

# PREDICTED ENERGY ASSESSMENT

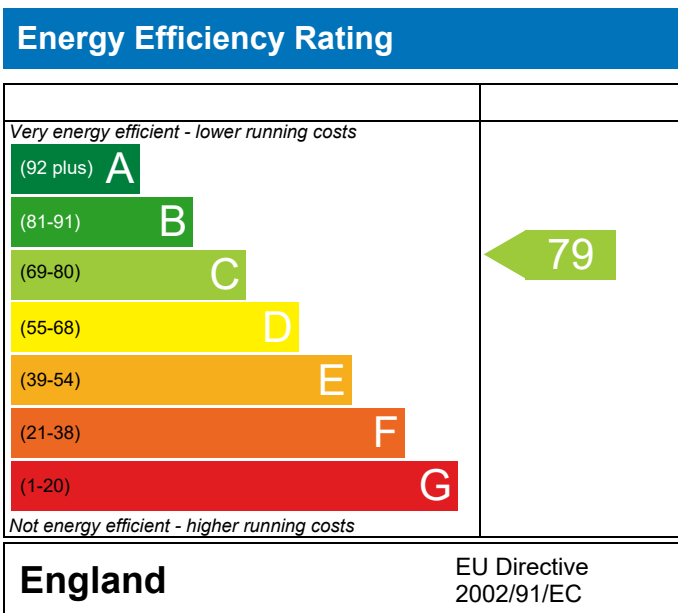


Flat 11, Block G, Knightswood,  
TUNBRIDGE WELLS,  
TN2

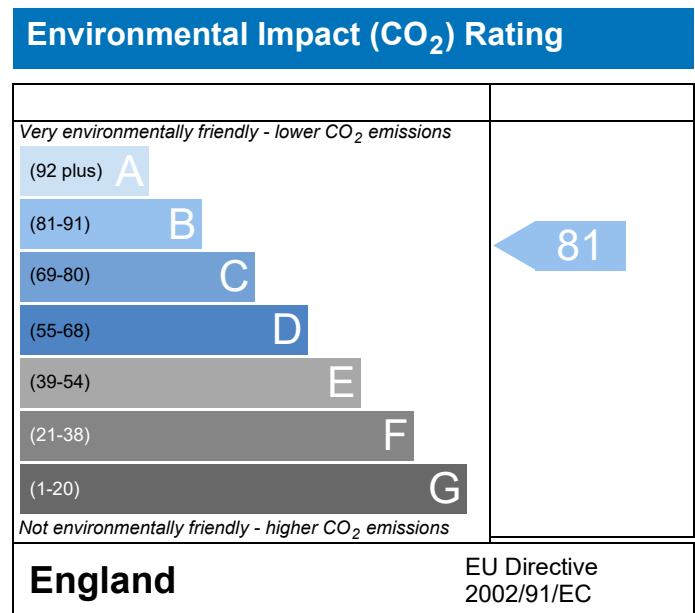
Dwelling type: Flat, End-Terrace  
Date of assessment: 19/02/2021  
Produced by: Gary Nicholls  
Total floor area: 69.15 m<sup>2</sup>

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.



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 (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	Plot 028 - Block G	Issued on Date	19/02/2021
Assessment Reference	011 E	Prop Type Ref	BEC-Dand - KW3
Property	Flat 11, Block G, Knightswood, TUNBRIDGE WELLS, TN2		

SAP Rating	79 C	DER	25.17	TER	25.23
Environmental	81 B	% DER<TER	0.23		
CO <sub>2</sub> Emissions (t/year)	1.57	DFEE	33.22	TFEE	43.10
General Requirements Compliance	Pass	% DFEE<TFEE	22.93		

Assessor Details	Mr. Gary Nicholls, Gary Nicholls, Tel: 02033971373, gary@briaryenergy.co.uk	Assessor ID	W947-0001
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Client	
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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	Electricity		
Fuel factor	1.55 (electricity)		
Target Carbon Dioxide Emission Rate (TER)	25.23	kgCO <sub>2</sub> /m <sup>2</sup>	
Dwelling Carbon Dioxide Emission Rate (DER)	25.17	kgCO <sub>2</sub> /m <sup>2</sup>	Pass
	-0.06 (-0.2%)	kgCO <sub>2</sub> /m <sup>2</sup>	

##### 1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	43.10	kWh/m <sup>2</sup> /yr	
Dwelling Fabric Energy Efficiency (DFEE)	33.22	kWh/m <sup>2</sup> /yr	
	-9.9 (-23.0%)	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	0.15 (max. 0.30)	0.23 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Roof	0.15 (max. 0.20)	0.20 (max. 0.35)	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	2.60 (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

Main heating system	Room heaters with radiators or underfloor - Electric Panel, convector or radiant heaters	
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# BUILDING REGULATION COMPLIANCE

## Calculation Type: New Build (As Designed)



Secondary heating system

None

### 5 Cylinder insulation

Hot water storage

Measured cylinder loss: 1.27 kWh/day  
Permitted by DBSCG 1.89

Pass

Primary pipework insulated

No primary pipework

### 6 Controls

Space heating controls

Programmer and appliance thermostats

Pass

Hot water controls

Cylinderstat

Pass

### 7 Low energy lights

Percentage of fixed lights with low-energy fittings

100 %

Minimum

75 %

Pass

### 8 Mechanical ventilation

Continuous supply and extract system

Specific fan power

0.50

Maximum

1.5

Pass

MVHR efficiency

91 %

Minimum

70 %

Pass

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

### 9 Summertime temperature

Overheating risk (South East England)

Medium

Pass

Based on:

Overshading

Average

Windows facing South West

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

Air change rate

4.21 ach

Blinds/curtains

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

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

### Party Walls

Type

U-value

Filled Cavity with Edge Sealing

0.00

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

Pass

### Air permeability and pressure testing

#### 3 Air permeability

Air permeability at 50 pascals

2.60 (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

External wall U-value

0.12

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

Party wall U-value

0.00

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

Roof U-value

0.11

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

Door U-value

1.09

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

Door U-value

1.09

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

Air permeability

2.6

m<sup>3</sup>/m<sup>2</sup>h

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# FULL SAP CALCULATION PRINTOUT

## Calculation Type: New Build (As Designed)



<b>Property Reference</b>	Plot 028 - Block G		<b>Issued on Date</b>	19/02/2021	
<b>Assessment Reference</b>	011 E	<b>Prop Type Ref</b>	BEC-Dand - KW3		
<b>Property</b>	Flat 11, Block G, Knightswood, TUNBRIDGE WELLS, TN2				
<b>SAP Rating</b>	79 C	<b>DER</b>	25.17	<b>TER</b>	25.23
<b>Environmental</b>	81 B	<b>% DER&lt;TER</b>	0.23		
<b>CO<sub>2</sub> Emissions (t/year)</b>	1.57	<b>DFEE</b>	33.22	<b>TFEE</b>	43.10
<b>General Requirements Compliance</b>	Pass	<b>% DFEE&lt;TFEE</b>	22.93		
<b>Assessor Details</b>	Mr. Gary Nicholls, Gary Nicholls, Tel: 02033971373, gary@briaryenergy.co.uk			<b>Assessor ID</b>	W947-0001
<b>Client</b>					

# FULL SAP CALCULATION PRINTOUT

## Calculation Type: New Build (As Designed)



### REGULATIONS COMPLIANCE REPORT - Approved Document L1A, 2013 Edition, England

REGULATIONS COMPLIANCE REPORT - Approved Document L1A, 2013 Edition, England

DWELLING AS DESIGNED

Top-floor flat, total floor area 69 m<sup>2</sup>

This report covers items included within the SAP calculations.  
It is not a complete report of regulations compliance.

