

# PREDICTED ENERGY ASSESSMENT



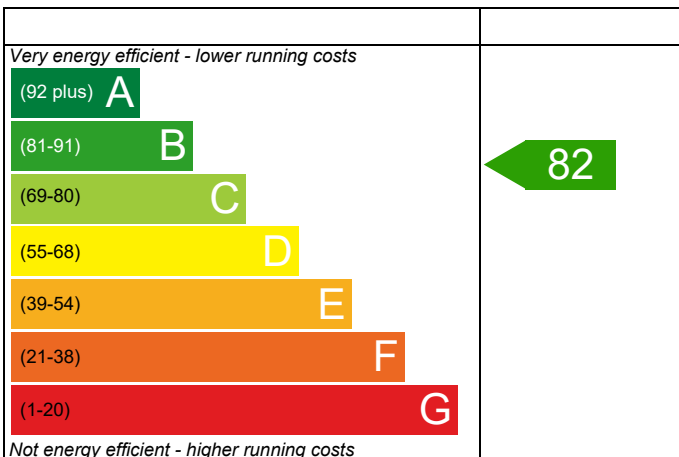
PL 16 - D - GF

Dwelling type: Flat, Detached  
 Date of assessment: 17/12/2020  
 Produced by: Michael Juckes  
 Total floor area: 62.88 m<sup>2</sup>

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 (CO<sub>2</sub>) emissions.

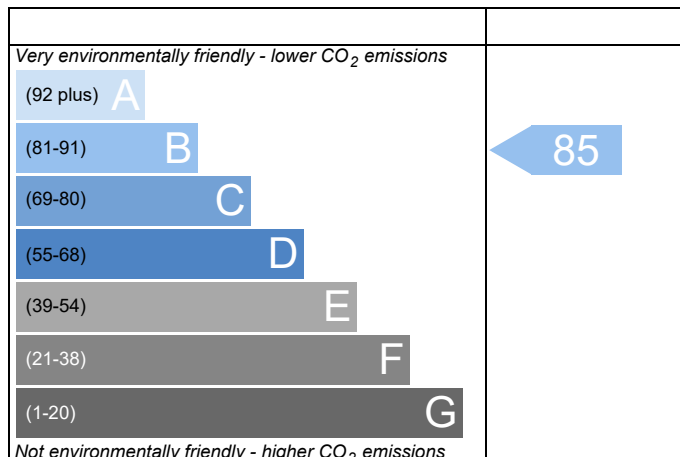
## Energy Efficiency Rating



**England** EU Directive 2002/91/EC

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

## Environmental Impact (CO<sub>2</sub>) Rating



**England** EU Directive 2002/91/EC

The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO<sub>2</sub>) 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.*

# BUILDING REGULATION COMPLIANCE

## Calculation Type: New Build (As Designed)



Property Reference	016 - PRJ010331 - GF		Issued on Date	17/12/2020
Assessment Reference	016 D	Prop Type Ref	Apartment - GF	
Property	PL 16 - D - GF			

SAP Rating	82 B	DER	21.20	TER	21.56
Environmental	85 B	% DER<TER	1.65		
CO <sub>2</sub> Emissions (t/year)	1.09	DFEE	56.35	TFEE	61.60
General Requirements Compliance	Pass	% DFEE<TFEE	8.51		

Assessor Details	Mr. Michael Juckes, Michael Juckes, Tel: 02033971373, michael@briaryenergy.co.uk	Assessor ID	T850-0001
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### 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)	21.56	kgCO <sub>2</sub> /m <sup>2</sup>	
Dwelling Carbon Dioxide Emission Rate (DER)	21.20	kgCO <sub>2</sub> /m <sup>2</sup>	Pass
	-0.36 (-1.7%)	kgCO <sub>2</sub> /m <sup>2</sup>	

##### 1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	61.60	kWh/m <sup>2</sup> /yr	
Dwelling Fabric Energy Efficiency (DFEE)	56.35	kWh/m <sup>2</sup> /yr	
	-5.2 (-8.4%)	kWh/m <sup>2</sup> /yr	Pass

#### Criterion 2 – Limits on design flexibility

##### Limiting Fabric Standards

##### 2 Fabric U-values

Element	Average	Highest	
External wall	0.24 (max. 0.30)	0.26 (max. 0.70)	Pass
Floor	0.16 (max. 0.25)	0.16 (max. 0.70)	Pass
Openings	1.33 (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)	m <sup>3</sup> /(h.m <sup>2</sup> ) @ 50 Pa	
Maximum	10.0	m <sup>3</sup> /(h.m <sup>2</sup> ) @ 50 Pa	Pass

