

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

Property Reference	088 - PRJ013014				Issued on Date	03/06/2025
Assessment Reference	088	Prop Type Ref	C-SP			
Property	5 Moorman Road, Netley Abbey, SOUTHAMPTON, SO31 5JU					
SAP Rating	85 B	DER	14.44	TER	17.61	
Environmental	88 B	% DER<TER	18.00			
CO ₂ Emissions (t/year)	1.14	DFEE	44.12	TFEE	50.83	
General Requirements Compliance	Pass	% DFEE<TFEE	13.20			
Assessor Details	Mr. Christopher Nicholls, Briary Energy Limited, Tel: 0203 397 1373, chris@briaryenergy.co.uk				Assessor ID	U903-0001
Client						

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

REGULATIONS COMPLIANCE REPORT - Approved Document L1A, 2013 Edition, England

REGULATIONS COMPLIANCE REPORT - Approved Document L1A, 2013 Edition, England

DWELLING AS BUILT

Semi-Detached House, total floor area 95 m²

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating:Mains gas

Fuel factor:1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER) 17.61 kgCO₂/m²

Dwelling Carbon Dioxide Emission Rate (DER) 14.44 kgCO₂/m²OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)50.8 kWh/m²/yr

Dwelling Fabric Energy Efficiency (DFEE)44.1 kWh/m²/yrOK

2 Fabric U-values

Element	Average	Highest	
External wall	0.21 (max. 0.30)	0.21 (max. 0.70)	OK
Party wall	0.00 (max. 0.20)	-	OK
Floor	0.18 (max. 0.25)	0.18 (max. 0.70)	OK
Roof	0.08 (max. 0.20)	0.08 (max. 0.35)	OK
Openings	1.37 (max. 2.00)	1.40 (max. 3.30)	OK

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals: 3.92 (measured in this dwelling)
Maximum 10.0 OK

4 Heating efficiency

Main heating system: Boiler system with radiators or underfloor - Mains gas

Data from database

Vaillant ecoFIT sustain 835 VUW 356/6-3 (H-GB)

Combi boiler

Efficiency: 89.3% SEDBUK2009

Minimum: 88.0% OK

Secondary heating system:

None

5 Cylinder insulation

Hot water storage No cylinder

6 Controls

Space heating controls: Time and temperature zone control OK

Hot water controls:

No cylinder

Boiler interlock

Yes

OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings:100%
Minimum 75% OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (Southern England): Slight OK

Based on:

Overshading:

Average

Windows facing South East: 3.44 m², No overhang

Windows facing North West: 7.72 m², No overhang

Air change rate: 4.68 ach

Blinds/curtains: Dark-coloured curtain or roller blind, closed 100% of daylight hours

10 Key features

Party wall U-value 0.00 W/m²K

Roof U-value 0.08 W/m²K

Air permeability 3.9 m³/m²h

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE 09 Jan 2014

SAP 2012 WORKSHEET FOR New Build (As Built) (Version 9.92, January 2014)
CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE 09 Jan 2014

1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	47.3200 (1b)	x 2.3700 (2b)	= 112.1484 (1b) - (3b)
First floor	47.3200 (1c)	x 2.6300 (2c)	= 124.4516 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	94.6400		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 236.6000 (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) = 0.1691 (8)
Pressure test					Yes
Measured/design AP50					3.9200
Infiltration rate					0.3651 (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) =	0.3377 (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	0.4305	0.4221	0.4137	0.3715	0.3630	0.3208	0.3208	0.3124	0.3377	0.3630	0.3799	0.3968 (22b)
Effective ac	0.5927	0.5891	0.5856	0.5690	0.5659	0.5515	0.5515	0.5488	0.5570	0.5659	0.5722	0.5787 (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)			11.1600	1.3258	14.7955		(27)
Flr - Ground			47.3200	0.1800	8.5176	75.6000	3577.3920 (28a)
Wl - Brick (Timber Frame)	82.3680	11.1680	71.2000	0.2100	14.9520	7.4000	526.8800 (29a)
Wl - Clad (Timber Frame)	15.3040	2.0810	13.2230	0.2100	2.7768	7.4000	97.8502 (29a)
Rf - Ins Joist	47.3200		47.3200	0.0800	3.7856	7.4000	350.1680 (30)
Total net area of external elements Aum(A, m ²)			192.3130				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	47.3355		(33)
Party Wall			43.9660	0.0000	0.0000	7.4000	325.3484 (32)
Stud			75.7405			7.4000	560.4794 (32c)
Internal Floor			47.3200			7.4000	350.1680 (32d)
Internal Ceiling			47.3200			7.4000	350.1680 (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) = 6138.4540 (34)
64.8611 (35)
16.3874 (36)
(33) + (36) = 63.7229 (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	46.2756	45.9946	45.7192	44.4254	44.1834	43.0566	43.0566	42.8479	43.4906	44.1834	44.6730	45.1850 (38)
Heat transfer coeff	109.9985	109.7175	109.4420	108.1483	107.9062	106.7794	106.7794	106.5708	107.2135	107.9062	108.3959	108.9079 (39)
Average = Sum(39)m / 12 =												108.1471 (39)
HLP	1.1623	1.1593	1.1564	1.1427	1.1402	1.1283	1.1283	1.1261	1.1329	1.1402	1.1453	1.1508 (40)
HLP (average)												1.1427 (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												2.6841 (42)
Average daily hot water use (litres/day)												97.9464 (43)
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Daily hot water use	107.7411	103.8232	99.9053	95.9875	92.0696	88.1518	88.1518	92.0696	95.9875	99.9053	103.8232	107.7411 (44)
Energy conte	159.7769	139.7419	144.2011	125.7180	120.6294	104.0940	96.4584	110.6874	112.0094	130.5362	142.4904	154.7354 (45)
Energy content (annual)										Total = Sum(45)m =		1541.0786 (45)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE 09 Jan 2014

Distribution loss (46)m = 0.15 x (45)m	23.9665	20.9613	21.6302	18.8577	18.0944	15.6141	14.4688	16.6031	16.8014	19.5804	21.3736	23.2103 (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	0.6483	0.5430	0.4998	0.4129	0.3826	0.4586	0.4838	0.5869	0.6206	0.6496 (61)
Total heat required for water heating calculated for each month	160.4477	140.3505	144.8494	126.2610	121.1292	104.5070	96.8411	111.1460	112.4932	131.1230	143.1110	155.3850 (62)
WWHRS	-52.6564	-46.3310	-47.2867	-38.9056	-36.1243	-29.8006	-25.2209	-30.5368	-31.4278	-38.8513	-45.0045	-50.8949 eq. (G10)
Total of WWHRS savings												-473.0406
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	107.7913	94.0195	97.5627	87.3555	85.0049	74.7064	71.6202	80.6093	81.0655	92.2717	98.1065	104.4901 (64)
Heat gains from water heating, kWh/month	53.2935	46.6163	48.1089	41.9370	40.2342	34.7145	32.1681	36.9182	37.3641	43.5500	47.5332	51.6119 (65)
Solar input (sum of months) = Sum(63)m =												
Total per year (kWh/year) = Sum(64)m =												

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	134.2030	134.2030	134.2030	134.2030	134.2030	134.2030	134.2030	134.2030	134.2030	134.2030	134.2030	134.2030 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	24.4194	21.6891	17.6388	13.3537	9.9820	8.4273	9.1059	11.8363	15.8866	20.1717	23.5433	25.0981 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	247.3602	249.9270	243.4587	229.6884	212.3059	195.9688	185.0546	182.4878	188.9561	202.7264	220.1089	236.4460 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	36.4203	36.4203	36.4203	36.4203	36.4203	36.4203	36.4203	36.4203	36.4203	36.4203	36.4203	36.4203 (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)	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624 (71)
Water heating gains (Table 5)	71.6311	69.3695	64.6626	58.2458	54.0783	48.2146	43.2367	49.6213	51.8946	58.5349	66.0183	69.3709 (72)
Total internal gains	409.6715	407.2465	392.0209	367.5488	342.6271	318.8715	303.6581	310.2062	322.9981	347.6939	375.9314	397.1758 (73)

