

Full SAP Calculation Printout



Plot Reference	UNIT 01			Issued on Date	08/07/2026
Assessment Reference	001	Plot Type Ref	UNIT 01		
Plot Address	UNIT 01, Stoney Wood Quarter, 34 The Fairway, LONDON, NW7 3HS			SAP Version	10.2
SAP Rating	82 B	DER	3.51	TER	14.21
Environmental	97 A	% DER < TER			75.30
CO ₂ Emissions (t/year)	0.26	DFEE	34.79	TFEE	40.63
Compliance Check	See BREL	% DFEE < TFEE			14.39
% DPER < TPER	50.65	DPER	37.51	TPER	76.01
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)	79.0000		237.0000
Dwelling volume			237.0000

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	3 * 10 = 30.0000 (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) =	30.0000 / (5) = 0.1266 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	3.0000 (17)
Infiltration rate	0.2766 (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) = 0.1936 (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	0.2468	0.2420	0.2372	0.2130	0.2081	0.1839	0.1839	0.1791	0.1936	0.2081	0.2178	0.2275 (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	0.5305	0.5293	0.5281	0.5227	0.5217	0.5169	0.5169	0.5160	0.5187	0.5217	0.5237	0.5259 (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							
1			21.8900	0.7940	17.3797		(27)
ground floor			79.0000	0.1000	7.9000	110.0000	8690.0000 (28a)
exposed wall	44.4000	21.8900	22.5100	0.1500	3.3765	60.0000	1350.6001 (29a)
stair wall	20.7000		20.7000	0.1700	3.5190	9.0000	186.3000 (29a)
corridor wall	16.2000		16.2000	0.2500	4.0500	9.0000	145.8000 (29a)
Total net area of external elements Aum(A, m ²)			160.3000				(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) = 36.2252		(33)
Main dwelling							
pw			38.4000	0.0000	0.0000	110.0000	4224.0002 (32)
pc			79.0000			30.0000	2370.0000 (32b)
iw			176.4000			9.0000	1587.5999 (32c)
Heat capacity Cm = Sum(A x k)							(28)...(30) + (32) + (32a)...(32e) = 18554.3002 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							234.8646 (35)
List of Thermal Bridges							
K1 Element				Length	Psi-value	Total	
E2 Other lintels (including other steel lintels)				8.2000	0.0500	0.4100	
E3 Sill				8.2000	0.0500	0.4100	

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E4 Jamb	19.4800	0.0500	0.9740
E5 Ground floor (normal)	14.9000	0.1600	2.3840
E7 Party floor between dwellings (in blocks of flats)	28.0000	0.0700	1.9600
E16 Corner (normal)	12.0000	0.0900	1.0800
E17 Corner (inverted - internal area greater than external area)	9.0000	-0.0900	-0.8100
E18 Party wall between dwellings	3.0000	0.0600	0.1800
E25 Staggered party wall between dwellings	3.0000	0.0600	0.1800
Thermal bridges (Sum(L x Psi) calculated using Appendix K)			6.7680 (36)
Point Thermal bridges			0.0000
Total fabric heat loss		(33) + (36) + (36a) =	42.9932 (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	41.4879	41.3953	41.3046	40.8786	40.7989	40.4279	40.4279	40.3592	40.5708	40.7989	40.9602	41.1287 (38)
Average = Sum(39)m / 12 =	84.4811	84.3886	84.2979	83.8719	83.7922	83.4211	83.4211	83.3524	83.5641	83.7922	83.9534	84.1220 (39)
												83.8715
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	1.0694	1.0682	1.0671	1.0617	1.0607	1.0560	1.0560	1.0551	1.0578	1.0607	1.0627	1.0648 (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												2.4436 (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	28.1575	27.7393	27.1505	26.0647	25.2516	24.3501	23.8631	24.4479	25.0846	26.0493	27.1574	28.0623 (42b)
Hot water usage for other uses	39.6550	38.2130	36.7710	35.3290	33.8870	32.4450	32.4450	33.8870	35.3290	36.7710	38.2130	39.6550 (42c)
Average daily hot water use (litres/day)												62.1565 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Energy conte	67.8126	65.9524	63.9215	61.3937	59.1387	56.7951	56.3082	58.3349	60.4137	62.8203	65.3705	67.7174 (44)
Energy content (annual)	107.3985	93.9153	98.2450	84.0449	79.6120	69.8362	68.0999	72.2309	74.4961	85.2466	93.1322	106.0290 (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 (or HIU 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)
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 (57)
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 (59)
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 (61)
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 (62)
Total heat required for water heating calculated for each month	91.2887	79.8280	83.5082	71.4382	67.6702	59.3608	57.8849	61.3962	63.3217	72.4596	79.1624	90.1247 (63a)
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 (63b)
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 (63c)
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 (63d)
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 (64)
Output from w/h	91.2887	79.8280	83.5082	71.4382	67.6702	59.3608	57.8849	61.3962	63.3217	72.4596	79.1624	90.1247 (64)
12Total per year (kWh/year)												877.4435 (64)
Electric shower(s)	52.2072	46.5170	50.7948	48.4729	49.3824	47.1061	48.6763	49.3824	48.4729	50.7948	49.8397	52.2072 (64a)
Heat gains from water heating, kWh/month	35.8740	31.5863	33.5758	29.9778	29.2632	26.6167	26.6403	27.6947	27.9486	30.8136	32.2505	35.5830 (65)
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =												593.8536 (64a)

