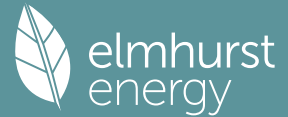


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Property Reference	UNIT 43				Issued on Date	02/07/2025	
Assessment Reference	UNIT 43			Prop Type Ref			
Property	Flat 44, Alexander House, 205 Kings Road, READING, RG1 4FW						
SAP Rating	85 B	DER	4.99	TER	14.14		
Environmental	97 A	% DER < TER				64.71	
CO ₂ Emissions (t/year)	0.19	DFEE	45.92	TFEE	46.14		
Compliance Check	See BREL	% DFEE < TFEE				0.48	
% DPER < TPER	30.53	DPER	52.45	TPER	75.50		
Assessor Details	Mr. Ondrej Gajdos				Assessor ID	W452-0001	
Client							

SAP 10 WORKSHEET FOR New Build (As Built) (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	41.2000 (1b)	2.5000 (2b)	103.0000 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	41.2000		103.0000 (4)
Dwelling volume			103.0000 (5)

2. Ventilation rate

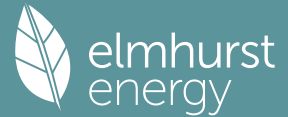
	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
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) = 0.1942 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	3.9200 (17)
Infiltration rate	0.3902 (18)
Number of sides sheltered	3 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] = 0.7750 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) = 0.3024 (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	0.3855	0.3780	0.3704	0.3326	0.3251	0.2873	0.2873	0.2797	0.3024	0.3251	0.3402	0.3553 (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	0.5743	0.5714	0.5686	0.5553	0.5528	0.5413	0.5413	0.5391	0.5457	0.5528	0.5579	0.5631 (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			6.5000	1.1450	7.4427		(27)
2			6.5000	1.1450	7.4427		(27)
1			2.1000	1.0000	2.1000		(26)
top floor exposed new	28.5000	13.0000	15.5000	0.2000	3.1000	18.0000	279.0000 (29a)
corridor new	31.5000	2.1000	29.4000	0.2300	6.7620	14.0000	411.6000 (29a)
flat roof new	22.1000		22.1000	0.1300	2.8730	9.0000	198.9000 (30)
roof terrace new	17.6000		17.6000	0.1300	2.2880	9.0000	158.4000 (30)
Total net area of external elements Aum(A, m ²)			99.7000				(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) = 32.0085		(33)
Main dwelling							
pw			10.7500	0.0000	0.0000	20.0000	215.0000 (32)
pf			39.7000			30.0000	1191.0000 (32d)
iw			56.5000			9.0000	508.5000 (32c)
Heat capacity Cm = Sum(A x k)							(28)...(30) + (32) + (32a)...(32e) = 2962.4000 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							71.9029 (35)
List of Thermal Bridges							
K1 Element				Length	Psi-value	Total	

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E2 Other lintels (including other steel lintels)	6.2000	0.0470	0.2914	
E3 Sill	5.2000	0.0150	0.0780	
E4 Jamb	14.2000	0.0470	0.6674	
E15 Flat roof with parapet	11.6000	0.1970	2.2852	
E16 Corner (normal)	2.5000	0.1800	0.4500	
E17 Corner (inverted - internal area greater than external area)	2.5000	0.0000	0.0000	
E18 Party wall between dwellings	5.0000	0.2400	1.2000	
E24 Eaves (insulation at ceiling level - inverted)	11.6000	0.0500	0.5800	
Thermal bridges (Sum(L x Psi) calculated using Appendix K)				5.5520 (36)
Point Thermal bridges				0.0000
Total fabric heat loss		(33) + (36) + (36a) =		37.5605 (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	19.5212	19.4231	19.3269	18.8753	18.7908	18.3975	18.3975	18.3246	18.5490	18.7908	18.9617	19.1405 (38)
Average = Sum(39)m / 12 =	57.0817	56.9836	56.8874	56.4358	56.3513	55.9580	55.9580	55.8851	56.1095	56.3513	56.5222	56.7009 (39)
												56.4354
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	1.3855	1.3831	1.3808	1.3698	1.3678	1.3582	1.3582	1.3564	1.3619	1.3678	1.3719	1.3762 (40)
Days in month	31	28	31	30	31	30	31	31	30	31	30	31