6. Solar gains

[Jan]												Area m2	Solar flux Table 6a W/m2	Specific data or Table 6b	Specific data or Table 6c	Access factor Table 6d	Gains W
Southeast												3.4430	36.7938	0.7300	0.7200	0.7700	46.1424 (77)
Northwest												7.7170	11.2829	0.7300	0.7200	0.7700	31.7146 (81)
Solar gains	77.8571	143.1537	223.8502	324.2617	406.0086	421.9027	398.9230	335.0573	258.1687	165.7597	95.1732	65.3881 (83)					
Total gains	487.5286	550.4002	615.8710	691.8104	748.6357	740.7742	702.5811	645.2635	581.1669	513.4536	471.1046	462.5639 (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	15.5014	15.5411	15.5802	15.7666	15.8019	15.9687	15.9687	15.9999	15.9040	15.8019	15.7305	15.6566
alpha	2.0334	2.0361	2.0387	2.0511	2.0535	2.0646	2.0646	2.0667	2.0603	2.0535	2.0487	2.0438
util living area	0.9496	0.9340	0.9058	0.8512	0.7647	0.6462	0.5325	0.5781	0.7502	0.8801	0.9346	0.9543 (86)
MIT	17.7291	18.0148	18.5440	19.2717	19.9637	20.5052	20.7687	20.7164	20.2674	19.3885	18.4422	17.6784 (87)
Th 2	19.9503	19.9527	19.9550	19.9661	19.9682	19.9778	19.9778	19.9796	19.9741	19.9682	19.9640	19.9596 (88)
util rest of house	0.9437	0.9262	0.8941	0.8312	0.7294	0.5850	0.4409	0.4893	0.6999	0.8599	0.9256	0.9490 (89)
MIT 2	15.5903	16.0005	16.7594	17.7962	18.7586	19.4827	19.7989	19.7482	19.1919	17.9785	16.6237	15.5192 (90)
Living area fraction	15.9555	16.3445	17.0641	18.0482	18.9644	19.6573	19.9645	19.9136	19.3755	18.2193	16.9342	15.8879 (92)
MIT	15.9555	16.3445	17.0641	18.0482	18.9644	19.6573	19.9645	19.9136	19.3755	18.2193	16.9342	15.8879 (92)
Temperature adjustment	15.8055	16.1945	16.9141	17.8982	18.8144	19.5073	19.8145	19.7636	19.2255	18.0693	16.7842	-0.1500
adjusted MIT	15.8055	16.1945	16.9141	17.8982	18.8144	19.5073	19.8145	19.7636	19.2255	18.0693	16.7842	15.7379 (93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Useful gains	441.9220	486.3363	520.4599	538.2698	509.7559	409.2545	298.2231	301.8461	380.2048	414.7011	416.0153	422.7504 (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	1265.5868	1239.2018	1139.7420	973.1362	767.6840	524.0003	343.2409	358.4578	549.5238	805.9802	1049.7287	1256.5685 (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	612.8066	505.9256	460.7458	313.1038	191.8985	0.0000	0.0000	0.0000	0.0000	291.1117	456.2736	620.3606 (98)
Space heating												3452.2262 (98)
Space heating per m ²												36.4775 (99)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE 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													3827.3018 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	612.8066	505.9256	460.7458	313.1038	191.8985	0.0000	0.0000	0.0000	0.0000	291.1117	456.2736	620.3606	(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)	679.3865	560.8931	510.8047	347.1218	212.7478	0.0000	0.0000	0.0000	0.0000	322.7402	505.8466	687.7612	(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	107.7913	94.0195	97.5627	87.3555	85.0049	74.7064	71.6202	80.6093	81.0655	92.2717	98.1065	104.4901	(64)
Efficiency of water heater (217)m	87.8270	87.7170	87.4400	86.7807	85.4612	76.4000	76.4000	76.4000	76.4000	86.4421	87.4061	87.9109	(216)
Fuel for water heating, kWh/month	122.7314	107.1850	111.5767	100.6624	99.4661	97.7832	93.7437	105.5095	106.1066	106.7440	112.2422	118.8590	(219)
Water heating fuel used												1282.6099	(219)
Annual totals kWh/year													
Space heating fuel - main system												3827.3018	(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)												431.2545	(232)
Total delivered energy for all uses												5616.1662	(238)

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	3827.3018	0.2160	826.6972 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1282.6099	0.2160	277.0437 (264)
Space and water heating			1103.7409 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	431.2545	0.5190	223.8211 (268)
Total CO2, kg/year			1366.4870 (272)
Dwelling Carbon Dioxide Emission Rate (DER)			14.4400 (273)

16 CO2 EMISSIONS ASSOCIATED WITH APPLIANCES AND COOKING AND SITE-WIDE ELECTRICITY GENERATION TECHNOLOGIES

DER		14.4400	ZC1
Total Floor Area	TFA	94.6400	
Assumed number of occupants	N	2.6841	
CO2 emission factor in Table 12 for electricity displaced from grid	EF	0.5190	
CO2 emissions from appliances, equation (L14)		15.4882	ZC2
CO2 emissions from cooking, equation (L16)		1.9381	ZC3
Total CO2 emissions		31.8663	ZC4
Residual CO2 emissions offset from biofuel CHP		0.0000	ZC5
Additional allowable electricity generation, kWh/m²/year		0.0000	ZC6
Resulting CO2 emissions offset from additional allowable electricity generation		0.0000	ZC7
Net CO2 emissions		31.8663	ZC8

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF TARGET EMISSIONS 09 Jan 2014

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

1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	47.3200 (1b)	x 2.3700 (2b)	= 112.1484 (1b) - (3b)
First floor	47.3200 (1c)	x 2.6300 (2c)	= 124.4516 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	94.6400		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 236.6000 (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) = 0.1268 (8)
Pressure test					Yes
Measured/design AP50					5.0000
Infiltration rate					0.3768 (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) =	0.3485 (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	0.4444	0.4357	0.4270	0.3834	0.3747	0.3311	0.3311	0.3224	0.3485	0.3747	0.3921	0.4095 (22b)
Effective ac	0.5987	0.5949	0.5911	0.5735	0.5702	0.5548	0.5548	0.5520	0.5607	0.5702	0.5769	0.5839 (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
TER Opaque door			2.0900	1.0000	2.0900		(26)
TER Opening Type (Uw = 1.40)			11.1600	1.3258	14.7955		(27)
Floor - Ground			47.3200	0.1300	6.1516		(28a)
W1 - Brick (Timber Frame)	82.3680	11.1680	71.2000	0.1800	12.8160		(29a)
W1 - Clad (Timber Frame)	15.3040	2.0810	13.2230	0.1800	2.3801		(29a)
Rf - Ins Joist	47.3200		47.3200	0.1300	6.1516		(30)
Total net area of external elements Aum(A, m ²)			192.3130				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	44.3848		(33)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							250.0000 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							9.4460 (36)
Total fabric heat loss						(33) + (36) =	53.8308 (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	46.7483	46.4490	46.1555	44.7773	44.5194	43.3190	43.3190	43.0967	43.7814	44.5194	45.0411	45.5864 (38)
Heat transfer coeff	100.5791	100.2797	99.9863	98.6081	98.3502	97.1498	97.1498	96.9275	97.6122	98.3502	98.8719	99.4172 (39)
Average = Sum(39)m / 12 =												98.6068 (39)
HLP	1.0628	1.0596	1.0565	1.0419	1.0392	1.0265	1.0265	1.0242	1.0314	1.0392	1.0447	1.0505 (40)
HLP (average)												1.0419 (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												2.6841 (42)
Average daily hot water use (litres/day)												97.9464 (43)
Daily hot water use	107.7411	103.8232	99.9053	95.9875	92.0696	88.1518	88.1518	92.0696	95.9875	99.9053	103.8232	107.7411 (44)
Energy conte	159.7769	139.7419	144.2011	125.7180	120.6294	104.0940	96.4584	110.6874	112.0094	130.5362	142.4904	154.7354 (45)
Energy content (annual)										Total = Sum(45)m =		1541.0786 (45)
Distribution loss (46)m = 0.15 x (45)m	23.9665	20.9613	21.6302	18.8577	18.0944	15.6141	14.4688	16.6031	16.8014	19.5804	21.3736	23.2103 (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)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF TARGET EMISSIONS 09 Jan 2014

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	50.9589	46.0274	50.9107	47.3363	46.9177	43.4721	44.9212	46.9177	47.3363	50.9107	49.3151	50.9589 (61)
Total heat required for water heating calculated for each month	210.7358	185.7693	195.1118	173.0543	167.5471	147.5661	141.3796	157.6051	159.3457	181.4468	191.8055	205.6943 (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)
Output from w/h	210.7358	185.7693	195.1118	173.0543	167.5471	147.5661	141.3796	157.6051	159.3457	181.4468	191.8055	205.6943 (64)
Heat gains from water heating, kWh/month	65.8655	57.9710	60.6745	53.6353	51.8387	45.4793	43.3027	48.5330	49.0772	56.1309	59.7068	64.1892 (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	134.2030	134.2030	134.2030	134.2030	134.2030	134.2030	134.2030	134.2030	134.2030	134.2030	134.2030	134.2030 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	24.5721	21.8247	17.7491	13.4372	10.0445	8.4800	9.1629	11.9103	15.9859	20.2978	23.6905	25.2550 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	247.3602	249.9270	243.4587	229.6884	212.3059	195.9688	185.0546	182.4878	188.9561	202.7264	220.1089	236.4460 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	36.4203	36.4203	36.4203	36.4203	36.4203	36.4203	36.4203	36.4203	36.4203	36.4203	36.4203	36.4203 (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)	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624 (71)
Water heating gains (Table 5)	88.5290	86.2664	81.5518	74.4935	69.6757	63.1657	58.2026	65.2325	68.1628	75.4448	82.9262	86.2759 (72)
Total internal gains	426.7221	424.2790	409.0204	383.8800	358.2869	333.8753	318.6810	325.8915	339.3657	364.7299	392.9865	414.2378 (73)

