

PREDICTED ENERGY ASSESSMENT

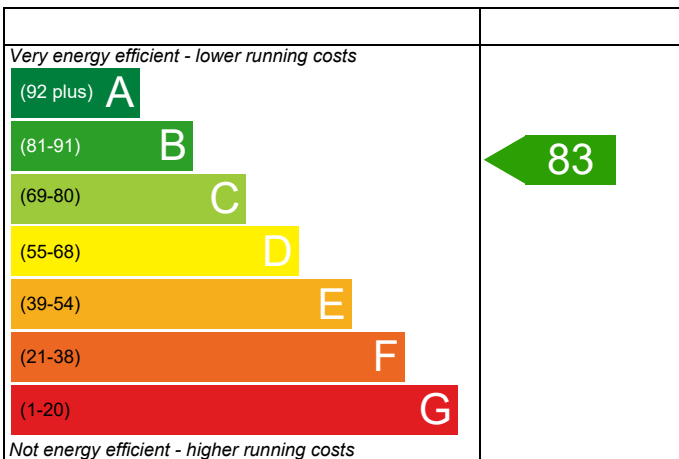
Plot 217

Dwelling type: Flat, Detached
 Date of assessment: 30/03/2022
 Produced by: Gary Nicholls
 Total floor area: 45.63 m²

This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

The energy performance has been assessed using the Government approved SAP2012 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO₂) emissions.

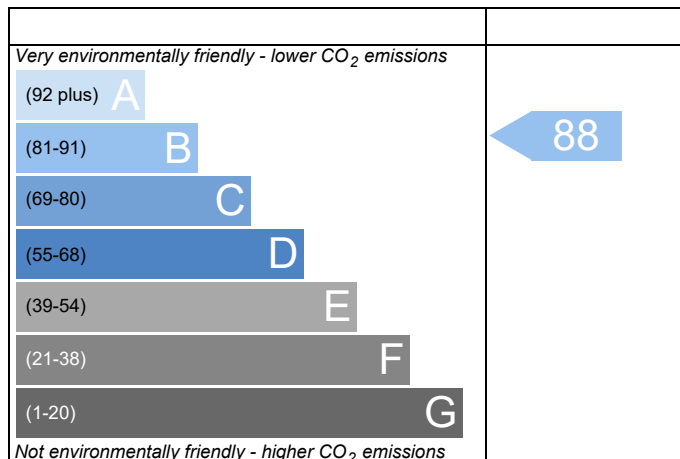
Energy Efficiency Rating



England EU Directive 2002/91/EC

The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.

Environmental Impact (CO₂) Rating



England EU Directive 2002/91/EC

The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO₂) emissions. The higher the rating the less impact it has on the environment.

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

Property Reference	217 - PRJ009077	Issued on Date	30/03/2022
Assessment Reference	217 D	Prop Type Ref	BSP603-1
Property	Plot 217		

SAP Rating	83 B	DER	19.69	TER	20.79
Environmental	88 B	% DER<TER	5.27		
CO ₂ Emissions (t/year)	0.77	DFEE	45.82	TTEE	48.12
General Requirements Compliance	Pass	% DFEE<TTEE	4.79		

Assessor Details	Chris Nicholls, , Tel: ,	Assessor ID	W947-0001
Client			

CALCULATION OF HEAT DEMAND 09 Jan 2014

SAP 2012 WORKSHEET FOR New Build (As Designed) (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	45.6300 (1b)	x 2.3700 (2b)	= 108.1431 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	45.6300		(3a)+(3b)+(3c)+(3d)+(3e)...(3n) = 108.1431 (5)
Dwelling volume			

2. Ventilation rate

	main heating	secondary heating	other	total	m ³ 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				0 + 10 =	0.0000 (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) =				0.0000 / (5) =	0.0000 (8)								
Pressure test				Yes									
Measured/design AP50				5.0100									
Infiltration rate				0.2505	(18)								
Number of sides sheltered				0	(19)								
Shelter factor			(20) = 1 - [0.075 x (19)] =		1.0000 (20)								
Infiltration rate adjusted to include shelter factor			(21) = (18) x (20) =		0.2505 (21)								
Wind speed	Jan 4.5000	Feb 4.5000	Mar 4.4000	Apr 3.9000	May 3.8000	Jun 3.4000	Jul 3.3000	Aug 3.3000	Sep 3.5000	Oct 3.8000	Nov 3.9000	Dec 4.1000	(22)
Wind factor	1.1250	1.1250	1.1000	0.9750	0.9500	0.8500	0.8250	0.8250	0.8750	0.9500	0.9750	1.0250	(22a)
Adj infilt rate	0.2818	0.2818	0.2756	0.2442	0.2380	0.2129	0.2067	0.2067	0.2192	0.2380	0.2442	0.2568	(22b)
Mechanical extract ventilation - decentralised													
If mechanical ventilation:													0.5000 (23a)
Effective ac	0.5318	0.5318	0.5256	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5068	(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
Windows (Uw = 1.30)			4.8000	1.2357	5.9316		(27)
Solid Door			1.9600	1.2000	2.3520		(26)
W1 - Brick	49.9650	4.8010	45.1640	0.2800	12.6459	104.1000	4701.5724 (29a)
W1 - To Corridor	12.0420		12.0420	0.2600	3.1309	104.1000	1253.5722 (29a)
W1 - Stud to Lobby	7.3840	1.9570	5.4270	0.2107	1.1435	4.4800	24.3130 (29a)
Total net area of external elements Aum(A, m ²)			69.3930				(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) =	25.2039	(33)
Party Floor			45.6250			40.0000	1825.0000 (32d)
Party Ceiling			45.6250			70.0000	3193.7500 (32b)
1st Floor Stud			74.5003			5.8200	433.5918 (32c)
Heat capacity Cm = Sum(A x k)							(28)...(30) + (32) + (32a)...(32e) = 11431.7994 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							250.5325 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							4.9789 (36)
Total fabric heat loss							(33) + (36) = 30.1827 (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
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FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

