

PREDICTED ENERGY ASSESSMENT

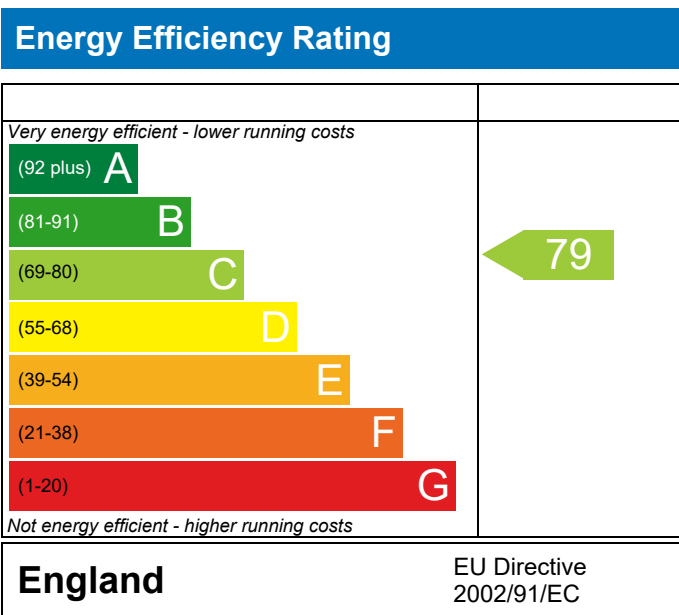


Flat 2, Block G, Knightswood,
TUNBRIDGE WELLS,
TN2

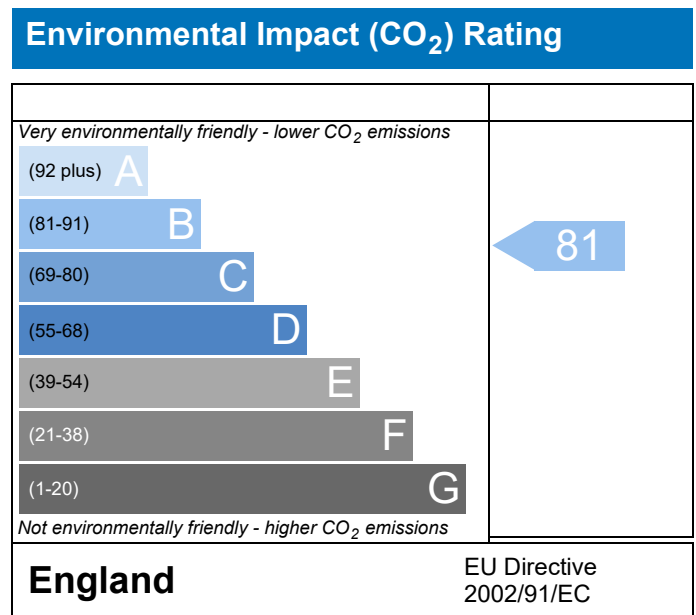
Dwelling type: Flat, Semi-Detached
Date of assessment: 19/02/2021
Produced by: Gary Nicholls
Total floor area: 49.86 m²

This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

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



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



The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO₂) emissions. The higher the rating the less impact it has on the environment.

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

BUILDING REGULATION COMPLIANCE

Calculation Type: New Build (As Designed)



Property Reference	Plot 019 - Block G		Issued on Date	19/02/2021	
Assessment Reference	002 S	Prop Type Ref	BEC-Dand - KW3		
Property	Flat 2, Block G, Knightswood, TUNBRIDGE WELLS, TN2				
SAP Rating	79 C	DER	30.96	TER	31.41
Environmental	81 B	% DER<TER	1.44		
CO ₂ Emissions (t/year)	1.32	DFEE	44.48	TFEE	57.05
General Requirements Compliance	Pass	% DFEE<TFEE	22.04		
Assessor Details	Mr. Gary Nicholls, Gary Nicholls, Tel: 02033971373, gary@briaryenergy.co.uk			Assessor ID	W947-0001
Client					

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

Criterion 1 – Achieving the TER and TFEE rate

1a TER and DER

Fuel for main heating	Electricity		
Fuel factor	1.55 (electricity)		
Target Carbon Dioxide Emission Rate (TER)	31.41	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	30.96	kgCO ₂ /m ²	Pass
	-0.45 (-1.4%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	57.05	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	44.48	kWh/m ² /yr	
	-12.5 (-21.9%)	kWh/m ² /yr	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.18 (max. 0.30)	0.18 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Floor	0.14 (max. 0.25)	0.14 (max. 0.70)	Pass
Openings	1.35 (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 ³ /(h.m ²) @ 50 Pa	
Maximum	10.0	m ³ /(h.m ²) @ 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 room thermostat

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)

Slight

Pass

Based on:

Overshading

Average

Windows facing South West

5.58 m², No overhang

Windows facing North West

5.12 m², 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/m²K

Pass

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals

2.60 (design value) m³/(h.m²) @ 50 Pa

Maximum

10.0 m³/(h.m²) @ 50 Pa

Pass

10 Key features

Party wall U-value

0.00

W/m²K

Door U-value

1.09

W/m²K

Door U-value

1.09

W/m²K

Air permeability

2.6

m³/m²h

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FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)



Property Reference	Plot 019 - Block G		Issued on Date	19/02/2021	
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SAP Rating	79 C	DER	30.96	TER	31.41
Environmental	81 B	% DER<TER	1.44		
CO₂ Emissions (t/year)	1.32	DFEE	44.48	TFEE	57.05
General Requirements Compliance	Pass	% DFEE<TFEE	22.04		
Assessor Details	Mr. Gary Nicholls, Gary Nicholls, Tel: 02033971373, gary@briaryenergy.co.uk			Assessor ID	W947-0001
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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