##### Limiting System Efficiencies

##### 4 Heating efficiency

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# BUILDING REGULATION COMPLIANCE

## Calculation Type: New Build (As Designed)



Main heating system

Boiler system with radiators or underfloor - Mains gas  
Data from database  
Ideal LOGIC COMBI ESP1 30  
Combi boiler  
Efficiency: 89.6% SEDBUK2009  
Minimum: 88.0%

Pass

Secondary heating system

None

### 5 Cylinder insulation

Hot water storage

No cylinder

### 6 Controls

Space heating controls

Programmer, room thermostat and TRVs

Pass

Hot water controls

No cylinder

Boiler interlock

Yes

Pass

### 7 Low energy lights

Percentage of fixed lights with low-energy fittings

100 %

Minimum

75 %

Pass

### 8 Mechanical ventilation

Not applicable

## Criterion 3 – Limiting the effects of heat gains in summer

### 9 Summertime temperature

Overheating risk (Thames Valley)

Slight

Pass

Based on:

Overshading

Average

Windows facing North East

3.98 m<sup>2</sup>, No overhang

Windows facing North West

5.42 m<sup>2</sup>, No overhang

Air change rate

4.55 ach

Blinds/curtains

Dark-coloured curtain or roller blind, closed 100% of daylight hours

## Criterion 4 – Building performance consistent with DER and DFEE rate

### Air permeability and pressure testing

#### 3 Air permeability

Air permeability at 50 pascals

5.01 (design value) m<sup>3</sup>/(h.m<sup>2</sup>) @ 50 Pa

Maximum

10.0 m<sup>3</sup>/(h.m<sup>2</sup>) @ 50 Pa

Pass

### 10 Key features

Door U-value

1.00 W/m<sup>2</sup>K

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# FULL SAP CALCULATION PRINTOUT

## Calculation Type: New Build (As Designed)



Property Reference	016 - PRJ010331 - GF	Issued on Date	17/12/2020
Assessment Reference	016 D	Prop Type Ref	Apartment - GF
Property	PL 16 - D - GF		

SAP Rating	82 B	DER	21.20	TER	21.56
Environmental	85 B	% DER<TER	1.65		
CO <sub>2</sub> Emissions (t/year)	1.09	DFEE	56.35	TTEE	61.60
General Requirements Compliance	Pass	% DFEE<TTEE	8.51		

Assessor Details	Mr. Michael Juckes, Michael Juckes, Tel: 02033971373, michael@briaryenergy.co.uk	Assessor ID	T850-0001
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Client	
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### 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 <sup>2</sup> )	Storey height (m)	Volume (m <sup>3</sup> )
Ground floor	62.8800 (1b)	x 2.4300 (2b)	= 152.7984 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	62.8800		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 152.7984 (5)

#### 2. Ventilation rate

	main heating	secondary heating	other	total	m <sup>3</sup> 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				2 * 10 =	20.0000 (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) =				20.0000 / (5) =	0.1309 (8)
Pressure test				Yes	
Measured/design AP50					5.0100
Infiltration rate					0.3814 (18)
Number of sides sheltered					0 (19)
Shelter factor			(20) = 1 - [0.075 x (19)] =		1.0000 (20)
Infiltration rate adjusted to include shelter factor			(21) = (18) x (20) =		0.3814 (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	3.3000	3.4000	3.2000	3.3000	3.5000	3.5000	3.8000 (22)
Wind factor	1.0500	1.0000	1.0000	0.9250	0.9250	0.8250	0.8500	0.8000	0.8250	0.8750	0.8750	0.9500 (22a)
Adj infilt rate												
Effective ac	0.4005	0.3814	0.3814	0.3528	0.3528	0.3146	0.3242	0.3051	0.3146	0.3337	0.3337	0.3623 (22b)
	0.5802	0.5727	0.5727	0.5622	0.5622	0.5495	0.5525	0.5465	0.5495	0.5557	0.5557	0.5656 (25)

