



elmhurst
energy



SAP Report Submission for Building Regulations Compliance

Client:

Project: Abbey Road Retail Park
Barking

Contact: Paul Pasifull
Paul Pasifull
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Report Issue Date: 24/02/2022

EXCELLENCE
IN ENERGY
ASSESSMENT

PREDICTED ENERGY ASSESSMENT

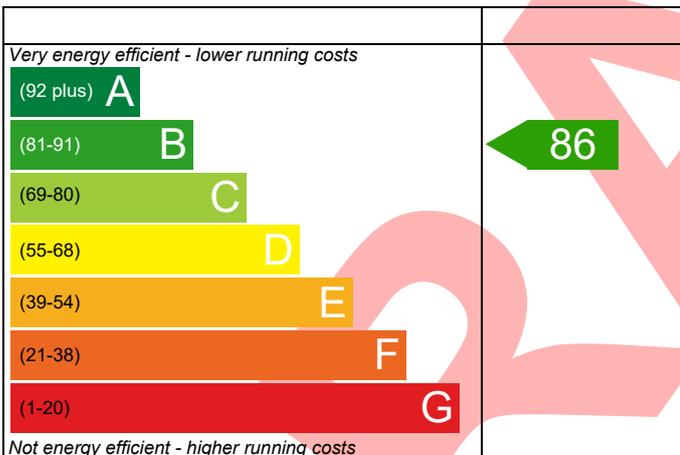
Abbey Road Retail Park,
Barking

Dwelling type: Flat, End-Terrace
Date of assessment: 24/02/2022
Produced by: Paul Pasifull
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.

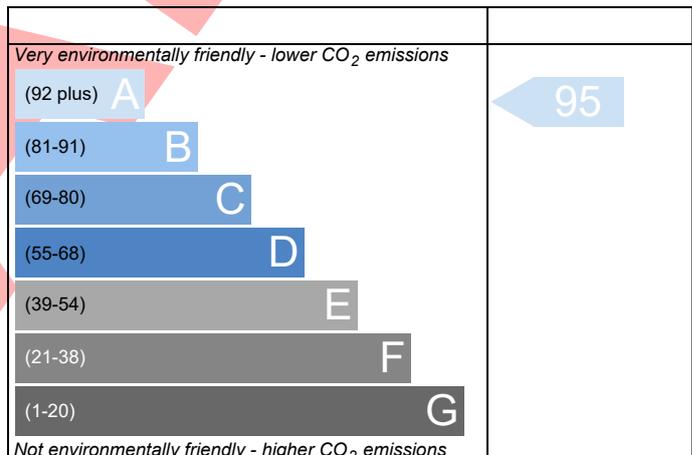
Energy Efficiency Rating



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	WH190 Plot 336	Issued on Date	24/02/2022
Assessment Reference	Plot 336	Prop Type Ref	Flat Type B1N-11
Property	Abbey Road Retail Park, Barking		

SAP Rating	86 B	DER	7.78	TER	14.42
Environmental	95 A	% DER<TER	46.03		
CO ₂ Emissions (t/year)	0.42	DFEE	30.35	TFEE	32.08
General Requirements Compliance	Pass	% DFEE<TFEE	5.41		

Assessor Details	Mr. Paul Pasifull, Stansted Environmental Services, Tel: 01277225709, paul@sestesting.com	Assessor ID	Q133-0001
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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)	14.42	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	7.78	kgCO ₂ /m ²	Pass
	-6.64 (-46.0%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	32.08	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	30.35	kWh/m ² /yr	
	-1.8 (-5.6%)	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 336		Issued on Date	24/02/2022
Assessment Reference	Plot 336	Prop Type Ref	Flat Type B1N-11	
Property	Abbey Road Retail Park, Barking			

SAP Rating	86 B	DER	7.78	TER	14.42
Environmental	95 A	% DER<TER	46.03		
CO ₂ Emissions (t/year)	0.42	DFEE	30.35	TFEE	32.08
General Requirements Compliance	Pass	% DFEE<TFEE	5.41		

Assessor Details	Mr. Paul Pasifull, Stansted Environmental Services, Tel: 01277225709, paul@sestesting.com	Assessor ID	Q133-0001
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	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	2.75	0.25	
External wall	E18 Party wall between dwellings	Table K1 - Approved	0.060	5.50	0.33	
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: **5.52** W/mK:
 Y-Value: **0.120** W/m²K:

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

Property Reference	WH190 Plot 336			Issued on Date	24/02/2022
Assessment Reference	Plot 336	Prop Type Ref	Flat Type B1N-11		
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SAP Rating	86 B	DER	7.78	TER	14.42
Environmental	95 A	% DER<TER	46.03		
CO ₂ Emissions (t/year)	0.42	DFEE	30.35	TFEE	32.08
General Requirements Compliance	Pass	% DFEE<TFEE	5.41		
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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) 14.42 kgCO₂/m²
Dwelling Carbon Dioxide Emission Rate (DER) 7.78 kgCO₂/m²OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE) 32.1 kWh/m²/yr
Dwelling Fabric Energy Efficiency (DFEE) 30.3 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/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	
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)
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				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	0.1626	0.1594	0.1562	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	5.8300		5.8300	0.2700	1.5741	150.0000	874.5000 (29a)
3. Uni panel cladding	15.0300	7.1800	7.8500	0.1400	1.0990	14.0000	109.9000 (29a)
1. Uni panel brick	25.3300	6.6700	18.6600	0.1400	2.6124	14.0000	261.2400 (29a)
Total net area of external elements Aum(A, m2)			46.1900				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	23.6472		(33)
Party Wall 1			9.8700	0.0000	0.0000	180.0000	1776.6000 (32)
Party Wall 2			36.3300	0.0000	0.0000	70.0000	2543.1000 (32)
Party Floor			66.1200			40.0000	2644.8000 (32d)
Party Ceilings			66.1200			40.0000	2644.8000 (32b)
Internal Wall - SFS			135.6900			9.0000	1221.2100 (32c)
Heat capacity Cm = Sum(A x k)						(28)...(30) + (32) + (32a)...(32e) =	12076.1500 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							182.6399 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							5.5233 (36)
Total fabric heat loss						(33) + (36) =	29.1705 (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	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)
Average = Sum(39)m / 12 =	56.4450	56.4450	56.4450	56.4450	56.4450	56.4450	56.4450	56.4450	56.4450	56.4450	56.4450	56.4450 (39)
HLP	0.8537	0.8537	0.8537	0.8537	0.8537	0.8537	0.8537	0.8537	0.8537	0.8537	0.8537	0.8537 (40)
HLP (average)												0.8537 (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	22.5120	23.2624	22.5120	23.2624 (57)
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	174.6855	153.8017	161.1329	143.9002	140.6230	125.0850	119.5916	131.9724	131.9723	149.2429	158.4940	170.2989 (62)
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	59.4292	59.4292	59.4292	59.4292	59.4292	59.4292	59.4292	59.4292	59.4292	59.4292	59.4292	59.4292 (85)
alpha	4.9619	4.9619	4.9619	4.9619	4.9619	4.9619	4.9619	4.9619	4.9619	4.9619	4.9619	4.9619
util living area	0.9879	0.9769	0.9513	0.8880	0.7635	0.5865	0.4320	0.4714	0.7016	0.9119	0.9769	0.9905 (86)
MIT	20.0121	20.1771	20.4185	20.6882	20.8867	20.9755	20.9956	20.9932	20.9425	20.6871	20.2901	19.9619 (87)
Th 2	20.2071	20.2071	20.2071	20.2071	20.2071	20.2071	20.2071	20.2071	20.2071	20.2071	20.2071	20.2071 (88)
util rest of house	0.9852	0.9720	0.9407	0.8645	0.7191	0.5213	0.3560	0.3931	0.6383	0.8881	0.9710	0.9883 (89)
MIT 2	18.8838	19.1219	19.4661	19.8382	20.0912	20.1882	20.2048	20.2033	20.1578	19.8443	19.2872	18.8111 (90)
Living area fraction												
MIT	19.3048	19.5156	19.8214	20.1553	20.3880	20.4820	20.4998	20.4980	20.4506	20.1588	19.6614	19.2404 (92)
Temperature adjustment												0.0000
adjusted MIT	19.3048	19.5156	19.8214	20.1553	20.3880	20.4820	20.4998	20.4980	20.4506	20.1588	19.6614	19.2404 (93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Useful gains	429.9006	478.9623	509.3257	507.2599	445.8763	323.5980	218.9153	229.3841	337.7623	413.6935	413.5452	410.2108 (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	846.9459	824.9775	751.9282	635.3081	490.3954	332.0077	220.1264	231.3142	358.4577	539.5463	709.0296	848.9583 (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	310.2817	232.5222	180.4962	92.1947	33.1223	0.0000	0.0000	0.0000	0.0000	93.6345	212.7487	326.4281 (98)
Space heating												1481.4284 (98)