4. Water heating energy requirements (kWh/year)												
Assumed occupancy												1.4386 (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												
	20.9109	20.6003	20.1630	19.3567	18.7529	18.0834	17.7217	18.1560	18.6288	19.3452	20.1682	20.8402 (42b)
Hot water usage for other uses												
	29.3625	28.2948	27.2271	26.1593	25.0916	24.0239	24.0239	25.0916	26.1593	27.2271	28.2948	29.3625 (42c)
Average daily hot water use (litres/day)												46.0809 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Energy conte	50.2734	48.8951	47.3901	45.5160	43.8445	42.1073	41.7456	43.2476	44.7882	46.5723	48.4630	50.2027 (44)
Energy content (annual)	79.6208	69.6260	72.8368	62.3091	59.0231	51.7758	50.4877	53.5496	55.2283	63.1982	69.0444	78.6054 (45)
Distribution loss (46)m = 0.15 x (45)m												
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (46)
Water storage loss:												
Total storage loss												
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (56)
If cylinder contains dedicated solar storage												
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (57)
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												
	67.6777	59.1821	61.9113	52.9628	50.1696	44.0094	42.9146	45.5171	46.9441	53.7185	58.6878	66.8145 (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	67.6777	59.1821	61.9113	52.9628	50.1696	44.0094	42.9146	45.5171	46.9441	53.7185	58.6878	66.8145 (64)
												651 (64)
12Total per year (kWh/year)												
Electric shower(s)	38.7121	34.4928	37.6648	35.9430	36.6175	34.9295	36.0939	36.6175	35.9430	37.6648	36.9565	38.7121 (64a)
												440.3475 (64a)
Heat gains from water heating, kWh/month	26.5974	23.4187	24.8940	22.2265	21.6968	19.7347	19.7521	20.5337	20.7218	22.8458	23.9111	26.3817 (65)

5. Internal gains (see Table 5 and 5a)												
Metabolic gains (Table 5), Watts												
(66)m	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	71.9292	71.9292	71.9292	71.9292	71.9292	71.9292	71.9292	71.9292	71.9292	71.9292	71.9292	71.9292 (66)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	62.8277	69.5592	62.8277	64.9219	62.8277	64.9219	62.8277	62.8277	64.9219	62.8277	64.9219	62.8277 (67)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	124.5629	125.8554	122.5982	115.6639	106.9106	98.6838	93.1877	91.8952	95.1524	102.0867	110.8400	119.0668 (68)
Pumps, fans	30.1929	30.1929	30.1929	30.1929	30.1929	30.1929	30.1929	30.1929	30.1929	30.1929	30.1929	30.1929 (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)	-57.5433	-57.5433	-57.5433	-57.5433	-57.5433	-57.5433	-57.5433	-57.5433	-57.5433	-57.5433	-57.5433	-57.5433 (71)
Total internal gains	35.7492	34.8493	33.4597	30.8701	29.1623	27.4094	26.5485	27.5990	28.7802	30.7067	33.2098	35.4592 (72)
	267.7185	274.8427	263.4643	256.0347	243.4794	235.5938	227.1427	226.9006	233.4333	240.1998	253.5505	261.9324 (73)

