

PREDICTED ENERGY ASSESSMENT

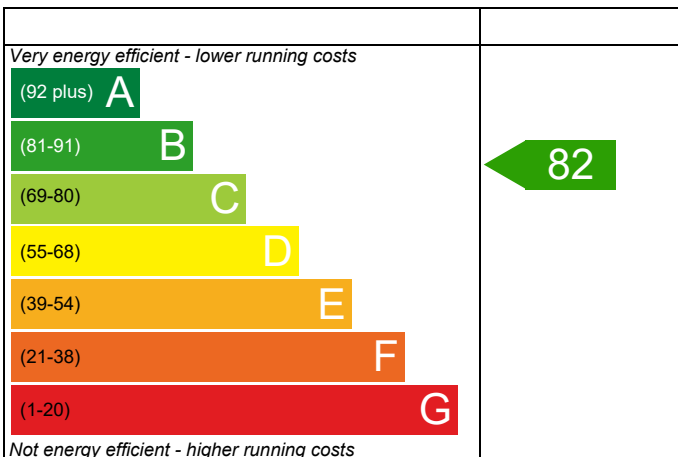
Plot 214

Dwelling type: Flat, Detached
Date of assessment: 30/03/2022
Produced by: Gary Nicholls
Total floor area: 47.771 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

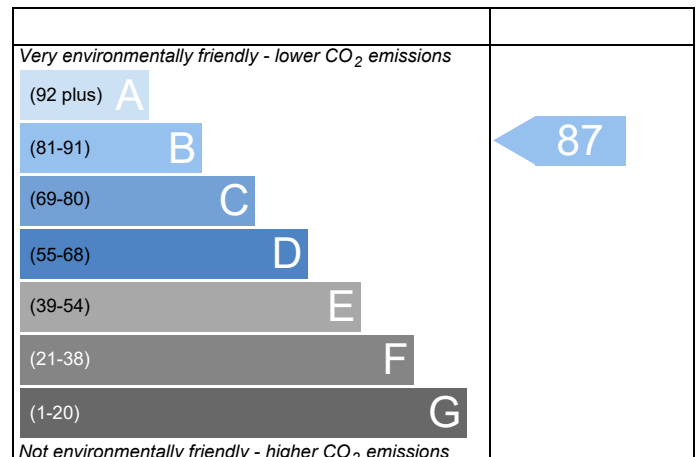


England

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	214 - PRJ009077	Issued on Date	30/03/2022
Assessment Reference	214 D	Prop Type Ref	BSP603-1
Property	Plot 214		

SAP Rating	82 B	DER	21.89	TER	22.84
Environmental	87 B	% DER<TER	4.15		
CO ₂ Emissions (t/year)	0.90	DFEE	56.09	TTEE	60.67
General Requirements Compliance	Pass	% DFEE<TTEE	7.54		

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	47.7710 (1b)	x 2.3830 (2b)	= 113.8383 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	47.7710		(3a)+(3b)+(3c)+(3d)+(3e)...(3n) = 113.8383 (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)			5.7600	1.2357	7.1179		(27)					
Solid Door			1.9600	1.2000	2.3520		(26)					
Fir - Ground			47.7710	0.1800	8.5988	75.6000	3611.4876 (28a)					
W1 - Brick	54.2130	7.7170	46.4960	0.2800	13.0189	104.1000	4840.2336 (29a)					
W1 - To Corridor	16.4530		16.4530	0.2600	4.2778	104.1000	1712.7573 (29a)					
RF - Ceiling below Corridor	2.1460		2.1460	0.1800	0.3863	4.4800	9.6141 (30)					
Total net area of external elements Aum(A, m ²)			120.5860				(31)					
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	35.7516		(33)					
Party Ceiling			45.6250			70.0000	3193.7500 (32b)					
Ground Floor Stud			82.5233			5.8200	480.2855 (32c)					
Heat capacity Cm = Sum(A x k)						(28)...(30) + (32) + (32a)...(32e) =	13848.1281 (34)					
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							289.8857 (35)					
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							4.7334 (36)					
Total fabric heat loss						(33) + (36) =	40.4850 (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