FULL SAP CALCULATION PRINTOUT

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Space heating per m2 (98) / (4) = 22.4051 (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	1481.4284 (98)
Space heat from Boilers = (98) x 0.17 x 1.00 x 1.05	270.6570 (307a)
Space heat from Combined Heat and Power = (98) x 0.83 x 1.00 x 1.05	1284.8429 (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	34.0434 (313)
Annual totals kWh/year	
Electricity for pumps and fans:	
(MEVCentralised, 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	3743.2677 (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	648.0911	0.2160	139.9877 (367)
Electrical efficiency of CHP unit			33.2000 (361)
Heat efficiency of CHP unit			38.6000 (362)
Space heating from Combined Heat and Power	3328.6085	0.2160	718.9794 (363)
less credit emissions for electricity	-1105.0980	0.5190	-573.5459 (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	34.0434	0.5190	17.6685 (372)
Total CO2 associated with community systems (negative value allowed since DFEE <= TFEE)			475.9496 (373)
Space and water heating			475.9496 (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			514.3179 (383)
Dwelling Carbon Dioxide Emission Rate (DER)			7.7800 (384)

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

DER		7.7800 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		27.2154 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		27.2154 ZC8

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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					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	5.8300		5.8300	0.1800	1.0494		(29a)					
3. Uni panel cladding	15.0300	7.1800	7.8500	0.1800	1.4130		(29a)					
1. Uni panel brick	25.3300	6.6700	18.6600	0.1800	3.3588		(29a)					
Total net area of external elements Aum(A, m2)			46.1900				(31)					
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) =	24.1829	(33)					
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							250.0000 (35)					
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							3.8808 (36)					
Total fabric heat loss						(33) + (36) =	28.0637 (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	59.7473	59.5761	59.4083	58.6200	58.4725	57.7860	57.7860	57.6589	58.0505	58.4725	58.7709	59.0828 (39)
Average = Sum(39)m / 12 =												58.6193 (39)
HLP	0.9036	0.9010	0.8985	0.8866	0.8843	0.8740	0.8740	0.8720	0.8780	0.8843	0.8889	0.8936 (40)
HLP (average)												0.8866 (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												

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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)
(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	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 m2	Solar flux Table 6a W/m2	Specific data or Table 6b	g Specific data or Table 6c	FF	Access factor Table 6d	Gains W						
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	76.8515	77.0723	77.2900	78.3293	78.5269	79.4598	79.4598	79.6350	79.0979	78.5269	78.1282	77.7158	
alpha	6.1234	6.1382	6.1527	6.2220	6.2351	6.2973	6.2973	6.3090	6.2732	6.2351	6.2085	6.1811	
util living area	0.9945	0.9843	0.9530	0.8585	0.6890	0.4948	0.3569	0.3954	0.6315	0.9073	0.9858	0.9961	(86)
MIT	20.2160	20.3935	20.6260	20.8566	20.9683	20.9965	20.9996	20.9993	20.9856	20.8239	20.4747	20.1825	(87)
Th 2	20.1644	20.1666	20.1688	20.1789	20.1808	20.1897	20.1897	20.1913	20.1863	20.1808	20.1770	20.1730	(88)
util rest of house	0.9928	0.9797	0.9400	0.8261	0.6371	0.4336	0.2914	0.3262	0.5634	0.8769	0.9808	0.9949	(89)
MIT 2	19.1232	19.3808	19.7105	20.0236	20.1530	20.1876	20.1896	20.1911	20.1763	19.9918	19.5082	19.0811	(90)
Living area fraction	fLA = Living area / (4) =												0.3731 (91)
MIT	19.5309	19.7587	20.0521	20.3344	20.4572	20.4894	20.4918	20.4926	20.4782	20.3022	19.8688	19.4921	(92)
Temperature adjustment													0.0000
adjusted MIT	19.5309	19.7587	20.0521	20.3344	20.4572	20.4894	20.4918	20.4926	20.4782	20.3022	19.8688	19.4921	(93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Useful gains	469.0061	547.3886	600.5019	594.7736	496.7977	338.9685	224.7830	235.7641	364.1942	476.4400	461.2464	442.8088	(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	910.0056	885.2206	805.1051	670.2849	512.0552	340.3255	224.8917	235.9761	370.2600	567.3142	750.4331	903.4976	(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	328.1036	227.0231	152.2247	54.3681	11.3516	0.0000	0.0000	0.0000	0.0000	67.6104	208.2144	342.7525	(98)
Space heating													1391.6486 (98)
Space heating per m2													(98) / (4) = 21.0473 (99)

