

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

Property Reference	019 - PRJ013014	Issued on Date	28/03/2024
Assessment Reference	019	Prop Type Ref	2B
Property	3 Deeble Way, Netley Abbey, Southampton, SO31 5JP		

SAP Rating	85 B	DER	15.18	TER	18.52
Environmental	88 B	% DER<TER	18.06		
CO ₂ Emissions (t/year)	1.04	DFEE	45.80	TFEE	51.59
General Requirements Compliance	Pass	% DFEE<TFEE	11.21		

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	40.9100 (1b)	x 2.3700 (2b)	= 96.9567 (1b) - (3b)
First floor	40.9100 (1c)	x 2.6200 (2c)	= 107.1842 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	81.8200		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 204.1409 (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) =	0.1470 (8)			
Pressure test								Yes				
Measured/design AP50									4.6600			
Infiltration rate									0.3800 (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) =	0.3515 (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	0.4305	0.4042	0.3954	0.3690	0.3690	0.3602	0.3602	0.3515	0.3515	0.3778	0.3778	0.3866 (22b)
Effective ac	0.5927	0.5817	0.5782	0.5681	0.5681	0.5649	0.5649	0.5618	0.5618	0.5714	0.5714	0.5747 (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)			9.0800	1.3258	12.0379		(27)
Flr - Ground			40.9120	0.1800	7.3642	75.6000	3092.9472 (28a)
Wl - Brick (Timber Frame)	90.3710	11.1690	79.2020	0.2100	16.6324	7.4000	586.0948 (29a)
Rf - Ins Joist	40.9120		40.9120	0.0800	3.2730	7.4000	302.7488 (30)
Total net area of external elements Aum(A, m ²)			172.1960				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	41.8154		(33)
Party Wall			46.2040	0.0000	0.0000	7.4000	341.9096 (32)
Stud			70.7018			7.4000	523.1936 (32c)
Internal Floor			40.9120			7.4000	302.7488 (32d)
Internal Ceiling			40.9120			7.4000	302.7488 (32e)
Heat capacity Cm = Sum (A x k)							(28)...(30) + (32) + (32a)...(32e) = 5452.3916 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							66.6389 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							15.3835 (36)
Total fabric heat loss							(33) + (36) = 57.1989 (37)

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

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(38)m	Jan 39.9269	Feb 39.1858	Mar 38.9491	Apr 38.2704	May 38.2704	Jun 38.0546	Jul 38.0546	Aug 37.8440	Sep 37.8440	Oct 38.4915	Nov 38.4915	Dec 38.7177 (38)
Heat transfer coeff	97.1258	96.3847	96.1481	95.4693	95.4693	95.2535	95.2535	95.0429	95.0429	95.6904	95.6904	95.9166 (39)
Average = Sum(39)m / 12 =												95.7073 (39)
HLP	Jan 1.1871	Feb 1.1780	Mar 1.1751	Apr 1.1668	May 1.1668	Jun 1.1642	Jul 1.1642	Aug 1.1616	Sep 1.1616	Oct 1.1695	Nov 1.1695	Dec 1.1723 (40)
HLP (average)												1.1697 (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												2.4965 (42)
Average daily hot water use (litres/day)												93.4916 (43)
Daily hot water use	Jan 102.8407	Feb 99.1011	Mar 95.3614	Apr 91.6217	May 87.8821	Jun 84.1424	Jul 84.1424	Aug 87.8821	Sep 91.6217	Oct 95.3614	Nov 99.1011	Dec 102.8407 (44)
Energy conte	152.5098	133.3861	137.6425	120.0000	115.1429	99.3596	92.0712	105.6531	106.9149	124.5990	136.0096	147.6976 (45)
Energy content (annual)										Total = Sum(45)m =		1470.9864 (45)
Distribution loss (46)m = 0.15 x (45)m	22.8765	20.0079	20.6464	18.0000	17.2714	14.9039	13.8107	15.8480	16.0372	18.6899	20.4014	22.1546 (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	0.6702	0.5948	0.5907	0.4948	0.4554	0.3762	0.3486	0.4178	0.4408	0.5347	0.6065	0.6490 (61)
Total heat required for water heating calculated for each month	153.1800	133.9809	138.2331	120.4948	115.5983	99.7358	92.4199	106.0709	107.3557	125.1337	136.6161	148.3467 (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	153.1800	133.9809	138.2331	120.4948	115.5983	99.7358	92.4199	106.0709	107.3557	125.1337	136.6161	148.3467 (64)
RHI water heating demand										Total per year (kWh/year) = Sum(64)m =		1477.1660 (64)
Heat gains from water heating, kWh/month	50.8771	44.4996	45.9138	40.0237	38.3989	33.1311	30.7008	35.2341	35.6594	41.5629	45.3748	49.2717 (65)