CALCULATION OF HEAT DEMAND 09 Jan 2014

(38)m	18.9789	18.9789	18.7554	17.8436	17.8436	17.8436	17.8436	17.8436	17.8436	17.8436	17.8436	17.8436	18.0849 (38)
Heat transfer coeff	49.1616	49.1616	48.9381	48.0263	48.0263	48.0263	48.0263	48.0263	48.0263	48.0263	48.0263	48.0263	48.2676 (39)
Average = Sum(39)m / 12 =													48.3116 (39)
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
HLP (average)	1.0774	1.0774	1.0725	1.0525	1.0525	1.0525	1.0525	1.0525	1.0525	1.0525	1.0525	1.0578	(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													1.5627 (42)
Average daily hot water use (litres/day)													71.3140 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Energy conte	78.4455	75.5929	72.7403	69.8878	67.0352	64.1826	64.1826	67.0352	69.8878	72.7403	75.5929	78.4455	(44)
Energy content (annual)	116.3323	101.7450	104.9917	91.5343	87.8294	75.7901	70.2306	80.5907	81.5532	95.0424	103.7462	112.6617	(45)
Distribution loss (46)m = 0.15 x (45)m	17.4499	15.2618	15.7488	13.7302	13.1744	11.3685	10.5346	12.0886	12.2330	14.2564	15.5619	16.8992	(46)
Water storage loss:													
Total storage loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(56)
If cylinder contains dedicated solar storage													
Combi loss	14.4907	13.0718	14.4460	13.9502	14.3935	13.9042	14.3521	14.3790	13.9293	14.4243	13.9936	14.4820	(61)
Total heat required for water heating calculated for each month	130.8230	114.8168	119.4378	105.4846	102.2229	89.6943	84.5828	94.9697	95.4825	109.4667	117.7398	127.1437	(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	130.8230	114.8168	119.4378	105.4846	102.2229	89.6943	84.5828	94.9697	95.4825	109.4667	117.7398	127.1437	(64)
RHI water heating demand													
Heat gains from water heating, kWh/month	42.3032	37.0982	38.5213	33.9227	32.8017	28.6763	26.9397	30.3912	30.5988	35.2077	37.9940	41.0805	(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	93.7618	93.7618	93.7618	93.7618	93.7618	93.7618	93.7618	93.7618	93.7618	93.7618	93.7618	93.7618	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	34.3917	30.5464	24.8420	18.8070	14.0584	11.8687	12.8246	16.6699	22.3743	28.4093	33.1578	35.3475	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	202.8448	204.9497	199.6454	188.3533	174.0990	160.7019	151.7519	149.6470	154.9512	166.2434	180.4977	193.8948	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	45.9389	45.9389	45.9389	45.9389	45.9389	45.9389	45.9389	45.9389	45.9389	45.9389	45.9389	45.9389	(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)	-62.5079	-62.5079	-62.5079	-62.5079	-62.5079	-62.5079	-62.5079	-62.5079	-62.5079	-62.5079	-62.5079	-62.5079	(71)
Water heating gains (Table 5)	56.8591	55.2056	51.7759	47.1149	44.0882	39.8281	36.2093	40.8483	42.4983	47.3221	52.7695	55.2157	(72)
Total internal gains	374.2884	370.8945	356.4561	334.4680	312.4385	292.5916	280.9786	287.3580	300.0166	322.1676	346.6178	364.6508	(73)