8c. Space cooling requirement

Not applicable

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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													1488.3942 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	328.1036	227.0231	152.2247	54.3681	11.3516	0.0000	0.0000	0.0000	0.0000	67.6104	208.2144	342.7525	(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)	350.9130	242.8055	162.8072	58.1477	12.1407	0.0000	0.0000	0.0000	0.0000	72.3106	222.6892	366.5802	(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	86.5618	85.9480	84.7667	82.5600	80.5415	79.8000	79.8000	79.8000	79.8000	82.9474	85.6449	86.7345	(217)
Fuel for water heating, kWh/month	194.6581	172.4466	182.7924	167.0468	166.9167	149.2465	142.1124	157.6272	157.8771	172.4671	178.0698	189.2130	(219)
Water heating fuel used													2030.4738 (219)
Annual totals kWh/year													
Space heating fuel - main system													1488.3942 (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													3890.8489 (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	1488.3942	0.2160	321.4931 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	2030.4738	0.2160	438.5823 (264)
Space and water heating			760.0755 (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			953.1335 (272)
Emissions per m2 for space and water heating			11.4954 (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) = (11.4954 * 1.00) + 2.3311 + 0.5887, rounded to 2 d.p.			14.4200 (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	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					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	5.8300		5.8300	0.2700	1.5741	150.0000	874.5000 (29a)
3. Uni panel cladding	15.0300	7.1800	7.8500	0.1400	1.0990	14.0000	109.9000 (29a)
1. Uni panel brick	25.3300	6.6700	18.6600	0.1400	2.6124	14.0000	261.2400 (29a)
Total net area of external elements Aum(A, m2)			46.1900				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	23.6472		(33)
Party Wall 1			9.8700	0.0000	0.0000	180.0000	1776.6000 (32)
Party Wall 2			36.3300	0.0000	0.0000	70.0000	2543.1000 (32)
Party Floor			66.1200			40.0000	2644.8000 (32d)
Party Ceilings			66.1200			30.0000	1983.6000 (32b)
Internal Wall - SFS			135.6900			9.0000	1221.2100 (32c)
Heat capacity Cm = Sum(A x k)						(28)...(30) + (32) + (32a)...(32e) =	11414.9500 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							172.6399 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							5.5233 (36)
Total fabric heat loss						(33) + (36) =	29.1705 (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	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)
Average = Sum(39)m / 12 =	58.7975	58.7062	58.6166	58.1961	58.1174	57.7511	57.7511	57.6832	57.8922	58.1174	58.2766	58.4430 (39)
												58.1957 (39)
HLP	0.8893	0.8879	0.8865	0.8802	0.8790	0.8734	0.8734	0.8724	0.8756	0.8790	0.8814	0.8839 (40)
HLP (average)												0.8802 (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)