#### 1a TER and DER

Fuel for main heating:Electricity  
Fuel factor:1.55 (electricity)  
Target Carbon Dioxide Emission Rate (TER) 25.23 kgCO<sub>2</sub>/m<sup>2</sup>  
Dwelling Carbon Dioxide Emission Rate (DER) 25.17 kgCO<sub>2</sub>/m<sup>2</sup>OK

#### 1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)43.1 kWh/m<sup>2</sup>/yr  
Dwelling Fabric Energy Efficiency (DFEE)33.2 kWh/m<sup>2</sup>/yrOK

#### 2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.23 (max. 0.70)	OK
Party wall	0.00 (max. 0.20)	-	OK
Floor	(no floor)		
Roof	0.15 (max. 0.20)	0.20 (max. 0.35)	OK
Openings	1.33 (max. 2.00)	1.40 (max. 3.30)	OK

#### 2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

#### 3 Air permeability

Air permeability at 50 pascals: 2.60 (design value)  
Maximum 10.0 OK

#### 4 Heating efficiency

Main heating system: Room heaters with radiators or underfloor - Electric  
Panel, convector or radiant heaters

Secondary heating system: None

#### 5 Cylinder insulation

Hot water storage Measured cylinder loss: 1.27 kWh/day  
Permitted by DBSCG 1.89 OK  
Primary pipework insulated: No primary pipework

#### 6 Controls

Space heating controls: Programmer and appliance thermostats OK

Hot water controls: Cylinderstat OK

#### 7 Low energy lights

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

#### 8 Mechanical ventilation

Continuous supply and extract system  
Specific fan power: 0.50  
Maximum 1.5 OK  
MVHR efficiency: 91%  
Minimum: 70% OK

#### 9 Summertime temperature

Overheating risk (South East England): Medium OK

Based on:

Overshading: Average  
Windows facing South West: 4.81 m<sup>2</sup>, No overhang  
Air change rate: 4.21 ach  
Blinds/curtains: Dark-coloured curtain or roller blind, closed 100% of daylight hours

#### 10 Key features

External wall U-value	0.12 W/m <sup>2</sup> K
Party wall U-value	0.00 W/m <sup>2</sup> K
Roof U-value	0.11 W/m <sup>2</sup> K
Door U-value	1.09 W/m <sup>2</sup> K
Door U-value	1.09 W/m <sup>2</sup> K
Air permeability	2.6 m <sup>3</sup> /m <sup>2</sup> h

# FULL SAP CALCULATION PRINTOUT

## Calculation Type: New Build (As Designed)



### CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE 09 Jan 2014

SAP 2012 WORKSHEET FOR New Build (As Designed) (Version 9.92, January 2014)  
 CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE 09 Jan 2014

#### 1. Overall dwelling dimensions

	Area (m <sup>2</sup> )	Storey height (m)	Volume (m <sup>3</sup> )
Ground floor	69.1500 (1b)	2.1500 (2b)	148.6725 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	69.1500		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	148.6725 (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				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					2.6000	
Infiltration rate					0.1300	(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) =	0.1203 (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	0.1533	0.1503	0.1473	0.1323	0.1293	0.1142	0.1142	0.1112	0.1203	0.1293	0.1353	0.1413 (22b)
Balanced mechanical ventilation with heat recovery												
If mechanical ventilation:												
If balanced with heat recovery: efficiency in % allowing for in-use factor (from Table 4h) =												
Effective ac	0.2666	0.2636	0.2606	0.2455	0.2425	0.2275	0.2275	0.2245	0.2335	0.2425	0.2485	0.2545 (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)			4.8100	1.3258	6.3769		(27)		
Solid Door			2.1400	1.0900	2.3326		(26)		
Roof Window (U <sub>w</sub> = 1.40)			2.1100	1.3258	2.7973		(27a)		
Wl - Brick	0.8600		0.8600	0.2300	0.1978	5.8200	5.0052 (29a)		
Wl - To Corridor	24.5700	2.1420	22.4280	0.1600	3.5885	13.4400	301.4323 (29a)		
Wl - Dormer	13.4600	4.8140	8.6460	0.1800	1.5563	0.0000	0.0000 (29a)		
Wl - Stud Ashlar	21.9300		21.9300	0.1200	2.6316	0.0000	0.0000 (29a)		
Rf - Ins Joist	40.6300		40.6300	0.1100	4.4693	5.8200	236.4666 (30)		
Rf - Ins Rafter	30.3700	2.1110	28.2590	0.2000	5.6518	1.8000	50.8662 (30)		
Rf - Flat Roof Dormer	7.0500		7.0500	0.1600	1.1280	1.8000	12.6900 (30)		
Total net area of external elements A <sub>um</sub> (A, m <sup>2</sup> )	138.8630								
Fabric heat loss, W/K = Sum (A x U)				(26) ... (30) + (32) =	30.7301		(33)		
Party Wall			11.6600	0.0000	0.0000	20.0000	233.2000 (32)		
Party Floor			69.1500			40.0000	2766.0000 (32d)		
1st Floor Stud			91.0439			5.8200	529.8755 (32c)		
Heat capacity C <sub>m</sub> = Sum(A x k)								(28) ... (30) + (32) + (32a) ... (32e) =	4135.5358 (34)
Thermal mass parameter (TMP) = C <sub>m</sub> / TFA in kJ/m <sup>2</sup> K									59.8053 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)									9.1691 (36)
Total fabric heat loss								(33) + (36) =	39.8992 (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	13.0784	12.9309	12.7834	12.0459	11.8984	11.1610	11.1610	11.0135	11.4560	11.8984	12.1934	12.4884 (38)
Heat transfer coeff	52.9776	52.8301	52.6826	51.9451	51.7976	51.0602	51.0602	50.9127	51.3552	51.7976	52.0926	52.3876 (39)
Average = Sum(39)m / 12 =												
	51.9083 (39)											
HLP	0.7661	0.7640	0.7619	0.7512	0.7491	0.7384	0.7384	0.7363	0.7427	0.7491	0.7533	0.7576 (40)
HLP (average)												
Days in month	31	28	31	30	31	30	31	31	30	31	30	31 (41)

#### 4. Water heating energy requirements (kWh/year)

Assumed occupancy	2.2253 (42)
Average daily hot water use (litres/day)	87.0512 (43)

