



SAP Report Submission for Building Regulations Compliance

Client: Cheryl Simmonds
Belford Property Holdings Ltd.

Project: 1, Belford House, 53 Hampton Road
Forest Gate, E7 0PD

Contact: Gareth John
Myideashed

Report Issue Date: 26/08/2024

EXCELLENCE
IN ENERGY
ASSESSMENT

PREDICTED ENERGY ASSESSMENT

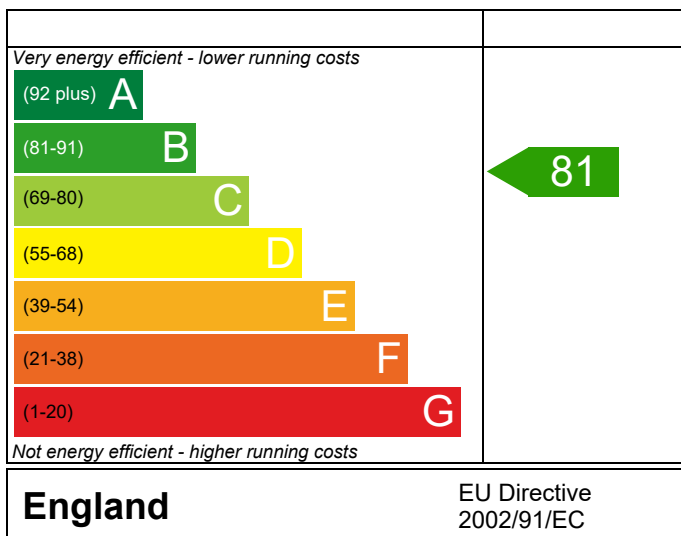
1, Belford House, 53 Hampton Road,
Forest Gate,
E7 0PD

Dwelling type: Flat, End-Terrace
Date of assessment: 26/08/2024
Produced by: Iftikhar Ahmed
Total floor area: 83.65 m²
DRRN: 8276-2208-2140

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.

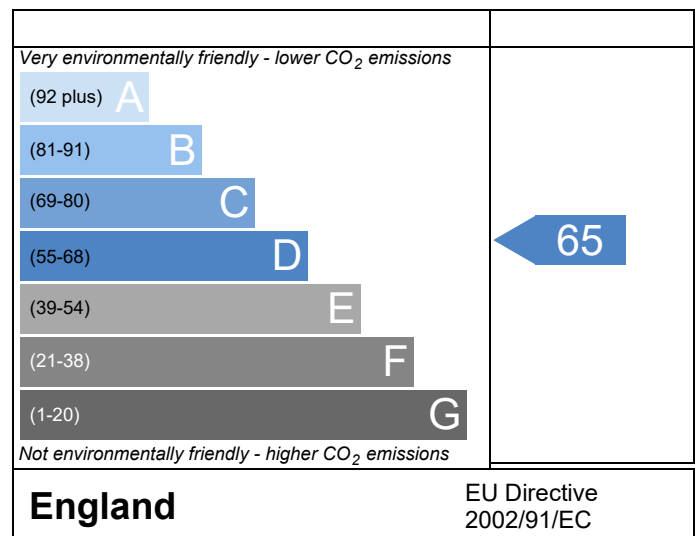
The energy performance has been assessed using the Government approved SAP2012 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO₂) emissions.

Energy Efficiency Rating



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



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 been produced by an accredited Elmhurst member whose work is subject to quality assurance audits. The data used to produce the report has been verified by the Elmhurst members' portal.

FULL SAP CALCULATION PRINTOUT

Calculation Type: Conversion (As Designed)

Property Reference	000010-1	Issued on Date	26/08/2024
Assessment Reference	004	Prop Type Ref	Forest Gate Part L1b
Property	1, Belford House, 53 Hampton Road, Forest Gate, E7 OPD		
SAP Rating	81 B	DER	N/A
Environmental	65 D	% DER<TER	N/A
CO ₂ Emissions (t/year)	2.69	DFEE	N/A
General Requirements Compliance	N/A	% DFEE<TFEE	N/A
Assessor Details	Mr. Iftikhar Ahmed, Iftikhar Ahmed, Tel: 01706 662 700, ifty@energynational.co.uk		Assessor ID
Client	Cheryl Simmonds, Forest Gate		

CALCULATION OF HEAT DEMAND 09 Jan 2014

SAP 2012 WORKSHEET FOR Conversion (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	83.6500 (1b)	x 2.9500 (2b)	= 246.7675 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	83.6500		(3a)+(3b)+(3c)+(3d)+(3e)...(3n) = 246.7675 (5)
Dwelling volume			

2. Ventilation rate

	main heating	secondary heating	other	total	m3 per hour
Number of chimneys	0	0	0	0 * 40 =	0.0000 (6a)
Number of open flues	0	0	0	0 * 20 =	0.0000 (6b)
Number of intermittent fans				3 * 10 =	30.0000 (7a)
Number of passive vents				0 * 10 =	0.0000 (7b)
Number of flueless gas fires				0 * 40 =	0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(7a)+(7b)+(7c) =				30.0000 / (5) =	0.1216 (8)
Pressure test					No
Measured/design AP50					15.0000
Infiltration rate					0.8716 (18)
Number of sides sheltered					4 (19)
Shelter factor			(20) = 1 - [0.075 x (19)] =		0.7000 (20)
Infiltration rate adjusted to include shelter factor			(21) = (18) x (20) =		0.6101 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	4.2000	4.0000	4.0000	3.7000	3.7000	3.2000	3.3000	3.5000	3.3000	3.5000	3.5000	3.9000 (22)
Wind factor	1.0500	1.0000	1.0000	0.9250	0.9250	0.8000	0.8250	0.8750	0.8250	0.8750	0.8750	0.9750 (22a)
Adj infilt rate	0.6406	0.6101	0.6101	0.5643	0.5643	0.4881	0.5033	0.5338	0.5033	0.5338	0.5338	0.5948 (22b)
Effective ac	0.7052	0.6861	0.6861	0.6592	0.6592	0.6191	0.6267	0.6425	0.6267	0.6425	0.6425	0.6769 (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
Trple Glazing units (Uw = 1.00)			18.9800	0.9615	18.2500		(27)
Glazed Door (Uw = 1.00)			2.8000	0.9615	2.6923		(27)
Heat Loss Floor 1			83.6500	0.1600	13.3840		(28a)
External Wall 1	108.5100	21.7800	86.7300	0.1700	14.7441		(29a)
Sheltered solid Wall	20.8800		20.8800	0.1256	2.6222		(29a)
Total net area of external elements Aum(A, m ²)			213.0400				(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		51.6926		(33)
Party Wall 1			32.5300	0.0000	0.0000		(32)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							250.0000 (35)
Thermal bridges (Default value 0.150 * total exposed area)							31.9560 (36)
Total fabric heat loss						(33) + (36) =	83.6486 (37)
Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)							
(38)m	57.4257	55.8723	55.8723	53.6842	53.6842	50.4163	51.0319
Heat transfer coeff	141.0743	139.5209	139.5209	137.3328	137.3328	134.0648	134.6805
Average = Sum(39)m / 12 =							137.0739 (39)

