

PREDICTED ENERGY ASSESSMENT



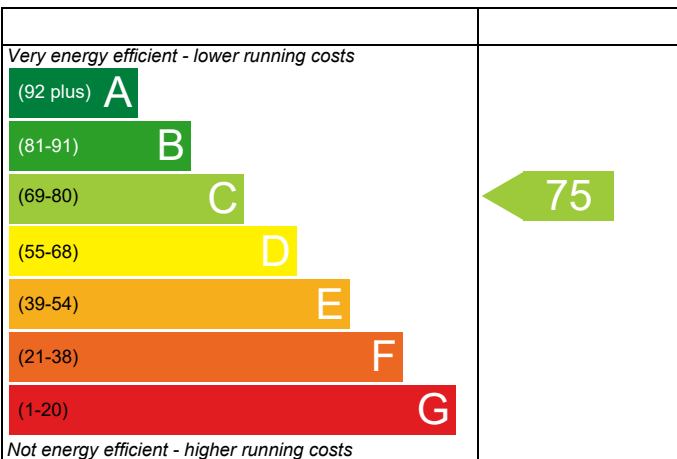
Flat 6, Block G, Knightswood,
TUNBRIDGE WELLS,
TN2

Dwelling type: Flat, End-Terrace
Date of assessment: 19/02/2021
Produced by: Gary Nicholls
Total floor area: 69.92 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.

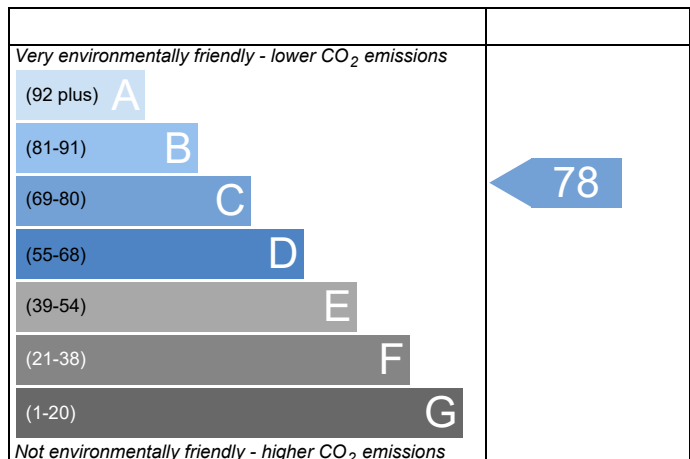
Energy Efficiency Rating



England EU Directive 2002/91/EC

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

Environmental Impact (CO₂) Rating



England EU Directive 2002/91/EC

The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (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 023 - Block G		Issued on Date	19/02/2021	
Assessment Reference	006 E	Prop Type Ref	BEC-Dand - KW3		
Property	Flat 6, Block G, Knightswood, TUNBRIDGE WELLS, TN2				
SAP Rating	75 C	DER	30.27	TER	29.90
Environmental	78 C	% DER<TER	-1.24		
CO ₂ Emissions (t/year)	1.83	DFEE	45.70	TFEE	59.87
General Requirements Compliance	Fail	% DFEE<TFEE	23.67		
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)	29.90	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	30.27	kgCO ₂ /m ²	
Excess emissions	0.37 (1.2%)	kgCO ₂ /m ²	Fail

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	59.87	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	45.70	kWh/m ² /yr	
	-14.2 (-23.7%)	kWh/m ² /yr	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.19 (max. 0.30)	0.21 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Floor	0.18 (max. 0.25)	0.18 (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 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)

Slight

Pass

Based on:

Overshading

Average

Windows facing North East

7.10 m², No overhang

Windows facing South East

3.33 m², No overhang

Air change rate

3.87 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)



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Assessment Reference	006 E	Prop Type Ref	BEC-Dand - KW3		
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SAP Rating	75 C	DER	30.27	TER	29.90
Environmental	78 C	% DER<TER	-1.24		
CO₂ Emissions (t/year)	1.83	DFEE	45.70	TFEE	59.87
General Requirements Compliance	Fail	% DFEE<TFEE	23.67		
Assessor Details	Mr. Gary Nicholls, Gary Nicholls, Tel: 02033971373, gary@briaryenergy.co.uk			Assessor ID	W947-0001
Client					

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

Mid-floor flat, total floor area 70 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) 29.90 kgCO₂/m²
Dwelling Carbon Dioxide Emission Rate (DER) 30.27 kgCO₂/m²Fail
Excess emissions =0.37 kgCO₂/m² (1.2%)

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)59.9 kWh/m²/yr
Dwelling Fabric Energy Efficiency (DFEE)45.7 kWh/m²/yrOK

2 Fabric U-values

Element	Average	Highest	
External wall	0.19 (max. 0.30)	0.21 (max. 0.70)	OK
Party wall	0.00 (max. 0.20)	-	OK
Floor	0.18 (max. 0.25)	0.18 (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 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): Slight OK

Based on:

Overshading: Average
Windows facing North East: 7.10 m², No overhang
Windows facing South East: 3.33 m², No overhang
Air change rate: 3.87 ach
Blinds/curtains: Dark-coloured curtain or roller blind, closed 100% of daylight hours