Ground-floor flat, total floor area 50 m²

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) 31.41 kgCO₂/m²
Dwelling Carbon Dioxide Emission Rate (DER) 30.96 kgCO₂/m²OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)57.0 kWh/m²/yr
Dwelling Fabric Energy Efficiency (DFEE)44.5 kWh/m²/yrOK

2 Fabric U-values

Element	Average	Highest	
External wall	0.18 (max. 0.30)	0.18 (max. 0.70)	OK
Party wall	0.00 (max. 0.20)	-	OK
Floor	0.14 (max. 0.25)	0.14 (max. 0.70)	OK
Roof (no roof)			
Openings	1.35 (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 room thermostat 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): Slight OK

Based on:

Overshading: Average
Windows facing South West: 5.58 m², No overhang
Windows facing North West: 5.12 m², No overhang
Air change rate: 4.21 ach
Blinds/curtains: Dark-coloured curtain or roller blind, closed 100% of daylight hours

10 Key features

Party wall U-value 0.00 W/m²K
Door U-value 1.09 W/m²K
Door U-value 1.09 W/m²K
Air permeability 2.6 m³/m²h

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 ²)	Storey height (m)	Volume (m ³)
Ground floor	49.8600 (1b)	2.3800 (2b)	118.6668 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	49.8600		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	118.6668 (5)

2. Ventilation rate

	main heating	secondary heating	other	total	m ³ per hour							
Number of chimneys	0	0	0	0 * 40 =	0.0000 (6a)							
Number of open flues	0	0	0	0 * 20 =	0.0000 (6b)							
Number of intermittent fans				0 * 10 =	0.0000 (7a)							
Number of passive vents				0 * 10 =	0.0000 (7b)							
Number of flueless gas fires				0 * 40 =	0.0000 (7c)							
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)						
Wind speed	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind factor	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)
Adj infilt rate	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)
Balanced mechanical ventilation with heat recovery	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)
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 ²	Openings m ²	NetArea m ²	U-value W/m ² K	A x U W/K	K-value kJ/m ² K	A x K kJ/K					
Windows (Uw = 1.40)			10.7000	1.3258	14.1856		(27)					
Solid Door			2.1400	1.0900	2.3326		(26)					
Flr - Ground			49.8600	0.1400	6.9804	70.5600	3518.1216 (28a)					
Wl - Brick	38.5800	10.6960	27.8840	0.1800	5.0191	39.3600	1097.5142 (29a)					
Wl - To Corridor	23.4540	2.1420	21.3120	0.1800	3.8362	4.4800	95.4778 (29a)					
Total net area of external elements Aum(A, m ²)			111.8960				(31)					
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	32.3539		(33)					
Party Wall			11.0690	0.0000	0.0000	54.0300	598.0581 (32)					
Party Ceiling			49.8620			70.0000	3490.3400 (32b)					
Ground Floor Block			38.4123			54.0300	2075.4176 (32c)					
Ground Floor Stud			48.5146			5.8200	282.3548 (32c)					
Heat capacity Cm = Sum(A x k)						(28)...(30) + (32) + (32a)...(32e) =	11157.2841 (34)					
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							223.7722 (35)					
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							7.3347 (36)					
Total fabric heat loss						(33) + (36) =	39.6886 (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	10.4388	10.3211	10.2034	9.6148	9.4970	8.9084	8.9084	8.7907	9.1439	9.4970	9.7325	9.9679 (38)
Average = Sum(39)m / 12 =	50.1275	50.0097	49.8920	49.3034	49.1857	48.5970	48.5970	48.4793	48.8325	49.1857	49.4211	49.6566 (39)
HLP	1.0054	1.0030	1.0006	0.9888	0.9865	0.9747	0.9747	0.9723	0.9794	0.9865	0.9912	0.9959 (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												
Average daily hot water use (litres/day)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use	81.6662	78.6965	75.7269	72.7572	69.7875	66.8178	66.8178	69.7875	72.7572	75.7269	78.6965	81.6662 (44)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)



CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE 09 Jan 2014

Energy content (annual)	121.1086	105.9224	109.3024	95.2925	91.4354	78.9018	73.1141	83.8995	84.9016	98.9446	108.0058	117.2873 (45)
Distribution loss (46)m = 0.15 x (45)m												1168.1161 (45)
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												
If cylinder contains dedicated solar storage												
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												
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												
Heat gains from water heating, kWh/month												
Total per year (kWh/year) = Sum(64)m =												1446.2461 (64)
	59.1662	52.2880	55.2407	49.9728	49.2999	44.5229	43.2080	46.7942	46.5178	51.7967	54.1999	57.8956 (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	84.2990	84.2990	84.2990	84.2990	84.2990	84.2990	84.2990	84.2990	84.2990	84.2990	84.2990	84.2990 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	13.1122	11.6462	9.4713	7.1704	5.3599	4.5251	4.8895	6.3556	8.5305	10.8314	12.6418	13.4767 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	146.8703	148.3944	144.5538	136.3777	126.0568	116.3567	109.8764	108.3523	112.1929	120.3690	130.6899	140.3900 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	31.4299	31.4299	31.4299	31.4299	31.4299	31.4299	31.4299	31.4299	31.4299	31.4299	31.4299	31.4299 (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)	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392 (71)
Water heating gains (Table 5)	79.5245	77.8095	74.2482	69.4066	66.2633	61.8373	58.0753	62.8954	64.6080	69.6192	75.2777	77.8167 (72)
Total internal gains	287.7968	286.1398	276.5630	261.2444	245.9698	231.0087	221.1309	225.8930	233.6210	249.1092	266.8990	279.9731 (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	5.5750	36.7938	0.5000	0.0000	0.7700	78.9734 (79)						
Northwest	5.1210	11.2829	0.5000	0.0000	0.7700	22.2453 (81)						
Solar gains	101.2186	179.8018	265.6391	362.0367	435.5380	445.5962	424.1058	367.2513	298.7038	204.0111	122.5822	85.7514 (83)
Total gains	389.0154	465.9415	542.2021	623.2810	681.5078	676.6050	645.2368	593.1443	532.3248	453.1203	389.4812	365.7244 (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	61.8273	61.9728	62.1191	62.8607	63.0111	63.7744	63.7744	63.9292	63.4669	63.0111	62.7110	62.4136
alpha	5.1218	5.1315	5.1413	5.1907	5.2007	5.2516	5.2516	5.2619	5.2311	5.2007	5.1807	5.1609
util living area	0.9893	0.9736	0.9315	0.8196	0.6409	0.4555	0.3307	0.3746	0.6104	0.8850	0.9764	0.9920 (86)
MIT	20.0436	20.2563	20.5377	20.8180	20.9561	20.9939	20.9991	20.9983	20.9745	20.7654	20.3496	20.0011 (87)
Th 2	20.0789	20.0808	20.0828	20.0926	20.0946	20.1045	20.1045	20.1065	20.1005	20.0946	20.0907	20.0867 (88)
util rest of house	0.9864	0.9668	0.9148	0.7835	0.5874	0.3935	0.2638	0.3025	0.5393	0.8511	0.9691	0.9898 (89)
MIT 2	18.8176	19.1242	19.5197	19.8953	20.0555	20.1006	20.1041	20.1057	20.0820	19.8417	19.2688	18.7619 (90)
Living area fraction												
MIT	19.4158	19.6766	20.0164	20.3455	20.4950	20.5365	20.5408	20.5413	20.5175	20.2924	19.7962	19.3666 (92)
Temperature adjustment												0.0000
adjusted MIT	19.4158	19.6766	20.0164	20.3455	20.4950	20.5365	20.5408	20.5413	20.5175	20.2924	19.7962	19.3666 (93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Useful gains	0.9837	0.9632	0.9135	0.7941	0.6116	0.4236	0.2965	0.3377	0.5730	0.8592	0.9662	0.9875 (94)
Ext temp.	382.6832	448.7800	495.2946	494.9493	416.7830	286.6062	191.2845	200.3211	305.0115	389.3430	376.3011	361.1482 (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	757.7187	738.9754	674.3622	564.3042	432.5878	288.4975	191.5131	200.7659	313.3837	476.7282	627.4607	753.1226 (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	279.0264	195.0113	133.2262	49.9355	11.7588	0.0000	0.0000	0.0000	0.0000	65.0146	180.8350	291.6290 (98)
Space heating per m2												1206.4368 (98)
												(98) / (4) = 24.1965 (99)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)



CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE 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																		1206.4368 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec						
Space heating requirement	279.0264	195.0113	133.2262	49.9355	11.7588	0.0000	0.0000	0.0000	0.0000	65.0146	180.8350	291.6290	(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)	279.0264	195.0113	133.2262	49.9355	11.7588	0.0000	0.0000	0.0000	0.0000	65.0146	180.8350	291.6290	(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	144.7306	127.2584	132.9244	118.1525	115.0574	101.7618	96.7361	107.5215	107.7616	122.5666	130.8658	140.9093	(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	144.7306	127.2584	132.9244	118.1525	115.0574	101.7618	96.7361	107.5215	107.7616	122.5666	130.8658	140.9093	(219)					
Water heating fuel used													(219)					
Annual totals kWh/year													(219)					
Space heating fuel - main system													1206.4368	(211)				
Space heating fuel - secondary													0.0000	(215)				
Electricity for pumps and fans: (BalancedWithHeatRecovery, Database: in-use factor = 1.2500, SFP = 0.6250)													90.4834	(230a)				
mechanical ventilation fans (SFP = 0.6250)													90.4834	(231)				
Total electricity for the above, kWh/year													231.5660	(232)				
Electricity for lighting (calculated in Appendix L)													2974.7323	(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	1206.4368	0.5190	626.1407 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1446.2461	0.5190	750.6017 (264)
Space and water heating			1376.7424 (265)
Pumps and fans	90.4834	0.5190	46.9609 (267)
Energy for lighting	231.5660	0.5190	120.1828 (268)
Total CO2, kg/year			1543.8861 (272)
Dwelling Carbon Dioxide Emission Rate (DER)			30.9600 (273)

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

DER			30.9600	ZC1
Total Floor Area		TFA	49.8600	
Assumed number of occupants		N	1.6860	
CO2 emission factor in Table 12 for electricity displaced from grid		EF	0.5190	
CO2 emissions from appliances, equation (L14)			17.4553	ZC2
CO2 emissions from cooking, equation (L16)			3.1982	ZC3
Total CO2 emissions			51.6136	ZC4
Residual CO2 emissions offset from biofuel CHP			0.0000	ZC5
Additional allowable electricity generation, kWh/m ² /year			0.0000	ZC6
Resulting CO2 emissions offset from additional allowable electricity generation			0.0000	ZC7
Net CO2 emissions			51.6136	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 ²)	Storey height (m)	Volume (m ³)
Ground floor	49.8600 (1b)	2.3800 (2b)	118.6668 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	49.8600		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	118.6668 (5)

