



elmhurst
energy



SAP Report Submission for Building Regulations Compliance

Client:

Project: Abbey Road Retail Park
Barking

Contact: Heidi Pateman
Heidi Pateman
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Report Issue Date: 24/02/2022

EXCELLENCE
IN ENERGY
ASSESSMENT

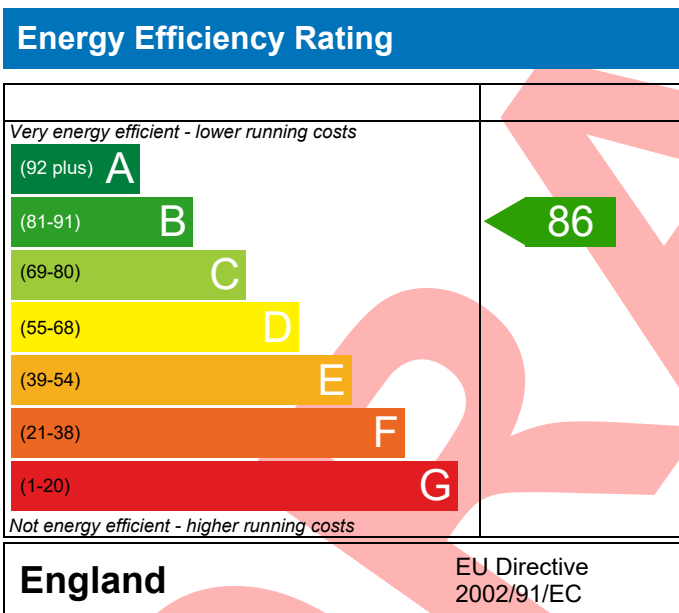
PREDICTED ENERGY ASSESSMENT

Abbey Road Retail Park,
Barking

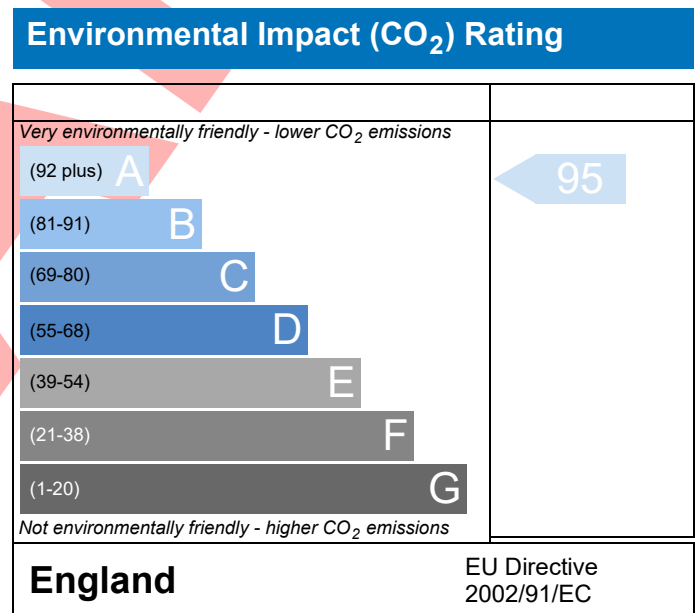
Dwelling type: Flat, End-Terrace
Date of assessment: 24/02/2022
Produced by: Heidi Pateman
Total floor area: 66.12 m²

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	WH190 Plot 350	Issued on Date	24/02/2022
Assessment Reference	Plot 350	Prop Type Ref	Flat Type B1N-11
Property	Abbey Road Retail Park, Barking		

SAP Rating	86 B	DER	7.75	TER	14.37
Environmental	95 A	% DER<TER	46.07		
CO ₂ Emissions (t/year)	0.42	DFEE	30.18	TFEE	31.85
General Requirements Compliance	Pass	% DFEE<TFEE	5.27		

Assessor Details	Mr. Paul Pasifull, Stansted Environmental Services, Tel: 01277225709, paul@sestesting.com	Assessor ID	P722-0001
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Client	
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SUMMARY FOR INPUT DATA FOR New Build (As Designed)

Criterion 1 – Achieving the TER and TFEE rate

1a TER and DER

Fuel for main heating	Mains gas (c)		
Fuel factor	1.00 (mains gas)		
Target Carbon Dioxide Emission Rate (TER)	14.37	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	7.75	kgCO ₂ /m ²	Pass
	-6.62 (-46.1%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	31.85	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	30.18	kWh/m ² /yr	
	-1.7 (-5.3%)	kWh/m ² /yr	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.16 (max. 0.30)	0.27 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Openings	1.40 (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	3.00 (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	Community heating scheme	-
Secondary heating system	None	

5 Cylinder insulation

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BUILDING REGULATION COMPLIANCE

Calculation Type: New Build (As Designed)

Hot water storage	Measured cylinder loss: 0.40 kWh/day Permitted by DBSCG 0.50	Pass
Primary pipework insulated	No primary pipework	

6 Controls

Space heating controls	Charging system linked to use of community heating, programmer and at least two room stats	Pass
Hot water controls	No cylinderstat	

7 Low energy lights

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

8 Mechanical ventilation

Continuous extract system		
Specific fan power	0.16	
Maximum	0.7	Pass

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (Thames Valley)	Slight	Pass
Based on:		
Overshading	Average	
Windows facing North	2.39 m ² , No overhang	
Windows facing East	6.67 m ² , No overhang	
Windows facing South	4.79 m ² , No overhang	
Air change rate	4.00 ach	
Blinds/curtains	None	

Criterion 4 – Building performance consistent with DER and DFEE rate

Party Walls

Type	U-value		
Solid Wall	0.00	W/m ² K	Pass
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	3.00 (design value)	m ³ /(h.m ²) @ 50 Pa	
Maximum	10.0	m ³ /(h.m ²) @ 50 Pa	Pass

10 Key features

External wall U-value	0.14	W/m ² K
External wall U-value	0.14	W/m ² K
Party wall U-value	0.00	W/m ² K
Party wall U-value	0.00	W/m ² K
Air permeability	3.0	m ³ /m ² h
Community CHP, Mains gas	N/A	
Photovoltaic array	265.00	kWh/Year

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RECOMMENDATIONS

	Typical cost	Typical savings per year	Energy efficiency	Environmental impact	Result
Low energy lights			0	0	Already installed
Solar water heating			0	0	Not applicable
Photovoltaic			0	0	Not applicable
Wind turbine			0	0	Not applicable
Totals	£0	£0	B 86	A 95	

DRAFT

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THERMAL BRIDGING

Calculation Type: New Build (As Designed)

Property Reference	WH190 Plot 350		Issued on Date	24/02/2022	
Assessment Reference	Plot 350	Prop Type Ref	Flat Type B1N-11		
Property	Abbey Road Retail Park, Barking				
SAP Rating	86 B	DER	7.75	TER	14.37
Environmental	95 A	% DER<TER	46.07		
CO ₂ Emissions (t/year)	0.42	DFEE	30.18	TFEE	31.85
General Requirements Compliance	Pass	% DFEE<TFEE	5.27		
Assessor Details	Mr. Paul Pasifull, Stansted Environmental Services, Tel: 01277225709, paul@sestesting.com			Assessor ID	P722-0001
Client					