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

CALCULATION OF HEAT DEMAND 09 Jan 2014

(38)m	19.9784	19.9784	19.7431	18.7833	18.7833	18.7833	18.7833	18.7833	18.7833	18.7833	18.7833	18.7833	19.0374 (38)
Heat transfer coeff	60.4634	60.4634	60.2282	59.2683	59.2683	59.2683	59.2683	59.2683	59.2683	59.2683	59.2683	59.2683	59.5224 (39)
Average = Sum(39)m / 12 =													59.5687 (39)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
HLP	1.2657	1.2657	1.2608	1.2407	1.2407	1.2407	1.2407	1.2407	1.2407	1.2407	1.2407	1.2407	1.2460 (40)
HLP (average)													1.2470 (40)
Days in month	31	28	31	30	31	30	31	31	30	31	30	31	31 (41)

4. Water heating energy requirements (kWh/year)

Assumed occupancy													1.6247 (42)
Average daily hot water use (litres/day)													72.7873 (43)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Daily hot water use	80.0660	77.1545	74.2430	71.3315	68.4200	65.5085	65.5085	68.4200	71.3315	74.2430	77.1545	80.0660	(44)
Energy conte	118.7356	103.8469	107.1607	93.4253	89.6438	77.3558	71.6815	82.2556	83.2379	97.0058	105.8894	114.9890	(45)
Energy content (annual)													Total = Sum(45)m = 1145.2272 (45)
Distribution loss (46)m = 0.15 x (45)m	17.8103	15.5770	16.0741	14.0138	13.4466	11.6034	10.7522	12.3383	12.4857	14.5509	15.8834	17.2484	(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	0.0000	(57)
Combi loss	14.5021	13.0814	14.4556	13.9582	14.4009	13.9103	14.3578	14.3857	13.9364	14.4330	14.0034	14.4931	(61)
Total heat required for water heating calculated for each month	133.2377	116.9283	121.6163	107.3835	104.0447	91.2661	86.0393	96.6413	97.1744	111.4388	119.8928	129.4822	(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	133.2377	116.9283	121.6163	107.3835	104.0447	91.2661	86.0393	96.6413	97.1744	111.4388	119.8928	129.4822	(64)
Total per year (kWh/year) = Sum(64)m =													1315.1452 (64)
RHI water heating demand													1315 (64)
Heat gains from water heating, kWh/month	43.1051	37.7994	39.2448	34.5535	33.4068	29.1984	27.4235	30.9464	31.1607	35.8627	38.7091	41.8571	(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	97.4836	97.4836	97.4836	97.4836	97.4836	97.4836	97.4836	97.4836	97.4836	97.4836	97.4836	97.4836	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	34.7374	30.8534	25.0917	18.9960	14.1997	11.9880	12.9535	16.8374	22.5992	28.6948	33.4911	35.7028	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	211.1157	213.3065	207.7859	196.0333	181.1978	167.2545	157.9395	155.7488	161.2693	173.0219	187.8575	201.8008	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	46.3731	46.3731	46.3731	46.3731	46.3731	46.3731	46.3731	46.3731	46.3731	46.3731	46.3731	46.3731	(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)	-64.9891	-64.9891	-64.9891	-64.9891	-64.9891	-64.9891	-64.9891	-64.9891	-64.9891	-64.9891	-64.9891	-64.9891	(71)
Water heating gains (Table 5)	57.9370	56.2492	52.7484	47.9909	44.9016	40.5533	36.8596	41.5946	43.2788	48.2025	53.7626	56.2596	(72)
Total internal gains	385.6577	382.2767	367.4937	344.8879	322.1668	301.6634	289.6202	296.0485	309.0149	331.7869	356.9788	375.6308	(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		2.5200	12.1063	0.7600	0.7200	0.7700	11.5688 (75)						
Southwest		3.2400	38.7358	0.7600	0.7200	0.7700	47.5923 (79)						
Solar gains	59.1612	106.2425	156.3279	215.7704	243.2512	268.2501	246.4128	218.7982	181.2951	123.4700	80.5608	55.4608	(83)
Total gains	444.8189	488.5192	523.8216	560.6583	565.4180	569.9136	536.0330	514.8467	490.3100	455.2569	437.5396	431.0916	(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	63.6203	63.6203	63.8688	64.9032	64.9032	64.9032	64.9032	64.9032	64.9032	64.9032	64.9032	64.6261	
alpha	5.2414	5.2414	5.2579	5.3269	5.3269	5.3269	5.3269	5.3269	5.3269	5.3269	5.3269	5.3084	
util living area	0.9923	0.9868	0.9708	0.9234	0.8263	0.6212	0.4811	0.5104	0.7642	0.9411	0.9836	0.9934	(86)
MIT	20.0260	20.1475	20.3847	20.6670	20.8657	20.9769	20.9950	20.9932	20.9309	20.6664	20.3230	20.0172	(87)
Th 2	19.8678	19.8678	19.8717	19.8876	19.8876	19.8876	19.8876	19.8876	19.8876	19.8876	19.8876	19.8834	(88)
util rest of house													
0.9895	0.9819	0.9598	0.8947	0.7652	0.5205	0.3624	0.3884	0.6738	0.9132	0.9766	0.9910	(89)	
MIT 2	19.0090	19.1286	19.3631	19.6404	19.8072	19.8792	19.8866	19.8862	19.8556	19.6456	19.3188	19.0130	(90)
Living area fraction													fLA = Living area / (4) = 0.4637 (91)
MIT	19.4806	19.6010	19.8368	20.1164	20.2980	20.3882	20.4005	20.3995	20.3542	20.1189	19.7844	19.4786	(92)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