FULL SAP CALCULATION PRINTOUT

Calculation Type: Conversion (As Designed)

CALCULATION OF HEAT DEMAND 09 Jan 2014

HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	1.6865	1.6679	1.6679	1.6418	1.6418	1.6027	1.6100	1.6254	1.6100	1.6254	1.6254	1.6590 (40)
Days in month												1.6387 (40)
	31	28	31	30	31	30	31	31	30	31	30	31 (41)

4. Water heating energy requirements (kWh/year)

Assumed occupancy												2.5285 (42)
Average daily hot water use (litres/day)												94.2514 (43)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use	103.6765	99.9064	96.1364	92.3663	88.5963	84.8262	84.8262	88.5963	92.3663	96.1364	99.9064	103.6765 (44)
Energy conte	153.7492	134.4701	138.7611	120.9753	116.0786	100.1670	92.8195	106.5117	107.7838	125.6116	137.1149	148.8979 (45)
Energy content (annual)												Total = Sum(45)m = 1482.9409 (45)
Distribution loss (46)m = 0.15 x (45)m												
	23.0624	20.1705	20.8142	18.1463	17.4118	15.0251	13.9229	15.9768	16.1676	18.8417	20.5672	22.3347 (46)
Water storage loss:												
Store volume												150.0000 (47)
b) If manufacturer declared loss factor is not known :												
Hot water storage loss factor from Table 2 (kWh/litre/day)												0.0115 (51)
Volume factor from Table 2a												0.9283 (52)
Temperature factor from Table 2b												0.6000 (53)
Enter (49) or (54) in (55)												0.9648 (55)
Total storage loss												
	29.9084	27.0140	29.9084	28.9436	29.9084	28.9436	29.9084	29.9084	28.9436	29.9084	28.9436	29.9084 (56)
If cylinder contains dedicated solar storage												
	29.9084	27.0140	29.9084	28.9436	29.9084	28.9436	29.9084	29.9084	28.9436	29.9084	28.9436	29.9084 (57)
Primary 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 (59)
Total heat required for water heating calculated for each month												
	183.6577	161.4841	168.6695	149.9189	145.9871	129.1107	122.7279	136.4201	136.7274	155.5201	166.0586	178.8063 (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												
	183.6577	161.4841	168.6695	149.9189	145.9871	129.1107	122.7279	136.4201	136.7274	155.5201	166.0586	178.8063 (64)
RHI water heating demand												Total per year (kWh/year) = Sum(64)m = 1835.0883 (64)
Heat gains from water heating, kWh/month												1835 (64)
	75.0484	66.3225	70.0648	63.3792	62.5229	56.4604	54.7892	59.3419	58.9930	65.6926	68.7456	73.4353 (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	151.7087	151.7087	151.7087	151.7087	151.7087	151.7087	151.7087	151.7087	151.7087	151.7087	151.7087	151.7087 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5												
	50.5707	44.9164	36.5285	27.6544	20.6720	17.4522	18.8577	24.5119	32.8999	41.7739	48.7564	51.9762 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5												
	338.6561	342.1703	333.3147	314.4621	290.6640	268.2972	253.3548	249.8406	258.6962	277.5489	301.3469	323.7137 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5												
	52.6993	52.6993	52.6993	52.6993	52.6993	52.6993	52.6993	52.6993	52.6993	52.6993	52.6993	52.6993 (69)
Pumps, fans	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (70)
Losses e.g. evaporation (negative values) (Table 5)												
	-101.1391	-101.1391	-101.1391	-101.1391	-101.1391	-101.1391	-101.1391	-101.1391	-101.1391	-101.1391	-101.1391	-101.1391 (71)
Water heating gains (Table 5)												
	100.8714	98.6943	94.1731	88.0266	84.0361	78.4173	73.6414	79.7606	81.9347	88.2965	95.4800	98.7033 (72)
Total internal gains												
	593.3672	589.0499	567.2852	533.4120	498.6410	467.4356	449.1228	457.3820	476.7998	510.8882	548.8522	577.6622 (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
North					4.5500	11.9672	0.6800	0.7000	0.7700			17.9616 (74)
Southeast					0.8600	40.3681	0.6800	0.7000	0.7700			11.4519 (77)
South					6.4000	50.8329	0.6800	0.7000	0.7700			107.3160 (78)
Southwest					0.8600	40.3681	0.6800	0.7000	0.7700			11.4519 (79)
West					6.3100	22.3142	0.6800	0.7000	0.7700			46.4462 (80)
South					2.8000	50.8329	0.6800	0.7000	0.7700			46.9508 (78)
Solar gains	241.5783	361.3492	507.4544	676.7314	748.4080	807.7332	778.1581	716.9462	619.8323	445.5798	297.3633	204.1641 (83)
Total gains	834.9455	950.3991	1074.7396	1210.1434	1247.0491	1275.1687	1227.2809	1174.3282	1096.6320	956.4680	846.2155	781.8263 (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	41.1771	41.6355	41.6355	42.2989	42.2989	43.3300	43.1319	42.7233	43.1319	42.7233	42.7233	41.8601
alpha	3.7451	3.7757	3.7757	3.8199	3.8199	3.8887	3.8755	3.8482	3.8755	3.8482	3.8482	3.7907
util living area	0.9823	0.9704	0.9385	0.8526	0.6987	0.4499	0.2515	0.2764	0.5929	0.8686	0.9636	0.9856 (86)
MIT	19.8473	20.0049	20.2819	20.6165	20.8352	20.9309	20.9433	20.9424	20.9026	20.6527	20.2242	19.8311 (87)

FULL SAP CALCULATION PRINTOUT

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CALCULATION OF HEAT DEMAND 09 Jan 2014

Th 2	19.5505	19.5639	19.5639	19.5829	19.5829	19.6114	19.6060	19.5947	19.6060	19.5947	19.5947	19.5704 (88)
util rest of house	0.9759	0.9599	0.9159	0.8001	0.5983	0.3141	0.0994	0.1151	0.4540	0.8079	0.9481	0.9802 (89)
MIT 2	18.1008	18.3353	18.7239	19.1795	19.4253	19.5261	19.5242	19.5124	19.5064	19.2471	18.6739	18.0922 (90)
Living area fraction									fLA = Living area / (4) =			0.3586 (91)
MIT	18.7272	18.9341	19.2826	19.6949	19.9310	20.0299	20.0331	20.0252	20.0071	19.7512	19.2299	18.7158 (92)
Temperature adjustment												0.0000
adjusted MIT	18.7272	18.9341	19.2826	19.6949	19.9310	20.0299	20.0331	20.0252	20.0071	19.7512	19.2299	18.7158 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9709	0.9539	0.9104	0.8049	0.6252	0.3562	0.1462	0.1649	0.4966	0.8159	0.9429	0.9758	(94)
Useful gains	810.6365	906.5443	978.4760	974.0067	779.6113	454.2214	179.4590	193.6299	544.5469	780.4147	797.9046	762.9371	(95)
Ext temp.	5.7000	6.2000	8.0000	10.6000	13.7000	16.6000	18.7000	18.6000	15.8000	12.3000	8.6000	5.7000	(96)
Heat loss rate W	1837.7979	1776.6750	1574.1630	1249.0228	855.7142	459.8290	179.5482	193.7877	566.6207	1013.1342	1445.3326	1806.2359	(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	764.2081	584.7278	443.1912	198.0116	56.6206	0.0000	0.0000	0.0000	0.0000	173.1433	466.1482	776.2143	(98)
Space heating													3462.2650 (98)
RHI space heating demand													3462 (98)