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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	(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	(56)
If cylinder contains dedicated solar storage	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(57)
Primary loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(59)
Heat gains from water heating, kWh/month	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 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	53.9278	54.0117	54.0942	54.4851	54.5589	54.9049	54.9049	54.9695	54.7711	54.5589	54.4099	54.2549	
alpha	4.5952	4.6008	4.6063	4.6323	4.6373	4.6603	4.6603	4.6646	4.6514	4.6373	4.6273	4.6170	
util living area	0.9924	0.9845	0.9658	0.9163	0.8110	0.6418	0.4816	0.5273	0.7623	0.9401	0.9855	0.9941	(86)
MIT	19.7811	19.9634	20.2365	20.5629	20.8193	20.9548	20.9904	20.9855	20.8991	20.5595	20.1027	19.7391	(87)
Th 2	20.1766	20.1778	20.1790	20.1844	20.1854	20.1901	20.1901	20.1910	20.1883	20.1854	20.1834	20.1812	(88)
util rest of house	0.9907	0.9811	0.9581	0.8973	0.7703	0.5739	0.3971	0.4409	0.7014	0.9225	0.9817	0.9927	(89)
MIT 2	19.0536	19.2351	19.5046	19.8225	20.0544	20.1651	20.1866	20.1853	20.1258	19.8256	19.3790	19.0155	(90)
Living area fraction													fLA = Living area / (4) = 0.3731 (91)
MIT	19.3250	19.5069	19.7777	20.0988	20.3398	20.4598	20.4865	20.4838	20.4143	20.0994	19.6490	19.2855	(92)
Temperature adjustment													0.0000
adjusted MIT	19.3250	19.5069	19.7777	20.0988	20.3398	20.4598	20.4865	20.4838	20.4143	20.0994	19.6490	19.2855	(93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9884	0.9777	0.9537	0.8951	0.7785	0.5973	0.4285	0.4729	0.7195	0.9203	0.9786	0.9908	(94)
Useful gains	372.9488	425.7662	463.7817	475.5793	432.6219	323.0921	221.8402	231.4734	329.7161	377.3652	361.2414	353.1697	(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	883.4337	857.5131	778.2914	651.7239	502.1210	338.4075	224.4495	235.5691	365.5494	552.0829	731.3141	881.6417	(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	379.8008	290.1339	233.9952	126.8241	51.7074	0.0000	0.0000	0.0000	0.0000	129.9900	266.4524	393.1832	(98)
Space heating													1872.0869 (98)
Space heating per m ²													(98) / (4) = 28.3135 (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	542.8601	427.3580	438.3927	0.0000	0.0000	0.0000	0.0000	(100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.9145	0.9548	0.9424	0.0000	0.0000	0.0000	0.0000	(101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	496.4535	408.0491	413.1497	0.0000	0.0000	0.0000	0.0000	(102)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

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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	155.3033	204.8922	177.5112	0.0000	0.0000	0.0000	0.0000 (104)
Space cooling												537.7066 (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	38.8258	51.2230	44.3778	0.0000	0.0000	0.0000	0.0000 (107)
Space cooling												134.4267 (107)
Space cooling per m2												2.0331 (108)
Energy for space heating												28.3135 (99)
Energy for space cooling												2.0331 (108)
Total												30.3465 (109)
Dwelling Fabric Energy Efficiency (DFEE)												30.3 (109)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