	Junction detail	Source Type	Psi (W/mK)	Length (m)	Result	Reference
External wall	E2 Other lintels (including other steel lintels)	Table K1 - Approved	0.300	6.57	1.97	
External wall	E4 Jamb	Table K1 - Approved	0.050	16.88	0.84	
External wall	E7 Party floor between dwellings (in blocks of flats)	Table K1 - Approved	0.070	16.80	1.18	
External wall	E7 Party floor between dwellings (in blocks of flats)	Table K1 - Approved	0.070	13.64	0.95	
External wall	E8 Balcony within a dwelling, wall insulation continuous	Table K1 - Approved	0.000	3.16	0.00	
External wall	E16 Corner (normal)	Table K1 - Approved	0.090	2.68	0.24	
External wall	E18 Party wall between dwellings	Table K1 - Approved	0.060	5.35	0.32	
Party wall	P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	Table K1 - Default	0.000	16.80	0.00	
Party wall	P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	Table K1 - Default	0.000	16.80	0.00	

Total: **5.51** W/mK:
 Y-Value: **0.123** W/m²K:

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

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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

Mid-floor flat, total floor area 66 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:Mains gas (c)
Fuel factor:1.00 (mains gas)
Target Carbon Dioxide Emission Rate (TER) 14.37 kgCO₂/m²
Dwelling Carbon Dioxide Emission Rate (DER) 7.75 kgCO₂/m²OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)31.9 kWh/m²/yr
Dwelling Fabric Energy Efficiency (DFEE)30.2 kWh/m²/yrOK

2 Fabric U-values

Element	Average	Highest	
External wall	0.16 (max. 0.30)	0.27 (max. 0.70)	OK
Party wall	0.00 (max. 0.20)	-	OK
Floor	(no floor)		
Roof	(no roof)		
Openings	1.40 (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: 3.00 (design value)
Maximum 10.0 OK

4 Heating efficiency

Main heating system: Community heating scheme -
Secondary heating system: None

5 Cylinder insulation

Hot water storage Measured cylinder loss: 0.40 kWh/day
Permitted by DBSCG 0.50 OK
Primary pipework insulated: No primary pipework

6 Controls

Space heating controls: Charging system linked to use of community heating, programmer and at least two room statsOK
Hot water controls: No cylinderstat

7 Low energy lights

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

8 Mechanical ventilation

Continuous extract system
Specific fan power: 0.16
Maximum 0.7 OK

9 Summertime temperature

Overheating risk (Thames Valley): Slight OK
Based on:
Overshading: Average
Windows facing North: 2.39 m², No overhang
Windows facing East: 6.67 m², No overhang
Windows facing South: 4.79 m², No overhang
Air change rate: 4.00 ach
Blinds/curtains: None

10 Key features

External wall U-value 0.14 W/m²K
External wall U-value 0.14 W/m²K
Party wall U-value 0.00 W/m²K
Party wall U-value 0.00 W/m²K
Air permeability 3.0 m³/m²h
Community CHP, Mains gas
Photovoltaic array 265.00 kWh/Year

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 (m2)	Storey height (m)	Volume (m3)
Ground floor	66.1200 (1b)	2.5000 (2b)	165.3000 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	66.1200		165.3000 (4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	165.3000 (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				0 * 10 =	0.0000 (7a)
Number of passive vents				0 * 10 =	0.0000 (7b)
Number of flueless gas fires				0 * 40 =	0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(7a)+(7b)+(7c) =				0.0000 / (5) =	0.0000 (8)
Pressure test					Yes
Measured/design AP50					3.0000
Infiltration rate					0.1500 (18)
Number of sides sheltered					2 (19)
Shelter factor				(20) = 1 - [0.075 x (19)] =	0.8500 (20)
Infiltration rate adjusted to include shelter factor				(21) = (18) x (20) =	0.1275 (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				0.1403	0.1371	0.1211	0.1211	0.1179	0.1275	0.1371	0.1434	0.1498 (22b)
Mechanical extract ventilation - centralised												0.5000 (23a)
If mechanical ventilation:												
Effective ac	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000 (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)			7.1800	1.3258	9.5189		(27)
Full glazed door (Uw = 1.40)			6.6700	1.3258	8.8428		(27)
2. Column wall	5.6700		5.6700	0.2700	1.5309	150.0000	850.5000 (29a)
3. Uni panel cladding	14.6200	7.1800	7.4400	0.1400	1.0416	14.0000	104.1600 (29a)
1. Uni panel brick	24.6400	6.6700	17.9700	0.1400	2.5158	14.0000	251.5800 (29a)
Total net area of external elements Aum(A, m2)			44.9300				(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) =	23.4500	(33)
Party Wall 1			9.6000	0.0000	0.0000	180.0000	1728.0000 (32)
Party Wall 2			35.3400	0.0000	0.0000	70.0000	2473.8000 (32)
Party Floor			66.1200			40.0000	2644.8000 (32d)
Party Ceilings			66.1200			40.0000	2644.8000 (32b)
Internal Wall - SFS			131.9900			9.0000	1187.9100 (32c)
Heat capacity Cm = Sum(A x k)						(28)...(30) + (32) + (32a)...(32e) =	11885.5500 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							179.7573 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							5.5080 (36)
Total fabric heat loss						(33) + (36) =	28.9580 (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
(38)m	27.2745	27.2745	27.2745	27.2745	27.2745	27.2745	27.2745	27.2745	27.2745	27.2745	27.2745	27.2745 (38)
Heat transfer coeff	56.2325	56.2325	56.2325	56.2325	56.2325	56.2325	56.2325	56.2325	56.2325	56.2325	56.2325	56.2325 (39)
Average = Sum(39)m / 12 =												56.2325 (39)

HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	0.8505	0.8505	0.8505	0.8505	0.8505	0.8505	0.8505	0.8505	0.8505	0.8505	0.8505	0.8505 (40)
HLP (average)												0.8505 (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												2.1484 (42)
Average daily hot water use (litres/day)												85.2239 (43)
Daily hot water use	93.7463	90.3374	86.9284	83.5195	80.1105	76.7015	76.7015	80.1105	83.5195	86.9284	90.3374	93.7463 (44)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE 09 Jan 2014

