323	110.3235	110.0412	108.7270	108.7270	108.4836	109.2332	110.0412	110.6122	111.2093 (39)
Average = Sum(39)m / 12 =												110.3221 (39)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.1786	1.1751	1.1718	1.1559	1.1530	1.1392	1.1392	1.1367	1.1445	1.1530	1.1590	1.1652 (40)
HLP (average)												1.1559 (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												2.6931 (42)
Average daily hot water use (litres/day)												98.1614 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Energy conte	107.9776	104.0511	100.1247	96.1982	92.2718	88.3453	88.3453	92.2718	96.1982	100.1247	104.0511	107.9776 (44)
Energy content (annual)	160.1276	140.0487	144.5177	125.9940	120.8942	104.3225	96.6702	110.9304	112.2553	130.8227	142.8032	155.0751 (45)
Distribution loss (46)m = 0.15 x (45)m												1544.4617 (45)

Water storage loss:	24.0191	21.0073	21.6777	18.8991	18.1341	15.6484	14.5005	16.6396	16.8383	19.6234	21.4205	23.2613 (46)
Total storage loss												
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 (56)
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	0.6708	0.6086	0.6503	0.5454	0.5020	0.4147	0.3843	0.4606	0.4859	0.5887	0.6206	0.6496 (61)
WWHRS	160.7984	140.6573	145.1680	126.5394	121.3962	104.7373	97.0545	111.3910	112.7412	131.4114	143.4239	155.7247 (62)
Total of WWHRS savings	-52.8094	-46.4657	-47.4242	-39.0182	-36.2287	-29.8865	-25.2932	-30.6245	-31.5182	-38.9634	-45.1348	-51.0429 eq. (G10)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-474.4098
Output from w/h								Solar input (sum of months) = Sum(63)m =				
	107.9890	94.1916	97.7438	87.5212	85.1676	74.8508	71.7613	80.7666	81.2231	92.4480	98.2890	104.6817 (64)
Heat gains from water heating, kWh/month								Total per year (kWh/year) = Sum(64)m =				
	53.4101	46.7183	48.2147	42.0294	40.3228	34.7909	32.2389	36.9995	37.4464	43.6457	47.6372	51.7249 (65)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.8521	0.8257	0.7801	0.7057	0.6057	0.4765	0.3519	0.3859	0.5644	0.7315	0.8215	0.8611 (94)
Useful gains	592.3617	633.1363	658.6290	653.8878	590.7744	454.1085	320.2223	329.4821	444.7251	519.8512	547.3753	571.7602 (95)
Ext temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000 (96)
Heat loss rate W	1343.3282	1315.0273	1210.3531	1030.1553	806.6472	544.3411	352.9345	370.3128	578.6363	856.7977	1115.0161	1331.9598 (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	558.7191	458.2307	410.4828	270.9126	160.6094	0.0000	0.0000	0.0000	0.0000	250.6882	408.7014	565.5885 (98)
Space heating												3083.9327 (98)
Space heating per m2												32.3128 (99)
										(98) / (4) =		

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF ENERGY RATINGS FOR IMPROVED DWELLING 09 Jan 2014

8c. Space cooling requirement

Not applicable

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

Fraction of space heat from secondary/supplementary system (Table 11)													0.0000 (201)
Fraction of space heat from main system(s)													1.0000 (202)
Efficiency of main space heating system 1 (in %)													90.2000 (206)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
Space heating requirement													3418.9941 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	558.7191	458.2307	410.4828	270.9126	160.6094	0.0000	0.0000	0.0000	0.0000	250.6882	408.7014	565.5885	(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)	619.4225	508.0163	455.0807	300.3466	178.0592	0.0000	0.0000	0.0000	0.0000	277.9249	453.1057	627.0382	(211)
Water heating requirement	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(215)
Water heating													
Water heating requirement	107.9890	94.1916	97.7438	87.5212	85.1676	74.8508	71.7613	80.7666	81.2231	92.4480	98.2890	104.6817	(64)
Efficiency of water heater (217)m	87.6360	87.5050	87.1717	86.3898	84.8868	76.4000	76.4000	76.4000	76.4000	86.0141	87.1482	87.7253	(216)
Fuel for water heating, kWh/month	123.2244	107.6414	112.1279	101.3097	100.3308	97.9723	93.9284	105.7154	106.3129	107.4800	112.7837	119.3291	(219)
Water heating fuel used												1288.1558	(219)
Annual totals kWh/year													
Space heating fuel - main system												3418.9941	(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)													430.9551 (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												3485.8656	(238)