#### 3. Heat losses and heat loss parameter

Element	Gross m <sup>2</sup>	Openings m <sup>2</sup>	NetArea m <sup>2</sup>	U-value W/m <sup>2</sup> K	A x U W/K	K-value kJ/m <sup>2</sup> K	A x K kJ/K
Windows (U <sub>w</sub> = 1.40)			9.4000	1.3258	12.4621		(27)
Solid Door			1.9700	1.0000	1.9700		(26)
Flr - Ground			62.8800	0.1600	10.0608	75.0000	4716.0000 (28a)
Wl - Brick	43.9890	9.3960	34.5930	0.2600	8.9942	58.7400	2031.9928 (29a)
Wl - To Corridor	39.8580	1.9730	37.8850	0.2200	8.3347	58.7400	2225.3649 (29a)
Total net area of external elements A <sub>um</sub> (A, m <sup>2</sup> )			146.7280				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	41.8218		(33)
Party Ceiling			62.8830			70.0000	4401.8100 (32b)
Ground Floor Stud			120.5904			5.8200	701.8361 (32c)
Heat capacity C <sub>m</sub> = Sum (A x k)					(28)...(30) + (32) + (32a)...(32e) =		14077.0038 (34)
Thermal mass parameter (TMP = C <sub>m</sub> / TFA) in kJ/m <sup>2</sup> K							223.8709 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							9.3926 (36)
Total fabric heat loss					(33) + (36) =		51.2144 (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	29.2549	28.8790	28.8790	28.3496	28.3496	27.7078	27.8613	27.5588	27.7078	28.0195	28.0195	28.5215 (38)
Heat transfer coeff												

# FULL SAP CALCULATION PRINTOUT

## Calculation Type: New Build (As Designed)



### CALCULATION OF HEAT DEMAND 09 Jan 2014

Average = Sum(39)m / 12 =	80.4693	80.0934	80.0934	79.5639	79.5639	78.9221	79.0757	78.7731	78.9221	79.2339	79.2339	79.7358 (39)
												79.4734 (39)
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	1.2797	1.2737	1.2737	1.2653	1.2653	1.2551	1.2576	1.2528	1.2551	1.2601	1.2601	1.2681 (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													2.0618 (42)
Average daily hot water use (litres/day)													83.1673 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Energy content (annual)	91.4841	88.1574	84.8307	81.5040	78.1773	74.8506	74.8506	78.1773	81.5040	84.8307	88.1574	91.4841 (44)	
Distribution loss (46)m = 0.15 x (45)m	20.3502	17.7984	18.3664	16.0123	15.3642	13.2581	12.2856	14.0979	14.2663	16.6259	18.1485	19.7081 (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	14.5893	13.1549	14.5285	14.0193	14.4571	13.9568	14.4008	14.4373	13.9909	14.4990	14.0783	14.5775 (61)	
Total heat required for water heating calculated for each month	150.2575	131.8112	136.9712	120.7678	116.8849	102.3441	96.3047	108.4232	109.0992	125.3386	135.0684	145.9649 (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	150.2575	131.8112	136.9712	120.7678	116.8849	102.3441	96.3047	108.4232	109.0992	125.3386	135.0684	145.9649 (64)	
RHI water heating demand													
Heat gains from water heating, kWh/month	48.7570	42.7419	44.3443	38.9987	37.6715	32.8780	30.8332	34.8596	35.1212	40.4789	43.7488	47.3307 (65)	
												1479.2357 (64)	
												1479 (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	123.7070	123.7070	123.7070	123.7070	123.7070	123.7070	123.7070	123.7070	123.7070	123.7070	123.7070	123.7070 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	42.4772	37.7279	30.6824	23.2286	17.3636	14.6591	15.8397	20.5890	27.6345	35.0884	40.9533	43.6578 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	268.8769	271.6670	264.6361	249.6680	230.7735	213.0153	201.1517	198.3616	205.3926	220.3607	239.2552	257.0134 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	49.4325	49.4325	49.4325	49.4325	49.4325	49.4325	49.4325	49.4325	49.4325	49.4325	49.4325	49.4325 (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)	-82.4713	-82.4713	-82.4713	-82.4713	-82.4713	-82.4713	-82.4713	-82.4713	-82.4713	-82.4713	-82.4713	-82.4713 (71)
Water heating gains (Table 5)	65.5336	63.6041	59.6026	54.1649	50.6337	45.6639	41.4425	46.8544	48.7795	54.4072	60.7622	63.6165 (72)
Total internal gains	470.5559	466.6672	448.5892	420.7295	392.4389	367.0064	352.1020	359.4731	375.4747	403.5243	434.6388	457.9559 (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	3.9780	12.9236	0.5000	0.0000	0.7700	19.7928 (75)						
Northwest	5.4180	12.9236	0.5000	0.0000	0.7700	26.9576 (81)						
Solar gains	46.7505	86.0826	153.7614	259.8954	339.0999	386.0137	357.5688	292.5360	203.0999	112.5384	60.3668	37.7419 (83)
Total gains	517.3064	552.7497	602.3506	680.6249	731.5389	753.0201	709.6708	652.0091	578.5746	516.0627	495.0057	495.6978 (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	48.5934	48.8215	48.8215	49.1464	49.1464	49.5460	49.4498	49.6397	49.5460	49.3511	49.3511	49.0404	
alpha	4.2396	4.2548	4.2548	4.2764	4.2764	4.3031	4.2967	4.3093	4.3031	4.2901	4.2901	4.2694	
util living area	0.9871	0.9816	0.9624	0.8992	0.7502	0.5081	0.3431	0.3826	0.7064	0.9257	0.9771	0.9889 (86)	
MIT	19.7797	19.9022	20.1903	20.5685	20.8604	20.9808	20.9973	20.9959	20.9218	20.5745	20.1295	19.7630 (87)	
Th 2	19.8567	19.8615	19.8615	19.8681	19.8681	19.8762	19.8742	19.8780	19.8762	19.8722	19.8722	19.8659 (88)	
util rest of house	0.9831	0.9759	0.9502	0.8668	0.6779	0.4012	0.2197	0.2506	0.6011	0.8938	0.9688	0.9854 (89)	
MIT 2	18.7792	18.9036	19.1850	19.5448	19.7876	19.8701	19.8739	19.8775	19.8422	19.5628	19.1375	18.7700 (90)	
Living area fraction													
MIT	19.2203	19.3438	19.6282	19.9961	20.2606	20.3597	20.3692	20.3705	20.3181	20.0088	19.5748	19.2078 (92)	
Temperature adjustment													
adjusted MIT	19.0703	19.1938	19.4782	19.8461	20.1106	20.2097	20.2192	20.2205	20.1681	19.8588	19.4248	19.0578 (93)	