Energy content (annual)	139.0231	121.5905	125.4705	109.3882	104.9606	90.5730	83.9292	96.3100	97.4603	113.5805	123.9820	134.6365 (45)
Distribution loss (46)m = 0.15 x (45)m												1340.9045 (45)
Water storage loss:												
Store volume												10.0000 (47)
a) If manufacturer declared loss factor is known (kWh/day):												0.4000 (48)
Temperature factor from Table 2b												1.0000 (49)
Enter (49) or (54) in (55)												0.4000 (55)
Total storage loss												
If cylinder contains dedicated solar storage												
Primary loss	23.2624	21.0112	23.2624	22.5120	23.2624	22.5120	23.2624	23.2624	23.2624	22.5120	23.2624	23.2624 (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												
	74.7551	66.1978	70.2489	63.9812	63.4293	57.7251	56.4364	60.5530	60.0151	66.2954	68.8336	73.2965 (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	107.4188	107.4188	107.4188	107.4188	107.4188	107.4188	107.4188	107.4188	107.4188	107.4188	107.4188	107.4188 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	16.8163	14.9361	12.1468	9.1959	6.8741	5.8034	6.2708	8.1510	10.9402	13.8911	16.2130	17.2837 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	188.0777	190.0293	185.1112	174.6411	161.4245	149.0028	140.7043	138.7526	143.6708	154.1408	167.3574	179.7792 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	33.7419	33.7419	33.7419	33.7419	33.7419	33.7419	33.7419	33.7419	33.7419	33.7419	33.7419	33.7419 (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)	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351 (71)
Water heating gains (Table 5)	100.4773	98.5086	94.4205	88.8628	85.2545	80.1738	75.8554	81.3884	83.3544	89.1068	95.6023	98.5169 (72)
Total internal gains	360.5969	358.6997	346.9042	327.9255	308.7787	290.2056	278.0561	283.5177	293.1910	312.3644	334.3983	350.8053 (73)

6. Solar gains

[Jan]	Area m2	Solar flux Table 6a W/m2	Specific data or Table 6b	FF Specific data or Table 6c	Access factor Table 6d	Gains W						
North	2.3900	10.6334	0.4200	0.7000	0.7700	5.1779 (74)						
South	4.7900	46.7521	0.4200	0.7000	0.7700	45.6265 (78)						
East	6.6700	19.6403	0.4200	0.7000	0.7700	26.6903 (76)						
Solar gains	77.4946	136.8315	197.9855	259.9933	302.1762	304.1620	291.5568	259.8793	219.6537	154.3300	93.7502	65.6908 (83)
Total gains	438.0915	495.5312	544.8897	587.9188	610.9549	594.3676	569.6129	543.3970	512.8446	466.6944	428.1485	416.4962 (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	58.7123	58.7123	58.7123	58.7123	58.7123	58.7123	58.7123	58.7123	58.7123	58.7123	58.7123	58.7123
alpha	4.9142	4.9142	4.9142	4.9142	4.9142	4.9142	4.9142	4.9142	4.9142	4.9142	4.9142	4.9142
util living area	0.9873	0.9759	0.9496	0.8854	0.7605	0.5841	0.4303	0.4694	0.6987	0.9095	0.9758	0.9899 (86)
MIT	20.0053	20.1718	20.4149	20.6861	20.8855	20.9750	20.9954	20.9930	20.9417	20.6851	20.2855	19.9545 (87)
Th 2	20.2098	20.2098	20.2098	20.2098	20.2098	20.2098	20.2098	20.2098	20.2098	20.2098	20.2098	20.2098 (88)
util rest of house	0.9845	0.9708	0.9389	0.8618	0.7164	0.5194	0.3549	0.3918	0.6359	0.8856	0.9698	0.9877 (89)
MIT 2	18.8772	19.1173	19.4639	19.8379	20.0923	20.1904	20.2074	20.2059	20.1596	19.8443	19.2837	18.8037 (90)
Living area fraction										FLA = Living area / (4) =		
MIT	19.2981	19.5107	19.8187	20.1544	20.3882	20.4832	20.5014	20.4996	20.4514	20.1580	19.6575	19.2331 (92)
Temperature adjustment												0.0000
adjusted MIT	19.2981	19.5107	19.8187	20.1544	20.3882	20.4832	20.5014	20.4996	20.4514	20.1580	19.6575	19.2331 (93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Useful gains	429.4904	478.2717	508.1976	505.6021	444.0792	322.3188	218.1427	228.5549	336.3889	412.4593	412.9417	409.8770 (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	843.3794	821.5986	748.9449	632.8620	488.5619	330.8254	219.3879	230.5307	357.1546	537.4710	706.1404	845.3478 (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	307.9334	230.7157	179.1160	91.6271	33.0951	0.0000	0.0000	0.0000	0.0000	93.0087	211.1030	323.9903 (98)
Space heating												1470.5893 (98)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE 09 Jan 2014

Space heating per m2 (98) / (4) = 22.2412 (99)

8c. Space cooling requirement

Not applicable

9b. Energy requirements

Fraction of space heat from secondary/supplementary system (Table 11)	0.0000 (301)
Fraction of space heat from community system	1.0000 (302)
Fraction of heat from community Boilers	0.1740 (303a)
Fraction of heat from community Combined Heat and Power	0.8260 (303b)
Fraction of total space heat from community Boilers	0.1740 (304a)
Fraction of total space heat from community Combined Heat and Power	0.8260 (304b)
Factor for control and charging method (Table 4c(3)) for community space heating	1.0000 (305)
Factor for control and charging method (Table 4c(3)) for community water heating	1.0000 (305a)
Distribution loss factor (Table 12c) for community heating system	1.0500 (306)
Space heating:	
Annual space heating requirement	1470.5893 (98)
Space heat from Boilers = (98) x 0.17 x 1.00 x 1.05	268.6767 (307a)
Space heat from Combined Heat and Power = (98) x 0.83 x 1.00 x 1.05	1275.4421 (307b)
Efficiency of secondary/supplementary heating system in % (from Table 4a or Appendix E)	0.0000 (308)
Space heating fuel for secondary/supplementary system	0.0000 (309)
Water heating	
Annual water heating requirement	1760.8005 (64)
Water heat from Boilers = (64) x 0.17 x 1.00 x 1.05	321.6982 (310a)
Water heat from Combined Heat and Power = (64) x 0.83 x 1.00 x 1.05	1527.1423 (310b)
Electricity used for heat distribution	33.9296 (313)
Annual totals kWh/year	
Electricity for pumps and fans:	
(MEV)Centralised, Database: in-use factor = 1.3000, SFP = 0.2080)	
mechanical ventilation fans (SFP = 0.2080)	41.9465 (330a)
Total electricity for the above, kWh/year	41.9465 (331)
Electricity for lighting (calculated in Appendix L)	296.9808 (332)
Energy saving/generation technologies (Appendices M ,N and Q)	
Total delivered energy for all uses	3731.8867 (338)