CALCULATION OF HEAT DEMAND 09 Jan 2014

Temperature adjustment													-0.1500
adjusted MIT	19.3306	19.4510	19.6868	19.9664	20.1480	20.2382	20.2505	20.2495	20.2042	19.9689	19.6344		19.3286 (93)

 8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9878	0.9797	0.9576	0.8971	0.7809	0.5534	0.4017	0.4288	0.7016	0.9156	0.9746	0.9895	(94)
Useful gains	439.3870	478.5971	501.5984	502.9513	441.5215	315.3995	215.3304	220.7816	344.0201	416.8344	426.4296	426.5459	(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													
Month fracti	908.8011	885.8513	788.1922	649.9622	494.7724	322.3114	216.3613	222.2266	367.7110	561.2060	742.8948	900.4914	(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	349.2441	273.6749	213.2258	105.8479	39.6187	0.0000	0.0000	0.0000	0.0000	107.4125	227.8550	352.6155	(98)
RHI space heating demand												1669.4942	(98)
												1669	(98)

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 (m ²)	Storey height (m)	Volume (m ³)
Ground floor	47.7710 (1b)	2.3830 (2b)	113.8383 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	47.7710		113.8383 (4)
Dwelling volume			(3a)+(3b)+(3c)+(3d)+(3e)...(3n) = 113.8383 (5)

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	0.2505 (18)
Number of sides sheltered				0	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												0.5000 (23a)
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 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)			5.7600	1.2357	7.1179		(27)
Solid Door			1.9600	1.2000	2.3520		(26)
Flr - Ground			47.7710	0.1800	8.5988	75.6000	3611.4876 (28a)
Wl - Brick	54.2130	7.7170	46.4960	0.2800	13.0189	104.1000	4840.2336 (29a)
Wl - To Corridor	16.4530		16.4530	0.2600	4.2778	104.1000	1712.7573 (29a)
Rf - Ceiling below Corridor	2.1460		2.1460	0.1800	0.3863	4.4800	9.6141 (30)
Total net area of external elements Aum(A, m ²)			120.5860				(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) =	35.7516	(33)
Party Ceiling			45.6250			70.0000	3193.7500 (32b)
Ground Floor Stud			82.5233			5.8200	480.2855 (32c)
Heat capacity Cm = Sum(A x k)							(28)...(30) + (32) + (32a)...(32e) = 13848.1281 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							289.8857 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							4.7334 (36)
Total fabric heat loss							(33) + (36) = 40.4850 (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	21.3900	21.1547	20.9195	19.7431	19.5079	18.7833	18.7833	18.7833	18.8021	19.5079	19.9784	20.4489 (38)
Heat transfer coeff	61.8750	61.6397	61.4045	60.2282	59.9929	59.2683	59.2683	59.2683	59.2871	59.9929	60.4634	60.9339 (39)
Average = Sum(39)m / 12 =												60.3019 (39)
HLP	1.2952	1.2903	1.2854	1.2608	1.2558	1.2407	1.2407	1.2407	1.2411	1.2558	1.2657	1.2755 (40)
HLP (average)												1.2623 (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												1.6247 (42)
Average daily hot water use (litres/day)												72.7873 (43)
Daily hot water use	80.0660	77.1545	74.2430	71.3315	68.4200	65.5085	65.5085	68.4200	71.3315	74.2430	77.1545	80.0660 (44)
Energy conte	118.7356	103.8469	107.1607	93.4253	89.6438	77.3558	71.6815	82.2556	83.2379	97.0058	105.8894	114.9890 (45)
Energy content (annual)												Total = Sum(45)m = 1145.2272 (45)