6. Solar gains

[Jan]												
	Area			Solar flux		g		FF		Access		Gains
	m2			Table 6a		Table 6b		Table 6c		factor		W
				W/m2		or		or		Table 6d		
Southeast	3.4430			36.7938		0.6300		0.7000		0.7700		38.7154 (77)
Northwest	7.7170			11.2829		0.6300		0.7000		0.7700		26.6099 (81)

Solar gains	65.3253	120.1118	187.8195	272.0689	340.6579	353.9937	334.7128	281.1268	216.6142	139.0792	79.8542	54.8633 (83)
Total gains	492.0474	544.3908	596.8399	655.9488	698.9449	687.8690	653.3937	607.0183	555.9799	503.8091	472.8407	469.1011 (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	65.3438	65.5389	65.7312	66.6499	66.8247	67.6504	67.6504	67.8056	67.3300	66.8247	66.4721	66.1075	
alpha	5.3563	5.3693	5.3821	5.4433	5.4550	5.5100	5.5100	5.5204	5.4887	5.4550	5.4315	5.4072	
util living area	0.9990	0.9981	0.9950	0.9823	0.9340	0.8006	0.6309	0.6935	0.9144	0.9892	0.9980	0.9993 (86)	
MIT	19.8019	19.9192	20.1359	20.4444	20.7348	20.9279	20.9845	20.9747	20.8325	20.4688	20.0870	19.7857 (87)	
Th 2	20.0314	20.0340	20.0365	20.0485	20.0508	20.0613	20.0613	20.0632	20.0572	20.0508	20.0462	20.0415 (88)	
util rest of house	0.9987	0.9974	0.9931	0.9748	0.9045	0.7196	0.5081	0.5720	0.8642	0.9835	0.9972	0.9990 (89)	
MIT 2	18.4203	18.5936	18.9117	19.3667	19.7703	20.0084	20.0550	20.0515	19.9072	19.4070	18.8481	18.4039 (90)	
Living area fraction	18.6562	18.8200	19.1207	19.5507	19.9350	20.1654	20.2137	20.2092	20.0652	19.5883	19.0597	18.6398 (92)	
MIT	18.6562	18.8200	19.1207	19.5507	19.9350	20.1654	20.2137	20.2092	20.0652	19.5883	19.0597	18.6398 (93)	
Temperature adjustment												0.0000	
adjusted MIT	18.6562	18.8200	19.1207	19.5507	19.9350	20.1654	20.2137	20.2092	20.0652	19.5883	19.0597	18.6398 (93)	

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Useful gains	491.0306	542.2695	591.1998	635.9909	629.0977	501.8858	345.6760	359.5384	480.7760	493.4467	470.8818	468.3543 (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	1443.9337	1395.8926	1261.9013	1050.2464	809.9104	540.6772	351.0695	369.2130	582.2751	884.0017	1182.4745	1435.5674 (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	708.9600	573.6347	499.0019	298.2640	134.5246	0.0000	0.0000	0.0000	0.0000	290.5729	512.3467	719.6066 (98)
Space heating												3736.9113 (98)
Space heating per m2												39.4855 (99)

8c. Space cooling requirement

Not applicable

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF TARGET EMISSIONS 09 Jan 2014

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 %)												93.4000 (206)
Efficiency of secondary/supplementary heating system, %												0.0000 (208)
Space heating requirement												4000.9757 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Space heating requirement	708.9600	573.6347	499.0019	298.2640	134.5246	0.0000	0.0000	0.0000	0.0000	290.5729	512.3467	719.6066 (98)
Space heating efficiency (main heating system 1)	93.4000	93.4000	93.4000	93.4000	93.4000	0.0000	0.0000	0.0000	0.0000	93.4000	93.4000	93.4000 (210)
Space heating fuel (main heating system)	759.0578	614.1700	534.2632	319.3404	144.0306	0.0000	0.0000	0.0000	0.0000	311.1059	548.5511	770.4568 (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	210.7358	185.7693	195.1118	173.0543	167.5471	147.5661	141.3796	157.6051	159.3457	181.4468	191.8055	205.6943 (64)
Efficiency of water heater (217)m	87.8676	87.7016	87.3130	86.4094	84.5046	80.3000	80.3000	80.3000	80.3000	86.2308	87.4054	80.3000 (216)
Fuel for water heating, kWh/month	239.8333	211.8198	223.4625	200.2725	198.2698	183.7685	176.0643	196.2704	198.4380	210.4201	219.4435	233.9000 (219)
Water heating fuel used												2491.9627 (219)
Annual totals kWh/year												
Space heating fuel - main system												4000.9757 (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)												433.9512 (232)
Total delivered energy for all uses												7001.8896 (238)

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	4000.9757	0.2160	864.2108 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	2491.9627	0.2160	538.2639 (264)
Space and water heating			1402.4747 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	433.9512	0.5190	225.2207 (268)
Total CO2, kg/m2/year			1666.6204 (272)
Emissions per m2 for space and water heating			14.8190 (272a)
Fuel factor (mains gas)			1.0000
Emissions per m2 for lighting			2.3798 (272b)
Emissions per m2 for pumps and fans			0.4113 (272c)
Target Carbon Dioxide Emission Rate (TER) = (14.8190 * 1.00) + 2.3798 + 0.4113, rounded to 2 d.p.			17.6100 (273)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

Property Reference	088 - PRJ013014	Issued on Date	03/06/2025
Assessment Reference	088	Prop Type Ref	C-SP
Property	5 Moorman Road, Netley Abbey, SOUTHAMPTON, SO31 5JU		

SAP Rating	85 B	DER	14.44	TER	17.61
Environmental	88 B	% DER<TER	18.00		
CO ₂ Emissions (t/year)	1.14	DFEE	44.12	TFEE	50.83
General Requirements Compliance	Pass	% DFEE<TFEE	13.20		

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

Client	
--------	--

CALCULATION OF HEAT DEMAND 09 Jan 2014

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

1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	47.3200 (1b)	x 2.3700 (2b)	= 112.1484 (1b) - (3b)
First floor	47.3200 (1c)	x 2.6300 (2c)	= 124.4516 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	94.6400		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 236.6000 (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) =	0.1691 (8)			
Pressure test								Yes				
Measured/design AP50									3.9200			
Infiltration rate									0.3651 (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) =	0.3377 (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	0.4137	0.3883	0.3799	0.3546	0.3546	0.3461	0.3461	0.3377	0.3377	0.3630	0.3630	0.3715 (22b)
Effective ac	0.5856	0.5754	0.5722	0.5629	0.5629	0.5599	0.5599	0.5570	0.5570	0.5659	0.5659	0.5690 (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)			11.1600	1.3258	14.7955		(27)
Floor - Ground			47.3200	0.1800	8.5176	75.6000	3577.3920 (28a)
W1 - Brick (Timber Frame)	82.3680	11.1680	71.2000	0.2100	14.9520	7.4000	526.8800 (29a)
W1 - Clad (Timber Frame)	15.3040	2.0810	13.2230	0.2100	2.7768	7.4000	97.8502 (29a)
RF - Ins Joist	47.3200		47.3200	0.0800	3.7856	7.4000	350.1680 (30)
Total net area of external elements Aum, m ²			192.3130				(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =	47.3355			(33)
Party Wall			43.9660	0.0000	0.0000	7.4000	325.3484 (32)
Stud			75.7405			7.4000	560.4794 (32c)
Internal Floor			47.3200			7.4000	350.1680 (32d)
Internal Ceiling			47.3200			7.4000	350.1680 (32e)
Heat capacity Cm = Sum (A x k)			(28)...(30) + (32) + (32a)...(32e) =				6138.4540 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							64.8611 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							16.3874 (36)
Total fabric heat loss						(33) + (36) =	63.7229 (37)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF HEAT DEMAND 09 Jan 2014

Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)												
(38)m	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Heat transfer coeff	45.7192	44.9262	44.6730	43.9469	43.9469	43.7159	43.7159	43.4906	43.4906	44.1834	44.1834	44.4254 (38)
Average = Sum(39)m / 12 =	109.4420	108.6491	108.3959	107.6698	107.6698	107.4388	107.4388	107.2135	107.2135	107.9062	107.9062	108.1483 (39)
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	1.1564	1.1480	1.1453	1.1377	1.1377	1.1352	1.1352	1.1329	1.1329	1.1402	1.1402	1.1427 (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												2.6841 (42)	
Average daily hot water use (litres/day)												97.9464 (43)	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Daily hot water use													
Energy conte	107.7411	103.8232	99.9053	95.9875	92.0696	88.1518	88.1518	92.0696	95.9875	99.9053	103.8232	107.7411 (44)	
Energy content (annual)	159.7769	139.7419	144.2011	125.7180	120.6294	104.0940	96.4584	110.6874	112.0094	130.5362	142.4904	154.7354 (45)	
Distribution loss (46)m = 0.15 x (45)m										Total = Sum(45)m =		1541.0786 (45)	
	23.9665	20.9613	21.6302	18.8577	18.0944	15.6141	14.4688	16.6031	16.8014	19.5804	21.3736	23.2103 (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	0.6483	0.5430	0.4998	0.4129	0.3826	0.4586	0.4838	0.5869	0.6206	0.6496 (61)	
Total heat required for water heating calculated for each month													
	160.4477	140.3505	144.8494	126.2610	121.1292	104.5070	96.8411	111.1460	112.4932	131.1230	143.1110	155.3850 (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													
	160.4477	140.3505	144.8494	126.2610	121.1292	104.5070	96.8411	111.1460	112.4932	131.1230	143.1110	155.3850 (64)	
								Total per year (kWh/year) = Sum(64)m =					1547.6441 (64)
RHI water heating demand												1548 (64)	
Heat gains from water heating, kWh/month													
	53.2935	46.6163	48.1089	41.9370	40.2342	34.7145	32.1681	36.9182	37.3641	43.5500	47.5332	51.6119 (65)	