12b. Carbon dioxide emissions - Community heating scheme

	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year
Efficiency of heat source Boilers			91.4000 (367a)
Space heating from Boilers	645.9244	0.2160	139.5197 (367)
Electrical efficiency of CHP unit			33.2000 (361)
Heat efficiency of CHP unit			38.6000 (362)
Space heating from Combined Heat and Power	3304.2542	0.2160	713.7189 (363)
less credit emissions for electricity	-1097.0124	0.5190	-569.3494 (364)
Water heating from Combined Heat and Power	3956.3271	0.2160	854.5667 (365)
less credit emissions for electricity	-1313.5006	0.5190	-681.7068 (366)
Electrical energy for heat distribution	33.9296	0.5190	17.6095 (372)
Total CO2 associated with community systems (negative value allowed since DFEE <= TFEE)			474.3585 (373)
Space and water heating			474.3585 (376)
Pumps and fans	41.9465	0.5190	21.7702 (378)
Energy for lighting	296.9808	0.5190	154.1331 (379)
Energy saving/generation technologies			
PV Unit	-265.0000	0.5190	-137.5350 (380)
Total CO2, kg/year			512.7268 (383)
Dwelling Carbon Dioxide Emission Rate (DER)			7.7500 (384)

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

DER			7.7500 ZC1
Total Floor Area		TFA	66.1200
Assumed number of occupants		N	2.1484
CO2 emission factor in Table 12 for electricity displaced from grid		EF	0.5190
CO2 emissions from appliances, equation (L14)			16.8558 ZC2
CO2 emissions from cooking, equation (L16)			2.5796 ZC3
Total CO2 emissions			27.1854 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			27.1854 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	66.1200 (1b)	2.5000 (2b)	165.3000 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	66.1200		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	165.3000 (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) =	0.1210 (8)
Pressure test				Yes	
Measured/design AP50					5.0000
Infiltration rate					0.3710 (18)
Number of sides sheltered					2 (19)
Shelter factor			(20) = 1 - [0.075 x (19)] =		0.8500 (20)
Infiltration rate adjusted to include shelter factor			(21) = (18) x (20) =		0.3153 (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	0.4021	0.3942	0.3863	0.3469	0.3390	0.2996	0.2996	0.2917	0.3153	0.3390	0.3548	0.3705 (22b)
Effective ac	0.5808	0.5777	0.5746	0.5602	0.5575	0.5449	0.5449	0.5425	0.5497	0.5575	0.5629	0.5686 (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 Opening Type (Uw = 1.40)			13.8500	1.3258	18.3617		(27)					
2. Column wall	5.6700		5.6700	0.1800	1.0206		(29a)					
3. Uni panel cladding	14.6200	7.1800	7.4400	0.1800	1.3392		(29a)					
1. Uni panel brick	24.6400	6.6700	17.9700	0.1800	3.2346		(29a)					
Total net area of external elements Aum(A, m2)			44.9300				(31)					
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) =	23.9561	(33)					
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							250.0000 (35)					
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							3.8655 (36)					
Total fabric heat loss						(33) + (36) =	27.8216 (37)					
Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)												
(38)m	31.6835	31.5123	31.3445	30.5563	30.4088	29.7223	29.7223	29.5951	29.9867	30.4088	30.7071	31.0191 (38)
Heat transfer coeff	59.5052	59.3340	59.1662	58.3779	58.2304	57.5439	57.5439	57.4168	57.8084	58.2304	58.5288	58.8407 (39)
Average = Sum(39)m / 12 =												58.3772 (39)
HLP	0.9000	0.8974	0.8948	0.8829	0.8807	0.8703	0.8703	0.8684	0.8743	0.8807	0.8852	0.8899 (40)
HLP (average)												0.8829 (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												2.1484 (42)
Average daily hot water use (litres/day)												85.2239 (43)
Daily hot water use	93.7463	90.3374	86.9284	83.5195	80.1105	76.7015	76.7015	80.1105	83.5195	86.9284	90.3374	93.7463 (44)
Energy conte	139.0231	121.5905	125.4705	109.3882	104.9606	90.5730	83.9292	96.3100	97.4603	113.5805	123.9820	134.6365 (45)
Energy content (annual)												Total = Sum(45)m = 1340.9045 (45)
Distribution loss (46)m = 0.15 x (45)m	20.8535	18.2386	18.8206	16.4082	15.7441	13.5860	12.5894	14.4465	14.6190	17.0371	18.5973	20.1955 (46)
Water storage loss:												
Store volume												10.0000 (47)
a) If manufacturer declared loss factor is known (kWh/day):												0.3712 (48)
Temperature factor from Table 2b												0.5400 (49)
Enter (49) or (54) in (55)												0.2005 (55)
Total storage loss												

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

CALCULATION OF TARGET EMISSIONS 09 Jan 2014

If cylinder contains dedicated solar storage	6.2141	5.6127	6.2141	6.0136	6.2141	6.0136	6.2141	6.2141	6.0136	6.2141	6.0136	6.2141	(56)
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	(57)
Total heat required for water heating calculated for each month	168.4996	148.2144	154.9470	137.9139	134.4371	119.0987	113.4057	125.7865	125.9859	143.0570	152.5077	164.1130	(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	168.4996	148.2144	154.9470	137.9139	134.4371	119.0987	113.4057	125.7865	125.9859	143.0570	152.5077	164.1130	(64)
Heat gains from water heating, kWh/month	69.8064	61.7280	65.3001	59.1921	58.4806	52.9360	51.4877	55.6043	55.2261	61.3467	64.0445	68.3478	(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)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	16.8163	14.9361	12.1468	9.1959	6.8741	5.8034	6.2708	8.1510	10.9402	13.8911	16.2130	17.2837	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	188.0777	190.0293	185.1112	174.6411	161.4245	149.0028	140.7043	138.7526	143.6708	154.1408	167.3574	179.7792	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	33.7419	33.7419	33.7419	33.7419	33.7419	33.7419	33.7419	33.7419	33.7419	33.7419	33.7419	33.7419	(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)	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351	(71)
Water heating gains (Table 5)	93.8258	91.8571	87.7690	82.2113	78.6030	73.5223	69.2039	74.7369	76.7029	82.4553	88.9508	91.8654	(72)
Total internal gains	356.9454	355.0482	343.2527	324.2740	305.1272	286.5541	274.4046	279.8662	289.5395	308.7129	330.7468	347.1538	(73)