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	17.8103	15.5770	16.0741	14.0138	13.4466	11.6034	10.7522	12.3383	12.4857	14.5509	15.8834	17.2484 (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	14.5021	13.0814	14.4556	13.9582	14.4009	13.9103	14.3578	14.3857	13.9364	14.4330	14.0034	14.4931 (61)
Total heat required for water heating calculated for each month	133.2377	116.9283	121.6163	107.3835	104.0447	91.2661	86.0393	96.6413	97.1744	111.4388	119.8928	129.4822 (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	133.2377	116.9283	121.6163	107.3835	104.0447	91.2661	86.0393	96.6413	97.1744	111.4388	119.8928	129.4822 (64)
Heat gains from water heating, kWh/month	43.1051	37.7994	39.2448	34.5535	33.4068	29.1984	27.4235	30.9464	31.1607	35.8627	38.7091	41.8571 (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	97.4836	97.4836	97.4836	97.4836	97.4836	97.4836	97.4836	97.4836	97.4836	97.4836	97.4836	97.4836 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	34.7374	30.8534	25.0917	18.9960	14.1997	11.9880	12.9535	16.8374	22.5992	28.6948	33.4911	35.7028 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	211.1157	213.3065	207.7859	196.0333	181.1978	167.2545	157.9395	155.7488	161.2693	173.0219	187.8575	201.8008 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	46.3731	46.3731	46.3731	46.3731	46.3731	46.3731	46.3731	46.3731	46.3731	46.3731	46.3731	46.3731 (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)	-64.9891	-64.9891	-64.9891	-64.9891	-64.9891	-64.9891	-64.9891	-64.9891	-64.9891	-64.9891	-64.9891	-64.9891 (71)
Water heating gains (Table 5)	57.9370	56.2492	52.7484	47.9909	44.9016	40.5533	36.8596	41.5946	43.2788	48.2025	53.7626	56.2596 (72)
Total internal gains	385.6577	382.2767	367.4937	344.8879	322.1668	301.6634	289.6202	296.0485	309.0149	331.7869	356.9788	375.6308 (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	2.5200	11.2829	0.7600	0.7200	0.7700	10.7821 (75)						
Southwest	3.2400	36.7938	0.7600	0.7200	0.7700	45.2063 (79)						
Solar gains	55.9884	98.9503	144.9009	195.4841	233.5122	238.2253	227.0105	197.6611	162.2640	111.9261	67.7134	47.4924 (83)
Total gains	441.6461	481.2270	512.3946	540.3720	555.6790	539.8887	516.6307	493.7096	471.2789	443.7130	424.6922	423.1232 (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	62.1689	62.4062	62.6453	63.8688	64.1193	64.9032	64.9032	64.9032	64.8826	64.1193	63.6203	63.1290
alpha	5.1446	5.1604	5.1764	5.2579	5.2746	5.3269	5.3269	5.3269	5.3255	5.2746	5.2414	5.2086
util living area	0.9927	0.9876	0.9749	0.9366	0.8423	0.6669	0.4981	0.5415	0.7769	0.9458	0.9860	0.9941 (86)
MIT	19.9853	20.1172	20.3323	20.6181	20.8457	20.9668	20.9941	20.9909	20.9261	20.6494	20.2773	19.9681 (87)
