				User D	etails:						
Assessor Name:					Strom	a Num	ber:				
Software Name:	Stroma FSA	AP 2012	2		Softwa				Versio	on: 1.0.5.33	
					Address			SHP + F	Pγ		
Address :	Chester Roa	d Hostel	, 2 Che	ster Roa	ad, LON	DON, N	19 5BP				
Overall dwelling dimen	sions:			<b>A</b>	- ( 2)		A., 11a	: l- 4 ( \		\\ a   1 ( 2 )	<u> </u>
Ground floor					a(m²) 55.3	(1a) x		ight(m) .09	(2a) =	Volume(m³)	)    (3a)
Total floor area TFA = (1a)	)+(1b)+(1c)+(	1d)+(1e)-	+(1n	ı)		(4)			]` '		`
Dwelling volume		, , ,	`	´ <u>L</u>			)+(3c)+(3d	l)+(3e)+	.(3n) =	170.88	(5)
2. Ventilation rate:											
2. Volulation fato.	main		condar	у	other		total			m³ per hou	r
Number of chimneys	heating 0	ne	eating 0	] + [	0	] = [	0	X 4	40 =	0	(6a)
Number of open flues	0	Ī + 🗀	0	j + F	0	] = [	0	x	20 =	0	(6b)
Number of intermittent fan	s					<b>,</b>	0	x '	10 =	0	(7a)
Number of passive vents						Ī	0	x -	10 =	0	(7b)
Number of flueless gas fire	es						0	X 4	40 =	0	(7c)
						_			A in a k	ongo nor bo	
		(0-1	(01-) - (7	-) - ( <del>-</del> 1-) - (		_				nanges per ho	_
Infiltration due to chimneys						ontinue fr	0 om (9) to (		÷ (5) =	0	(8)
Number of storeys in the			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				(2) (2)			0	(9)
Additional infiltration								[(9)	-1]x0.1 =	0	(10)
Structural infiltration: 0.2						•	uction			0	(11)
if both types of wall are pre deducting areas of opening			onding to	the great	er wall are	a (atter					
If suspended wooden flo			d) or 0.	1 (seale	ed), else	enter 0				0	(12)
If no draught lobby, ente	er 0.05, else e	nter 0								0	(13)
Percentage of windows	and doors dra	aught stri	ipped							0	(14)
Window infiltration					0.25 - [0.2	, ,	_			0	(15)
Infiltration rate					(8) + (10)					0	(16)
Air permeability value, q	•			•	•	•	etre of e	nvelope	area	2.5	(17)
If based on air permeability  Air permeability value applies							is heina u	sed.		0.12	(18)
Number of sides sheltered		ii lest iias k	been don	e or a deg	gree air per	теаышу	is being us	3 <del>0</del> 0		0	(19)
Shelter factor					(20) = 1 -	0.075 x (1	19)] =			1	(20)
Infiltration rate incorporatir	ng shelter fact	or			(21) = (18)	x (20) =				0.12	(21)
Infiltration rate modified for	r monthly wind	d speed									_
Jan Feb N	Mar Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Monthly average wind spe	ed from Table	- <del></del>								=	
(22)m= 5.1 5 4	.9 4.4	4.3	3.8	3.8	3.7	4	4.3	4.5	4.7	]	
Wind Factor (22a)m = (22)	m ÷ 4										
	23 1.1	1.08	0.95	0.95	0.92	1	1.08	1.12	1.18	]	

Adjusted infiltration rate (allowing for shelter an	d wind speed) = (21a) x	(22a)m		
0.16 0.16 0.15 0.14 0.13	0.12 0.12 0.12	0.12 0.13 0.14	0.15	
Calculate effective air change rate for the appli	cable case	' '		
If mechanical ventilation:	) v Emy (equation (NE)) athe	anuico (22h) — (22a)	Į	0.5 (23a)
If exhaust air heat pump using Appendix N, (23b) = (23a If balanced with heat recovery: efficiency in % allowing f			Ĺ	0.5 (23b)
a) If balanced mechanical ventilation with he			_ 	75.65 (23c)
(24a)m= 0.28 0.28 0.27 0.26 0.26	0.24 0.24 0.24	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	<del>- ` ` </del>	÷ 100] (24a)
b) If balanced mechanical ventilation without			, , , , , , ,	,
(24b)m= 0 0 0 0 0	0 0 0	0 0 0	0	(24b)
c) If whole house extract ventilation or positive	re input ventilation from	outside		
if $(22b)m < 0.5 \times (23b)$ , then $(24c) = (23b)$	•			
(24c)m= 0 0 0 0 0	0 0 0	0 0 0	0	(24c)
d) If natural ventilation or whole house positive				
if (22b)m = 1, then (24d)m = (22b)m other	· · · · · · · · · · · · · · · · · · ·	<del>, , , , , , , , , , , , , , , , , , , </del>		(0.4.1)
(24d)m= 0 0 0 0 0	0 0 0	0 0 0	0	(24d)
Effective air change rate - enter (24a) or (24k		<del>1                                    </del>		(05)
(25)m= 0.28 0.28 0.27 0.26 0.26	0.24 0.24 0.24	0.25 0.26 0.26	0.27	(25)
3. Heat losses and heat loss parameter:				
ELEMENT Gross Openings area (m²)	Net Area U-val A ,m <sup>2</sup> W/m <sup>2</sup>		k-value kJ/m².k	
		(*****)		
Doors Type 1	2.13 × 1	2.13		(26)
Doors Type 1 Doors Type 2				
Doors Type 2	0.96 × 1	= 0.96		(26)
Doors Type 2 Doors Type 3	0.96 × 1 0.96 × 1	= 0.96		(26) (26)
Doors Type 2 Doors Type 3 Doors Type 4	0.96 × 1  0.96 × 1  0.7 × 1	= 0.96 = 0.96 = 0.7		(26) (26) (26)
Doors Type 2 Doors Type 3 Doors Type 4 Doors Type 5	0.96 × 1 0.96 × 1 0.7 × 1 0.2 × 1	= 0.96 = 0.96 = 0.7 = 0.2		(26) (26) (26) (26)
Doors Type 2 Doors Type 3 Doors Type 4	0.96	= 0.96 = 0.96 = 0.7 = 0.2 + 0.04] = 0.98		(26) (26) (26) (26) (27)
Doors Type 2 Doors Type 3 Doors Type 4 Doors Type 5 Windows Type 1	0.96	= 0.96 = 0.96 = 0.7 = 0.2 + 0.04] = 0.98 + 0.04] = 2.3		(26) (26) (26) (26) (27) (27)
Doors Type 2 Doors Type 3 Doors Type 4 Doors Type 5 Windows Type 1 Windows Type 2	0.96	= 0.96 $= 0.96$ $= 0.7$ $= 0.2$ $+ 0.04] = 0.98$ $+ 0.04] = 2.3$ $+ 0.04] = 2.3$		(26) (26) (26) (26) (27) (27) (27)
Doors Type 2 Doors Type 3 Doors Type 4 Doors Type 5 Windows Type 1 Windows Type 2 Windows Type 3	0.96	= 0.96 $= 0.96$ $= 0.7$ $= 0.2$ $+ 0.04] = 0.98$ $+ 0.04] = 2.3$ $+ 0.04] = 2.3$ $+ 0.04] = 1.67$		(26) (26) (26) (26) (27) (27) (27) (27)
Doors Type 2 Doors Type 3 Doors Type 4 Doors Type 5 Windows Type 1 Windows Type 2 Windows Type 3 Windows Type 4	0.96	= 0.96 $= 0.96$ $= 0.7$ $= 0.2$ $+ 0.04] = 0.98$ $+ 0.04] = 2.3$ $+ 0.04] = 2.3$ $+ 0.04] = 1.67$ $+ 0.04] = 0.37$		(26) (26) (26) (26) (27) (27) (27) (27) (27)
Doors Type 2 Doors Type 3 Doors Type 4 Doors Type 5 Windows Type 1 Windows Type 2 Windows Type 3 Windows Type 4 Windows Type 5 Floor	0.96	= 0.96 = 0.96 = 0.7 = 0.2 + 0.04] = 0.98 + 0.04] = 2.3 + 0.04] = 2.3 + 0.04] = 1.67 + 0.04] = 0.37 = 6.083		(26) (26) (26) (26) (27) (27) (27) (27) (27) (27)
Doors Type 2 Doors Type 3 Doors Type 4 Doors Type 5 Windows Type 1 Windows Type 2 Windows Type 3 Windows Type 4 Windows Type 4 Windows Type 5 Floor Walls Type 1  15.17  2.65	0.96	= 0.96 = 0.96 = 0.7 = 0.2 + 0.04] = 0.98 + 0.04] = 2.3 + 0.04] = 2.3 + 0.04] = 1.67 + 0.04] = 0.37 = 6.083 = 1.63		(26) (26) (26) (26) (27) (27) (27) (27) (27) (27) (27) (29)
Doors Type 2 Doors Type 3 Doors Type 4 Doors Type 5 Windows Type 1 Windows Type 2 Windows Type 3 Windows Type 4 Windows Type 4 Windows Type 5 Floor Walls Type 1 15.17 2.65 Walls Type 2 1.85 0	0.96	= 0.96 = 0.96 = 0.7 = 0.2 + 0.04] = 0.98 + 0.04] = 2.3 + 0.04] = 2.3 + 0.04] = 1.67 + 0.04] = 0.37 = 6.083 = 1.63 = 0.24		(26) (26) (26) (26) (27) (27) (27) (27) (27) (27) (29)
Doors Type 2 Doors Type 3 Doors Type 4 Doors Type 5 Windows Type 1 Windows Type 2 Windows Type 3 Windows Type 3 Windows Type 4 Windows Type 5 Floor Walls Type1  15.17  2.65 Walls Type2  1.85  0  Walls Type3  6.73  0	0.96	= 0.96 = 0.96 = 0.7 = 0.2 + 0.04] = 0.98 + 0.04] = 2.3 + 0.04] = 2.3 + 0.04] = 1.67 + 0.04] = 0.37 = 6.083 = 1.63 = 0.24 = 0.87		(26) (26) (26) (26) (27) (27) (27) (27) (27) (27) (29) (29)
Doors Type 3 Doors Type 3 Doors Type 4 Doors Type 5 Windows Type 1 Windows Type 2 Windows Type 3 Windows Type 3 Windows Type 4 Windows Type 5 Floor Walls Type1  15.17  2.65  Walls Type2  1.85  0  Walls Type3  6.73  0  Walls Type4  1.82  0	0.96	= 0.96 = 0.7 = 0.2 + 0.04] = 0.98 + 0.04] = 2.3 + 0.04] = 2.3 + 0.04] = 1.67 + 0.04] = 0.37 = 6.083 = 1.63 = 0.24 = 0.87 = 0.24		(26) (26) (26) (26) (27) (27) (27) (27) (27) (27) (29) (29) (29)
Doors Type 3 Doors Type 3 Doors Type 4 Doors Type 5 Windows Type 1 Windows Type 2 Windows Type 3 Windows Type 4 Windows Type 4 Windows Type 5 Floor Walls Type1	0.96	= 0.96 = 0.96 = 0.7 = 0.2 + 0.04] = 0.98 + 0.04] = 2.3 + 0.04] = 2.3 + 0.04] = 1.67 + 0.04] = 0.37 = 6.083 = 1.63 = 0.24 = 0.87 = 0.24 = 0.72		(26) (26) (26) (26) (27) (27) (27) (27) (27) (27) (29) (29) (29) (29)
Doors Type 3         Doors Type 4         Doors Type 5         Windows Type 1         Windows Type 2         Windows Type 3         Windows Type 4         Windows Type 5         Floor         Walls Type1       15.17         Walls Type2       1.85         Walls Type3       6.73         Walls Type4       1.82         Walls Type5       6.36         Walls Type6       28.74	0.96	= 0.96 = 0.96 = 0.7 = 0.2 + 0.04] = 0.98 + 0.04] = 2.3 + 0.04] = 2.3 + 0.04] = 1.67 + 0.04] = 0.37 = 6.083 = 1.63 = 0.24 = 0.87 = 0.24 = 0.72 = 2.68		(26) (26) (26) (26) (27) (27) (27) (27) (27) (27) (29) (29) (29) (29) (29) (29)
Doors Type 3 Doors Type 3 Doors Type 4 Doors Type 5 Windows Type 1 Windows Type 2 Windows Type 3 Windows Type 4 Windows Type 4 Windows Type 5 Floor Walls Type1	0.96	= 0.96 = 0.96 = 0.7 = 0.2 + 0.04] = 0.98 + 0.04] = 2.3 + 0.04] = 2.3 + 0.04] = 1.67 + 0.04] = 0.37 = 6.083 = 1.63 = 0.24 = 0.87 = 0.24 = 0.72 = 2.68		(26) (26) (26) (26) (27) (27) (27) (27) (27) (27) (29) (29) (29) (29)

* for windows and roof windows, us ** include the areas on both sides of				atou uomg	, romaia i	, [( i, o vaio	10) 10.0 1] 0	J			
Fabric heat loss, W/K = S (A	x U)				(26)(30)	+ (32) =				27.32	(33)
Heat capacity Cm = S(A x k	)					((28)	(30) + (32	2) + (32a).	(32e) =	6083	(34)
Thermal mass parameter (T	MP = Cm -	÷ TFA) ir	n kJ/m²K			Indica	tive Value	: Low		100	(35)
For design assessments where the can be used instead of a detailed co		e construct	ion are no	t known pr	ecisely the	e indicative	e values of	TMP in Ta	able 1f		
Thermal bridges : S (L x Y)	alculated	using Ap	pendix I	K						20.32	(36)
if details of thermal bridging are not	known (36)	= 0.05 x (3	1)								
Total fabric heat loss						(33) +	(36) =			47.64	(37)
Ventilation heat loss calculation	ed monthl	у		1	1	(38)m	= 0.33 × (	25)m x (5)		ī	
Jan Feb Ma	r Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
(38)m= 15.85 15.68 15.5	14.62	14.44	13.56	13.56	13.39	13.91	14.44	14.8	15.15		(38)
Heat transfer coefficient, W/	(					(39)m	= (37) + (	38)m			
(39)m= 63.49 63.32 63.14	62.26	62.08	61.2	61.2	61.03	61.56	62.08	62.44	62.79		
		•		•	•		Average =	Sum(39) <sub>1.</sub>	12 /12=	62.22	(39)
Heat loss parameter (HLP),	N/m²K			1	1	(40)m	= (39)m ÷	(4)		1	
(40)m= 1.15 1.14 1.14	1.13	1.12	1.11	1.11	1.1	1.11	1.12	1.13	1.14		
Number of days in month (T	able 1e)						Average =	Sum(40) <sub>1</sub> .	12 /12=	1.13	(40)
Number of days in month (T		D/I OV	live	11	A	Can	Oct	Novi	Daa		
Jan Feb Ma (41)m= 31 28 31	r Apr 30	May	Jun 30	Jul	Aug	Sep	Oct	Nov	Dec		(41)
(41)m= 31 28 31	30	31	30	31	31	30	31	30	31		(41)
4. Water heating energy re	quirement:								kWh/ye	ear:	
Assumed occupancy, N if TFA > 13.9, N = 1 + 1.76			349 x (TF	-A -13.9	)2)] + 0.0	0013 x (	TFA -13.		kWh/ye	ear:	(42)
Assumed occupancy, N if TFA > 13.9, N = 1 + 1.76 if TFA £ 13.9, N = 1	x [1 - exp	o(-0.000 <b>3</b>					TFA -13.	9)	85	ear:	
Assumed occupancy, N if TFA > 13.9, N = 1 + 1.76	age in litre	o(-0.0003 es per da 5% if the d	ay Vd,av Iwelling is	erage = designed	(25 x N)	+ 36		9) 78		ear:	(42)
Assumed occupancy, N if TFA > 13.9, N = 1 + 1.76 if TFA £ 13.9, N = 1  Annual average hot water us Reduce the annual average hot wa not more that 125 litres per person	age in litre er usage by per day (all v	es per da 5% if the d vater use, l	ay Vd,av Iwelling is thot and co	erage = designed i ld)	(25 x N) to achieve	+ 36 a water us	se target o	9) 78	.05	ear:	
Assumed occupancy, N if TFA > 13.9, N = 1 + 1.76 if TFA £ 13.9, N = 1 Annual average hot water us Reduce the annual average hot wa	age in litre er usage by per day (all v	es per da 5% if the d vater use, l	ay Vd,av dwelling is hot and co	erage = designed i ld) Jul	(25 x N) to achieve	+ 36		9) 78	85	ear:	
