

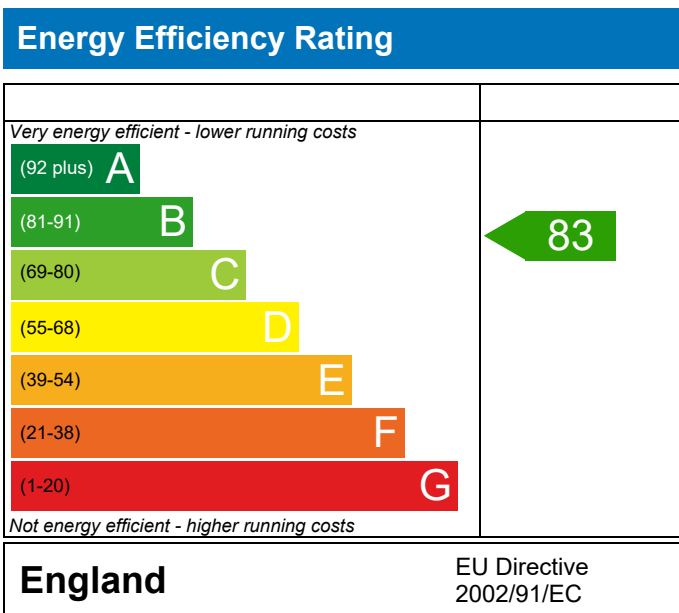
PREDICTED ENERGY ASSESSMENT

142 - PRJ009250 - GF

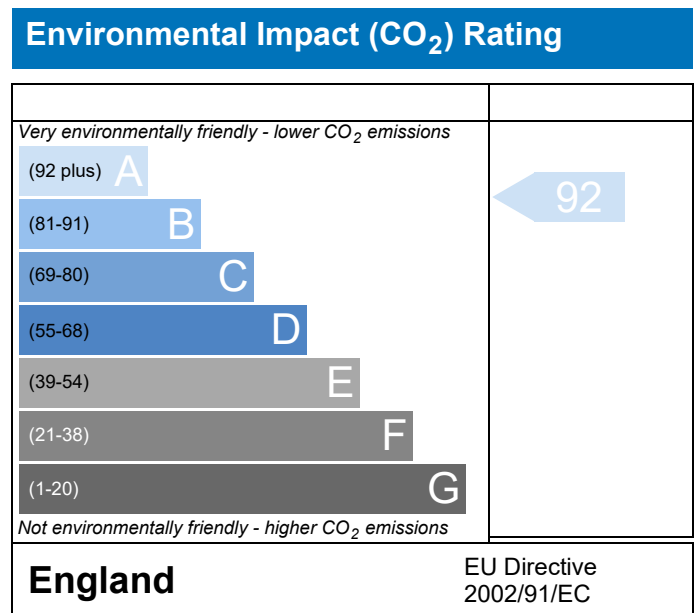
Dwelling type: Flat, End-Terrace
 Date of assessment: 13/10/2021
 Produced by: Michael Juckes
 Total floor area: 55.1 m²

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.



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.



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.

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

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

Property Reference	142 - PRJ009250 - GF	Issued on Date	13/10/2021
Assessment Reference	142 E	Prop Type Ref	Block 1C - GF
Property	142 - PRJ009250 - GF		

SAP Rating	83 B	DER	12.77	TER	20.76
Environmental	92 A	% DER<TER	38.49		
CO ₂ Emissions (t/year)	0.48	DFEE	48.83	TTEE	55.95
General Requirements Compliance	Pass	% DFEE<TTEE	12.72		