Th 2	19.8446	19.8484	19.8523	19.8717	19.8756	19.8876	19.8876	19.8876	19.8873	19.8756	19.8678	19.8600 (88)
util rest of house	0.9901	0.9830	0.9652	0.9116	0.7839	0.5666	0.3758	0.4163	0.6859	0.9191	0.9799	0.9919 (89)
MIT 2	18.9498	19.0830	19.2965	19.5833	19.7814	19.8747	19.8864	19.8856	19.8531	19.6204	19.2580	18.9454 (90)
Living area fraction	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000 (91)
MIT	19.4299	19.5625	19.7768	20.0631	20.2749	20.3811	20.4000	20.3981	20.3506	20.0975	19.7306	19.4196 (92)
Temperature adjustment												-0.1500
adjusted MIT	19.2799	19.4125	19.6268	19.9131	20.1249	20.2311	20.2500	20.2481	20.2006	19.9475	19.5806	19.2696 (93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Useful gains	0.9883	0.9807	0.9628	0.9127	0.7983	0.5991	0.4164	0.4579	0.7138	0.9211	0.9779	0.9904 (94)
Ext temp.	436.4904	471.9543	493.3440	493.2062	443.5889	323.4233	215.1082	226.0491	336.4031	408.7246	415.3076	419.0578 (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	926.8838	894.5484	806.0419	663.2991	505.4349	333.7456	216.3310	228.0699	361.6875	560.7848	754.6220	918.2520 (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	364.8527	283.9832	232.6472	122.4669	46.0135	0.0000	0.0000	0.0000	0.0000	113.1328	244.3064	371.4005 (98)
												1778.8032 (98)
												(98) / (4) = 37.2360 (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													1965.5284 (211)
Space heating requirement	364.8527	283.9832	232.6472	122.4669	46.0135	0.0000	0.0000	0.0000	0.0000	113.1328	244.3064	371.4005	(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)	403.1522	313.7936	257.0688	135.3225	50.8436	0.0000	0.0000	0.0000	0.0000	125.0086	269.9518	410.3873	(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	133.2377	116.9283	121.6163	107.3835	104.0447	91.2661	86.0393	96.6413	97.1744	111.4388	119.8928	129.4822	(64)
Efficiency of water heater (217)m	89.6212	89.5427	89.3753	88.9763	88.2569	87.3000	87.3000	87.3000	87.3000	88.8833	89.4210	89.6505	(216)
Fuel for water heating, kWh/month	148.6675	130.5838	136.0736	120.6878	117.8884	104.5431	98.5559	110.7002	111.3108	125.3765	134.0768	144.4299	(219)
Water heating fuel used													1482.8944 (219)
Annual totals kWh/year													
Space heating fuel - main system													1965.5284 (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)													33.3079 (230a)
central heating pump													30.0000 (230c)
main heating flue fan													45.0000 (230e)
Total electricity for the above, kWh/year													108.3079 (231)
Electricity for lighting (calculated in Appendix L)													245.3891 (232)
Total delivered energy for all uses													3802.1198 (238)