# FULL SAP CALCULATION PRINTOUT

## Calculation Type: New Build (As Designed)



### CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE 09 Jan 2014

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Daily hot water use	95.7563	92.2743	88.7922	85.3102	81.8281	78.3461	78.3461	81.8281	85.3102	88.7922	92.2743	95.7563	(44)
Energy conte	142.0038	124.1975	128.1606	111.7336	107.2110	92.5149	85.7287	98.3749	99.5498	116.0157	126.6403	137.5231	(45)
Energy content (annual)	Total = Sum(45)m =												1369.6540 (45)
Distribution loss (46)m = 0.15 x (45)m	21.3006	18.6296	19.2241	16.7600	16.0817	13.8772	12.8593	14.7562	14.9325	17.4024	18.9960	20.6285	(46)
Water storage loss:													
Store volume													150.0000 (47)
a) If manufacturer declared loss factor is known (kWh/day):													1.2700 (48)
Temperature factor from Table 2b													0.6000 (49)
Enter (49) or (54) in (55)													0.7620 (55)
Total storage loss	23.6220	21.3360	23.6220	22.8600	23.6220	22.8600	23.6220	23.6220	22.8600	23.6220	22.8600	23.6220	(56)
If cylinder contains dedicated solar storage	23.6220	21.3360	23.6220	22.8600	23.6220	22.8600	23.6220	23.6220	22.8600	23.6220	22.8600	23.6220	(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	165.6258	145.5335	151.7826	134.5936	130.8330	115.3749	109.3507	121.9969	122.4098	139.6377	149.5003	161.1451	(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	165.6258	145.5335	151.7826	134.5936	130.8330	115.3749	109.3507	121.9969	122.4098	139.6377	149.5003	161.1451	(64)
Total per year (kWh/year) = Sum(64)m =													1647.7840 (64)
Heat gains from water heating, kWh/month	66.1139	58.3645	61.5110	55.4394	54.5453	49.0492	47.4024	51.6073	51.3883	57.4728	60.3959	64.6240	(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	111.2656	111.2656	111.2656	111.2656	111.2656	111.2656	111.2656	111.2656	111.2656	111.2656	111.2656	111.2656	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	19.8419	17.6234	14.3323	10.8505	8.1109	6.8475	7.3990	9.6175	12.9086	16.3904	19.1300	20.3934	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	195.3051	197.3318	192.2247	181.3523	167.6278	154.7287	146.1113	144.0846	149.1918	160.0642	173.7887	186.6878	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	34.1266	34.1266	34.1266	34.1266	34.1266	34.1266	34.1266	34.1266	34.1266	34.1266	34.1266	34.1266	(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)	-89.0125	-89.0125	-89.0125	-89.0125	-89.0125	-89.0125	-89.0125	-89.0125	-89.0125	-89.0125	-89.0125	-89.0125	(71)
Water heating gains (Table 5)	88.8627	86.8519	82.6761	76.9992	73.3135	68.1239	63.7129	69.3646	71.3727	77.2484	83.8832	86.8603	(72)
Total internal gains	360.3894	358.1867	345.6128	325.5816	305.4318	286.0798	273.6029	279.4464	289.8527	310.0827	333.1816	350.3211	(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							
Southwest	4.8140	36.7938	0.5000	0.0000	0.7700	68.1933 (79)							
Southwest	2.1110	39.9751	0.6000	0.0000	1.0000	50.6325 (82)							
Solar gains	118.8258	209.2321	300.9337	391.7435	451.8934	453.2918	435.1609	390.3003	332.7677	235.5333	143.6538	100.7853	(83)
Total gains	479.2153	567.4188	646.5464	717.3251	757.3253	739.3717	708.7637	669.7467	622.6204	545.6160	476.8353	451.1063	(84)

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

Temperature during heating periods in the living area from Table 9, Th1 (C)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation factor for gains for living area, nil,m (see Table 9a)	21.6839	21.7444	21.8053	22.1149	22.1778	22.4982	22.4982	22.5633	22.3689	22.1778	22.0523	21.9281	(85)
alpha	2.4456	2.4496	2.4537	2.4743	2.4785	2.4999	2.4999	2.5042	2.4913	2.4785	2.4702	2.4619	
util living area	0.8836	0.8359	0.7670	0.6638	0.5409	0.4080	0.3045	0.3329	0.4991	0.7080	0.8410	0.8956	(86)
MIT	19.0937	19.4433	19.8899	20.3650	20.6994	20.8945	20.9629	20.9527	20.8175	20.3641	19.6554	19.0233	(87)
Th 2	20.2828	20.2846	20.2865	20.2958	20.2977	20.3070	20.3070	20.3089	20.3033	20.2977	20.2940	20.2902	(88)
util rest of house	0.8745	0.8238	0.7505	0.6411	0.5109	0.3699	0.2598	0.2870	0.4596	0.6825	0.8273	0.8873	(89)
MIT 2	17.6943	18.1921	18.8239	19.4897	19.9407	20.1970	20.2753	20.2671	20.1044	19.5038	18.5091	17.5983	(90)
Living area fraction	18.3152	18.7472	19.2969	19.8780	20.2773	20.5065	20.5804	20.5713	20.4208	19.8855	19.0177	18.2305	(91)
Temperature adjustment													0.0000
adjusted MIT	18.3152	18.7472	19.2969	19.8780	20.2773	20.5065	20.5804	20.5713	20.4208	19.8855	19.0177	18.2305	(93)

#### 8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.8440	0.7937	0.7252	0.6268	0.5100	0.3811	0.2776	0.3047	0.4664	0.6663	0.7985	0.8576	(94)
Useful gains	404.4380	450.3771	468.8506	449.6320	386.2386	281.7483	196.7727	204.0514	290.4211	363.5704	380.7467	386.8711	(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	742.4899	731.5496	674.1725	570.2563	444.2854	301.5850	203.2381	212.3719	324.6063	480.9663	620.8235	735.0259	(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)

# FULL SAP CALCULATION PRINTOUT

## Calculation Type: New Build (As Designed)



### CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE 09 Jan 2014

Space heating kWh	251.5107	188.9479	152.7595	86.8495	43.1869	0.0000	0.0000	0.0000	0.0000	87.3426	172.8553	259.0272 (98)
Space heating												1242.4796 (98)
Space heating per m2												(98) / (4) = 17.9679 (99)

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 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												1242.4796 (211)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	251.5107	188.9479	152.7595	86.8495	43.1869	0.0000	0.0000	0.0000	0.0000	87.3426	172.8553	259.0272	(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)	251.5107	188.9479	152.7595	86.8495	43.1869	0.0000	0.0000	0.0000	0.0000	87.3426	172.8553	259.0272	(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	165.6258	145.5335	151.7826	134.5936	130.8330	115.3749	109.3507	121.9969	122.4098	139.6377	149.5003	161.1451	(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	165.6258	145.5335	151.7826	134.5936	130.8330	115.3749	109.3507	121.9969	122.4098	139.6377	149.5003	161.1451	(219)
Water heating fuel used												1647.7840 (219)	
Annual totals kWh/year												1242.4796 (211)	
Space heating fuel - main system												0.0000 (215)	
Space heating fuel - secondary													