Assessor Details	Chris Nicholls, , Tel: ,	Assessor ID	T850-0001
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	55.1000 (1b)	x 2.5100 (2b)	= 138.3010 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	55.1000		(3a)+(3b)+(3c)+(3d)+(3e)...(3n) = 138.3010 (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				1	(19)								
Shelter factor			(20) = 1 - [0.075 x (19)] =		0.9250 (20)								
Infiltration rate adjusted to include shelter factor			(21) = (18) x (20) =		0.2317 (21)								
Wind speed	Jan 4.8000	Feb 4.5000	Mar 4.4000	Apr 3.9000	May 3.9000	Jun 3.6000	Jul 3.7000	Aug 3.5000	Sep 3.7000	Oct 4.0000	Nov 4.1000	Dec 4.4000	(22)
Wind factor	1.2000	1.1250	1.1000	0.9750	0.9750	0.9000	0.9250	0.8750	0.9250	1.0000	1.0250	1.1000	(22a)
Adj infilt rate	0.2781	0.2607	0.2549	0.2259	0.2259	0.2085	0.2143	0.2027	0.2143	0.2317	0.2375	0.2549	(22b)
Mechanical extract ventilation - centralised													
If mechanical ventilation:												0.5000	(23a)
Effective ac	0.5281	0.5107	0.5049	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5049	(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 = 1.40)			13.5000	1.3258	17.8977		(27)
Solid Door			2.1200	1.4000	2.9680		(26)
Flr - Ground			55.0990	0.0800	4.4079	110.0000	6060.8900 (28a)
Wl - Brick	53.8180	13.4990	40.3190	0.1800	7.2574	14.0000	564.4660 (29a)
Wl - To Corridor	4.7960	2.1240	2.6720	0.1300	0.3474	14.0000	37.4080 (29a)
Total net area of external elements Aum(A, m ²)			113.7100				(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) =	32.8784	(33)
Party Wall			24.0600	0.0000	0.0000	54.0300	1299.9618 (32)
Party Ceiling			55.0990			70.0000	3856.9300 (32b)
Ground Floor Stud			87.6291			5.8200	510.0015 (32c)
Heat capacity Cm = Sum(A x k)					(28)...(30) + (32) + (32a)...(32e) =	12329.6573	(34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							223.7687 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							10.7999 (36)
Total fabric heat loss						(33) + (36) =	43.6783 (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	24.1001	23.3069	23.0426	22.8197	22.8197	22.8197	22.8197	22.8197	22.8197	22.8197	22.8197	23.0426 (38)
Heat transfer coeff	67.7784	66.9853	66.7209	66.4980	66.4980	66.4980	66.4980	66.4980	66.4980	66.4980	66.4980	66.7209 (39)
Average = Sum(39)m / 12 =												66.6824 (39)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.2301	1.2157	1.2109	1.2069	1.2069	1.2069	1.2069	1.2069	1.2069	1.2069	1.2069	1.2109 (40)
HLP (average)												1.2102 (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												1.8403 (42)
Average daily hot water use (litres/day)												77.9069 (43)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use	85.6976	82.5813	79.4650	76.3487	73.2325	70.1162	70.1162	73.2325	76.3487	79.4650	82.5813	85.6976 (44)
Energy content	127.0870	111.1511	114.6980	99.9965	95.9490	82.7967	76.7233	88.0411	89.0926	103.8288	113.3373	123.0770 (45)
Energy content (annual)												Total = Sum(45)m = 1225.7783 (45)
Distribution loss (46)m = 0.15 x (45)m	19.0630	16.6727	17.2047	14.9995	14.3923	12.4195	11.5085	13.2062	13.3639	15.5743	17.0006	18.4615 (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	14.5436	13.1164	14.4903	13.9873	14.4277	13.9325	14.3783	14.4103	13.9624	14.4644	14.0391	14.5333 (61)