# FULL SAP CALCULATION PRINTOUT

## Calculation Type: New Build (As Designed)



CALCULATION OF HEAT DEMAND 09 Jan 2014

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 8. Space heating requirement  
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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9796	0.9717	0.9452	0.8661	0.6947	0.4338	0.2578	0.2914	0.6308	0.8933	0.9645	0.9822	(94)
Useful gains	506.7281	537.0954	569.3303	589.5027	508.1960	326.6789	182.9840	189.9974	364.9573	460.9988	477.4496	486.8722	(95)
Ext temp.	5.1000	5.6000	7.4000	9.9000	13.0000	16.0000	17.9000	17.8000	15.2000	11.6000	8.0000	5.1000	(96)
Heat loss rate W													
	1124.1764	1088.7735	967.3802	791.3498	565.7442	332.2418	183.3902	190.6729	392.0964	654.3758	905.2340	1112.9331	(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													
	459.3815	370.7277	296.1491	145.3299	42.8158	0.0000	0.0000	0.0000	0.0000	143.8725	308.0048	465.7893	(98)
Space heating													
RHI space heating demand												2232.0707	(98)
												2232	(98)

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# FULL SAP CALCULATION PRINTOUT

## Calculation Type: New Build (As Designed)



### CALCULATION OF ENERGY RATINGS 09 Jan 2014

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

#### 1. Overall dwelling dimensions

	Area (m <sup>2</sup> )	Storey height (m)	Volume (m <sup>3</sup> )
Ground floor	62.8800 (1b)	2.4300 (2b)	152.7984 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	62.8800		152.7984 (4)
Dwelling volume			(3a)+(3b)+(3c)+(3d)+(3e)...(3n) = 152.7984 (5)