Electricity for pumps and fans: (BalancedWithHeatRecovery, Database: in-use factor = 1.2500, SFP = 0.6250)												113.3628 (230a)
mechanical ventilation fans (SFP = 0.6250)												113.3628 (231)
Total electricity for the above, kWh/year												350.4140 (232)
Electricity for lighting (calculated in Appendix L)												3354.0404 (238)
Total delivered energy for all uses												

-----  
 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	1242.4796	0.5190	644.8469 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1647.7840	0.5190	855.1999 (264)
Space and water heating			1500.0468 (265)
Pumps and fans	113.3628	0.5190	58.8353 (267)
Energy for lighting	350.4140	0.5190	181.8649 (268)
Total CO2, kg/year			1740.7470 (272)
Dwelling Carbon Dioxide Emission Rate (DER)			25.1700 (273)

16 CO2 EMISSIONS ASSOCIATED WITH APPLIANCES AND COOKING AND SITE-WIDE ELECTRICITY GENERATION TECHNOLOGIES

DER		25.1700	ZC1
Total Floor Area		69.1500	TFA
Assumed number of occupants		2.2253	N
CO2 emission factor in Table 12 for electricity displaced from grid		0.5190	EF
CO2 emissions from appliances, equation (L14)		16.7366	ZC2
CO2 emissions from cooking, equation (L16)		2.4932	ZC3
Total CO2 emissions		44.3999	ZC4
Residual CO2 emissions offset from biofuel CHP		0.0000	ZC5
Additional allowable electricity generation, kWh/m <sup>2</sup> /year		0.0000	ZC6
Resulting CO2 emissions offset from additional allowable electricity generation		0.0000	ZC7
Net CO2 emissions		44.3999	ZC8



# FULL SAP CALCULATION PRINTOUT

## Calculation Type: New Build (As Designed)



### CALCULATION OF TARGET EMISSIONS 09 Jan 2014

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

#### 1. Overall dwelling dimensions

	Area (m <sup>2</sup> )	Storey height (m)	Volume (m <sup>3</sup> )
Ground floor	69.1500 (1b)	2.1500 (2b)	148.6725 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	69.1500		148.6725 (4)
Dwelling volume			(3a)+(3b)+(3c)+(3d)+(3e)...(3n) = 148.6725 (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) =	0.1345 (8)
Pressure test				Yes	
Measured/design AP50				5.0000	
Infiltration rate				0.3845	(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) =	0.3557 (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	0.4535	0.4446	0.4357	0.3913	0.3824	0.3379	0.3379	0.3290	0.3557	0.3824	0.4001	0.4179 (22b)
Effective ac	0.6028	0.5988	0.5949	0.5765	0.5731	0.5571	0.5571	0.5541	0.5633	0.5731	0.5801	0.5873 (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
TER Opaque door			2.1400	1.0000	2.1400		(26)
TER Opening Type (Uw = 1.40)			4.8100	1.3258	6.3769		(27)
TER Room Window (Uw = 1.70)			2.1100	1.5918	3.3586		(27a)
Wl - Brick	0.8600		0.8600	0.1800	0.1548		(29a)
Wl - To Corridor	24.5700	2.1420	22.4280	0.1800	4.0370		(29a)
Wl - Dormer	13.4600	4.8140	8.6460	0.1800	1.5563		(29a)
Wl - Stud Ashlar	21.9300		21.9300	0.1800	3.9474		(29a)
Rf - Ins Joist	40.6300		40.6300	0.1300	5.2819		(30)
Rf - Ins Rafter	30.3700	2.1110	28.2590	0.1300	3.6737		(30)
Rf - Flat Roof Dormer	7.0500		7.0500	0.1300	0.9165		(30)
Total net area of external elements Aum(A, m <sup>2</sup> )			138.8630				(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) = 31.4431		(33)

Thermal mass parameter (TMP = Cm / TFA) in kJ/m<sup>2</sup>K 250.0000 (35)  
Thermal bridges (Sum(L x Psi) calculated using Appendix K) 9.7098 (36)  
Total fabric heat loss (33) + (36) = 41.1529 (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	29.5760	29.3801	29.1881	28.2861	28.1174	27.3318	27.3318	27.1864	27.6344	28.1174	28.4588	28.8157 (38)
Heat transfer coeff	70.7289	70.5330	70.3410	69.4390	69.2703	68.4847	68.4847	68.3392	68.7873	69.2703	69.6117	69.9686 (39)
Average = Sum(39)m / 12 =												69.4382 (39)
HLP	1.0228	1.0200	1.0172	1.0042	1.0017	0.9904	0.9904	0.9883	0.9948	1.0017	1.0067	1.0118 (40)
HLP (average)												1.0042 (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												2.2253 (42)
Average daily hot water use (litres/day)												87.0512 (43)
Daily hot water use	95.7563	92.2743	88.7922	85.3102	81.8281	78.3461	78.3461	81.8281	85.3102	88.7922	92.2743	95.7563 (44)
Energy conte	142.0038	124.1975	128.1606	111.7336	107.2110	92.5149	85.7287	98.3749	99.5498	116.0157	126.6403	137.5231 (45)
Energy content (annual)												Total = Sum(45)m = 1369.6540 (45)
Distribution loss (46)m = 0.15 x (45)m	21.3006	18.6296	19.2241	16.7600	16.0817	13.8772	12.8593	14.7562	14.9325	17.4024	18.9960	20.6285 (46)



# FULL SAP CALCULATION PRINTOUT

## Calculation Type: New Build (As Designed)



### CALCULATION OF TARGET EMISSIONS 09 Jan 2014

8c. Space cooling requirement

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 %)													93.5000 (206)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
Space heating requirement													2262.0978 (211)
Space heating requirement	438.5702	334.3551	267.2812	138.4808	50.5525	0.0000	0.0000	0.0000	0.0000	136.5130	298.7865	450.5221	(98)
Space heating efficiency (main heating system 1)	93.5000	93.5000	93.5000	93.5000	93.5000	0.0000	0.0000	0.0000	0.0000	93.5000	93.5000	93.5000	(210)
Space heating fuel (main heating system)	469.0590	357.5990	285.8623	148.1078	54.0668	0.0000	0.0000	0.0000	0.0000	146.0032	319.5578	481.8419	(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	188.5987	166.2832	174.7555	156.8254	153.8059	137.6068	132.3236	144.9698	144.6417	162.6106	171.7321	184.1180	(64)
Efficiency of water heater (217)m	86.9924	86.6414	85.9441	84.4841	82.2042	79.8000	79.8000	79.8000	79.8000	84.3515	86.2777	87.1114	(217)
Fuel for water heating, kWh/month	216.7992	191.9212	203.3362	185.6271	187.1021	172.4396	165.8190	181.6665	181.2552	192.7775	199.0459	211.3594	(219)
Water heating fuel used													2289.1488 (219)
Annual totals kWh/year													
Space heating fuel - main system													2262.0978 (211)
Space heating fuel - secondary													0.0000 (215)
Electricity for pumps and fans:													
central heating pump													30.0000 (230c)
main heating flue fan													45.0000 (230e)
Total electricity for the above, kWh/year													75.0000 (231)
Electricity for lighting (calculated in Appendix L)													350.4140 (232)
Total delivered energy for all uses													4976.6606 (238)