2. Ventilation rate

	main heating	secondary heating	other	total	m ³ per hour
Number of chimneys	0	0	0	0 * 40 =	0.0000 (6a)
Number of open flues	0	0	0	0 * 20 =	0.0000 (6b)
Number of intermittent fans				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) =	0.1685 (8)
Pressure test				Yes	
Measured/design AP50				5.0000	
Infiltration rate				0.4185	(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) =		0.3871 (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	0.4936	0.4839	0.4743	0.4259	0.4162	0.3678	0.3678	0.3581	0.3871	0.4162	0.4355	0.4549 (22b)
	0.6218	0.6171	0.6125	0.5907	0.5866	0.5676	0.5676	0.5641	0.5749	0.5866	0.5948	0.6035 (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					
TER Opaque door			2.1400	1.0000	2.1400		(26)					
TER Opening Type (Uw = 1.40)			10.3200	1.3258	13.6818		(27)					
F1r - Ground			49.8600	0.1300	6.4818		(28a)					
W1 - Brick	38.5800	10.3200	28.2600	0.1800	5.0868		(29a)					
W1 - To Corridor	23.4540	2.1420	21.3120	0.1800	3.8362		(29a)					
Total net area of external elements Aum(A, m ²)			111.8920				(31)					
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) =	31.2266	(33)					
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							250.0000 (35)					
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							8.6111 (36)					
Total fabric heat loss							(33) + (36) = 39.8377 (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	24.3508	24.1655	23.9840	23.1311	22.9715	22.2286	22.2286	22.0911	22.5148	22.9715	23.2943	23.6318 (38)
Average = Sum(39)m / 12 =	64.1885	64.0032	63.8216	62.9687	62.8092	62.0663	62.0663	61.9287	62.3524	62.8092	63.1320	63.4695 (39)
												62.9680 (39)
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	1.2874	1.2837	1.2800	1.2629	1.2597	1.2448	1.2448	1.2421	1.2506	1.2597	1.2662	1.2730 (40)
Days in month												1.2629 (40)
	31	28	31	30	31	30	31	31	30	31	30	31 (41)

4. Water heating energy requirements (kWh/year)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Assumed occupancy												1.6860 (42)
Average daily hot water use (litres/day)												74.2420 (43)
Daily hot water use	81.6662	78.6965	75.7269	72.7572	69.7875	66.8178	66.8178	69.7875	72.7572	75.7269	78.6965	81.6662 (44)
Energy conte	121.1086	105.9224	109.3024	95.2925	91.4354	78.9018	73.1141	83.8995	84.9016	98.9446	108.0058	117.2873 (45)
Energy content (annual)												Total = Sum(45)m = 1168.1161 (45)
Distribution loss (46)m = 0.15 x (45)m	18.1663	15.8884	16.3954	14.2939	13.7153	11.8353	10.9671	12.5849	12.7352	14.8417	16.2009	17.5931 (46)
Water storage loss:												150.0000 (47)
Store volume												1.3938 (48)
a) If manufacturer declared loss factor is known (kWh/day):												0.5400 (49)
Temperature factor from Table 2b												0.7527 (55)
Enter (49) or (54) in (55)												

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)



CALCULATION OF TARGET EMISSIONS 09 Jan 2014

Total storage loss	23.3325	21.0745	23.3325	22.5798	23.3325	22.5798	23.3325	23.3325	22.5798	23.3325	22.5798	23.3325	(56)
If cylinder contains dedicated solar storage	23.3325	21.0745	23.3325	22.5798	23.3325	22.5798	23.3325	23.3325	22.5798	23.3325	22.5798	23.3325	(57)
Primary loss	23.2624	21.0112	23.2624	22.5120	23.2624	22.5120	23.2624	23.2624	22.5120	23.2624	22.5120	23.2624	(59)
Total heat required for water heating calculated for each month	167.7035	148.0081	155.8973	140.3843	138.0303	123.9937	119.7090	130.4944	129.9934	145.5395	153.0976	163.8822	(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	167.7035	148.0081	155.8973	140.3843	138.0303	123.9937	119.7090	130.4944	129.9934	145.5395	153.0976	163.8822	(64)
Heat gains from water heating, kWh/month	77.5445	68.8878	73.6190	67.7582	67.6782	62.3083	61.5864	65.1725	64.3032	70.1750	71.9854	76.2739	(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	84.2990	84.2990	84.2990	84.2990	84.2990	84.2990	84.2990	84.2990	84.2990	84.2990	84.2990	84.2990	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	13.1439	11.6743	9.4942	7.1877	5.3729	4.5360	4.9013	6.3709	8.5511	10.8575	12.6723	13.5092	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	146.8703	148.3944	144.5538	136.3777	126.0568	116.3567	109.8764	108.3523	112.1929	120.3690	130.6899	140.3900	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	31.4299	31.4299	31.4299	31.4299	31.4299	31.4299	31.4299	31.4299	31.4299	31.4299	31.4299	31.4299	(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)	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	(71)
Water heating gains (Table 5)	104.2265	102.5116	98.9502	94.1087	90.9653	86.5393	82.7774	87.5975	89.3101	94.3212	99.9797	102.5187	(72)
Total internal gains	315.5305	313.8699	304.2879	288.9638	273.6847	258.7217	248.8448	253.6104	261.3437	276.8374	294.6316	307.7077	(73)