Total heat required for water heating calculated for each month	141.6306	124.2675	129.1883	113.9838	110.3767	96.7292	91.1016	102.4514	103.0550	118.2933	127.3764	137.6103 (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	141.6306	124.2675	129.1883	113.9838	110.3767	96.7292	91.1016	102.4514	103.0550	118.2933	127.3764	137.6103 (64)
RHI water heating demand												Total per year (kWh/year) = Sum(64)m = 1396.0641 (64)
Heat gains from water heating, kWh/month	45.8923	40.2369	41.7597	36.7457	35.5100	31.0130	29.1051	32.8763	33.1139	38.1392	41.1944	44.5564 (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	110.4173	110.4173	110.4173	110.4173	110.4173	110.4173	110.4173	110.4173	110.4173	110.4173	110.4173	110.4173 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	35.7591	31.7609	25.8297	19.5548	14.6174	12.3406	13.3345	17.3327	23.2639	29.5388	34.4762	36.7530 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	239.4676	241.9526	235.6906	222.3597	205.5318	189.7160	179.1501	176.6651	182.9271	196.2580	213.0858	228.9017 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	47.8820	47.8820	47.8820	47.8820	47.8820	47.8820	47.8820	47.8820	47.8820	47.8820	47.8820	47.8820 (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)	-73.6116	-73.6116	-73.6116	-73.6116	-73.6116	-73.6116	-73.6116	-73.6116	-73.6116	-73.6116	-73.6116	-73.6116 (71)
Water heating gains (Table 5)	61.6832	59.8763	56.1286	51.0356	47.7285	43.0736	39.1197	44.1885	45.9915	51.2624	57.2145	59.8877 (72)
Total internal gains	424.5978	421.2775	405.3367	380.6379	355.5655	332.8181	319.2921	325.8741	339.8702	364.7470	392.4643	413.2301 (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		9.4690	13.7622	0.7600	0.7000	0.7700	48.0437 (75)					
Southeast		4.0300	42.6275	0.7600	0.7000	0.7700	63.3345 (77)					
Solar gains	111.3782	183.4136	288.6998	444.2208	536.2615	595.7821	556.7804	471.4602	357.7867	228.0053	137.7585	90.2897 (83)
Total gains	535.9760	604.6911	694.0365	824.8587	891.8270	928.6001	876.0724	797.3344	697.6570	592.7523	530.2228	503.5198 (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	50.5309	51.1292	51.3318	51.5039	51.5039	51.5039	51.5039	51.5039	51.5039	51.5039	51.5039	51.3318
alpha	4.3687	4.4086	4.4221	4.4336	4.4336	4.4336	4.4336	4.4336	4.4336	4.4336	4.4336	4.4221
util living area	0.9762	0.9602	0.9119	0.7838	0.5944	0.3968	0.2726	0.2910	0.5503	0.8328	0.9512	0.9797 (86)
MIT	19.9732	20.1480	20.4591	20.7828	20.9477	20.9928	20.9990	20.9987	20.9723	20.7707	20.3503	19.9700 (87)
Th 2	19.8960	19.9075	19.9113	19.9145	19.9145	19.9145	19.9145	19.9145	19.9145	19.9145	19.9145	19.9113 (88)
util rest of house	0.9695	0.9495	0.8894	0.7384	0.5279	0.3218	0.1908	0.2012	0.4597	0.7812	0.9355	0.9739 (89)
MIT 2	18.9995	19.1779	19.4751	19.7612	19.8858	19.9120	19.9144	19.9143	19.9033	19.7616	19.3822	19.0092 (90)
Living area fraction										fLA = Living area / (4) =		0.4299 (91)
MIT	19.4181	19.5950	19.8982	20.2004	20.3424	20.3767	20.3807	20.3805	20.3629	20.1954	19.7985	19.4223 (92)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