6. Solar gains												
[Jan]												
	Area											
	m2											
	Solar flux											
	Table 6a											
	W/m2											
	Specific data											
	or Table 6b											
	Specific data											
	or Table 6c											
	Access											
	factor											
	Table 6d											
	Gains											
	W											
West	6.5000											44.5887 (80)
West	6.5000											44.5887 (80)
Solar gains	89.1773	174.4498	287.2939	419.0010	513.5015	525.6602	500.4499	429.8791	334.1347	206.9993	111.1936	73.3351 (83)
Total gains	356.8959	449.2924	550.7582	675.0357	756.9809	761.2540	727.5926	656.7797	567.5680	447.1992	364.7441	335.2675 (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	14.4160	14.4408	14.4652	14.5810	14.6028	14.7055	14.7055	14.7247	14.6658	14.6028	14.5587	14.5128
alpha	1.9611	1.9627	1.9643	1.9721	1.9735	1.9804	1.9804	1.9816	1.9777	1.9735	1.9706	1.9675
util living area	0.9036	0.8571	0.7847	0.6674	0.5373	0.4079	0.3111	0.3519	0.5325	0.7485	0.8684	0.9130 (86)
MIT	17.5837	18.1139	18.8691	19.7335	20.3598	20.7392	20.8914	20.8577	20.5356	19.6291	18.4465	17.4857 (87)
Th 2	19.7745	19.7763	19.7781	19.7866	19.7881	19.7955	19.7955	19.7969	19.7927	19.7881	19.7849	19.7816 (88)
util rest of house	0.8918	0.8405	0.7605	0.6319	0.4891	0.3447	0.2341	0.2710	0.4664	0.7110	0.8502	0.9023 (89)
MIT 2	16.7142	17.2279	17.9520	18.7627	19.3214	19.6405	19.7490	19.7321	19.4938	18.6983	17.5692	16.6232 (90)
Living area fraction	fLA = Living area / (4) =											
MIT	17.1848	17.7075	18.4484	19.2882	19.8835	20.2352	20.3673	20.3413	20.0577	19.2021	18.0441	17.0901 (92)
Temperature adjustment	0.0000											
adjusted MIT	17.1848	17.7075	18.4484	19.2882	19.8835	20.2352	20.3673	20.3413	20.0577	19.2021	18.0441	17.0901 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.8587	0.8054	0.7295	0.6158	0.4931	0.3686	0.2716	0.3088	0.4819	0.6901	0.8170	0.8703 (94)
Useful gains	306.4769	361.8796	401.7938	415.7173	373.2470	280.5716	197.6024	202.7914	273.4853	308.5991	297.9909	291.7990 (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	735.4868	729.8144	679.7119	586.2640	461.1487	315.3324	210.8106	220.2623	334.2812	484.7405	618.5844	730.8785 (97)
Space heating kWh	319.1834	247.2522	206.7711	122.7937	65.3989	0.0000	0.0000	0.0000	0.0000	131.0492	230.8273	326.6752 (98a)
Space heating requirement - total per year (kWh/year)	1649.9509											
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	319.1834	247.2522	206.7711	122.7937	65.3989	0.0000	0.0000	0.0000	0.0000	131.0492	230.8273	326.6752 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)	1649.9509											
Space heating per m2	(98c) / (4) = 40.0474 (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	526.0048	414.0889	424.7269	0.0000	0.0000	0.0000	0.0000 (100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.8116	0.8554	0.8275	0.0000	0.0000	0.0000	0.0000 (101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	426.9301	354.2280	351.4553	0.0000	0.0000	0.0000	0.0000 (102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	868.4455	830.3578	748.7747	0.0000	0.0000	0.0000	0.0000 (103)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	317.8911	354.2406	295.6056	0.0000	0.0000	0.0000	0.0000 (104)
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 (106)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	79.4728	88.5601	73.9014	0.0000	0.0000	0.0000	0.0000 (107)
Space cooling requirement	241.9343 (107)											
Energy for space heating	40.0474 (99)											
Energy for space cooling	5.8722 (108)											
Total	45.9195 (109)											
Fabric Energy Efficiency (DFEE)	45.9 (109)											

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

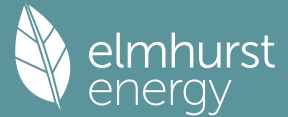
1. Overall dwelling characteristics

	Area (m2)	Storey height (m)	Volume (m3)
Main dwelling	41.2000 (1b)	x 2.5000 (2b)	= 103.0000 (1b) - (3b)
Ground floor			
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	41.2000		103.0000 (4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n) =	103.0000 (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	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	20.0000 / (5) = 0.1942 (8)
Pressure test	Yes

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Pressure Test Method
Measured/design AP50
Infiltration rate
Number of sides sheltered

Blower Door
5.0000 (17)
0.4442 (18)
3 (19)

Shelter factor

(20) = 1 - [0.075 x (19)] = 0.7750 (20)
(21) = (18) x (20) = 0.3442 (21)

Infiltration rate adjusted to include shelter factor

Wind speed	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	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	0.4389	0.4303	0.4217	0.3787	0.3701	0.3270	0.3270	0.3184	0.3442	0.3701	0.3873	0.4045	(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	0.5963	0.5926	0.5889	0.5717	0.5685	0.5535	0.5535	0.5507	0.5592	0.5685	0.5750	0.5818	(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			2.1000	1.0000	2.1000			(26)
TER Opening Type			8.2000	1.1450	9.3893			(27)
top floor exposed new	28.5000		20.3000	0.1800	3.6540			(29a)
corridor new	31.5000	2.1000	29.4000	0.1800	5.2920			(29b)
flat roof new	22.1000		22.1000	0.1100	2.4310			(30)
roof terrace new	17.6000		17.6000	0.1100	1.9360			(30)
Total net area of external elements Aum(A, m2)			99.7000					(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) =	24.8023		(33)
Main dwelling								
pw			10.7500	0.0000	0.0000			(32)