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

Metabolic gains (Table 5), Watts	Jan 149.7892	Feb 149.7892	Mar 149.7892	Apr 149.7892	May 149.7892	Jun 149.7892	Jul 149.7892	Aug 149.7892	Sep 149.7892	Oct 149.7892	Nov 149.7892	Dec 149.7892 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	55.8308	49.5885	40.3280	30.5309	22.8222	19.2675	20.8192	27.0616	36.3220	46.1191	53.8278	57.3825 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	333.1376	336.5945	327.8832	309.3378	285.9275	263.9252	249.2263	245.7693	254.4807	273.0261	296.4364	318.4387 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	52.4754	52.4754	52.4754	52.4754	52.4754	52.4754	52.4754	52.4754	52.4754	52.4754	52.4754	52.4754 (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)	-99.8595	-99.8595	-99.8595	-99.8595	-99.8595	-99.8595	-99.8595	-99.8595	-99.8595	-99.8595	-99.8595	-99.8595 (71)
Water heating gains (Table 5)	68.3832	66.2196	61.7121	55.5885	51.6114	46.0154	41.2646	47.3577	49.5270	55.8641	63.0206	66.2254 (72)
Total internal gains	562.7568	557.8078	535.3285	500.8623	465.7663	434.6133	416.7152	425.5938	445.7348	480.4144	518.6899	547.4518 (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			
Southeast				2.7240	45.0642	0.7300	0.7200	0.7700	44.7123 (77)			
Northwest				6.3550	14.6130	0.7300	0.7200	0.7700	33.8255 (81)			
Solar gains	78.5379	123.8216	199.1239	293.4539	347.8662	399.4431	364.9442	318.4939	243.0489	157.2851	95.8917	64.7126 (83)
Total gains	641.2946	681.6294	734.4523	794.3163	813.6325	834.0564	781.6594	744.0876	688.7837	637.6995	614.5816	612.1645 (84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)												21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)												
tau	Jan 15.5937	Feb 15.7136	Mar 15.7523	Apr 15.8643	May 15.8643	Jun 15.9002	Jul 15.9002	Aug 15.9355	Sep 15.9355	Oct 15.8276	Nov 15.8276	Dec 15.7903
alpha	2.0396	2.0476	2.0502	2.0576	2.0576	2.0600	2.0600	2.0624	2.0624	2.0552	2.0552	2.0527
util living area	0.8890	0.8726	0.8326	0.7585	0.6471	0.4837	0.3629	0.3679	0.5773	0.7571	0.8526	0.8949 (86)
MIT	18.5377	18.7294	19.1969	19.8117	20.3825	20.7764	20.9168	20.9174	20.6600	20.0528	19.2570	18.5376 (87)
Th 2	19.9304	19.9376	19.9400	19.9466	19.9466	19.9488	19.9488	19.9508	19.9508	19.9445	19.9445	19.9422 (88)
util rest of house	0.8760	0.8579	0.8125	0.7277	0.5971	0.4064	0.2599	0.2606	0.5023	0.7176	0.8324	0.8825 (89)
MIT 2	16.7273	17.0006	17.6618	18.5192	19.2848	19.7643	19.9053	19.9092	19.6464	18.8660	17.7596	16.7324 (90)
Living area fraction									fLA = Living area / (4) =			0.1678 (91)

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MIT	17.0311	17.2907	17.9194	18.7361	19.4690	19.9341	20.0750	20.0784	19.8165	19.0651	18.0109	17.0353 (92)
Temperature adjustment												-0.1500
adjusted MIT	16.8811	17.1407	17.7694	18.5861	19.3190	19.7841	19.9250	19.9284	19.6665	18.9151	17.8609	16.8853 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.8248	0.8056	0.7594	0.6796	0.5630	0.3931	0.2575	0.2581	0.4793	0.6702	0.7794	0.8323 (94)	
Useful gains	528.9565	549.1131	557.7438	539.7939	458.0377	327.8988	201.2419	192.0642	330.1561	427.3843	478.9759	509.5140 (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													
	1085.9773	1064.1547	968.1563	810.1614	593.7277	369.9740	211.9400	202.2909	395.9918	633.0028	867.0405	1063.2657 (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													
	414.4235	346.1079	305.3469	194.6646	100.9534	0.0000	0.0000	0.0000	0.0000	152.9801	279.4065	411.9913 (98)	
Space heating													2205.8741 (98)
RHI space heating demand													2206 (98)

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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	40.9100 (1b)	x 2.3700 (2b)	= 96.9567 (1b) - (3b)
First floor	40.9100 (1c)	x 2.6200 (2c)	= 107.1842 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	81.8200		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 204.1409 (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) = 0.1470 (8)
Pressure test					Yes
Measured/design AP50					4.6600
Infiltration rate					0.3800 (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) =	0.3515 (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	0.4481	0.4393	0.4305	0.3866	0.3778	0.3339	0.3339	0.3251	0.3515	0.3778	0.3954	0.4130 (22b)
Effective ac	0.6004	0.5965	0.5927	0.5747	0.5714	0.5557	0.5557	0.5528	0.5618	0.5714	0.5782	0.5853 (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)			9.0800	1.3258	12.0379		(27)
Flr - Ground			40.9120	0.1800	7.3642	75.6000	3092.9472 (28a)
Wl - Brick (Timber Frame)	90.3710	11.1690	79.2020	0.2100	16.6324	7.4000	586.0948 (29a)
Rf - Ins Joist	40.9120		40.9120	0.0800	3.2730	7.4000	302.7488 (30)
Total net area of external elements Aum(A, m ²)			172.1960				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	41.8154		(33)
Party Wall			46.2040	0.0000	0.0000	7.4000	341.9096 (32)
Stud			70.7018			7.4000	523.1936 (32c)
Internal Floor			40.9120			7.4000	302.7488 (32d)
Internal Ceiling			40.9120			7.4000	302.7488 (32e)
Heat capacity Cm = Sum(A x k)							(28)...(30) + (32) + (32a)...(32e) = 5452.3916 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							66.6389 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							15.3835 (36)
Total fabric heat loss							(33) + (36) = 57.1989 (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	40.4470	40.1844	39.9269	38.7177	38.4915	37.4383	37.4383	37.2433	37.8440	38.4915	38.9491	39.4276 (38)
Heat transfer coeff	97.6459	97.3833	97.1258	95.9166	95.6904	94.6372	94.6372	94.4422	95.0429	95.6904	96.1481	96.6265 (39)
Average = Sum(39)m / 12 =												95.9155 (39)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.1934	1.1902	1.1871	1.1723	1.1695	1.1567	1.1567	1.1543	1.1616	1.1695	1.1751	1.1810 (40)
HLP (average)												1.1723 (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												2.4965 (42)
Average daily hot water use (litres/day)												93.4916 (43)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use	102.8407	99.1011	95.3614	91.6217	87.8821	84.1424	84.1424	87.8821	91.6217	95.3614	99.1011	102.8407 (44)
Energy conte	152.5098	133.3861	137.6425	120.0000	115.1429	99.3596	92.0712	105.6531	106.9149	124.5990	136.0096	147.6976 (45)
Energy content (annual)												Total = Sum(45)m = 1470.9864 (45)
Distribution loss (46)m = 0.15 x (45)m												