FULL SAP CALCULATION PRINTOUT

Calculation Type: Conversion (As Designed)

CALCULATION OF ENERGY RATINGS 09 Jan 2014

SAP 2012 WORKSHEET FOR Conversion (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	83.6500 (1b)	x 2.9500 (2b)	= 246.7675 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	83.6500		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 246.7675 (5)

2. Ventilation rate

	main heating	secondary heating	other	total	m ³ per hour
Number of chimneys	0	+	0	=	0 * 40 = 0.0000 (6a)
Number of open flues	0	+	0	=	0 * 20 = 0.0000 (6b)
Number of intermittent fans					3 * 10 = 30.0000 (7a)
Number of passive vents					0 * 10 = 0.0000 (7b)
Number of flueless gas fires					0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans	= (6a)+(6b)+(7a)+(7b)+(7c) =				Air changes per hour
Pressure test					30.0000 / (5) = 0.1216 (8)
Measured/design AP50					No
Infiltration rate					15.0000
Number of sides sheltered					0.8716 (18)
					4 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] =				0.7000 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) =				0.6101 (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												
Effective ac	0.7779	0.7626	0.7474	0.6711	0.6559	0.5796	0.5796	0.5643	0.6101	0.6559	0.6864	0.7169 (22b)
	0.8025	0.7908	0.7793	0.7252	0.7151	0.6680	0.6680	0.6592	0.6861	0.7151	0.7355	0.7569 (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
Triple Glazing units (Uw = 1.00)			18.9800	0.9615	18.2500		(27)
Glazed Door (Uw = 1.00)			2.8000	0.9615	2.6923		(27)
Heat Loss Floor 1			83.6500	0.1600	13.3840		(28a)
External Wall 1	108.5100	21.7800	86.7300	0.1700	14.7441		(29a)
Sheltered solid Wall	20.8800		20.8800	0.1256	2.6222		(29a)
Total net area of external elements Aum(A, m ²)			213.0400				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	51.6926		(33)
Party Wall 1			32.5300	0.0000	0.0000		(32)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							250.0000 (35)
Thermal bridges (Default value 0.150 * total exposed area)							31.9560 (36)
Total fabric heat loss						(33) + (36) =	83.6486 (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
Heat transfer coeff	65.3540	64.3973	63.4596	59.0550	58.2309	54.3946	54.3946	53.6842	55.8723	58.2309	59.8980	61.6409 (38)
Average = Sum(39)m / 12 =	149.0026	148.0459	147.1082	142.7036	141.8795	138.0432	138.0432	137.3328	139.5209	141.8795	143.5466	145.2895 (39)
												142.6996 (39)
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	1.7813	1.7698	1.7586	1.7060	1.6961	1.6502	1.6502	1.6418	1.6679	1.6961	1.7160	1.7369 (40)
Days in month												1.7059 (40)
	31	28	31	30	31	30	31	31	30	31	30	31 (41)

4. Water heating energy requirements (kWh/year)

Assumed occupancy												2.5285 (42)
Average daily hot water use (litres/day)												94.2514 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Energy conte	103.6765	99.9064	96.1364	92.3663	88.5963	84.8262	84.8262	88.5963	92.3663	96.1364	99.9064	103.6765 (44)
Energy content (annual)	153.7492	134.4701	138.7611	120.9753	116.0786	100.1670	92.8195	106.5117	107.7838	125.6116	137.1149	148.8979 (45)
Distribution loss (46)m = 0.15 x (45)m										Total = Sum(45)m =		1482.9409 (45)
Water storage loss:	23.0624	20.1705	20.8142	18.1463	17.4118	15.0251	13.9229	15.9768	16.1676	18.8417	20.5672	22.3347 (46)
Store volume												150.0000 (47)
b) If manufacturer declared loss factor is not known :												
Hot water storage loss factor from Table 2 (kWh/litre/day)												0.0115 (51)

FULL SAP CALCULATION PRINTOUT

Calculation Type: Conversion (As Designed)

CALCULATION OF ENERGY RATINGS 09 Jan 2014

Volume factor from Table 2a												0.9283 (52)
Temperature factor from Table 2b												0.6000 (53)
Enter (49) or (54) in (55)												0.9648 (55)
Total storage loss	29.9084	27.0140	29.9084	28.9436	29.9084	28.9436	29.9084	29.9084	28.9436	29.9084	28.9436	29.9084 (56)
If cylinder contains dedicated solar storage	29.9084	27.0140	29.9084	28.9436	29.9084	28.9436	29.9084	29.9084	28.9436	29.9084	28.9436	29.9084 (57)
Primary 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 (59)
Total heat required for water heating calculated for each month	183.6577	161.4841	168.6695	149.9189	145.9871	129.1107	122.7279	136.4201	136.7274	155.5201	166.0586	178.8063 (62)
WWHRS	-53.3833	-46.9693	-47.9389	-39.4511	-36.6354	-30.2255	-25.5864	-30.9773	-31.8785	-39.4021	-45.6338	-51.5955 eq. (G10)
Total of WWHRS savings												-479.6770
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	130.2743	114.5149	120.7306	110.4678	109.3516	98.8852	97.1415	105.4428	104.8489	116.1179	120.4247	127.2108 (64)
Heat gains from water heating, kWh/month	75.0484	66.3225	70.0648	63.3792	62.5229	56.4604	54.7892	59.3419	58.9930	65.6926	68.7456	73.4353 (65)
Total per year (kWh/year) = Sum(64)m = 1355.4113 (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	151.7087	151.7087	151.7087	151.7087	151.7087	151.7087	151.7087	151.7087	151.7087	151.7087	151.7087	151.7087 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	50.5707	44.9164	36.5285	27.6544	20.6720	17.4522	18.8577	24.5119	32.8999	41.7739	48.7564	51.9762 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	338.6561	342.1703	333.3147	314.4621	290.6640	268.2972	253.3548	249.8406	258.6962	277.5489	301.3469	323.7137 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	52.6993	52.6993	52.6993	52.6993	52.6993	52.6993	52.6993	52.6993	52.6993	52.6993	52.6993	52.6993 (69)
Pumps, fans	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (70)
Losses e.g. evaporation (negative values) (Table 5)	-101.1391	-101.1391	-101.1391	-101.1391	-101.1391	-101.1391	-101.1391	-101.1391	-101.1391	-101.1391	-101.1391	-101.1391 (71)
Water heating gains (Table 5)	100.8714	98.6943	94.1731	88.0266	84.0361	78.4173	73.6414	79.7606	81.9347	88.2965	95.4800	98.7033 (72)
Total internal gains	593.3672	589.0499	567.2852	533.4120	498.6410	467.4356	449.1228	457.3820	476.7998	510.8882	548.8522	577.6622 (73)