6. Solar gains

[Jan]		Area	Solar flux	g	FF	Access	Gains						
		m2	Table 6a	Specific data	Specific data	factor	W						
			W/m2	or Table 6b	or Table 6c	Table 6d							
Northeast		1.9210	12.1063	0.7600	0.7200	0.7700	8.8189 (75)						
Southwest		2.8800	38.7358	0.7600	0.7200	0.7700	42.3043 (79)						
Solar gains	51.1232	91.4041	133.4678	182.6005	204.5983	225.0699	206.9639	184.6461	154.2299	105.9411	69.5337	47.9776	(83)
Total gains	425.4116	462.2986	489.9239	517.0684	517.0367	517.6615	487.9425	472.0041	454.2465	428.1087	416.1515	412.6285	(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	64.5931	64.5931	64.8881	66.1200	66.1200	66.1200	66.1200	66.1200	66.1200	66.1200	66.1200	65.7894	
alpha	5.3062	5.3062	5.3259	5.4080	5.4080	5.4080	5.4080	5.4080	5.4080	5.4080	5.4080	5.3860	
util living area	0.9850	0.9758	0.9511	0.8859	0.7709	0.5626	0.4304	0.4542	0.6959	0.9041	0.9693	0.9869	(86)
MIT	20.1630	20.2810	20.5025	20.7526	20.9095	20.9863	20.9973	20.9964	20.9580	20.7548	20.4473	20.1564	(87)
Th 2	20.0193	20.0193	20.0234	20.0398	20.0398	20.0398	20.0398	20.0398	20.0398	20.0398	20.0398	20.0354	(88)
util rest of house													
MIT	0.9806	0.9688	0.9368	0.8543	0.7138	0.4810	0.3379	0.3593	0.6169	0.8711	0.9591	0.9830	(89)
MIT 2	19.2789	19.3940	19.6108	19.8548	19.9840	20.0343	20.0391	20.0389	20.0192	19.8615	19.5747	19.2858	(90)
Living area fraction										fLA = Living area / (4) =		0.5052	(91)
MIT	19.7255	19.8421	20.0612	20.3083	20.4515	20.5152	20.5231	20.5226	20.4935	20.3128	20.0155	19.7256	(92)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

CALCULATION OF ENERGY RATINGS 09 Jan 2014

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

1. Overall dwelling dimensions

	Area (m2)	Storey height (m)	Volume (m3)
Ground floor	45.6300 (1b)	x 2.3700 (2b)	= 108.1431 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	45.6300		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 108.1431 (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				0 * 10 =	0.0000 (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) =					0.0000 / (5) =	0.0000 (8)
Pressure test					Yes	
Measured/design AP50					5.0100	
Infiltration rate					0.2505	(18)
Number of sides sheltered					0	(19)
Shelter factor					(20) = 1 - [0.075 x (19)] =	1.0000 (20)
Infiltration rate adjusted to include shelter factor					(21) = (18) x (20) =	0.2505 (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	0.3194	0.3131	0.3069	0.2756	0.2693	0.2380	0.2380	0.2317	0.2505	0.2693	0.2818	0.2943 (22b)
Mechanical extract ventilation - decentralised												
If mechanical ventilation:												
Effective ac	0.5694	0.5631	0.5569	0.5256	0.5193	0.5000	0.5000	0.5000	0.5005	0.5193	0.5318	0.5443 (25)

3. Heat losses and heat loss parameter

Element	Gross m2	Openings m2	NetArea m2	U-value W/m2K	A x U W/K	K-value kJ/m2K	A x K kJ/K
Windows (Uw = 1.30)			4.8000	1.2357	5.9316		(27)
Solid Door			1.9600	1.2000	2.3520		(26)
Wl - Brick	49.9650	4.8010	45.1640	0.2800	12.6459	104.1000	4701.5724 (29a)
Wl - To Corridor	12.0420		12.0420	0.2600	3.1309	104.1000	1253.5722 (29a)
Wl - Stud to Lobby	7.3840	1.9570	5.4270	0.2107	1.1435	4.4800	24.3130 (29a)
Total net area of external elements Aum(A, m2)			69.3930				(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =	25.2039			(33)
Party Floor			45.6250			40.0000	1825.0000 (32d)
Party Ceiling			45.6250			70.0000	3193.7500 (32b)
1st Floor Stud			74.5003			5.8200	433.5918 (32c)
Heat capacity Cm = Sum(A x k)			(28)...(30) + (32) + (32a)...(32e) =				11431.7994 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							250.5325 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							4.9789 (36)
Total fabric heat loss			(33) + (36) =				30.1827 (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	20.3199	20.0964	19.8729	18.7554	18.5319	17.8436	17.8436	17.8436	17.8615	18.5319	18.9789	19.4259 (38)
Heat transfer coeff	50.5026	50.2791	50.0556	48.9381	48.7146	48.0263	48.0263	48.0263	48.0442	48.7146	49.1616	49.6086 (39)
Average = Sum(39)m / 12 =												
HLP	1.1068	1.1019	1.0970	1.0725	1.0676	1.0525	1.0525	1.0525	1.0529	1.0676	1.0774	1.0872 (40)
HLP (average)												
Days in month	31	28	31	30	31	30	31	31	30	31	30	31 (41)

4. Water heating energy requirements (kWh/year)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Assumed occupancy												
Average daily hot water use (litres/day)												
Daily hot water use	78.4455	75.5929	72.7403	69.8878	67.0352	64.1826	64.1826	67.0352	69.8878	72.7403	75.5929	78.4455 (44)
Energy conte	116.3323	101.7450	104.9917	91.5343	87.8294	75.7901	70.2306	80.5907	81.5532	95.0424	103.7462	112.6617 (45)
Energy content (annual)												
Total = Sum(45)m =												