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

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	69.9200 (1b)	2.4000 (2b)	167.8080 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	69.9200		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	167.8080 (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)

	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:												0.5000 (23a)
If balanced with heat recovery: efficiency in % allowing for in-use factor (from Table 4h) =												77.3500 (23c)
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)			10.4300	1.3258	13.8277		(27)
Solid Door			2.1400	1.0900	2.3326		(26)
Flr - Exposed Floor			69.9200	0.1800	12.5856	70.5600	4933.5552 (28b)
Wl - Clad	52.3500	10.4300	41.9200	0.2100	8.8032	5.8200	243.9744 (29a)
Wl - To Corridor	30.8000	2.1420	28.6580	0.1600	4.5853	13.4400	385.1635 (29a)
Total net area of external elements Aum(A, m ²)			153.0680				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	42.1343		(33)
Party Wall			10.7200	0.0000	0.0000	20.0000	214.4000 (32)
Party Ceiling			69.9200			30.0000	2097.6000 (32b)
1st Floor Stud			108.6192			5.8200	632.1637 (32c)
Heat capacity Cm = Sum(A x k)							(28)...(30) + (32) + (32a)...(32e) = 8506.8569 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							121.6656 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							9.7399 (36)
Total fabric heat loss						(33) + (36) =	51.8742 (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	14.7617	14.5952	14.4287	13.5963	13.4299	12.5975	12.5975	12.4310	12.9304	13.4299	13.7628	14.0958 (38)
Average = Sum(39)m / 12 =	66.6359	66.4694	66.3029	65.4705	65.3041	64.4717	64.4717	64.3052	64.8046	65.3041	65.6370	65.9700 (39)
												65.4289 (39)
HLP	0.9530	0.9506	0.9483	0.9364	0.9340	0.9221	0.9221	0.9197	0.9268	0.9340	0.9387	0.9435 (40)
HLP (average)												0.9358 (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												2.2442 (42)
Average daily hot water use (litres/day)												87.4993 (43)
Daily hot water use	96.2492	92.7493	89.2493	85.7493	82.2493	78.7494	78.7494	82.2493	85.7493	89.2493	92.7493	96.2492 (44)
Energy conte	142.7348	124.8368	128.8204	112.3087	107.7629	92.9912	86.1700	98.8813	100.0623	116.6130	127.2922	138.2311 (45)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)



CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE 09 Jan 2014

Energy content (annual)												Total = Sum(45)m =	1376.7047 (45)
Distribution loss (46)m = 0.15 x (45)m													
	21.4102	18.7255	19.3231	16.8463	16.1644	13.9487	12.9255	14.8322	15.0093	17.4919	19.0938	20.7347	(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	166.3568	146.1728	152.4424	135.1687	131.3849	115.8512	109.7920	122.5033	122.9223	140.2350	150.1522	161.8531	(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	166.3568	146.1728	152.4424	135.1687	131.3849	115.8512	109.7920	122.5033	122.9223	140.2350	150.1522	161.8531	(64)
												Total per year (kWh/year) = Sum(64)m =	1654.8347 (64)
Heat gains from water heating, kWh/month	66.3569	58.5770	61.7304	55.6307	54.7288	49.2076	47.5491	51.7756	51.5587	57.6714	60.6126	64.8594	(65)

5. Internal gains (see Table 5 and 5a)

Metabolic gains (Table 5), Watts													
(66)m	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	112.2091	112.2091	112.2091	112.2091	112.2091	112.2091	112.2091	112.2091	112.2091	112.2091	112.2091	112.2091	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	18.5975	16.5181	13.4334	10.1700	7.6022	6.4181	6.9350	9.0143	12.0990	15.3625	17.9303	19.1144	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	197.1103	199.1557	194.0014	183.0284	169.1771	156.1588	147.4618	145.4164	150.5707	161.5436	175.3949	188.4133	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	34.2209	34.2209	34.2209	34.2209	34.2209	34.2209	34.2209	34.2209	34.2209	34.2209	34.2209	34.2209	(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)	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	(71)
Water heating gains (Table 5)	89.1894	87.1682	82.9709	77.2648	73.5602	68.3438	63.9101	69.5909	71.6093	77.5153	84.1842	87.1766	(72)
Total internal gains	361.5599	359.5047	347.0685	327.1259	307.0022	287.5834	274.9696	280.6843	290.9417	311.0841	334.1722	351.3670	(73)