6. Solar gains

[Jan]	Area m2	Solar flux Table 6a W/m2	Specific data or Table 6b g	Specific data or Table 6c FF	Access factor Table 6d	Gains W							
Southwest	5.3800	36.7938	0.6300	0.7000	0.7700	60.4963 (79)							
Northwest	4.9400	11.2829	0.6300	0.7000	0.7700	17.0342 (81)							
Solar gains	77.5305	137.7212	203.4650	277.2936	333.5848	341.2863	324.8275	281.2855	228.7886	156.2634	93.8941	65.6832	(83)
Total gains	393.0610	451.5912	507.7529	566.2574	607.2696	600.0080	573.6723	534.8959	490.1322	433.1009	388.5257	373.3909	(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	53.9427	54.0988	54.2528	54.9876	55.1273	55.7871	55.7871	55.9110	55.5311	55.1273	54.8454	54.5538	
alpha	4.5962	4.6066	4.6169	4.6658	4.6752	4.7191	4.7191	4.7274	4.7021	4.6752	4.6564	4.6369	
util living area	0.9937	0.9873	0.9707	0.9210	0.8074	0.6267	0.4684	0.5196	0.7670	0.9454	0.9873	0.9950	(86)
MIT	19.7479	19.9250	20.2042	20.5563	20.8268	20.9608	20.9919	20.9871	20.8995	20.5498	20.0889	19.7200	(87)
Th 2	19.8507	19.8537	19.8565	19.8700	19.8725	19.8843	19.8843	19.8865	19.8798	19.8725	19.8674	19.8621	(88)
util rest of house	0.9916	0.9832	0.9609	0.8945	0.7483	0.5318	0.3536	0.4003	0.6798	0.9211	0.9824	0.9933	(89)
MIT 2	18.2132	18.4718	18.8741	19.3719	19.7133	19.8602	19.8816	19.8817	19.8061	19.3763	18.7210	18.1805	(90)
Living area fraction	fLA = Living area / (4) =												0.4880 (91)
MIT	18.9621	19.1809	19.5231	19.9499	20.2566	20.3973	20.4234	20.4211	20.3397	19.9489	19.3885	18.9317	(92)
Temperature adjustment													0.0000
adjusted MIT	18.9621	19.1809	19.5231	19.9499	20.2566	20.3973	20.4234	20.4211	20.3397	19.9489	19.3885	18.9317	(93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	0.9894	0.9800	0.9573	0.8966	0.7700	0.5770	0.4099	0.4588	0.7183	0.9231	0.9796	0.9914	(94)
Useful gains	388.8913	442.5409	486.0896	507.7221	467.6223	346.1873	235.1308	245.3905	352.0589	399.7928	380.6184	370.1940	(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	941.1367	914.0243	831.1572	695.7951	537.4347	359.8154	237.3041	249.0210	389.0593	587.1990	775.7967	935.0158	(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	410.8706	316.8368	256.7303	135.4126	51.9404	0.0000	0.0000	0.0000	0.0000	139.4302	284.5284	420.2274	(98)
Space heating													2015.9767 (98)
Space heating per m2													(98) / (4) = 40.4327 (99)

8c. Space cooling requirement

Not applicable

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)



CALCULATION OF TARGET EMISSIONS 09 Jan 2014

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 %)													93.5000 (206)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
Space heating requirement													2156.1248 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	410.8706	316.8368	256.7303	135.4126	51.9404	0.0000	0.0000	0.0000	0.0000	139.4302	284.5284	420.2274	(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)	439.4338	338.8629	274.5779	144.8263	55.5513	0.0000	0.0000	0.0000	0.0000	149.1232	304.3085	449.4411	(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	167.7035	148.0081	155.8973	140.3843	138.0303	123.9937	119.7090	130.4944	129.9934	145.5395	153.0976	163.8822	(64)
Efficiency of water heater (217)m	87.1143	86.7945	86.1364	84.7179	82.4658	79.8000	79.8000	79.8000	79.8000	84.6998	86.4450	79.8000	(216)
Fuel for water heating, kWh/month	192.5099	170.5271	180.9890	165.7080	167.3789	155.3805	150.0113	163.5269	162.8990	171.8299	177.1040	187.8977	(219)
Water heating fuel used													2045.7621 (219)
Annual totals kWh/year													2156.1248 (211)
Space heating fuel - main system													0.0000 (215)
Space heating fuel - secondary													
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)													232.1253 (232)
Total delivered energy for all uses													4509.0122 (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	2156.1248	0.2160	465.7230 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	2045.7621	0.2160	441.8846 (264)
Space and water heating			907.6076 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	232.1253	0.5190	120.4730 (268)
Total CO2, kg/m2/year			1067.0056 (272)
Emissions per m2 for space and water heating			18.2031 (272a)
Fuel factor (electricity)			1.5500
Emissions per m2 for lighting			2.4162 (272b)
Emissions per m2 for pumps and fans			0.7807 (272c)
Target Carbon Dioxide Emission Rate (TER) = (18.2031 * 1.55) + 2.4162 + 0.7807, rounded to 2 d.p.			31.4100 (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 (m ²)	Storey height (m)	Volume (m ³)
Ground floor	49.8600 (1b)	2.3800 (2b)	118.6668 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	49.8600		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	118.6668 (5)

2. Ventilation rate

	main heating	secondary heating	other	total	m ³ per hour
Number of chimneys	0	0	0	0 * 40 =	0.0000 (6a)
Number of open flues	0	0	0	0 * 20 =	0.0000 (6b)
Number of intermittent fans				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) =	0.1685 (8)
Pressure test					Yes
Measured/design AP50					2.6000
Infiltration rate					0.2985 (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) =	0.2761 (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	0.3521	0.3452	0.3383	0.3038	0.2969	0.2623	0.2623	0.2554	0.2761	0.2969	0.3107	0.3245 (22b)
Effective ac	0.5620	0.5596	0.5572	0.5461	0.5441	0.5344	0.5344	0.5326	0.5381	0.5441	0.5483	0.5526 (25)