6. Solar gains

[Jan]	Area m2	Solar flux Table 6a W/m2	Specific data or Table 6b	Specific data or Table 6c	Access factor Table 6d	Gains W
North	4.5500	10.6334	0.6800	0.7000	0.7700	15.9597 (74)
Southeast	0.8600	36.7938	0.6800	0.7000	0.7700	10.4379 (77)
South	6.4000	46.7521	0.6800	0.7000	0.7700	98.7009 (78)
Southwest	0.8600	36.7938	0.6800	0.7000	0.7700	10.4379 (79)
West	6.3100	19.6403	0.6800	0.7000	0.7700	40.8806 (80)
South	2.8000	46.7521	0.6800	0.7000	0.7700	43.1816 (78)

Solar gains	219.5985	378.3970	528.1754	670.1467	763.6721	763.5465	733.9197	663.5482	577.3685	421.1284	263.8451	187.3878 (83)
Total gains	812.9657	967.4469	1095.4606	1203.5587	1262.3131	1230.9821	1183.0425	1120.9302	1054.1683	932.0167	812.6973	765.0500 (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	38.9861	39.2380	39.4881	40.7070	40.9434	42.0812	42.0812	42.2989	41.6355	40.9434	40.4679	39.9824
alpha	3.5991	3.6159	3.6325	3.7138	3.7296	3.8054	3.8054	3.8199	3.7757	3.7296	3.6979	3.6655
util living area	0.9879	0.9768	0.9547	0.9030	0.8057	0.6457	0.4928	0.5342	0.7533	0.9251	0.9783	0.9902 (86)
MIT	19.5825	19.7793	20.0615	20.4199	20.6949	20.8703	20.9231	20.9163	20.8044	20.4410	19.9643	19.5751 (87)
Th 2	19.4831	19.4912	19.4991	19.5366	19.5436	19.5767	19.5767	19.5829	19.5639	19.5436	19.5294	19.5145 (88)
util rest of house	0.9838	0.9690	0.9389	0.8685	0.7363	0.5296	0.3433	0.3834	0.6484	0.8906	0.9695	0.9868 (89)
MIT 2	17.6696	17.9584	18.3655	18.8867	19.2393	19.4511	19.4877	19.4910	19.3853	18.9336	18.2557	17.6810 (90)
Living area fraction	18.3556	18.6114	18.9737	19.4366	19.7613	19.9601	20.0025	20.0022	19.8942	19.4742	18.8684	18.3603 (91)
MIT	18.3556	18.6114	18.9737	19.4366	19.7613	19.9601	20.0025	20.0022	19.8942	19.4742	18.8684	18.3603 (92)
Temperature adjustment												0.0000
adjusted MIT	18.3556	18.6114	18.9737	19.4366	19.7613	19.9601	20.0025	20.0022	19.8942	19.4742	18.8684	18.3603 (93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Useful gains	0.9794	0.9629	0.9319	0.8656	0.7481	0.5632	0.3898	0.4303	0.6755	0.8885	0.9642	0.9831 (94)
Ext temp.	796.2467	931.5443	1020.8423	1041.8444	944.2755	693.3458	461.1653	482.3084	712.1321	828.1131	783.5832	752.1288 (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	2094.3258	2029.9197	1834.9850	1503.6103	1143.7388	739.9238	469.6880	494.6968	808.4155	1259.0684	1689.3174	2057.3457 (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	965.7709	738.1082	605.7221	332.4714	148.4007	0.0000	0.0000	0.0000	0.0000	320.6307	652.1286	971.0814 (98)
Space heating per m2												4734.3142 (98)
												(98) / (4) = 56.5967 (99)

FULL SAP CALCULATION PRINTOUT

Calculation Type: Conversion (As Designed)

CALCULATION OF ENERGY RATINGS 09 Jan 2014

8c. Space cooling requirement

Not applicable

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

Fraction of space heat from secondary/supplementary system (Table 11)														0.0000 (201)
Fraction of space heat from main system(s)														1.0000 (202)
Efficiency of main space heating system 1 (in %)														100.0000 (206)
Efficiency of secondary/supplementary heating system, %														0.0000 (208)
Space heating requirement														4734.3142 (211)
Space heating requirement	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
965.7709	738.1082	605.7221	332.4714	148.4007	0.0000	0.0000	0.0000	0.0000	0.0000	320.6307	652.1286	971.0814	(98)	
Space heating efficiency (main heating system 1)														
100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	0.0000	0.0000	0.0000	0.0000	100.0000	100.0000	100.0000	(210)	
Space heating fuel (main heating system)														
965.7709	738.1082	605.7221	332.4714	148.4007	0.0000	0.0000	0.0000	0.0000	0.0000	320.6307	652.1286	971.0814	(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	0.0000	(215)	
Water heating requirement														
130.2743	114.5149	120.7306	110.4678	109.3516	98.8852	97.1415	105.4428	104.8489	116.1179	120.4247	127.2108	127.2108	(64)	
Efficiency of water heater (217)m														
100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	(216)	
Fuel for water heating, kWh/month														
130.2743	114.5149	120.7306	110.4678	109.3516	98.8852	97.1415	105.4428	104.8489	116.1179	120.4247	127.2108	127.2108	(219)	
Water heating fuel used														
1355.4113													(219)	
Annual totals kWh/year														
Space heating fuel - main system														4734.3142 (211)
Space heating fuel - secondary														0.0000 (215)
Electricity for pumps and fans:														
Total electricity for the above, kWh/year														0.0000 (231)
Electricity for lighting (calculated in Appendix L)														357.2375 (232)
Total delivered energy for all uses														6446.9629 (238)

10a. Fuel costs - using Table 12 prices

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1 (0.00*15.29 + 1.00*5.50)	4734.3142	5.5000	260.3873 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (electric off-peak tariff)			
High-rate fraction			0.1159 (243)
Low-rate fraction			0.8841 (244)
High-rate cost	157.1075	15.2900	24.0217 (245)
Low-rate cost	1198.3038	5.5000	65.9067 (246)
Pumps and fans for heating (0.90*15.29 + 0.10*5.50)	0.0000	0.0000	0.0000 (249)
Energy for lighting (0.90*15.29 + 0.10*5.50)	357.2375	14.3110	51.1243 (250)
Additional standing charges			24.0000 (251)
Total energy cost			425.4400 (255)

11a. SAP rating - Individual heating systems

Energy cost deflator (Table 12):		0.4200 (256)
Energy cost factor (ECF)	[(255) x (256)] / [(4) + 45.0] =	1.3889 (257)
SAP value		80.6245
SAP rating (Section 12)		81 (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	4734.3142	0.5190	2457.1091 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating	1355.4113	0.5190	703.4584 (264)
Space and water heating			3160.5675 (265)
Pumps and fans	0.0000	0.0000	0.0000 (267)
Energy for lighting	357.2375	0.5190	185.4063 (268)
Total kg/year			3345.9738 (272)
CO2 emissions per m2			40.0000 (273)
EI value			65.1488
EI rating			65 (274)
EI band			D