CALCULATION OF HEAT DEMAND 09 Jan 2014

Temperature adjustment													-0.1500
adjusted MIT	19.2681	19.4450	19.7482	20.0504	20.1924	20.2267	20.2307	20.2305	20.2129	20.0454	19.6485		19.2723 (93)

 8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9647	0.9440	0.8855	0.7445	0.5455	0.3436	0.2147	0.2275	0.4854	0.7881	0.9309	0.9695	(94)
Useful gains	517.0455	570.8130	614.5997	614.1407	486.4588	319.0686	188.0732	181.3774	338.6183	467.1543	493.5585	488.1501	(95)
Ext temp.	5.0000	5.4000	7.1000	9.5000	12.6000	15.4000	17.4000	17.5000	15.0000	11.7000	8.1000	5.2000	(96)
Heat loss rate W	967.0719	940.8073	843.8974	701.5804	504.8764	320.9657	188.2349	181.5761	346.6474	554.9550	767.9500	938.9174	(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	334.8196	248.6362	170.5975	62.9566	13.7027	0.0000	0.0000	0.0000	0.0000	65.3237	197.5619	335.3709	(98)
Space heating												1428.9690	(98)
RHI space heating demand												1429	(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 (m2)	Storey height (m)	Volume (m3)
Ground floor	55.1000 (1b)	2.5100 (2b)	138.3010 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	55.1000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	138.3010 (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				1	(19)
Shelter factor			(20) = 1 - [0.075 x (19)] =		0.9250 (20)
Infiltration rate adjusted to include shelter factor			(21) = (18) x (20) =		0.2317 (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				0.2549	0.2491	0.2201	0.2201	0.2143	0.2317	0.2491	0.2607	0.2723 (22b)
Mechanical extract ventilation - centralised												0.5000 (23a)
If mechanical ventilation:												
Effective ac	0.5454	0.5396	0.5338	0.5049	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5107	0.5223 (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 = 1.40)			13.5000	1.3258	17.8977		(27)
Solid Door			2.1200	1.4000	2.9680		(26)
Flr - Ground			55.0990	0.0800	4.4079	110.0000	6060.8900 (28a)
Wl - Brick	53.8180	13.4990	40.3190	0.1800	7.2574	14.0000	564.4660 (29a)
Wl - To Corridor	4.7960	2.1240	2.6720	0.1300	0.3474	14.0000	37.4080 (29a)
Total net area of external elements Aum(A, m2)			113.7100				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	32.8784		(33)
Party Wall			24.0600	0.0000	0.0000	54.0300	1299.9618 (32)
Party Ceiling			55.0990			70.0000	3856.9300 (32b)
Ground Floor Stud			87.6291			5.8200	510.0015 (32c)
Heat capacity Cm = Sum(A x k)					(28)...(30) + (32) + (32a)...(32e) =		12329.6573 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							223.7687 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							10.7999 (36)
Total fabric heat loss						(33) + (36) =	43.6783 (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	24.8932	24.6288	24.3645	23.0426	22.8197	22.8197	22.8197	22.8197	22.8197	22.8197	23.3069	23.8357 (38)
Heat transfer coeff	68.5715	68.3072	68.0428	66.7209	66.4980	66.4980	66.4980	66.4980	66.4980	66.4980	66.9853	67.5140 (39)
Average = Sum(39)m / 12 =												67.0941 (39)
HLP	1.2445	1.2397	1.2349	1.2109	1.2069	1.2069	1.2069	1.2069	1.2069	1.2069	1.2157	1.2253 (40)
HLP (average)												1.2177 (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												1.8403 (42)
Average daily hot water use (litres/day)												77.9069 (43)
Daily hot water use	85.6976	82.5813	79.4650	76.3487	73.2325	70.1162	70.1162	73.2325	76.3487	79.4650	82.5813	85.6976 (44)
Energy conte	127.0870	111.1511	114.6980	99.9965	95.9490	82.7967	76.7233	88.0411	89.0926	103.8288	113.3373	123.0770 (45)
Energy content (annual)										Total = Sum(45)m =		1225.7783 (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	19.0630	16.6727	17.2047	14.9995	14.3923	12.4195	11.5085	13.2062	13.3639	15.5743	17.0006	18.4615 (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	14.5436	13.1164	14.4903	13.9873	14.4277	13.9325	14.3783	14.4103	13.9624	14.4644	14.0391	14.5333 (61)
Total heat required for water heating calculated for each month	141.6306	124.2675	129.1883	113.9838	110.3767	96.7292	91.1016	102.4514	103.0550	118.2933	127.3764	137.6103 (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	141.6306	124.2675	129.1883	113.9838	110.3767	96.7292	91.1016	102.4514	103.0550	118.2933	127.3764	137.6103 (64)
Heat gains from water heating, kWh/month	45.8923	40.2369	41.7597	36.7457	35.5100	31.0130	29.1051	32.8763	33.1139	38.1392	41.1944	44.5564 (65)
Solar input (sum of months) = Sum(63)m =											0.0000 (63)	
Total per year (kWh/year) = Sum(64)m =											1396.0641 (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	110.4173	110.4173	110.4173	110.4173	110.4173	110.4173	110.4173	110.4173	110.4173	110.4173	110.4173	110.4173 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	35.7591	31.7609	25.8297	19.5548	14.6174	12.3406	13.3345	17.3327	23.2639	29.5388	34.4762	36.7530 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	239.4676	241.9526	235.6906	222.3597	205.5318	189.7160	179.1501	176.6651	182.9271	196.2580	213.0858	228.9017 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	47.8820	47.8820	47.8820	47.8820	47.8820	47.8820	47.8820	47.8820	47.8820	47.8820	47.8820	47.8820 (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)	-73.6116	-73.6116	-73.6116	-73.6116	-73.6116	-73.6116	-73.6116	-73.6116	-73.6116	-73.6116	-73.6116	-73.6116 (71)
Water heating gains (Table 5)	61.6832	59.8763	56.1286	51.0356	47.7285	43.0736	39.1197	44.1885	45.9915	51.2624	57.2145	59.8877 (72)
Total internal gains	424.5978	421.2775	405.3367	380.6379	355.5655	332.8181	319.2921	325.8741	339.8702	364.7470	392.4643	413.2301 (73)