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF HEAT DEMAND 09 Jan 2014

Living area fraction									fLA = Living area / (4) =	0.1708 (91)		
MIT	17.0194	17.2904	17.9374	18.7677	19.5008	19.9607	20.0981	20.1010	19.8389	19.0787	18.0063	17.0175 (92)
Temperature adjustment												-0.1500
adjusted MIT	16.8694	17.1404	17.7874	18.6177	19.3508	19.8107	19.9481	19.9510	19.6889	18.9287	17.8563	16.8675 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.8287	0.8080	0.7594	0.6765	0.5580	0.3876	0.2545	0.2563	0.4778	0.6717	0.7831	0.8366	(94)
Useful gains	588.3035	614.6198	629.4919	613.5265	521.6315	373.5693	229.5768	219.0736	374.7590	481.5660	534.8045	565.4896	(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	1222.4031	1199.5337	1093.4281	917.0997	673.0198	420.1610	241.5381	230.6128	449.1031	715.2732	977.2305	1196.9365	(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	471.7701	393.0621	345.1685	218.5727	112.6330	0.0000	0.0000	0.0000	0.0000	173.8781	318.5467	469.7965	(98)
RHI space heating demand												2503.4276	(98)
												2503	(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	47.3200 (1b)	x 2.3700 (2b)	= 112.1484 (1b) - (3b)
First floor	47.3200 (1c)	x 2.6300 (2c)	= 124.4516 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	94.6400		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 236.6000 (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) = 0.1691 (8)
Pressure test					Yes
Measured/design AP50					3.9200
Infiltration rate					0.3651 (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) =	0.3377 (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	0.4305	0.4221	0.4137	0.3715	0.3630	0.3208	0.3208	0.3124	0.3377	0.3630	0.3799	0.3968 (22b)
Effective ac	0.5927	0.5891	0.5856	0.5690	0.5659	0.5515	0.5515	0.5488	0.5570	0.5659	0.5722	0.5787 (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)			11.1600	1.3258	14.7955		(27)
Flr - Ground			47.3200	0.1800	8.5176	75.6000	3577.3920 (28a)
Wl - Brick (Timber Frame)	82.3680	11.1680	71.2000	0.2100	14.9520	7.4000	526.8800 (29a)
Wl - Clad (Timber Frame)	15.3040	2.0810	13.2230	0.2100	2.7768	7.4000	97.8502 (29a)
Rf - Ins Joist	47.3200		47.3200	0.0800	3.7856	7.4000	350.1680 (30)
Total net area of external elements Aum(A, m ²)			192.3130				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	47.3355		(33)
Party Wall			43.9660	0.0000	0.0000	7.4000	325.3484 (32)
Stud			75.7405			7.4000	560.4794 (32c)
Internal Floor			47.3200			7.4000	350.1680 (32d)
Internal Ceiling			47.3200			7.4000	350.1680 (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) = 6138.4540 (34)
64.8611 (35)
16.3874 (36)
(33) + (36) = 63.7229 (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	46.2756	45.9946	45.7192	44.4254	44.1834	43.0566	43.0566	42.8479	43.4906	44.1834	44.6730	45.1850 (38)
Heat transfer coeff	109.9985	109.7175	109.4420	108.1483	107.9062	106.7794	106.7794	106.5708	107.2135	107.9062	108.3959	108.9079 (39)
Average = Sum(39)m / 12 =												108.1471 (39)
HLP	1.1623	1.1593	1.1564	1.1427	1.1402	1.1283	1.1283	1.1261	1.1329	1.1402	1.1453	1.1508 (40)
HLP (average)												1.1427 (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												2.6841 (42)
Average daily hot water use (litres/day)												97.9464 (43)
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Daily hot water use	107.7411	103.8232	99.9053	95.9875	92.0696	88.1518	88.1518	92.0696	95.9875	99.9053	103.8232	107.7411 (44)
Energy conte	159.7769	139.7419	144.2011	125.7180	120.6294	104.0940	96.4584	110.6874	112.0094	130.5362	142.4904	154.7354 (45)
Energy content (annual)										Total = Sum(45)m =		1541.0786 (45)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF ENERGY RATINGS 09 Jan 2014

Distribution loss (46)m = 0.15 x (45)m	23.9665	20.9613	21.6302	18.8577	18.0944	15.6141	14.4688	16.6031	16.8014	19.5804	21.3736	23.2103 (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	0.6483	0.5430	0.4998	0.4129	0.3826	0.4586	0.4838	0.5869	0.6206	0.6496 (61)
Total heat required for water heating calculated for each month	160.4477	140.3505	144.8494	126.2610	121.1292	104.5070	96.8411	111.1460	112.4932	131.1230	143.1110	155.3850 (62)
WWHRS	-52.6564	-46.3310	-47.2867	-38.9056	-36.1243	-29.8006	-25.2209	-30.5368	-31.4278	-38.8513	-45.0045	-50.8949 eq. (G10)
Total of WWHRS savings												-473.0406
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	107.7913	94.0195	97.5627	87.3555	85.0049	74.7064	71.6202	80.6093	81.0655	92.2717	98.1065	104.4901 (64)
Heat gains from water heating, kWh/month	53.2935	46.6163	48.1089	41.9370	40.2342	34.7145	32.1681	36.9182	37.3641	43.5500	47.5332	51.6119 (65)
Total per year (kWh/year) = Sum(64)m = 1074.6035 (64)												

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	161.0436	161.0436	161.0436	161.0436	161.0436	161.0436	161.0436	161.0436	161.0436	161.0436	161.0436	161.0436 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	61.0485	54.2228	44.0969	33.3842	24.9551	21.0681	22.7649	29.5906	39.7165	50.4292	58.8583	62.7453 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	369.1943	373.0253	363.3711	342.8185	316.8745	292.4907	276.2009	272.3698	282.0240	302.5767	328.5207	352.9044 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	53.7884	53.7884	53.7884	53.7884	53.7884	53.7884	53.7884	53.7884	53.7884	53.7884	53.7884	53.7884 (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)	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624 (71)
Water heating gains (Table 5)	71.6311	69.3695	64.6626	58.2458	54.0783	48.2146	43.2367	49.6213	51.8946	58.5349	66.0183	69.3709 (72)
Total internal gains	612.3435	607.0873	582.6002	544.9181	506.3774	472.2431	452.6720	462.0513	484.1047	522.0104	563.8670	595.4902 (73)

6. Solar gains

[Jan]				Area m2	Solar flux Table 6a W/m2		g		FF		Access factor Table 6d		Gains W
							Specific data or Table 6b		Specific data or Table 6c				
Southeast				3.4430	36.7938		0.7300		0.7200		0.7700		46.1424 (77)
Northwest				7.7170	11.2829		0.7300		0.7200		0.7700		31.7146 (81)
Solar gains	77.8571	143.1537	223.8502	324.2617	406.0086	421.9027	398.9230	335.0573	258.1687	165.7597	95.1732		65.3881 (83)
Total gains	690.2005	750.2409	806.4504	869.1798	912.3861	894.1457	851.5950	797.1086	742.2734	687.7701	659.0402		660.8782 (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	15.5014	15.5411	15.5802	15.7666	15.8019	15.9687	15.9687	15.9999	15.9040	15.8019	15.7305	15.6566
alpha	2.0334	2.0361	2.0387	2.0511	2.0535	2.0646	2.0646	2.0667	2.0603	2.0535	2.0487	2.0438
util living area	0.9101	0.8913	0.8581	0.7965	0.7039	0.5800	0.4653	0.5031	0.6721	0.8174	0.8876	0.9165 (86)
MIT	18.1224	18.3833	18.8642	19.5202	20.1315	20.6018	20.8222	20.7842	20.4190	19.6536	18.7891	18.0714 (87)
Th 2	19.9503	19.9527	19.9550	19.9661	19.9682	19.9778	19.9778	19.9796	19.9741	19.9682	19.9640	19.9596 (88)
util rest of house	0.9004	0.8796	0.8421	0.7720	0.6649	0.5182	0.3789	0.4178	0.6166	0.7904	0.8735	0.9075 (89)
MIT 2	16.1481	16.5201	17.2047	18.1313	18.9705	19.5880	19.8442	19.8092	19.3705	18.3353	17.1104	16.0781 (90)
Living area fraction	16.4852	16.8383	17.4881	18.3685	19.1688	19.7611	20.0112	19.9757	19.5495	18.5604	17.3971	16.4185 (92)
MIT	16.4852	16.8383	17.4881	18.3685	19.1688	19.7611	20.0112	19.9757	19.5495	18.5604	17.3971	16.4185 (92)
Temperature adjustment												-0.1500
adjusted MIT	16.3352	16.6883	17.3381	18.2185	19.0188	19.6111	19.8612	19.8257	19.3995	18.4104	17.2471	16.2685 (93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Useful gains	0.8522	0.8287	0.7888	0.7205	0.6229	0.4934	0.3681	0.4036	0.5802	0.7380	0.8224	0.8609 (94)
Ext temp.	588.1936	621.6953	636.1592	626.2554	568.3347	441.1744	313.4998	321.7222	430.6476	507.5464	541.9786	568.9259 (95)
Heat loss rate W	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000 (96)
Month fracti	1323.8510	1293.3808	1186.1387	1007.7765	789.7400	535.0848	348.2267	365.0775	568.1785	842.7936	1099.9028	1314.3545 (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	547.3291	451.3727	409.1848	274.6952	164.7256	0.0000	0.0000	0.0000	0.0000	249.4239	401.7054	554.5989 (98)
Space heating per m ²												3053.0355 (98)
										(98) / (4) =		32.2595 (99)