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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													2983.0023 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	480.8988	397.7668	361.9343	244.1648	147.3473	0.0000	0.0000	0.0000	0.0000	219.3403	352.4632	486.7524	(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)	533.1473	440.9831	401.2576	270.6927	163.3562	0.0000	0.0000	0.0000	0.0000	243.1711	390.7574	539.6368	(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	103.6946	90.4415	93.7947	83.9226	81.6353	71.7145	68.6982	77.3516	77.8015	88.6057	94.3127	100.5189	(64)
Efficiency of water heater (217)m	87.3997	87.2795	86.9670	86.2165	84.7429	76.4000	76.4000	76.4000	76.4000	85.7437	86.8870	76.4000	(216)
Fuel for water heating, kWh/month	118.6440	103.6228	107.8510	97.3394	96.3329	93.8672	89.9191	101.2456	101.8344	103.3378	108.5464	114.8854	(219)
Water heating fuel used												1237.4262	(219)
Annual totals kWh/year													
Space heating fuel - main system												2983.0023	(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)												394.3960	(232)
Total delivered energy for all uses												4689.8245	(238)

10a. Fuel costs - using Table 12 prices

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	2983.0023	3.4800	103.8085 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1237.4262	3.4800	43.0624 (247)
Pumps and fans for heating	75.0000	13.1900	9.8925 (249)
Energy for lighting	394.3960	13.1900	52.0208 (250)
Additional standing charges			120.0000 (251)
Total energy cost			328.7842 (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] =	1.0889 (257)
SAP value		84.8104
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	2983.0023	0.2160	644.3285 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1237.4262	0.2160	267.2841 (264)
Space and water heating			911.6125 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	394.3960	0.5190	204.6915 (268)
Total kg/year			1155.2291 (272)
CO2 emissions per m2			14.1200 (273)
EI value			87.7937
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	$3.48 / 0.8319 = 4.183$, stars = 5
Water heating environmental impact	$0.216 / 0.8319 = 0.2596$, 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	40.9100 (1b)	x 2.3700 (2b)	= 96.9567 (1b) - (3b)
First floor	40.9100 (1c)	x 2.6200 (2c)	= 107.1842 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	81.8200		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 204.1409 (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) = 0.1470 (8)
Pressure test					Yes
Measured/design AP50					4.6600
Infiltration rate					0.3800 (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) =		0.3515 (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	0.4305	0.4042	0.3954	0.3690	0.3690	0.3602	0.3602	0.3515	0.3515	0.3778	0.3778	0.3866 (22b)
Effective ac	0.5927	0.5817	0.5782	0.5681	0.5681	0.5649	0.5649	0.5618	0.5618	0.5714	0.5714	0.5747 (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)			9.0800	1.3258	12.0379		(27)
Flr - Ground			40.9120	0.1800	7.3642	75.6000	3092.9472 (28a)
Wl - Brick (Timber Frame)	90.3710	11.1690	79.2020	0.2100	16.6324	7.4000	586.0948 (29a)
Rf - Ins Joist	40.9120		40.9120	0.0800	3.2730	7.4000	302.7488 (30)
Total net area of external elements Aum(A, m ²)			172.1960				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	41.8154		(33)
Party Wall			46.2040	0.0000	0.0000	7.4000	341.9096 (32)
Stud			70.7018			7.4000	523.1936 (32c)
Internal Floor			40.9120			7.4000	302.7488 (32d)
Internal Ceiling			40.9120			7.4000	302.7488 (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
(28)...(30) + (32) + (32a)...(32e) = 5452.3916 (34)
(33) + (36) = 57.1989 (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	39.9269	39.1858	38.9491	38.2704	38.2704	38.0546	38.0546	37.8440	37.8440	38.4915	38.4915	38.7177 (38)
Heat transfer coeff	97.1258	96.3847	96.1481	95.4693	95.4693	95.2535	95.2535	95.0429	95.0429	95.6904	95.6904	95.9166 (39)
Average = Sum(39)m / 12 =												95.7073 (39)
HLP	1.1871	1.1780	1.1751	1.1668	1.1668	1.1642	1.1642	1.1616	1.1616	1.1695	1.1695	1.1723 (40)
HLP (average)												1.1697 (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												2.4965 (42)
Average daily hot water use (litres/day)												93.4916 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Energy conte	102.8407	99.1011	95.3614	91.6217	87.8821	84.1424	84.1424	87.8821	91.6217	95.3614	99.1011	102.8407 (44)
Energy content (annual)	152.5098	133.3861	137.6425	120.0000	115.1429	99.3596	92.0712	105.6531	106.9149	124.5990	136.0096	147.6976 (45)
Distribution loss (46)m = 0.15 x (45)m												Total = Sum(45)m = 1470.9864 (45)