6. Solar gains

[Jan]	Area m ²	Solar flux Table 6a W/m ²	g Specific data or Table 6b	FF Specific data or Table 6c	Access factor Table 6d	Gains W						
Northeast	9.4690	11.2829	0.7600	0.7000	0.7700	39.3887 (75)						
Southeast	4.0300	36.7938	0.7600	0.7000	0.7700	54.6670 (77)						
Solar gains	94.0556	173.2948	271.8612	395.0983	495.7101	515.5118	487.2760	408.6398	313.9744	200.8977	115.0396	78.9503 (83)
Total gains	518.6534	594.5724	677.1980	775.7362	851.2756	848.3299	806.5681	734.5139	653.8447	565.6446	507.5039	492.1804 (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	49.9464	50.1398	50.3346	51.3318	51.5039	51.5039	51.5039	51.5039	51.5039	51.5039	51.1292	50.7288
alpha	4.3298	4.3427	4.3556	4.4221	4.4336	4.4336	4.4336	4.4336	4.4336	4.4336	4.4086	4.3819
util living area	0.9820	0.9670	0.9297	0.8315	0.6680	0.4897	0.3602	0.4114	0.6508	0.8876	0.9674	0.9852 (86)
MIT	19.8400	20.0416	20.3475	20.7019	20.9085	20.9813	20.9962	20.9932	20.9387	20.6517	20.1925	19.8109 (87)
Th 2	19.8846	19.8884	19.8922	19.9113	19.9145	19.9145	19.9145	19.9145	19.9145	19.9145	19.9075	19.8998 (88)
util rest of house	0.9770	0.9581	0.9114	0.7927	0.6064	0.4115	0.2726	0.3168	0.5664	0.8510	0.9571	0.9811 (89)
MIT 2	18.8594	19.0591	19.3548	19.6914	19.8592	19.9066	19.9136	19.9127	19.8845	19.6608	19.2247	18.8431 (90)
Living area fraction	19.2810	19.4815	19.7816	20.1259	20.3104	20.3687	20.3790	20.3772	20.3378	20.0868	19.6408	19.2592 (92)
Temperature adjustment	19.1310	19.3315	19.6316	19.9759	20.1604	20.2187	20.2290	20.2272	20.1878	19.9368	19.4908	-0.1500
adjusted MIT												19.1092 (93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Useful gains	504.4933	566.4226	613.8187	616.9063	528.6025	368.0521	240.5190	252.9852	384.9518	481.8369	483.2653	481.0029 (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	1016.9849	985.7762	893.5098	738.9918	562.5968	373.6299	241.3233	254.5041	404.8248	620.8807	830.0001	1006.5796 (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	381.2937	281.8057	208.0902	87.9015	25.2918	0.0000	0.0000	0.0000	0.0000	103.4486	249.6491	391.0291 (98)
Space heating												1728.5097 (98)
Space heating per m ²												(98) / (4) = 31.3704 (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													1909.9554 (211)
Space heating requirement	381.2937	281.8057	208.0902	87.9015	25.2918	0.0000	0.0000	0.0000	0.0000	103.4486	249.6491	391.0291	(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)	421.3191	311.3875	229.9339	97.1288	27.9467	0.0000	0.0000	0.0000	0.0000	114.3078	275.8554	432.0763	(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	141.6306	124.2675	129.1883	113.9838	110.3767	96.7292	91.1016	102.4514	103.0550	118.2933	127.3764	137.6103	(64)
Efficiency of water heater (217)m	89.6104	89.4961	89.2470	88.6650	87.8793	87.3000	87.3000	87.3000	87.3000	88.7643	89.3930	89.6446	(217)
Fuel for water heating, kWh/month	158.0516	138.8525	144.7537	128.5555	125.6004	110.8009	104.3546	117.3556	118.0469	133.2668	142.4904	153.5065	(219)
Water heating fuel used													1575.6354 (219)
Annual totals kWh/year													
Space heating fuel - main system													1909.9554 (211)
Space heating fuel - secondary													0.0000 (215)
Electricity for pumps and fans: (MEVCentralised, Database: in-use factor = 1.3000, SFP = 0.3380)													
mechanical ventilation fans (SFP = 0.3380)													57.0298 (230a)
central heating pump													30.0000 (230c)
main heating flue fan													45.0000 (230e)
Total electricity for the above, kWh/year													132.0298 (231)
Electricity for lighting (calculated in Appendix L)													252.6067 (232)
Energy saving/generation technologies (Appendices M ,N and Q)													
PV Unit 0 (0.80 * 0.90 * 951 * 1.00) =													-684.4435 (233)
Total delivered energy for all uses													3185.7838 (238)

10a. Fuel costs - using Table 12 prices

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year	
Space heating - main system 1	1909.9554	3.4800	66.4664	(240)
Space heating - secondary	0.0000	0.0000	0.0000	(242)
Water heating (other fuel)	1575.6354	3.4800	54.8321	(247)
Mechanical ventilation fans	57.0298	13.1900	7.5222	(249)
Pumps and fans for heating	75.0000	13.1900	9.8925	(249)
Energy for lighting	252.6067	13.1900	33.3188	(250)
Additional standing charges			120.0000	(251)
Energy saving/generation technologies				
PV Unit	0.0000	0.0000	0.0000	(252)
Total energy cost			292.0321	(255)

11a. SAP rating - Individual heating systems

Energy cost deflator (Table 12):		0.4200	(256)
Energy cost factor (ECF)	$[(255) \times (256)] / [(4) + 45.0] =$	1.2253	(257)
SAP value		82.9069	
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	1909.9554	0.2160	412.5504	(261)
Space heating - secondary	0.0000	0.0000	0.0000	(263)
Water heating (other fuel)	1575.6354	0.2160	340.3372	(264)
Space and water heating			752.8876	(265)
Pumps and fans	132.0298	0.5190	68.5235	(267)
Energy for lighting	252.6067	0.5190	131.1029	(268)
Energy saving/generation technologies				
PV Unit	-684.4435	0.5190	-355.2262	(269)
Total kg/year			597.2878	(272)
CO2 emissions per m2			10.8400	(273)
EI value			92.0043	
EI rating			92	(274)
EI band			A	

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

CALCULATION OF ENERGY RATINGS 09 Jan 2014

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 $3.48 / 0.8849 = 3.933$, stars = 4
Water heating environmental impact $0.216 / 0.8849 = 0.2441$, stars = 4