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

CALCULATION OF ENERGY RATINGS 09 Jan 2014

Distribution loss (46)m = 0.15 x (45)m	17.4499	15.2618	15.7488	13.7302	13.1744	11.3685	10.5346	12.0886	12.2330	14.2564	15.5619	16.8992 (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	14.4907	13.0718	14.4460	13.9502	14.3935	13.9042	14.3521	14.3790	13.9293	14.4243	13.9936	14.4820 (61)
Total heat required for water heating calculated for each month	130.8230	114.8168	119.4378	105.4846	102.2229	89.6943	84.5828	94.9697	95.4825	109.4667	117.7398	127.1437 (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	130.8230	114.8168	119.4378	105.4846	102.2229	89.6943	84.5828	94.9697	95.4825	109.4667	117.7398	127.1437 (64)
Heat gains from water heating, kWh/month	42.3032	37.0982	38.5213	33.9227	32.8017	28.6763	26.9397	30.3912	30.5988	35.2077	37.9940	41.0805 (65)
Solar input (sum of months) = Sum(63)m = 0.0000 (63)												
Total per year (kWh/year) = Sum(64)m = 1291.8645 (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	93.7618	93.7618	93.7618	93.7618	93.7618	93.7618	93.7618	93.7618	93.7618	93.7618	93.7618	93.7618 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	34.3917	30.5464	24.8420	18.8070	14.0584	11.8687	12.8246	16.6699	22.3743	28.4093	33.1578	35.3475 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	202.8448	204.9497	199.6454	188.3533	174.0990	160.7019	151.7519	149.6470	154.9512	166.2434	180.4977	193.8948 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	45.9389	45.9389	45.9389	45.9389	45.9389	45.9389	45.9389	45.9389	45.9389	45.9389	45.9389	45.9389 (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)	-62.5079	-62.5079	-62.5079	-62.5079	-62.5079	-62.5079	-62.5079	-62.5079	-62.5079	-62.5079	-62.5079	-62.5079 (71)
Water heating gains (Table 5)	56.8591	55.2056	51.7759	47.1149	44.0882	39.8281	36.2093	40.8483	42.4983	47.3221	52.7695	55.2157 (72)
Total internal gains	374.2884	370.8945	356.4561	334.4680	312.4385	292.5916	280.9786	287.3580	300.0166	322.1676	346.6178	364.6508 (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						
Northeast	1.9210	11.2829	0.7600	0.7200	0.7700	8.2192 (75)						
Southwest	2.8800	36.7938	0.7600	0.7200	0.7700	40.1834 (79)						
Solar gains	48.4026	85.1776	123.7953	165.5432	196.5165	199.9754	190.7668	166.9132	138.1354	96.0946	58.4723	41.1008 (83)
Total gains	422.6910	456.0721	480.2514	500.0112	508.9549	492.5670	471.7453	454.2712	438.1520	418.2623	405.0901	405.7517 (84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Thl (C)	21.0000 (85)											
Utilisation factor for gains for living area, nil,m (see Table 9a)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
tau	62.8780	63.1575	63.4395	64.8881	65.1858	66.1200	66.1200	66.1200	66.0954	65.1858	64.5931	64.0111
alpha	5.1919	5.2105	5.2293	5.3259	5.3457	5.4080	5.4080	5.4080	5.4064	5.3457	5.3062	5.2674
util living area	0.9860	0.9774	0.9577	0.9038	0.7896	0.6048	0.4447	0.4812	0.7076	0.9110	0.9736	0.9883 (86)
MIT	20.1165	20.2460	20.4484	20.7077	20.8933	20.9802	20.9968	20.9951	20.9551	20.7380	20.3984	20.1012 (87)
Th 2	19.9953	19.9993	20.0033	20.0234	20.0274	20.0398	20.0398	20.0398	20.0395	20.0274	20.0193	20.0113 (88)
util rest of house	0.9818	0.9707	0.9450	0.8754	0.7340	0.5222	0.3494	0.3834	0.6274	0.8790	0.9646	0.9848 (89)
MIT 2	19.2132	19.3433	19.5425	19.8011	19.9604	20.0313	20.0390	20.0385	20.0176	19.8363	19.5105	19.2115 (90)
Living area fraction	19.6695	19.7993	20.0001	20.2591	20.4316	20.5106	20.5229	20.5218	20.4912	20.2918	19.9590	19.6609 (92)
Temperature adjustment	19.5195	19.6493	19.8501	20.1091	20.2816	20.3606	20.3729	20.3718	20.3412	20.1418	19.8090	-0.1500
adjusted MIT												19.5109 (93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Useful gains	0.9793	0.9679	0.9427	0.8782	0.7495	0.5505	0.3828	0.4177	0.6539	0.8833	0.9623	0.9825 (94)
Ext temp.	413.9438	441.4108	452.7228	439.1040	381.4751	271.1684	180.5634	189.7309	286.4983	369.4473	389.8034	398.6595 (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	768.6215	741.5815	668.2491	548.5505	418.0519	276.6622	181.1962	190.7486	299.8524	464.8258	624.7945	759.5540 (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 per m2	263.8803	201.7148	160.3515	78.8015	27.2131	0.0000	0.0000	0.0000	0.0000	70.9616	169.1936	268.5055 (98)
(98) / (4) = 27.1887 (99)												