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	2262.0978	0.2160	488.6131 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	2289.1488	0.2160	494.4562 (264)
Space and water heating			983.0693 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	350.4140	0.5190	181.8649 (268)
Total CO2, kg/m2/year			1203.8591 (272)
Emissions per m2 for space and water heating			14.2165 (272a)
Fuel factor (electricity)			1.5500
Emissions per m2 for lighting			2.6300 (272b)
Emissions per m2 for pumps and fans			0.5629 (272c)
Target Carbon Dioxide Emission Rate (TER) = (14.2165 * 1.55) + 2.6300 + 0.5629, rounded to 2 d.p.			25.2300 (273)

# FULL SAP CALCULATION PRINTOUT

## Calculation Type: New Build (As Designed)



### CALCULATION OF FABRIC ENERGY EFFICIENCY 09 Jan 2014

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

#### 1. Overall dwelling dimensions

	Area (m2)	Storey height (m)	Volume (m3)
Ground floor	69.1500 (1b)	2.1500 (2b)	148.6725 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	69.1500		148.6725 (4)
Dwelling volume			(3a)+(3b)+(3c)+(3d)+(3e)...(3n) = 148.6725 (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				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) =	0.1345 (8)
Pressure test				Yes	
Measured/design AP50				2.6000	
Infiltration rate					0.2645 (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) =	0.2447 (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	0.3120	0.3059	0.2997	0.2692	0.2630	0.2325	0.2325	0.2263	0.2447	0.2630	0.2753	0.2875 (22b)
	0.5487	0.5468	0.5449	0.5362	0.5346	0.5270	0.5270	0.5256	0.5299	0.5346	0.5379	0.5413 (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)			4.8100	1.3258	6.3769		(27)
Solid Door			2.1400	1.0900	2.3326		(26)
Roof Window (Uw = 1.40)			2.1100	1.3258	2.7973		(27a)
Wl - Brick	0.8600		0.8600	0.2300	0.1978	5.8200	5.0052 (29a)
Wl - To Corridor	24.5700	2.1420	22.4280	0.1600	3.5885	13.4400	301.4323 (29a)
Wl - Dormer	13.4600	4.8140	8.6460	0.1800	1.5563	0.0000	0.0000 (29a)
Wl - Stud Ashlar	21.9300		21.9300	0.1200	2.6316	0.0000	0.0000 (29a)
Rf - Ins Joist	40.6300		40.6300	0.1100	4.4693	5.8200	236.4666 (30)
Rf - Ins Rafter	30.3700	2.1110	28.2590	0.2000	5.6518	1.8000	50.8662 (30)
Rf - Flat Roof Dormer	7.0500		7.0500	0.1600	1.1280	1.8000	12.6900 (30)
Total net area of external elements Aum(A, m2)			138.8630				(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) = 30.7301		(33)
Party Wall			11.6600	0.0000	0.0000	20.0000	233.2000 (32)
Party Floor			69.1500			40.0000	2766.0000 (32d)
1st Floor Stud			91.0439			5.8200	529.8755 (32c)
Heat capacity Cm = Sum(A x k)							(28)...(30) + (32) + (32a)...(32e) = 4135.5358 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							59.8053 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							9.1691 (36)
Total fabric heat loss							(33) + (36) = 39.8992 (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	26.9185	26.8258	26.7349	26.3081	26.2282	25.8564	25.8564	25.7876	25.9996	26.2282	26.3898	26.5587 (38)
Heat transfer coeff	66.8177	66.7250	66.6341	66.2073	66.1274	65.7557	65.7557	65.6868	65.8989	66.1274	66.2890	66.4579 (39)
Average = Sum(39)m / 12 =												66.2069 (39)
HLP	0.9663	0.9649	0.9636	0.9574	0.9563	0.9509	0.9509	0.9499	0.9530	0.9563	0.9586	0.9611 (40)
HLP (average)												0.9574 (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												2.2253 (42)
Average daily hot water use (litres/day)												87.0512 (43)
Daily hot water use	95.7563	92.2743	88.7922	85.3102	81.8281	78.3461	78.3461	81.8281	85.3102	88.7922	92.2743	95.7563 (44)

# FULL SAP CALCULATION PRINTOUT

## Calculation Type: New Build (As Designed)



### CALCULATION OF FABRIC ENERGY EFFICIENCY 09 Jan 2014

Energy content (annual)	142.0038	124.1975	128.1606	111.7336	107.2110	92.5149	85.7287	98.3749	99.5498	116.0157	126.6403	137.5231 (45)
Distribution loss (46)m = 0.15 x (45)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (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)
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)
Heat gains from water heating, kWh/month	30.1758	26.3920	27.2341	23.7434	22.7823	19.6594	18.2173	20.9047	21.1543	24.6533	26.9111	29.2237 (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	111.2656	111.2656	111.2656	111.2656	111.2656	111.2656	111.2656	111.2656	111.2656	111.2656	111.2656	111.2656 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	19.8419	17.6234	14.3323	10.8505	8.1109	6.8475	7.3990	9.6175	12.9086	16.3904	19.1300	20.3934 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	195.3051	197.3318	192.2247	181.3523	167.6278	154.7287	146.1113	144.0846	149.1918	160.0642	173.7887	186.6878 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	34.1266	34.1266	34.1266	34.1266	34.1266	34.1266	34.1266	34.1266	34.1266	34.1266	34.1266	34.1266 (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)	-89.0125	-89.0125	-89.0125	-89.0125	-89.0125	-89.0125	-89.0125	-89.0125	-89.0125	-89.0125	-89.0125	-89.0125 (71)
Water heating gains (Table 5)	40.5589	39.2737	36.6050	32.9769	30.6214	27.3048	24.4857	28.0977	29.3810	33.1362	37.3765	39.2791 (72)
Total internal gains	312.0856	310.6086	299.5417	281.5593	262.7397	245.2607	234.3757	238.1795	247.8611	265.9705	286.6749	302.7399 (73)

#### 6. Solar gains

[Jan]	Area m2	Solar flux Table 6a W/m2	Specific data or Table 6b	Specific data or Table 6c	FF	Access factor Table 6d	Gains W					
Southwest	4.8140	36.7938	0.5000	0.0000	0.7700	68.1933 (79)						
Southwest	2.1110	39.9751	0.6000	0.0000	1.0000	50.6325 (82)						
Solar gains	118.8258	209.2321	300.9337	391.7435	451.8934	453.2918	435.1609	390.3003	332.7677	235.5333	143.6538	100.7853 (83)
Total gains	430.9114	519.8407	600.4754	673.3029	714.6332	698.5525	669.5365	628.4798	580.6287	501.5038	430.3286	403.5252 (84)