3. Heat losses and heat loss parameter

Element	Gross m ²	Openings m ²	NetArea m ²	U-value W/m ² K	A x U W/K	K-value kJ/m ² K	A x K kJ/K
Windows (Uw = 1.40)			10.7000	1.3258	14.1856		(27)
Solid Door			2.1400	1.0900	2.3326		(26)
Flr - Ground			49.8600	0.1400	6.9804	70.5600	3518.1216 (28a)
Wl - Brick	38.5800	10.6960	27.8840	0.1800	5.0191	39.3600	1097.5142 (29a)
Wl - To Corridor	23.4540	2.1420	21.3120	0.1800	3.8362	4.4800	95.4778 (29a)
Total net area of external elements Aum(A, m ²)			111.8960				(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =	32.3539			(33)
Party Wall			11.0690	0.0000	0.0000	54.0300	598.0581 (32)
Party Ceiling			49.8620			70.0000	3490.3400 (32b)
Ground Floor Block			38.4123			54.0300	2075.4176 (32c)
Ground Floor Stud			48.5146			5.8200	282.3548 (32c)
Heat capacity Cm = Sum(A x k)			(28)...(30) + (32) + (32a)...(32e) =				11157.2841 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							223.7722 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							7.3347 (36)
Total fabric heat loss			(33) + (36) =				39.6886 (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	22.0073	21.9130	21.8207	21.3867	21.3055	20.9276	20.9276	20.8576	21.0732	21.3055	21.4698	21.6415 (38)
Heat transfer coeff	61.6959	61.6017	61.5093	61.0753	60.9942	60.6162	60.6162	60.5462	60.7618	60.9942	61.1584	61.3301 (39)
Average = Sum(39)m / 12 =	61.0750 (39)											
HLP	1.2374	1.2355	1.2336	1.2249	1.2233	1.2157	1.2157	1.2143	1.2186	1.2233	1.2266	1.2300 (40)
HLP (average)	1.2249 (40)											
Days in month	31	28	31	30	31	30	31	31	30	31	30	31 (41)

4. Water heating energy requirements (kWh/year)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Assumed occupancy	1.6860 (42)											
Average daily hot water use (litres/day)	74.2420 (43)											
Daily hot water use	81.6662	78.6965	75.7269	72.7572	69.7875	66.8178	66.8178	69.7875	72.7572	75.7269	78.6965	81.6662 (44)
Energy conte	121.1086	105.9224	109.3024	95.2925	91.4354	78.9018	73.1141	83.8995	84.9016	98.9446	108.0058	117.2873 (45)
Energy content (annual)	Total = Sum(45)m = 1168.1161 (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 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	0.0000 (56)
If cylinder contains dedicated solar storage	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (57)
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	0.0000 (59)
Heat gains from water heating, kWh/month	25.7356	22.5085	23.2268	20.2497	19.4300	16.7666	15.5368	17.8287	18.0416	21.0257	22.9512	24.9235	(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	84.2990	84.2990	84.2990	84.2990	84.2990	84.2990	84.2990	84.2990	84.2990	84.2990	84.2990	84.2990	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	13.1122	11.6462	9.4713	7.1704	5.3599	4.5251	4.8895	6.3556	8.5305	10.8314	12.6418	13.4767	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	146.8703	148.3944	144.5538	136.3777	126.0568	116.3567	109.8764	108.3523	112.1929	120.3690	130.6899	140.3900	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	31.4299	31.4299	31.4299	31.4299	31.4299	31.4299	31.4299	31.4299	31.4299	31.4299	31.4299	31.4299	(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)	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	(71)
Water heating gains (Table 5)	34.5908	33.4948	31.2188	28.1245	26.1156	23.2870	20.8827	23.9632	25.0578	28.2604	31.8767	33.4994	(72)
Total internal gains	242.8631	241.8251	233.5336	219.9623	205.8221	192.4584	183.9383	186.9608	194.0708	207.7504	223.4981	235.6558	(73)

6. Solar gains

[Jan]													
		Area	Solar flux	Specific data	Specific data	FF	Access	Gains					
		m2	Table 6a	g	Specific data		factor	W					
			W/m2	or Table 6b	or Table 6c		Table 6d						
Southwest		5.5750	36.7938	0.5000	0.0000	0.7700	78.9734	(79)					
Northwest		5.1210	11.2829	0.5000	0.0000	0.7700	22.2453	(81)					
Solar gains	101.2186	179.8018	265.6391	362.0367	435.5380	445.5962	424.1058	367.2513	298.7038	204.0111	122.5822	85.7514	(83)
Total gains	344.0817	421.6268	499.1727	581.9990	641.3601	638.0547	608.0441	554.2121	492.7746	411.7615	346.0803	321.4071	(84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)													21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
tau	50.2342	50.3111	50.3866	50.7446	50.8122	51.1290	51.1290	51.1881	51.0065	50.8122	50.6757	50.5338	
alpha	4.3489	4.3541	4.3591	4.3830	4.3875	4.4086	4.4086	4.4125	4.4004	4.3875	4.3784	4.3689	
util living area	0.9943	0.9860	0.9633	0.8969	0.7612	0.5795	0.4321	0.4902	0.7437	0.9416	0.9883	0.9958	(86)
MIT	19.6106	19.8365	20.1695	20.5608	20.8400	20.9631	20.9919	20.9862	20.8931	20.5007	19.9721	19.5639	(87)
Th 2	19.8902	19.8917	19.8932	19.9001	19.9014	19.9074	19.9074	19.9086	19.9051	19.9014	19.8988	19.8960	(88)
util rest of house	0.9926	0.9818	0.9524	0.8676	0.7018	0.4917	0.3281	0.3798	0.6599	0.9183	0.9841	0.9945	(89)
MIT 2	18.6379	18.8626	19.1893	19.5623	19.7999	19.8912	19.9054	19.9047	19.8493	19.5183	19.0042	18.5960	(90)
Living area fraction													0.4880 (91)
MIT	19.1125	19.3379	19.6676	20.0495	20.3074	20.4143	20.4356	20.4324	20.3586	19.9977	19.4765	19.0683	(92)
Temperature adjustment													0.0000
adjusted MIT	19.1125	19.3379	19.6676	20.0495	20.3074	20.4143	20.4356	20.4324	20.3586	19.9977	19.4765	19.0683	(93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	0.9910	0.9792	0.9497	0.8720	0.7251	0.5335	0.3789	0.4338	0.6969	0.9207	0.9821	0.9932	(94)
Useful gains	340.9992	412.8674	474.0718	507.5207	465.0338	340.4314	230.4131	240.4350	343.4372	379.0988	339.8831	319.2126	(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	913.8730	889.3962	809.9305	680.9625	525.0033	352.4395	232.4970	244.1472	380.2846	573.2048	756.9278	911.8748	(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	426.2181	320.2273	249.8788	124.8781	44.6173	0.0000	0.0000	0.0000	0.0000	144.4148	300.2722	440.9406	(98)
Space heating												2051.4473	(98)
Space heating per m2												(98) / (4) =	41.1441 (99)

