

Full SAP Calculation Printout



Plot Reference	UNIT 09				Issued on Date	08/07/2026	
Assessment Reference	001			Plot Type Ref	UNIT 09		
Plot Address	UNIT 09, Stoney Wood Quarter, 34 The Fairway, LONDON, NW7 3HS				SAP Version	10.2	
SAP Rating	82 B	DER	3.68	TER	13.85		
Environmental	97 A	% DER < TER				73.43	
CO ₂ Emissions (t/year)	0.19	DFEE	27.60	TFEE	27.34		
Compliance Check	See BREL	% DFEE < TFEE				-0.94	
% DPER < TPER	46.75	DPER	39.65	TPER	74.45		
Assessor Details	Mr. Ondrej Gajdos				Assessor ID	W452-0001	
Client							

SAP 10 WORKSHEET FOR New Build (As Designed) (Version 10.2, February 2022)
CALCULATION OF FABRIC ENERGY EFFICIENCY

1. Overall dwelling characteristics

	Area (m ²)	Storey height (m)	Volume (m ³)
Main dwelling			
Ground floor			
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	55.0000		137.5000
Dwelling volume			137.5000

2. Ventilation rate

	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
Number of blocked chimneys	0 * 20 = 0.0000 (6f)
Number of intermittent extract fans	2 * 10 = 20.0000 (7a)
Number of passive vents	0 * 10 = 0.0000 (7b)
Number of flueless gas fires	0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) =	20.0000 / (5) = 0.1455 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	3.0000 (17)
Infiltration rate	0.2955 (18)
Number of sides sheltered	4 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] = 0.7000 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) = 0.2068 (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	0.2637	0.2585	0.2534	0.2275	0.2223	0.1965	0.1965	0.1913	0.2068	0.2223	0.2327	0.2430 (22b)
If exhaust air heat pump using Appendix N, (23b) = (23a) x Fmv (equation (N5)), otherwise (23b) = (23a)												0.0000 (23b)
If balanced with heat recovery: efficiency in % allowing for in-use factor (from Table 4h) =												0.0000 (23c)
Effective ac	0.5348	0.5334	0.5321	0.5259	0.5247	0.5193	0.5193	0.5183	0.5214	0.5247	0.5271	0.5295 (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
Main dwelling							
dl			3.4300	1.0000	3.4300		(26)
1			24.3100	0.7940	19.3011		(27)
exposed wall	37.2500	27.7400	9.5100	0.1500	1.4265	60.0000	570.6000 (29a)
Total net area of external elements Aum(A, m ²)			37.2500				(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) = 24.1576		(33)
Main dwelling							
pw			46.5000	0.0000	0.0000	110.0000	5115.0000 (32)
pf			55.0000			40.0000	2200.0000 (32d)
pc			55.0000			30.0000	1650.0000 (32b)
iw			121.0000			9.0000	1089.0000 (32c)
Heat capacity Cm = Sum(A x k)						(28)...(30) + (32) + (32a)...(32e) =	10624.6000 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							193.1745 (35)
List of Thermal Bridges							
K1 Element					Length	Psi-value	Total
E2 Other lintels (including other steel lintels)					11.0900	0.0500	0.5545
E3 Sill					9.7200	0.0500	0.4860
E4 Jamb					40.0000	0.0500	2.0000

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E7 Party floor between dwellings (in blocks of flats)	3.5000	0.0700	0.2450
E24 Eaves (insulation at ceiling level - inverted)	9.0000	0.0800	0.7200
E16 Corner (normal)	10.0000	0.0900	0.9000
E17 Corner (inverted - internal area greater than external area)	7.5000	-0.0900	-0.6750
E25 Staggered party wall between dwellings	2.5000	0.0600	0.1500
Thermal bridges (Sum(L x Psi) calculated using Appendix K)			4.3805 (36)
Point Thermal bridges			(36a) = 0.0000
Total fabric heat loss		(33) + (36) + (36a) =	28.5381 (37)

Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)												
(38)m	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Heat transfer coeff	24.2651	24.2038	24.1438	23.8617	23.8090	23.5633	23.5633	23.5178	23.6579	23.8090	23.9157	24.0273 (38)
Average = Sum(39)m / 12 =	52.8032	52.7419	52.6819	52.3998	52.3471	52.1014	52.1014	52.0559	52.1961	52.3471	52.4538	52.5654 (39)
												52.3996
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	0.9601	0.9589	0.9579	0.9527	0.9518	0.9473	0.9473	0.9465	0.9490	0.9518	0.9537	0.9557 (40)
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

4. Water heating energy requirements (kWh/year)												
Assumed occupancy												1.8374 (42)
Hot water usage for mixer showers												0.0000 (42a)
Hot water usage for baths												23.7862 (42b)
Hot water usage for other uses												33.4464 (42c)
Average daily hot water use (litres/day)												52.4594 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Energy conte	57.2326	55.6631	53.9494	51.8160	49.9129	47.9351	47.5238	49.2340	50.9881	53.0192	55.1716	57.1522 (44)
Energy content (annual)	90.6425	79.2635	82.9183	70.9335	67.1924	58.9418	57.4759	60.9619	62.8734	71.9466	78.6020	89.4865 (45)
Distribution loss (46)m = 0.15 x (45)m												871.2382
Water storage loss (or HIU loss):												0.0000 (46)
Total storage loss												0.0000 (56)
If cylinder contains dedicated solar storage												0.0000 (57)
Primary loss												0.0000 (59)
Combi loss												0.0000 (61)
Total heat required for water heating calculated for each month												77.0461 (62)
WWHRS												0.0000 (63a)
PV diverter												0.0000 (63b)
Solar input												0.0000 (63c)
FGHRS												0.0000 (63d)
Output from w/h												77.0461 (64)
12Total per year (kWh/year)												740.5525 (64)
Electric shower(s)												741 (64)
Heat gains from water heating, kWh/month												44.0667 (64a)
												501.2557 (64a)

5. Internal gains (see Table 5 and 5a)												
Metabolic gains (Table 5), Watts												
(66)m	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	91.8680	91.8680	91.8680	91.8680	91.8680	91.8680	91.8680	91.8680	91.8680	91.8680	91.8680	91.8680 (66)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	80.7953	89.4519	80.7953	83.4884	80.7953	83.4884	80.7953	80.7953	83.4884	80.7953	83.4884	80.7953 (67)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	160.1856	161.8479	157.6591	148.7417	137.4852	126.9056	119.8378	118.1755	122.3643	131.2817	142.5382	153.1178 (68)
Pumps, fans	32.1868	32.1868	32.1868	32.1868	32.1868	32.1868	32.1868	32.1868	32.1868	32.1868	32.1868	32.1868 (69)
Losses e.g. evaporation (negative values) (Table 5)	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)
Water heating gains (Table 5)	-73.4944	-73.4944	-73.4944	-73.4944	-73.4944	-73.4944	-73.4944	-73.4944	-73.4944	-73.4944	-73.4944	-73.4944 (71)
Total internal gains	40.6965	39.6718	38.0897	35.1417	33.1975	31.2019	30.2220	31.4180	32.7628	34.9560	37.8056	40.3663 (72)
	332.2378	341.5319	327.1045	317.9323	302.0384	292.1563	281.4155	280.9492	289.1760	297.5933	314.3926	324.8398 (73)

6. Solar gains															
[Jan]				Area	Solar flux		g		FF		Access	Gains			
				m2	Table 6a		Specific data		Specific data		factor	W			
					W/m2		or Table 6b		or Table 6c		Table 6d				
North				2.0000	10.6334		0.5300		0.7000		0.7700	5.4678 (74)			
Northeast				18.2300	11.2829		0.5300		0.7000		0.7700	52.8830 (75)			
East				4.0800	19.6403		0.5300		0.7000		0.7700	20.6022 (76)			
Solar gains				78.9530	158.3964	278.0698	443.8284	585.1888	619.0099	581.0061	470.1794	334.8629	191.8111	98.9743	64.6874 (83)
Total gains				411.1908	499.9283	605.1743	761.7606	887.2272	911.1662	862.4216	751.1287	624.0389	489.4044	413.3669	389.5272 (84)