Calculation of stars for heating and DHW

Main heating energy efficiency	$5.50 \times (1 + 0.29 \times 0.20) / 1.0000 = 5.819$, stars = 3
Main heating environmental impact	$0.519 \times (1 + 0.29 \times 0.20) / 1.0000 = 0.5491$, stars = 2

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Water heating energy efficiency
Water heating environmental impact

$6.63 / 1.0000 = 6.635$, stars = 4
 $0.519 / 1.0000 = 0.5190$, stars = 3

FULL SAP CALCULATION PRINTOUT

Calculation Type: Conversion (As Designed)

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

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

1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	83.6500 (1b)	x 2.9500 (2b)	= 246.7675 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	83.6500		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 246.7675 (5)

2. Ventilation rate

	main heating	secondary heating	other	total	m3 per hour
Number of chimneys	0	+	0	=	0 * 40 = 0.0000 (6a)
Number of open flues	0	+	0	=	0 * 20 = 0.0000 (6b)
Number of intermittent fans					3 * 10 = 30.0000 (7a)
Number of passive vents					0 * 10 = 0.0000 (7b)
Number of flueless gas fires					0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(7a)+(7b)+(7c) =					30.0000 / (5) = 0.1216 (8)
Pressure test					No
Measured/design AP50					15.0000
Infiltration rate					0.8716 (18)
Number of sides sheltered					4 (19)
Shelter factor					(20) = 1 - [0.075 x (19)] = 0.7000 (20)
Infiltration rate adjusted to include shelter factor					(21) = (18) x (20) = 0.6101 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	4.2000	4.0000	4.0000	3.7000	3.7000	3.2000	3.3000	3.5000	3.3000	3.5000	3.5000	3.9000 (22)
Wind factor	1.0500	1.0000	1.0000	0.9250	0.9250	0.8000	0.8250	0.8750	0.8250	0.8750	0.8750	0.9750 (22a)
Adj infilt rate												
	0.6406	0.6101	0.6101	0.5643	0.5643	0.4881	0.5033	0.5338	0.5033	0.5338	0.5338	0.5948 (22b)
Effective ac	0.7052	0.6861	0.6861	0.6592	0.6592	0.6191	0.6267	0.6425	0.6267	0.6425	0.6425	0.6769 (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					
Trple Glazing units (Uw = 1.00)			18.9800	0.9615	18.2500		(27)					
Glazed Door (Uw = 1.00)			2.8000	0.9615	2.6923		(27)					
Heat Loss Floor 1			83.6500	0.1600	13.3840		(28a)					
External Wall 1	108.5100	21.7800	86.7300	0.1700	14.7441		(29a)					
Sheltered solid Wall	20.8800		20.8800	0.1256	2.6222		(29a)					
Total net area of external elements Aum(A, m2)			213.0400				(31)					
Fabric heat loss, W/K = Sum (A x U)				(26) ... (30) + (32) =	51.6926		(33)					
Party Wall 1			32.5300	0.0000	0.0000		(32)					
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							250.0000 (35)					
Thermal bridges (Default value 0.150 * total exposed area)							31.9560 (36)					
Total fabric heat loss							(33) + (36) = 83.6486 (37)					
Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)												
(38)m	Jan 57.4257	Feb 55.8723	Mar 55.8723	Apr 53.6842	May 53.6842	Jun 50.4163	Jul 51.0319	Aug 52.3202	Sep 51.0319	Oct 52.3202	Nov 52.3202	Dec 55.1240 (38)
Heat transfer coeff	141.0743	139.5209	139.5209	137.3328	137.3328	134.0648	134.6805	135.9688	134.6805	135.9688	135.9688	138.7726 (39)
Average = Sum(39)m / 12 =												137.0739 (39)
HLP	Jan 1.6865	Feb 1.6679	Mar 1.6679	Apr 1.6418	May 1.6418	Jun 1.6027	Jul 1.6100	Aug 1.6254	Sep 1.6100	Oct 1.6254	Nov 1.6254	Dec 1.6590 (40)
HLP (average)												1.6387 (40)
Days in month	31	28	31	30	31	30	31	31	30	31	30	31 (41)

4. Water heating energy requirements (kWh/year)

Assumed occupancy												2.5285 (42)
Average daily hot water use (litres/day)												94.2514 (43)
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Daily hot water use	103.6765	99.9064	96.1364	92.3663	88.5963	84.8262	84.8262	88.5963	92.3663	96.1364	99.9064	103.6765 (44)
Energy conte	153.7492	134.4701	138.7611	120.9753	116.0786	100.1670	92.8195	106.5117	107.7838	125.6116	137.1149	148.8979 (45)
Energy content (annual)										Total = Sum(45)m =		1482.9409 (45)
Distribution loss (46)m = 0.15 x (45)m												
	23.0624	20.1705	20.8142	18.1463	17.4118	15.0251	13.9229	15.9768	16.1676	18.8417	20.5672	22.3347 (46)
Water storage loss:												
Store volume												150.0000 (47)
b) If manufacturer declared loss factor is not known :												
Hot water storage loss factor from Table 2 (kWh/litre/day)												0.0115 (51)