8c. Space cooling requirement

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

CALCULATION OF ENERGY RATINGS 09 Jan 2014

Not applicable

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

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
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 %)													90.5000 (206)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
Space heating requirement													1370.8529 (211)
Space heating requirement	263.8803	201.7148	160.3515	78.8015	27.2131	0.0000	0.0000	0.0000	0.0000	70.9616	169.1936	268.5055	(98)
Space heating efficiency (main heating system 1)	90.5000	90.5000	90.5000	90.5000	90.5000	0.0000	0.0000	0.0000	0.0000	90.5000	90.5000	90.5000	(210)
Space heating fuel (main heating system)	291.5804	222.8892	177.1840	87.0735	30.0697	0.0000	0.0000	0.0000	0.0000	78.4107	186.9543	296.6911	(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	130.8230	114.8168	119.4378	105.4846	102.2229	89.6943	84.5828	94.9697	95.4825	109.4667	117.7398	127.1437	(64)
Efficiency of water heater (217)m	89.4137	89.3125	89.1057	88.6402	87.9539	87.3000	87.3000	87.3000	87.3000	88.5312	89.1590	89.4464	(216)
Fuel for water heating, kWh/month	146.3121	128.5563	134.0405	119.0030	116.2234	102.7426	96.8875	108.7854	109.3728	123.6477	132.0560	142.1452	(219)
Water heating fuel used													1459.7725 (219)
Annual totals kWh/year													
Space heating fuel - main system													1370.8529 (211)
Space heating fuel - secondary													0.0000 (215)
Electricity for pumps and fans: (MEVDecentralised, Database: total watage = 6.9550, total flow = 29.0000, SFP = 0.2398)													
mechanical ventilation fans (SFP = 0.2398)													31.6416 (230a)
central heating pump													30.0000 (230c)
main heating flue fan													45.0000 (230e)
Total electricity for the above, kWh/year													106.6416 (231)
Electricity for lighting (calculated in Appendix L)													242.9471 (232)
Total delivered energy for all uses													3180.2140 (238)

10a. Fuel costs - using Table 12 prices

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year	
Space heating - main system 1	1370.8529	3.4800	47.7057	(240)
Space heating - secondary	0.0000	0.0000	0.0000	(242)
Water heating (other fuel)	1459.7725	3.4800	50.8001	(247)
Mechanical ventilation fans	31.6416	13.1900	4.1735	(249)
Pumps and fans for heating	75.0000	13.1900	9.8925	(249)
Energy for lighting	242.9471	13.1900	32.0447	(250)
Additional standing charges			120.0000	(251)
Total energy cost			264.6165	(255)

11a. SAP rating - Individual heating systems

Energy cost deflator (Table 12):		0.4200	(256)
Energy cost factor (ECF)	$[(255) \times (256)] / [(4) + 45.0] =$	1.2263	(257)
SAP value		82.8932	
SAP rating (Section 12)		83	(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	1370.8529	0.2160	296.1042	(261)
Space heating - secondary	0.0000	0.0000	0.0000	(263)
Water heating (other fuel)	1459.7725	0.2160	315.3109	(264)
Space and water heating			611.4151	(265)
Pumps and fans	106.6416	0.5190	55.3470	(267)
Energy for lighting	242.9471	0.5190	126.0895	(268)
Total kg/year			792.8516	(272)
CO2 emissions per m2			17.3800	(273)
EI value			88.2774	
EI rating			88	(274)
EI band			B	

Calculation of stars for heating and DHW

Main heating energy efficiency	$3.48 \times (1 + 0.29 \times 0.00) / 0.9050 = 3.845$, stars = 4
Main heating environmental impact	$0.216 \times (1 + 0.29 \times 0.00) / 0.9050 = 0.2387$, stars = 4
Water heating energy efficiency	$3.48 / 0.8840 = 3.937$, stars = 4
Water heating environmental impact	$0.216 / 0.8840 = 0.2444$, stars = 4

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

CALCULATION OF ENERGY RATINGS 09 Jan 2014

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

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

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

1. Overall dwelling dimensions

	Area (m2)	Storey height (m)	Volume (m3)
Ground floor	45.6300 (1b)	2.3700 (2b)	108.1431 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	45.6300		108.1431 (4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	108.1431 (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				0 * 10 =	0.0000 (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) =				0.0000 / (5) =	0.0000 (8)
Pressure test				Yes	
Measured/design AP50				5.0100	
Infiltration rate				0.2505 (18)	
Number of sides sheltered				0 (19)	
Shelter factor			(20) = 1 - [0.075 x (19)] =		1.0000 (20)
Infiltration rate adjusted to include shelter factor			(21) = (18) x (20) =		0.2505 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	4.5000	4.5000	4.4000	3.9000	3.8000	3.4000	3.3000	3.3000	3.5000	3.8000	3.9000	4.1000 (22)
Wind factor	1.1250	1.1250	1.1000	0.9750	0.9500	0.8500	0.8250	0.8250	0.8750	0.9500	0.9750	1.0250 (22a)
Adj infilt rate	0.2818	0.2818	0.2756	0.2442	0.2380	0.2129	0.2067	0.2067	0.2192	0.2380	0.2442	0.2568 (22b)
Mechanical extract ventilation - decentralised												0.5000 (23a)
If mechanical ventilation:												
Effective ac	0.5318	0.5318	0.5256	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5068 (25)