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

Temperature during heating periods in the living area from Table 9, Th1 (C)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation factor for gains for living area, nil,m (see Table 9a)												
tau	17.1924	17.2163	17.2398	17.3510	17.3719	17.4701	17.4701	17.4884	17.4322	17.3719	17.3296	17.2855
alpha	2.1462	2.1478	2.1493	2.1567	2.1581	2.1647	2.1647	2.1659	2.1621	2.1581	2.1553	2.1524
util living area	0.9161	0.8791	0.8246	0.7403	0.6308	0.5023	0.3892	0.4241	0.5972	0.7830	0.8864	0.9256 (86)
MIT	18.3177	18.7024	19.2455	19.8692	20.3861	20.7379	20.8923	20.8664	20.5957	19.8969	18.9838	18.2289 (87)
Th 2	20.1115	20.1127	20.1138	20.1189	20.1199	20.1244	20.1244	20.1253	20.1227	20.1199	20.1180	20.1159 (88)
util rest of house	0.9081	0.8680	0.8085	0.7161	0.5950	0.4507	0.3225	0.3569	0.5478	0.7570	0.8741	0.9184 (89)
MIT 2	17.6372	18.0139	18.5432	19.1451	19.6280	19.9428	20.0652	20.0488	19.8274	19.1857	18.3002	17.5531 (90)
Living area fraction									fLA = Living area / (4) =			0.4437 (91)
MIT	17.9391	18.3194	18.8548	19.4663	19.9643	20.2956	20.4322	20.4115	20.1683	19.5012	18.6035	17.8530 (92)
Temperature adjustment												0.0000
adjusted MIT	17.9391	18.3194	18.8548	19.4663	19.9643	20.2956	20.4322	20.4115	20.1683	19.5012	18.6035	17.8530 (93)

#### 8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.8833	0.8408	0.7819	0.6962	0.5882	0.4612	0.3467	0.3797	0.5505	0.7361	0.8481	0.8947 (94)
Useful gains	380.6262	437.0781	469.5313	468.7467	420.3603	322.1726	232.1345	238.6297	319.6307	369.1816	364.9472	361.0537 (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	911.3358	895.4069	823.2502	699.5693	546.4986	374.5152	251.9864	263.5046	399.8938	588.6146	762.5536	907.3483 (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	394.8479	307.9970	263.1669	166.1923	93.8469	0.0000	0.0000	0.0000	0.0000	163.2581	286.2766	406.4432 (98)
Space heating												2082.0288 (98)
Space heating per m2												(98) / (4) = 30.1089 (99)

#### 8c. Space cooling requirement

Calculated for June, July and August. See Table 10b	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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
Heat loss rate W	0.0000	0.0000	0.0000	0.0000	0.0000	618.1032	486.5919	499.2198	0.0000	0.0000	0.0000	0.0000 (100)

# FULL SAP CALCULATION PRINTOUT

## Calculation Type: New Build (As Designed)



### CALCULATION OF FABRIC ENERGY EFFICIENCY 09 Jan 2014

Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.7880	0.8394	0.8207	0.0000	0.0000	0.0000	0.0000 (101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	487.0673	408.4626	409.7079	0.0000	0.0000	0.0000	0.0000 (102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	860.7075	826.9474	785.2417	0.0000	0.0000	0.0000	0.0000 (103)
Month fracti	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.0000	0.0000 (103a)
Space cooling kWh												
Space cooling	0.0000	0.0000	0.0000	0.0000	0.0000	269.0210	311.3527	279.3971	0.0000	0.0000	0.0000	0.0000 (104)
Space cooling												859.7708 (104)
Cooled fraction												FC = cooled area / (4) =
Intermittency factor (Table 10b)												1.0000 (105)
Intermittency factor (Table 10b)	0.0000	0.0000	0.0000	0.0000	0.0000	0.2500	0.2500	0.2500	0.0000	0.0000	0.0000	0.0000 (106)
Space cooling kWh												
Space cooling	0.0000	0.0000	0.0000	0.0000	0.0000	67.2552	77.8382	69.8493	0.0000	0.0000	0.0000	0.0000 (107)
Space cooling												214.9427 (107)
Space cooling per m2												3.1084 (108)
Energy for space heating												30.1089 (99)
Energy for space cooling												3.1084 (108)
Total												33.2172 (109)
Dwelling Fabric Energy Efficiency (DFEE)												33.2 (109)

# FULL SAP CALCULATION PRINTOUT

## Calculation Type: New Build (As Designed)



### CALCULATION OF TARGET FABRIC ENERGY EFFICIENCY 09 Jan 2014

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

#### 1. Overall dwelling dimensions

	Area (m <sup>2</sup> )	Storey height (m)	Volume (m <sup>3</sup> )
Ground floor	69.1500 (1b)	2.1500 (2b)	148.6725 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	69.1500		148.6725 (4)
Dwelling volume			(3a)+(3b)+(3c)+(3d)+(3e)...(3n) = 148.6725 (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) =	0.1345 (8)
Pressure test				Yes	
Measured/design AP50					5.0000
Infiltration rate					0.3845 (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) =	0.3557 (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	0.4535	0.4446	0.4357	0.3913	0.3824	0.3379	0.3379	0.3290	0.3557	0.3824	0.4001	0.4179 (22b)
Effective ac	0.6028	0.5988	0.5949	0.5765	0.5731	0.5571	0.5571	0.5541	0.5633	0.5731	0.5801	0.5873 (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
TER Opaque door			2.1400	1.0000	2.1400		(26)
TER Opening Type (Uw = 1.40)			4.8100	1.3258	6.3769		(27)
TER Room Window (Uw = 1.70)			2.1100	1.5918	3.3586		(27a)
Wl - Brick	0.8600		0.8600	0.1800	0.1548		(29a)
Wl - To Corridor	24.5700	2.1420	22.4280	0.1800	4.0370		(29a)
Wl - Dormer	13.4600	4.8140	8.6460	0.1800	1.5563		(29a)
Wl - Stud Ashlar	21.9300		21.9300	0.1800	3.9474		(29a)
Rf - Ins Joist	40.6300		40.6300	0.1300	5.2819		(30)
Rf - Ins Rafter	30.3700	2.1110	28.2590	0.1300	3.6737		(30)
Rf - Flat Roof Dormer	7.0500		7.0500	0.1300	0.9165		(30)
Total net area of external elements Aum(A, m <sup>2</sup> )			138.8630				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	31.4431		(33)

Thermal mass parameter (TMP = Cm / TFA) in kJ/m <sup>2</sup> K							250.0000 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							9.7098 (36)
Total fabric heat loss						(33) + (36) =	41.1529 (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	29.5760	29.3801	29.1881	28.2861	28.1174	27.3318	27.3318	27.1864	27.6344	28.1174	28.4588	28.8157 (38)
Heat transfer coeff	70.7289	70.5330	70.3410	69.4390	69.2703	68.4847	68.4847	68.3392	68.7873	69.2703	69.6117	69.9686 (39)
Average = Sum(39)m / 12 =												69.4382 (39)
HLP	1.0228	1.0200	1.0172	1.0042	1.0017	0.9904	0.9904	0.9883	0.9948	1.0017	1.0067	1.0118 (40)
HLP (average)												1.0042 (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												2.2253 (42)
Average daily hot water use (litres/day)												87.0512 (43)
Daily hot water use	95.7563	92.2743	88.7922	85.3102	81.8281	78.3461	78.3461	81.8281	85.3102	88.7922	92.2743	95.7563 (44)
Energy conte	142.0038	124.1975	128.1606	111.7336	107.2110	92.5149	85.7287	98.3749	99.5498	116.0157	126.6403	137.5231 (45)
Energy content (annual)												Total = Sum(45)m = 1369.6540 (45)
Distribution loss (46)m = 0.15 x (45)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (46)