	22.8765	20.0079	20.6464	18.0000	17.2714	14.9039	13.8107	15.8480	16.0372	18.6899	20.4014	22.1546 (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	0.6702	0.5948	0.5907	0.4948	0.4554	0.3762	0.3486	0.4178	0.4408	0.5347	0.6065	0.6490 (61)
Total heat required for water heating calculated for each month	153.1800	133.9809	138.2331	120.4948	115.5983	99.7358	92.4199	106.0709	107.3557	125.1337	136.6161	148.3467 (62)
WWHRS	-49.4854	-43.5394	-44.4384	-36.5722	-33.9630	-28.0213	-23.7216	-28.7193	-29.5543	-36.5280	-42.3034	-47.8278 eq. (G10)
Total of WWHRS savings												-444.6741
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	103.6946	90.4415	93.7947	83.9226	81.6353	71.7145	68.6982	77.3516	77.8015	88.6057	94.3127	100.5189 (64)
Heat gains from water heating, kWh/month	50.8771	44.4996	45.9138	40.0237	38.3989	33.1311	30.7008	35.2341	35.6594	41.5629	45.3748	49.2717 (65)

Metabolic gains (Table 5), Watts												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(66)m	149.7892	149.7892	149.7892	149.7892	149.7892	149.7892	149.7892	149.7892	149.7892	149.7892	149.7892	149.7892 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	55.8308	49.5885	40.3280	30.5309	22.8222	19.2675	20.8192	27.0616	36.3220	46.1191	53.8278	57.3825 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	333.1376	336.5945	327.8832	309.3378	285.9275	263.9252	249.2263	245.7693	254.4807	273.0261	296.4364	318.4387 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	52.4754	52.4754	52.4754	52.4754	52.4754	52.4754	52.4754	52.4754	52.4754	52.4754	52.4754	52.4754 (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)	-99.8595	-99.8595	-99.8595	-99.8595	-99.8595	-99.8595	-99.8595	-99.8595	-99.8595	-99.8595	-99.8595	-99.8595 (71)
Water heating gains (Table 5)	68.3832	66.2196	61.7121	55.5885	51.6114	46.0154	41.2646	47.3577	49.5270	55.8641	63.0206	66.2254 (72)
Total internal gains	562.7568	557.8078	535.3285	500.8623	465.7663	434.6133	416.7152	425.5938	445.7348	480.4144	518.6899	547.4518 (73)

[Jan					Area	Solar flux			g	FF		Access		Gains
					m2	Table 6a			Specific data	Specific data		factor		W
						W/m2			or Table 6b	or Table 6c		Table 6d		

Southeast					2.7240	45.0642			0.7300	0.7200		0.7700		44.7123 (77)
Northwest					6.3550	14.6130			0.7300	0.7200		0.7700		33.8255 (81)

Solar gains	78.5379	123.8216	199.1239	293.4539	347.8662	399.4431	364.9442	318.4939	243.0489	157.2851	95.8917	64.7126	(83)	
Total gains	641.2946	681.6294	734.4523	794.3163	813.6325	834.0564	781.6594	744.0876	688.7837	637.6995	614.5816	612.1645	(84)	