#### 2. Ventilation rate

	main heating	secondary heating	other	total	m <sup>3</sup> 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				2 * 10 =	20.0000 (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) =				20.0000 / (5) =	0.1309 (8)
Pressure test					Yes
Measured/design AP50					5.0100
Infiltration rate					0.3814 (18)
Number of sides sheltered					0 (19)
Shelter factor				(20) = 1 - [0.075 x (19)] =	1.0000 (20)
Infiltration rate adjusted to include shelter factor				(21) = (18) x (20) =	0.3814 (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 infiltr rate												
Effective ac	0.4863	0.4767	0.4672	0.4195	0.4100	0.3623	0.3623	0.3528	0.3814	0.4100	0.4291	0.4481 (22b)
	0.6182	0.6136	0.6091	0.5880	0.5840	0.5656	0.5656	0.5622	0.5727	0.5840	0.5920	0.6004 (25)

#### 3. Heat losses and heat loss parameter

Element	Gross m <sup>2</sup>	Openings m <sup>2</sup>	NetArea m <sup>2</sup>	U-value W/m <sup>2</sup> K	A x U W/K	K-value kJ/m <sup>2</sup> K	A x K kJ/K
Windows (U <sub>w</sub> = 1.40)			9.4000	1.3258	12.4621		(27)
Solid Door			1.9700	1.0000	1.9700		(26)
F1r - Ground			62.8800	0.1600	10.0608	75.0000	4716.0000 (28a)
W1 - Brick	43.9890	9.3960	34.5930	0.2600	8.9942	58.7400	2031.9928 (29a)
W1 - To Corridor	39.8580	1.9730	37.8850	0.2200	8.3347	58.7400	2225.3649 (29a)
Total net area of external elements A <sub>um</sub> , m <sup>2</sup>			146.7280				(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) = 41.8218		(33)
Party Ceiling			62.8830			70.0000	4401.8100 (32b)
Ground Floor Stud			120.5904			5.8200	701.8361 (32c)
Heat capacity Cm = Sum (A x k)						(28)...(30) + (32) + (32a)...(32e) =	14077.0038 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m <sup>2</sup> K							223.8709 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							9.3926 (36)
Total fabric heat loss						(33) + (36) =	51.2144 (37)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)												
(38)m	31.1734	30.9419	30.7150	29.6492	29.4497	28.5215	28.5215	28.3496	28.8790	29.4497	29.8531	30.2749 (38)
Heat transfer coeff	82.3877	82.1562	81.9293	80.8635	80.6641	79.7358	79.7358	79.5639	80.0934	80.6641	81.0675	81.4892 (39)
Average = Sum(39)m / 12 =	80.8625 (39)											
HLP	1.3102	1.3066	1.3029	1.2860	1.2828	1.2681	1.2681	1.2653	1.2737	1.2828	1.2892	1.2959 (40)
HLP (average)	1.2860 (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	2.0618 (42)											
Average daily hot water use (litres/day)	83.1673 (43)											
Daily hot water use	91.4841	88.1574	84.8307	81.5040	78.1773	74.8506	74.8506	78.1773	81.5040	84.8307	88.1574	91.4841 (44)
Energy conte	135.6682	118.6563	122.4427	106.7485	102.4277	88.3873	81.9039	93.9859	95.1084	110.8396	120.9901	131.3874 (45)
Energy content (annual)												Total = Sum(45)m = 1308.5461 (45)
Distribution loss (46)m = 0.15 x (45)m	20.3502											
Water storage loss:	17.7984	18.3664	16.0123	15.3642	13.2581	12.2856	14.0979	14.2663	16.6259	18.1485	19.7081	(46)
Total storage loss												