Assumed occupancy, N if TFA > 13.9, N = 1 + 1.76 if TFA £ 13.9, N = 1  Annual average hot water us Reduce the annual average hot wa not more that 125 litres per person  Jan Feb Ma  Hot water usage in litres per day for	age in litre er usage by per day (all v r Apr	es per da 5% if the d vater use, l	ay Vd,av dwelling is hot and co	erage = designed i ld) Jul	(25 x N) to achieve Aug (43)	+ 36 a water us	se target o	9) 78	.05 Dec	ear:	
Assumed occupancy, N if TFA > 13.9, N = 1 + 1.76 if TFA £ 13.9, N = 1  Annual average hot water us Reduce the annual average hot wa not more that 125 litres per person  Jan Feb Ma  Hot water usage in litres per day for	age in litre er usage by per day (all v r Apr	es per da 5% if the d vater use, I May Vd,m = fa	ay Vd,av Iwelling is thot and co Jun ctor from	erage = designed in the designed in the designed in the designed in the design in thed	(25 x N) to achieve	+ 36 a water us Sep 76.49	Oct	9) 78 Nov 82.73	.05 Dec 85.85		
Assumed occupancy, N if TFA > 13.9, N = 1 + 1.76 if TFA £ 13.9, N = 1  Annual average hot water us Reduce the annual average hot wa not more that 125 litres per person  Jan Feb Ma  Hot water usage in litres per day for	age in litre er usage by per day (all ver Apresech month) 76.49	es per da 5% if the d vater use, I May Vd,m = fa	ay Vd,av Iwelling is hot and co Jun ctor from 7	erage = designed id)  Jul Table 1c x  70.24	(25 x N) to achieve Aug (43) 73.36	+ 36 a water us Sep 76.49	Oct  79.61  Total = Su	9) 78 Nov 82.73 m(44)112 =	.05 Dec 85.85	936.55	(43)
Assumed occupancy, N if TFA > 13.9, N = 1 + 1.76 if TFA £ 13.9, N = 1  Annual average hot water us Reduce the annual average hot wa not more that 125 litres per person  Jan Feb Ma  Hot water usage in litres per day for  (44)m= 85.85 82.73 79.6	age in litre er usage by per day (all v r Apr each month 76.49	es per da 5% if the d vater use, I May Vd,m = fa	ay Vd,av Iwelling is hot and co Jun ctor from 7	erage = designed id)  Jul Table 1c x  70.24	(25 x N) to achieve Aug (43) 73.36	+ 36 a water us Sep 76.49	Oct  79.61  Total = Su	9) 78 Nov 82.73 m(44)112 =	.05 Dec 85.85		(43)
Assumed occupancy, N if TFA > 13.9, N = 1 + 1.76 if TFA £ 13.9, N = 1  Annual average hot water us Reduce the annual average hot wa not more that 125 litres per person  Jan Feb Ma  Hot water usage in litres per day fo  (44)m= 85.85 82.73 79.6  Energy content of hot water used -	age in litre er usage by our day (all ver Apr each month 76.49	es per da 5% if the covater use, I May Vd,m = fa 73.36 onthly = 4.	ay Vd,av liwelling is that and co  Jun ctor from 7  70.24  190 x Vd,r  82.94	erage = designed in designed i	(25 x N) to achieve  Aug (43)  73.36  77m / 3600  88.2	+ 36 a water us  Sep  76.49  6 kWh/mor  89.25	Oct  79.61  Total = Sunth (see Tailor) 104.01	Nov  82.73  m(44)12 = ables 1b, 1	85.85 85.85 c, 1d) 123.3		(43)
Assumed occupancy, N if TFA > 13.9, N = 1 + 1.76 if TFA £ 13.9, N = 1  Annual average hot water us Reduce the annual average hot wa not more that 125 litres per person  Jan Feb Ma  Hot water usage in litres per day for  (44)m= 85.85 82.73 79.6  Energy content of hot water used -  (45)m= 127.31 111.35 114.5	age in litre er usage by per day (all ver Aproximate) 76.49  all calculated means 1000.17  int of use (note that are approximate) 100.17	es per da 5% if the covater use, I May Vd,m = fa 73.36 onthly = 4.	ay Vd,av liwelling is that and co  Jun ctor from 7  70.24  190 x Vd,r  82.94	erage = designed in designed i	(25 x N) to achieve  Aug (43)  73.36  77.36  88.2	+ 36 a water us  Sep  76.49  6 kWh/mor  89.25	Oct  79.61  Total = Sunth (see Tailor) 104.01	Nov  82.73  m(44) <sub>112</sub> = ables 1b, 1  113.54	85.85 85.85 c, 1d) 123.3	936.55	(43)
Assumed occupancy, N if TFA > 13.9, N = 1 + 1.76 if TFA £ 13.9, N = 1  Annual average hot water us Reduce the annual average hot wa not more that 125 litres per person  Jan Feb Ma  Hot water usage in litres per day for (44)m= 85.85 82.73 79.6  Energy content of hot water used - (45)m= 127.31 111.35 114.1	age in litre er usage by per day (all ver Aproximate) 76.49  all calculated means 1000.17  int of use (note that are approximate) 100.17	es per da 5% if the day ater use, I May $Vd,m = fa$ 73.36 onthly = 4.	ay Vd,av Iwelling is hot and co Jun ctor from 7 70.24 190 x Vd,r 82.94	erage = designed in did)  Jul Table 1c x  70.24  76.86  enter 0 in	(25 x N) to achieve  Aug (43)  73.36  77.36  27 m / 3600  88.2  boxes (46)	+ 36 a water us  Sep  76.49  0 kWh/mor  89.25	Oct  79.61  Total = Su  104.01  Total = Su	82.73 m(44) <sub>112</sub> = ables 1b, 1 113.54 m(45) <sub>112</sub> =	.05  Dec  85.85  c, 1d)  123.3	936.55	(43)
Assumed occupancy, N if TFA > 13.9, N = 1 + 1.76 if TFA £ 13.9, N = 1  Annual average hot water us Reduce the annual average hot wa not more that 125 litres per person  Jan Feb Ma  Hot water usage in litres per day for  (44)m= 85.85 82.73 79.6  Energy content of hot water used -  (45)m= 127.31 111.35 114.5  If instantaneous water heating at por  (46)m= 19.1 16.7 17.25	age in litre er usage by per day (all var Apr each month) 76.49 calculated m 100.17 int of use (not apr)	es per da 5% if the de vater use, les May Vd,m = fa 73.36 onthly = 4. 96.12 o hot water 14.42	ay Vd,av liwelling is hot and co  Jun ctor from 70.24  190 x Vd,r 82.94  r storage),	erage = designed of ld)  Jul Table 1c x  70.24  76.86  enter 0 in  11.53	(25 x N) to achieve  Aug (43)  73.36  77.36  88.2  boxes (46)  13.23	+ 36 a water us  Sep  76.49  89.25  ) to (61)  13.39	Oct  79.61  Total = Su  104.01  Total = Su  15.6	82.73 m(44) <sub>112</sub> = ables 1b, 1 113.54 m(45) <sub>112</sub> =	.05  Dec  85.85  c, 1d)  123.3	936.55	(43)
Assumed occupancy, N if TFA > 13.9, N = 1 + 1.76 if TFA £ 13.9, N = 1  Annual average hot water us Reduce the annual average hot wa not more that 125 litres per person  Jan Feb Ma  Hot water usage in litres per day fo  (44)m= 85.85 82.73 79.6  Energy content of hot water used - (45)m= 127.31 111.35 114.3  If instantaneous water heating at per (46)m= 19.1 16.7 17.24  Water storage loss:	age in litre er usage by per day (all ver Apreach month) 76.49  calculated m 100.17  int of use (not all section) 15.03	es per da 5% if the de vater use, les yet ruse, les yet ru	ay Vd,av liwelling is that and co  Jun ctor from 7 70.24  190 x Vd,r 82.94  r storage), 12.44  /WHRS	erage = designed in designed i	(25 x N) to achieve  Aug (43)  73.36  77.36  88.2  boxes (46)  13.23  within sa	+ 36 a water us  Sep  76.49  89.25  ) to (61)  13.39	Oct  79.61  Total = Su  104.01  Total = Su  15.6	82.73 m(44) <sub>112</sub> = ables 1b, 1 113.54 m(45) <sub>112</sub> =	85 .05 Dec 85.85 123.3	936.55	(43) (44) (45) (46)
Assumed occupancy, N if TFA > 13.9, N = 1 + 1.76 if TFA £ 13.9, N = 1  Annual average hot water us Reduce the annual average hot wa not more that 125 litres per person  Jan Feb Ma Hot water usage in litres per day for  (44)m= 85.85 82.73 79.6  Energy content of hot water used -  (45)m= 127.31 111.35 114.1  If instantaneous water heating at por (46)m= 19.1 16.7 17.2  Water storage loss:  Storage volume (litres) including the community heating and not otherwise if no stored hot with	age in litre er usage by per day (all var Apr each month 100.17  int of use (not 15.03)  ding any stank in dv	es per da 5% if the de vater use, if May Vd,m = fa 73.36  onthly = 4. 96.12  o hot water 14.42  olar or W velling, e	ay Vd,av liwelling is hot and co  Jun ctor from 70.24  190 x Vd,r 82.94  r storage), 12.44  /WHRS	erage = designed in designed i	(25 x N) to achieve  Aug (43)  73.36  77.36  88.2  boxes (46)  13.23  within sa (47)	+ 36 a water us  Sep  76.49  89.25  ) to (61)  13.39  ame ves	Oct  79.61  Total = Su  104.01  Total = Su  15.6  sel	Nov  82.73  m(44) <sub>112</sub> = ables 1b, 1  113.54  m(45) <sub>112</sub> = 17.03	85 .05 Dec 85.85 123.3	936.55	(43) (44) (45) (46)
Assumed occupancy, N if TFA > 13.9, N = 1 + 1.76 if TFA £ 13.9, N = 1  Annual average hot water us Reduce the annual average hot wa not more that 125 litres per person  Jan Feb Ma  Hot water usage in litres per day for  (44)m= 85.85 82.73 79.6  Energy content of hot water used - (45)m= 127.31 111.35 114.1  If instantaneous water heating at per (46)m= 19.1 16.7 17.20 Water storage loss: Storage volume (litres) including the community heating and not otherwise if no stored hot water used in the community heating and not otherwise if no stored hot water used in the community heating and not otherwise if no stored hot water used in the community heating and not otherwise if no stored hot water used in the community heating and not otherwise if no stored hot water used in the community heating and not otherwise if no stored hot water used in the community heating and not otherwise if no stored hot water used in the community heating and not otherwise if no stored hot water used in the community heating and not otherwise if no stored hot water used in the community heating and not otherwise if no stored hot water used in the community heating and not otherwise if no stored hot water used in the community heating and not otherwise if no stored hot water used in the community heating and not otherwise if no stored hot water used in the community heating and not otherwise if no stored hot water used in the community heating and not otherwise in the community heating and notherwise in the c	age in litre er usage by per day (all var Apreach month) 76.49  calculated m 100.17 int of use (not appear) 15.03 ding any stank in dy ater (this in	es per da 5% if the de vater use, i  May Vd,m = fa  73.36  onthly = 4.  96.12  o hot water  14.42  olar or Water velling, e	ay Vd,av liwelling is that and co  Jun ctor from 7 70.24  190 x Vd,r 82.94  r storage), 12.44  /WHRS Inter 110 Instantar	erage = designed of ld)  Jul Table 1c x  70.24  76.86  enter 0 in  11.53  storage 0 litres in neous co	(25 x N) to achieve  Aug (43)  73.36  77.36  88.2  boxes (46)  13.23  within sa (47)	+ 36 a water us  Sep  76.49  89.25  ) to (61)  13.39  ame ves	Oct  79.61  Total = Su  104.01  Total = Su  15.6  sel	Nov  82.73  m(44) <sub>112</sub> = ables 1b, 1  113.54  m(45) <sub>112</sub> = 17.03	85 .05 Dec 85.85 c, 1d) 123.3	936.55	(43) (44) (45) (46) (47)
Assumed occupancy, N if TFA > 13.9, N = 1 + 1.76 if TFA £ 13.9, N = 1  Annual average hot water us Reduce the annual average hot wa not more that 125 litres per person  Jan Feb Ma Hot water usage in litres per day for  (44)m= 85.85 82.73 79.6  Energy content of hot water used -  (45)m= 127.31 111.35 114.1  If instantaneous water heating at por (46)m= 19.1 16.7 17.2  Water storage loss:  Storage volume (litres) including the community heating and not otherwise if no stored hot with	age in litre er usage by per day (all vor each month) 76.49 76.49 76.49 76.49 76.49 76.49 76.49 76.49 76.49 76.49 76.49 76.49 76.49 76.49 76.49 76.49 76.49 76.49 76.49	es per da 5% if the de vater use, i  May Vd,m = fa  73.36  onthly = 4.  96.12  o hot water  14.42  olar or Water velling, e	ay Vd,av liwelling is that and co  Jun ctor from 7 70.24  190 x Vd,r 82.94  r storage), 12.44  /WHRS Inter 110 Instantar	erage = designed of ld)  Jul Table 1c x  70.24  76.86  enter 0 in  11.53  storage 0 litres in neous co	(25 x N) to achieve  Aug (43)  73.36  77.36  88.2  boxes (46)  13.23  within sa (47)	+ 36 a water us  Sep  76.49  89.25  ) to (61)  13.39  ame ves	Oct  79.61  Total = Su  104.01  Total = Su  15.6  sel	Nov  82.73  m(44) <sub>112</sub> = ables 1b, 1  113.54  m(45) <sub>112</sub> = 17.03	85 .05 Dec 85.85 123.3	936.55	(43) (44) (45) (46)