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												3384.7401	(211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	547.3291	451.3727	409.1848	274.6952	164.7256	0.0000	0.0000	0.0000	0.0000	249.4239	401.7054	554.5989	(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)	606.7950	500.4132	453.6417	304.5401	182.6226	0.0000	0.0000	0.0000	0.0000	276.5232	445.3497	614.8546	(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	107.7913	94.0195	97.5627	87.3555	85.0049	74.7064	71.6202	80.6093	81.0655	92.2717	98.1065	104.4901	(64)
Efficiency of water heater	87.5966	87.4761	87.1686	86.4331	84.9754	76.4000	76.4000	76.4000	76.4000	86.0049	87.1115	87.6889	(216)
(217)m	87.5966	87.4761	87.1686	86.4331	84.9754	76.4000	76.4000	76.4000	76.4000	86.0049	87.1115	87.6889	(217)
Fuel for water heating, kWh/month	123.0541	107.4802	111.9241	101.0672	100.0347	97.7832	93.7437	105.5095	106.1066	107.2866	112.6218	119.1600	(219)
Water heating fuel used	123.0541	107.4802	111.9241	101.0672	100.0347	97.7832	93.7437	105.5095	106.1066	107.2866	112.6218	119.1600	(219)
Annual totals kWh/year												1285.7716	(219)
Space heating fuel - main system												3384.7401	(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)												431.2545	(232)
Total delivered energy for all uses												5176.7662	(238)

10a. Fuel costs - using Table 12 prices

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	3384.7401	3.4800	117.7890 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1285.7716	3.4800	44.7449 (247)
Pumps and fans for heating	75.0000	13.1900	9.8925 (249)
Energy for lighting	431.2545	13.1900	56.8825 (250)
Additional standing charges			120.0000 (251)
Total energy cost			349.3088 (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] = 1.0506 (257)
SAP value	85.3437
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	3384.7401	0.2160	731.1039 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1285.7716	0.2160	277.7267 (264)
Space and water heating			1008.8305 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	431.2545	0.5190	223.8211 (268)
Total kg/year			1271.5766 (272)
CO2 emissions per m2			13.4400 (273)
EI value			87.7978
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	47.3200 (1b)	x 2.3700 (2b)	= 112.1484 (1b) - (3b)
First floor	47.3200 (1c)	x 2.6300 (2c)	= 124.4516 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	94.6400		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 236.6000 (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) = 0.1691 (8)
Pressure test					Yes
Measured/design AP50					3.9200
Infiltration rate					0.3651 (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) =	0.3377 (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	0.4137	0.3983	0.3799	0.3546	0.3546	0.3461	0.3461	0.3377	0.3377	0.3630	0.3630	0.3715 (22b)
Effective ac	0.5856	0.5754	0.5722	0.5629	0.5629	0.5599	0.5599	0.5570	0.5570	0.5659	0.5659	0.5690 (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)			11.1600	1.3258	14.7955		(27)
Flr - Ground			47.3200	0.1800	8.5176	75.6000	3577.3920 (28a)
Wl - Brick (Timber Frame)	82.3680	11.1680	71.2000	0.2100	14.9520	7.4000	526.8800 (29a)
Wl - Clad (Timber Frame)	15.3040	2.0810	13.2230	0.2100	2.7768	7.4000	97.8502 (29a)
Rf - Ins Joist	47.3200		47.3200	0.0800	3.7856	7.4000	350.1680 (30)
Total net area of external elements Aum(A, m ²)			192.3130				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	47.3355		(33)
Party Wall			43.9660	0.0000	0.0000	7.4000	325.3484 (32)
Stud			75.7405			7.4000	560.4794 (32c)
Internal Floor			47.3200			7.4000	350.1680 (32d)
Internal Ceiling			47.3200			7.4000	350.1680 (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) = 6138.4540 (34)
64.8611 (35)
16.3874 (36)
(33) + (36) = 63.7229 (37)

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

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(38)m	45.7192	44.9262	44.6730	43.9469	43.9469	43.7159	43.7159	43.4906	43.4906	44.1834	44.1834	44.4254 (38)
Heat transfer coeff	109.4420	108.6491	108.3959	107.6698	107.6698	107.4388	107.4388	107.2135	107.2135	107.9062	107.9062	108.1483 (39)
Average = Sum(39)m / 12 =												107.9243 (39)
HLP	1.1564	1.1480	1.1453	1.1377	1.1377	1.1352	1.1352	1.1329	1.1329	1.1402	1.1402	1.1427 (40)
HLP (average)												1.1404 (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												2.6841 (42)
Average daily hot water use (litres/day)												97.9464 (43)
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Daily hot water use	107.7411	103.8232	99.9053	95.9875	92.0696	88.1518	88.1518	92.0696	95.9875	99.9053	103.8232	107.7411 (44)
Energy conte	159.7769	139.7419	144.2011	125.7180	120.6294	104.0940	96.4584	110.6874	112.0094	130.5362	142.4904	154.7354 (45)
Energy content (annual)										Total = Sum(45)m =		1541.0786 (45)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

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

Distribution loss (46)m = 0.15 x (45)m	23.9665	20.9613	21.6302	18.8577	18.0944	15.6141	14.4688	16.6031	16.8014	19.5804	21.3736	23.2103 (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	0.6483	0.5430	0.4998	0.4129	0.3826	0.4586	0.4838	0.5869	0.6206	0.6496 (61)
Total heat required for water heating calculated for each month	160.4477	140.3505	144.8494	126.2610	121.1292	104.5070	96.8411	111.1460	112.4932	131.1230	143.1110	155.3850 (62)
WWHRS	-52.6564	-46.3310	-47.2867	-38.9056	-36.1243	-29.8006	-25.2209	-30.5368	-31.4278	-38.8513	-45.0045	-50.8949 eq. (G10)
Total of WWHRS savings												-473.0406
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	107.7913	94.0195	97.5627	87.3555	85.0049	74.7064	71.6202	80.6093	81.0655	92.2717	98.1065	104.4901 (64)
Heat gains from water heating, kWh/month	53.2935	46.6163	48.1089	41.9370	40.2342	34.7145	32.1681	36.9182	37.3641	43.5500	47.5332	51.6119 (65)
Total per year (kWh/year) = Sum(64)m =												
1074.6035 (64)												