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	55.1000 (1b)	2.5100 (2b)	138.3010 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	55.1000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	138.3010 (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				1	(19)
Shelter factor			(20) = 1 - [0.075 x (19)] =		0.9250 (20)
Infiltration rate adjusted to include shelter factor			(21) = (18) x (20) =		0.2317 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	4.8000	4.5000	4.4000	3.9000	3.9000	3.6000	3.7000	3.5000	3.7000	4.0000	4.1000	4.4000 (22)
Wind factor	1.2000	1.1250	1.1000	0.9750	0.9750	0.9000	0.9250	0.8750	0.9250	1.0000	1.0250	1.1000 (22a)
Adj infilt rate	0.2781	0.2607	0.2549	0.2259	0.2259	0.2085	0.2143	0.2027	0.2143	0.2317	0.2375	0.2549 (22b)
Mechanical extract ventilation - centralised												0.5000 (23a)
If mechanical ventilation:												
Effective ac	0.5281	0.5107	0.5049	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5049 (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 = 1.40)			13.5000	1.3258	17.8977		(27)
Solid Door			2.1200	1.4000	2.9680		(26)
Flr - Ground			55.0990	0.0800	4.4079	110.0000	6060.8900 (28a)
Wl - Brick	53.8180	13.4990	40.3190	0.1800	7.2574	14.0000	564.4660 (29a)
Wl - To Corridor	4.7960	2.1240	2.6720	0.1300	0.3474	14.0000	37.4080 (29a)
Total net area of external elements Aum(A, m2)			113.7100				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	32.8784		(33)
Party Wall			24.0600	0.0000	0.0000	54.0300	1299.9618 (32)
Party Ceiling			55.0990			70.0000	3856.9300 (32b)
Ground Floor Stud			87.6291			5.8200	510.0015 (32c)
Heat capacity Cm = Sum(A x k)						(28)...(30) + (32) + (32a)...(32e) =	12329.6573 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							223.7687 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							10.7999 (36)
Total fabric heat loss						(33) + (36) =	43.6783 (37)

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
(38)m	24.1001	23.3069	23.0426	22.8197	22.8197	22.8197	22.8197	22.8197	22.8197	22.8197	22.8197	23.0426 (38)
Heat transfer coeff	67.7784	66.9853	66.7209	66.4980	66.4980	66.4980	66.4980	66.4980	66.4980	66.4980	66.4980	66.7209 (39)
Average = Sum(39)m / 12 =												66.6824 (39)

HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	1.2301	1.2157	1.2109	1.2069	1.2069	1.2069	1.2069	1.2069	1.2069	1.2069	1.2069	1.2109 (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												1.8403 (42)
Average daily hot water use (litres/day)												77.9069 (43)
Daily hot water use	85.6976	82.5813	79.4650	76.3487	73.2325	70.1162	70.1162	73.2325	76.3487	79.4650	82.5813	85.6976 (44)
Energy conte	127.0870	111.1511	114.6980	99.9965	95.9490	82.7967	76.7233	88.0411	89.0926	103.8288	113.3373	123.0770 (45)
Energy content (annual)										Total = Sum(45)m =		1225.7783 (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	19.0630	16.6727	17.2047	14.9995	14.3923	12.4195	11.5085	13.2062	13.3639	15.5743	17.0006	18.4615 (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	14.5436	13.1164	14.4903	13.9873	14.4277	13.9325	14.3783	14.4103	13.9624	14.4644	14.0391	14.5333 (61)
Total heat required for water heating calculated for each month	141.6306	124.2675	129.1883	113.9838	110.3767	96.7292	91.1016	102.4514	103.0550	118.2933	127.3764	137.6103 (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	141.6306	124.2675	129.1883	113.9838	110.3767	96.7292	91.1016	102.4514	103.0550	118.2933	127.3764	137.6103 (64)
Heat gains from water heating, kWh/month	45.8923	40.2369	41.7597	36.7457	35.5100	31.0130	29.1051	32.8763	33.1139	38.1392	41.1944	44.5564 (65)
												1396.0641 (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	110.4173	110.4173	110.4173	110.4173	110.4173	110.4173	110.4173	110.4173	110.4173	110.4173	110.4173	110.4173 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	35.7591	31.7609	25.8297	19.5548	14.6174	12.3406	13.3345	17.3327	23.2639	29.5388	34.4762	36.7530 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	239.4676	241.9526	235.6906	222.3597	205.5318	189.7160	179.1501	176.6651	182.9271	196.2580	213.0858	228.9017 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	47.8820	47.8820	47.8820	47.8820	47.8820	47.8820	47.8820	47.8820	47.8820	47.8820	47.8820	47.8820 (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)	-73.6116	-73.6116	-73.6116	-73.6116	-73.6116	-73.6116	-73.6116	-73.6116	-73.6116	-73.6116	-73.6116	-73.6116 (71)
Water heating gains (Table 5)	61.6832	59.8763	56.1286	51.0356	47.7285	43.0736	39.1197	44.1885	45.9915	51.2624	57.2145	59.8877 (72)
Total internal gains	424.5978	421.2775	405.3367	380.6379	355.5655	332.8181	319.2921	325.8741	339.8702	364.7470	392.4643	413.2301 (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	9.4690	13.7622	0.7600	0.7000	0.7700	48.0437 (75)						
Southeast	4.0300	42.6275	0.7600	0.7000	0.7700	63.3345 (77)						
Solar gains	111.3782	183.4136	288.6998	444.2208	536.2615	595.7821	556.7804	471.4602	357.7867	228.0053	137.7585	90.2897 (83)
Total gains	535.9760	604.6911	694.0365	824.8587	891.8270	928.6001	876.0724	797.3344	697.6570	592.7523	530.2228	503.5198 (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	50.5309	51.1292	51.3318	51.5039	51.5039	51.5039	51.5039	51.5039	51.5039	51.5039	51.5039	51.3318
alpha	4.3687	4.4086	4.4221	4.4336	4.4336	4.4336	4.4336	4.4336	4.4336	4.4336	4.4336	4.4221
util living area	0.9762	0.9602	0.9119	0.7838	0.5944	0.3968	0.2726	0.2910	0.5503	0.8328	0.9512	0.9797 (86)
MIT	19.9732	20.1480	20.4591	20.7828	20.9477	20.9928	20.9990	20.9987	20.9723	20.7707	20.3503	19.9700 (87)
Th 2	19.8960	19.9075	19.9113	19.9145	19.9145	19.9145	19.9145	19.9145	19.9145	19.9145	19.9145	19.9113 (88)
util rest of house	0.9695	0.9495	0.8894	0.7384	0.5279	0.3218	0.1908	0.2012	0.4597	0.7812	0.9355	0.9739 (89)
MIT 2	18.9995	19.1779	19.4751	19.7612	19.8858	19.9120	19.9144	19.9143	19.9033	19.7616	19.3822	19.0092 (90)
Living area fraction	19.4181	19.5950	19.8982	20.2004	20.3424	20.3767	20.3807	20.3805	20.3629	20.1954	19.7985	19.4223 (92)
Temperature adjustment	19.2681	19.4450	19.7482	20.0504	20.1924	20.2267	20.2307	20.2305	20.2129	20.0454	19.6485	-0.1500
adjusted MIT												19.2723 (93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Useful gains	0.9647	0.9440	0.8855	0.7445	0.5455	0.3436	0.2147	0.2275	0.4854	0.7881	0.9309	0.9695 (94)
Ext temp.	517.0455	570.8130	614.5997	614.1407	486.4588	319.0686	188.0732	181.3774	338.6183	467.1543	493.5585	488.1501 (95)
Heat loss rate W	5.0000	5.4000	7.1000	9.5000	12.6000	15.4000	17.4000	17.5000	15.0000	11.7000	8.1000	5.2000 (96)
Month fracti	967.0719	940.8073	843.8974	701.5804	504.8764	320.9657	188.2349	181.5761	346.6474	554.9550	767.9500	938.9174 (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	334.8196	248.6362	170.5975	62.9566	13.7027	0.0000	0.0000	0.0000	0.0000	65.3237	197.5619	335.3709 (98)
												1428.9690 (98)
												(98) / (4) = 25.9341 (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													1578.9713 (211)
Space heating requirement	334.8196	248.6362	170.5975	62.9566	13.7027	0.0000	0.0000	0.0000	0.0000	65.3237	197.5619	335.3709	(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)	369.9664	274.7361	188.5055	69.5653	15.1411	0.0000	0.0000	0.0000	0.0000	72.1809	218.3004	370.5755	(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	141.6306	124.2675	129.1883	113.9838	110.3767	96.7292	91.1016	102.4514	103.0550	118.2933	127.3764	137.6103	(64)
Efficiency of water heater (217)m	89.5245	89.4079	89.0927	88.4123	87.6422	87.3000	87.3000	87.3000	87.3000	88.4122	89.2180	89.5450	(216)
Fuel for water heating, kWh/month	158.2032	138.9895	145.0044	128.9230	125.9401	110.8009	104.3546	117.3556	118.0469	133.7975	142.7698	153.6772	(219)
Water heating fuel used													1577.8626 (219)
Annual totals kWh/year													
Space heating fuel - main system													1578.9713 (211)
Space heating fuel - secondary													0.0000 (215)
Electricity for pumps and fans: (MEV Centralised, Database: in-use factor = 1.3000, SFP = 0.3380)													
mechanical ventilation fans (SFP = 0.3380)													57.0298 (230a)
central heating pump													30.0000 (230c)
main heating flue fan													45.0000 (230e)
Total electricity for the above, kWh/year													132.0298 (231)
Electricity for lighting (calculated in Appendix L)													252.6067 (232)
Energy saving/generation technologies (Appendices M ,N and Q)													
PV Unit 0 (0.80 * 0.90 * 1082 * 1.00) =													-778.7405 (233)
Total delivered energy for all uses													2762.7300 (238)