# FULL SAP CALCULATION PRINTOUT

## Calculation Type: New Build (As Designed)



### CALCULATION OF ENERGY RATINGS 09 Jan 2014

If cylinder contains dedicated solar storage	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(56)
Combi loss	14.5893	13.1549	14.5285	14.0193	14.4571	13.9568	14.4008	14.4373	13.9909	14.4990	14.0783	14.5775	14.5775	(61)
Total heat required for water heating calculated for each month	150.2575	131.8112	136.9712	120.7678	116.8849	102.3441	96.3047	108.4232	109.0992	125.3386	135.0684	145.9649	145.9649	(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	0.0000	(63)
Output from w/h	150.2575	131.8112	136.9712	120.7678	116.8849	102.3441	96.3047	108.4232	109.0992	125.3386	135.0684	145.9649	145.9649	(64)
Heat gains from water heating, kWh/month	48.7570	42.7419	44.3443	38.9987	37.6715	32.8780	30.8332	34.8596	35.1212	40.4789	43.7488	47.3307	47.3307	(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	123.7070	123.7070	123.7070	123.7070	123.7070	123.7070	123.7070	123.7070	123.7070	123.7070	123.7070	123.7070	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	42.4772	37.7279	30.6824	23.2286	17.3636	14.6591	15.8397	20.5890	27.6345	35.0884	40.9533	43.6578	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	268.8769	271.6670	264.6361	249.6680	230.7735	213.0153	201.1517	198.3616	205.3926	220.3607	239.2552	257.0134	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	49.4325	49.4325	49.4325	49.4325	49.4325	49.4325	49.4325	49.4325	49.4325	49.4325	49.4325	49.4325	(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)	-82.4713	-82.4713	-82.4713	-82.4713	-82.4713	-82.4713	-82.4713	-82.4713	-82.4713	-82.4713	-82.4713	-82.4713	(71)
Water heating gains (Table 5)	65.5336	63.6041	59.6026	54.1649	50.6337	45.6639	41.4425	46.8544	48.7795	54.4072	60.7622	63.6165	(72)
Total internal gains	470.5559	466.6672	448.5892	420.7295	392.4389	367.0064	352.1020	359.4731	375.4747	403.5243	434.6388	457.9559	(73)

#### 6. Solar gains

[Jan]	Area m <sup>2</sup>	Solar flux Table 6a W/m <sup>2</sup>	Specific data or Table 6b	g Specific data or Table 6c	FF Specific data or Table 6c	Access factor Table 6d	Gains W						
Northeast	3.9780	11.2829	0.5000	0.0000	0.0000	0.7700	17.2802 (75)						
Northwest	5.4180	11.2829	0.5000	0.0000	0.0000	0.7700	23.5354 (81)						
Solar gains	40.8156	83.0813	149.6861	245.8276	330.4405	352.2845	329.5550	262.7250	182.3949	101.5319	51.3566	33.3321	(83)
Total gains	511.3715	549.7485	598.2753	666.5571	722.8794	719.2909	681.6570	622.1981	557.8696	505.0563	485.9954	491.2879	(84)

#### 7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Thl (C)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation factor for gains for living area, nil,m (see Table 9a)													21.0000 (85)
tau	47.4619	47.5957	47.7275	48.3565	48.4761	49.0404	49.0404	49.1464	48.8215	48.4761	48.2349	47.9852	
alpha	4.1641	4.1730	4.1818	4.2238	4.2317	4.2694	4.2694	4.2764	4.2548	4.2317	4.2157	4.1990	
util living area	0.9897	0.9849	0.9710	0.9272	0.8235	0.6525	0.4996	0.5616	0.8059	0.9500	0.9834	0.9913	(86)
MIT	19.6276	19.7663	20.0408	20.4286	20.7544	20.9348	20.9836	20.9736	20.8362	20.4304	19.9719	19.6044	(87)
Th 2	19.8328	19.8357	19.8385	19.8518	19.8543	19.8659	19.8659	19.8681	19.8615	19.8543	19.8493	19.8440	(88)
util rest of house	0.9867	0.9803	0.9619	0.9037	0.7689	0.5578	0.3781	0.4358	0.7261	0.9289	0.9776	0.9887	(89)
MIT 2	18.6097	18.7491	19.0211	19.4028	19.6926	19.8363	19.8617	19.8604	19.7719	19.4144	18.9645	18.5955	(90)
Living area fraction									fLA = Living area / (4) =			0.4408	(91)
MIT	19.0585	19.1976	19.4706	19.8550	20.1607	20.3206	20.3563	20.3512	20.2411	19.8623	19.4086	19.0403	(92)
Temperature adjustment												-0.1500	
adjusted MIT	18.9085	19.0476	19.3206	19.7050	20.0107	20.1706	20.2063	20.2012	20.0911	19.7123	19.2586	18.8903	(93)

#### 8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9835	0.9763	0.9568	0.9001	0.7772	0.5848	0.4157	0.4744	0.7443	0.9256	0.9736	0.9859	(94)
Useful gains	502.9417	536.7402	572.4097	599.9747	561.8128	420.6208	283.3330	295.1656	415.2088	467.4904	473.1730	484.3378	(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	1203.5581	1162.3102	1050.3825	873.7318	670.3713	444.1735	287.5500	302.4351	479.8453	735.0321	985.6678	1197.0993	(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	521.2586	420.3830	355.6118	197.1051	80.7675	0.0000	0.0000	0.0000	0.0000	199.0510	368.9963	530.2946	(98)
Space heating												2673.4679	(98)
Space heating per m <sup>2</sup>												42.5170	(99)