3. Heat losses and heat loss parameter

Element	Gross m2	Openings m2	NetArea m2	U-value W/m2K	A x U W/K	K-value kJ/m2K	A x K kJ/K
Windows (Uw = 1.30)			4.8000	1.2357	5.9316		(27)
Solid Door			1.9600	1.2000	2.3520		(26)
Wl - Brick	49.9650	4.8010	45.1640	0.2800	12.6459	104.1000	4701.5724 (29a)
Wl - To Corridor	12.0420		12.0420	0.2600	3.1309	104.1000	1253.5722 (29a)
Wl - Stud to Lobby	7.3840	1.9570	5.4270	0.2107	1.1435	4.4800	24.3130 (29a)
Total net area of external elements Aum(A, m2)			69.3930				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	25.2039		(33)
Party Floor			45.6250			40.0000	1825.0000 (32d)
Party Ceiling			45.6250			70.0000	3193.7500 (32b)
1st Floor Stud			74.5003			5.8200	433.5918 (32c)
Heat capacity Cm = Sum(A x k)						(28)...(30) + (32) + (32a)...(32e) =	11431.7994 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							250.5325 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							4.9789 (36)
Total fabric heat loss						(33) + (36) =	30.1827 (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	18.9789	18.9789	18.7554	17.8436	17.8436	17.8436	17.8436	17.8436	17.8436	17.8436	17.8436	18.0849 (38)
Heat transfer coeff	49.1616	49.1616	48.9381	48.0263	48.0263	48.0263	48.0263	48.0263	48.0263	48.0263	48.0263	48.2676 (39)
Average = Sum(39)m / 12 =												48.3116 (39)
HLP	1.0774	1.0774	1.0725	1.0525	1.0525	1.0525	1.0525	1.0525	1.0525	1.0525	1.0525	1.0578 (40)
HLP (average)												1.0588 (40)
Days in month	31	28	31	30	31	30	31	31	30	31	30	31 (41)

4. Water heating energy requirements (kWh/year)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Assumed occupancy												1.5627 (42)
Average daily hot water use (litres/day)												71.3140 (43)
Daily hot water use	78.4455	75.5929	72.7403	69.8878	67.0352	64.1826	64.1826	67.0352	69.8878	72.7403	75.5929	78.4455 (44)
Energy conte	116.3323	101.7450	104.9917	91.5343	87.8294	75.7901	70.2306	80.5907	81.5532	95.0424	103.7462	112.6617 (45)
Energy content (annual)										Total = Sum(45)m =		1122.0477 (45)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