Energy lost from water storage, kWh/year	$(48) \times (49) = 110 \tag{50}$
<ul> <li>b) If manufacturer's declared cylinder loss factor is not know</li> <li>Hot water storage loss factor from Table 2 (kWh/litre/day)</li> </ul>	0.02 (51)
If community heating see section 4.3	0.02
Volume factor from Table 2a	1.03 (52)
Temperature factor from Table 2b	0.6 (53)
Energy lost from water storage, kWh/year	$(47) \times (51) \times (52) \times (53) = 1.03$ (54)
Enter (50) or (54) in (55)	1.03 (55)
Water storage loss calculated for each month	$((56)m = (55) \times (41)m$
(56)m= 32.01 28.92 32.01 30.98 32.01 30.98 32.0	32.01 30.98 32.01 30.98 32.01 (56)
If cylinder contains dedicated solar storage, (57)m = (56)m x [(50) – (H11)] ÷	(50), else (57)m = (56)m where (H11) is from Appendix H
(57)m= 32.01 28.92 32.01 30.98 32.01 30.98 32.0	32.01 30.98 32.01 30.98 32.01 (57)
Primary circuit loss (annual) from Table 3	0 (58)
Primary circuit loss calculated for each month $(59)$ m = $(58) \div$	365 × (41)m
(modified by factor from Table H5 if there is solar water hea	` ,
(59)m= 23.26 21.01 23.26 22.51 23.26 22.51 23.26	23.26 22.51 23.26 22.51 23.26 (59)
Combi loss calculated for each month (61)m = (60) ÷ 365 × (4	1)m
(61)m= 0 0 0 0 0 0 0 0	0 0 0 0 0 (61)
Total heat required for water heating calculated for each mon	h (62)m = 0.85 × (45)m + (46)m + (57)m + (59)m + (61)m
(62)m= 182.59 161.28 170.18 153.67 151.4 136.44 132.1	
Solar DHW input calculated using Appendix G or Appendix H (negative quar	
(add additional lines if FGHRS and/or WWHRS applies, see	
(63)m= 0 0 0 0 0 0	0 0 0 0 (63)
Output from water heater	
(64)m= 182.59 161.28 170.18 153.67 151.4 136.44 132.1	1 143.48 142.75 159.29 167.03 178.57
	Output from water heater (annual) <sub>112</sub> 1878.81 (64)
Heat gains from water heating, kWh/month 0.25 ´ [0.85 × (45	m + (61)m] + 0.8 x [(46)m + (57)m + (59)m ]
(65)m= 86.55 76.97 82.43 76.1 76.18 70.37 69.78	73.55 72.47 78.81 80.55 85.22 (65)
include (57)m in calculation of (65)m only if cylinder is in th	e dwelling or hot water is from community heating
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= 92.31 92.31 92.31 92.31 92.31 92.31 92.31	92.31 92.31 92.31 92.31 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a)	<del>-!!!</del>
(67)m= 15.91 14.14 11.5 8.7 6.51 5.49 5.93	7.71 10.35 13.15 15.34 16.36 (67)
Appliances gains (calculated in Appendix L, equation L13 or	
(68)m= 160.96 162.63 158.42 149.46 138.15 127.52 120.4	
Cooking gains (calculated in Appendix L, equation L15 or L15	
(69)m= 32.23 32.23 32.23 32.23 32.23 32.23 32.23 32.23	32.23 32.23 32.23 32.23 32.23 (69)
Pumps and fans gains (Table 5a)	32.25   32.25   32.25   32.25
(70)m=	0 0 0 0 0 (70)
Losses e.g. evaporation (negative values) (Table 5)  (71)m= -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85   -73.85	5 -73.85 -73.85 -73.85 -73.85 (71)
(71)m= -73.85 -73.85 -73.85 -73.85 -73.85 -73.85 -73.85	(11)

Water h	eating	g gains (T	able 5)													
	116.34	<del>``</del>	110.79	105.7	102.39	9	7.74	93.79	98.	85	100.65	105.92	2 111.87	114.54	]	(72)
_ Total in	terna	I gains =			ļ		(66)	ım + (67)m	+ (68	3)m +	(69)m + (7	70)m +	(71)m + (72)	m	ı	
(73)m=	343.9	341.99	331.4	314.55	297.74	28	81.44	270.83	276	.01	284.65	301.68	3 321.13	335.45	]	(73)
6. Sola	ır gain	is:														
Solar ga	ins are	calculated u	using sola	r flux from	Table 6a	and	assoc	iated equa	tions	to con	vert to the	applic	able orientat	ion.		
Orientat		Access F	actor	Area			Flu				g		FF		Gains	
		Table 6d		m²			Tal	ble 6a		Та	ıble 6b		Table 6c		(W)	
Northeas	st 0.9x	0.77	X	3.0	36	X	1	1.28	x		0.4	x	0.7	=	1.88	(75)
Northeas	st 0.9x	0.77	X	0.3	32	X	1	1.28	X		0.4	x	0.7	=	0.7	(75)
Northeas	st 0.9x	0.77	X	3.0	36	X	2	22.97	x		0.4	x	0.7	=	3.83	(75)
Northeas	st 0.9x	0.77	X	0.3	32	X	2	22.97	x		0.4	x	0.7	=	1.43	(75)
Northeas	st 0.9x	0.77	X	3.0	36	X	4	1.38	x		0.4	x	0.7	=	6.91	(75)
Northeas	st 0.9x	0.77	X	0.3	32	x	4	1.38	x		0.4	x	0.7	=	2.57	(75)
Northeas	st 0.9x	0.77	X	3.0	36	x	6	7.96	x		0.4	x	0.7	=	11.34	(75)
Northeas	st 0.9x	0.77	X	0.3	32	x	6	7.96	x		0.4	x	0.7	=	4.22	(75)
Northeas	st <sub>0.9x</sub>	0.77	х	0.8	36	X	9	1.35	Х		0.4	X	0.7		15.24	(75)
Northeas	st 0.9x	0.77	x	0.3	32	x	9	1.35	х		0.4	x	0.7		5.67	(75)
Northeas	0.9x	0.77	x	0.0	36	х	9	7.38	×		0.4	x	0.7	=	16.25	(75)
Northeas	0.9x	0.77	x	0.3	32	x	9	7.38	x		0.4	x	0.7	=	6.05	(75)
Northeas	0.9x	0.77	x	0.8	36	X	9	91.1	X		0.4	x	0.7	=	15.2	(75)
Northeas	0.9x	0.77	x	0.3	32	x	9	91.1	Х		0.4	x	0.7	=	5.66	(75)
Northeas	st 0.9x	0.77	x	0.8	36	х	7	2.63	x		0.4	x	0.7	=	12.12	(75)
Northeas	st 0.9x	0.77	х	0.3	32	X	7	2.63	x		0.4	х	0.7	=	4.51	(75)
Northeas	st 0.9x	0.77	X	0.8	36	X	5	50.42	x		0.4	x	0.7	=	8.41	(75)
Northeas	st 0.9x	0.77	X	0.3	32	x	5	50.42	x		0.4	x	0.7	=	3.13	(75)
Northeas	st 0.9x	0.77	X	0.8	36	X	2	28.07	x		0.4	x	0.7	=	4.68	(75)
Northeas	st 0.9x	0.77	х	0.3	32	X	2	28.07	x		0.4	x	0.7	=	1.74	(75)
Northeas	st 0.9x	0.77	X	0.8	36	x		14.2	x		0.4	x	0.7	=	2.37	(75)
Northeas	st 0.9x	0.77	X	0.3	32	x		14.2	x		0.4	x	0.7	=	0.88	(75)
Northeas	st 0.9x	0.77	X	3.0	36	x	9	9.21	x		0.4	x	0.7	=	1.54	(75)
Northeas	st 0.9x	0.77	x	0.3	32	x	9	9.21	x		0.4	×	0.7	_ =	0.57	(75)
Southwe	st <sub>0.9x</sub>	0.77	X	2.0	)1	x	3	86.79			0.4	x	0.7	=	14.35	(79)
Southwe	st <sub>0.9x</sub>	0.77	X	2.0	)1	X	3	86.79			0.4	×	0.7		14.35	(79)
Southwe	st <sub>0.9x</sub>	0.77	x	1.4	16	x	3	86.79			0.4	×	0.7	_ =	10.42	(79)
Southwe	st <sub>0.9x</sub>	0.77	X	2.0	)1	X	6	62.67			0.4	×	0.7	_ =	24.44	(79)
Southwe	st <sub>0.9x</sub>	0.77	x	2.0	)1	x	6	62.67			0.4	x	0.7	=	24.44	(79)
Southwe	st <sub>0.9x</sub>	0.77	x	1.4	16	x	6	62.67			0.4	×	0.7		17.76	(79)
Southwe	st <sub>0.9x</sub>	0.77	x	2.0	)1	x	8	35.75			0.4	x	0.7	=	33.45	(79)
Southwe	st <sub>0.9x</sub>	0.77	x	2.0	)1	x	8	35.75			0.4	X	0.7	=	33.45	(79)

Southwosta o. F							<b>1</b> 1				_		(70)
Southwest <sub>0.9x</sub>	0.77	X	1.4		X	85.75	]	0.4	×	0.7	=	24.29	(79)
Southwest <sub>0.9x</sub>	0.77	X	2.0	1	X	106.25	]	0.4	X	0.7	=	41.44	(79)
Southwest <sub>0.9x</sub>	0.77	X	2.0	1	X	106.25	]	0.4	×	0.7	=	41.44	(79)
Southwest <sub>0.9x</sub>	0.77	X	1.4	6	X	106.25	_	0.4	X	0.7	=	30.1	(79)
Southwest <sub>0.9x</sub>	0.77	X	2.0	1	X	119.01	_	0.4	X	0.7	=	46.42	(79)
Southwest <sub>0.9x</sub>	0.77	X	2.0	1	X	119.01	_	0.4	X	0.7	=	46.42	(79)
Southwest <sub>0.9x</sub>	0.77	X	1.4	6	X	119.01	]	0.4	X	0.7	=	33.72	(79)
Southwest <sub>0.9x</sub>	0.77	X	2.0	1	X	118.15	]	0.4	X	0.7	=	46.08	(79)
Southwest <sub>0.9x</sub>	0.77	X	2.0	1	X	118.15	]	0.4	X	0.7	=	46.08	(79)
Southwest <sub>0.9x</sub>	0.77	X	1.4	6	X	118.15	]	0.4	X	0.7	=	33.47	(79)
Southwest <sub>0.9x</sub>	0.77	X	2.0	1	x	113.91	]	0.4	X	0.7	=	44.43	(79)
Southwest <sub>0.9x</sub>	0.77	X	2.0	1	x	113.91		0.4	X	0.7	=	44.43	(79)
Southwest <sub>0.9x</sub>	0.77	X	1.4	6	x	113.91	]	0.4	x	0.7	=	32.27	(79)
Southwest <sub>0.9x</sub>	0.77	X	2.0	1	x	104.39	]	0.4	x	0.7	_ =	40.71	(79)
Southwest <sub>0.9x</sub>	0.77	х	2.0	1	x	104.39	j	0.4	х	0.7	=	40.71	(79)
Southwest <sub>0.9x</sub>	0.77	X	1.4	6	x	104.39	וֹ וֹ	0.4	x	0.7		29.57	(79)
Southwest <sub>0.9x</sub>	0.77	X	2.0	1	x	92.85	į	0.4	x	0.7		36.21	(79)
Southwest <sub>0.9x</sub>	0.77	Х	2.0	1	x =	92.85		0.4	X	0.7		36.21	(79)
Southwest <sub>0.9x</sub>	0.77	X	1.4	6	x	92.85	i i	0.4	x	0.7	= -	26.3	(79)
Southwest <sub>0.9x</sub>	0.77	X	2.0	1	х	69.27		0.4	Х	0.7	<del>-</del>	27.02	(79)
Southwest <sub>0.9x</sub>	0.77	X	2.0	1	x	69.27	1	0.4	Х	0.7	=	27.02	(79)
Southwest <sub>0.9x</sub>	0.77	X	1.4	6	x	69.27		0.4	X	0.7		19.62	(79)
Southwest <sub>0.9x</sub>	0.77	X	2.0	1	x	44.07		0.4	X	0.7		17.19	(79)
Southwest <sub>0.9x</sub>	0.77	X	2.0	_	x	44.07	i i	0.4	X	0.7		17.19	(79)
Southwest <sub>0.9x</sub>	0.77	x	1.4	6	x	44.07	1	0.4	T x	0.7		12.49	(79)
Southwest <sub>0.9x</sub>	0.77	X	2.0	1	x	31.49	1	0.4	×	0.7	= =	12.28	(79)
Southwest <sub>0.9x</sub>	0.77	X	2.0		x	31.49	1	0.4	×	0.7	= =	12.28	(79)
Southwest <sub>0.9x</sub>	0.77	X	1.4	==	x	31.49	1	0.4	x	0.7	= =	8.92	(79)
<u>L</u>				<u> </u>		<u> </u>		0		<u> </u>		0.02	( -/
Solar gains in	watts. ca	lculated	for each	n month			(83)m	ı = Sum(74)m	(82)m				
(83)m= 41.71	71.9	100.66	128.54	147.46	147.93	141.98	127		80.08		35.59	1	(83)
Total gains – ir	nternal a	nd solar	(84)m =	(73)m	+ (83)m	n , watts		I	-	!		1	
(84)m= 385.61	413.89	432.05	443.09	445.2	429.38	412.81	403	.64 394.93	381.7	6 371.25	371.04		(84)
7. Mean inter	nal temp	erature (	(heating	season	)	,			,		•	•	
Temperature					<u></u>	from Tal	ble 9.	Th1 (°C)				21	(85)
Utilisation fac	_	•			•		•						`
Jan	Feb	Mar	Apr	May	Jun	Jul	A	ug Sep	Oc	Nov	Dec	]	
(86)m= 0.95	0.94	0.92	0.88	0.81	0.69	0.56	0.5	<u> </u>	0.88	+	0.96	1	(86)
Mean interna	Ltompor	eture in l	living are	22 T1 (f	ollow et	one 3 to	7 in T	able 9c)			!	1	
(87)m= 18.76	18.96	19.32	19.82	20.3	20.69	20.88	20.		19.99	19.31	18.73	1	(87)
			!		ļ.	_!	<u> </u>		1	1	1	1	` '
Temperature		eating po 20.43	eriods in	20.44	dwellin 20.45	<del>-</del>	1		20.4	1 20.44	20.42	1	(88)
(88)m= 20.43	20.43	∠∪.43	∠∪.44	∠0.44	20.45	20.45	20.	45 20.44	20.44	20.44	20.43	]	(00)

Utilisation	factor for g	ains for	rest of d	wellina l	h2 m (se	e Table	9a)						
(89)m= 0.9	<u>_</u>	0.91	0.87	0.79	0.66	0.51	0.54	0.72	0.87	0.93	0.95		(89)
Mean inte	ernal temper	ature in	the rest	of dwelli	ng T2 (fo	ollow ste	eps 3 to 7	r in Tabl	e 9c)				
(90)m= 18		18.86	19.35	19.82	20.2	20.36	20.35	20.1	19.53	18.85	18.27		(90)
	L		•					f	LA = Livin	g area ÷ (4	1) =	0.51	(91)
Mean inte	ernal temper	ature (fo	or the wh	ole dwel	llina) = fl	A × T1	+ (1 – fl	A) x T2			L		_
(92)m= 18.		19.09	19.59	20.06	20.45	20.62	20.6	20.34	19.76	19.08	18.5		(92)
Apply adj	ustment to t	he meai	n interna	tempera	ature fro	m Table	4e, whe	re appro	ppriate				
	.53 18.73	19.09	19.59	20.06	20.45	20.62	20.6	20.34	19.76	19.08	18.5		(93)
8. Space	heating requ	uiremen	t										
	he mean int		•		ed at ste	ep 11 of	Table 9b	o, so tha	t Ti,m=(	76)m an	d re-calc	ulate	
	an Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
<u> </u>	factor for g	L	<u> </u>		• • • • • • • • • • • • • • • • • • • •	J 311	119						
(94)m= 0.9	<del></del>	0.9	0.85	0.78	0.66	0.53	0.55	0.72	0.85	0.91	0.94		(94)
Useful ga	ins, hmGm	, W = (9	4)m x (8	4)m									
(95)m= 360	0.57 381.03	387.29	377.77	346.87	282.86	216.84	222.35	283.22	324.83	339.35	348.87		(95)
Monthly a	verage exte	rnal ten	perature	from Ta	able 8								
(96)m= 4.	3 4.9	6.5	8.9	11.7	14.6	16.6	16.4	14.1	10.6	7.1	4.2		(96)
Heat loss	rate for me	an interr	nal tempe	erature, I	<u>_m</u> , W =	=[(39) <mark>m</mark> :	x [( <mark>9</mark> 3)m	(96)m	]				
(97)m= $903$	3.74 875.9 <mark>7</mark>	795.23	665.53	519.14	358	246.18	256.61	384.39	568.84	748.09	898.1		(97)
Space he	ating require	ement fo	r each n	nonth, k	Wh/mont	th = 0.02	24 x [(97)	)m – (95	)m] x (4′	)m			
(98)m= $404$	1.11 332.6	303.51	207.19	128.17	0	0	0	0	181.54	294.29	408.63		_
							Tota	l per year	(kWh/year	) = Sum(9	8) <sub>15,912</sub> =	2260.05	(98)
Space he	ating require	ement ir	kWh/m²	/year								40.87	(99)
9a. Energy	requiremer	nts – Ind	lividual h	eating sy	/stems i	ncluding	micro-C	HP)					
Space he	•												_
Fraction of	of space hea	at from s	econdar	y/supple	mentary	system						0	(201)
Fraction of	of space hea	at from n	nain syst	em(s)									_
Fraction of	of total heati						(202) = 1 -	- (201) =				1	(202)
		ng from	main sys	stem 1			(202) = 1 - (204) = (204)	. ,	(203)] =		[	1	(202)
Efficiency	of main spa	_	•				, ,	. ,	(203)] =		[		╡ .