10a. Fuel costs - using Table 12 prices

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	3418.9941	3.4800	118.9810 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1288.1558	3.4800	44.8278 (247)
Pumps and fans for heating	75.0000	13.1900	9.8925 (249)
Energy for lighting	430.9551	13.1900	56.8430 (250)
Additional standing charges			120.0000 (251)
Energy saving/generation technologies			
PV Unit	-1727.2394	13.1900	-227.8229 (252)
Total energy cost			122.7214 (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] =	0.3670 (257)
SAP value		94.8802
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	3418.9941	0.2160	738.5027 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1288.1558	0.2160	278.2417 (264)
Space and water heating			1016.7444 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	430.9551	0.5190	223.6657 (268)
Energy saving/generation technologies			
PV Unit	-1727.2394	0.5190	-896.4372 (269)
Total kg/year			382.8978 (272)
CO2 emissions per m2			4.0100 (273)
EI value			96.3466
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	47.7200 (1b)	x 2.3700 (2b)	= 113.0964 (1b) - (3b)
First floor	47.7200 (1c)	x 2.6200 (2c)	= 125.0264 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	95.4400		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 238.1228 (5)

2. Ventilation rate

										main	secondary	other	total	m3 per hour			
										heating	heating						
Number of chimneys										0	+	0	+	0	=	0 * 40 =	0.0000 (6a)
Number of open flues										0	+	0	+	0	=	0 * 20 =	0.0000 (6b)
Number of intermittent fans																4 * 10 =	40.0000 (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) =										40.0000 / (5) =							0.1680 (8)
Pressure test										Yes							
Measured/design AP50																	4.5000
Infiltration rate																	0.3930 (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) =							0.3635 (21)
Wind speed	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec					
Wind factor	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)				
Adj infilt rate	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)				
	0.4453	0.4180	0.4089	0.3817	0.3817	0.3726	0.3726	0.3635	0.3635	0.3908	0.3908	0.3999	(22b)				
Effective ac	0.5991	0.5874	0.5836	0.5728	0.5728	0.5694	0.5694	0.5661	0.5661	0.5764	0.5764	0.5799	(25)				