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	161.0436	161.0436	161.0436	161.0436	161.0436	161.0436	161.0436	161.0436	161.0436	161.0436	161.0436	161.0436 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	61.0485	54.2228	44.0969	33.3842	24.9551	21.0681	22.7649	29.5906	39.7165	50.4292	58.8583	62.7453 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	369.1943	373.0253	363.3711	342.8185	316.8745	292.4907	276.2009	272.3698	282.0240	302.5767	328.5207	352.9044 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	53.7884	53.7884	53.7884	53.7884	53.7884	53.7884	53.7884	53.7884	53.7884	53.7884	53.7884	53.7884 (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)	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624 (71)
Water heating gains (Table 5)	71.6311	69.3695	64.6626	58.2458	54.0783	48.2146	43.2367	49.6213	51.8946	58.5349	66.0183	69.3709 (72)
Total internal gains	612.3435	607.0873	582.6002	544.9181	506.3774	472.2431	452.6720	462.0513	484.1047	522.0104	563.8670	595.4902 (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				3.4430	45.0642	0.7300		0.7200		0.7700		56.5141 (77)
Northwest				7.7170	14.6130	0.7300		0.7200		0.7700		41.0750 (81)
Solar gains	97.5891	153.5751	246.2876	361.9931	428.4323	491.6665	449.3125	392.5872	300.2724	194.8795	119.0920	80.4492 (83)
Total gains	709.9326	760.6624	828.8878	906.9112	934.8097	963.9096	901.9845	854.6385	784.3771	716.8899	682.9589	675.9393 (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	15.5802	15.6939	15.7305	15.8366	15.8366	15.8707	15.8707	15.9040	15.9040	15.8019	15.8019	15.7666
alpha	2.0387	2.0463	2.0487	2.0558	2.0558	2.0580	2.0580	2.0603	2.0603	2.0535	2.0535	2.0511
util living area	0.8919	0.8744	0.8322	0.7546	0.6405	0.4752	0.3560	0.3624	0.5738	0.7579	0.8555	0.8981 (86)
MIT	18.5147	18.7151	19.1966	19.8226	20.3939	20.7833	20.9195	20.9195	20.6632	20.0492	19.2397	18.5103 (87)
Th 2	19.9550	19.9618	19.9640	19.9702	19.9702	19.9722	19.9722	19.9741	19.9741	19.9682	19.9682	19.9661 (88)
util rest of house	0.8795	0.8602	0.8126	0.7244	0.5915	0.4003	0.2570	0.2588	0.5007	0.7194	0.8361	0.8863 (89)
MIT 2	16.7115	16.9971	17.6781	18.5505	19.3169	19.7913	19.9290	19.9324	19.6691	18.8788	17.7523	16.7102 (90)
Living area fraction									fLA = Living area / (4)			0.1708 (91)
MIT	17.0194	17.2904	17.9374	18.7677	19.5008	19.9607	20.0981	20.1010	19.8389	19.0787	18.0063	17.0175 (92)
Temperature adjustment												-0.1500
adjusted MIT	16.8694	17.1404	17.7874	18.6177	19.3508	19.8107	19.9481	19.9510	19.6889	18.9287	17.8563	16.8675 (93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Useful gains	588.3035	614.6198	629.4919	613.5265	521.6315	373.5693	229.5768	219.0736	374.7590	481.5660	534.8045	565.4896 (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	1222.4031	1199.5337	1093.4281	917.0997	673.0198	420.1610	241.5381	230.6128	449.1031	715.2732	977.2305	1196.9365 (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	471.7701	393.0621	345.1685	218.5727	112.6330	0.0000	0.0000	0.0000	0.0000	173.8781	318.5467	469.7965 (98)
Space heating												2503.4276 (98)
Space heating per m ²										(98) / (4) =		26.4521 (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													2775.4186 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	471.7701	393.0621	345.1685	218.5727	112.6330	0.0000	0.0000	0.0000	0.0000	173.8781	318.5467	469.7965	(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)	523.0267	435.7673	382.6702	242.3200	124.8702	0.0000	0.0000	0.0000	0.0000	192.7695	353.1560	520.8387	(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	107.7913	94.0195	97.5627	87.3555	85.0049	74.7064	71.6202	80.6093	81.0655	92.2717	98.1065	104.4901	(64)
Efficiency of water heater (217)m	87.2683	87.1610	86.7471	85.7759	83.6976	76.4000	76.4000	76.4000	76.4000	84.8844	86.5202	87.3299	(216)
Fuel for water heating, kWh/month	123.5172	107.8687	112.4679	101.8415	101.5619	97.7832	93.7437	105.5095	106.1066	108.7029	113.3915	119.6499	(219)
Water heating fuel used												1292.1445	(219)
Annual totals kWh/year													
Space heating fuel - main system												2775.4186	(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)												431.2545	(232)
Total delivered energy for all uses												4573.8176	(238)

10a. Fuel costs - using BEDF prices (572)

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	2775.4186	5.7300	159.0315 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1292.1445	5.7300	74.0399 (247)
Pumps and fans for heating	75.0000	24.1800	18.1350 (249)
Energy for lighting	431.2545	24.1800	104.2773 (250)
Additional standing charges			114.0000 (251)
Total energy cost			469.4837 (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	2775.4186	0.2160	599.4904 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1292.1445	0.2160	279.1032 (264)
Space and water heating			878.5936 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	431.2545	0.5190	223.8211 (268)
Total kg/year			1141.3397 (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	2775.4186	1.2200	3386.0108 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1292.1445	1.2200	1576.4162 (264)
Space and water heating			4962.4270 (265)
Pumps and fans	75.0000	3.0700	230.2500 (267)
Energy for lighting	431.2545	3.0700	1323.9513 (268)
Primary energy kWh/year			6516.6283 (272)
Primary energy kWh/m2/year			68.8570 (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	+ 9.6	-£ 471	-1010 kg (88.5%)

Measures omitted - SAP change or cost saving too small:	SAP change	Cost change	CO2 change
N Solar water heating	+ 0.9	-£ 34	-148 kg (13.0%)

Recommended measures	Typical annual savings	Energy efficiency	Environmental impact
Solar photovoltaic panels	£471 10.67 kg/m²	A 95	A 96
Total Savings	£471 10.67 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 572 TEST (30 May 2025)
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	£122	£122	£0
Mains gas	£347	£347	£0
Space heating	£291	£291	£0
Water heating	£74	£74	£0
Lighting	£104	£104	£0
Generated (PV)	-£0	-£471	£471
Total cost of fuels	£469	-£2	£471
Total cost of uses	£469	-£2	£471
Delivered energy	48 kWh/m²	28 kWh/m²	21 kWh/m²
Carbon dioxide emissions	1.1 tonnes	0.1 tonnes	1.0 tonnes
CO2 emissions per m²	12 kg/m²	1 kg/m²	11 kg/m²
Primary energy	69 kWh/m²	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	47.3200 (1b)	x 2.3700 (2b)	= 112.1484 (1b) - (3b)
First floor	47.3200 (1c)	x 2.6300 (2c)	= 124.4516 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	94.6400		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 236.6000 (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) = 0.1691 (8)
Pressure test					Yes
Measured/design AP50					3.9200
Infiltration rate					0.3651 (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) =	0.3377 (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	0.4305	0.4221	0.4137	0.3715	0.3630	0.3208	0.3208	0.3124	0.3377	0.3630	0.3799	0.3968 (22b)
Effective ac	0.5927	0.5891	0.5856	0.5690	0.5659	0.5515	0.5515	0.5488	0.5570	0.5659	0.5722	0.5787 (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)			11.1600	1.3258	14.7955		(27)
Flr - Ground			47.3200	0.1800	8.5176	75.6000	3577.3920 (28a)
Wl - Brick (Timber Frame)	82.3680	11.1680	71.2000	0.2100	14.9520	7.4000	526.8800 (29a)
Wl - Clad (Timber Frame)	15.3040	2.0810	13.2230	0.2100	2.7768	7.4000	97.8502 (29a)
Rf - Ins Joist	47.3200		47.3200	0.0800	3.7856	7.4000	350.1680 (30)
Total net area of external elements Aum(A, m ²)			192.3130				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	47.3355		(33)
Party Wall			43.9660	0.0000	0.0000	7.4000	325.3484 (32)
Stud			75.7405			7.4000	560.4794 (32c)
Internal Floor			47.3200			7.4000	350.1680 (32d)
Internal Ceiling			47.3200			7.4000	350.1680 (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) = 6138.4540 (34)
64.8611 (35)
16.3874 (36)
(33) + (36) = 63.7229 (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	46.2756	45.9946	45.7192	44.4254	44.1834	43.0566	43.0566	42.8479	43.4906	44.1834	44.6730	45.1850 (38)
Heat transfer coeff	109.9985	109.7175	109.4420	108.1483	107.9062	106.7794	106.7794	106.5708	107.2135	107.9062	108.3959	108.9079 (39)
Average = Sum(39)m / 12 =												108.1471 (39)
HLP	1.1623	1.1593	1.1564	1.1427	1.1402	1.1283	1.1283	1.1261	1.1329	1.1402	1.1453	1.1508 (40)
HLP (average)												1.1427 (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												2.6841 (42)
Average daily hot water use (litres/day)												97.9464 (43)
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Daily hot water use	107.7411	103.8232	99.9053	95.9875	92.0696	88.1518	88.1518	92.0696	95.9875	99.9053	103.8232	107.7411 (44)
Energy conte	159.7769	139.7419	144.2011	125.7180	120.6294	104.0940	96.4584	110.6874	112.0094	130.5362	142.4904	154.7354 (45)
Energy content (annual)										Total = Sum(45)m =		1541.0786 (45)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF ENERGY RATINGS FOR IMPROVED DWELLING 09 Jan 2014

Distribution loss (46)m = 0.15 x (45)m	23.9665	20.9613	21.6302	18.8577	18.0944	15.6141	14.4688	16.6031	16.8014	19.5804	21.3736	23.2103 (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	0.6483	0.5430	0.4998	0.4129	0.3826	0.4586	0.4838	0.5869	0.6206	0.6496 (61)
Total heat required for water heating calculated for each month	160.4477	140.3505	144.8494	126.2610	121.1292	104.5070	96.8411	111.1460	112.4932	131.1230	143.1110	155.3850 (62)
WWHRS	-52.6564	-46.3310	-47.2867	-38.9056	-36.1243	-29.8006	-25.2209	-30.5368	-31.4278	-38.8513	-45.0045	-50.8949 eq. (G10)
Total of WWHRS savings												-473.0406
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	107.7913	94.0195	97.5627	87.3555	85.0049	74.7064	71.6202	80.6093	81.0655	92.2717	98.1065	104.4901 (64)
Heat gains from water heating, kWh/month	53.2935	46.6163	48.1089	41.9370	40.2342	34.7145	32.1681	36.9182	37.3641	43.5500	47.5332	51.6119 (65)
Total per year (kWh/year) = Sum(64)m = 1074.6035 (64)												