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	122.1807	122.1807	122.1807	122.1807	122.1807	122.1807	122.1807	122.1807	122.1807	122.1807	122.1807	122.1807 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	109.6220	121.3672	109.6220	113.2761	109.6220	113.2761	109.6220	109.6220	113.2761	109.6220	113.2761	109.6220 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	217.3379	219.5931	213.9099	201.8109	186.5382	172.1839	162.5944	160.3391	166.0223	178.1213	193.3941	207.7483 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	35.2181	35.2181	35.2181	35.2181	35.2181	35.2181	35.2181	35.2181	35.2181	35.2181	35.2181	35.2181 (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)	-97.7445	-97.7445	-97.7445	-97.7445	-97.7445	-97.7445	-97.7445	-97.7445	-97.7445	-97.7445	-97.7445	-97.7445 (71)
Water heating gains (Table 5)	48.2177	47.0034	45.1287	41.6358	39.3322	36.9677	35.8068	37.2240	38.8175	41.4161	44.7924	47.8266 (72)
Total internal gains	434.8318	447.6179	428.3148	416.3769	395.1465	382.0818	367.6774	366.8393	377.7701	388.8136	411.1167	424.8511 (73)

6. Solar gains

[Jan]	Area m2	Solar flux Table 6a W/m2	g Specific data or Table 6b	FF Specific data or Table 6c	Access factor Table 6d	Gains W
Northeast East	9.8900 12.0000	11.2829 19.6403	0.5300 0.5300	0.7000 0.7000	0.7700 0.7700	28.6897 (75) 60.5948 (76)
Solar gains	89.2845	176.9350	300.4284	457.5005	581.1876	604.8036
Total gains	524.1163	624.5529	728.7431	873.8774	976.3341	986.8854
						571.6967
						939.3741
						476.7693
						355.2474
						212.0212
						111.6537
						73.2597 (83)
						498.1108 (84)