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

71.9029 (35)

List of Thermal Bridges

K1 Element	Length	Psi-value	Total	
E2 Other lintels (including other steel lintels)	6.2000	0.0500	0.3100	
E3 Sill	5.2000	0.0500	0.2600	
E4 Jamb	14.2000	0.0500	0.7100	
E15 Flat roof with parapet	11.6000	0.5600	6.4960	
E16 Corner (normal)	2.5000	0.0900	0.2250	
E17 Corner (inverted - internal area greater than external area)	2.5000	-0.0900	-0.2250	
E18 Party wall between dwellings	5.0000	0.0600	0.3000	
E24 Eaves (insulation at ceiling level - inverted)	11.6000	0.2400	2.7840	
Thermal bridges (Sum(L x Psi) calculated using Appendix K)				10.8600 (36)
Point Thermal bridges				(36a) = 0.0000
Total fabric heat loss				(33) + (36) + (36a) = 35.6623 (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	
	20.2688	20.1417	20.0171	19.4318	19.3223	18.8125	18.8125	18.7181	19.0089	19.3223	19.5438	19.7754	(38)
Heat transfer coeff	55.9311	55.8040	55.6794	55.0941	54.9846	54.4748	54.4748	54.3804	54.6712	54.9846	55.2061	55.4377	(39)
Average = Sum(39)m / 12 =												55.0936	

HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	1.3576	1.3545	1.3514	1.3372	1.3346	1.3222	1.3222	1.3199	1.3270	1.3346	1.3400	1.3456	(40)
HLP (average)												1.3372	
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31	

4. Water heating energy requirements (kWh/year)

Assumed occupancy													1.4386 (42)
Hot water usage for mixer showers													(42a)
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	
Hot water usage for baths													(42b)
20.9109	20.6003	20.1630	19.3567	18.7529	18.0834	17.7217	18.1560	18.6288	19.3452	20.1682	20.8402		
Hot water usage for other uses													(42c)
29.3625	28.2948	27.2271	26.1593	25.0916	24.0239	24.0239	25.0916	26.1593	27.2271	28.2948	29.3625		
Average daily hot water use (litres/day)												46.0809	(43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	50.2734	48.8951	47.3901	45.5160	43.8445	42.1073	41.7456	43.2476	44.7882	46.5723	48.4630	50.2027	(44)
Energy conte	79.6208	69.6260	72.8368	62.3091	59.0231	51.7758	50.4877	53.5496	55.2283	63.1982	69.0444	78.6054	(45)
Energy content (annual)										Total = Sum(45)m =		765.3052	
Distribution loss (46)m = 0.15 x (45)m													(46)
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	
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													(57)
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	
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													
67.6777	59.1821	61.9113	52.9628	50.1696	44.0094	42.9146	45.5171	46.9441	53.7185	58.6878	66.8145		(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	67.6777	59.1821	61.9113	52.9628	50.1696	44.0094	42.9146	45.5171	46.9441	53.7185	58.6878	66.8145	(64)
12Total per year (kWh/year)										Total per year (kWh/year) = Sum(64)m =		650.5094	(64)
Electric shower(s)	38.7121	34.4928	37.6648	35.9430	36.6175	34.9295	36.0939	36.6175	35.9430	37.6648	36.9565	38.7121	(64a)
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =												440.3475	(64a)
Heat gains from water heating, kWh/month	26.5974	23.4187	24.8940	22.2265	21.6968	19.7347	19.7521	20.5337	20.7218	22.8458	23.9111	26.3817	(65)