Temperature during heating periods in the living area from Table 9, Th1 (C)												21.0000 (85)
Utilisation factor for gains for living area, n11,m (see Table 9a)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
tau	15.5937	15.7136	15.7523	15.8643	15.8643	15.9002	15.9002	15.9355	15.9355	15.8276	15.8276	15.7903
alpha	2.0396	2.0476	2.0502	2.0576	2.0576	2.0600	2.0600	2.0624	2.0624	2.0552	2.0552	2.0527
util living area	0.8890	0.8726	0.8326	0.7585	0.6471	0.4837	0.3629	0.3679	0.5773	0.7571	0.8526	0.8949 (86)
MIT	18.5377	18.7294	19.1969	19.8117	20.3825	20.7764	20.9168	20.9174	20.6600	20.0528	19.2570	18.5376 (87)
Th 2	19.9304	19.9376	19.9400	19.9466	19.9466	19.9488	19.9488	19.9508	19.9508	19.9445	19.9445	19.9422 (88)
util rest of house	0.8760	0.8579	0.8125	0.7277	0.5971	0.4064	0.2599	0.2606	0.5023	0.7176	0.8324	0.8825 (89)
MIT 2	16.7273	17.0006	17.6618	18.5192	19.2848	19.7643	19.9053	19.9092	19.6464	18.8660	17.7596	16.7324 (90)
Living area fraction										fLA = Living area / (4) =		0.1678 (91)
MIT	17.0311	17.2907	17.9194	18.7361	19.4690	19.9341	20.0750	20.0784	19.8165	19.0651	18.0109	17.0353 (92)
Temperature adjustment												-0.1500
adjusted MIT	16.8811	17.1407	17.7694	18.5861	19.3190	19.7841	19.9250	19.9284	19.6665	18.9151	17.8609	16.8853 (93)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.8248	0.8056	0.7594	0.6796	0.5630	0.3931	0.2575	0.2581	0.4793	0.6702	0.7794	0.8323 (94)
Useful gains	528.9565	549.1131	557.7438	539.7939	458.0377	327.8988	201.2419	192.0642	330.1561	427.3843	478.9759	509.5140 (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												
	1085.9773	1064.1547	968.1563	810.1614	593.7277	369.9740	211.9400	202.2909	395.9918	633.0028	867.0405	1063.2657 (97)
Month fracti	1.0000	1.0000		1.0000	1.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000 (97a)
Space heating kWh												
	414.4235	346.1079	305.3469	194.6646	100.9534	0.0000	0.0000	0.0000	0.0000	152.9801	279.4065	411.9913 (98)
Space heating												2205.8741 (98)
Space heating per m2												26.9601 (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												2445.5367 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Space heating requirement	414.4235	346.1079	305.3469	194.6646	100.9534	0.0000	0.0000	0.0000	0.0000	152.9801	279.4065	411.9913 (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)	459.4495	383.7117	338.5220	215.8144	111.9217	0.0000	0.0000	0.0000	0.0000	169.6010	309.7633	456.7531 (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	103.6946	90.4415	93.7947	83.9226	81.6353	71.7145	68.6982	77.3516	77.8015	88.6057	94.3127	100.5189 (64)
Efficiency of water heater (217)m	87.0530	86.9463	86.5273	85.5452	83.4599	76.4000	76.4000	76.4000	76.4000	84.5957	86.2676	76.4000 (216)
Fuel for water heating, kWh/month	119.1166	104.0199	108.3990	98.1032	97.8138	93.8672	89.9191	101.2456	101.8344	104.7402	109.3258	115.3880 (219)
Water heating fuel used												1243.7729 (219)
Annual totals kWh/year												
Space heating fuel - main system												2445.5367 (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)												394.3960 (232)
Total delivered energy for all uses												4158.7056 (238)

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

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	2445.5367	7.6100	186.1053 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1243.7729	7.6100	94.6511 (247)
Pumps and fans for heating	75.0000	31.0800	23.3100 (249)
Energy for lighting	394.3960	31.0800	122.5783 (250)
Additional standing charges			105.0000 (251)
Total energy cost			531.6447 (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	2445.5367	0.2160	528.2359 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1243.7729	0.2160	268.6549 (264)
Space and water heating			796.8909 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	394.3960	0.5190	204.6915 (268)
Total kg/year			1040.5074 (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	2445.5367	1.2200	2983.5548 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1243.7729	1.2200	1517.4029 (264)
Space and water heating			4500.9577 (265)
Pumps and fans	75.0000	3.0700	230.2500 (267)
Energy for lighting	394.3960	3.0700	1210.7958 (268)
Primary energy kWh/year			5942.0034 (272)
Primary energy kWh/m2/year			72.6229 (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	+ 10.5	-£ 605	-1010 kg (97.1%)

Measures omitted - SAP change or cost saving too small:

N Solar water heating	+ 0.9	-£ 44	-143 kg (13.7%)
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Recommended measures	Typical annual savings		Energy efficiency	Environmental impact
Solar photovoltaic panels	£605	12.35 kg/m²	A 95	A 97
Total Savings	£605	12.35 kg/m²		
Potential energy efficiency rating:			A 95	
Potential environmental impact rating:				A 97

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	£146	£146	£0
Mains gas	£386	£386	£0
Space heating	£314	£314	£0
Water heating	£95	£95	£0
Lighting	£123	£123	£0
Generated (PV)	-£0	-£605	£605
Total cost of fuels	£532	-£73	£605
Total cost of uses	£532	-£73	£605
Delivered energy	51 kWh/m²	27 kWh/m²	24 kWh/m²
Carbon dioxide emissions	1.0 tonnes	0.0 tonnes	1.0 tonnes
CO2 emissions per m²	13 kg/m²	0 kg/m²	12 kg/m²
Primary energy	73 kWh/m²	0 kWh/m²	73 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	40.9100 (1b)	x 2.3700 (2b)	= 96.9567 (1b) - (3b)
First floor	40.9100 (1c)	x 2.6200 (2c)	= 107.1842 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	81.8200		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 204.1409 (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) = 0.1470 (8)
Pressure test					Yes
Measured/design AP50					4.6600
Infiltration rate					0.3800 (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) =	0.3515 (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	0.4481	0.4393	0.4305	0.3866	0.3778	0.3339	0.3339	0.3251	0.3515	0.3778	0.3954	0.4130 (22b)
Effective ac	0.6004	0.5965	0.5927	0.5747	0.5714	0.5557	0.5557	0.5528	0.5618	0.5714	0.5782	0.5853 (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)			9.0800	1.3258	12.0379		(27)
Flr - Ground			40.9120	0.1800	7.3642	75.6000	3092.9472 (28a)
Wl - Brick (Timber Frame)	90.3710	11.1690	79.2020	0.2100	16.6324	7.4000	586.0948 (29a)
Rf - Ins Joist	40.9120		40.9120	0.0800	3.2730	7.4000	302.7488 (30)
Total net area of external elements Aum(A, m ²)			172.1960				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	41.8154		(33)
Party Wall			46.2040	0.0000	0.0000	7.4000	341.9096 (32)
Stud			70.7018			7.4000	523.1936 (32c)
Internal Floor			40.9120			7.4000	302.7488 (32d)
Internal Ceiling			40.9120			7.4000	302.7488 (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
(28)...(30) + (32) + (32a)...(32e) = 5452.3916 (34)
(33) + (36) = 57.1989 (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	40.4470	40.1844	39.9269	38.7177	38.4915	37.4383	37.4383	37.2433	37.8440	38.4915	38.9491	39.4276 (38)
Heat transfer coeff	97.6459	97.3833	97.1258	95.9166	95.6904	94.6372	94.6372	94.4422	95.0429	95.6904	96.1481	96.6265 (39)
Average = Sum(39)m / 12 =												95.9155 (39)
HLP	1.1934	1.1902	1.1871	1.1723	1.1695	1.1567	1.1567	1.1543	1.1616	1.1695	1.1751	1.1810 (40)
HLP (average)												1.1723 (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												2.4965 (42)
Average daily hot water use (litres/day)												93.4916 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Energy conte	102.8407	99.1011	95.3614	91.6217	87.8821	84.1424	84.1424	87.8821	91.6217	95.3614	99.1011	102.8407 (44)
Energy content (annual)	152.5098	133.3861	137.6425	120.0000	115.1429	99.3596	92.0712	105.6531	106.9149	124.5990	136.0096	147.6976 (45)
Distribution loss (46)m = 0.15 x (45)m												Total = Sum(45)m = 1470.9864 (45)