7. Mean internal temperature (heating season)												
Temperature during heating periods in the living area from Table 9, Th1 (C)												21.0000 (85)

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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	55.8920	55.9570	56.0207	56.3223	56.3790	56.6448	56.6448	56.6943	56.5422	56.3790	56.2643	56.1449
alpha	4.7261	4.7305	4.7347	4.7548	4.7586	4.7763	4.7763	4.7796	4.7695	4.7586	4.7510	4.7430
util living area	0.9853	0.9648	0.9064	0.7429	0.5340	0.3640	0.2655	0.3179	0.5586	0.8672	0.9696	0.9884 (86)
MIT	19.8176	20.0898	20.4655	20.8308	20.9676	20.9957	20.9993	20.9983	20.9713	20.7018	20.1844	19.7632 (87)
Th 2	20.1168	20.1177	20.1186	20.1229	20.1237	20.1275	20.1275	20.1282	20.1260	20.1237	20.1221	20.1204 (88)
util rest of house	0.9819	0.9570	0.8878	0.7056	0.4879	0.3152	0.2130	0.2581	0.4943	0.8339	0.9615	0.9856 (89)
MIT 2	19.0465	19.3133	19.6714	19.9972	20.1036	20.1255	20.1273	20.1276	20.1110	19.8990	19.4126	18.9957 (90)
Living area fraction									FLA = Living area / (4) =			0.2964 (91)
MIT	19.2750	19.5434	19.9068	20.2443	20.3596	20.3834	20.3857	20.3857	20.3659	20.1369	19.6413	19.2231 (92)
Temperature adjustment												0.0000
adjusted MIT	19.2750	19.5434	19.9068	20.2443	20.3596	20.3834	20.3857	20.3857	20.3659	20.1369	19.6413	19.2231 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9776	0.9509	0.8828	0.7110	0.5005	0.3296	0.2286	0.2758	0.5124	0.8345	0.9561	0.9819 (94)
Useful gains	401.9965	475.3665	534.2457	541.6105	444.0353	300.2985	197.1072	207.1562	319.7376	408.3863	395.2169	382.4940 (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	790.7293	772.3219	706.2946	594.4370	453.3065	301.3219	197.2397	207.4770	327.0567	499.2295	657.8417	789.6981 (97)
Space heating kWh	289.2172	199.5540	128.0044	38.0351	6.8978	0.0000	0.0000	0.0000	0.0000	67.5873	189.0899	302.9598 (98a)
Space heating requirement - total per year (kWh/year)												1221.3455
Solar heating kWh	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (98b)
Solar heating contribution - total per year (kWh/year)												0.0000
Space heating kWh	289.2172	199.5540	128.0044	38.0351	6.8978	0.0000	0.0000	0.0000	0.0000	67.5873	189.0899	302.9598 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												1221.3455
Space heating per m2										(98c) / (4) =		22.2063 (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	489.7535	385.5506	395.6252	0.0000	0.0000	0.0000	0.0000 (100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.9851	0.9929	0.0000	0.0000	0.0000	0.0000 (101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	482.4427	382.8275	0.0000	0.0000	0.0000	0.0000 (102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	1035.8092	980.4297	851.8975	0.0000	0.0000	0.0000	0.0000 (103)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	398.4239	444.6160	343.5476	0.0000	0.0000	0.0000	0.0000 (104)
Cooled fraction									fc = cooled area / (4) =			1.0000 (105)
Intermittency factor (Table 10b)	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500 (106)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	99.6060	111.1540	85.8869	0.0000	0.0000	0.0000	0.0000 (107)
Space cooling requirement												296.6469 (107)
Energy for space heating												22.2063 (99)
Energy for space cooling												5.3936 (108)
Total												27.5999 (109)
Fabric Energy Efficiency (DFEE)												27.6 (109)