•		ace heat	ting syste	em 1	g system		, ,	. ,	(203)] =			1	(204)
Efficiency	of main spa	ace heat	ting syste	em 1	g system Jun		, ,	. ,	(203)] =	Nov	Dec	1 100	(204) (206) (208)
Efficiency	of main spa	ry/suppl	ting systementar	em 1 y heating May	Jun	n, %	(204) = (20	02) × [1 –		Nov	Dec	1 100 0	(204) (206) (208)
Efficiency	of main spa of seconda an Feb ating require	ry/suppl	ting systementar	em 1 y heating May	Jun	n, %	(204) = (20	02) × [1 –		Nov 294.29	Dec 408.63	1 100 0	(204) (206) (208)
Efficiency  Ja  Space he	of main spa of seconda an Feb ating require	ry/suppl Mar ement (0	ementar Apr calculate	em 1 y heating May d above)	Jun	n, % Jul	(204) = (204) Aug	02) × [1 -	Oct			1 100 0	(204) (206) (208)
Efficiency  Ja  Space he	of main span of secondar of se	ry/suppl Mar ement (0	ementar Apr calculate	em 1 y heating May d above)	Jun	n, % Jul	(204) = (204) Aug	02) × [1 -	Oct			1 100 0	(204) (206) (208) ar
Efficiency  Ja  Space he  404  (211)m = {	of main span of secondar of se	mace head ry/suppl Mar ement (d 303.51 (4)] } x ^	ementar Apr calculate 207.19	m 1 y heating May d above) 128.17	Jun 0	n, % Jul 0	Aug 0	02) × [1 -	Oct 181.54	294.29	408.63	1 100 0	(204) (206) (208) ar
Space he  (211)m = {	of main span of secondar of se	mare hear y/supplement (0 303.51 4)] } x 2	Apr calculate 207.19 100 ÷ (20 207.19	em 1 y heating May d above) 128.17 06) 128.17	Jun 0	n, % Jul 0	Aug 0	02) × [1 -	Oct 181.54	294.29	408.63	1 100 0 kWh/ye	(204) (206) (208) ar
Space he  (211)m = {  Space he	of main spar of secondar an Feb ating require 1.11 332.6 [(98)m x (20 1.11 332.6	mar ement (days 303.51 303.51 econdar	ting systementar Apr calculate 207.19 100 ÷ (20 207.19	em 1 y heating May d above) 128.17 06) 128.17	Jun 0	n, % Jul 0	Aug 0	02) × [1 -	Oct 181.54	294.29	408.63	1 100 0 kWh/ye	(204) (206) (208) ar
Space he  (211)m = {  Space he	of main span of secondar of se	mar ement (days 303.51 303.51 econdar	ting systementar Apr calculate 207.19 100 ÷ (20 207.19	em 1 y heating May d above) 128.17 06) 128.17	Jun 0	n, % Jul 0	(204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204)	02) × [1 -	Oct  181.54  181.54  ar) =Sum(2)	294.29 294.29 211) <sub>15,1012</sub>	408.63	1 100 0 kWh/ye	(204) (206) (208) ar (211)
Efficiency  Space he $404$ (211)m = {  404  Space he = {[(98)m x)}	of main span of secondar of se	mace head ry/supplement (0 303.51 44)] } x 303.51 econdar 00 ÷ (20	Apr calculate 207.19 100 ÷ (20 207.19 ry), kWh/	m 1 y heating May d above) 128.17 06) 128.17 month	Jun 0 0	o 0	(204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204)	02) × [1 -   Sep  0  0  (kWh/yea	Oct  181.54  181.54  ar) =Sum(2)	294.29 294.29 211) <sub>15,1012</sub>	408.63	1 100 0 kWh/ye	(204) (206) (208) ar

#### Water heating Water heating from separate community system: Annual water heating requirement (64)1878.81 Fraction of heat from community CHP (303a) Factor for charging method for community water heating (305)1 Distribution loss factor (Table 12c) for community heating system (306)1.1 Water heat from CHP (64) x (303a) x (305) x (306) = (310a) 2066.69 Electricity used for heat distribution $0.01 \times [(307a)...(307e) + (310a)...(310e)] =$ (313)20.67 **Annual totals** kWh/year kWh/year Space heating fuel used, main system 1 2260.05 Electricity for pumps, fans and electric keep-hot mechanical ventilation - balanced, extract or positive input from outside 218.89 (230a) sum of (230a)...(230g) = Total electricity for the above, kWh/year (231)218.89 (232) Electricity for lighting 281.06 Electricity generated by PVs (233)-1537.91 1222.09 Total delivered energy for all uses (211)...(221) + (231) + (232)...(237b) = (338)12a. CO2 emissions - Individual heating systems including micro-CHP **Emission factor** Energy **Emissions** kWh/year kg CO2/kWh kg CO2/year (211) Space heating (main system 1) (261)0.519 1172.96 Space heating (secondary) (215) x (263)0.519 0 Water heating from community system **Emission factor Emissions** Energy kWh/year kg CO2/kWh kg CO2/year CO2 from other sources of space and water heating (not CHP) If there is CHP using two fuels repeat (363) to (366) for the second fuel Efficiency of heat source 1 (%) 329 (367a) CO2 associated with heat source 1 $[(307b)+(310b)] \times 100 \div (367b) \times$ (367)0.52 326.02 Electrical energy for heat distribution (372)[(313) x 0.52 10.73 Total CO2 associated with community systems (363)...(366) + (368)...(372)336.75 (373)Electricity for pumps, fans and electric keep-hot (231) x (267)0.519 113.61 (232) x Electricity for lighting (268)0.519 145.87 Energy saving/generation technologies Item 1 (269)0.519 -798.17 sum of (265)...(271) =Total CO2, kg/year 971.01 (272) $(272) \div (4) =$ **Dwelling CO2 Emission Rate** (273)17.56 El rating (section 14) (274)87

			User.I	Details:						
Assessor Name: Software Name:	Stroma FSA		Property	Strom Softwa	are Vei	rsion:	 SHP + F		on: 1.0.5.33	
Address :	Chester Road						0111 11	v		
1. Overall dwelling dime	nsions:									
Ground floor			Are	a(m²)	(1a) x		ight(m)	(2a) =	Volume(m³	(3a)
	a) . (1b) . (1a) . (1	d\.(1a\. (	10)			3	.09	(2a) =	108.15	(Ja)
Total floor area TFA = (1a	a)+(1D)+(1C)+(1	a)+(1e)+(	<sup>in)</sup>	35	(4)	\	n (O )	(0.)		_
Dwelling volume					(3a)+(3b)	)+(3c)+(3c	d)+(3e)+	.(3n) =	108.15	(5)
2. Ventilation rate:	main	second	arv	other		total			m³ per hou	r
Number of objection	heating	heating	,, 		7 <u>-</u> F			40 =	-	_
Number of chimneys	0		ᆜ 닏	0	╛╘	0		20 =	0	(6a)
Number of open flues	0	+ 0	+	0	] = [	0			0	(6b)
Number of intermittent fai	ns				Ļ	0		10 =	0	(7a)
Number of passive vents					Ĺ	0		10 =	0	(7b)
Number of flueless gas fin	res					0	X 4	40 =	0	(7c)
								Air ch	nanges per ho	our
Infiltration due to chimney	s, flues and far	ns = (6a) + (6b) +	-(7a)+(7b)+	(7c) =	Г	0		÷ (5) =	0	(8)
If a pressurisation test has b					continue fr	rom (9) to				`` <i>`</i>
Number of storeys in th	ne dw <mark>elling</mark> (ns)								0	(9)
Additional infiltration Structural infiltration: 0.	25 for steel or t	imber frame	or 0.35 fo	r masoni	ry constr	ruction	[(9)	-1]x0.1 =	0	(10)
if both types of wall are pr					•	dellon			0	(' ' ')
deducting areas of opening	• /- /		0.1 (222)	مط/ مامم	antar O				_	7,40
If suspended wooden f If no draught lobby, ent	,	•	u.i (seai	ea), eise	enter o				0	(12)
Percentage of windows	•								0	(14)
Window infiltration		0 11		0.25 - [0.2	x (14) ÷ 1	00] =			0	(15)
Infiltration rate				(8) + (10)	+ (11) + (1	12) + (13)	+ (15) =		0	(16)
Air permeability value,			•		•	etre of e	envelope	area	2.5	(17)
If based on air permeabili  Air permeability value applies	•					io boing u	and		0.12	(18)
Number of sides sheltere		rtest nas been d	one or a de	gree air pe	ппеаышу	is being u	seu		0	(19)
Shelter factor				(20) = 1 -	[0.0 <b>75</b> x (1	19)] =			1	(20)
Infiltration rate incorporat	ing shelter facto	or		(21) = (18	) x (20) =				0.12	(21)
Infiltration rate modified for	or monthly wind	speed		,					1	
Jan Feb	Mar Apr	May Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Monthly average wind sp		7						1	1	
(22)m= 5.1 5	4.9 4.4	4.3 3.8	3.8	3.7	4	4.3	4.5	4.7		
Wind Factor (22a)m = (22	2)m ÷ 4									
(22a)m= 1.27 1.25	1.23 1.1	1.08 0.95	0.95	0.92	1	1.08	1.12	1.18		

djusted infiltra	ation rat	e (allowi	ng for sh	nelter an	d wind s	speed) =	: (21a) x	(22a)m					
0.16	0.16	0.15	0.14	0.13	0.12	0.12	0.12	0.12	0.13	0.14	0.15		
Calculate effect If mechanica		_	rate for t	he appli	cable ca	se					I	0.5	(2
If exhaust air he			endix N. (2	3b) = (23a	a) × Fmv (e	eguation (	N5)) . othe	rwise (23b	) = (23a)			0.5	(2
If balanced with									, , ,			75.65	(2
a) If balance		-	-	_					2b)m + (	23b) x [	ا (23c) – 1		(
24a)m= 0.28	0.28	0.27	0.26	0.26	0.24	0.24	0.24	0.25	0.26	0.26	0.27		(2
b) If balance	d mech	anical ve	entilation	without	heat red	covery (ľ	u MV) (24t	)m = (22	<u>.                                    </u>	23b)	ļ		
24b)m= 0	0	0	0	0	0	0	0	0	0	0	0		(2
c) If whole h				•	•				_		•		
if (22b)n		<u> </u>	<u> </u>	ŕ	ŕ –	· ·	<del>r ` ` </del>	ŕ –	<u>`</u>	ŕ		1	(2
24c)m= 0	0	0	0	0		0	0	0	0	0	0		(2
d) If natural if (22b)n									0.51				
24d)m= 0	0	0	0	0	0	0	0	0	0	0	0		(2
Effective air	change	rate - er	nter (24a	or (24b	o) or (24	c) or (24	ld) in bo	· (25)					
25)m= 0.28	0.28	0.27	0.26	0.26	0.24	0.24	0.24	0.25	0.26	0.26	0.27		(2
3. Heat losse	ond be	et less i	oromot	or:									
LEMENT	Gros		Openin		Net Ar	ea	U-val	16	AXU		k-value	<u>,</u>	λΧk
	area		m		A ,r		W/m2		(W/	K)	kJ/m²-k		J/K
oo <mark>rs Type 1</mark>					2.13	x	1		2.13				(2
oo <mark>rs Type 2</mark>					0.94	x	1	<u> </u>	0.94				(2
Ooors Type 3					0.75	x	1	] =	0.75				(2
oors Type 4		'			0.68	х	1	=	0.68				(2
Vindows Type	: 1				2	x1	/[1/( 1.2 )+	0.04] =	2.29				(2
Vindows Type	2				1.04	x1	/[1/( 1.2 )+	0.04] =	1.19				(2
Vindows Type	3				0.32	<sub>x</sub> 1	/[1/( 1.2 )+	0.04] =	0.37	$\overline{}$			(2
Vindows Type	4				1.45	x1	/[1/( 1.2 )+	0.04] =	1.66				(2
Valls Type1	15.4	18	4.24		11.24	1 x	0.13	=	1.46	<b>=</b> [			(2
Valls Type2	2.04	4	0		2.04	X	0.13	=	0.27			<b>=</b>	(2
Valls Type3	2.8	7	0		2.87	X	0.13	=	0.37			<b>=</b>	(2
Valls Type4	18.3	9	5.07	一	13.32	<u>2</u> x	0.13	<u> </u>	1.73	Ħ i			(2
Roof	35		0	一	35	x	0.1	<del>-</del>	3.5	Ħ i			(;
KOOI		m²			73.78	3							(
otal area of e	lements	,											
otal area of e	roof wind	ows, use e			alue calcul	ated using	g formula 1	/[(1/U-valu	ie)+0.04] a	as given in	paragraph	3.2	
otal area of e for windows and include the area	roof windo	ows, use e sides of ir	nternal wal		alue calcul	ated using	g formula 1 (26)(30		ie)+0.04] a	as given in	paragraph 		
	roof winde as on both ss, W/K :	ows, use e sides of ir = S (A x	nternal wal		alue calcul	ated using		) + (32) =		as given in 2) + (32a).		17.34	(3

For design assessments where the details of the construction are not known precisely the indicative values of TMP in Table 1f

an be used instea													
hermal bridge	•	,			•	<						11.07	(36