6. Solar gains

[Jan]		Area	Solar flux	g	FF	Access	Gains						
		m2	Table 6a	Specific data	Specific data	factor	W						
			W/m2	or Table 6b	or Table 6c	Table 6d							
Northeast		7.0980	11.2829	0.5000	0.0000	0.7700	30.8332 (75)						
Southeast		3.3320	36.7938	0.5000	0.0000	0.7700	47.1999 (77)						
Solar gains	78.0331	143.1608	223.0822	322.0068	402.2933	417.6909	395.0801	332.3840	256.8985	165.5579	95.3307	65.5732	(83)
Total gains	439.5930	502.6655	570.1507	649.1327	709.2954	705.2743	670.0497	613.0683	547.8402	476.6420	429.5029	416.9402	(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	35.4616	35.5504	35.6397	36.0928	36.1848	36.6520	36.6520	36.7469	36.4637	36.1848	36.0013	35.8196	
alpha	3.3641	3.3700	3.3760	3.4062	3.4123	3.4435	3.4435	3.4498	3.4309	3.4123	3.4001	3.3880	
util living area	0.9729	0.9569	0.9224	0.8431	0.7101	0.5428	0.4104	0.4615	0.6903	0.8873	0.9576	0.9770	(86)
MIT	19.3517	19.5814	19.9506	20.4076	20.7490	20.9276	20.9789	20.9686	20.8326	20.3797	19.7889	19.3084	(87)
Th 2	20.1227	20.1247	20.1267	20.1367	20.1387	20.1488	20.1488	20.1508	20.1447	20.1387	20.1347	20.1307	(88)
util rest of house	0.9686	0.9500	0.9100	0.8188	0.6679	0.4818	0.3359	0.3837	0.6317	0.8641	0.9498	0.9732	(89)
MIT 2	17.9078	18.2401	18.7692	19.4134	19.8644	20.0850	20.1354	20.1296	19.9825	19.3903	18.5500	17.8502	(90)
Living area fraction												FLA = Living area / (4) =	
MIT	18.5267	18.8150	19.2756	19.8395	20.2436	20.4462	20.4970	20.4892	20.3469	19.8144	19.0810	18.4752	(92)
Temperature adjustment												0.0000	
adjusted MIT	18.5267	18.8150	19.2756	19.8395	20.2436	20.4462	20.4970	20.4892	20.3469	19.8144	19.0810	18.4752	(93)

8. Space heating requirement

Utilisation	0.9581	0.9371	0.8956	0.8095	0.6733	0.5038	0.3669	0.4154	0.6464	0.8539	0.9376	0.9637	(94)
Useful gains	421.1811	471.0708	510.6485	525.4494	477.5816	355.2916	245.8160	254.6697	354.1272	407.0034	402.6994	401.8178	(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	948.0080	924.9239	847.0598	716.2177	557.9308	376.9144	251.2440	262.9593	404.8270	601.7373	786.3990	941.7361	(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	391.9592	304.9893	250.2900	137.3532	59.7798	0.0000	0.0000	0.0000	0.0000	144.8820	276.2636	401.6992	(98)
Space heating												1967.2163 (98)	
Space heating per m2												(98) / (4) =	28.1352 (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

	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 %)													100.0000 (206)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
Space heating requirement													1967.2163 (211)
Space heating requirement	391.9592	304.9893	250.2900	137.3532	59.7798	0.0000	0.0000	0.0000	0.0000	144.8820	276.2636	401.6992	(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)	391.9592	304.9893	250.2900	137.3532	59.7798	0.0000	0.0000	0.0000	0.0000	144.8820	276.2636	401.6992	(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	166.3568	146.1728	152.4424	135.1687	131.3849	115.8512	109.7920	122.5033	122.9223	140.2350	150.1522	161.8531	(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	166.3568	146.1728	152.4424	135.1687	131.3849	115.8512	109.7920	122.5033	122.9223	140.2350	150.1522	161.8531	(219)
Water heating fuel used													1654.8347 (219)
Annual totals kWh/year													
Space heating fuel - main system													1967.2163 (211)
Space heating fuel - secondary													0.0000 (215)
Electricity for pumps and fans: (BalancedWithHeatRecovery, Database: in-use factor = 1.2500, SFP = 0.6250) mechanical ventilation fans (SFP = 0.6250)													127.9536 (230a)
Total electricity for the above, kWh/year													127.9536 (231)
Electricity for lighting (calculated in Appendix L)													328.4376 (232)
Total delivered energy for all uses													4078.4422 (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	1967.2163	0.5190	1020.9853	(261)
Space heating - secondary	0.0000	0.0000	0.0000	(263)
Water heating (other fuel)	1654.8347	0.5190	858.8592	(264)
Space and water heating			1879.8445	(265)
Pumps and fans	127.9536	0.5190	66.4079	(267)
Energy for lighting	328.4376	0.5190	170.4591	(268)
Total CO2, kg/year			2116.7115	(272)
Dwelling Carbon Dioxide Emission Rate (DER)			30.2700	(273)