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Volume factor from Table 2a												0.9283 (52)
Temperature factor from Table 2b												0.6000 (53)
Enter (49) or (54) in (55)												0.9648 (55)
Total storage loss	29.9084	27.0140	29.9084	28.9436	29.9084	28.9436	29.9084	29.9084	28.9436	29.9084	28.9436	29.9084 (56)
If cylinder contains dedicated solar storage	29.9084	27.0140	29.9084	28.9436	29.9084	28.9436	29.9084	29.9084	28.9436	29.9084	28.9436	29.9084 (57)
Primary 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 (59)
Total heat required for water heating calculated for each month	183.6577	161.4841	168.6695	149.9189	145.9871	129.1107	122.7279	136.4201	136.7274	155.5201	166.0586	178.8063 (62)
WWHRS	-53.3833	-46.9693	-47.9389	-39.4511	-36.6354	-30.2255	-25.5864	-30.9773	-31.8785	-39.4021	-45.6338	-51.5955 eq. (G10)
Total of WWHRS savings												-479.6770
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	130.2743	114.5149	120.7306	110.4678	109.3516	98.8852	97.1415	105.4428	104.8489	116.1179	120.4247	127.2108 (64)
Heat gains from water heating, kWh/month	75.0484	66.3225	70.0648	63.3792	62.5229	56.4604	54.7892	59.3419	58.9930	65.6926	68.7456	73.4353 (65)
Total per year (kWh/year) = Sum(64)m = 1355.4113 (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	151.7087	151.7087	151.7087	151.7087	151.7087	151.7087	151.7087	151.7087	151.7087	151.7087	151.7087	151.7087 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	50.5707	44.9164	36.5285	27.6544	20.6720	17.4522	18.8577	24.5119	32.8999	41.7739	48.7564	51.9762 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	338.6561	342.1703	333.3147	314.4621	290.6640	268.2972	253.3548	249.8406	258.6962	277.5489	301.3469	323.7137 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	52.6993	52.6993	52.6993	52.6993	52.6993	52.6993	52.6993	52.6993	52.6993	52.6993	52.6993	52.6993 (69)
Pumps, fans	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (70)
Losses e.g. evaporation (negative values) (Table 5)	-101.1391	-101.1391	-101.1391	-101.1391	-101.1391	-101.1391	-101.1391	-101.1391	-101.1391	-101.1391	-101.1391	-101.1391 (71)
Water heating gains (Table 5)	100.8714	98.6943	94.1731	88.0266	84.0361	78.4173	73.6414	79.7606	81.9347	88.2965	95.4800	98.7033 (72)
Total internal gains	593.3672	589.0499	567.2852	533.4120	498.6410	467.4356	449.1228	457.3820	476.7998	510.8882	548.8522	577.6622 (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		
North				4.5500	11.9672	0.6800	0.7000		0.7700	17.9616 (74)		
Southeast				0.8600	40.3681	0.6800	0.7000		0.7700	11.4519 (77)		
South				6.4000	50.8329	0.6800	0.7000		0.7700	107.3160 (78)		
Southwest				0.8600	40.3681	0.6800	0.7000		0.7700	11.4519 (79)		
West				6.3100	22.3142	0.6800	0.7000		0.7700	46.4462 (80)		
South				2.8000	50.8329	0.6800	0.7000		0.7700	46.9508 (78)		
Solar gains	241.5783	361.3492	507.4544	676.7314	748.4080	807.7332	778.1581	716.9462	619.8323	445.5798	297.3633	204.1641 (83)
Total gains	834.9455	950.3991	1074.7396	1210.1434	1247.0491	1275.1687	1227.2809	1174.3282	1096.6320	956.4680	846.2155	781.8263 (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	41.1771	41.6355	41.6355	42.2989	42.2989	43.3300	43.1319	42.7233	43.1319	42.7233	42.7233	42.8601
alpha	3.7451	3.7757	3.7757	3.8199	3.8199	3.8887	3.8755	3.8482	3.8755	3.8482	3.8482	3.7907
util living area	0.9823	0.9704	0.9385	0.8526	0.6987	0.4499	0.2515	0.2764	0.5929	0.8686	0.9636	0.9856 (86)
MIT	19.8473	20.0049	20.2819	20.6165	20.8352	20.9309	20.9433	20.9424	20.9026	20.6527	20.2242	19.8311 (87)
Th 2	19.5505	19.5639	19.5639	19.5829	19.5829	19.6114	19.6060	19.5947	19.6060	19.5947	19.5947	19.5704 (88)
util rest of house	0.9759	0.9599	0.9159	0.8001	0.5983	0.3141	0.0994	0.1151	0.4540	0.8079	0.9481	0.9802 (89)
MIT 2	18.1008	18.3353	18.7239	19.1795	19.4253	19.5261	19.5242	19.5124	19.5064	19.2471	18.6739	18.0922 (90)
Living area fraction	18.7272	18.9341	19.2826	19.6949	19.9310	20.0299	20.0331	20.0252	20.0071	19.7512	19.2299	18.7158 (91)
MIT	18.7272	18.9341	19.2826	19.6949	19.9310	20.0299	20.0331	20.0252	20.0071	19.7512	19.2299	18.7158 (92)
Temperature adjustment												0.0000
adjusted MIT	18.7272	18.9341	19.2826	19.6949	19.9310	20.0299	20.0331	20.0252	20.0071	19.7512	19.2299	18.7158 (93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Useful gains	810.6365	906.5443	978.4760	974.0067	779.6113	454.2214	179.4590	193.6299	544.5469	780.4147	797.9046	762.9371 (95)
Ext temp.	5.7000	6.2000	8.0000	10.6000	13.7000	16.6000	18.7000	18.6000	15.8000	12.3000	8.6000	5.7000 (96)
Heat loss rate W	1837.7979	1776.6750	1574.1630	1249.0228	855.7142	459.8290	179.5482	193.7877	566.6207	1013.1342	1445.3326	1806.2359 (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	764.2081	584.7278	443.1912	198.0116	56.6206	0.0000	0.0000	0.0000	0.0000	173.1433	466.1482	776.2143 (98)
Space heating												3462.2650 (98)
Space heating per m2												41.3899 (99)

FULL SAP CALCULATION PRINTOUT

Calculation Type: Conversion (As Designed)

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

8c. Space cooling requirement

Not applicable

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

Fraction of space heat from secondary/supplementary system (Table 11)													0.0000 (201)
Fraction of space heat from main system(s)													1.0000 (202)
Efficiency of main space heating system 1 (in %)													100.0000 (206)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
Space heating requirement													3462.2650 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	764.2081	584.7278	443.1912	198.0116	56.6206	0.0000	0.0000	0.0000	0.0000	173.1433	466.1482	776.2143	(98)
Space heating efficiency (main heating system 1)	100.0000	100.0000	100.0000	100.0000	100.0000	0.0000	0.0000	0.0000	0.0000	100.0000	100.0000	100.0000	(210)
Space heating fuel (main heating system)	764.2081	584.7278	443.1912	198.0116	56.6206	0.0000	0.0000	0.0000	0.0000	173.1433	466.1482	776.2143	(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	130.2743	114.5149	120.7306	110.4678	109.3516	98.8852	97.1415	105.4428	104.8489	116.1179	120.4247	127.2108	(64)
Efficiency of water heater (217)m	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	(216)
Fuel for water heating, kWh/month	130.2743	114.5149	120.7306	110.4678	109.3516	98.8852	97.1415	105.4428	104.8489	116.1179	120.4247	127.2108	(219)
Water heating fuel used												1355.4113	(219)
Annual totals kWh/year													
Space heating fuel - main system												3462.2650	(211)
Space heating fuel - secondary												0.0000	(215)
Electricity for pumps and fans:													
Total electricity for the above, kWh/year												0.0000	(231)
Electricity for lighting (calculated in Appendix L)												357.2375	(232)
Total delivered energy for all uses												5174.9137	(238)

10a. Fuel costs - using BEDF prices (551)

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1 (0.00*35.09 + 1.00*14.87)	3462.2650	14.8700	514.8388 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (electric off-peak tariff)			
High-rate fraction			0.1159 (243)
Low-rate fraction			0.8841 (244)
High-rate cost	157.1075	35.0900	55.1290 (245)
Low-rate cost	1198.3038	14.8700	178.1878 (246)
Pumps and fans for heating (0.90*35.09 + 0.10*14.87)	0.0000	0.0000	0.0000 (249)
Energy for lighting (0.90*35.09 + 0.10*14.87)	357.2375	33.0680	118.1313 (250)
Additional standing charges			0.0000 (251)
Total energy cost			866.2869 (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	3462.2650	0.5190	1796.9155 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating	1355.4113	0.5190	703.4584 (264)
Space and water heating			2500.3740 (265)
Pumps and fans	0.0000	0.0000	0.0000 (267)
Energy for lighting	357.2375	0.5190	185.4063 (268)
Total kg/year			2685.7802 (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	3462.2650	3.0700	10629.1536 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating	1355.4113	3.0700	4161.1125 (264)
Space and water heating			14790.2661 (265)
Pumps and fans	0.0000	0.0000	0.0000 (267)
Energy for lighting	357.2375	3.0700	1096.7191 (268)
Primary energy kWh/year			15886.9852 (272)
Primary energy kWh/m2/year			189.9221 (273)