details of therma otal fabric he		are not kn	own (36) =	= 0.05 x (3	1)			(33) +	(36) =			00.44	(3
entilation hea		alculated	l monthly	./				` '	, ,	25)m x (5)		28.41	(3
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
38)m= 10.03	9.92	9.81	9.25	9.14	8.58	8.58	8.47	8.81	9.14	9.36	9.59		(3
leat transfer o	coefficier	nt W/K				l .		(39)m	= (37) + (37)	1		l	
39)m= 38.44	38.33	38.22	37.66	37.55	36.99	36.99	36.88	37.21	37.55	37.77	37.99		
	ļ			<u> </u>		<u> </u>	<u>!</u>	,	Average =	Sum(39) <sub>1</sub>	12 /12=	37.63	(3
eat loss para	· `						· ·		= (39)m ÷	<del>`                                    </del>	i	1	
0)m= 1.1	1.1	1.09	1.08	1.07	1.06	1.06	1.05	1.06	1.07	1.08	1.09	4.00	<b>—</b> ,,
lumber of day	/s in mor	nth (Tabl	le 1a)					,	Average =	Sum(40) <sub>1</sub>	12 /12=	1.08	(4
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
1)m= 31	28	31	30	31	30	31	31	30	31	30	31		(4
I. Water heat	ting ener	gy requi	rement:								kWh/ye	ear:	
noumed cool													
SSumed occu	ipancy, i	N								1	.28		(-
if TFA > 13.9	9, N = 1		[1 - exp	(-0.0003	349 x (TF	FA -13.9	)2)] + 0.0	013 x (	ΓFA -13.		.28		(4
if TFA > 13.9 if TFA £ 13.9	9, N = 1 9, N = 1	+ 1.76 x							ΓFA -13.	9)	_		`
if <mark>TFA &gt; 13.9</mark> if TFA £ 13.9 nn <mark>ual av</mark> erag	9, N = 1 9, N = 1 ge hot wa	+ 1.76 x	ge in litre	es per da	y Vd,av	erage =	(25 x N)	+ 36		9)	.62		`
if TFA > 13.9 if TFA £ 13.9 nnual averag educe the annual	9, N = 1 9, N = 1 ge hot wa al average	+ 1.76 x ater usag	ge in litre	es per da 5% if the o	y Vd,av welling is	erage = designed	(25 x N)	+ 36		9)	_		`
if TFA > 13.9 if TFA £ 13.9 nnual averag educe the annual	9, N = 1 9, N = 1 ge hot wa al average	+ 1.76 x ater usag	ge in litre	es per da 5% if the o	y Vd,av welling is	erage = designed	(25 x N)	+ 36		9)	_		`
if TFA > 13.9 if TFA £ 13.9 nnual averageduce the annual at more that 125  Jan	9, N = 1 9, N = 1 ge hot wa al average litres per p	+ 1.76 x ater usag hot water person per	ge in litre usage by a day (all w	es per da 5% if the d vater use, I	y Vd,av welling is not and co	erage = designed (d)	(25 x N) to achieve	+ 36 a water us	se target o	9) 64	J.62		`
if TFA > 13.9 if TFA £ 13.9 nnual averageduce the annual t more that 125  Jan  ot water usage in	9, N = 1 9, N = 1 ge hot wa al average litres per p	+ 1.76 x ater usag hot water person per	ge in litre usage by a day (all w	es per da 5% if the d vater use, I	y Vd,av welling is not and co	erage = designed (d)	(25 x N) to achieve	+ 36 a water us	se target o	9) 64	J.62		,
if TFA > 13.9 if TFA £ 13.9 if TFA £ 13.9 innual averageduce the annual at more that 125  Jan  Jan ot water usage in 4)m= 71.08	9, N = 1 9, N = 1 le hot was al average litres per per per litres	+ 1.76 x ater usag hot water person per Mar day for ea	ge in litre usage by s day (all w Apr ach month 63.32	es per da 5% if the da vater use, I May Vd,m = fa 60.74	y Vd,av welling is not and co Jun ctor from 1	erage = designed (d)  Jul Table 1c x  58.16	(25 x N) to achieve  Aug (43)  60.74	+ 36 a water us Sep 63.32	Oct  65.91  Total = Su	9) 64 Nov 68.49 m(44) <sub>112</sub> =	Dec 71.08	775.4	(
if TFA > 13.9 if TFA £ 13.9 if TFA £ 13.9 innual average duce the annual at more that 125  Jan  Jan of water usage in 4)m= 71.08  pergy content of	9, N = 1 9, N = 1 le hot was all average litres per per per litres per per litres per li	+ 1.76 x  ater usag hot water person per Mar day for ea  65.91  used - calc	ge in litre usage by s day (all w Apr ach month 63.32	es per da $5\%$ if the $a$ $a$ $a$ $a$ $b$ $a$ $b$ $a$	y Vd,av welling is not and co Jun ctor from 1 58.16	erage = designed (d)  Jul  Jul  Jable 1c x  58.16	(25 x N) to achieve  Aug (43)  60.74	+ 36 a water us  Sep  63.32 b kWh/more	Oct  65.91  Fotal = Su  th (see Ta	9) 64 Nov 68.49 m(44)112 = ables 1b, 1	71.08 = (c, 1d)	775.4	( <i>i</i>
if TFA > 13.9 if TFA £ 13.9 nnual averageduce the annual at more that 125  Jan of water usage in 4)m= 71.08  nergy content of	9, N = 1 9, N = 1 le hot was al average litres per per per litres	+ 1.76 x ater usag hot water person per Mar day for ea	ge in litre usage by s day (all w Apr ach month 63.32	es per da 5% if the da vater use, I May Vd,m = fa 60.74	y Vd,av welling is not and co Jun ctor from 1	erage = designed (d)  Jul Table 1c x  58.16	(25 x N) to achieve  Aug (43)  60.74	+ 36 a water us  Sep  63.32 0 kWh/mor  73.89	Oct  65.91  Total = Su  with (see Ta  86.12	9) 64 Nov 68.49 m(44) <sub>112</sub> = ables 1b, 1	71.08 = (c, 1d) 102.08		(.
if TFA > 13.9 if TFA £ 13.9 nnual averageduce the annual at more that 125  Jan of water usage if 4)m= 71.08  hergy content of 5)m= 105.41	9, N = 1 9, N = 1 ge hot waal average litres per	+ 1.76 x  ater usag hot water person per Mar day for ea 65.91  used - calc 95.13	ge in litre usage by a day (all w Apr ach month 63.32 culated mo 82.94	es per da 5% if the of the orater use, I May Vd,m = fact 60.74 conthly = 4.	Jun 58.16 58.67	erage = designed and signed and s	(25 x N) to achieve Aug (43) 60.74 07m / 3600 73.02	+ 36 a water us  Sep  63.32 0 kWh/mor  73.89	Oct  65.91  Total = Su  with (see Ta  86.12	9) 64 Nov 68.49 m(44)112 = ables 1b, 1	71.08 = (c, 1d) 102.08	775.4	(4
if TFA > 13.9 if TFA £ 13.9 if TFA £ 13.9 innual average educe the annual at more that 125  Jan of water usage if 4)m= 71.08 inergy content of 5)m= 105.41 instantaneous w 6)m= 15.81	9, N = 1 9, N = 1 ge hot waal average litres per litres	+ 1.76 x  ater usag hot water person per Mar day for ea 65.91  used - calc 95.13	ge in litre usage by a day (all w Apr ach month 63.32 culated mo 82.94	es per da 5% if the of the orater use, I May Vd,m = fact 60.74 conthly = 4.	Jun 58.16 58.67	erage = designed and signed and s	(25 x N) to achieve Aug (43) 60.74 07m / 3600 73.02	+ 36 a water us  Sep  63.32 0 kWh/mor  73.89	Oct  65.91  Total = Su  with (see Ta  86.12	9) 64 Nov 68.49 m(44) <sub>112</sub> = ables 1b, 1	71.08 = (c, 1d) 102.08		(4
if TFA > 13.9 if TFA £ 13.9 if TFA £ 13.9 innual average duce the annual at more that 125  Jan of water usage in 4)m= 71.08 inergy content of 5)m= 105.41 instantaneous was 6)m= 15.81 dater storage	9, N = 1 9, N = 1 le hot was all average litres per per litres per per litres per per litres per per litres pe	ter usage hot water person per Mar day for ea 65.91  used - calc 95.13  ng at point 14.27	ge in litre usage by a day (all w Apr ach month 63.32  culated mo 82.94  of use (no	es per da 5% if the of tater use, I May Vd,m = fa 60.74 onthly = 4. 79.58	y Vd,av welling is not and co Jun 58.16 190 x Vd,r 68.67 r storage),	erage = designed ald)  Jul Table 1c x  58.16  m x nm x E  63.64  enter 0 in  9.55	(25 x N) to achieve Aug (43) 60.74 73.02 boxes (46) 10.95	+ 36 a water us  Sep  63.32 73.89 1 to (61) 11.08	Oct  65.91  Total = Su  86.12  Total = Su  12.92	9) 64 Nov 68.49 m(44) <sub>112</sub> = ables 1b, 1 94 m(45) <sub>112</sub> =	71.08 = (c, 1d) 102.08		(.
if TFA > 13.9 if TFA £ 13.9 if TFA £ 13.9 innual average aduce the annual at more that 125  Jan of water usage in 4)m= 71.08 inergy content of 5)m= 105.41 instantaneous water usage in 15.81 dater storage torage volume	9, N = 1 9, N = 1 ge hot waal average litres per litres	ter usage hot water person per Mar day for ea 65.91  used - calc 95.13  ng at point 14.27	ge in litre usage by a day (all w  Apr ach month 63.32  culated mo 82.94  of use (no 12.44	es per da 5% if the of vater use, I  May Vd,m = fact 60.74  79.58  hot water 11.94  plar or W	y Vd,av welling is not and co Jun 58.16 190 x Vd,r 68.67 r storage),	erage = designed and and and and and and and and and an	(25 x N) to achieve  Aug (43)  60.74  73.02  boxes (46)  10.95	+ 36 a water us  Sep  63.32 73.89 1 to (61) 11.08	Oct  65.91  Total = Su  86.12  Total = Su  12.92	9)  Nov  68.49  m(44) 112 = ables 1b, 1  94  m(45) 112 =	71.08 = (c, 1d) 102.08		(.
if TFA > 13.9 if TFA £ 13.9 if TFA £ 13.9 in ual average duce the annual at more that 125  Jan of water usage in 4)m= 71.08  deergy content of 5)m= 105.41 instantaneous was 15.81 dater storage torage volum community h	9, N = 1 9, N = 1 19, N = 1 19 hot was all average litres per	ter usage hot water person per Mar day for ea 65.91  used - calc 95.13  ng at point 14.27  includin nd no ta	ge in litre usage by a day (all w Apr ach month 63.32  culated mo 82.94  of use (no 12.44  ag any so ank in dw	es per da 5% if the of tater use, I  May  Vd,m = fat 60.74  79.58  The hot water 11.94  Delar or Water Welling, e	y Vd,av welling is not and co Jun 58.16 190 x Vd,r 68.67 r storage), 10.3	erage = designed (Id)  Jul Table 1c x  58.16  63.64  enter 0 in  9.55  storage  litres in	(25 x N) to achieve  Aug (43)  60.74  73.02  boxes (46)  10.95  within sa (47)	+ 36 a water us  Sep  63.32 73.89 71.08 11.08	Oct  65.91  Total = Su  86.12  Total = Su  12.92  sel	9)  Nov  68.49  m(44) <sub>112</sub> = 2  14.1	71.08 = (c, 1d) 102.08 =		(.
if TFA > 13.9 if TFA £ 13.9 if TFA £ 13.9 innual average duce the annual at more that 125  Jan of water usage in 1.08 instantaneous water usage in 1.05.41 instantaneous water usage in 1.05.41 instantaneous water storage to age volume community has the rwise if not the residence of the residence in the residence	9, N = 1 9, N = 1 19 hot was all average litres per	ter usage hot water person per Mar day for ea 65.91  used - calc 95.13  ng at point 14.27  includin nd no ta	ge in litre usage by a day (all w Apr ach month 63.32  culated mo 82.94  of use (no 12.44  ag any so ank in dw	es per da 5% if the of tater use, I  May  Vd,m = fat 60.74  79.58  The hot water 11.94  Delar or Water Welling, e	y Vd,av welling is not and co Jun 58.16 190 x Vd,r 68.67 r storage), 10.3	erage = designed (Id)  Jul Table 1c x  58.16  63.64  enter 0 in  9.55  storage  litres in	(25 x N) to achieve  Aug (43)  60.74  73.02  boxes (46)  10.95  within sa (47)	+ 36 a water us  Sep  63.32 73.89 71.08 11.08	Oct  65.91  Total = Su  86.12  Total = Su  12.92  sel	9)  Nov  68.49  m(44) <sub>112</sub> = 2  14.1	71.08 = (c, 1d) 102.08 =		(.