	22.8765	20.0079	20.6464	18.0000	17.2714	14.9039	13.8107	15.8480	16.0372	18.6899	20.4014	22.1546 (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	0.6702	0.5948	0.5907	0.4948	0.4554	0.3762	0.3486	0.4178	0.4408	0.5347	0.6065	0.6490 (61)
Total heat required for water heating calculated for each month	153.1800	133.9809	138.2331	120.4948	115.5983	99.7358	92.4199	106.0709	107.3557	125.1337	136.6161	148.3467 (62)
WWHRS	-49.4854	-43.5394	-44.4384	-36.5722	-33.9630	-28.0213	-23.7216	-28.7193	-29.5543	-36.5280	-42.3034	-47.8278 eq. (G10)
Total of WWHRS savings												-444.6741
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	103.6946	90.4415	93.7947	83.9226	81.6353	71.7145	68.6982	77.3516	77.8015	88.6057	94.3127	100.5189 (64)
								Solar input (sum of months) = Sum(63)m =				0.0000 (63)
								Total per year (kWh/year) = Sum(64)m =				1032.4919 (64)
Heat gains from water heating, kWh/month	50.8771	44.4996	45.9138	40.0237	38.3989	33.1311	30.7008	35.2341	35.6594	41.5629	45.3748	49.2717 (65)

Metabolic gains (Table 5), Watts												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(66)m	149.7892	149.7892	149.7892	149.7892	149.7892	149.7892	149.7892	149.7892	149.7892	149.7892	149.7892	149.7892 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	55.8308	49.5885	40.3280	30.5309	22.8222	19.2675	20.8192	27.0616	36.3220	46.1191	53.8278	57.3825 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	333.1376	336.5945	327.8832	309.3378	285.9275	263.9252	249.2263	245.7693	254.4807	273.0261	296.4364	318.4387 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	52.4754	52.4754	52.4754	52.4754	52.4754	52.4754	52.4754	52.4754	52.4754	52.4754	52.4754	52.4754 (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)	-99.8595	-99.8595	-99.8595	-99.8595	-99.8595	-99.8595	-99.8595	-99.8595	-99.8595	-99.8595	-99.8595	-99.8595 (71)
Water heating gains (Table 5)	68.3832	66.2196	61.7121	55.5885	51.6114	46.0154	41.2646	47.3577	49.5270	55.8641	63.0206	66.2254 (72)
Total internal gains	562.7568	557.8078	535.3285	500.8623	465.7663	434.6133	416.7152	425.5938	445.7348	480.4144	518.6899	547.4518 (73)

[illegible]