#### 8c. Space cooling requirement

Not applicable











# FULL SAP CALCULATION PRINTOUT

## Calculation Type: New Build (As Designed)



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

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 (none)	Typical annual savings	Energy efficiency	Environmental impact
	Total Savings    £0		0.00 kg/m <sup>2</sup>

Potential energy efficiency rating:                      B 82  
 Potential environmental impact rating:                      B 85

Fuel prices for cost data on this page from database revision number 467 TEST (29 Oct 2020)  
 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	£70	£70	£0
Mains gas	£254	£254	£0
Space heating	£202	£202	£0
Water heating	£66	£66	£0
Lighting	£56	£56	£0
Total cost of fuels	£324	£324	£0
Total cost of uses	£324	£324	£0
Delivered energy	72 kWh/m <sup>2</sup>	72 kWh/m <sup>2</sup>	0 kWh/m <sup>2</sup>
Carbon dioxide emissions	1.1 tonnes	1.1 tonnes	0.0 tonnes
CO2 emissions per m <sup>2</sup>	17 kg/m <sup>2</sup>	17 kg/m <sup>2</sup>	0 kg/m <sup>2</sup>
Primary energy	99 kWh/m <sup>2</sup>	99 kWh/m <sup>2</sup>	0 kWh/m <sup>2</sup>

# FULL SAP CALCULATION PRINTOUT

## Calculation Type: New Build (As Designed)



CALCULATION OF ENERGY RATINGS FOR IMPROVED DWELLING 09 Jan 2014

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SAP 2012 WORKSHEET FOR New Build (As Designed) (Version 9.92, January 2014)  
CALCULATION OF ENERGY RATINGS FOR IMPROVED DWELLING 09 Jan 2014  
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No improvements selected / applicable

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# 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)



<b>Property Reference</b>	016 - PRJ010331 - GF	<b>Issued on Date</b>	17/12/2020
<b>Assessment Reference</b>	016 D	<b>Prop Type Ref</b>	Apartment - GF
<b>Property</b>	PL 16 - D - GF		

<b>SAP Rating</b>	82 B	<b>DER</b>	21.20	<b>TER</b>	21.56
<b>Environmental</b>	85 B	<b>% DER&lt;TER</b>	1.65		
<b>CO<sub>2</sub> Emissions (t/year)</b>	1.09	<b>DFEE</b>	56.35	<b>TFEE</b>	61.60
<b>General Requirements Compliance</b>	Pass	<b>% DFEE&lt;TFEE</b>	8.51		

<b>Assessor Details</b>	Mr. Michael Juckes, Michael Juckes, Tel: 02033971373, michael@briaryenergy.co.uk	<b>Assessor ID</b>	T850-0001
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<b>Client</b>	
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### 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)	21.56	kgCO <sub>2</sub> /m <sup>2</sup>	
Dwelling Carbon Dioxide Emission Rate (DER)	21.20	kgCO <sub>2</sub> /m <sup>2</sup>	Pass
	-0.36 (-1.7%)	kgCO <sub>2</sub> /m <sup>2</sup>	

##### 1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	61.60	kWh/m <sup>2</sup> /yr	
Dwelling Fabric Energy Efficiency (DFEE)	56.35	kWh/m <sup>2</sup> /yr	
	-5.2 (-8.4%)	kWh/m <sup>2</sup> /yr	Pass

#### Criterion 2 – Limits on design flexibility

##### Limiting Fabric Standards

##### 2 Fabric U-values

Element	Average	Highest	
External wall	0.24 (max. 0.30)	0.26 (max. 0.70)	Pass
Floor	0.16 (max. 0.25)	0.16 (max. 0.70)	Pass
Openings	1.33 (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

Not applicable

## Criterion 3 – Limiting the effects of heat gains in summer

### 9 Summertime temperature

Overheating risk (Thames Valley)

Based on:

Overshading

Windows facing North East

Windows facing North West

Air change rate

Blinds/curtains

## Criterion 4 – Building performance consistent with DER and DFEE rate

### Air permeability and pressure testing

#### 3 Air permeability

Air permeability at 50 pascals

Maximum

### 10 Key features

Door U-value  W/m<sup>2</sup>K

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