if TFA > 13.9 if TFA £ 13.9 if TFA £ 13.9 inual average aduce the annual at more that 125  Jan of water usage in 4)m= 71.08  hergy content of 5)m= 105.41 instantaneous water storage torage volume community here is not atternated.	9, N = 1 9, N = 1 19, N = 1 19e hot water litres per li	ter usage hot water person per Mar day for each 65.91  used - calc 95.13  ng at point 14.27  including the matter of the matter	ge in litre usage by a day (all w Apr ach month 63.32  culated mo 82.94  of use (no 12.44  ag any so nk in dw er (this in	es per da 5% if the of vater use, I  May Vd,m = fact 60.74  79.58  The one of the office of the offi	Jun total from 5 58.16 190 x Vd,r 68.67 10.3 VWHRS nter 110 nstantar	erage = designed and and and and and and and and and an	(25 x N) to achieve  Aug (43)  60.74  73.02  boxes (46)  10.95  within sa (47)	+ 36 a water us  Sep  63.32 73.89 71.08 11.08	Oct  65.91  Total = Su  86.12  Total = Su  12.92  sel	9)  Nov  68.49  m(44) <sub>112</sub> = ables 1b, 1  94  m(45) <sub>112</sub> = 14.1	71.08 = (c, 1d) 102.08 =		( ( (
if TFA > 13.9 if TFA £ 13.9 if TFA £ 13.9 innual average duce the annual at more that 125  Jan of water usage in 4)m= 71.08  hergy content of 5)m= 105.41 instantaneous w folia 15.81 /ater storage torage volum community here is now atter storage i) If manufact	9, N = 1 9, N = 1 19, N = 1 19e hot was all average litres per	ter usage hot water person per Mar day for each 65.91  used - calcondinates of the second sec	ge in litre usage by a day (all w  Apr ach month 63.32  culated mo 82.94  of use (no 12.44  ag any so ank in dw er (this in	es per da 5% if the of vater use, I  May Vd,m = fact 60.74  79.58  The one of the office of the offi	Jun total from 5 58.16 190 x Vd,r 68.67 10.3 VWHRS nter 110 nstantar	erage = designed and and and and and and and and and an	(25 x N) to achieve  Aug (43)  60.74  73.02  boxes (46)  10.95  within sa (47)	+ 36 a water us  Sep  63.32 73.89 71.08 11.08	Oct  65.91  Total = Su  86.12  Total = Su  12.92  sel	9) 64 Nov 68.49 m(44)12 = ables 1b, 1 94 m(45)112 =	71.08 = c, 1d) 102.08 = 15.31		( ( (
if TFA > 13.9 if TFA £ 13.9 if TFA £ 13.9 innual averageduce the annual at more that 125  Jan of water usage in 4)m= 71.08  hergy content of 5)m= 105.41 instantaneous water storage torage volume community head to the community head at the com	9, N = 1 9, N = 1 19, N = 1 19 hot was all average litres per	+ 1.76 x  ater usage hot water person per  Mar day for each 65.91  used - calc 95.13  ng at point 14.27  includin nd no tal hot water eclared lo	ge in litre usage by a day (all w Apr ach month 63.32  culated mo 82.94  of use (no 12.44  ag any so ank in dw er (this in oss facto 2b	es per da 5% if the of tater use, I  May  Vd,m = fat 60.74  79.58  The hot water 11.94  Delar or Water arcludes in the control of the control	Jun total from 5 58.16 190 x Vd,r 68.67 10.3 VWHRS nter 110 nstantar	erage = designed (d)  Jul Table 1c x  58.16  63.64  enter 0 in  9.55  storage 0 litres in neous con/day):	(25 x N) to achieve  Aug (43)  60.74  73.02  boxes (46)  10.95  within sa (47)	+ 36 a water us  Sep  63.32 73.89 10 to (61) 11.08 ame vess ers) ente	Oct  65.91  Total = Su  86.12  Total = Su  12.92  sel	9)  Nov  68.49  m(44) 112 = ables 1b, 1  94  m(45) 112 = 1  14.1	71.08 = (c, 1d) 102.08 = 15.31		(.) (.) (.) (.)
if TFA > 13.9 if TFA £ 13.9 if TFA £ 13.9 innual average educe the annual of more that 125  Jan of water usage in 4)m= 71.08  nergy content of 5)m= 105.41  instantaneous w 6)m= 15.81  /ater storage torage volum community hetherwise if no vater storage in manufact emperature from the more of the manufact emperature from the more of the manufact of the manufact emperature from the manufact emperature emperature from the manufact emperature emperature emperature emperature emperature emperature emperature emperature emperature emperatu	9, N = 1 9, N = 1 19, N =	ter usage hot water person per Mar day for ea 65.91  used - calc 95.13  ng at point 14.27  includin nd no ta hot water eclared lom Table storage eclared of the	ge in litre usage by a day (all w Apr ach month 63.32  culated mo 12.44  of use (no 12.44  ag any so ank in dw er (this in oss facto 2b , kWh/ye cylinder l	es per da 5% if the of	y Vd,av welling is not and co Jun 58.16 190 x Vd,r 68.67 10.3 /WHRS nter 110 nstantar wn (kWh	erage = designed and and and and and and and and and an	(25 x N) to achieve  Aug (43)  60.74  73.02  boxes (46)  10.95  within sa (47) pmbi boile	+ 36 a water us  Sep  63.32 73.89 10 to (61) 11.08 ame vess ers) ente	Oct  65.91  Total = Su  86.12  Total = Su  12.92  sel	9) 64 Nov 68.49 m(44) <sub>112</sub> = ables 1b, 1 94 m(45) <sub>112</sub> = 14.1	71.08 = (c, 1d) 102.08 = 15.31 0		(4 (4 (4 (4 (4)
if TFA > 13.9 if TFA £ 13.9 if TFA £ 13.9 innual average educe the annual of more that 125  Jan of water usage if 4)m= 71.08  nergy content of 5)m= 105.41  instantaneous w 6)m= 15.81 /ater storage torage volum community h of therwise if no /ater storage in lift manufact emperature fa nergy lost fro in lift manufact of water storage	9, N = 1 9, N = 1 19, N =	ter usage hot water person per Mar day for each of 5.91  used - calconditions of the person per 14.27  including at point 14.27  including at hot water person per 14.27  including at point 14.27  including at point 14.27	ge in litre usage by a day (all w Apr ach month 63.32  culated mo 82.94  of use (no 12.44  ag any so ank in dw er (this in oss facto 2b , kWh/ye cylinder l com Tabl	es per da 5% if the of	y Vd,av welling is not and co Jun 58.16 190 x Vd,r 68.67 10.3 /WHRS nter 110 nstantar wn (kWh	erage = designed and and and and and and and and and an	(25 x N) to achieve  Aug (43)  60.74  73.02  boxes (46)  10.95  within sa (47) pmbi boile	+ 36 a water us  Sep  63.32 73.89 10 to (61) 11.08 ame vess ers) ente	Oct  65.91  Total = Su  86.12  Total = Su  12.92  sel	9) 64 Nov 68.49 m(44) <sub>112</sub> = ables 1b, 1 94 m(45) <sub>112</sub> = 14.1	Dec 71.08 = (c, 1d) 102.08 = 15.31 0		(4 (4 (4 (4 (4)
if TFA £ 13.9 Innual average leduce the annual of more that 125  Jan lot water usage in 14)m= 71.08  Interpretation of 15)m= 105.41  Instantaneous water usage in 105.41	9, N = 1 9, N = 1 19, N =	ter usage hot water person per Mar day for ea 65.91  used - calc 95.13  ng at point 14.27  includin nd no ta hot water eclared le storage eclared of factor free sections.	ge in litre usage by a day (all w Apr ach month 63.32  culated mo 82.94  of use (no 12.44  ag any so nk in dw er (this in oss facto 2b , kWh/ye cylinder l com Tabl	es per da 5% if the of	y Vd,av welling is not and co Jun 58.16 190 x Vd,r 68.67 10.3 /WHRS nter 110 nstantar wn (kWh	erage = designed and and and and and and and and and an	(25 x N) to achieve  Aug (43)  60.74  73.02  boxes (46)  10.95  within sa (47) pmbi boile	+ 36 a water us  Sep  63.32 73.89 10 to (61) 11.08 ame vess ers) ente	Oct  65.91  Total = Su  86.12  Total = Su  12.92  sel	9) 64 Nov 68.49 m(44) <sub>112</sub> = ables 1b, 1 94 m(45) <sub>112</sub> = 1 14.1	71.08 = (c, 1d) 102.08 = 15.31 0		(4) (4) (4) (4) (4) (4) (4) (5) (5) (5)

	) x (51) x (52) x (53) = 1.03 (54)
Enter (50) or (54) in (55)  Water storage loss calculated for each month ((56)	1.03    (55) $(55)$
	, . , , , , , , , , , , , , , , , , , ,
(56)m= 32.01 28.92 32.01 30.98 32.01 30.98 32.01 32.01 30.98 32.01 32.01 30.98 32.01 32.01 30.98 32.01 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98 32.01 30.98	2.01 30.98 32.01 30.98 32.01 (56)
	2.01 30.98 32.01 30.98 32.01 (57)
Primary aircuit loss (annual) from Table 2	0 (58)
Primary circuit loss (annual) from Table 3 Primary circuit loss calculated for each month (59)m = (58) ÷ 365 ×	
(modified by factor from Table H5 if there is solar water heating a	
	3.26 22.51 23.26 22.51 23.26 (59)
Combi loss calculated for each month (61)m = (60) $\div$ 365 × (41)m	
(61)m= 0 0 0 0 0 0 0	0 0 0 0 (61)
Total heat required for water heating calculated for each month (62	$2m = 0.85 \times (45)m + (46)m + (57)m + (59)m + (61)m$
(62)m= 160.68 142.12 150.41 136.43 134.86 122.17 118.91 12	28.3 127.39 141.39 147.5 157.36 (62)
Solar DHW input calculated using Appendix G or Appendix H (negative quantity) (et	nter '0' if no solar contribution to water heating)
(add additional lines if FGHRS and/or WWHRS applies, see Appen	ndix G)
(63)m= 0 0 0 0 0 0 0	0 0 0 0 0 (63)
Output from water heater	
(64)m= 160.68 142.12 150.41 136.43 134.86 122.17 118.91 12	28.3 127.39 141.39 147.5 157.36
	Output from water heater (annual) <sub>112</sub> 1667.51 (64)
Heat gains from water heating, kWh/month 0.25 / [0.85 x (45)m + (	(61)m] + 0.8 x [(46)m + (57)m + (59)m ]
(65)m= 79.27 70.6 75.85 70.37 70.68 65.63 65.38 6	88.5 67.36 72.86 74.05 78.16 (65)
include (57)m in calculation of (65)m only if cylinder is in the dwe	elling or hot water is from community heating
5. Internal gains (see Table 5 and 5a):	
Metabolic gains (Table 5), Watts	
Jan   Feb   Mar   Apr   May   Jun   Jul   A	Aug Sep Oct Nov Dec
	Aug         Sep         Oct         Nov         Dec           4.04         64.04         64.04         64.04         (66)
	4.04 64.04 64.04 64.04 (66)
(66)m= 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04	4.04 64.04 64.04 64.04 (66)
(66)m= 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04	4.04 64.04 64.04 64.04 64.04 (66) see Table 5 5.08 6.82 8.66 10.11 10.78 (67)
(66)m=       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04 <t< td=""><td>4.04 64.04 64.04 64.04 64.04 (66) see Table 5 5.08 6.82 8.66 10.11 10.78 (67)</td></t<>	4.04 64.04 64.04 64.04 64.04 (66) see Table 5 5.08 6.82 8.66 10.11 10.78 (67)
(66)m=       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04 <t< td=""><td>4.04 64.04 64.04 64.04 64.04 (66)  see Table 5  5.08 6.82 8.66 10.11 10.78  , also see Table 5  0.56 83.41 89.49 97.16 104.38 (68)</td></t<>	4.04 64.04 64.04 64.04 64.04 (66)  see Table 5  5.08 6.82 8.66 10.11 10.78  , also see Table 5  0.56 83.41 89.49 97.16 104.38 (68)
(66)m=       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04 <t< td=""><td>4.04 64.04 64.04 64.04 64.04 (66)  see Table 5  5.08 6.82 8.66 10.11 10.78  , also see Table 5  0.56 83.41 89.49 97.16 104.38 (68)</td></t<>	4.04 64.04 64.04 64.04 64.04 (66)  see Table 5  5.08 6.82 8.66 10.11 10.78  , also see Table 5  0.56 83.41 89.49 97.16 104.38 (68)
(66)m= 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04 64.04	4.04 64.04 64.04 64.04 64.04 (66)  see Table 5  5.08 6.82 8.66 10.11 10.78  , also see Table 5  0.56 83.41 89.49 97.16 104.38  Iso see Table 5
(66)m=       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04 <t< td=""><td>4.04 64.04 64.04 64.04 64.04 (66)  see Table 5  5.08 6.82 8.66 10.11 10.78  , also see Table 5  0.56 83.41 89.49 97.16 104.38  Iso see Table 5</td></t<>	4.04 64.04 64.04 64.04 64.04 (66)  see Table 5  5.08 6.82 8.66 10.11 10.78  , also see Table 5  0.56 83.41 89.49 97.16 104.38  Iso see Table 5
(66)m=       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04 <t< td=""><td>4.04 64.04 64.04 64.04 64.04 (66)  see Table 5  5.08 6.82 8.66 10.11 10.78  , also see Table 5  0.56 83.41 89.49 97.16 104.38  Iso see Table 5  29.4 29.4 29.4 29.4 29.4 (69)</td></t<>	4.04 64.04 64.04 64.04 64.04 (66)  see Table 5  5.08 6.82 8.66 10.11 10.78  , also see Table 5  0.56 83.41 89.49 97.16 104.38  Iso see Table 5  29.4 29.4 29.4 29.4 29.4 (69)
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(66)m=       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04       64.04 <t< td=""><td>4.04 64.04 64.04 64.04 64.04 (66)  see Table 5  5.08 6.82 8.66 10.11 10.78  , also see Table 5  0.56 83.41 89.49 97.16 104.38  lso see Table 5  29.4 29.4 29.4 29.4 29.4 (69)  0 0 0 0 0 0 (70)  51.23 -51.23 -51.23 -51.23 (71)</td></t<>	4.04 64.04 64.04 64.04 64.04 (66)  see Table 5  5.08 6.82 8.66 10.11 10.78  , also see Table 5  0.56 83.41 89.49 97.16 104.38  lso see Table 5  29.4 29.4 29.4 29.4 29.4 (69)  0 0 0 0 0 0 (70)  51.23 -51.23 -51.23 -51.23 (71)
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Solar gains are calculated using solar flux from Table 6a and associated equations to convert to the applicable orientation.