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

DER			30.2700	ZC1
Total Floor Area		TFA	69.9200	
Assumed number of occupants		N	2.2442	
CO2 emission factor in Table 12 for electricity displaced from grid		EF	0.5190	
CO2 emissions from appliances, equation (L14)			16.7053	ZC2
CO2 emissions from cooking, equation (L16)			2.4723	ZC3
Total CO2 emissions			49.4476	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			49.4476	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 (m2)	Storey height (m)	Volume (m3)
Ground floor	69.9200 (1b)	x 2.4000 (2b)	= 167.8080 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	69.9200		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 167.8080 (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) =	0.1192 (8)
Pressure test				Yes	
Measured/design AP50				5.0000	
Infiltration rate				0.3692	(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) =		0.3415 (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	0.4354	0.4269	0.4183	0.3756	0.3671	0.3244	0.3244	0.3159	0.3415	0.3671	0.3842	0.4013 (22b)
Effective ac	0.5948	0.5911	0.5875	0.5706	0.5674	0.5526	0.5526	0.5499	0.5583	0.5674	0.5738	0.5805 (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)			10.4300	1.3258	13.8277		(27)					
F1r - Exposed Floor			69.9200	0.1300	9.0896		(28b)					
W1 - Clad	52.3500	10.4300	41.9200	0.1800	7.5456		(29a)					
W1 - To Corridor	30.8000	2.1420	28.6580	0.1800	5.1584		(29a)					
Total net area of external elements Aum(A, m2)			153.0680				(31)					
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) =	37.7613	(33)					
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							250.0000 (35)					
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							15.4671 (36)					
Total fabric heat loss						(33) + (36) =	53.2284 (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	32.9374	32.7336	32.5338	31.5954	31.4198	30.6025	30.6025	30.4511	30.9173	31.4198	31.7750	32.1463 (38)
Average = Sum(39)m / 12 =	86.1658	85.9620	85.7622	84.8238	84.6482	83.8309	83.8309	83.6795	84.1457	84.6482	85.0034	85.3747 (39)
HLP	1.2323	1.2294	1.2266	1.2132	1.2106	1.1990	1.1990	1.1968	1.2035	1.2106	1.2157	1.2210 (40)
HLP (average)												1.2131 (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												2.2442 (42)
Average daily hot water use (litres/day)												87.4993 (43)
Daily hot water use	96.2492	92.7493	89.2493	85.7493	82.2493	78.7494	78.7494	82.2493	85.7493	89.2493	92.7493	96.2492 (44)
Energy conte	142.7348	124.8368	128.8204	112.3087	107.7629	92.9912	86.1700	98.8813	100.0623	116.6130	127.2922	138.2311 (45)
Energy content (annual)												Total = Sum(45)m = 1376.7047 (45)
Distribution loss (46)m = 0.15 x (45)m	21.4102	18.7255	19.3231	16.8463	16.1644	13.9487	12.9255	14.8322	15.0093	17.4919	19.0938	20.7347 (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	189.3297	166.9225	175.4153	157.4006	154.3578	138.0830	132.7649	145.4762	145.1541	163.2079	172.3840	184.8260	(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	189.3297	166.9225	175.4153	157.4006	154.3578	138.0830	132.7649	145.4762	145.1541	163.2079	172.3840	184.8260	(64)
Heat gains from water heating, kWh/month	84.7353	75.1768	80.1087	73.4161	73.1071	66.9930	65.9275	70.1540	69.3442	76.0497	78.3981	83.2377	(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	112.2091	112.2091	112.2091	112.2091	112.2091	112.2091	112.2091	112.2091	112.2091	112.2091	112.2091	112.2091	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	18.5975	16.5181	13.4334	10.1700	7.6022	6.4181	6.9350	9.0143	12.0990	15.3625	17.9303	19.1144	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	197.1103	199.1557	194.0014	183.0284	169.1771	156.1588	147.4618	145.4164	150.5707	161.5436	175.3949	188.4133	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	34.2209	34.2209	34.2209	34.2209	34.2209	34.2209	34.2209	34.2209	34.2209	34.2209	34.2209	34.2209	(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)	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	(71)
Water heating gains (Table 5)	113.8915	111.8702	107.6730	101.9668	98.2622	93.0459	88.6122	94.2930	96.3114	102.2174	108.8863	111.8787	(72)
Total internal gains	389.2620	387.2068	374.7705	354.8280	334.7042	315.2855	302.6716	308.3864	318.6438	338.7862	361.8742	379.0690	(73)

6. Solar gains

[Jan]	Area	Solar flux	g	FF	Access	Gains
	m ²	Table 6a	Specific data	Specific data	factor	W
		W/m ²	or Table 6b	or Table 6c	Table 6d	
Northeast	7.0980	11.2829	0.6300	0.7000	0.7700	24.4754
Southeast	3.3320	36.7938	0.6300	0.7000	0.7700	37.4673
Solar gains	61.9427	113.6410	177.0827	255.6090	319.3404	331.5630
Total gains	451.2046	500.8478	551.8532	610.4369	654.0446	646.8485