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

Distribution loss (46)m = 0.15 x (45)m	17.4499	15.2618	15.7488	13.7302	13.1744	11.3685	10.5346	12.0886	12.2330	14.2564	15.5619	16.8992 (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	14.4907	13.0718	14.4460	13.9502	14.3935	13.9042	14.3521	14.3790	13.9293	14.4243	13.9936	14.4820 (61)
Total heat required for water heating calculated for each month	130.8230	114.8168	119.4378	105.4846	102.2229	89.6943	84.5828	94.9697	95.4825	109.4667	117.7398	127.1437 (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	130.8230	114.8168	119.4378	105.4846	102.2229	89.6943	84.5828	94.9697	95.4825	109.4667	117.7398	127.1437 (64)
Heat gains from water heating, kWh/month	42.3032	37.0982	38.5213	33.9227	32.8017	28.6763	26.9397	30.3912	30.5988	35.2077	37.9940	41.0805 (65)
Solar input (sum of months) = Sum(63)m = 0.0000 (63)												
Total per year (kWh/year) = Sum(64)m = 1291.8645 (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	93.7618	93.7618	93.7618	93.7618	93.7618	93.7618	93.7618	93.7618	93.7618	93.7618	93.7618	93.7618 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	34.3917	30.5464	24.8420	18.8070	14.0584	11.8687	12.8246	16.6699	22.3743	28.4093	33.1578	35.3475 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	202.8448	204.9497	199.6454	188.3533	174.0990	160.7019	151.7519	149.6470	154.9512	166.2434	180.4977	193.8948 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	45.9389	45.9389	45.9389	45.9389	45.9389	45.9389	45.9389	45.9389	45.9389	45.9389	45.9389	45.9389 (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)	-62.5079	-62.5079	-62.5079	-62.5079	-62.5079	-62.5079	-62.5079	-62.5079	-62.5079	-62.5079	-62.5079	-62.5079 (71)
Water heating gains (Table 5)	56.8591	55.2056	51.7759	47.1149	44.0882	39.8281	36.2093	40.8483	42.4983	47.3221	52.7695	55.2157 (72)
Total internal gains	374.2884	370.8945	356.4561	334.4680	312.4385	292.5916	280.9786	287.3580	300.0166	322.1676	346.6178	364.6508 (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						
Northeast	1.9210	12.1063	0.7600	0.7200	0.7700	8.8189 (75)						
Southwest	2.8800	38.7358	0.7600	0.7200	0.7700	42.3043 (79)						
Solar gains	51.1232	91.4041	133.4678	182.6005	204.5983	225.0699	206.9639	184.6461	154.2299	105.9411	69.5337	47.9776 (83)
Total gains	425.4116	462.2986	489.9239	517.0684	517.0367	517.6615	487.9425	472.0041	454.2465	428.1087	416.1515	412.6285 (84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation factor for gains for living area, nil,m (see Table 9a)	64.5931	64.5931	64.8881	66.1200	66.1200	66.1200	66.1200	66.1200	66.1200	66.1200	66.1200	65.7894
tau	5.3062	5.3062	5.3259	5.4080	5.4080	5.4080	5.4080	5.4080	5.4080	5.4080	5.4080	5.3860
alpha	0.9850	0.9758	0.9511	0.8859	0.7709	0.5626	0.4304	0.4542	0.6959	0.9041	0.9693	0.9869 (86)
util living area	20.1630	20.2810	20.5025	20.7526	20.9095	20.9863	20.9973	20.9964	20.9580	20.7548	20.4473	20.1564 (87)
MIT	20.0193	20.0193	20.0234	20.0398	20.0398	20.0398	20.0398	20.0398	20.0398	20.0398	20.0398	20.0354 (88)
Th 2	0.9806	0.9688	0.9368	0.8543	0.7138	0.4810	0.3379	0.3593	0.6169	0.8711	0.9591	0.9830 (89)
util rest of house	19.2789	19.3940	19.6108	19.8548	19.9840	20.0343	20.0391	20.0389	20.0192	19.8615	19.5747	19.2858 (90)
Living area fraction	19.7255	19.8421	20.0612	20.3083	20.4515	20.5152	20.5231	20.5226	20.4935	20.3128	20.0155	19.7256 (92)
MIT 2	19.5755	19.6921	19.9112	20.1583	20.3015	20.3652	20.3731	20.3726	20.3435	20.1628	19.8655	19.5756 (93)
Temperature adjustment adjusted MIT												-0.1500
												19.5756 (93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Useful gains	416.1132	446.5737	458.0302	443.9704	377.5838	263.6005	180.6721	185.2513	292.1168	374.9694	398.2070	404.6804 (95)
Ext temp.	4.3000	4.8000	6.6000	9.0000	11.8000	14.8000	16.6000	16.5000	14.0000	10.5000	7.1000	4.2000 (96)
Heat loss rate W	750.9684	732.1176	651.4266	535.8930	408.2960	267.2758	181.2102	185.9853	304.6530	464.0664	613.0816	742.1442 (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	249.1322	191.8854	143.8869	66.1843	22.8499	0.0000	0.0000	0.0000	0.0000	66.2882	154.7097	251.0730 (98)
Space heating per m2												1146.0096 (98)
												(98) / (4) = 25.1153 (99)

8c. Space cooling requirement

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

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

Not applicable

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

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
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 %)													90.5000 (206)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
Space heating requirement													1266.3090 (211)
Space heating requirement	249.1322	191.8854	143.8869	66.1843	22.8499	0.0000	0.0000	0.0000	0.0000	66.2882	154.7097	251.0730	(98)
Space heating efficiency (main heating system 1)	90.5000	90.5000	90.5000	90.5000	90.5000	0.0000	0.0000	0.0000	0.0000	90.5000	90.5000	90.5000	(210)
Space heating fuel (main heating system)	275.2842	212.0281	158.9910	73.1318	25.2485	0.0000	0.0000	0.0000	0.0000	73.2466	170.9500	277.4288	(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	130.8230	114.8168	119.4378	105.4846	102.2229	89.6943	84.5828	94.9697	95.4825	109.4667	117.7398	127.1437	(64)
Efficiency of water heater (217)m	89.3721	89.2749	89.0200	88.5065	87.8676	87.3000	87.3000	87.3000	87.3000	88.4800	89.0888	89.3984	(216)
Fuel for water heating, kWh/month	146.3802	128.6104	134.1696	119.1828	116.3374	102.7426	96.8875	108.7854	109.3728	123.7192	132.1601	142.2214	(219)
Water heating fuel used													1460.5695 (219)
Annual totals kWh/year													
Space heating fuel - main system													1266.3090 (211)
Space heating fuel - secondary													0.0000 (215)
Electricity for pumps and fans: (MEVDecentralised, Database: total watage = 6.9550, total flow = 29.0000, SFP = 0.2398)													
mechanical ventilation fans (SFP = 0.2398)													31.6416 (230a)
central heating pump													30.0000 (230c)
main heating flue fan													45.0000 (230e)
Total electricity for the above, kWh/year													106.6416 (231)
Electricity for lighting (calculated in Appendix L)													242.9471 (232)
Total delivered energy for all uses													3076.4671 (238)