SAP 2012 EPC IMPROVEMENTS

FULL SAP CALCULATION PRINTOUT

Calculation Type: Conversion (As Designed)

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

Current energy efficiency rating: B 81
Current environmental impact rating: D 65

(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/m²	

Potential energy efficiency rating: B 81
Potential environmental impact rating: D 65

Fuel prices for cost data on this page from database revision number 551 TEST (31 Jul 2024)
Recommendation texts revision number 4.9c (22 Feb 2014)

Typical heating and lighting costs of this home (per year, Thames Valley):			
	Current	Potential	Saving
Electricity	£866	£866	£0
Space heating	£515	£515	£0
Water heating	£233	£233	£0
Lighting	£118	£118	£0
Total cost of fuels	£866	£866	£0
Total cost of uses	£866	£866	£0
Delivered energy	62 kWh/m²	62 kWh/m²	0 kWh/m²
Carbon dioxide emissions	2.7 tonnes	2.7 tonnes	0.0 tonnes
CO2 emissions per m²	32 kg/m²	32 kg/m²	0 kg/m²
Primary energy	190 kWh/m²	190 kWh/m²	0 kWh/m²

FULL SAP CALCULATION PRINTOUT

Calculation Type: Conversion (As Designed)

CALCULATION OF ENERGY RATINGS FOR IMPROVED DWELLING 09 Jan 2014

SAP 2012 WORKSHEET FOR Conversion (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: Conversion (As Designed)

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

SAP 2012 WORKSHEET FOR Conversion (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

U-VALUE CALCULATOR REPORT

Property Reference	000010-1	Issued on Date	26/08/2024
Assessment Reference	004	Prop Type Ref	Forest Gate Part L1b
Project	1, Belford House, 53 Hampton Road, Forest Gate, E7 0PD		
Calculation Type	Conversion (As Designed)		

SAP Rating	81 B	DER	N/A	TER	N/A
Environmental	65 D	% DER<TER	N/A		
CO ₂ Emissions (t/year)	2.69	DFEE	N/A	TFEE	N/A
General Requirements Compliance	N/A	% DFEE<TFEE	N/A		

Assessor Details	Mr. Iftikhar Ahmed, Iftikhar Ahmed, Tel: 01706 662 700, ifty@energynational.co.uk	Assessor ID	D226-0001
Client	Cheryl Simmonds, Forest Gate		

Building Elements

Wall 000001 - Masonry solid wall

Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	Brick, outer leaf				
	Main construction	110	0.7700	0.1429	82.81
	Main construction	110	0.9407	0.1169	17.19
Layer 2	Brick, inner leaf				
	Main construction	110	0.5600	0.1964	82.81
	Main construction	110	0.8803	0.1250	17.19
Layer 3	Celotex GA4000				
	Main construction	100	0.0220	4.5455	88.38
	Main construction	100	0.1300	0.7692	11.62
	Corrections - Air Gap: Level 0, Fasteners: None or plastic				
Layer 4	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Layer 5	Kooltherm K17 Insulated Plasterboard (52.5mm)				
	Main construction	52.5	0.0269	1.9500	100.00
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 6	Plaster, standard				
	Main construction	5	0.4000	0.0125	100.00
Int surface				0.1300	

Total resistance:	Upper limit = 6.228 m ² K/W	Lower limit = 5.403 m ² K/W	Average = 5.816 m ² K/W
	Total correction = 0.0011 m ² K/W	U-value (unrounded) = 0.17 W/m ² K	

Unheated space: None

Total thickness: 390 mm

U-value: 0.17 W/m² K

Kappa: n/a

U-VALUE CALCULATOR REPORT

Property Reference	000010-1	Issued on Date	26/08/2024
Assessment Reference	004	Prop Type Ref	Forest Gate Part L1b
Project	1, Belford House, 53 Hampton Road, Forest Gate, E7 0PD		
Calculation Type	Conversion (As Designed)		

SAP Rating	81 B	DER	N/A	TER	N/A
Environmental	65 D	% DER<TER	N/A		
CO ₂ Emissions (t/year)	2.69	DFEE	N/A	TFEE	N/A
General Requirements Compliance	N/A	% DFEE<TFEE	N/A		

Assessor Details	Mr. Iftikhar Ahmed, Iftikhar Ahmed, Tel: 01706 662 700, ifty@energynational.co.uk	Assessor ID	D226-0001
Client	Cheryl Simmonds, Forest Gate		

Building Elements

Wall 000005 - Masonry wall partial cavity fill

Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	Brick, outer leaf				
	Main construction	105	0.7700	0.1364	80.85
	Main construction	105	0.8800	0.1193	19.15
Layer 2	Standard cavity				
	Main construction	50	0.2778	0.1800	100.00
	Corrections - Cavity Unventilated, Emissivity: Normal				
Layer 3	Kooltherm K8 Cavity Board (45mm +)				
	Main construction	100	0.0200	5.0000	100.00
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 4	Blockwork, dense				
	Main construction	100	1.1300	0.0885	93.18
	Main construction	100	0.8800	0.1136	6.82
Layer 5	airspace/plaster dabs				
	Main construction	15	0.0882	0.1700	80.00
	Main construction	15	0.0882	0.1700	20.00
	Corrections - Cavity Unventilated, Emissivity: Normal				
Layer 6	Kooltherm K17 Insulated Plasterboard (52.5mm)				
	Main construction	52.5	0.0269	1.9500	100.00
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 7	Plaster, standard				
	Main construction	3	0.4000	0.0075	100.00
Int surface				0.1300	

Total resistance:	Upper limit = 7.701 m ² K/W	Lower limit = 7.700 m ² K/W	Average = 7.700 m ² K/W
	Total correction = 0.0049 m ² K/W	U-value (unrounded) = 0.14 W/m ² K	

Unheated space: None

Total thickness: 426 mm

U-value: 0.14 W/m² K

Kappa: n/a

U-VALUE CALCULATOR REPORT

Property Reference	000010-1	Issued on Date	26/08/2024
Assessment Reference	004	Prop Type Ref	Forest Gate Part L1b
Project	1, Belford House, 53 Hampton Road, Forest Gate, E7 OPD		
Calculation Type	Conversion (As Designed)		

SAP Rating	81 B	DER	N/A	TER	N/A
Environmental	65 D	% DER<TER	N/A		
CO ₂ Emissions (t/year)	2.69	DFEE	N/A	TFEE	N/A
General Requirements Compliance	N/A	% DFEE<TFEE	N/A		