10a. Fuel costs - using Table 12 prices

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year	
Space heating - main system 1	1965.5284	3.4800	68.4004	(240)
Space heating - secondary	0.0000	0.0000	0.0000	(242)
Water heating (other fuel)	1482.8944	3.4800	51.6047	(247)
Mechanical ventilation fans	33.3079	13.1900	4.3933	(249)
Pumps and fans for heating	75.0000	13.1900	9.8925	(249)
Energy for lighting	245.3891	13.1900	32.3668	(250)
Additional standing charges			120.0000	(251)
Total energy cost			286.6577	(255)

11a. SAP rating - Individual heating systems

Energy cost deflator (Table 12):		0.4200 (256)
Energy cost factor (ECF)	$[(255) \times (256)] / [(4) + 45.0] =$	1.2978 (257)
SAP value		81.8960
SAP rating (Section 12)		82 (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	1965.5284	0.2160	424.5541	(261)
Space heating - secondary	0.0000	0.0000	0.0000	(263)
Water heating (other fuel)	1482.8944	0.2160	320.3052	(264)
Space and water heating			744.8593	(265)
Pumps and fans	108.3079	0.5190	56.2118	(267)
Energy for lighting	245.3891	0.5190	127.3569	(268)
Total kg/year			928.4281	(272)
CO2 emissions per m2			19.4300	(273)
EI value			86.5896	
EI rating			87	(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	$3.48 / 0.8858 = 3.929$, stars = 4
Water heating environmental impact	$0.216 / 0.8858 = 0.2439$, 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	47.7710 (1b)	2.3830 (2b)	113.8383 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	47.7710		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	113.8383 (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)			5.7600	1.2357	7.1179		(27)
Solid Door			1.9600	1.2000	2.3520		(26)
Flr - Ground			47.7710	0.1800	8.5988	75.6000	3611.4876 (28a)
Wl - Brick	54.2130	7.7170	46.4960	0.2800	13.0189	104.1000	4840.2336 (29a)
Wl - To Corridor	16.4530		16.4530	0.2600	4.2778	104.1000	1712.7573 (29a)
Rf - Ceiling below Corridor	2.1460		2.1460	0.1800	0.3863	4.4800	9.6141 (30)
Total net area of external elements Aum(A, m2)			120.5860				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	35.7516		(33)
Party Ceiling			45.6250			70.0000	3193.7500 (32b)
Ground Floor Stud			82.5233			5.8200	480.2855 (32c)
Heat capacity Cm = Sum(A x k)						(28)...(30) + (32) + (32a)...(32e) =	13848.1281 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							289.8857 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							4.7334 (36)
Total fabric heat loss						(33) + (36) =	40.4850 (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	19.9784	19.9784	19.7431	18.7833	18.7833	18.7833	18.7833	18.7833	18.7833	18.7833	18.7833	19.0374 (38)
Heat transfer coeff	60.4634	60.4634	60.2282	59.2683	59.2683	59.2683	59.2683	59.2683	59.2683	59.2683	59.2683	59.5224 (39)
Average = Sum(39)m / 12 =												59.5687 (39)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.2657	1.2657	1.2608	1.2407	1.2407	1.2407	1.2407	1.2407	1.2407	1.2407	1.2407	1.2460 (40)
HLP (average)												1.2470 (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												1.6247 (42)
Average daily hot water use (litres/day)												72.7873 (43)
Daily hot water use	80.0660	77.1545	74.2430	71.3315	68.4200	65.5085	65.5085	68.4200	71.3315	74.2430	77.1545	80.0660 (44)
Energy conte	118.7356	103.8469	107.1607	93.4253	89.6438	77.3558	71.6815	82.2556	83.2379	97.0058	105.8894	114.9890 (45)
Energy content (annual)										Total = Sum(45)m =		1145.2272 (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	17.8103	15.5770	16.0741	14.0138	13.4466	11.6034	10.7522	12.3383	12.4857	14.5509	15.8834	17.2484 (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	14.5021	13.0814	14.4556	13.9582	14.4009	13.9103	14.3578	14.3857	13.9364	14.4330	14.0034	14.4931 (61)
Total heat required for water heating calculated for each month	133.2377	116.9283	121.6163	107.3835	104.0447	91.2661	86.0393	96.6413	97.1744	111.4388	119.8928	129.4822 (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	133.2377	116.9283	121.6163	107.3835	104.0447	91.2661	86.0393	96.6413	97.1744	111.4388	119.8928	129.4822 (64)
Heat gains from water heating, kWh/month	43.1051	37.7994	39.2448	34.5535	33.4068	29.1984	27.4235	30.9464	31.1607	35.8627	38.7091	41.8571 (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	97.4836	97.4836	97.4836	97.4836	97.4836	97.4836	97.4836	97.4836	97.4836	97.4836	97.4836	97.4836 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	34.7374	30.8534	25.0917	18.9960	14.1997	11.9880	12.9535	16.8374	22.5992	28.6948	33.4911	35.7028 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	211.1157	213.3065	207.7859	196.0333	181.1978	167.2545	157.9395	155.7488	161.2693	173.0219	187.8575	201.8008 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	46.3731	46.3731	46.3731	46.3731	46.3731	46.3731	46.3731	46.3731	46.3731	46.3731	46.3731	46.3731 (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)	-64.9891	-64.9891	-64.9891	-64.9891	-64.9891	-64.9891	-64.9891	-64.9891	-64.9891	-64.9891	-64.9891	-64.9891 (71)
Water heating gains (Table 5)	57.9370	56.2492	52.7484	47.9909	44.9016	40.5533	36.8596	41.5946	43.2788	48.2025	53.7626	56.2596 (72)
Total internal gains	385.6577	382.2767	367.4937	344.8879	322.1668	301.6634	289.6202	296.0485	309.0149	331.7869	356.9788	375.6308 (73)