SAP 10 WORKSHEET FOR New Build (As Designed) (Version 10.2, February 2022)
CALCULATION OF TARGET FABRIC ENERGY EFFICIENCY

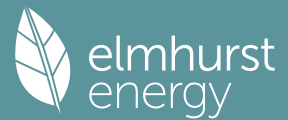
1. Overall dwelling characteristics

	Area (m2)	Storey height (m)	Volume (m3)
Main dwelling	55.0000		
Ground floor		2.5000	137.5000
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	55.0000		
Dwelling volume			137.5000

2. Ventilation rate

	m3 per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
Number of blocked chimneys	0 * 20 = 0.0000 (6f)
Number of intermittent extract fans	2 * 10 = 20.0000 (7a)
Number of passive vents	0 * 10 = 0.0000 (7b)
Number of flueless gas fires	0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans	(6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(7a)+(7b)+(7c) = 20.0000 / (5) = 0.1455 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	5.0000 (17)

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Infiltration rate 0.3955 (18)
Number of sides sheltered 4 (19)

Shelter factor (20) = 1 - [0.075 x (19)] = 0.7000 (20)
Infiltration rate adjusted to include shelter factor (21) = (18) x (20) = 0.2768 (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 infiltr rate	0.3529	0.3460	0.3391	0.3045	0.2976	0.2630	0.2630	0.2561	0.2768	0.2976	0.3114	0.3253	(22b)
If exhaust air heat pump using Appendix N, (23b) = (23a) x Fmv (equation (N5)), otherwise (23b) = (23a)													(23b)
If balanced with heat recovery: efficiency in % allowing for in-use factor (from Table 4h) =													(23c)
Effective ac	0.5623	0.5599	0.5575	0.5464	0.5443	0.5346	0.5346	0.5328	0.5383	0.5443	0.5485	0.5529	(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	
Main dwelling								
TER Opaque door			3.4300	1.0000	3.4300			(26)
TER Opening Type			10.3300	1.1450	11.8282			(27)
exposed wall	37.2500	13.7600	23.4900	0.1800	4.2282			(29a)
Total net area of external elements Aum(A, m2)			37.2500					(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) =	19.4864		(33)
Main dwelling pw			46.5000	0.0000	0.0000			(32)

Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K 193.1745 (35)

List of Thermal Bridges

K1 Element	Length	Psi-value	Total	
E2 Other lintels (including other steel lintels)	11.0900	0.0500	0.5545	
E3 Sill	9.7200	0.0500	0.4860	
E4 Jamb	40.0000	0.0500	2.0000	
E7 Party floor between dwellings (in blocks of flats)	3.5000	0.0700	0.2450	
E24 Eaves (insulation at ceiling level - inverted)	9.0000	0.2400	2.1600	
E16 Corner (normal)	10.0000	0.0900	0.9000	
E17 Corner (inverted - internal area greater than external area)	7.5000	-0.0900	-0.6750	
E25 Staggered party wall between dwellings	2.5000	0.0600	0.1500	

Thermal bridges (Sum(L x Psi) calculated using Appendix K) 5.8205 (36)
Point Thermal bridges (36a) = 0.0000
Total fabric heat loss (33) + (36) + (36a) = 25.3069 (37)

Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)
(38)m Jan 25.5137 Feb 25.4039 Mar 25.2963 Apr 24.7911 May 24.6966 Jun 24.2565 Jul 24.2565 Aug 24.1750 Sep 24.4260 Oct 24.6966 Nov 24.8878 Dec 25.0877 (38)
Heat transfer coeff 50.8206 50.7109 50.6033 50.0980 50.0035 49.5634 49.5634 49.4820 49.7329 50.0035 50.1947 50.3947 (39)
Average = Sum(39)m / 12 = 50.0976