CALCULATION OF TARGET FABRIC ENERGY EFFICIENCY 09 Jan 2014

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

1. Overall dwelling dimensions

	Area (m2)	Storey height (m)	Volume (m3)
Ground floor	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	5.8300		5.8300	0.1800	1.0494		(29a)
3. Uni panel cladding	15.0300	7.1800	7.8500	0.1800	1.4130		(29a)
1. Uni panel brick	25.3300	6.6700	18.6600	0.1800	3.3588		(29a)
Total net area of external elements Aum(A, m2)			46.1900				(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) =	24.1829	(33)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							250.0000 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							3.8808 (36)
Total fabric heat loss						(33) + (36) =	28.0637 (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	59.7473	59.5761	59.4083	58.6200	58.4725	57.7860	57.7860	57.6589	58.0505	58.4725	58.7709	59.0828 (39)
Average = Sum(39)m / 12 =												58.6193 (39)
HLP	0.9036	0.9010	0.8985	0.8866	0.8843	0.8740	0.8740	0.8720	0.8780	0.8843	0.8889	0.8936 (40)
HLP (average)												0.8866 (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	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	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, 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	76.8515	77.0723	77.2900	78.3293	78.5269	79.4598	79.4598	79.6350	79.0979	78.5269	78.1282	77.7158
alpha	6.1234	6.1382	6.1527	6.2220	6.2351	6.2973	6.2973	6.3090	6.2732	6.2351	6.2085	6.1811
util living area	0.9972	0.9908	0.9683	0.8898	0.7287	0.5288	0.3826	0.4270	0.6799	0.9375	0.9925	0.9981 (86)
MIT	20.1332	20.3157	20.5613	20.8197	20.9570	20.9950	20.9994	20.9989	20.9786	20.7741	20.3975	20.1000 (87)
Th 2	20.1644	20.1666	20.1688	20.1789	20.1808	20.1897	20.1897	20.1913	20.1863	20.1808	20.1770	20.1730 (88)
util rest of house	0.9964	0.9879	0.9588	0.8614	0.6767	0.4641	0.3125	0.3526	0.6096	0.9142	0.9897	0.9975 (89)
MIT 2	19.3713	19.5540	19.7954	20.0424	20.1546	20.1876	20.1896	20.1910	20.1758	20.0094	19.6449	19.3454 (90)
Living area fraction	fLA = Living area / (4) =											
MIT	19.6556	19.8382	20.0811	20.3324	20.4540	20.4888	20.4917	20.4925	20.4753	20.2947	19.9257	19.6270 (92)
Temperature adjustment	0.0000											
adjusted MIT	19.6556	19.8382	20.0811	20.3324	20.4540	20.4888	20.4917	20.4925	20.4753	20.2947	19.9257	19.6270 (93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.9957	0.9866	0.9576	0.8672	0.6947	0.4882	0.3387	0.3804	0.6353	0.9179	0.9887	0.9970 (94)	
Useful gains	414.2686	497.1138	560.5019	573.4999	490.9606	338.3163	224.7241	235.6356	360.9125	447.1939	411.2942	388.1164 (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	917.4558	889.9607	806.8325	670.1702	511.8674	340.2924	224.8875	235.9672	370.0909	566.8760	753.7763	911.4679 (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	374.3713	263.9931	183.2699	69.6026	15.5546	0.0000	0.0000	0.0000	0.0000	89.0435	246.5872	389.3735 (98)
Space heating per m2	(98) / (4) =											24.6793 (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	543.1886	427.6165	438.2075	0.0000	0.0000	0.0000	0.0000 (100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.9821	0.9935	0.9900	0.0000	0.0000	0.0000	0.0000 (101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	533.4729	424.8565	433.8120	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	256.6343	319.1579	275.1353	0.0000	0.0000	0.0000	0.0000 (104)
Space cooling Cooled fraction	fc = cooled area / (4) =											850.9276 (104)
Intermittency factor (Table 10b)												1.0000 (105)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

CALCULATION OF TARGET FABRIC ENERGY EFFICIENCY 09 Jan 2014

Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	0.2500	0.2500	0.2500	0.0000	0.0000	0.0000	0.0000	(106)
Space cooling	0.0000	0.0000	0.0000	0.0000	0.0000	64.1586	79.7895	68.7838	0.0000	0.0000	0.0000	0.0000	(107)
Space cooling per m2													212.7319 (107)
Energy for space heating													3.2174 (108)
Energy for space cooling													24.6793 (99)
Total													3.2174 (108)
Target Fabric Energy Efficiency (TFEE)													27.8967 (109)
													32.1 (109)

SUMMARY FOR INPUT DATA

Calculation Type: New Build (As Designed)

Property Reference	WH190 Plot 336		Issued on Date	24/02/2022	
Assessment Reference	Plot 336	Prop Type Ref	Flat Type B1N-11		
Property	Abbey Road Retail Park, Barking				
SAP Rating	86 B	DER	7.78	TER	14.42
Environmental	95 A	% DER<TER	46.03		
CO ₂ Emissions (t/year)	0.42	DFEE	30.35	TFEE	32.08
General Requirements Compliance	Pass	% DFEE<TFEE	5.41		
Assessor Details	Mr. Paul Pasifull, Stansted Environmental Services, Tel: 01277225709, paul@sestesting.com			Assessor ID	Q133-0001
Client					

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
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	182.64	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	5.83	5.83
	3. Uni panel cladding	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.14	14.00	15.03	7.85
	1. Uni panel brick	Steel Frame	Steel frame wall (warm frame or hybrid construction)	0.14	14.00	25.33	18.66

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	9.87
	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	36.33

9.2 Internal Walls	Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
	Internal Wall - SFS	Other	9.00	135.69

10.1 Party Ceilings

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)	2.75	0.090	No
Table K1 - Approved	E18 Party wall between dwellings	5.50	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="0.120"/>	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	No	
Waste Water Heat Recovery Storage System	No	
Solar Panel	No	
Water use <= 125 litres/person/day	Yes	
SAP Code	901	
<hr/>		
29.0 Hot Water Cylinder	HIU	
Insulation Type	Measured Loss	
Cylinder Volume	10.00	L
Loss	0.40	kWh/day
<hr/>		
32.0 Photovoltaic Unit	More Dwellings, One Block	
Apportioned	265.00	kWh/Year

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None