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	56.3513	56.4849	56.6165	57.2429	57.3616	57.9209	57.9209	58.0256	57.7041	57.3616	57.1219	56.8735	56.8735	
alpha	4.7568	4.7657	4.7744	4.8162	4.8241	4.8614	4.8614	4.8684	4.8469	4.8241	4.8081	4.7916	4.7916	
util living area	0.9972	0.9950	0.9884	0.9651	0.8952	0.7438	0.5777	0.6373	0.8695	0.9768	0.9947	0.9978	(86)	
MIT	19.6912	19.8273	20.0752	20.4194	20.7320	20.9263	20.9829	20.9730	20.8321	20.4406	20.0094	19.6685	(87)	
Th 2	19.8942	19.8965	19.8988	19.9095	19.9115	19.9208	19.9208	19.9226	19.9172	19.9115	19.9074	19.9032	(88)	
util rest of house	0.9963	0.9932	0.9841	0.9512	0.8525	0.6499	0.4465	0.5050	0.8008	0.9649	0.9925	0.9970	(89)	
MIT 2	18.1611	18.3613	18.7230	19.2225	19.6439	19.8709	19.9145	19.9113	19.7788	19.2606	18.6352	18.1343	(90)	
Living area fraction	fLA = Living area / (4) =												0.4286	(91)
MIT	18.8170	18.9897	19.3026	19.7355	20.1103	20.3232	20.3725	20.3664	20.2303	19.7664	19.2242	18.7919	(92)	
Temperature adjustment													0.0000	
adjusted MIT	18.8170	18.9897	19.3026	19.7355	20.1103	20.3232	20.3725	20.3664	20.2303	19.7664	19.2242	18.7919	(93)	

8. Space heating requirement

Utilisation	0.9950	0.9912	0.9810	0.9484	0.8614	0.6875	0.5032	0.5621	0.8236	0.9628	0.9906	0.9959	(94)		
Useful gains	448.9409	496.4524	541.3742	578.9612	563.4112	444.6999	310.1170	321.6554	430.3636	452.7255	433.4259	429.3716	(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	1250.8665	1211.1765	1097.9771	919.1106	711.9169	479.7848	316.2491	331.9055	515.8383	775.9195	1030.6023	1245.7776	(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	596.6326	480.2946	414.1126	244.9076	110.4882	0.0000	0.0000	0.0000	0.0000	240.4563	429.9670	607.4061	(98)		
Space heating													3124.2651	(98)	
Space heating per m2													(98) / (4) =	44.6834	(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													3341.4600 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	596.6326	480.2946	414.1126	244.9076	110.4882	0.0000	0.0000	0.0000	0.0000	240.4563	429.9670	607.4061	(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)	638.1098	513.6840	442.9012	261.9332	118.1692	0.0000	0.0000	0.0000	0.0000	257.1726	459.8578	649.6322	(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	189.3297	166.9225	175.4153	157.4006	154.3578	138.0830	132.7649	145.4762	145.1541	163.2079	172.3840	184.8260	(64)
Efficiency of water heater (217)m	87.6683	87.4750	87.0278	85.9890	83.9403	79.8000	79.8000	79.8000	79.8000	85.8460	87.1556	79.8000	(216)
Fuel for water heating, kWh/month	215.9613	190.8232	201.5623	183.0473	183.8901	173.0364	166.3721	182.3011	181.8974	190.1169	197.7889	210.6162	(219)
Water heating fuel used													2277.4131 (219)
Annual totals kWh/year													
Space heating fuel - main system													3341.4600 (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)													328.4376 (232)
Total delivered energy for all uses													6022.3107 (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	3341.4600	0.2160	721.7554 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	2277.4131	0.2160	491.9212 (264)
Space and water heating			1213.6766 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	328.4376	0.5190	170.4591 (268)
Total CO2, kg/m2/year			1423.0607 (272)
Emissions per m2 for space and water heating			17.3581 (272a)
Fuel factor (electricity)			1.5500
Emissions per m2 for lighting			2.4379 (272b)
Emissions per m2 for pumps and fans			0.5567 (272c)
Target Carbon Dioxide Emission Rate (TER) = (17.3581 * 1.55) + 2.4379 + 0.5567, rounded to 2 d.p.			29.9000 (273)

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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	69.9200 (1b)	x 2.4000 (2b)	= 167.8080 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	69.9200		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 167.8080 (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) =	0.1192 (8)
Pressure test				Yes	
Measured/design AP50				2.6000	
Infiltration rate				0.2492	(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) =		0.2305 (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	0.2939	0.2881	0.2824	0.2535	0.2478	0.2190	0.2190	0.2132	0.2305	0.2478	0.2593	0.2708 (22b)
Effective ac	0.5432	0.5415	0.5399	0.5321	0.5307	0.5240	0.5240	0.5227	0.5266	0.5307	0.5336	0.5367 (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)			10.4300	1.3258	13.8277		(27)
Solid Door			2.1400	1.0900	2.3326		(26)
F1r - Exposed Floor			69.9200	0.1800	12.5856	70.5600	4933.5552 (28b)
W1 - Clad	52.3500	10.4300	41.9200	0.2100	8.8032	5.8200	243.9744 (29a)
W1 - To Corridor	30.8000	2.1420	28.6580	0.1600	4.5853	13.4400	385.1635 (29a)
Total net area of external elements Aum, m2			153.0680				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	42.1343		(33)
Party Wall			10.7200	0.0000	0.0000	20.0000	214.4000 (32)
Party Ceiling			69.9200			20.0000	1398.4000 (32b)
1st Floor Stud			108.6192			5.8200	632.1637 (32c)
Heat capacity Cm = Sum(A x k)							(28)...(30) + (32) + (32a)...(32e) =
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							7807.6569 (34)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							111.6656 (35)
Total fabric heat loss							9.7399 (36)
							(33) + (36) =
							51.8742 (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	30.0797	29.9868	29.8958	29.4683	29.3883	29.0159	29.0159	28.9470	29.1593	29.3883	29.5501	29.7193 (38)
Average = Sum(39)m / 12 =	81.9538	81.8610	81.7700	81.3425	81.2625	80.8901	80.8901	80.8212	81.0335	81.2625	81.4243	81.5934 (39)

HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	1.1721	1.1708	1.1695	1.1634	1.1622	1.1569	1.1569	1.1559	1.1589	1.1622	1.1645	1.1670 (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												2.2442 (42)
Average daily hot water use (litres/day)												87.4993 (43)
Daily hot water use	96.2492	92.7493	89.2493	85.7493	82.2493	78.7494	78.7494	82.2493	85.7493	89.2493	92.7493	96.2492 (44)
Energy content (annual)	142.7348	124.8368	128.8204	112.3087	107.7629	92.9912	86.1700	98.8813	100.0623	116.6130	127.2922	138.2311 (45)
Distribution loss (46)m = 0.15 x (45)m												Total = Sum(45)m =
Water storage loss:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1376.7047 (45)

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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	30.3312	26.5278	27.3743	23.8656	22.8996	19.7606	18.3111	21.0123	21.2632	24.7803	27.0496	29.3741	29.3741	(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	112.2091	112.2091	112.2091	112.2091	112.2091	112.2091	112.2091	112.2091	112.2091	112.2091	112.2091	112.2091	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	18.5975	16.5181	13.4334	10.1700	7.6022	6.4181	6.9350	9.0143	12.0990	15.3625	17.9303	19.1144	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	197.1103	199.1557	194.0014	183.0284	169.1771	156.1588	147.4618	145.4164	150.5707	161.5436	175.3949	188.4133	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	34.2209	34.2209	34.2209	34.2209	34.2209	34.2209	34.2209	34.2209	34.2209	34.2209	34.2209	34.2209	(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)	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	(71)
Water heating gains (Table 5)	40.7677	39.4759	36.7935	33.1467	30.7791	27.4453	24.6117	28.2423	29.5323	33.3068	37.5689	39.4813	(72)
Total internal gains	313.1382	311.8124	300.8910	283.0078	264.2210	246.6849	235.6712	239.3357	248.8647	266.8756	287.5568	303.6717	(73)

6. Solar gains

[Jan]			Area m2	Solar flux Table 6a W/m2	g Specific data or Table 6b	FF Specific data or Table 6c	Access factor Table 6d	Gains W					
Northeast			7.0980	11.2829	0.5000	0.0000	0.7700	30.8332 (75)					
Southeast			3.3320	36.7938	0.5000	0.0000	0.7700	47.1999 (77)					
Solar gains	78.0331	143.1608	223.0822	322.0068	402.2933	417.6909	395.0801	332.3840	256.8985	165.5579	95.3307	65.5732	(83)
Total gains	391.1713	454.9732	523.9732	605.0146	666.5143	664.3758	630.7513	571.7197	505.7632	432.4335	382.8876	369.2449	(84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Thl (C)													21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
tau	26.4636	26.4936	26.5231	26.6625	26.6887	26.8116	26.8116	26.8345	26.7641	26.6887	26.6357	26.5805	
alpha	2.7642	2.7662	2.7682	2.7775	2.7792	2.7874	2.7874	2.7890	2.7843	2.7792	2.7757	2.7720	
util living area	0.9774	0.9648	0.9390	0.8814	0.7797	0.6388	0.5079	0.5651	0.7715	0.9176	0.9668	0.9806	(86)
MIT	18.6618	18.9153	19.3542	19.9279	20.4386	20.7778	20.9153	20.8840	20.5978	19.9338	19.1900	18.6048	(87)
Th 2	19.9424	19.9434	19.9445	19.9494	19.9503	19.9546	19.9546	19.9554	19.9530	19.9503	19.9485	19.9465	(88)
util rest of house	0.9736	0.9589	0.9283	0.8597	0.7376	0.5661	0.4059	0.4630	0.7117	0.8979	0.9602	0.9773	(89)
MIT 2	17.8061	18.0575	18.4902	19.0492	19.5250	19.8188	19.9181	19.9014	19.6808	19.0667	18.3360	17.7525	(90)
Living area fraction									fLA = Living area / (4) =				0.4286 (91)
MIT	18.1729	18.4252	18.8605	19.4258	19.9166	20.2298	20.3455	20.3226	20.0738	19.4384	18.7020	18.1178	(92)
Temperature adjustment												0.0000	
adjusted MIT	18.1729	18.4252	18.8605	19.4258	19.9166	20.2298	20.3455	20.3226	20.0738	19.4384	18.7020	18.1178	(93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Useful gains	0.9650	0.9478	0.9147	0.8469	0.7361	0.5866	0.4459	0.5011	0.7194	0.8861	0.9499	0.9696	(94)
Ext temp.	377.4856	431.2455	479.2731	512.4154	490.5887	389.6909	281.2307	286.4861	363.8593	383.1883	363.6887	358.0162	(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	1136.9389	1107.1856	1010.7199	856.1949	667.7016	455.3968	302.9758	317.0286	484.0800	718.2289	944.6880	1135.6047	(97)
Space heating kWh	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	(97a)
Space heating per m2	565.0332	454.2318	395.3964	247.5213	131.7720	0.0000	0.0000	0.0000	0.0000	249.2702	418.3195	578.5258	(98)
												3040.0702	(98)
													43.4793 (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	760.3670	598.5868	614.2408	0.0000	0.0000	0.0000	0.0000	(100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.7796	0.8385	0.8054	0.0000	0.0000	0.0000	0.0000	(101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	592.7914	501.9392	494.7016	0.0000	0.0000	0.0000	0.0000	(102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	860.3663	819.4162	751.9112	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													