7. Mean internal temperature (heating season)

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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	61.0074	61.0743	61.1400	61.4505	61.5090	61.7826	61.7826	61.8335	61.6769	61.5090	61.3909	61.2678
alpha	5.0672	5.0716	5.0760	5.0967	5.1006	5.1188	5.1188	5.1222	5.1118	5.1006	5.0927	5.0845
util living area	0.9958	0.9894	0.9694	0.8916	0.7299	0.5300	0.3888	0.4501	0.7226	0.9480	0.9907	0.9968 (86)
MIT	19.7134	19.9276	20.2530	20.6584	20.9034	20.9843	20.9973	20.9946	20.9320	20.5624	20.0593	19.6719 (87)
Th 2	20.0259	20.0269	20.0278	20.0323	20.0331	20.0370	20.0370	20.0377	20.0355	20.0331	20.0314	20.0297 (88)
util rest of house	0.9945	0.9862	0.9602	0.8623	0.6729	0.4549	0.3047	0.3582	0.6439	0.9271	0.9873	0.9958 (89)
MIT 2	18.8574	19.0705	19.3897	19.7712	19.9732	20.0303	20.0363	20.0362	20.0007	19.6947	19.2060	18.8191 (90)
Living area fraction									fLA = Living area / (4) =			0.3089 (91)
MIT	19.1218	19.3352	19.6564	20.0452	20.2605	20.3249	20.3331	20.3322	20.2883	19.9627	19.4696	19.0825 (92)
Temperature adjustment												0.0000
adjusted MIT	19.1218	19.3352	19.6564	20.0452	20.2605	20.3249	20.3331	20.3322	20.2883	19.9627	19.4696	19.0825 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9929	0.9833	0.9559	0.8628	0.6870	0.4778	0.3307	0.3866	0.6659	0.9253	0.9847	0.9944 (94)
Useful gains	520.4046	614.0941	696.5874	753.9715	670.7056	471.5075	310.6895	326.1731	488.0824	555.9279	514.7730	495.3343 (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	1252.1598	1218.1673	1109.0539	934.7693	717.3008	477.5796	311.4215	327.7585	517.1213	784.5200	1038.4668	1251.9424 (97)
Space heating kWh	544.4259	405.9372	306.8751	130.1744	34.6668	0.0000	0.0000	0.0000	0.0000	170.0725	377.0595	562.9164 (98a)
Space heating requirement - total per year (kWh/year)												2532.1279
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	544.4259	405.9372	306.8751	130.1744	34.6668	0.0000	0.0000	0.0000	0.0000	170.0725	377.0595	562.9164 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												2532.1279
Space heating per m2										(98c) / (4) =		32.0523 (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	784.1587	617.3164	633.4784	0.0000	0.0000	0.0000	0.0000 (100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.9440	0.9726	0.9541	0.0000	0.0000	0.0000	0.0000 (101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	740.2327	600.3823	604.3824	0.0000	0.0000	0.0000	0.0000 (102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	1111.4409	1058.0435	948.2480	0.0000	0.0000	0.0000	0.0000 (103)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	267.2699	340.4999	255.8360	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	66.8175	85.1250	63.9590	0.0000	0.0000	0.0000	0.0000 (107)
Space cooling requirement												215.9014 (107)
Energy for space heating												32.0523 (99)
Energy for space cooling												2.7329 (108)
Total												34.7852 (109)
Fabric Energy Efficiency (DFEE)												34.8 (109)

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

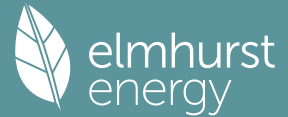
1. Overall dwelling characteristics

	Area (m2)	Storey height (m)	Volume (m3)
Main dwelling	79.0000 (1b)	x 3.0000 (2b)	= 237.0000 (1b) - (3b)
Ground floor			
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	79.0000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n) =	237.0000 (5)

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	3 * 10 = 30.0000 (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)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) =	30.0000 / (5) = 0.1266 (8)
Pressure test	Yes
Pressure Test Method	Blower Door

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Measured/design AP50 5.0000 (17)
 Infiltration rate 0.3766 (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) = 0.2636 (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	0.3361	0.3295	0.3229	0.2900	0.2834	0.2504	0.2504	0.2438	0.2636	0.2834	0.2966	0.3097	(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	0.5565	0.5543	0.5521	0.5420	0.5402	0.5314	0.5314	0.5297	0.5347	0.5402	0.5440	0.5480	(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 Opening Type			19.7500	1.1450	22.6145			(27)
ground floor			79.0000	0.1300	10.2700			(28a)
exposed wall	44.4000	19.7500	24.6500	0.1800	4.4370			(29a)
stair wall	20.7000		20.7000	0.1800	3.7260			(29a)
corridor wall	16.2000		16.2000	0.1800	2.9160			(29a)
Total net area of external elements Aum(A, m2)			160.3000					(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) =	43.9635		(33)
Main dwelling								
pw			38.4000	0.0000	0.0000			(32)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K								234.8646 (35)