6. Solar gains

[Jan]	Area m ²	Solar flux Table 6a W/m ²	g Specific data or Table 6b	FF Specific data or Table 6c	Access factor Table 6d	Gains W							
North	2.3900	10.6334	0.6300	0.7000	0.7700	7.7668 (74)							
East	6.6700	19.6403	0.6300	0.7000	0.7700	40.0355 (76)							
South	4.7900	46.7521	0.6300	0.7000	0.7700	68.4397 (78)							
Solar gains	116.2420	205.2472	296.9783	389.9900	453.2642	456.2430	437.3352	389.8190	329.4805	231.4950	140.6253	98.5362	(83)
Total gains	473.1874	560.2954	640.2310	714.2640	758.3914	742.7971	711.7398	669.6852	619.0200	540.2079	471.3721	445.6901	(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	77.1641	77.3868	77.6063	78.6542	78.8534	79.7941	79.7941	79.9708	79.4291	78.8534	78.4514	78.0356	
alpha	6.1443	6.1591	6.1738	6.2436	6.2569	6.3196	6.3196	6.3314	6.2953	6.2569	6.2301	6.2024	
util living area	0.9945	0.9842	0.9525	0.8571	0.6869	0.4928	0.3554	0.3937	0.6294	0.9063	0.9857	0.9961	(86)
MIT	20.2215	20.3987	20.6305	20.8594	20.9692	20.9967	20.9996	20.9993	20.9861	20.8267	20.4793	20.1880	(87)
Th 2	20.1675	20.1697	20.1719	20.1821	20.1840	20.1928	20.1928	20.1945	20.1894	20.1840	20.1801	20.1761	(88)
util rest of house	0.9928	0.9796	0.9395	0.8247	0.6351	0.4320	0.2904	0.3251	0.5615	0.8758	0.9807	0.9948	(89)
MIT 2	19.1335	19.3909	19.7193	20.0299	20.1570	20.1908	20.1927	20.1942	20.1797	19.9981	19.5172	19.0915	(90)
Living area fraction	fLA = Living area / (4) = 0.3731 (91)												
MIT	19.5394	19.7669	20.0593	20.3394	20.4600	20.4915	20.4938	20.4946	20.4806	20.3073	19.8761	19.5006	(92)
Temperature adjustment	0.0000												
adjusted MIT	19.5394	19.7669	20.0593	20.3394	20.4600	20.4915	20.4938	20.4946	20.4806	20.3073	19.8761	19.5006	(93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Useful gains	468.9886	547.3031	600.1739	593.7933	495.3024	337.7181	223.9597	234.8972	362.9912	475.8940	461.1788	442.7986
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	906.8238	882.1127	802.2507	667.8064	510.0999	339.0187	224.0630	235.0991	368.8515	565.2583	747.7722	900.2983
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
Space heating kWh	325.7494	224.9921	150.3451	53.2895	11.0094	0.0000	0.0000	0.0000	0.0000	66.4870	206.3473	340.3798
Space heating	1378.5996 (98)											
Space heating per m ²	(98) / (4) = 20.8500 (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													1474.4381 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	325.7494	224.9921	150.3451	53.2895	11.0094	0.0000	0.0000	0.0000	0.0000	66.4870	206.3473	340.3798	(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)	348.3951	240.6332	160.7969	56.9941	11.7747	0.0000	0.0000	0.0000	0.0000	71.1091	220.6923	364.0426	(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	168.4996	148.2144	154.9470	137.9139	134.4371	119.0987	113.4057	125.7865	125.9859	143.0570	152.5077	164.1130	(64)
Efficiency of water heater (217)m	86.5439	85.9245	84.7336	82.5192	80.5206	79.8000	79.8000	79.8000	79.8000	82.9103	85.6210	86.7175	(217)
Fuel for water heating, kWh/month	194.6985	172.4938	182.8637	167.1295	166.9599	149.2465	142.1124	157.6272	157.8771	172.5443	178.1195	189.2500	(219)
Water heating fuel used													2030.9225 (219)
Annual totals kWh/year													
Space heating fuel - main system													1474.4381 (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)													296.9808 (232)
Total delivered energy for all uses													3877.3414 (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	1474.4381	0.2160	318.4786 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	2030.9225	0.2160	438.6793 (264)
Space and water heating			757.1579 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	296.9808	0.5190	154.1331 (268)
Total CO2, kg/m2/year			950.2159 (272)
Emissions per m2 for space and water heating			11.4513 (272a)
Fuel factor (mains gas)			1.0000
Emissions per m2 for lighting			2.3311 (272b)
Emissions per m2 for pumps and fans			0.5887 (272c)
Target Carbon Dioxide Emission Rate (TER) = (11.4513 * 1.00) + 2.3311 + 0.5887, rounded to 2 d.p.			14.3700 (273)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

CALCULATION OF FABRIC ENERGY EFFICIENCY 09 Jan 2014

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

1. Overall dwelling dimensions

	Area (m2)	Storey height (m)	Volume (m3)
Ground floor	66.1200 (1b)	x 2.5000 (2b)	= 165.3000 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	66.1200		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 165.3000 (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) =	0.1210 (8)
Pressure test				Yes	
Measured/design AP50					3.0000
Infiltration rate					0.2710 (18)
Number of sides sheltered					2 (19)
Shelter factor				(20) = 1 - [0.075 x (19)] =	0.8500 (20)
Infiltration rate adjusted to include shelter factor				(21) = (18) x (20) =	0.2303 (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	0.2937	0.2879	0.2822	0.2534	0.2476	0.2188	0.2188	0.2131	0.2303	0.2476	0.2591	0.2707 (22b)
Effective ac	0.5431	0.5415	0.5398	0.5321	0.5307	0.5239	0.5239	0.5227	0.5265	0.5307	0.5336	0.5366 (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)			7.1800	1.3258	9.5189		(27)
Full glazed door (Uw = 1.40)			6.6700	1.3258	8.8428		(27)
2. Column wall	5.6700		5.6700	0.2700	1.5309	150.0000	850.5000 (29a)
3. Uni panel cladding	14.6200	7.1800	7.4400	0.1400	1.0416	14.0000	104.1600 (29a)
1. Uni panel brick	24.6400	6.6700	17.9700	0.1400	2.5158	14.0000	251.5800 (29a)
Total net area of external elements Aum(A, m2)			44.9300				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	23.4500		(33)
Party Wall 1			9.6000	0.0000	0.0000	180.0000	1728.0000 (32)
Party Wall 2			35.3400	0.0000	0.0000	70.0000	2473.8000 (32)
Party Floor			66.1200			40.0000	2644.8000 (32d)
Party Ceilings			66.1200			30.0000	1983.6000 (32b)
Internal Wall - SFS			131.9900			9.0000	1187.9100 (32c)

Heat capacity Cm = Sum(A x k) (28)...(30) + (32) + (32a)...(32e) = 11224.3500 (34)
 Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K 169.7573 (35)
 Thermal bridges (Sum(L x Psi) calculated using Appendix K) 5.5080 (36)
 Total fabric heat loss (33) + (36) = 28.9580 (37)

Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(38)m	29.6270	29.5356	29.4461	29.0255	28.9468	28.5805	28.5805	28.5127	28.7216	28.9468	29.1060	29.2724 (38)
Heat transfer coeff	58.5850	58.4937	58.4041	57.9836	57.9049	57.5386	57.5386	57.4707	57.6797	57.9049	58.0641	58.2305 (39)
Average = Sum(39)m / 12 =												57.9832 (39)
HLP	0.8860	0.8847	0.8833	0.8769	0.8758	0.8702	0.8702	0.8692	0.8723	0.8758	0.8782	0.8807 (40)
HLP (average)												0.8769 (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												2.1484 (42)
Average daily hot water use (litres/day)												85.2239 (43)
Daily hot water use	93.7463	90.3374	86.9284	83.5195	80.1105	76.7015	76.7015	80.1105	83.5195	86.9284	90.3374	93.7463 (44)
Energy conte	139.0231	121.5905	125.4705	109.3882	104.9606	90.5730	83.9292	96.3100	97.4603	113.5805	123.9820	134.6365 (45)
Energy content (annual)												Total = Sum(45)m = 1340.9045 (45)
Distribution loss (46)m = 0.15 x (45)m												