10a. Fuel costs - using BEDF prices (483)

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year	
Space heating - main system 1	1578.9713	3.7400	59.0535	(240)
Space heating - secondary	0.0000	0.0000	0.0000	(242)
Water heating (other fuel)	1577.8626	3.7400	59.0121	(247)
Mechanical ventilation fans	57.0298	19.1200	10.9041	(249)
Pumps and fans for heating	75.0000	19.1200	14.3400	(249)
Energy for lighting	252.6067	19.1200	48.2984	(250)
Additional standing charges			94.0000	(251)
Energy saving/generation technologies				
PV Unit	0.0000	0.0000	0.0000	(252)
Total energy cost			285.6081	(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	1578.9713	0.2160	341.0578	(261)
Space heating - secondary	0.0000	0.0000	0.0000	(263)
Water heating (other fuel)	1577.8626	0.2160	340.8183	(264)
Space and water heating			681.8761	(265)
Pumps and fans	132.0298	0.5190	68.5235	(267)
Energy for lighting	252.6067	0.5190	131.1029	(268)
Energy saving/generation technologies				
PV Unit	-778.7405	0.5190	-404.1663	(269)
Total kg/year			477.3362	(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	1578.9713	1.2200	1926.3450	(261)
Space heating - secondary	0.0000	0.0000	0.0000	(263)
Water heating (other fuel)	1577.8626	1.2200	1924.9924	(264)
Space and water heating			3851.3374	(265)
Pumps and fans	132.0298	3.0700	405.3315	(267)
Energy for lighting	252.6067	3.0700	775.5026	(268)
Energy saving/generation technologies				
PV Unit	-778.7405	3.0700	-2390.7333	(269)
Primary energy kWh/year			2641.4382	(272)
Primary energy kWh/m2/year			47.9390	(273)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

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

 SAP 2012 EPC IMPROVEMENTS

Current energy efficiency rating: B 83
 Current environmental impact rating: A 92

(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: SAP change Cost change CO2 change
 (none)

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

Potential energy efficiency rating: B 83
 Potential environmental impact rating: A 92

Fuel prices for cost data on this page from database revision number 483 TEST (30 Sep 2021)
 Recommendation texts revision number 4.9c (22 Feb 2014)

Typical heating and lighting costs of this home (per year, South East England):

	Current	Potential	Saving
Electricity	£74	£74	£0
Mains gas	£212	£212	£0
Space heating	£178	£178	£0
Water heating	£59	£59	£0
Lighting	£48	£48	£0
Total cost of fuels	£286	£286	£0
Total cost of uses	£285	£285	£0
Delivered energy	50 kWh/m ²	50 kWh/m ²	0 kWh/m ²
Carbon dioxide emissions	0.5 tonnes	0.5 tonnes	0.0 tonnes
CO2 emissions per m ²	9 kg/m ²	9 kg/m ²	0 kg/m ²
Primary energy	48 kWh/m ²	48 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	142 - PRJ009250 - GF		Issued on Date	13/10/2021	
Assessment Reference	142 E	Prop Type Ref	Block 1C - GF		
Property	142 - PRJ009250 - GF				
SAP Rating	83 B	DER	12.77	TER	20.76
Environmental	92 A	% DER<TER	38.49		
CO₂ Emissions (t/year)	0.48	DFEE	48.83	TFEE	55.95
General Requirements Compliance	Pass	% DFEE<TFEE	12.72		
Assessor Details	Chris Nicholls, , Tel: ,		Assessor ID	T850-0001	
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)	20.76	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	12.77	kgCO ₂ /m ²	Pass
	-7.99 (-38.5%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	55.95	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	48.83	kWh/m ² /yr	
	-7.1 (-12.7%)	kWh/m ² /yr	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.18 (max. 0.30)	0.18 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Floor	0.08 (max. 0.25)	0.08 (max. 0.70)	Pass
Openings	1.40 (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	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

Specific fan power

Maximum

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (South East England)

Based on:

Overshading

Windows facing North East

Windows facing South East

Air change rate

Blinds/curtains

Criterion 4 – Building performance consistent with DER and DFEE rate

Party Walls

Type	U-value		
Filled Cavity with Edge Sealing	<input type="text" value="0.00"/>	W/m ² K	<input type="text" value="Pass"/>

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals

Maximum

10 Key features

External wall U-value W/m²K

Party wall U-value W/m²K

Floor U-value W/m²K

Photovoltaic array kW

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