Assessor Details	Mr. Iftikhar Ahmed, Iftikhar Ahmed, Tel: 01706 662 700, ifty@energynational.co.uk	Assessor ID	D226-0001
Client	Cheryl Simmonds, Forest Gate		

Building Elements

Floor 000004 - floor- suspended timber floor

Floor Type: Suspended Floor

Area = 83.65 m², Perimeter = 43.86 m, Wall thickness = 300.00 mm, Soil: Clay

Depth of underfloor space below ground: 0.200 m Floor wind shielding: Average (suburban)

Floor height above ground: h = 0.200 m

U-value of walls above ground: U_w = 1.500 m

Ventilation openings per perimeter length: e = 0.0015 %

Mean wind speed: v = 5.000 m/s

Resistance on solum: R_g = 0.000 m²K/W

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.1700	
Layer 1	Isulation/joists				
	Main construction	200	0.0400	5.0000	90.91
	Main construction	200	0.1300	1.5385	9.09
Layer 2	Chipboard				
	Main construction	22	0.1300	0.1692	100.00
Layer 3	Underlay, wool				
	Main construction	20	0.0600	0.3333	100.00
Layer 4	Woodblock				
	Main construction	35	0.1300	0.2692	100.00
Int surface				0.1700	

Total resistance: Upper limit = 5.463 m² K/W Lower limit = 5.263 m² K/W Average = 5.363 m² K/W

Total correction = 0.0000 m² K/W

U-value (unrounded) = 0.16 W/m² K

Unheated space: None

Total thickness: 277 mm

U-value: 0.16 W/m² K

Kappa: n/a

SUMMARY FOR INPUT DATA

Calculation Type: Conversion (As Designed)

Property Reference	000010-1	Issued on Date	26/08/2024
Assessment Reference	004	Prop Type Ref	Forest Gate Part L1b
Property	1, Belford House, 53 Hampton Road, Forest Gate, E7 OPD		
SAP Rating	81 B	DER	N/A
Environmental	65 D	% DER<TER	N/A
CO ₂ Emissions (t/year)	2.69	DFEE	N/A
General Requirements Compliance	N/A	% DFEE<TFEE	N/A
Assessor Details	Mr. Iftikhar Ahmed, Iftikhar Ahmed, Tel: 01706 662 700, ifty@energynational.co.uk		Assessor ID
Client	Cheryl Simmonds, Forest Gate		

SUMMARY FOR INPUT DATA FOR: Conversion (As Designed)

Orientation	South			
Property Tenure	Unknown			
Transaction Type	New dwelling			
Terrain Type	Suburban			
1.0 Property Type	Flat, End-Terrace			
2.0 Number of Storeys	1			
3.0 Date Built	2022			
4.0 Sheltered Sides	4			
5.0 Sunlight/Shade	Average or unknown			
6.0 Measurements				
	Ground Floor:	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
		43.86 m	83.65 m ²	2.95 m
7.0 Living Area	30.00	m ²		
8.0 Thermal Mass Parameter	Simple calculation - Medium			
Thermal Mass	250.00	kJ/m ² K		
9.0 External Walls				
Description	Type		U-Value (W/m ² K)	Gross Area (m ²)
				Nett Area (m ²)
External Wall 1	Solid Wall		0.17	108.51
Sheltered solid Wall	Cavity Wall		0.14	20.88
9.1 Party Walls				
Description	Type	Construction	U-Value (W/m ² K)	Area (m ²)
Party Wall 1	Solid Wall		0.00	32.53
11.0 Heat Loss Floors				
Description	Type	Construction	U-Value (W/m ² K)	Area (m ²)
Heat Loss Floor 1	Ground Floor - Timber		0.16	83.65
12.0 Opening Types				

SUMMARY FOR INPUT DATA

Calculation Type: Conversion (As Designed)

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Trple Glazing units	Manufacture r	Window	Triple glazed			0.68		0.70	1.00
External door	Manufacture r	Half Glazed Door	Triple glazed			0.68		0.70	1.00
Glazed Door	Manufacture r	Window	Triple glazed			0.68		0.70	1.00

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Opening 1	Window	[1] External Wall 1	South	None	0.00					2.80	
Opening 2	Window	[1] External Wall 1	South	Dark-coloured venetian blind	0.00					3.95	1
Opening 3	Window	[1] External Wall 1	South West	Dark-coloured venetian blind	0.00					0.86	1
Opening 4	Window	[1] External Wall 1	South East	Dark-coloured venetian blind	0.00					0.86	1
Opening 5	Window	[1] External Wall 1	South	Dark-coloured venetian blind	0.00					2.45	1
Opening 6	Window	[1] External Wall 1	North	Dark-coloured venetian blind	0.00					1.67	1
Opening 7	Window	[1] External Wall 1	North	Dark-coloured venetian blind	0.00					1.46	1
Opening 8	Window	[1] External Wall 1	North	Dark-coloured venetian blind	0.00					1.42	1
Opening 9	Window	[1] External Wall 1	West	Dark-coloured venetian blind	0.00					1.89	1
Opening 10	Window	[1] External Wall 1	West	Dark-coloured venetian blind	0.00					4.42	1

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	
17.0 Thermal Bridging	Default	
Y-value	0.150	W/m²K
18.0 Pressure Testing	No	

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows slightly open
Cross ventilation possible	Yes
Night Ventilation	No

SUMMARY FOR INPUT DATA

Calculation Type: Conversion (As Designed)

Air change rate

Mechanical Ventilation

Mechanical Ventilation System Present

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				3
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System

22.0 Lighting

Internal

Total number of light fittings	14	
Total number of L.E.L. fittings	14	
Percentage of L.E.L. fittings	100.00	%

External

External lights fitted	Yes
Light and motion sensor	Yes

23.0 Electricity Tariff

24.0 Main Heating 1

	SAP table	
Description	Electric storage heaters	
Percentage of Heat	100	%
Main Heating	SEK	
SAP Code	409	
Efficiency (SAP Table)	100.0	%
Controls	CSD Controls for high heat retention storage heaters	
Sap Code	2404	

25.0 Main Heating 2

Community Heating

28.0 Water Heating

	HEI Immersion
Water Heating	Independent
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery Instantaneous System 1	Yes
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage System	No
Solar Panel	No
Water use <= 125 litres/person/day	Yes
SAP Code	903
Immersion Heater	Dual

28.2 Waste Water Heat Recovery System

SUMMARY FOR INPUT DATA

Calculation Type: Conversion (As Designed)

Total rooms with shower and/or bath

Instantaneous System 1

Database ID	80182
Brand Model	Showersave, Blue QB1-21D
Details	Year: 2020 + current Efficiency: 69.7 Utilisation factor: 0.952
Number of mixer showers in rooms with a bath	1
Number of mixer showers in rooms without a bath	1

29.0 Hot Water Cylinder

Hot Water Cylinder	
Cylinder In Heated Space	Yes
Insulation Type	Foam
Insulation Thickness	80 mm
Cylinder Volume	150.00 L

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None