3. Heat losses and heat loss parameter

Element	Gross m2		Openings m2		NetArea m2		U-value W/m2K		A x U W/K		K-value kJ/m2K		A x K kJ/K		
Solid Door					2.0900		1.2000		2.5080				(26)		
Windows (Uw = 1.40)					11.5800		1.3258		15.3390				(27)		
Flr - Ground					47.7150		0.1800		8.5887		75.6000		3607.2540 (28a)		
Wl - Brick (Timber Frame)	97.6560		13.6650		83.9910		0.2100		17.6381		7.4000		621.5334 (29a)		
Rf - Ins Joist	47.7150				47.7150		0.0800		3.8172		7.4000		353.0910 (30)		
Total net area of external elements Aum(A, m2)					193.0810								(31)		
Fabric heat loss, W/K = Sum (A x U)					(26) ... (30) + (32) =		47.8910						(33)		
Party Wall					46.7690		0.0000		0.0000		7.4000		346.0906 (32)		
Stud					74.4133						7.4000		550.6581 (32c)		
Internal Floor					47.7150						7.4000		353.0910 (32d)		
Internal Ceiling					47.7150						7.4000		353.0910 (32e)		
Heat capacity Cm = Sum(A x k)													(28) ... (30) + (32) + (32a) ... (32e) = 6184.8091 (34)		
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K													64.8031 (35)		
Thermal bridges (Sum(L x Psi) calculated using Appendix K)													16.8602 (36)		
Total fabric heat loss											(33) + (36) =		64.7512 (37)		
Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)															
(38)m	47.0811	46.1563	45.8610	45.0141	45.0141	44.7448	44.7448	44.4820	44.4820	45.2899	45.2899	45.5722	(38)		
Heat transfer coeff															
	111.8323	110.9075	110.6122	109.7653	109.7653	109.4960	109.4960	109.2332	109.2332	110.0412	110.0412	110.3235	(39)		
Average = Sum(39)m / 12 =															
	110.0622	(39)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
HLP	1.1718	1.1621	1.1590	1.1501	1.1501	1.1473	1.1473	1.1445	1.1445	1.1530	1.1530	1.1559	(40)		
HLP (average)															
	1.1532 (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												2.6931 (42)
Average daily hot water use (litres/day)												98.1614 (43)
Daily hot water use	Jan 107.9776	Feb 104.0511	Mar 100.1247	Apr 96.1982	May 92.2718	Jun 88.3453	Jul 88.3453	Aug 92.2718	Sep 96.1982	Oct 100.1247	Nov 104.0511	Dec 107.9776 (44)
Energy conte	160.1276	140.0487	144.5177	125.9940	120.8942	104.3225	96.6702	110.9304	112.2553	130.8227	142.8032	155.0751 (45)
Energy content (annual)												Total = Sum(45)m = 1544.4617 (45)
Distribution loss (46)m = 0.15 x (45)m												

Water storage loss:	24.0191	21.0073	21.6777	18.8991	18.1341	15.6484	14.5005	16.6396	16.8383	19.6234	21.4205	23.2613 (46)
Total storage loss												
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 (56)
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	0.6708	0.6086	0.6503	0.5454	0.5020	0.4147	0.3843	0.4606	0.4859	0.5887	0.6206	0.6496 (61)
WWHRS	160.7984	140.6573	145.1680	126.5394	121.3962	104.7373	97.0545	111.3910	112.7412	131.4114	143.4239	155.7247 (62)
Total of WWHRS savings	-52.8094	-46.4657	-47.4242	-39.0182	-36.2287	-29.8865	-25.2932	-30.6245	-31.5182	-38.9634	-45.1348	-51.0429 eq. (G10)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-474.4098
Output from w/h								Solar input (sum of months) = Sum(63)m =				
	107.9890	94.1916	97.7438	87.5212	85.1676	74.8508	71.7613	80.7666	81.2231	92.4480	98.2890	104.6817 (64)
								Total per year (kWh/year) = Sum(64)m =				
Heat gains from water heating, kWh/month	53.4101	46.7183	48.2147	42.0294	40.3228	34.7909	32.2389	36.9995	37.4464	43.6457	47.6372	51.7249 (65)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.8278	0.8039	0.7489	0.6600	0.5410	0.3721	0.2415	0.2418	0.4602	0.6627	0.7810	0.8363 (94)
Useful gains	594.2551	627.8148	653.0371	639.8143	539.5533	382.2498	232.6694	222.0714	385.5711	494.5235	542.0944	569.6853 (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	1240.4836	1219.4068	1115.6912	937.1810	686.3694	426.6106	243.7877	232.6673	456.6913	727.7578	991.0283	1212.6441 (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	480.7941	397.5499	344.2147	214.1040	109.2312	0.0000	0.0000	0.0000	0.0000	173.5263	323.2324	478.3613 (98)
Space heating												2521.0138 (98)
Space heating per m2												26.4146 (99)
										(98) / (4) =		