List of Thermal Bridges

K1 Element	Length	Psi-value	Total	
E2 Other lintels (including other steel lintels)	8.2000	0.0500	0.4100	
E3 Sill	8.2000	0.0500	0.4100	
E4 Jamb	19.4800	0.0500	0.9740	
E5 Ground floor (normal)	14.9000	0.1600	2.3840	
E7 Party floor between dwellings (in blocks of flats)	28.0000	0.0700	1.9600	
E16 Corner (normal)	12.0000	0.0900	1.0800	
E17 Corner (inverted - internal area greater than external area)	9.0000	-0.0900	-0.8100	
E18 Party wall between dwellings	3.0000	0.0600	0.1800	
E25 Staggered party wall between dwellings	3.0000	0.0600	0.1800	
Thermal bridges (Sum(L x Psi) calculated using Appendix K)				6.7680 (36)
Point Thermal Bridges			(36a) =	0.0000
Total fabric heat loss			(33) + (36) + (36a) =	50.7315 (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	43.5224	43.3509	43.1827	42.3930	42.2453	41.5574	41.5574	41.4300	41.8224	42.2453	42.5442	42.8567	(38)
Heat transfer coeff	94.2539	94.0824	93.9143	93.1245	92.9768	92.2889	92.2889	92.1616	92.5539	92.9768	93.2757	93.5882	(39)
Average = Sum(39)m / 12 =													93.1238

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
HLP	1.1931	1.1909	1.1888	1.1788	1.1769	1.1682	1.1682	1.1666	1.1716	1.1769	1.1807	1.1847	(40)
HLP (average)													1.1788
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31	

4. Water heating energy requirements (kWh/year)

Assumed occupancy													2.4436 (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	0.0000	(42a)
Hot water usage for baths													
28.1575	27.7393	27.1505	26.0647	25.2516	24.3501	23.8631	24.4479	25.0846	26.0493	27.1574	28.0623		(42b)
Hot water usage for other uses													
39.6550	38.2130	36.7710	35.3290	33.8870	32.4450	32.4450	33.8870	35.3290	36.7710	38.2130	39.6550		(42c)
Average daily hot water use (litres/day)													62.1565 (43)
Daily hot water use													
67.8126	65.9524	63.9215	61.3937	59.1387	56.7951	56.3082	58.3349	60.4137	62.8203	65.3705	67.7174		(44)
Energy conte	107.3985	93.9153	98.2450	84.0449	79.6120	69.8362	68.0999	72.2309	74.4961	85.2466	93.1322	106.0290	(45)
Energy content (annual)										Total = Sum(45)m =			1032.2865
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	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	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	(59)
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	(61)
Total heat required for water heating calculated for each month													
91.2887	79.8280	83.5082	71.4382	67.6702	59.3608	57.8849	61.3962	63.3217	72.4596	79.1624	90.1247		(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													
91.2887	79.8280	83.5082	71.4382	67.6702	59.3608	57.8849	61.3962	63.3217	72.4596	79.1624	90.1247		(64)
Total per year (kWh/year)										Total per year (kWh/year) = Sum(64)m =			877.4435 (64)
Electric shower(s)													
52.2072	46.5170	50.7948	48.4729	49.3824	47.1061	48.6763	49.3824	48.4729	50.7948	49.8397	52.2072		(64a)
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =													593.8536 (64a)
Heat gains from water heating, kWh/month													
35.8740	31.5863	33.5758	29.9778	29.2632	26.6167	26.6403	27.6947	27.9486	30.8136	32.2505	35.5830		(65)

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

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Metabolic gains (Table 5), Watts												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(66)m	122.1807	122.1807	122.1807	122.1807	122.1807	122.1807	122.1807	122.1807	122.1807	122.1807	122.1807	122.1807
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	109.6220	121.3672	109.6220	113.2761	109.6220	113.2761	109.6220	109.6220	113.2761	109.6220	113.2761	109.6220
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	217.3379	219.5931	213.9099	201.8109	186.5382	172.1839	162.5944	160.3391	166.0223	178.1213	193.3941	207.7483
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	35.2181	35.2181	35.2181	35.2181	35.2181	35.2181	35.2181	35.2181	35.2181	35.2181	35.2181	35.2181
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
Losses e.g. evaporation (negative values) (Table 5)	-97.7445	-97.7445	-97.7445	-97.7445	-97.7445	-97.7445	-97.7445	-97.7445	-97.7445	-97.7445	-97.7445	-97.7445
Water heating gains (Table 5)	48.2177	47.0034	45.1287	41.6358	39.3322	36.9677	35.8068	37.2240	38.8175	41.4161	44.7924	47.8266
Total internal gains	434.8318	447.6179	428.3148	416.3769	395.1465	382.0818	367.6774	366.8393	377.7701	388.8136	411.1167	424.8511