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Space cooling	0.0000	0.0000	0.0000	0.0000	0.0000	192.6540	236.2028	191.3639	0.0000	0.0000	0.0000	0.0000 (104)
Cooled fraction												620.2207 (104)
Intermittency factor (Table 10b)												1.0000 (105)
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	48.1635	59.0507	47.8410	0.0000	0.0000	0.0000	0.0000 (107)
Space cooling per m2												155.0552 (107)
Energy for space heating												2.2176 (108)
Energy for space cooling												43.4793 (99)
Total												2.2176 (108)
Dwelling Fabric Energy Efficiency (DFEE)												45.6969 (109)
												45.7 (109)

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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	69.9200 (1b)	x 2.4000 (2b)	= 167.8080 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	69.9200		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 167.8080 (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) =	0.1192 (8)
Pressure test				Yes	
Measured/design AP50					5.0000
Infiltration rate					0.3692 (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) =		0.3415 (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	0.4354	0.4269	0.4183	0.3756	0.3671	0.3244	0.3244	0.3159	0.3415	0.3671	0.3842	0.4013 (22b)
	0.5948	0.5911	0.5875	0.5706	0.5674	0.5526	0.5526	0.5499	0.5583	0.5674	0.5738	0.5805 (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)			10.4300	1.3258	13.8277		(27)					
F1r - Exposed Floor			69.9200	0.1300	9.0896		(28b)					
W1 - Clad	52.3500	10.4300	41.9200	0.1800	7.5456		(29a)					
W1 - To Corridor	30.8000	2.1420	28.6580	0.1800	5.1584		(29a)					
Total net area of external elements Aum, m2			153.0680				(31)					
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) =	37.7613	(33)					
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							250.0000 (35)					
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							15.4671 (36)					
Total fabric heat loss						(33) + (36) =	53.2284 (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	32.9374	32.7336	32.5338	31.5954	31.4198	30.6025	30.6025	30.4511	30.9173	31.4198	31.7750	32.1463 (38)
Average = Sum(39)m / 12 =	86.1658	85.9620	85.7622	84.8238	84.6482	83.8309	83.8309	83.6795	84.1457	84.6482	85.0034	85.3747 (39)
												84.8229 (39)
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	1.2323	1.2294	1.2266	1.2132	1.2106	1.1990	1.1990	1.1968	1.2035	1.2106	1.2157	1.2210 (40)
Days in month												1.2131 (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												2.2442 (42)
Average daily hot water use (litres/day)												87.4993 (43)
Daily hot water use	96.2492	92.7493	89.2493	85.7493	82.2493	78.7494	78.7494	82.2493	85.7493	89.2493	92.7493	96.2492 (44)
Energy conte	142.7348	124.8368	128.8204	112.3087	107.7629	92.9912	86.1700	98.8813	100.0623	116.6130	127.2922	138.2311 (45)
Energy content (annual)												Total = Sum(45)m = 1376.7047 (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)

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Calculation Type: New Build (As Designed)



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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	30.3312	26.5278	27.3743	23.8656	22.8996	19.7606	18.3111	21.0123	21.2632	24.7803	27.0496	29.3741	(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	112.2091	112.2091	112.2091	112.2091	112.2091	112.2091	112.2091	112.2091	112.2091	112.2091	112.2091	112.2091	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	18.5975	16.5181	13.4334	10.1700	7.6022	6.4181	6.9350	9.0143	12.0990	15.3625	17.9303	19.1144	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	197.1103	199.1557	194.0014	183.0284	169.1771	156.1588	147.4618	145.4164	150.5707	161.5436	175.3949	188.4133	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	34.2209	34.2209	34.2209	34.2209	34.2209	34.2209	34.2209	34.2209	34.2209	34.2209	34.2209	34.2209	(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)	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	-89.7672	(71)
Water heating gains (Table 5)	40.7677	39.4759	36.7935	33.1467	30.7791	27.4453	24.6117	28.2423	29.5323	33.3068	37.5689	39.4813	(72)
Total internal gains	313.1382	311.8124	300.8910	283.0078	264.2210	246.6849	235.6712	239.3357	248.8647	266.8756	287.5568	303.6717	(73)