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	161.0436	161.0436	161.0436	161.0436	161.0436	161.0436	161.0436	161.0436	161.0436	161.0436	161.0436	161.0436 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	61.0485	54.2228	44.0969	33.3842	24.9551	21.0681	22.7649	29.5906	39.7165	50.4292	58.8583	62.7453 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	369.1943	373.0253	363.3711	342.8185	316.8745	292.4907	276.2009	272.3698	282.0240	302.5767	328.5207	352.9044 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	53.7884	53.7884	53.7884	53.7884	53.7884	53.7884	53.7884	53.7884	53.7884	53.7884	53.7884	53.7884 (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)	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624 (71)
Water heating gains (Table 5)	71.6311	69.3695	64.6626	58.2458	54.0783	48.2146	43.2367	49.6213	51.8946	58.5349	66.0183	69.3709 (72)
Total internal gains	612.3435	607.0873	582.6002	544.9181	506.3774	472.2431	452.6720	462.0513	484.1047	522.0104	563.8670	595.4902 (73)

6. Solar gains

[Jan]				Area m2	Solar flux Table 6a W/m2	g		FF		Access factor		Gains W
						Specific data or Table 6b		Specific data or Table 6c		Table 6d		
Southeast				3.4430	36.7938	0.7300		0.7200		0.7700		46.1424 (77)
Northwest				7.7170	11.2829	0.7300		0.7200		0.7700		31.7146 (81)
Solar gains	77.8571	143.1537	223.8502	324.2617	406.0086	421.9027	398.9230	335.0573	258.1687	165.7597	95.1732	65.3881 (83)
Total gains	690.2005	750.2409	806.4504	869.1798	912.3861	894.1457	851.5950	797.1086	742.2734	687.7701	659.0402	660.8782 (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	15.5014	15.5411	15.5802	15.7666	15.8019	15.9687	15.9687	15.9999	15.9040	15.8019	15.7305	15.6566
alpha	2.0334	2.0361	2.0387	2.0511	2.0535	2.0646	2.0646	2.0667	2.0603	2.0535	2.0487	2.0438
util living area	0.9101	0.8913	0.8581	0.7965	0.7039	0.5800	0.4653	0.5031	0.6721	0.8174	0.8876	0.9165 (86)
MIT	18.1224	18.3833	18.8642	19.5202	20.1315	20.6018	20.8222	20.7842	20.4190	19.6536	18.7891	18.0714 (87)
Th 2	19.9503	19.9527	19.9550	19.9661	19.9682	19.9778	19.9778	19.9796	19.9741	19.9682	19.9640	19.9596 (88)
util rest of house	0.9004	0.8796	0.8421	0.7720	0.6649	0.5182	0.3789	0.4178	0.6166	0.7904	0.8735	0.9075 (89)
MIT 2	16.1481	16.5201	17.2047	18.1313	18.9705	19.5880	19.8442	19.8092	19.3705	18.3353	17.1104	16.0781 (90)
Living area fraction	16.4852	16.8383	17.4881	18.3685	19.1688	19.7611	20.0112	19.9757	19.5495	18.5604	17.3971	16.4185 (92)
MIT	16.4852	16.8383	17.4881	18.3685	19.1688	19.7611	20.0112	19.9757	19.5495	18.5604	17.3971	16.4185 (92)
Temperature adjustment												-0.1500
adjusted MIT	16.3352	16.6883	17.3381	18.2185	19.0188	19.6111	19.8612	19.8257	19.3995	18.4104	17.2471	16.2685 (93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Useful gains	0.8522	0.8287	0.7888	0.7205	0.6229	0.4934	0.3681	0.4036	0.5802	0.7380	0.8224	0.8609 (94)
Ext temp.	588.1936	621.6953	636.1592	626.2554	568.3347	441.1744	313.4998	321.7222	430.6476	507.5464	541.9786	568.9259 (95)
Heat loss rate W	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000 (96)
Month fracti	1323.8510	1293.3808	1186.1387	1007.7765	789.7400	535.0848	348.2267	365.0775	568.1785	842.7936	1099.9028	1314.3545 (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	547.3291	451.3727	409.1848	274.6952	164.7256	0.0000	0.0000	0.0000	0.0000	249.4239	401.7054	554.5989 (98)
Space heating per m2												3053.0355 (98)
(98) / (4) = 32.2595 (99)												

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													3384.7401 (211)
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Space heating requirement	547.3291	451.3727	409.1848	274.6952	164.7256	0.0000	0.0000	0.0000	0.0000	249.4239	401.7054	554.5989	(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)	606.7950	500.4132	453.6417	304.5401	182.6226	0.0000	0.0000	0.0000	0.0000	276.5232	445.3497	614.8546	(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	107.7913	94.0195	97.5627	87.3555	85.0049	74.7064	71.6202	80.6093	81.0655	92.2717	98.1065	104.4901	(64)
Efficiency of water heater (217)m	87.5966	87.4761	87.1686	86.4331	84.9754	76.4000	76.4000	76.4000	76.4000	86.0049	87.1115	87.6889	(216)
Fuel for water heating, kWh/month	123.0541	107.4802	111.9241	101.0672	100.0347	97.7832	93.7437	105.5095	106.1066	107.2866	112.6218	119.1600	(219)
Water heating fuel used												1285.7716	(219)
Annual totals kWh/year													
Space heating fuel - main system												3384.7401	(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)												431.2545	(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												3449.5268	(238)

10a. Fuel costs - using Table 12 prices

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	3384.7401	3.4800	117.7890 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1285.7716	3.4800	44.7449 (247)
Pumps and fans for heating	75.0000	13.1900	9.8925 (249)
Energy for lighting	431.2545	13.1900	56.8825 (250)
Additional standing charges			120.0000 (251)
Energy saving/generation technologies			
PV Unit	-1727.2394	13.1900	-227.8229 (252)
Total energy cost			121.4859 (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] =	0.3654 (257)
SAP value		94.9027
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	3384.7401	0.2160	731.1039 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1285.7716	0.2160	277.7267 (264)
Space and water heating			1008.8305 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	431.2545	0.5190	223.8211 (268)
Energy saving/generation technologies			
PV Unit	-1727.2394	0.5190	-896.4372 (269)
Total kg/year			375.1394 (272)
CO2 emissions per m2			3.9600 (273)
EI value			96.4001
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	47.3200 (1b)	x 2.3700 (2b)	= 112.1484 (1b) - (3b)
First floor	47.3200 (1c)	x 2.6300 (2c)	= 124.4516 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	94.6400		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 236.6000 (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) = 0.1691 (8)
Pressure test					Yes
Measured/design AP50					3.9200
Infiltration rate					0.3651 (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)	=	0.3377 (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												
Effective ac	0.4137	0.3983	0.3799	0.3546	0.3546	0.3461	0.3461	0.3377	0.3377	0.3630	0.3630	0.3715 (22b)
	0.5856	0.5754	0.5722	0.5629	0.5629	0.5599	0.5599	0.5570	0.5570	0.5659	0.5659	0.5690 (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)			11.1600	1.3258	14.7955		(27)
Flr - Ground			47.3200	0.1800	8.5176	75.6000	3577.3920 (28a)
Wl - Brick (Timber Frame)	82.3680	11.1680	71.2000	0.2100	14.9520	7.4000	526.8800 (29a)
Wl - Clad (Timber Frame)	15.3040	2.0810	13.2230	0.2100	2.7768	7.4000	97.8502 (29a)
Rf - Ins Joist	47.3200		47.3200	0.0800	3.7856	7.4000	350.1680 (30)
Total net area of external elements Aum(A, m ²)			192.3130				(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		47.3355		(33)
Party Wall			43.9660	0.0000	0.0000	7.4000	325.3484 (32)
Stud			75.7405			7.4000	560.4794 (32c)
Internal Floor			47.3200			7.4000	350.1680 (32d)
Internal Ceiling			47.3200			7.4000	350.1680 (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) = 6138.4540 (34)
64.8611 (35)
16.3874 (36)
(33) + (36) = 63.7229 (37)

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

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(38)m	45.7192	44.9262	44.6730	43.9469	43.9469	43.7159	43.7159	43.4906	43.4906	44.1834	44.1834	44.4254 (38)
Heat transfer coeff	109.4420	108.6491	108.3959	107.6698	107.6698	107.4388	107.4388	107.2135	107.2135	107.9062	107.9062	108.1483 (39)
Average = Sum(39)m / 12 =												107.9243 (39)
HLP	1.1564	1.1480	1.1453	1.1377	1.1377	1.1352	1.1352	1.1329	1.1329	1.1402	1.1402	1.1427 (40)
HLP (average)												1.1404 (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												2.6841 (42)
Average daily hot water use (litres/day)												97.9464 (43)
Daily hot water use	107.7411	103.8232	99.9053	95.9875	92.0696	88.1518	88.1518	92.0696	95.9875	99.9053	103.8232	107.7411 (44)
Energy conte	159.7769	139.7419	144.2011	125.7180	120.6294	104.0940	96.4584	110.6874	112.0094	130.5362	142.4904	154.7354 (45)
Energy content (annual)										Total = Sum(45)m =		1541.0786 (45)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