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

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

8c. Space cooling requirement

Not applicable

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

Fraction of space heat from secondary/supplementary system (Table 11)													0.0000 (201)
Fraction of space heat from main system(s)													1.0000 (202)
Efficiency of main space heating system 1 (in %)													90.2000 (206)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
Space heating requirement													2794.9156 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	480.7941	397.5499	344.2147	214.1040	109.2312	0.0000	0.0000	0.0000	0.0000	173.5263	323.2324	478.3613	(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)	533.0311	440.7426	381.6127	237.3659	121.0989	0.0000	0.0000	0.0000	0.0000	192.3795	358.3508	530.3341	(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	107.9890	94.1916	97.7438	87.5212	85.1676	74.8508	71.7613	80.7666	81.2231	92.4480	98.2890	104.6817	(64)
Efficiency of water heater (217)m	87.3076	87.1836	86.7351	85.7079	83.5855	76.4000	76.4000	76.4000	76.4000	84.8715	86.5545	76.4000	(216)
Fuel for water heating, kWh/month	123.6879	108.0383	112.6923	102.1157	101.8928	97.9723	93.9284	105.7154	106.3129	108.9270	113.5574	119.8189	(219)
Water heating fuel used													1294.6592 (219)
Annual totals kWh/year													
Space heating fuel - main system													2794.9156 (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)													430.9551 (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													2649.0839 (238)

10a. Fuel costs - using BEDF prices (538)

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	2794.9156	7.6100	212.6931 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1294.6592	7.6100	98.5236 (247)
Pumps and fans for heating	75.0000	31.0800	23.3100 (249)
Energy for lighting	430.9551	31.0800	133.9408 (250)
Additional standing charges			105.0000 (251)
Energy saving/generation technologies			
PV Unit	-1946.4459	31.0800	-604.9554 (252)
Total energy cost			-31.4879 (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	2794.9156	0.2160	603.7018 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1294.6592	0.2160	279.6464 (264)
Space and water heating			883.3482 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	430.9551	0.5190	223.6657 (268)
Energy saving/generation technologies			
PV Unit	-1946.4459	0.5190	-1010.2054 (269)
Total kg/year			135.7334 (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	2794.9156	1.2200	3409.7970 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1294.6592	1.2200	1579.4843 (264)
Space and water heating			4989.2812 (265)
Pumps and fans	75.0000	3.0700	230.2500 (267)
Energy for lighting	430.9551	3.0700	1323.0321 (268)
Energy saving/generation technologies			
PV Unit	-1946.4459	3.0700	-5975.5890 (269)
Primary energy kWh/year			566.9744 (272)
Primary energy kWh/m2/year			5.9406 (273)

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Built)

Property Reference	030 - PRJ013014	Issued on Date	28/03/2024
Assessment Reference	030	Prop Type Ref	C
Property	22 Deeble Way, Netley Abbey, Southampton, SO31 5JP		
SAP Rating	85 B	DER	14.38
Environmental	88 B	% DER<TER	17.35
CO ₂ Emissions (t/year)	1.15	DFEE	44.35
General Requirements Compliance	Pass	% DFEE<TFEE	11.71
Assessor Details	Mr. Christopher Nicholls, Briary Energy Limited, Tel: 0203 397 1373, chris@briaryenergy.co.uk		Assessor ID
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)	17.40	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	14.38	kgCO ₂ /m ²	Pass
	-3.02 (-17.4%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	50.23	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	44.35	kWh/m ² /yr	
	-5.9 (-11.8%)	kWh/m ² /yr	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.21 (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	4.50 (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

0.72 m², No overhang

Windows facing East

3.61 m², No overhang

Windows facing West

7.24 m², No overhang

Air change rate

4.68 ach

Blinds/curtains

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

Criterion 4 – Building performance consistent with DER and DFEE rate

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

4.50 (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

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