# FULL SAP CALCULATION PRINTOUT

## Calculation Type: New Build (As Designed)



### CALCULATION OF TARGET FABRIC ENERGY EFFICIENCY 09 Jan 2014

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)
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)
Heat gains from water heating, kWh/month	30.1758	26.3920	27.2341	23.7434	22.7823	19.6594	18.2173	20.9047	21.1543	24.6533	26.9111	29.2237	(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	111.2656	111.2656	111.2656	111.2656	111.2656	111.2656	111.2656	111.2656	111.2656	111.2656	111.2656	111.2656	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	19.8419	17.6234	14.3323	10.8505	8.1109	6.8475	7.3990	9.6175	12.9086	16.3904	19.1300	20.3934	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	195.3051	197.3318	192.2247	181.3523	167.6278	154.7287	146.1113	144.0846	149.1918	160.0642	173.7887	186.6878	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	34.1266	34.1266	34.1266	34.1266	34.1266	34.1266	34.1266	34.1266	34.1266	34.1266	34.1266	34.1266	(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)	-89.0125	-89.0125	-89.0125	-89.0125	-89.0125	-89.0125	-89.0125	-89.0125	-89.0125	-89.0125	-89.0125	-89.0125	(71)
Water heating gains (Table 5)	40.5589	39.2737	36.6050	32.9769	30.6214	27.3048	24.4857	28.0977	29.3810	33.1362	37.3765	39.2791	(72)
Total internal gains	312.0856	310.6086	299.5417	281.5593	262.7397	245.2607	234.3757	238.1795	247.8611	265.9705	286.6749	302.7399	(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						
Southwest		4.8140	36.7938		0.6300	0.7000	0.7700					54.1319	(79)
Southwest		2.1110	39.9751		0.6300	0.7000	1.0000					33.4934	(82)
Solar gains	87.6253	153.7748	220.0945	285.1916	328.1094	328.8234	315.7899	283.7805	242.8934	172.7899	105.8332	74.3904	(83)
Total gains	399.7109	464.3834	519.6362	566.7510	590.8491	574.0840	550.1655	521.9601	490.7545	438.7604	392.5081	377.1303	(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	67.8942	68.0828	68.2686	69.1554	69.3239	70.1190	70.1190	70.2683	69.8106	69.3239	68.9839	68.6320		
alpha	5.5263	5.5389	5.5512	5.6104	5.6216	5.6746	5.6746	5.6846	5.6540	5.6216	5.5989	5.5755		
util living area	0.9983	0.9958	0.9882	0.9614	0.8831	0.7167	0.5394	0.5884	0.8352	0.9750	0.9962	0.9988		(86)
MIT	19.9126	20.0636	20.2952	20.5879	20.8291	20.9624	20.9936	20.9899	20.9095	20.5915	20.1959	19.8871		(87)
Th 2	20.0643	20.0667	20.0690	20.0799	20.0819	20.0914	20.0914	20.0931	20.0877	20.0819	20.0778	20.0735		(88)
util rest of house	0.9978	0.9944	0.9841	0.9472	0.8415	0.6333	0.4324	0.4795	0.7665	0.9631	0.9947	0.9984		(89)
MIT 2	19.0686	19.2210	19.4523	19.7457	19.9654	20.0739	20.0897	20.0902	20.0378	19.7549	19.3624	19.0507		(90)
Living area fraction														(91)
MIT	19.4431	19.5948	19.8263	20.1194	20.3486	20.4681	20.4907	20.4893	20.4245	20.1261	19.7322	19.4218		(92)
Temperature adjustment														(93)
adjusted MIT	19.4431	19.5948	19.8263	20.1194	20.3486	20.4681	20.4907	20.4893	20.4245	20.1261	19.7322	19.4218		(93)

#### 8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
	0.9973	0.9935	0.9828	0.9479	0.8548	0.6694	0.4802	0.5282	0.7942	0.9638	0.9939	0.9980	(94)	
Useful gains	398.6295	461.3650	510.6914	537.2329	505.0561	384.3194	264.1929	275.6791	389.7356	422.8681	390.1212	376.3834	(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	1071.0519	1036.4698	937.3832	779.0635	599.0925	401.8754	266.4560	279.4619	435.0477	659.8756	879.3482	1065.0470	(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	500.2823	386.4705	317.4587	174.1180	69.9631	0.0000	0.0000	0.0000	0.0000	176.3336	352.2434	512.3657	(98)	
Space heating													(98) / (4) =	
Space heating per m2													35.9976	(99)

#### 8c. Space cooling requirement

Calculated for June, July and August. See Table 10b	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
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	
Heat loss rate W	0.0000	0.0000	0.0000	0.0000	0.0000	643.7564	506.7870	519.3783	0.0000	0.0000	0.0000	0.0000	(100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.8974	0.9501	0.9361	0.0000	0.0000	0.0000	0.0000	(101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	577.7326	481.5130	486.1708	0.0000	0.0000	0.0000	0.0000	(102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	728.6158	700.2268	671.9865	0.0000	0.0000	0.0000	0.0000	(103)
Month fracti	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.0000	0.0000	(103a)



# FULL SAP CALCULATION PRINTOUT

## Calculation Type: New Build (As Designed)



### CALCULATION OF TARGET FABRIC ENERGY EFFICIENCY 09 Jan 2014

Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	108.6359	162.7230	138.2469	0.0000	0.0000	0.0000	0.0000	(104)
Space cooling													409.6058 (104)
Cooled fraction									fC = cooled area / (4) =				1.0000 (105)
Intermittency factor (Table 10b)	0.0000	0.0000	0.0000	0.0000	0.0000	0.2500	0.2500	0.2500	0.0000	0.0000	0.0000	0.0000	(106)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	27.1590	40.6808	34.5617	0.0000	0.0000	0.0000	0.0000	(107)
Space cooling													102.4015 (107)
Space cooling per m2													1.4809 (108)
Energy for space heating													35.9976 (99)
Energy for space cooling													1.4809 (108)
Total													37.4785 (109)
Target Fabric Energy Efficiency (TFEE)													43.1 (109)

# BASIC COMPLIANCE REPORT

## Calculation Type: New Build (As Designed)



<b>Property Reference</b>	Plot 028 - Block G	<b>Issued on Date</b>	19/02/2021
<b>Assessment Reference</b>	011 E	<b>Prop Type Ref</b>	BEC-Dand - KW3
<b>Property</b>	Flat 11, Block G, Knightswood, TUNBRIDGE WELLS, TN2		