Temperature during heating periods in the living area from Table 9, Th1 (C)												21.0000 (85)
Utilisation factor for gains for living area, nll,m (see Table 9a)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
tau	15.5107	15.5525	15.5937	15.7903	15.8276	16.0038	16.0038	16.0368	15.9355	15.8276	15.7523	15.6743
alpha	2.0340	2.0368	2.0396	2.0527	2.0552	2.0669	2.0669	2.0691	2.0624	2.0552	2.0502	2.0450
util living area	0.9072	0.8896	0.8581	0.7992	0.7097	0.5871	0.4719	0.5078	0.6741	0.8159	0.8846	0.9135 (86)
MIT	18.1493	18.3985	18.8661	19.5111	20.1182	20.5932	20.8178	20.7810	20.4168	19.6615	18.8115	18.1018 (87)
Th 2	19.9253	19.9278	19.9304	19.9422	19.9445	19.9548	19.9548	19.9568	19.9508	19.9445	19.9400	19.9353 (88)
util rest of house	0.8969	0.8774	0.8417	0.7743	0.6700	0.5237	0.3827	0.4201	0.6172	0.7880	0.8699	0.9039 (89)
MIT 2	16.1696	16.5249	17.1907	18.1023	18.9361	19.5598	19.8200	19.7863	19.3498	18.3291	17.1253	16.1051 (90)
Living area fraction												0.1678 (91)
MIT	16.5018	16.8393	17.4719	18.3387	19.1344	19.7332	19.9874	19.9532	19.5288	18.5527	17.4083	16.4402 (92)
Temperature adjustment												-0.1500
adjusted MIT	16.3518	16.6893	17.3219	18.1887	18.9844	19.5832	19.8374	19.8032	19.3788	18.4027	17.2583	16.2902 (93)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.8482	0.8262	0.7884	0.7227	0.6274	0.4984	0.3718	0.4058	0.5808	0.7358	0.8184	0.8566 (94)
Useful gains	530.4410	556.1647	564.6140	551.8257	499.0035	387.3737	275.3310	282.9421	380.1975	451.8312	487.1661	513.9936 (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	1176.8104	1148.0795	1051.0849	890.9435	697.0510	471.5961	306.3827	321.4047	501.7153	746.6435	976.6983	1168.2307 (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	480.8988	397.7668	361.9343	244.1648	147.3473	0.0000	0.0000	0.0000	0.0000	219.3403	352.4632	486.7524 (98)
Space heating												2690.6680 (98)
Space heating per m2												32.8852 (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 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												2983.0023	(211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	480.8988	397.7668	361.9343	244.1648	147.3473	0.0000	0.0000	0.0000	0.0000	219.3403	352.4632	486.7524	(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)	533.1473	440.9831	401.2576	270.6927	163.3562	0.0000	0.0000	0.0000	0.0000	243.1711	390.7574	539.6368	(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	103.6946	90.4415	93.7947	83.9226	81.6353	71.7145	68.6982	77.3516	77.8015	88.6057	94.3127	100.5189	(64)
Efficiency of water heater (217)m	87.3997	87.2795	86.9670	86.2165	84.7429	76.4000	76.4000	76.4000	76.4000	85.7437	86.8870	76.4000	(216)
Fuel for water heating, kWh/month	118.6440	103.6228	107.8510	97.3394	96.3329	93.8672	89.9191	101.2456	101.8344	103.3378	108.5464	114.8854	(219)
Water heating fuel used												1237.4262	(219)
Annual totals kWh/year													
Space heating fuel - main system												2983.0023	(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)												394.3960	(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												2962.5851	(238)

10a. Fuel costs - using Table 12 prices

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	2983.0023	3.4800	103.8085 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1237.4262	3.4800	43.0624 (247)
Pumps and fans for heating	75.0000	13.1900	9.8925 (249)
Energy for lighting	394.3960	13.1900	52.0208 (250)
Additional standing charges			120.0000 (251)
Energy saving/generation technologies			
PV Unit	-1727.2394	13.1900	-227.8229 (252)
Total energy cost			100.9614 (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] =	0.3344 (257)
SAP value	95.3357	
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	2983.0023	0.2160	644.3285 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1237.4262	0.2160	267.2841 (264)
Space and water heating			911.6125 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	394.3960	0.5190	204.6915 (268)
Energy saving/generation technologies			
PV Unit	-1727.2394	0.5190	-896.4372 (269)
Total kg/year			258.7918 (272)
CO2 emissions per m2			3.1600 (273)
EI value			97.2656
EI rating			97
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	40.9100 (1b)	x 2.3700 (2b)	= 96.9567 (1b) - (3b)
First floor	40.9100 (1c)	x 2.6200 (2c)	= 107.1842 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	81.8200		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 204.1409 (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) = 0.1470 (8)
Pressure test					Yes
Measured/design AP50					4.6600
Infiltration rate					0.3800 (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) =	0.3515 (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	0.4305	0.4042	0.3954	0.3690	0.3690	0.3602	0.3602	0.3515	0.3515	0.3778	0.3778	0.3866 (22b)
Effective ac	0.5927	0.5817	0.5782	0.5681	0.5681	0.5649	0.5649	0.5618	0.5618	0.5714	0.5714	0.5747 (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)			9.0800	1.3258	12.0379		(27)
Flr - Ground			40.9120	0.1800	7.3642	75.6000	3092.9472 (28a)
Wl - Brick (Timber Frame)	90.3710	11.1690	79.2020	0.2100	16.6324	7.4000	586.0948 (29a)
Rf - Ins Joist	40.9120		40.9120	0.0800	3.2730	7.4000	302.7488 (30)
Total net area of external elements Aum(A, m ²)			172.1960				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	41.8154		(33)
Party Wall			46.2040	0.0000	0.0000	7.4000	341.9096 (32)
Stud			70.7018			7.4000	523.1936 (32c)
Internal Floor			40.9120			7.4000	302.7488 (32d)
Internal Ceiling			40.9120			7.4000	302.7488 (32e)
Heat capacity Cm = Sum(A x k)							(28)...(30) + (32) + (32a)...(32e) = 5452.3916 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							66.6389 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							15.3835 (36)
Total fabric heat loss							(33) + (36) = 57.1989 (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	39.9269	39.1858	38.9491	38.2704	38.2704	38.0546	38.0546	37.8440	37.8440	38.4915	38.4915	38.7177 (38)
Heat transfer coeff	97.1258	96.3847	96.1481	95.4693	95.4693	95.2535	95.2535	95.0429	95.0429	95.6904	95.6904	95.9166 (39)
Average = Sum(39)m / 12 =												95.7073 (39)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.1871	1.1780	1.1751	1.1668	1.1668	1.1642	1.1642	1.1616	1.1616	1.1695	1.1695	1.1723 (40)
HLP (average)												1.1697 (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												2.4965 (42)
Average daily hot water use (litres/day)												93.4916 (43)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use	102.8407	99.1011	95.3614	91.6217	87.8821	84.1424	84.1424	87.8821	91.6217	95.3614	99.1011	102.8407 (44)
Energy conte	152.5098	133.3861	137.6425	120.0000	115.1429	99.3596	92.0712	105.6531	106.9149	124.5990	136.0096	147.6976 (45)
Energy content (annual)												Total = Sum(45)m = 1470.9864 (45)
Distribution loss (46)m = 0.15 x (45)m												