6. Solar gains

[Jan]				Area m2	Solar flux Table 6a W/m2		g Specific data or Table 6b	FF Specific data or Table 6c	Access factor Table 6d		Gains W	
Northeast				8.9200	11.2829		0.6300	0.7000	0.7700		30.7581 (75)	
East				10.8300	19.6403		0.6300	0.7000	0.7700		65.0051 (76)	
Solar gains	95.7632	189.7727	322.2221	490.6799	623.3284	648.6527	613.1472	511.3430	381.0152	227.4037	119.7554	78.5756 (83)
Total gains	530.5949	637.3906	750.5368	907.0568	1018.4749	1030.7345	980.8246	878.1823	758.7853	616.2173	530.8721	503.4267 (84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)												
Utilisation factor for gains for living area, nil,m (see Table 9a)												21.0000 (85)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
tau	54.6818	54.7815	54.8796	55.3450	55.4329	55.8461	55.8461	55.9232	55.6862	55.4329	55.2553	55.0708
alpha	4.6455	4.6521	4.6586	4.6897	4.6955	4.7231	4.7231	4.7282	4.7124	4.6955	4.6837	4.6714
util living area	0.9957	0.9896	0.9710	0.9005	0.7510	0.5546	0.4102	0.4746	0.7472	0.9526	0.9909	0.9967
MIT	19.5219	19.7500	20.1046	20.5607	20.8585	20.9731	20.9947	20.9899	20.8983	20.4613	19.9084	19.4844
Th 2	19.9255	19.9273	19.9290	19.9370	19.9385	19.9455	19.9455	19.9468	19.9428	19.9385	19.9355	19.9323
util rest of house	0.9944	0.9864	0.9619	0.8715	0.6911	0.4708	0.3139	0.3700	0.6642	0.9324	0.9875	0.9956
MIT 2	18.5896	18.8171	19.1662	19.6007	19.8505	19.9341	19.9442	19.9441	19.8906	19.5221	18.9820	18.5574
Living area fraction	18.8776	19.1052	19.4560	19.8972	20.1618	20.2550	20.2687	20.2671	20.2018	19.8122	19.2681	18.8437
MIT	18.8776	19.1052	19.4560	19.8972	20.1618	20.2550	20.2687	20.2671	20.2018	19.8122	19.2681	18.8437
Temperature adjustment												0.0000
adjusted MIT	18.8776	19.1052	19.4560	19.8972	20.1618	20.2550	20.2687	20.2671	20.2018	19.8122	19.2681	18.8437

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9926	0.9830	0.9568	0.8703	0.7046	0.4961	0.3437	0.4024	0.6862	0.9294	0.9846	0.9941
Useful gains	526.6573	626.5826	718.1475	789.3993	717.5904	511.3257	337.1168	353.4009	520.6866	572.7115	522.7191	500.4561
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	1373.9915	1336.4616	1216.7536	1024.1084	786.7505	521.8931	338.5791	356.3968	564.7481	856.5179	1134.9886	1370.4788
Space heating kWh	630.4167	477.0387	370.9629	168.9905	51.4551	0.0000	0.0000	0.0000	0.0000	211.1520	440.8341	647.2969
Space heating requirement - total per year (kWh/year)												2998.1468
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
Solar heating contribution - total per year (kWh/year)												0.0000
Space heating kWh	630.4167	477.0387	370.9629	168.9905	51.4551	0.0000	0.0000	0.0000	0.0000	211.1520	440.8341	647.2969
Space heating requirement after solar contribution - total per year (kWh/year)												2998.1468
Space heating per m ²										(98c) / (4) =		37.9512 (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	867.5159	682.9381	700.4278	0.0000	0.0000	0.0000	0.0000
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.9217	0.9582	0.9336	0.0000	0.0000	0.0000	0.0000
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	799.5726	654.3694	653.9494	0.0000	0.0000	0.0000	0.0000
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	1162.6931	1106.4921	988.6587	0.0000	0.0000	0.0000	0.0000
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	261.4468	336.3793	249.0238	0.0000	0.0000	0.0000	0.0000
Cooled fraction									fc = cooled area / (4) =			
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
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	65.3617	84.0948	62.2559	0.0000	0.0000	0.0000	0.0000
Space cooling requirement												211.7125 (107)
Energy for space heating												37.9512 (99)
Energy for space cooling												2.6799 (108)
Total												40.6311 (109)
Fabric Energy Efficiency (TFEE)												40.6 (109)