<b>SAP Rating</b>	79 C	<b>DER</b>	25.17	<b>TER</b>	25.23
<b>Environmental</b>	81 B	<b>% DER&lt;TER</b>	0.23		
<b>CO<sub>2</sub> Emissions (t/year)</b>	1.57	<b>DFEE</b>	33.22	<b>TFEE</b>	43.10
<b>General Requirements Compliance</b>	Pass	<b>% DFEE&lt;TFEE</b>	22.93		

<b>Assessor Details</b>	Mr. Gary Nicholls, Gary Nicholls, Tel: 02033971373, gary@briaryenergy.co.uk	<b>Assessor ID</b>	W947-0001
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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	Electricity		
Fuel factor	1.55 (electricity)		
Target Carbon Dioxide Emission Rate (TER)	25.23	kgCO <sub>2</sub> /m <sup>2</sup>	
Dwelling Carbon Dioxide Emission Rate (DER)	25.17	kgCO <sub>2</sub> /m <sup>2</sup>	Pass
	-0.06 (-0.2%)	kgCO <sub>2</sub> /m <sup>2</sup>	

##### 1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	43.10	kWh/m <sup>2</sup> /yr	
Dwelling Fabric Energy Efficiency (DFEE)	33.22	kWh/m <sup>2</sup> /yr	
	-9.9 (-23.0%)	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	0.15 (max. 0.30)	0.23 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Roof	0.15 (max. 0.20)	0.20 (max. 0.35)	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	2.60 (design value)	
Maximum	10.0	Pass

##### Limiting System Efficiencies

##### 4 Heating efficiency

Main heating system	Room heaters with radiators or underfloor - Electric Panel, convector or radiant heaters	
Secondary heating system	None	

##### 5 Cylinder insulation

# BASIC COMPLIANCE REPORT

## Calculation Type: New Build (As Designed)



Hot water storage	Measured cylinder loss: 1.27 kWh/day Permitted by DBSCG 1.89	Pass
Primary pipework insulated	No primary pipework	

### 6 Controls

Space heating controls	Programmer and appliance thermostats	Pass
Hot water controls	Cylinderstat	Pass

### 7 Low energy lights

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

### 8 Mechanical ventilation

Continuous supply and extract system			
Specific fan power	0.50		
Maximum	1.5		Pass
MVHR efficiency	91	%	
Minimum	70	%	Pass

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

### 9 Summertime temperature

Overheating risk (South East England)	Medium	Pass
Based on:		
Overshading	Average	
Windows facing South West	4.81 m <sup>2</sup> , No overhang	
Air change rate	4.21 ach	
Blinds/curtains	Dark-coloured curtain or roller blind, closed 100% of daylight hours	

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

### Party Walls

Type	U-value	W/m <sup>2</sup> K	
Filled Cavity with Edge Sealing	0.00		Pass

### Air permeability and pressure testing

#### 3 Air permeability

Air permeability at 50 pascals	2.60 (design value)	
Maximum	10.0	Pass

### 10 Key features

External wall U-value	0.12	W/m <sup>2</sup> K
Party wall U-value	0.00	W/m <sup>2</sup> K
Roof U-value	0.11	W/m <sup>2</sup> K
Door U-value	1.09	W/m <sup>2</sup> K
Door U-value	1.09	W/m <sup>2</sup> K
Air permeability	2.6	m <sup>3</sup> /m <sup>2</sup> h

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

# BLOCK COMPLIANCE

## Calculation Type: New Build (As Designed)



Block Reference	000001	Issued on Date	19/02/2021
Block Name	block G		
Assessor Details	Mr. Gary Nicholls, Gary Nicholls, Tel: 02033971373, gary@briaryenergy.co.uk	Assessor ID	W947-0001
Client			

### Block Compliance Report - DER

Block Reference: 000001		Block Name: block G			
Property-Assessment Reference	Multiplier	Floor Area (m <sup>2</sup> )	DER (kgCO <sub>2</sub> /m <sup>2</sup> )	TER (kgCO <sub>2</sub> /m <sup>2</sup> )	% DER/TER
Plot 018 - Block G-001 S	1	69.95	25.81	26.41	2.27 %
Plot 019 - Block G-002 S	1	49.86	30.96	31.41	1.44 %
Plot 020 - Block G-003 E	1	69.95	23.56	23.25	-1.31 %
Plot 021 - Block G-004 M	1	49.86	26.43	26.72	1.08 %
Plot 022 - Block G-005 M	1	49.59	33.69	32.96	-2.21 %
Plot 023 - Block G-006 E	1	69.92	30.27	29.90	-1.24 %
Plot 024 - Block G-007 E	1	69.95	23.38	23.58	0.85 %
Plot 025 - Block G-008 M	1	49.86	26.79	26.37	-1.59 %
Plot 026 - Block G-009 M	1	49.59	28.18	27.99	-0.68 %
Plot 027 - Block G-010 E	1	69.92	25.02	25.16	0.57 %
Plot 028 - Block G-011 E	1	69.15	25.17	25.23	0.23 %
Plot 029 - Block G-012 M	1	76.64	26.26	26.58	1.21 %
Plot 030 - Block G-014 E	1	67.39	26.75	27.32	2.07 %
Totals:	13	811.63	352.27	352.89	
Average DER = 26.83 kgCO <sub>2</sub> /m <sup>2</sup>		% DER/TER	<b>PASS</b>		
Average TER = 26.90 kgCO <sub>2</sub> /m <sup>2</sup>		0.26 %			

# BLOCK COMPLIANCE

## Calculation Type: New Build (As Designed)



### Block Compliance Report - DFEE

Block Reference: 000001		Block Name: block G			
Property-Assessment Reference	Multiplier	Floor Area (m <sup>2</sup> )	DFEE (kWh/m <sup>2</sup> /yr)	TFEE (kWh/m <sup>2</sup> /yr)	% DFEE/TFEE
Plot 018 - Block G-001 S	1	69.95	37.89	48.57	21.99 %
Plot 019 - Block G-002 S	1	49.86	44.48	57.05	22.04 %
Plot 020 - Block G-003 E	1	69.95	32.53	38.06	14.54 %
Plot 021 - Block G-004 M	1	49.86	35.09	41.36	15.15 %
Plot 022 - Block G-005 M	1	49.59	49.52	62.09	20.26 %
Plot 023 - Block G-006 E	1	69.92	45.70	59.87	23.67 %
Plot 024 - Block G-007 E	1	69.95	32.02	39.14	18.20 %
Plot 025 - Block G-008 M	1	49.86	35.12	40.20	12.63 %
Plot 026 - Block G-009 M	1	49.59	38.58	45.56	15.33 %
Plot 027 - Block G-010 E	1	69.92	35.29	44.09	19.95 %
Plot 028 - Block G-011 E	1	69.15	33.22	43.10	22.93 %
Plot 029 - Block G-012 M	1	76.64	38.35	51.00	24.79 %
Plot 030 - Block G-014 E	1	67.39	36.97	49.52	25.34 %
Totals:	13	811.63	494.75	619.60	
Average DFEE = 37.75 kWh/m <sup>2</sup> /yr		% DFEE/TFEE		<b>PASS</b>	
Average TFEE = 47.49 kWh/m <sup>2</sup> /yr		20.51 %			