6. Solar gains

[Jan]	Area m2	Solar flux Table 6a W/m2	g Specific data or Table 6b	FF Specific data or Table 6c	Access factor Table 6d	Gains W							
Northeast	7.0980	11.2829	0.6300	0.7000	0.7700	24.4754 (75)							
Southeast	3.3320	36.7938	0.6300	0.7000	0.7700	37.4673 (77)							
Solar gains	61.9427	113.6410	177.0827	255.6090	319.3404	331.5630	313.6146	263.8464	203.9260	131.4199	75.6735	52.0520	(83)
Total gains	375.0808	425.4534	477.9737	538.6168	583.5615	578.2479	549.2858	503.1822	452.7907	398.2955	363.2304	355.7237	(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)													21.0000 (85)
tau	56.3513	56.4849	56.6165	57.2429	57.3616	57.9209	57.9209	58.0256	57.7041	57.3616	57.1219	56.8735	
alpha	4.7568	4.7657	4.7744	4.8162	4.8241	4.8614	4.8614	4.8684	4.8469	4.8241	4.8081	4.7916	
util living area	0.9988	0.9975	0.9936	0.9782	0.9260	0.7969	0.6363	0.7034	0.9139	0.9879	0.9976	0.9991	(86)
MIT	19.5915	19.7295	19.9818	20.3367	20.6721	20.8992	20.9742	20.9587	20.7781	20.3532	19.9127	19.5693	(87)
Th 2	19.8942	19.8965	19.8988	19.9095	19.9115	19.9208	19.9208	19.9226	19.9172	19.9115	19.9074	19.9032	(88)
util rest of house	0.9983	0.9966	0.9911	0.9688	0.8920	0.7075	0.4975	0.5670	0.8596	0.9813	0.9966	0.9987	(89)
MIT 2	18.6116	18.7511	19.0041	19.3623	19.6796	19.8717	19.9140	19.9100	19.7838	19.3836	18.9429	18.5966	(90)
Living area fraction										fLA = Living area / (4) =			
MIT	19.0316	19.1704	19.4231	19.7800	20.1050	20.3121	20.3684	20.3595	20.2100	19.7992	19.3586	19.0135	(92)
Temperature adjustment												0.0000	
adjusted MIT	19.0316	19.1704	19.4231	19.7800	20.1050	20.3121	20.3684	20.3595	20.2100	19.7992	19.3586	19.0135	(93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9979	0.9958	0.9897	0.9675	0.8991	0.7430	0.5579	0.6263	0.8771	0.9804	0.9959	0.9984	(94)
Useful gains	374.2794	423.6622	473.0328	521.0863	524.6608	429.6648	306.4219	315.1359	397.1235	390.4734	361.7364	355.1370	(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	1269.3609	1226.7149	1108.3174	922.8819	711.4678	478.8504	315.9119	331.3304	514.1322	778.6959	1042.0220	1264.6998	(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	665.9406	539.6515	472.6517	289.2929	138.9844	0.0000	0.0000	0.0000	0.0000	288.8375	489.8056	676.7147	(98)
Space heating												3561.8790	(98)
Space heating per m2												50.9422	(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	788.0101	620.3484	635.9643	0.0000	0.0000	0.0000	0.0000	(100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.8139	0.8867	0.8515	0.0000	0.0000	0.0000	0.0000	(101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	641.3372	550.0603	541.5271	0.0000	0.0000	0.0000	0.0000	(102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	759.6974	724.1967	671.8023	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	85.2193	129.5575	96.9248	0.0000	0.0000	0.0000	0.0000	(104)
Space cooling												311.7016	(104)
Cooled fraction												1.0000	(105)
Intermittency factor (Table 10b)													

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	21.3048	32.3894	24.2312	0.0000	0.0000	0.0000	0.0000	(107)
Space cooling per m2													77.9254 (107)
Energy for space heating													1.1145 (108)
Energy for space cooling													50.9422 (99)
Total													1.1145 (108)
Target Fabric Energy Efficiency (TFEE)													52.0567 (109)
													59.9 (109)

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Designed)



Property Reference	Plot 023 - Block G		Issued on Date	19/02/2021	
Assessment Reference	006 E	Prop Type Ref	BEC-Dand - KW3		
Property	Flat 6, Block G, Knightswood, TUNBRIDGE WELLS, TN2				
SAP Rating	75 C	DER	30.27	TER	29.90
Environmental	78 C	% DER<TER	-1.24		
CO₂ Emissions (t/year)	1.83	DFEE	45.70	TFEE	59.87
General Requirements Compliance	Fail	% DFEE<TFEE	23.67		
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)	29.90	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	30.27	kgCO ₂ /m ²	
Excess emissions	0.37 (1.2%)	kgCO ₂ /m ²	Fail

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	59.87	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	45.70	kWh/m ² /yr	
	-14.2 (-23.7%)	kWh/m ² /yr	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.19 (max. 0.30)	0.21 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Floor	0.18 (max. 0.25)	0.18 (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 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)	Slight	Pass
Based on:		
Overshading	Average	
Windows facing North East	7.10 m ² , No overhang	
Windows facing South East	3.33 m ² , No overhang	
Air change rate	3.87 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 %			