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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	71.9292	71.9292	71.9292	71.9292	71.9292	71.9292	71.9292	71.9292	71.9292	71.9292	71.9292	71.9292 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	63.3028	70.0853	63.3028	65.4129	63.3028	65.4129	63.3028	63.3028	65.4129	63.3028	65.4129	63.3028 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	124.5629	125.8554	122.5982	115.6639	106.9106	98.6838	93.1877	91.8952	95.1524	102.0867	110.8400	119.0668 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	30.1929	30.1929	30.1929	30.1929	30.1929	30.1929	30.1929	30.1929	30.1929	30.1929	30.1929	30.1929 (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)	-57.5433	-57.5433	-57.5433	-57.5433	-57.5433	-57.5433	-57.5433	-57.5433	-57.5433	-57.5433	-57.5433	-57.5433 (71)
Water heating gains (Table 5)	35.7492	34.8493	33.4597	30.8701	29.1623	27.4094	26.5485	27.5990	28.7802	30.7067	33.2098	35.4592 (72)
Total internal gains	268.1937	275.3688	263.9395	256.5257	243.9546	236.0848	227.6178	227.3757	233.9243	240.6750	254.0415	262.4076 (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	
West	8.2000		19.6403		0.6300		0.7000		0.7700		49.2190 (80)	
Solar gains	49.2190	96.2829	158.5641	231.2563	283.4133	290.1240	276.2099	237.2602	184.4167	114.2477	61.3703	40.4753 (83)
Total gains	317.4127	371.6516	422.5036	487.7820	527.3679	526.2088	503.8277	464.6359	418.3410	354.9227	315.4118	302.8829 (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	14.7125	14.7461	14.7791	14.9361	14.9658	15.1059	15.1059	15.1321	15.0516	14.9658	14.9058	14.8435	
alpha	1.9808	1.9831	1.9853	1.9957	1.9977	2.0071	2.0071	2.0088	2.0034	1.9977	1.9937	1.9896	
util living area	0.9189	0.8903	0.8459	0.7633	0.6561	0.5247	0.4128	0.4536	0.6320	0.8077	0.8924	0.9252 (86)	
MIT	17.4818	17.8877	18.5297	19.3750	20.0860	20.5971	20.8240	20.7809	20.3744	19.4237	18.3201	17.4168 (87)	
Th 2	19.7960	19.7984	19.8008	19.8118	19.8138	19.8235	19.8235	19.8253	19.8198	19.8138	19.8097	19.8053 (88)	
util rest of house	0.9088	0.8768	0.8266	0.7329	0.6094	0.4549	0.3200	0.3600	0.5667	0.7758	0.8770	0.9158 (89)	
MIT 2	16.6290	17.0264	17.6522	18.4664	19.1242	19.5727	19.7435	19.7196	19.4005	18.5354	17.4653	16.5709 (90)	
Living area fraction	fLA = Living area / (4) =												0.5413 (91)
MIT	17.0906	17.4926	18.1271	18.9582	19.6448	20.1272	20.3283	20.2941	19.9276	19.0162	17.9280	17.0287 (92)	
Temperature adjustment													0.0000
adjusted MIT	17.0906	17.4926	18.1271	18.9582	19.6448	20.1272	20.3283	20.2941	19.9276	19.0162	17.9280	17.0287 (93)	

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.8779	0.8434	0.7933	0.7077	0.6021	0.4740	0.3616	0.3993	0.5733	0.7500	0.8451	0.8861 (94)
Useful gains	278.6683	313.4399	335.1696	345.1897	317.5186	249.4480	182.1638	185.5195	239.8176	266.1796	266.5604	268.3721 (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	715.3937	702.7151	647.3917	554.1470	436.8426	301.0912	203.1003	211.7602	318.6035	462.7635	597.7721	711.1965 (97)
Space heating kWh	324.9237	261.5929	232.2933	150.4492	88.7771	0.0000	0.0000	0.0000	0.0000	146.2584	238.4724	329.4614 (98a)
Space heating requirement - total per year (kWh/year)	1772.2284											
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	324.9237	261.5929	232.2933	150.4492	88.7771	0.0000	0.0000	0.0000	0.0000	146.2584	238.4724	329.4614 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)	1772.2284											
Space heating per m ²	(98c) / (4) = 43.0153 (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	512.0634	403.1138	413.2913	0.0000	0.0000	0.0000	0.0000 (100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.7151	0.7734	0.7428	0.0000	0.0000	0.0000	0.0000 (101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	366.1992	311.7850	307.0097	0.0000	0.0000	0.0000	0.0000 (102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	593.1850	568.3039	523.6941	0.0000	0.0000	0.0000	0.0000 (103)
Space cooling kWh												
	0.0000	0.0000	0.0000	0.0000	0.0000	163.4298	190.8501	161.2132	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	40.8574	47.7125	40.3033	0.0000	0.0000	0.0000	0.0000 (107)
Space cooling requirement												128.8733 (107)
Energy for space heating												43.0153 (99)
Energy for space cooling												3.1280 (108)
Total												46.1432 (109)
Fabric Energy Efficiency (TFEE)												46.1 (109)