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

CALCULATION OF FABRIC ENERGY EFFICIENCY 09 Jan 2014

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	0.0000	0.0000	(46)
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	29.5424	25.8380	26.6625	23.2450	22.3041	19.2468	17.8350	20.4659	20.7103	24.1359	26.3462	28.6102	28.6102	(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	107.4188	107.4188	107.4188	107.4188	107.4188	107.4188	107.4188	107.4188	107.4188	107.4188	107.4188	107.4188	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	16.8163	14.9361	12.1468	9.1959	6.8741	5.8034	6.2708	8.1510	10.9402	13.8911	16.2130	17.2837	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	188.0777	190.0293	185.1112	174.6411	161.4245	149.0028	140.7043	138.7526	143.6708	154.1408	167.3574	179.7792	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	33.7419	33.7419	33.7419	33.7419	33.7419	33.7419	33.7419	33.7419	33.7419	33.7419	33.7419	33.7419	(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)	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351	(71)
Water heating gains (Table 5)	39.7075	38.4494	35.8367	32.2847	29.9787	26.7316	23.9717	27.5079	28.7643	32.4407	36.5919	38.4546	(72)
Total internal gains	299.8271	298.6404	288.3204	271.3474	253.5029	236.7634	226.1724	229.6372	238.6009	255.6983	275.3880	290.7431	(73)

6. Solar gains

[Jan]	Area m ²	Solar flux Table 6a W/m ²	g Specific data or Table 6b	FF Specific data or Table 6c	Access factor Table 6d	Gains W
North	2.3900	10.6334	0.4200	0.7000	0.7700	5.1779 (74)
South	4.7900	46.7521	0.4200	0.7000	0.7700	45.6265 (78)
East	6.6700	19.6403	0.4200	0.7000	0.7700	26.6903 (76)

Solar gains	77.4946	136.8315	197.9855	259.9933	302.1762	304.1620	291.5568	259.8793	219.6537	154.3300	93.7502	65.6908	(83)
Total gains	377.3218	435.4719	486.3059	531.3408	555.6791	540.9254	517.7292	489.5165	458.2546	410.0283	369.1381	356.4339	(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	53.2196	53.3028	53.3845	53.7717	53.8448	54.1876	54.1876	54.2515	54.0550	53.8448	53.6972	53.5437	
alpha	4.5480	4.5535	4.5590	4.5848	4.5897	4.6125	4.6125	4.6168	4.6037	4.5897	4.5798	4.5696	
util living area	0.9919	0.9837	0.9644	0.9139	0.8080	0.6391	0.4796	0.5251	0.7592	0.9381	0.9847	0.9937	(86)
MIT	19.7710	19.9552	20.2307	20.5595	20.8174	20.9539	20.9901	20.9851	20.8978	20.5562	20.0957	19.7286	(87)
Th 2	20.1794	20.1806	20.1817	20.1871	20.1882	20.1929	20.1929	20.1938	20.1911	20.1882	20.1861	20.1840	(88)
util rest of house	0.9901	0.9802	0.9566	0.8948	0.7673	0.5717	0.3958	0.4394	0.6987	0.9203	0.9808	0.9923	(89)
MIT 2	19.0468	19.2302	19.5020	19.8221	20.0553	20.1672	20.1892	20.1878	20.1275	19.8254	19.3752	19.0083	(90)
Living area fraction	$f_{LA} = \text{Living area} / (4) =$											0.3731 (91)	
MIT	19.3170	19.5007	19.7739	20.0972	20.3397	20.4608	20.4880	20.4853	20.4149	20.0980	19.6440	19.2770	(92)
Temperature adjustment													0.0000
adjusted MIT	19.3170	19.5007	19.7739	20.0972	20.3397	20.4608	20.4880	20.4853	20.4149	20.0980	19.6440	19.2770	(93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	0.9877	0.9766	0.9519	0.8924	0.7755	0.5948	0.4269	0.4711	0.7166	0.9180	0.9776	0.9903	(94)
Useful gains	372.6946	425.2936	462.9322	474.1770	430.9141	321.7694	221.0374	230.6069	328.3661	376.4074	360.8520	352.9688	(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	879.7729	854.0515	775.2498	649.2546	500.2784	337.2193	223.7105	234.7836	364.2398	549.9832	728.3568	877.9437	(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	377.2663	288.1253	232.3643	126.0558	51.6070	0.0000	0.0000	0.0000	0.0000	129.1404	264.6034	390.5813	(98)
Space heating												1859.7439 (98)	
Space heating per m ²												(98) / (4) = 28.1268 (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	540.8626	425.7855	436.7777	0.0000	0.0000	0.0000	0.0000	(100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.9140	0.9543	0.9419	0.0000	0.0000	0.0000	0.0000	(101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	494.3669	406.3212	411.3933	0.0000	0.0000	0.0000	0.0000	(102)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

CALCULATION OF FABRIC ENERGY EFFICIENCY 09 Jan 2014

Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	712.1525	683.4419	651.7400	0.0000	0.0000	0.0000	0.0000 (103)
Month fracti	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.0000	0.0000 (103a)
Space cooling kWh												
Space cooling	0.0000	0.0000	0.0000	0.0000	0.0000	156.8056	206.1778	178.8179	0.0000	0.0000	0.0000	0.0000 (104)
Space cooling												541.8014 (104)
Cooled fraction												1.0000 (105)
Intermittency factor (Table 10b)												
Intermittency factor	0.0000	0.0000	0.0000	0.0000	0.0000	0.2500	0.2500	0.2500	0.0000	0.0000	0.0000	0.0000 (106)
Space cooling kWh												
Space cooling	0.0000	0.0000	0.0000	0.0000	0.0000	39.2014	51.5445	44.7045	0.0000	0.0000	0.0000	0.0000 (107)
Space cooling												135.4503 (107)
Space cooling per m2												2.0486 (108)
Energy for space heating												28.1268 (99)
Energy for space cooling												2.0486 (108)
Total												30.1754 (109)
Dwelling Fabric Energy Efficiency (DFEE)												30.2 (109)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