8c. Space cooling requirement

Calculated for June, July and August. See Table 10b													
Ext. temp.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	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	569.7923	448.5599	460.1512	0.0000	0.0000	0.0000	0.0000	(100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.9260	0.9598	0.9429	0.0000	0.0000	0.0000	0.0000	(101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	527.6122	430.5444	433.8947	0.0000	0.0000	0.0000	0.0000	(102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	809.6146	773.3307	711.3483	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)



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Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	203.0417	255.0330	206.4254	0.0000	0.0000	0.0000	0.0000	(104)
Space cooling													664.5002 (104)
Cooled fraction													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	0.0000	(106)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	50.7604	63.7583	51.6064	0.0000	0.0000	0.0000	0.0000	(107)
Space cooling													166.1250 (107)
Space cooling per m2													3.3318 (108)
Energy for space heating													41.1441 (99)
Energy for space cooling													3.3318 (108)
Total													44.4760 (109)
Dwelling Fabric Energy Efficiency (DFEE)													44.5 (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 (m2)	Storey height (m)	Volume (m3)
Ground floor	49.8600 (1b)	2.3800 (2b)	118.6668 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	49.8600		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	118.6668 (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) =	0.1685 (8)
Pressure test				Yes	
Measured/design AP50				5.0000	
Infiltration rate				0.4185	(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) =		0.3871 (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	0.4936	0.4839	0.4743	0.4259	0.4162	0.3678	0.3678	0.3581	0.3871	0.4162	0.4355	0.4549 (22b)
	0.6218	0.6171	0.6125	0.5907	0.5866	0.5676	0.5676	0.5641	0.5749	0.5866	0.5948	0.6035 (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					
TER Opaque door			2.1400	1.0000	2.1400		(26)					
TER Opening Type (Uw = 1.40)			10.3200	1.3258	13.6818		(27)					
Flr - Ground			49.8600	0.1300	6.4818		(28a)					
Wl - Brick	38.5800	10.3200	28.2600	0.1800	5.0868		(29a)					
Wl - To Corridor	23.4540	2.1420	21.3120	0.1800	3.8362		(29a)					
Total net area of external elements Aum(A, m2)			111.8920				(31)					
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) =	31.2266	(33)					
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							250.0000 (35)					
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							8.6111 (36)					
Total fabric heat loss							(33) + (36) = 39.8377 (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
	24.3508	24.1655	23.9840	23.1311	22.9715	22.2286	22.2286	22.0911	22.5148	22.9715	23.2943	23.6318 (38)
Heat transfer coeff	64.1885	64.0032	63.8216	62.9687	62.8092	62.0663	62.0663	61.9287	62.3524	62.8092	63.1320	63.4695 (39)
Average = Sum(39)m / 12 =												62.9680 (39)
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	1.2874	1.2837	1.2800	1.2629	1.2597	1.2448	1.2448	1.2421	1.2506	1.2597	1.2662	1.2730 (40)
HLP (average)												1.2629 (40)
Days in month	31	28	31	30	31	30	31	31	30	31	30	31 (41)

4. Water heating energy requirements (kWh/year)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Assumed occupancy												1.6860 (42)
Average daily hot water use (litres/day)												74.2420 (43)
Daily hot water use	81.6662	78.6965	75.7269	72.7572	69.7875	66.8178	66.8178	69.7875	72.7572	75.7269	78.6965	81.6662 (44)
Energy conte	121.1086	105.9224	109.3024	95.2925	91.4354	78.9018	73.1141	83.8995	84.9016	98.9446	108.0058	117.2873 (45)
Energy content (annual)												Total = Sum(45)m = 1168.1161 (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)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)



CALCULATION OF TARGET FABRIC ENERGY EFFICIENCY 09 Jan 2014

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	0.0000	(59)
Heat gains from water heating, kWh/month	25.7356	22.5085	23.2268	20.2497	19.4300	16.7666	15.5368	17.8287	18.0416	21.0257	22.9512	24.9235	24.9235	(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	84.2990	84.2990	84.2990	84.2990	84.2990	84.2990	84.2990	84.2990	84.2990	84.2990	84.2990	84.2990	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	13.1439	11.6743	9.4942	7.1877	5.3729	4.5360	4.9013	6.3709	8.5511	10.8575	12.6723	13.5092	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	146.8703	148.3944	144.5538	136.3777	126.0568	116.3567	109.8764	108.3523	112.1929	120.3690	130.6899	140.3900	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	31.4299	31.4299	31.4299	31.4299	31.4299	31.4299	31.4299	31.4299	31.4299	31.4299	31.4299	31.4299	(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)	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	-67.4392	(71)
Water heating gains (Table 5)	34.5908	33.4948	31.2188	28.1245	26.1156	23.2870	20.8827	23.9632	25.0578	28.2604	31.8767	33.4994	(72)
Total internal gains	242.8948	241.8532	233.5565	219.9796	205.8350	192.4694	183.9501	186.9762	194.0914	207.7766	223.5286	235.6883	(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	5.3800		36.7938		0.6300		0.7000		0.7700		60.4963		(79)
Northwest	4.9400		11.2829		0.6300		0.7000		0.7700		17.0342		(81)
Solar gains	77.5305	137.7212	203.4650	277.2936	333.5848	341.2863	324.8275	281.2855	228.7886	156.2634	93.8941	65.6832	(83)
Total gains	320.4253	379.5744	437.0215	497.2733	539.4199	533.7557	508.7776	468.2617	422.8799	364.0400	317.4227	301.3715	(84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)														
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	53.9427	54.0988	54.2528	54.9876	55.1273	55.7871	55.7871	55.9110	55.5311	55.1273	54.8454	54.5538	21.0000	(85)
alpha	4.5962	4.6066	4.6169	4.6658	4.6752	4.7191	4.7191	4.7274	4.7021	4.6752	4.6564	4.6369		
util living area	0.9973	0.9936	0.9832	0.9479	0.8549	0.6863	0.5232	0.5842	0.8317	0.9701	0.9944	0.9980	(86)	
MIT	19.6174	19.7987	20.0879	20.4638	20.7729	20.9428	20.9872	20.9791	20.8547	20.4459	19.9635	19.5896	(87)	
Th 2	19.8507	19.8537	19.8565	19.8700	19.8725	19.8843	19.8843	19.8865	19.8798	19.8725	19.8674	19.8621	(88)	
util rest of house	0.9963	0.9914	0.9772	0.9284	0.8028	0.5891	0.3974	0.4546	0.7530	0.9552	0.9921	0.9972	(89)	
MIT 2	18.6031	18.7857	19.0738	19.4472	19.7243	19.8593	19.8813	19.8809	19.8021	19.4392	18.9615	18.5844	(90)	
Living area fraction	fLA = Living area / (4) =													
MIT	19.0981	19.2800	19.5686	19.9432	20.2360	20.3880	20.4209	20.4168	20.3158	19.9304	19.4505	19.0749	(92)	
Temperature adjustment	0.0000													
adjusted MIT	19.0981	19.2800	19.5686	19.9432	20.2360	20.3880	20.4209	20.4168	20.3158	19.9304	19.4505	19.0749	(93)	