Orientation: Access Factor Table 6d		Area m²		Flux Table 6a		g_ Table 6b		FF Table 6c		Gains (W)	
Northeast 0.9x 0.77	X	1.04	x	11.28	x	0.4	x	0.7	=	2.28	(75)
Northeast <sub>0.9x</sub> 0.77	X	0.32	х	11.28	x	0.4	x	0.7	=	0.7	(75)
Northeast 0.9x 0.77	X	1.04	х	22.97	x	0.4	x	0.7	=	4.63	(75)
Northeast 0.9x 0.77	X	0.32	x	22.97	x	0.4	x	0.7	] =	1.43	(75)
Northeast 0.9x 0.77	X	1.04	x	41.38	x	0.4	x	0.7	=	8.35	(75)
Northeast 0.9x 0.77	X	0.32	х	41.38	x	0.4	x	0.7	=	2.57	(75)
Northeast 0.9x 0.77	X	1.04	x	67.96	X	0.4	X	0.7	=	13.71	(75)
Northeast <sub>0.9x</sub> 0.77	X	0.32	x	67.96	x	0.4	x	0.7	=	4.22	(75)
Northeast <sub>0.9x</sub> 0.77	X	1.04	x	91.35	x	0.4	x	0.7	=	18.43	(75)
Northeast <sub>0.9x</sub> 0.77	X	0.32	x	91.35	x	0.4	x	0.7	=	5.67	(75)
Northeast <sub>0.9x</sub> 0.77	X	1.04	x	97.38	x	0.4	x	0.7	=	19.65	(75)
Northeast <sub>0.9x</sub> 0.77	X	0.32	x	97.38	x	0.4	x	0.7	=	6.05	(75)
Northeast <sub>0.9x</sub> 0.77	X	1.04	x	91.1	x	0.4	x	0.7	=	18.38	(75)
Northeast <sub>0.9x</sub> 0.77	X	0.32	x	91.1	x	0.4	x	0.7	=	5.66	(75)
Northeast <sub>0.9x</sub> 0.77	X	1.04	x	72.63	x	0.4	x	0.7	=	14.66	(75)
Northeast 0.9x 0.77	X	0.32	X	72.63	X	0.4	X	0.7	=	4.51	(75)
Northeast 0.9x 0.77	X	1.04	x	50.42	x	0.4	x	0.7	=	10.17	(75)
Northeast 0.9x 0.77	X	0.32	х	50.42	x	0.4	x	0.7	=	3.13	(75)
Northeast 0.9x 0.77	X	1.04	x	28.07	x	0.4	x	0.7	=	5.66	(75)
Northeast <sub>0.9x</sub> 0.77	X	0.32	x	28.07	х	0.4	x	0.7	=	1.74	(75)
Northeast 0.9x 0.77	X	1.04	x	14.2	×	0.4	x	0.7	=	2.86	(75)
Northeast 0.9x 0.77	X	0.32	х	14.2	x	0.4	x	0.7	=	0.88	(75)
Northeast 0.9x 0.77	x	1.04	х	9.21	X	0.4	X	0.7	=	1.86	(75)
Northeast <sub>0.9x</sub> 0.77	X	0.32	x	9.21	X	0.4	X	0.7	=	0.57	(75)
Southwest <sub>0.9x</sub> 0.77	X	2	x	36.79		0.4	X	0.7	=	14.28	(79)
Southwest <sub>0.9x</sub> 0.77	X	1.45	x	36.79		0.4	X	0.7	=	10.35	(79)
Southwest <sub>0.9x</sub> 0.77	X	2	x	62.67		0.4	X	0.7	=	24.32	(79)
Southwest <sub>0.9x</sub> 0.77	X	1.45	X	62.67		0.4	X	0.7	=	17.63	(79)
Southwest <sub>0.9x</sub> 0.77	X	2	x	85.75		0.4	x	0.7	=	33.28	(79)
Southwest <sub>0.9x</sub> 0.77	X	1.45	x	85.75	]	0.4	X	0.7	=	24.13	(79)
Southwest <sub>0.9x</sub> 0.77	X	2	x	106.25		0.4	X	0.7	=	41.23	(79)
Southwest <sub>0.9x</sub> 0.77	X	1.45	x	106.25		0.4	X	0.7	=	29.89	(79)
Southwest <sub>0.9x</sub> 0.77	X	2	x	119.01		0.4	X	0.7	=	46.19	(79)
Southwest <sub>0.9x</sub> 0.77	X	1.45	x	119.01		0.4	X	0.7	=	33.48	(79)
Southwest <sub>0.9x</sub> 0.77	X	2	x	118.15		0.4	x	0.7	=	45.85	(79)
Southwest <sub>0.9x</sub> 0.77	X	1.45	x	118.15		0.4	x	0.7	=	33.24	(79)
Southwest <sub>0.9x</sub> 0.77	X	2	x	113.91		0.4	x	0.7	=	44.21	(79)
Southwest <sub>0.9x</sub> 0.77	X	1.45	x	113.91	]	0.4	x	0.7	=	32.05	(79)
Southwest <sub>0.9x</sub> 0.77	X	2	X	104.39		0.4	x	0.7	=	40.51	(79)

Southwests 98															
Southwest0.se,		×	1.4	15	X	10	04.39			0.4	X	0.7	=	29.37	(79)
Southwesto, 0x	Southwest <sub>0.9x</sub> 0.77	X	2	2	X	9	2.85	]		0.4	X	0.7	=	36.03	(79)
Southwesto set 0.77 × x 1.45 × 66.27	Southwest <sub>0.9x</sub> 0.77	x	1.4	<b>1</b> 5	x	9	2.85			0.4	X	0.7	=	26.12	(79)
Southwesto.gs	Southwest <sub>0.9x</sub> 0.77	x	2	2	x	6	9.27			0.4	x	0.7	=	26.88	(79)
Southwesto 97	Southwest <sub>0.9x</sub> 0.77	X	1.4	<b>1</b> 5	X	6	9.27	]		0.4	x	0.7	=	19.49	(79)
Solutivest() 9x	Southwest <sub>0.9x</sub> 0.77	X	2	2	X	4	4.07	] [		0.4	x	0.7	=	17.1	(79)
Solar gains in watts, calculated for each month (83)m= Sum(74)m. (82)m  Solar gains in watts, calculated for each month (83)m= Sum(74)m. (82)m  (83)m= Z7.61	Southwest <sub>0.9x</sub> 0.77	X	1.4	<b>1</b> 5	x	4	4.07	]		0.4	x	0.7	=	12.4	(79)
Solar gains in watts, calculated for each month (83)m = Sum/74)m(82)m (27.61	Southwest <sub>0.9x</sub> 0.77	x	2	2	X	3	1.49	]		0.4	x	0.7	=	12.22	(79)
(83)   (83)   (83)   (83)   (83)   (83)   (83)   (83)   (83)   (83)   (83)   (83)   (83)   (83)   (83)   (83)   (83)   (83)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (8	Southwest <sub>0.9x</sub> 0.77	X	1.4	15	x	3	1.49	]		0.4	x	0.7	=	8.86	(79)
(83)   (83)   (83)   (83)   (83)   (83)   (83)   (83)   (83)   (83)   (83)   (83)   (83)   (83)   (83)   (83)   (83)   (83)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (84)   (8															
Total gains – internal and solar (84)m = (73)m + (83)m, watts  (84)m = 206.04   314.92   327.54   336.14   339   328.28   315.98   309.97   301.47   292.06   285.58   286.93   (84)  7. Mean internal temperature (heating season)  Temperature during heating periods in the living area from Table 9, Th1 (°C)	Solar gains in watts, c	alculated	for eac	h month				(83)m	ı = Sı	ım(74)m .	(82)m	_		•	
Reliman   Temperature   Centro   Cent	` '							89.0	05	75.46	53.78	33.25	23.51		(83)
7. Mean internal temperature (heating season)  Temperature during heating periods in the living area from Table 9, Th1 (°C)  21 (65)  Utilisation factor for gains for living area, h1,m (see Table 9a)  Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec (66)  Mean internal temperature in living area T1 (follow steps 3 to 7 in Table 9c)  (87)m 9.09 19.28 19.62 20.08 20.49 20.8 20.39 20.91 20.71 20.22 19.6 19.06 (87)  Temperature during heating periods in rest of dwelling from Table 9, Th2 (°C)  (88)m 20.45 20.45 20.46 20.46 20.46 20.47 20.47 20.47 20.47 20.47 20.47 20.46 20.46 20.46 (88)  Whan internal temperature in the rest of dwelling, h2,m (see Table 9a)  Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c)  (89)m 9.02 0.91 0.88 0.82 0.72 0.57 0.42 0.45 0.46 0.84 0.81 0.89 0.93 (89)  Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c)  (90)m 18.64 18.84 19.17 19.62 20.02 20.31 20.42 20.41 20.24 19.76 19.16 18.62 (90)  ### Mean internal temperature (for the whole dwelling) = fLA x T1 + (1 - fLA) x T2  (32)m 18.93 19.12 19.45 19.91 20.31 20.62 20.74 20.73 20.54 20.05 19.44 18.9 (92)  Apply adjustment to the mean internal temperature from Table 4e, where appropriate  33)m 18.83 19.12 19.45 19.91 20.31 20.62 20.74 20.73 20.54 20.05 19.44 18.9 (93)  8. Space heating requirement  Set Ti to the mean internal temperature obtained at step 11 of Table 9b, so that Ti,m=(76)m and re-calculate the utilisation factor for gains stming Table 9a  Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  Utilisation factor for gains, hmc.  94)m 0.91 0.89 0.86 0.8 0.71 0.58 0.45 0.47 0.64 0.8 0.8 0.88 0.91 (94)  Useful gains, hmcm, W = (94)m x (84)m  85)m 26.842 27.93 281.04 289.78 242.12 190.56 141.61 145.98 194.13 233.16 250.67 261.04 (95)  Housthly average external temperature from Table 8  (96)m 26.842 27.93 281.04 289.78 242.12 190.56 141.61 145.98 194.13 233.16 250.67 261.04 (96)		and solar	(84)m =	= (73)m ·	+ (8	33)m	, watts					·		ı	
Temperature during heating periods in the living area from Table 9, Th1 (°C)	(84)m= 296.04 314.92	327.54	336.14	339	32	28.28	315.98	308.	.97	301.47	292.06	285.58	285.93		(84)
Utilisation factor for gains for living area, h1,m (see Table 9a)  Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec (86)m= 0.93 0.91 0.88 0.83 0.74 0.61 0.47 0.5 0.67 0.83 0.9 0.93 0.96 (86)  Mean internal temperature in living area T1 (follow steps 3 to 7 in Table 9c)  (67)m= 19.09 19.26 19.62 20.08 20.49 20.8 20.93 20.91 20.71 20.22 19.6 19.06 19.06 (87)  Temperature during heating periods in rest of dwelling from Table 9, Th2 (**C*)  (68)m= 20.45 20.45 20.45 20.46 20.46 20.46 20.47 20.47 20.47 20.47 20.47 20.46 20.46 20.46 (88)  Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a)  Mean internal temperature in the rest of dwelling, h2,m (see Table 9a)  (89)m= 0.92 0.91 0.88 0.82 0.72 0.57 0.42 0.45 0.64 0.81 0.89 0.93 (89)  Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c)  (90)m= 18.64 18.84 19.17 19.62 20.02 20.31 20.42 20.41 20.24 19.76 19.16 18.62 (90)  Mean internal temperature (for the whole dwelling) = fLA x T1 + (1 - fLA) x T2  (92)m= 18.93 19.12 19.45 19.91 20.31 20.62 20.74 20.73 20.54 20.05 19.44 18.9 (92)  Apply adjustment to the mean internal temperature from Table 4e, where appropriate  (93)m= 18.93 19.12 19.45 19.91 20.31 20.62 20.74 20.73 20.54 20.05 19.44 18.9 (93)  8. Space heating requirement  Set T1 to the mean internal temperature obtained at step 11 of Table 9b, so that Ti,m=(76)m and re-calculate the utilisation factor for gains, hm:  (94)m= 0.91 0.89 0.86 0.8 0.8 0.71 0.58 0.45 0.47 0.64 0.8 0.8 0.8 0.91 (94)  Useful gains, hmGm, W = (94)m x (84)m  Useful gains, hmGm, W = (94)m x (84)m  (95)m= 268.42 279.9 28.10.4 269.78 242.12 190.56 141.61 145.98 194.13 233.16 250.67 261.04 (95)  Houthly average external temperature from Table 8 (96)m= 4.3 4.9 6.5 8.9 11.7 14.6 16.6 16.6 16.4 14.1 10.6 7.1 4.2 (96)	7. Mean internal tem	perature	(heating	season	)										
Sep   Oct   Nov   Dec   Dec	Temperature during I	neating p	eriods ir	n the livi	ng	area f	from Tab	ole 9,	Th1	1 (°C)				21	(85)
Mean internal temperature   In living area T1   Ifollow steps 3 to 7 in Table 9c	Utilisation factor for g	ains for I	iving are	ea, h1,m	(s	ee Ta	ble 9a)								
Mean internal temperature in living area T1 (follow steps 3 to 7 in Table 9c)         (87)m= 9.09 19.28 19.62 20.08 20.49 20.8 20.93 20.91 20.71 20.22 19.6 19.06       (87)         Temperature during heating periods in rest of dwelling from Table 9, Th2 (°C)         (88)m= 20.45 20.45 20.45 20.46 20.46 20.46 20.47 20.47 20.47 20.47 20.46 20.46 20.46       20.46 20.47 20.47 20.47 20.47 20.46 20.46 20.46       20.46 20.46 20.46         Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a)         (89)m= 0.92 0.91 0.88 0.82 0.72 0.57 0.42 0.45 0.64 0.81 0.89 0.93       (89)         Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c)         (90)m= 18.64 18.64 19.17 19.62 20.02 20.31 20.62 20.74 20.73 20.54 19.16 18.62 (90)         HEA × T1 + (1 - fLA) × T2         (92)m= 18.93 19.12 19.45 19.91 20.31 20.62 20.74 20.73 20.54 20.05 19.44 18.9 (92)         Apply adjustment to the mean internal temperature from Table 4e, where appropriate         (93)m= 18.93 19.12 19.45 19.91 20.31 20.62 20.74 20.73 20.54 20.05 19.44 18.9 (93)         3. Space heating requirement         Set T1 to the mean internal temperature obtained at step 11 of Table 9b, so that Ti,m=(76)m and re-calculate the utilisation factor for gains using Table 9a         Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec         Utilisation factor for gains, hmgm, W = (94)m x (84)m </td <td>Jan Feb</td> <td>Mar</td> <td>Apr</td> <td>May</td> <td></td> <td>Jun</td> <td>Jul</td> <td>Au</td> <td>ug</td> <td>Sep</td> <td>Oct</td> <td>Nov</td> <td>Dec</td> <td></td> <td></td>	Jan Feb	Mar	Apr	May		Jun	Jul	Au	ug	Sep	Oct	Nov	Dec		
(87)   19.09   19.28   19.62   20.08   20.49   20.8   20.93   20.91   20.71   20.22   19.6   19.06   (87)    Temperature during heating periods in rest of dwelling from Table 9, Th2 (°C)    (88)   20.45   20.45   20.45   20.46   20.46   20.47   20.47   20.47   20.47   20.46   20.46   20.46   20.46    Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a)    (89)   0.92   0.91   0.88   0.82   0.72   0.57   0.42   0.45   0.64   0.81   0.89   0.93   (89)    Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c)    (90)   18.64   18.84   19.17   19.62   20.02   20.31   20.42   20.41   20.24   19.76   19.16   18.62   (90)    (92)   18.93   19.12   19.45   19.91   20.31   20.62   20.74   20.73   20.54   20.05   19.44   18.9   (92)    Apply adjustment to the mean internal temperature from Table 4e, where appropriate (93)   8.93   19.12   19.45   19.91   20.31   20.62   20.74   20.73   20.54   20.05   19.44   18.9   (93)    3. Space heating requirement  Set Ti to the mean internal temperature obtained at step 11 of Table 9b, so that Ti,m=(76)m and re-calculate the utilisation factor for gains using Table 9a   Jan   Feb   Mar   Apr   May   Jun   Jul   Aug   Sep   Oct   Nov   Dec   Utilisation factor for gains, hm:  (94)   0.91   0.88   0.86   0.8   0.71   0.58   0.45   0.47   0.64   0.8   0.88   0.91   (94)   Useful gains, hmGm   W = (94) m x (84) m   (95) m =   268.42   27.9.9   281.04   269.78   242.12   190.56   141.61   145.98   194.13   233.16   250.67   261.04   (95)   Monthly average external temperature from Table 8   (96)   4.3   4.9   6.5   8.9   11.7   14.6   16.6   16.4   14.1   10.6   7.1   4.2   (96)   Heat loss rate for mean internal temperature, Lm   W = ((93) m x ((93) m - (96) m )	(86)m= 0.93 0.91	0.88	0.83	0.74	0	0.61	0.47	0.5	5	0.67	0.83	0.9	0.93		(86)