CALCULATION OF TARGET FABRIC ENERGY EFFICIENCY 09 Jan 2014

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

1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	66.1200 (1b)	2.5000 (2b)	165.3000 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	66.1200		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	165.3000 (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) =	0.1210 (8)
Pressure test					Yes
Measured/design AP50					5.0000
Infiltration rate					0.3710 (18)
Number of sides sheltered					2 (19)
Shelter factor				(20) = 1 - [0.075 x (19)] =	0.8500 (20)
Infiltration rate adjusted to include shelter factor				(21) = (18) x (20) =	0.3153 (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	0.4021	0.3942	0.3863	0.3469	0.3390	0.2996	0.2996	0.2917	0.3153	0.3390	0.3548	0.3705 (22b)
Effective ac	0.5808	0.5777	0.5746	0.5602	0.5575	0.5449	0.5449	0.5425	0.5497	0.5575	0.5629	0.5686 (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 Opening Type (Uw = 1.40)			13.8500	1.3258	18.3617		(27)
2. Column wall	5.6700		5.6700	0.1800	1.0206		(29a)
3. Uni panel cladding	14.6200	7.1800	7.4400	0.1800	1.3392		(29a)
1. Uni panel brick	24.6400	6.6700	17.9700	0.1800	3.2346		(29a)
Total net area of external elements Aum(A, m ²)			44.9300				(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) =	23.9561	(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)							3.8655 (36)
Total fabric heat loss						(33) + (36) =	27.8216 (37)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)												
(38)m	31.6835	31.5123	31.3445	30.5563	30.4088	29.7223	29.7223	29.5951	29.9867	30.4088	30.7071	31.0191 (38)
Heat transfer coeff	59.5052	59.3340	59.1662	58.3779	58.2304	57.5439	57.5439	57.4168	57.8084	58.2304	58.5288	58.8407 (39)
Average = Sum(39)m / 12 =												58.3772 (39)
HLP	0.9000	0.8974	0.8948	0.8829	0.8807	0.8703	0.8703	0.8684	0.8743	0.8807	0.8852	0.8899 (40)
HLP (average)												0.8829 (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												2.1484 (42)
Average daily hot water use (litres/day)												85.2239 (43)
Daily hot water use	93.7463	90.3374	86.9284	83.5195	80.1105	76.7015	76.7015	80.1105	83.5195	86.9284	90.3374	93.7463 (44)
Energy conte	139.0231	121.5905	125.4705	109.3882	104.9606	90.5730	83.9292	96.3100	97.4603	113.5805	123.9820	134.6365 (45)
Energy content (annual)												Total = Sum(45)m = 1340.9045 (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												
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 (57)
												0.0000 (59)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

CALCULATION OF TARGET FABRIC ENERGY EFFICIENCY 09 Jan 2014

Heat gains from water heating, kWh/month
 29.5424 25.8380 26.6625 23.2450 22.3041 19.2468 17.8350 20.4659 20.7103 24.1359 26.3462 28.6102 (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	107.4188	107.4188	107.4188	107.4188	107.4188	107.4188	107.4188	107.4188	107.4188	107.4188	107.4188	107.4188 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	16.8163	14.9361	12.1468	9.1959	6.8741	5.8034	6.2708	8.1510	10.9402	13.8911	16.2130	17.2837 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	188.0777	190.0293	185.1112	174.6411	161.4245	149.0028	140.7043	138.7526	143.6708	154.1408	167.3574	179.7792 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	33.7419	33.7419	33.7419	33.7419	33.7419	33.7419	33.7419	33.7419	33.7419	33.7419	33.7419	33.7419 (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)	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351	-85.9351 (71)
Water heating gains (Table 5)	39.7075	38.4494	35.8367	32.2847	29.9787	26.7316	23.9717	27.5079	28.7643	32.4407	36.5919	38.4546 (72)
Total internal gains	299.8271	298.6404	288.3204	271.3474	253.5029	236.7634	226.1724	229.6372	238.6009	255.6983	275.3880	290.7431 (73)

6. Solar gains

[Jan]		Area m2	Solar flux Table 6a W/m2	Specific data or Table 6b	FF Specific data or Table 6c	Access factor Table 6d	Gains W					
North		2.3900	10.6334	0.6300	0.7000	0.7700	7.7668 (74)					
East		6.6700	19.6403	0.6300	0.7000	0.7700	40.0355 (76)					
South		4.7900	46.7521	0.6300	0.7000	0.7700	68.4397 (78)					
Solar gains	116.2420	205.2472	296.9783	389.9900	453.2642	456.2430	437.3352	389.8190	329.4805	231.4950	140.6253	98.5362 (83)
Total gains	416.0691	503.8876	585.2986	661.3375	706.7671	693.0064	663.5076	619.4561	568.0814	487.1933	416.0132	389.2793 (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	77.1641	77.3868	77.6063	78.6542	78.8534	79.7941	79.7941	79.9708	79.4291	78.8534	78.4514	78.0356	
alpha	6.1443	6.1591	6.1738	6.2436	6.2569	6.3196	6.3196	6.3314	6.2953	6.2569	6.2301	6.2024	
util living area	0.9972	0.9907	0.9680	0.8886	0.7266	0.5268	0.3811	0.4253	0.6777	0.9369	0.9925	0.9981 (86)	
MIT	20.1386	20.3210	20.5660	20.8228	20.9582	20.9952	20.9995	20.9990	20.9792	20.7772	20.4020	20.1054 (87)	
Th 2	20.1675	20.1697	20.1719	20.1821	20.1840	20.1928	20.1928	20.1945	20.1894	20.1840	20.1801	20.1761 (88)	
util rest of house	0.9964	0.9879	0.9584	0.8602	0.6748	0.4624	0.3115	0.3514	0.6077	0.9134	0.9897	0.9975 (89)	
MIT 2	19.3793	19.5619	19.8025	20.0480	20.1584	20.1908	20.1927	20.1942	20.1793	20.0150	19.6520	19.3534 (90)	
Living area fraction	$f_{LA} = \text{Living area} / (4) =$												
MIT	19.6626	19.8451	20.0874	20.3371	20.4568	20.4909	20.4937	20.4945	20.4777	20.2994	19.9319	19.6340 (92)	
Temperature adjustment	0.0000												
adjusted MIT	19.6626	19.8451	20.0874	20.3371	20.4568	20.4909	20.4937	20.4945	20.4777	20.2994	19.9319	19.6340 (93)	

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9957	0.9865	0.9573	0.8660	0.6927	0.4864	0.3375	0.3790	0.6334	0.9172	0.9886	0.9970 (94)
Useful gains	414.2637	497.0742	560.2991	572.7335	489.5940	337.0891	223.9035	234.7742	359.7956	446.8387	411.2677	388.1144 (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	914.1562	886.7529	803.9134	667.6749	509.9144	338.9868	224.0591	235.0906	368.6866	564.8012	751.0336	908.1483 (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	371.9200	261.8641	181.2490	68.3578	15.1183	0.0000	0.0000	0.0000	0.0000	87.7641	244.6314	386.9052 (98)
Space heating per m2											(98) / (4) =	24.4678 (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	540.9128	425.8250	436.3675	0.0000	0.0000	0.0000	0.0000 (100)	
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.9827	0.9938	0.9903	0.0000	0.0000	0.0000	0.0000 (101)	
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	531.5439	423.1791	432.1441	0.0000	0.0000	0.0000	0.0000 (102)	
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	889.9095	853.8322	803.6176	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	258.0233	320.4059	276.3763	0.0000	0.0000	0.0000	0.0000 (104)	
Space cooling												854.8054 (104)	
Cooled fraction												$f_c = \text{cooled area} / (4) =$	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	64.5058	80.1015	69.0941	0.0000	0.0000	0.0000	0.0000	(107)
Space cooling per m2													213.7014 (107)
Energy for space heating													3.2320 (108)
Energy for space cooling													24.4678 (99)
Total													3.2320 (108)
Target Fabric Energy Efficiency (TFEE)													27.6998 (109)
													31.9 (109)