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9955	0.9900	0.9753	0.9299	0.8213	0.6351	0.4592	0.5184	0.7869	0.9562	0.9909	0.9966	(94)
Useful gains	318.9835	375.7776	426.2101	462.4257	443.0092	339.0076	233.6550	242.7305	332.7457	348.0807	314.5389	300.3405	(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	949.8644	920.3683	834.0610	695.3794	536.1372	359.2382	237.1513	248.7529	387.5679	586.0363	779.7090	944.1025	(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	469.3754	365.9649	303.4410	167.7266	69.2872	0.0000	0.0000	0.0000	0.0000	177.0389	334.9225	478.9589	(98)
Space heating	2366.7156												
Space heating per m2	(98) / (4) = 47.4672												
	(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	583.4232	459.2906	470.6584	0.0000	0.0000	0.0000	0.0000	(100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.8855	0.9363	0.9137	0.0000	0.0000	0.0000	0.0000	(101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	516.6339	430.0387	430.0524	0.0000	0.0000	0.0000	0.0000	(102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	687.7212	657.3206	610.9072	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	0.0000	0.0000	0.0000	0.0000	0.0000	123.1828	169.0977	134.5560	0.0000	0.0000	0.0000	0.0000	(104)
Space cooling	426.8365												
Cooled fraction	fC = cooled area / (4) = 1.0000												
Interruption factor (Table 10b)	(105)												

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	0.2500	0.2500	0.2500	0.0000	0.0000	0.0000	0.0000	(106)
Space cooling	0.0000	0.0000	0.0000	0.0000	0.0000	30.7957	42.2744	33.6390	0.0000	0.0000	0.0000	0.0000	(107)
Space cooling per m2													106.7091 (107)
Energy for space heating													2.1402 (108)
Energy for space cooling													47.4672 (99)
Total													2.1402 (108)
Target Fabric Energy Efficiency (TFEE)													49.6074 (109)
													57.0 (109)

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Designed)



Property Reference	Plot 019 - Block G		Issued on Date	19/02/2021
Assessment Reference	002 S	Prop Type Ref	BEC-Dand - KW3	
Property	Flat 2, Block G, Knightswood, TUNBRIDGE WELLS, TN2			
SAP Rating	79 C	DER	30.96	TER 31.41
Environmental	81 B	% DER<TER	1.44	
CO₂ Emissions (t/year)	1.32	DFEE	44.48	TFEE 57.05
General Requirements Compliance	Pass	% DFEE<TFEE	22.04	
Assessor Details	Mr. Gary Nicholls, Gary Nicholls, Tel: 02033971373, gary@briaryenergy.co.uk		Assessor ID	W947-0001
Client				

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

Criterion 1 – Achieving the TER and TFEE rate

1a TER and DER

Fuel for main heating	Electricity		
Fuel factor	1.55 (electricity)		
Target Carbon Dioxide Emission Rate (TER)	31.41	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	30.96	kgCO ₂ /m ²	Pass
	-0.45 (-1.4%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	57.05	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	44.48	kWh/m ² /yr	
	-12.5 (-21.9%)	kWh/m ² /yr	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.18 (max. 0.30)	0.18 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Floor	0.14 (max. 0.25)	0.14 (max. 0.70)	Pass
Openings	1.35 (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 room thermostat	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)	Slight	Pass
Based on:		
Overshading	Average	
Windows facing South West	5.58 m ² , No overhang	
Windows facing North West	5.12 m ² , 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 ² K	
Filled Cavity with Edge Sealing	0.00	W/m ² K	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

Party wall U-value	0.00	W/m ² K
Door U-value	1.09	W/m ² K
Door U-value	1.09	W/m ² K
Air permeability	2.6	m ³ /m ² 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 ²)	DER (kgCO ₂ /m ²)	TER (kgCO ₂ /m ²)	% 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 ₂ /m ²		% DER/TER	PASS		
Average TER = 26.90 kgCO ₂ /m ²		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 ²)	DFEE (kWh/m ² /yr)	TFEE (kWh/m ² /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 ² /yr		% DFEE/TFEE		PASS	
Average TFEE = 47.49 kWh/m ² /yr		20.51 %			