	22.8765	20.0079	20.6464	18.0000	17.2714	14.9039	13.8107	15.8480	16.0372	18.6899	20.4014	22.1546 (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	0.6702	0.5948	0.5907	0.4948	0.4554	0.3762	0.3486	0.4178	0.4408	0.5347	0.6065	0.6490 (61)
Total heat required for water heating calculated for each month	153.1800	133.9809	138.2331	120.4948	115.5983	99.7358	92.4199	106.0709	107.3557	125.1337	136.6161	148.3467 (62)
WWHRS	-49.4854	-43.5394	-44.4384	-36.5722	-33.9630	-28.0213	-23.7216	-28.7193	-29.5543	-36.5280	-42.3034	-47.8278 eq. (G10)
Total of WWHRS savings												-444.6741
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	103.6946	90.4415	93.7947	83.9226	81.6353	71.7145	68.6982	77.3516	77.8015	88.6057	94.3127	100.5189 (64)
Heat gains from water heating, kWh/month	50.8771	44.4996	45.9138	40.0237	38.3989	33.1311	30.7008	35.2341	35.6594	41.5629	45.3748	49.2717 (65)

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 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												2445.5367	(211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	414.4235	346.1079	305.3469	194.6646	100.9534	0.0000	0.0000	0.0000	0.0000	152.9801	279.4065	411.9913	(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)	459.4495	383.7117	338.5220	215.8144	111.9217	0.0000	0.0000	0.0000	0.0000	169.6010	309.7633	456.7531	(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	103.6946	90.4415	93.7947	83.9226	81.6353	71.7145	68.6982	77.3516	77.8015	88.6057	94.3127	100.5189	(64)
Efficiency of water heater (217)m	87.0530	86.9463	86.5273	85.5452	83.4599	76.4000	76.4000	76.4000	76.4000	84.5957	86.2676	87.1138	(216)
Fuel for water heating, kWh/month	119.1166	104.0199	108.3990	98.1032	97.8138	93.8672	89.9191	101.2456	101.8344	104.7402	109.3258	115.3880	(219)
Water heating fuel used												1243.7729	(219)
Annual totals kWh/year													
Space heating fuel - main system												2445.5367	(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)												394.3960	(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												2212.2596	(238)

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

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	2445.5367	7.6100	186.1053 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1243.7729	7.6100	94.6511 (247)
Pumps and fans for heating	75.0000	31.0800	23.3100 (249)
Energy for lighting	394.3960	31.0800	122.5783 (250)
Additional standing charges			105.0000 (251)
Energy saving/generation technologies			
PV Unit	-1946.4459	31.0800	-604.9554 (252)
Total energy cost			-73.3107 (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	2445.5367	0.2160	528.2359 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1243.7729	0.2160	268.6549 (264)
Space and water heating			796.8909 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	394.3960	0.5190	204.6915 (268)
Energy saving/generation technologies			
PV Unit	-1946.4459	0.5190	-1010.2054 (269)
Total kg/year			30.3020 (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	2445.5367	1.2200	2983.5548 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1243.7729	1.2200	1517.4029 (264)
Space and water heating			4500.9577 (265)
Pumps and fans	75.0000	3.0700	230.2500 (267)
Energy for lighting	394.3960	3.0700	1210.7958 (268)
Energy saving/generation technologies			
PV Unit	-1946.4459	3.0700	-5975.5890 (269)
Primary energy kWh/year			-33.5856 (272)
Primary energy kWh/m2/year			-0.4105 (273)

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Built)

Property Reference	019 - PRJ013014	Issued on Date	28/03/2024
Assessment Reference	019	Prop Type Ref	2B
Property	3 Deeble Way, Netley Abbey, Southampton, SO31 5JP		
SAP Rating	85 B	DER	15.18
Environmental	88 B	TER	18.52
CO ₂ Emissions (t/year)	1.04	% DER<TER	18.06
General Requirements Compliance	Pass	DfEE	45.80
		TfEE	51.59
		% DfEE<TfEE	11.21
Assessor Details	Mr. Christopher Nicholls, Briary Energy Limited, Tel: 0203 397 1373, chris@briaryenergy.co.uk		Assessor ID
			4299-0004
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)	18.52	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	15.18	kgCO ₂ /m ²	Pass
	-3.34 (-18.0%)	kgCO ₂ /m ²	

1b TfEE and DfEE

Target Fabric Energy Efficiency (TfEE)	51.59	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DfEE)	45.80	kWh/m ² /yr	
	-5.8 (-11.2%)	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	1.36 (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	4.66 (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 South East

2.72 m², No overhang

Windows facing North West

6.36 m², No overhang

Air change rate

4.67 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

4.66 (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.