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
HLP	0.9240	0.9220	0.9201	0.9109	0.9092	0.9012	0.9012	0.8997	0.9042	0.9092	0.9126	0.9163	(40)
HLP (average)												0.9109	
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31	

4. Water heating energy requirements (kWh/year)

Assumed occupancy													1.8374 (42)
Hot water usage for mixer showers	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(42a)
Hot water usage for baths	23.7862	23.4330	22.9355	22.0183	21.3314	20.5699	20.1585	20.6525	21.1904	22.0053	22.9414	23.7058	(42b)
Hot water usage for other uses	33.4464	32.2302	31.0139	29.7977	28.5815	27.3652	27.3652	28.5815	29.7977	31.0139	32.2302	33.4464	(42c)
Average daily hot water use (litres/day)													52.4594 (43)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Daily hot water use	57.2326	55.6631	53.9494	51.8160	49.9129	47.9351	47.5238	49.2340	50.9881	53.0192	55.1716	57.1522	(44)
Energy conte	90.6425	79.2635	82.9183	70.9335	67.1924	58.9418	57.4759	60.9619	62.8734	71.9466	78.6020	89.4865	(45)
Energy content (annual)										Total = Sum(45)m =			871.2382
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 (or HIU 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)
Combi loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(59)
Total heat required for water heating calculated for each month	77.0461	67.3740	70.4805	60.2934	57.1135	50.1005	48.8545	51.8177	53.4424	61.1546	66.8117	76.0636	(62)
WWHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63a)
PV diverter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63b)
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	(63c)
FGHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63d)
Output from w/h	77.0461	67.3740	70.4805	60.2934	57.1135	50.1005	48.8545	51.8177	53.4424	61.1546	66.8117	76.0636	(64)
12Total per year (kWh/year)										Total per year (kWh/year) = Sum(64)m =			740.5525 (64)
Electric shower(s)	44.0667	39.2638	42.8745	40.9146	41.6824	39.7609	41.0863	41.6824	40.9146	42.8745	42.0683	44.0667	(64a)
Heat gains from water heating, kWh/month	30.2782	26.6594	28.3388	25.3020	24.6990	22.4654	22.4852	23.3750	23.5893	26.0073	27.2200	30.0326	(65)
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =													501.2557 (64a)

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

Metabolic gains (Table 5), Watts													
(66)m	91.8680	91.8680	91.8680	91.8680	91.8680	91.8680	91.8680	91.8680	91.8680	91.8680	91.8680	91.8680	(66)