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

Distribution loss (46)m = 0.15 x (45)m	23.9665	20.9613	21.6302	18.8577	18.0944	15.6141	14.4688	16.6031	16.8014	19.5804	21.3736	23.2103 (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	0.6483	0.5430	0.4998	0.4129	0.3826	0.4586	0.4838	0.5869	0.6206	0.6496 (61)
Total heat required for water heating calculated for each month	160.4477	140.3505	144.8494	126.2610	121.1292	104.5070	96.8411	111.1460	112.4932	131.1230	143.1110	155.3850 (62)
WWHRS	-52.6564	-46.3310	-47.2867	-38.9056	-36.1243	-29.8006	-25.2209	-30.5368	-31.4278	-38.8513	-45.0045	-50.8949 eq. (G10)
Total of WWHRS savings												-473.0406
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	107.7913	94.0195	97.5627	87.3555	85.0049	74.7064	71.6202	80.6093	81.0655	92.2717	98.1065	104.4901 (64)
Heat gains from water heating, kWh/month	53.2935	46.6163	48.1089	41.9370	40.2342	34.7145	32.1681	36.9182	37.3641	43.5500	47.5332	51.6119 (65)
Solar input (sum of months) = Sum(63)m =												
Total per year (kWh/year) = Sum(64)m =												

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	161.0436	161.0436	161.0436	161.0436	161.0436	161.0436	161.0436	161.0436	161.0436	161.0436	161.0436	161.0436 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	61.0485	54.2228	44.0969	33.3842	24.9551	21.0681	22.7649	29.5906	39.7165	50.4292	58.8583	62.7453 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	369.1943	373.0253	363.3711	342.8185	316.8745	292.4907	276.2009	272.3698	282.0240	302.5767	328.5207	352.9044 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	53.7884	53.7884	53.7884	53.7884	53.7884	53.7884	53.7884	53.7884	53.7884	53.7884	53.7884	53.7884 (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)	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624	-107.3624 (71)
Water heating gains (Table 5)	71.6311	69.3695	64.6626	58.2458	54.0783	48.2146	43.2367	49.6213	51.8946	58.5349	66.0183	69.3709 (72)
Total internal gains	612.3435	607.0873	582.6002	544.9181	506.3774	472.2431	452.6720	462.0513	484.1047	522.0104	563.8670	595.4902 (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				3.4430	45.0642	0.7300		0.7200		0.7700		56.5141 (77)
Northwest				7.7170	14.6130	0.7300		0.7200		0.7700		41.0750 (81)
Solar gains	97.5891	153.5751	246.2876	361.9931	428.4323	491.6665	449.3125	392.5872	300.2724	194.8795	119.0920	80.4492 (83)
Total gains	709.9326	760.6624	828.8878	906.9112	934.8097	963.9096	901.9845	854.6385	784.3771	716.8899	682.9589	675.9393 (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	15.5802	15.6939	15.7305	15.8366	15.8366	15.8707	15.8707	15.9040	15.9040	15.8019	15.8019	15.7666
alpha	2.0387	2.0463	2.0487	2.0558	2.0558	2.0580	2.0580	2.0603	2.0603	2.0535	2.0535	2.0511
util living area	0.8919	0.8744	0.8322	0.7546	0.6405	0.4752	0.3560	0.3624	0.5738	0.7579	0.8555	0.8981 (86)
MIT	18.5147	18.7151	19.1966	19.8226	20.3939	20.7833	20.9195	20.9195	20.6632	20.0492	19.2397	18.5103 (87)
Th 2	19.9550	19.9618	19.9640	19.9702	19.9702	19.9722	19.9722	19.9741	19.9741	19.9682	19.9682	19.9661 (88)
util rest of house	0.8795	0.8602	0.8126	0.7244	0.5915	0.4003	0.2570	0.2588	0.5007	0.7194	0.8361	0.8863 (89)
MIT 2	16.7115	16.9971	17.6781	18.5505	19.3169	19.7913	19.9290	19.9324	19.6691	18.8788	17.7523	16.7102 (90)
Living area fraction									fLA = Living area / (4) =			0.1708 (91)
MIT	17.0194	17.2904	17.9374	18.7677	19.5008	19.9607	20.0981	20.1010	19.8389	19.0787	18.0063	17.0175 (92)
Temperature adjustment												-0.1500
adjusted MIT	16.8694	17.1404	17.7874	18.6177	19.3508	19.8107	19.9481	19.9510	19.6889	18.9287	17.8563	16.8675 (93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Useful gains	588.3035	614.6198	629.4919	613.5265	521.6315	373.5693	229.5768	219.0736	374.7590	481.5660	534.8045	565.4896 (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	1222.4031	1199.5337	1093.4281	917.0997	673.0198	420.1610	241.5381	230.6128	449.1031	715.2732	977.2305	1196.9365 (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	471.7701	393.0621	345.1685	218.5727	112.6330	0.0000	0.0000	0.0000	0.0000	173.8781	318.5467	469.7965 (98)
Space heating												2503.4276 (98)
Space heating per m ²										(98) / (4) =		26.4521 (99)

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													2775.4186	(211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Space heating requirement	471.7701	393.0621	345.1685	218.5727	112.6330	0.0000	0.0000	0.0000	0.0000	173.8781	318.5467	469.7965	(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)	523.0267	435.7673	382.6702	242.3200	124.8702	0.0000	0.0000	0.0000	0.0000	192.7695	353.1560	520.8387	(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	107.7913	94.0195	97.5627	87.3555	85.0049	74.7064	71.6202	80.6093	81.0655	92.2717	98.1065	104.4901	(64)	
Efficiency of water heater (217)m	87.2683	87.1610	86.7471	85.7759	83.6976	76.4000	76.4000	76.4000	76.4000	84.8844	86.5202	76.4000	(216)	
Fuel for water heating, kWh/month	123.5172	107.8687	112.4679	101.8415	101.5619	97.7832	93.7437	105.5095	106.1066	108.7029	113.3915	119.6499	(219)	
Water heating fuel used												1292.1445	(219)	
Annual totals kWh/year														
Space heating fuel - main system													2775.4186	(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)													431.2545	(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													2627.3717	(238)

10a. Fuel costs - using BEDF prices (572)

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	2775.4186	5.7300	159.0315 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1292.1445	5.7300	74.0399 (247)
Pumps and fans for heating	75.0000	24.1800	18.1350 (249)
Energy for lighting	431.2545	24.1800	104.2773 (250)
Additional standing charges			114.0000 (251)
Energy saving/generation technologies			
PV Unit	-1946.4459	24.1800	-470.6506 (252)
Total energy cost			-1.1669 (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	2775.4186	0.2160	599.4904 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1292.1445	0.2160	279.1032 (264)
Space and water heating			878.5936 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	431.2545	0.5190	223.8211 (268)
Energy saving/generation technologies			
PV Unit	-1946.4459	0.5190	-1010.2054 (269)
Total kg/year			131.1343 (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	2775.4186	1.2200	3386.0108 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1292.1445	1.2200	1576.4162 (264)
Space and water heating			4962.4270 (265)
Pumps and fans	75.0000	3.0700	230.2500 (267)
Energy for lighting	431.2545	3.0700	1323.9513 (268)
Energy saving/generation technologies			
PV Unit	-1946.4459	3.0700	-5975.5890 (269)
Primary energy kWh/year			541.0393 (272)
Primary energy kWh/m2/year			5.7168 (273)

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Built)

Property Reference	088 - PRJ013014	Issued on Date	03/06/2025
Assessment Reference	088	Prop Type Ref	C-SP
Property	5 Moorman Road, Netley Abbey, SOUTHAMPTON, SO31 5JU		
SAP Rating	85 B	DER	14.44
Environmental	88 B	TER	17.61
CO ₂ Emissions (t/year)	1.14	% DER<TER	18.00
General Requirements Compliance	Pass	DFEE	44.12
		TFEE	50.83
		% DFEE<TFEE	13.20
Assessor Details	Mr. Christopher Nicholls, Briary Energy Limited, Tel: 0203 397 1373, chris@briaryenergy.co.uk		Assessor ID
			U903-0001
Client			

SUMMARY FOR INPUT DATA FOR New Build (As Built)

Criterion 1 – Achieving the TER and TFEE rate

1a TER and DER

Fuel for main heating	Mains gas		
Fuel factor	1.00 (mains gas)		
Target Carbon Dioxide Emission Rate (TER)	17.61	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	14.44	kgCO ₂ /m ²	Pass
	-3.17 (-18.0%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	50.83	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	44.12	kWh/m ² /yr	
	-6.7 (-13.2%)	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	1.37 (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	3.92 (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

3.44 m², No overhang

Windows facing North West

7.72 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

3.92 (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

Air permeability

3.9

m³/m²h

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