10a. Fuel costs - using BEDF prices (491)

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	1266.3090	3.6300	45.9670 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1460.5695	3.6300	53.0187 (247)
Mechanical ventilation fans	31.6416	19.4400	6.1511 (249)
Pumps and fans for heating	75.0000	19.4400	14.5800 (249)
Energy for lighting	242.9471	19.4400	47.2289 (250)
Additional standing charges			95.0000 (251)
Total energy cost			261.9457 (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	1266.3090	0.2160	273.5227 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1460.5695	0.2160	315.4830 (264)
Space and water heating			589.0058 (265)
Pumps and fans	106.6416	0.5190	55.3470 (267)
Energy for lighting	242.9471	0.5190	126.0895 (268)
Total kg/year			770.4422 (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	1266.3090	1.2200	1544.8970 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1460.5695	1.2200	1781.8948 (264)
Space and water heating			3326.7918 (265)
Pumps and fans	106.6416	3.0700	327.3896 (267)
Energy for lighting	242.9471	3.0700	745.8475 (268)
Primary energy kWh/year			4400.0288 (272)
Primary energy kWh/m2/year			96.4284 (273)

SAP 2012 EPC IMPROVEMENTS

Current energy efficiency rating: B 83
 Current environmental impact rating: B 88

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

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

(For testing purposes):

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

Recommended measures: (none)	SAP change	Cost change	CO2 change
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Recommended measures (none)	Typical annual savings	Energy efficiency	Environmental impact
	Total Savings £0	0.00 kg/m ²	

Potential energy efficiency rating: B 83
 Potential environmental impact rating: B 88

Fuel prices for cost data on this page from database revision number 491 TEST (28 Feb 2022)
 Recommendation texts revision number 4.9c (22 Feb 2014)

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

	Current	Potential	Saving
Electricity	£68	£68	£0
Mains gas	£194	£194	£0
Space heating	£162	£162	£0
Water heating	£53	£53	£0
Lighting	£47	£47	£0
Total cost of fuels	£262	£262	£0
Total cost of uses	£262	£262	£0
Delivered energy	67 kWh/m ²	67 kWh/m ²	0 kWh/m ²
Carbon dioxide emissions	0.8 tonnes	0.8 tonnes	0.0 tonnes
CO2 emissions per m ²	17 kg/m ²	17 kg/m ²	0 kg/m ²
Primary energy	96 kWh/m ²	96 kWh/m ²	0 kWh/m ²

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

CALCULATION OF ENERGY RATINGS FOR IMPROVED DWELLING 09 Jan 2014

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

No improvements selected / applicable

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

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

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

No improvements selected / applicable

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Designed)

Property Reference	217 - PRJ009077		Issued on Date	30/03/2022	
Assessment Reference	217 D	Prop Type Ref	BSP603-1		
Property	Plot 217				
SAP Rating	83 B	DER	19.69	TER	20.79
Environmental	88 B	% DER<TER	5.27		
CO₂ Emissions (t/year)	0.77	DFEE	45.82	TFEE	48.12
General Requirements Compliance	Pass	% DFEE<TFEE	4.79		
Assessor Details	Chris Nicholls, , Tel: ,		Assessor ID	W947-0001	
Client					

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

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)	20.79	kgCO ₂ /m ²		
Dwelling Carbon Dioxide Emission Rate (DER)	19.69	kgCO ₂ /m ²		Pass
	-1.10 (-5.3%)	kgCO ₂ /m ²		

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	48.12	kWh/m ² /yr		
Dwelling Fabric Energy Efficiency (DFEE)	45.82	kWh/m ² /yr		
	-2.3 (-4.8%)	kWh/m ² /yr		Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.27 (max. 0.30)	0.28 (max. 0.70)	Pass
Openings	1.27 (max. 2.00)	1.30 (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	5.01 (design value)	
Maximum	10.0	Pass

Limiting System Efficiencies

4 Heating efficiency

Main heating system	Boiler system with radiators or underfloor - Mains gas Data from database Ideal LOGIC COMBI ESP1 30 Combi boiler Efficiency: 89.6% SEDBUK2009 Minimum: 88.0%	Pass
Secondary heating system	None	

5 Cylinder insulation

Hot water storage	No cylinder	
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BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Designed)

6 Controls

Space heating controls	Programmer, room thermostat and TRVs	Pass
Hot water controls	No cylinder	
Boiler interlock	Yes	Pass

7 Low energy lights

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

8 Mechanical ventilation

Continuous extract system (decentralised)			
Specific fan power	0.1900 0.1800		
Maximum	0.7		Pass

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (Midlands)	Not significant	Pass
Based on:		
Overshading	Average	
Windows facing North East	1.92 m ² , No overhang	
Windows facing South West	2.88 m ² , No overhang	
Air change rate	4.55 ach	
Blinds/curtains	Dark-coloured curtain or roller blind, closed 100% of daylight hours	

Criterion 4 – Building performance consistent with DER and DFEE rate

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals	5.01 (design value)	
Maximum	10.0	Pass

10 Key features

None	N/A
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