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Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	81.9955	90.7807	81.9955	84.7287	81.9955	84.7287	81.9955	81.9955	84.7287	81.9955	84.7287	81.9955 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	160.1856	161.8479	157.6591	148.7417	137.4852	126.9056	119.8378	118.1755	122.3643	131.2817	142.5382	153.1178 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	32.1868	32.1868	32.1868	32.1868	32.1868	32.1868	32.1868	32.1868	32.1868	32.1868	32.1868	32.1868 (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)	-73.4944	-73.4944	-73.4944	-73.4944	-73.4944	-73.4944	-73.4944	-73.4944	-73.4944	-73.4944	-73.4944	-73.4944 (71)
Water heating gains (Table 5)	40.6965	39.6718	38.0897	35.1417	33.1975	31.2019	30.2220	31.4180	32.7628	34.9560	37.8056	40.3663 (72)
Total internal gains	333.4380	342.8607	328.3047	319.1725	303.2386	293.3965	282.6157	282.1494	290.4162	298.7935	315.6328	326.0400 (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					0.8500	10.6334	0.6300	0.7000			0.7700			2.7622 (74)
Northeast					7.7500	11.2829	0.6300	0.7000			0.7700			26.7237 (75)
East					1.7300	19.6403	0.6300	0.7000			0.7700			10.3840 (76)
Solar gains	39.8699	79.9889	140.4288	224.1510	295.5553	312.6422	293.4456	237.4636	169.1137	96.8644	49.9805	32.6659	(83)	
Total gains	373.3079	422.8496	468.7335	543.3235	598.7939	606.0388	576.0613	519.6130	459.5299	395.6579	365.6133	358.7060	(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	58.0725	58.1981	58.3219	58.9101	59.0214	59.5455	59.5455	59.6435	59.3425	59.0214	58.7966	58.5633
alpha	4.8715	4.8799	4.8881	4.9273	4.9348	4.9697	4.9697	4.9762	4.9562	4.9348	4.9198	4.9042
util living area	0.9897	0.9801	0.9565	0.8733	0.7125	0.5132	0.3767	0.4340	0.6928	0.9227	0.9798	0.9914 (86)
MIT	19.8011	19.9939	20.2854	20.6696	20.9036	20.9844	20.9973	20.9947	20.9377	20.6110	20.1485	19.7695 (87)
Th 2	20.1471	20.1488	20.1505	20.1583	20.1597	20.1665	20.1665	20.1678	20.1639	20.1597	20.1568	20.1537 (88)
util rest of house	0.9872	0.9755	0.9462	0.8464	0.6637	0.4502	0.3063	0.3574	0.6258	0.8995	0.9741	0.9893 (89)
MIT 2	19.0544	19.2459	19.5315	19.8970	20.0954	20.1589	20.1656	20.1659	20.1287	19.8532	19.4063	19.0282 (90)
Living area fraction	fLA = Living area / (4) = 0.2964 (91)											
MIT	19.2757	19.4676	19.7549	20.1260	20.3350	20.4035	20.4121	20.4115	20.3685	20.0778	19.6262	19.2479 (92)
Temperature adjustment	0.0000											
adjusted MIT	19.2757	19.4676	19.7549	20.1260	20.3350	20.4035	20.4121	20.4115	20.3685	20.0778	19.6262	19.2479 (93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Useful gains	0.9839	0.9708	0.9405	0.8453	0.6743	0.4684	0.3271	0.3800	0.6430	0.8969	0.9697	0.9864 (94)
Ext temp.	367.2983	410.5052	440.8637	459.2723	403.7724	283.8767	188.4421	197.4748	295.4828	354.8703	354.5412	353.8383 (95)
Heat loss rate W	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000 (96)
Space heating kWh	761.0743	738.7337	670.7412	562.3986	431.7781	287.6438	188.9413	198.4992	311.7499	473.9216	628.7515	758.3349 (97)
Space heating requirement - total per year (kWh/year)	292.9693	220.5695	171.0288	74.2510	20.8363	0.0000	0.0000	0.0000	0.0000	88.5742	197.4314	300.9454 (98a)
Solar heating kWh	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (98b)
Solar heating contribution - total per year (kWh/year)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Space heating kWh	292.9693	220.5695	171.0288	74.2510	20.8363	0.0000	0.0000	0.0000	0.0000	88.5742	197.4314	300.9454 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)	1366.6059											
Space heating per m2	(98c) / (4) = 24.8474 (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	465.8964	366.7695	376.0628	0.0000	0.0000	0.0000	0.0000 (100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.9457	0.9729	0.9560	0.0000	0.0000	0.0000	0.0000 (101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	440.5953	356.8267	359.5148	0.0000	0.0000	0.0000	0.0000 (102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	677.8222	644.4336	580.0394	0.0000	0.0000	0.0000	0.0000 (103)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	170.8034	213.9795	164.0703	0.0000	0.0000	0.0000	0.0000 (104)
Cooled fraction	fc = cooled area / (4) = 1.0000 (105)											
Intermittency factor (Table 10b)	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500 (106)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	42.7008	53.4949	41.0176	0.0000	0.0000	0.0000	0.0000 (107)
Space cooling requirement	137.2133 (107)											
Energy for space heating	24.8474 (99)											
Energy for space cooling	2.4948 (108)											
Total	27.3422 (109)											
Fabric Energy Efficiency (TFEE)	27.3 (109)											