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Property Reference	WH190 Plot 350	Issued on Date	24/02/2022
Assessment Reference	Plot 350	Prop Type Ref	Flat Type B1N-11
Property	Abbey Road Retail Park, Barking		

SAP Rating	86 B	DER	7.75	TER	14.37
Environmental	95 A	% DER<TER	46.07		
CO ₂ Emissions (t/year)	0.42	DFEE	30.18	TFEE	31.85
General Requirements Compliance	Pass	% DFEE<TFEE	5.27		

Assessor Details	Mr. Paul Pasifull, Stansted Environmental Services, Tel: 01277225709, paul@sestesting.com	Assessor ID	P722-0001
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Client	
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SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	West
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Urban
1.0 Property Type	Flat, End-Terrace
2.0 Number of Storeys	1
3.0 Date Built	2022
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	16.80 m	66.12 m ²	2.50 m

7.0 Living Area	24.67	m ²
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8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	179.76	kJ/m ² K

9.0 External Walls

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)	Nett Area (m ²)
2. Column wall	Solid Wall	Solid wall : plasterboard on dabs, 200 mm dense block, insulated externally	0.27	150.00	5.67	5.67
3. Uni panel cladding	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.14	14.00	14.62	7.44
1. Uni panel brick	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.14	14.00	24.64	17.97

9.1 Party Walls

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)
Party Wall 1	Solid Wall	Dense plaster both sides, dense blocks, cavity or cavity fill	0.00	180.00	9.60
Party Wall 2	Filled Cavity with Edge Sealing	Single plasterboard on dabs on both sides, dense blocks, cavity or cavity fill	0.00	70.00	35.34

9.2 Internal Walls

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Wall - SFS	Other	9.00	131.99

10.1 Party Ceilings

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Party Ceiling	Other	9.00	131.99

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Party Ceilings	Precast concrete planks floor, screed, carpeted	30.00	66.12

11.1 Party Floors

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Party Floor	Precast concrete planks floor, screed, carpeted	40.00	66.12

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m ² K)
Windows	Manufacturer	Window	Double Low-E Hard 0.2			0.42		0.70	1.40
Full glazed door	Manufacturer	Window	Double Low-E Hard 0.2			0.42		0.70	1.40

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m ²)	Curtain Closed
Window East	Window	[2] 3. Uni panel cladding	North	None	0.00					2.39	
Glazed Door East	Window	[3] 1. Uni panel brick	East	None	0.00					6.67	
Window South	Window	[2] 3. Uni panel cladding	South	None	0.00					4.79	

14.0 Conservatory

15.0 Draught Proofing

 %

16.0 Draught Lobby

17.0 Thermal Bridging

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Table K1 - Approved	E2 Other lintels (including other steel lintels)	6.57	0.300	Yes
Table K1 - Approved	E4 Jamb	16.88	0.050	Yes
Table K1 - Approved	E7 Party floor between dwellings (in blocks of flats)	16.80	0.070	No
Table K1 - Approved	E7 Party floor between dwellings (in blocks of flats)	13.64	0.070	No
Table K1 - Approved	E8 Balcony within a dwelling, wall insulation continuous	3.16	0.000	No
Table K1 - Approved	E16 Corner (normal)	2.68	0.090	No
Table K1 - Approved	E18 Party wall between dwellings	5.35	0.060	No
Table K1 - Default	P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	16.80	0.000	No
Table K1 - Default	P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	16.80	0.000	No

Y-value	<input type="text" value="0.123"/>	W/m ² K
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18.0 Pressure Testing

Designed AP ₅₀	<input type="text" value="3.00"/>	m ³ /(h.m ²) @ 50 Pa
Property Tested ?	<input type="text"/>	
As Built AP ₅₀	<input type="text"/>	m ³ /(h.m ²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	<input type="text" value="Windows fully open"/>
Cross ventilation possible	<input type="text" value="No"/>
Night Ventilation	<input type="text" value="Yes"/>
Air change rate	<input type="text" value="4.00"/>

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	Yes
Mechanical Ventilation data Type	Database
Type	Mechanical extract ventilation - centralised
MV Reference Number	500644
Configuration	3
Manufacturer SFP	0.16
Duct Type	Rigid
Wet Rooms	3

20.0 Fans, Open Fireplaces, Flues

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

21.0 Fixed Cooling System

No

22.0 Lighting

Internal

Total number of light fittings	10	
Total number of L.E.L. fittings	10	
Percentage of L.E.L. fittings	100.00	%

External

External lights fitted: No

23.0 Electricity Tariff

Standard

24.0 Main Heating 1

None

26.0 Community Heating

Community Heating: Space and Water Combined

Space Community Heating

PCDF Index	n/a
Distribution Loss	Piping system >= 1991, pre-insulated, low temp, variable flow
Controls	CCL Charging system linked to use of community heating, programmer and at least two room stats
SAP Code	2312
PCDF Index	n/a

Heat Source	Fuel Type	Heating Use	Efficiency	Percentage Of Heat	Heat	Heat Power Ratio	Electrical
Heat Source 1	Boilers	Mains Gas	Space and Water	91.40	17.40%		
Heat Source 2	Combined Heat and Power	Mains Gas	Space and Water	91.40	82.60%	38.60	1.00 33.20

28.0 Water Heating

Water Heating	HWP From main heating 1
Flue Gas Heat Recovery System	Community Heating
Waste Water Heat Recovery Instantaneous System 1	No
	No

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Waste Water Heat Recovery Instantaneous System 2	<input type="text" value="No"/>	
Waste Water Heat Recovery Storage System	<input type="text" value="No"/>	
Solar Panel	<input type="text" value="No"/>	
Water use <= 125 litres/person/day	<input type="text" value="Yes"/>	
SAP Code	<input type="text" value="901"/>	
<hr/>		
29.0 Hot Water Cylinder	<input type="text" value="HIU"/>	
Insulation Type	<input type="text" value="Measured Loss"/>	
Cylinder Volume	<input type="text" value="10.00"/>	L
Loss	<input type="text" value="0.40"/>	kWh/day
<hr/>		
32.0 Photovoltaic Unit	<input type="text" value="More Dwellings, One Block"/>	
Apportioned	<input type="text" value="265.00"/>	kWh/Year

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None