6. Solar gains

[Jan]	Area	Solar flux	g	FF	Access	Gains						
	m ²	Table 6a	Specific data	Specific data	factor	W						
		W/m ²	or Table 6b	or Table 6c	Table 6d							
Northeast	2.5200	12.1063	0.7600	0.7200	0.7700	11.5688 (75)						
Southwest	3.2400	38.7358	0.7600	0.7200	0.7700	47.5923 (79)						
Solar gains	59.1612	106.2425	156.3279	215.7704	243.2512	268.2501	246.4128	218.7982	181.2951	123.4700	80.5608	55.4608 (83)
Total gains	444.8189	488.5192	523.8216	560.6583	565.4180	569.9136	536.0330	514.8467	490.3100	455.2569	437.5396	431.0916 (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	63.6203	63.6203	63.8688	64.9032	64.9032	64.9032	64.9032	64.9032	64.9032	64.9032	64.9032	64.6261
alpha	5.2414	5.2414	5.2579	5.3269	5.3269	5.3269	5.3269	5.3269	5.3269	5.3269	5.3269	5.3084
util living area	0.9923	0.9868	0.9708	0.9234	0.8263	0.6212	0.4811	0.5104	0.7642	0.9411	0.9836	0.9934 (86)
MIT	20.0260	20.1475	20.3847	20.6670	20.8657	20.9769	20.9950	20.9932	20.9309	20.6664	20.3230	20.0172 (87)
Th 2	19.8678	19.8678	19.8717	19.8876	19.8876	19.8876	19.8876	19.8876	19.8876	19.8876	19.8876	19.8834 (88)
util rest of house	0.9895	0.9819	0.9598	0.8947	0.7652	0.5205	0.3624	0.3884	0.6738	0.9132	0.9766	0.9910 (89)
MIT 2	19.0090	19.1286	19.3631	19.6404	19.8072	19.8792	19.8866	19.8862	19.8556	19.6456	19.3188	19.0130 (90)
Living area fraction	19.4806	19.6010	19.8368	20.1164	20.2980	20.3882	20.4005	20.3995	20.3542	20.1189	19.7844	19.4786 (92)
Temperature adjustment	19.3306	19.4510	19.6868	19.9664	20.1480	20.2382	20.2505	20.2495	20.2042	19.9689	19.6344	-0.1500
adjusted MIT												19.3286 (93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Useful gains	439.3870	478.5971	501.5984	502.9513	441.5215	315.3995	215.3304	220.7816	344.0201	416.8344	426.4296	426.5459 (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	908.8011	885.8513	788.1922	649.9622	494.7724	322.3114	216.3613	222.2266	367.7110	561.2060	742.8948	900.4914 (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	349.2441	273.6749	213.2258	105.8479	39.6187	0.0000	0.0000	0.0000	0.0000	107.4125	227.8550	352.6155 (98)
Space heating												1669.4942 (98)
Space heating per m2												(98) / (4) = 34.9479 (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													1844.7449 (211)
Space heating requirement	349.2441	273.6749	213.2258	105.8479	39.6187	0.0000	0.0000	0.0000	0.0000	107.4125	227.8550	352.6155	(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)	385.9051	302.4032	235.6086	116.9590	43.7775	0.0000	0.0000	0.0000	0.0000	118.6878	251.7734	389.6304	(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	133.2377	116.9283	121.6163	107.3835	104.0447	91.2661	86.0393	96.6413	97.1744	111.4388	119.8928	129.4822	(64)
Efficiency of water heater (217)m	89.5931	89.5177	89.3110	88.8597	88.1597	87.3000	87.3000	87.3000	87.3000	88.8418	89.3706	89.6177	(216)
Fuel for water heating, kWh/month	148.7142	130.6203	136.1717	120.8461	118.0185	104.5431	98.5559	110.7002	111.3108	125.4351	134.1525	144.4828	(219)
Water heating fuel used													1483.5511 (219)
Annual totals kWh/year													
Space heating fuel - main system													1844.7449 (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)													33.3079 (230a)
central heating pump													30.0000 (230c)
main heating flue fan													45.0000 (230e)
Total electricity for the above, kWh/year													108.3079 (231)
Electricity for lighting (calculated in Appendix L)													245.3891 (232)
Total delivered energy for all uses													3681.9930 (238)

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

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	1844.7449	3.6300	66.9642 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1483.5511	3.6300	53.8529 (247)
Mechanical ventilation fans	33.3079	19.4400	6.4751 (249)
Pumps and fans for heating	75.0000	19.4400	14.5800 (249)
Energy for lighting	245.3891	19.4400	47.7036 (250)
Additional standing charges			95.0000 (251)
Total energy cost			284.5758 (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	1844.7449	0.2160	398.4649 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1483.5511	0.2160	320.4470 (264)
Space and water heating			718.9119 (265)
Pumps and fans	108.3079	0.5190	56.2118 (267)
Energy for lighting	245.3891	0.5190	127.3569 (268)
Total kg/year			902.4807 (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	1844.7449	1.2200	2250.5888 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1483.5511	1.2200	1809.9323 (264)
Space and water heating			4060.5212 (265)
Pumps and fans	108.3079	3.0700	332.5053 (267)
Energy for lighting	245.3891	3.0700	753.3445 (268)
Primary energy kWh/year			5146.3709 (272)
Primary energy kWh/m2/year			107.7300 (273)

SAP 2012 EPC IMPROVEMENTS

Current energy efficiency rating: B 82
Current environmental impact rating: B 87

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 82	
Potential environmental impact rating:			B 87

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	£69	£69	£0
Mains gas	£216	£216	£0
Space heating	£183	£183	£0
Water heating	£54	£54	£0
Lighting	£48	£48	£0
Total cost of fuels	£285	£285	£0
Total cost of uses	£285	£285	£0
Delivered energy	77 kWh/m ²	77 kWh/m ²	0 kWh/m ²
Carbon dioxide emissions	0.9 tonnes	0.9 tonnes	0.0 tonnes
CO2 emissions per m ²	19 kg/m ²	19 kg/m ²	0 kg/m ²
Primary energy	108 kWh/m ²	108 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	214 - PRJ009077		Issued on Date	30/03/2022	
Assessment Reference	214 D	Prop Type Ref	BSP603-1		
Property	Plot 214				
SAP Rating	82 B	DER	21.89	TER	22.84
Environmental	87 B	% DER<TER	4.15		
CO₂ Emissions (t/year)	0.90	DFEE	56.09	TFEE	60.67
General Requirements Compliance	Pass	% DFEE<TFEE	7.54		
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)	22.84	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	21.89	kgCO ₂ /m ²	Pass
	-0.95 (-4.2%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	60.67	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	56.09	kWh/m ² /yr	
	-4.6 (-7.6%)	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
Floor	0.18 (max. 0.25)	0.18 (max. 0.70)	Pass
Roof	0.18 (max. 0.20)	0.18 (max. 0.35)	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	

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Designed)

5 Cylinder insulation

Hot water storage

6 Controls

Space heating controls

Hot water controls

Boiler interlock

7 Low energy lights

Percentage of fixed lights with low-energy fittings %

Minimum %

8 Mechanical ventilation

Continuous extract system (decentralised)
Specific fan power

Maximum

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (Midlands)

Based on:

Overshading

Windows facing North East

Windows facing South West

Air change rate

Blinds/curtains

Criterion 4 – Building performance consistent with DER and DFEE rate

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals

Maximum

10 Key features

Thermal bridging y-value W/m²K