Temperature during heating periods in rest of dwelling from Table 9, Th2 (°C) (88)nl= 20.45   20.45   20.45   20.46   20.46   20.46   20.47   20.47   20.47   20.47   20.46   20.46   20.46   20.46   (88)    Utilisation factor for gains for rest of dwelling, h2,m (sec Table 9a) (89)m= 0.92   0.91   0.88   0.82   0.72   0.57   0.42   0.45   0.64   0.81   0.89   0.93   (89)    Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c) (90)m= 18.64   18.84   19.17   19.62   20.02   20.31   20.42   20.41   20.24   19.76   19.16   18.62   (90)    Mean internal temperature (for the whole dwelling) = fLA × T1 + (1 - fLA) × T2 (92)m= 18.93   19.12   19.45   19.91   20.31   20.62   20.74   20.73   20.54   20.05   19.44   18.9   (92)    Apply adjustment to the mean internal temperature from Table 4e, where appropriate (93)m= 18.93   19.12   19.45   19.91   20.31   20.62   20.74   20.73   20.54   20.05   19.44   18.9   (93)    8. Space heating requirement  Set Ti to the mean internal temperature obtained at step 11 of Table 9b, so that Ti,m=(76)m and re-calculate the utilisation factor for gains, hm:  Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  Utilisation factor for gains, hm:  (94)m= 0.91   0.89   0.86   0.8   0.71   0.58   0.45   0.47   0.64   0.8   0.8   0.91   0.94   0.94   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95   0.95	Mean internal temper	ature in	living are	ea T1 (fo	ollo	w ste	ps 3 to 7	in T	able	9c)					
(88)m=	(87)m= 19.09 19.28	19.62	20.08	20.49	2	20.8	20.93	20.9	91	20.71	20.22	19.6	19.06		(87)
(88)m=	Temperature during l	neating n	eriods ir	rest of	dw	elling	from Ta	hle C	) Th	12 (°C)					
Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a)  (89)m= 0.92 0.91 0.88 0.82 0.72 0.57 0.42 0.45 0.64 0.81 0.89 0.93 (89)  Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c)  (90)m= 18.64 18.84 19.17 19.62 20.02 20.31 20.42 20.41 20.24 19.76 19.16 18.62 (90)  Mean internal temperature (for the whole dwelling) = fLA x T1 + (1 - fLA) x T2  (92)m= 18.93 19.12 19.45 19.91 20.31 20.62 20.74 20.73 20.54 20.05 19.44 18.9 (92)  Apply adjustment to the mean internal temperature from Table 4e, where appropriate  (93)m= 18.93 19.12 19.45 19.91 20.31 20.62 20.74 20.73 20.54 20.05 19.44 18.9 (93)  8. Space heating requirement  Set Ti to the mean internal temperature obtained at step 11 of Table 9b, so that Ti,m=(76)m and re-calculate the utilisation factor for gains using Table 9a  Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  Utilisation factor for gains, hm:  (94)m= 0.91 0.89 0.86 0.8 0.71 0.58 0.45 0.47 0.64 0.8 0.88 0.91 0.91  Useful gains, hmGm, W = (94)m x (84)m  (95)m= 268.42 279.9 281.04 269.78 242.12 190.56 141.61 145.98 194.13 233.16 250.67 261.04 (95)  Monthly average external temperature from Table 8  (96)m= 4.3 4.9 6.5 8.9 11.7 14.6 16.6 16.4 14.1 10.6 7.1 4.2 (96)  Heat loss rate for mean internal temperature, Lm, W = [(39)m x [(93)m x					-						20.46	20.46	20.46		(88)
Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c)  (90)m= 18.64	Litilization factor for	oine for	root of di	walling	h2	m (as	o Toblo	Oo)							
Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c)         (90)m= 18.64 18.84 19.17 19.62 20.02 20.31 20.42 20.41 20.24 19.76 19.16 18.62         FLA = Living area + (4) = 0.63         Mean internal temperature (for the whole dwelling) = fLA x T1 + (1 − fLA) x T2         (92)m= 18.93 19.12 19.45 19.91 20.31 20.62 20.74 20.73 20.54 20.05 19.44 18.9       (92)         Apply adjustment to the mean internal temperature from Table 4e, where appropriate         (93)m= 18.93 19.12 19.45 19.91 20.31 20.62 20.74 20.73 20.54 20.05 19.44 18.9       (93)         8. Space heating requirement         Set Ti to the mean internal temperature obtained at step 11 of Table 9b, so that Ti,m=(76)m and re-calculate the utilisation factor for gains using Table 9a         Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec         Utilisation factor for gains, hm:         (94)m= 0.91 0.89 0.86 0.8 0.71 0.58 0.45 0.47 0.64 0.8 0.8 0.88 0.91       (94)         Useful gains, hmGm , W = (94)m x (84)m       (95)m= 288.42 279.9 281.04 269.78 242.12 190.56 141.61 145.98 194.13 233.16 250.67 261.04       (95)         Monthly average external temperature from Table 8         (96)m= 4.3 4.9 6.5 8.9 11.7 14.6 16.6 16.4 16.4 14.1 10.6 7.1 4.2       (96)         Heat loss rate for mean internal temperature, Lm , W = [(39)m x [(93)m - (96)m]					_	·		<u> </u>	15	0.64	0.81	1 0.89	0.03		(89)
(90)m=	` '			l	<u> </u>							0.00	0.00		(33)
Mean internal temperature (for the whole dwelling) = fLA x T1 + (1 - fLA) x T2  (92)m= 18.93 19.12 19.45 19.91 20.31 20.62 20.74 20.73 20.54 20.05 19.44 18.9 (92)  Apply adjustment to the mean internal temperature from Table 4e, where appropriate  (93)m= 18.93 19.12 19.45 19.91 20.31 20.62 20.74 20.73 20.54 20.05 19.44 18.9 (93)  8. Space heating requirement  Set Ti to the mean internal temperature obtained at step 11 of Table 9b, so that Ti,m=(76)m and re-calculate the utilisation factor for gains using Table 9a  Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  Utilisation factor for gains, hm:  (94)m= 0.91 0.89 0.86 0.8 0.71 0.58 0.45 0.47 0.64 0.8 0.88 0.91  Useful gains, hmGm , W = (94)m x (84)m  (95)m= 268.42 279.9 281.04 269.78 242.12 190.56 141.61 145.98 194.13 233.16 250.67 261.04  Monthly average external temperature from Table 8  (96)m= 4.3 4.9 6.5 8.9 11.7 14.6 16.6 16.4 14.1 10.6 7.1 4.2  Heat loss rate for mean internal temperature, Lm , W = [(39)m x [(93)m - (96)m]					Ť			<del>i                                     </del>	_			T		I	(00)
Mean internal temperature (for the whole dwelling) = fLA × T1 + (1 - fLA) × T2  (92)m= 18.93 19.12 19.45 19.91 20.31 20.62 20.74 20.73 20.54 20.05 19.44 18.9  Apply adjustment to the mean internal temperature from Table 4e, where appropriate  (93)m= 18.93 19.12 19.45 19.91 20.31 20.62 20.74 20.73 20.54 20.05 19.44 18.9  8. Space heating requirement  Set Ti to the mean internal temperature obtained at step 11 of Table 9b, so that Ti,m=(76)m and re-calculate the utilisation factor for gains using Table 9a  Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  Utilisation factor for gains, hm:  (94)m= 0.91 0.89 0.86 0.8 0.71 0.58 0.45 0.47 0.64 0.8 0.8 0.8 0.91  Useful gains, hmGm , W = (94)m x (84)m  (95)m= 268.42 279.9 281.04 269.78 242.12 190.56 141.61 145.98 194.13 233.16 250.67 261.04  Monthly average external temperature from Table 8  (96)m= 4.3 4.9 6.5 8.9 11.7 14.6 16.6 16.4 14.1 10.6 7.1 4.2  Heat loss rate for mean internal temperature, Lm , W = ((39)m x [(93)m - (96)m]	(90)m= 18.64 18.84	19.17	19.62	20.02	<u> </u>	0.31	20.42	20.4	41						` ´
(92)m=											LA = LIVI	ilg area - (4	+) =	0.63	(91)
Apply adjustment to the mean internal temperature from Table 4e, where appropriate  (93)m= 18.93		ature (fo			llin	g) = fl	_A × T1	+ (1	– fL	A) × T2			ı	•	
(93)   18.93   19.12   19.45   19.91   20.31   20.62   20.74   20.73   20.54   20.05   19.44   18.9   (93)   8. Space heating requirement    Set Ti to the mean internal temperature obtained at step 11 of Table 9b, so that Ti,m=(76)m and re-calculate the utilisation factor for gains using Table 9a    Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec    Utilisation factor for gains, hm:  (94)m= 0.91   0.89   0.86   0.8   0.71   0.58   0.45   0.47   0.64   0.8   0.88   0.91    Useful gains, hmGm , W = (94)m x (84)m    (95)m= 268.42   279.9   281.04   269.78   242.12   190.56   141.61   145.98   194.13   233.16   250.67   261.04    Monthly average external temperature from Table 8    (96)m= 4.3   4.9   6.5   8.9   11.7   14.6   16.6   16.4   14.1   10.6   7.1   4.2    Heat loss rate for mean internal temperature, Lm , W = [(39)m x [(93)m - (96)m]	` '											19.44	18.9		(92)
8. Space heating requirement  Set Ti to the mean internal temperature obtained at step 11 of Table 9b, so that Ti,m=(76)m and re-calculate the utilisation factor for gains using Table 9a  Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  Utilisation factor for gains, hm:  (94)m= 0.91 0.89 0.86 0.8 0.71 0.58 0.45 0.47 0.64 0.8 0.88 0.91  Useful gains, hmGm , W = (94)m x (84)m  (95)m= 268.42 279.9 281.04 269.78 242.12 190.56 141.61 145.98 194.13 233.16 250.67 261.04  Monthly average external temperature from Table 8  (96)m= 4.3 4.9 6.5 8.9 11.7 14.6 16.6 16.4 14.1 10.6 7.1 4.2 (96)  Heat loss rate for mean internal temperature, Lm , W = [(39)m x [(93)m - (96)m]	· · · · · <del>· · · · · · · · · · · · · · </del>			<del></del>	_			<del></del>	_		•	1		1	(22)
Set Ti to the mean internal temperature obtained at step 11 of Table 9b, so that Ti,m=(76)m and re-calculate the utilisation factor for gains using Table 9a  Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  Utilisation factor for gains, hm:  (94)m= 0.91 0.89 0.86 0.8 0.71 0.58 0.45 0.47 0.64 0.8 0.88 0.91  Useful gains, hmGm , W = (94)m x (84)m  (95)m= 268.42 279.9 281.04 269.78 242.12 190.56 141.61 145.98 194.13 233.16 250.67 261.04  Monthly average external temperature from Table 8  (96)m= 4.3 4.9 6.5 8.9 11.7 14.6 16.6 16.4 14.1 10.6 7.1 4.2 (96)  Heat loss rate for mean internal temperature, Lm , W = [(39)m x [(93)m - (96)m]	` '			20.31	2	0.62	20.74	20.7	73	20.54	20.05	19.44	18.9		(93)
the utilisation factor for gains using Table 9a  Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  Utilisation factor for gains, hm:  (94)m= 0.91 0.89 0.86 0.8 0.71 0.58 0.45 0.47 0.64 0.8 0.88 0.91  Useful gains, hmGm , W = (94)m x (84)m  (95)m= 268.42 279.9 281.04 269.78 242.12 190.56 141.61 145.98 194.13 233.16 250.67 261.04  Monthly average external temperature from Table 8  (96)m= 4.3 4.9 6.5 8.9 11.7 14.6 16.6 16.4 14.1 10.6 7.1 4.2 (96)  Heat loss rate for mean internal temperature, Lm , W = [(39)m x [(93)m - (96)m]						- 4 - 4	. 44 . (	T	- 01	11		(70)	dan and	la (a	
Jan         Feb         Mar         Apr         May         Jun         Jul         Aug         Sep         Oct         Nov         Dec           Utilisation factor for gains, hm:           (94)m = 0.91			•		nea	at ste	ер 11 от	rabi	e 9b	, so tha	t 11,m=	(76)m an	d re-caid	culate	
Utilisation factor for gains, hm:				1		Jun	Jul	Aı	ua	Sep	Oct	Nov	Dec		
(94)m= 0.91 0.89 0.86 0.8 0.71 0.58 0.45 0.47 0.64 0.8 0.88 0.91  Useful gains, hmGm , W = (94)m x (84)m  (95)m= 268.42 279.9 281.04 269.78 242.12 190.56 141.61 145.98 194.13 233.16 250.67 261.04  Monthly average external temperature from Table 8  (96)m= 4.3 4.9 6.5 8.9 11.7 14.6 16.6 16.4 14.1 10.6 7.1 4.2 (96)  Heat loss rate for mean internal temperature, Lm , W = [(39)m x [(93)m - (96)m]				,					-9 1			1			
(95)m= 268.42 279.9 281.04 269.78 242.12 190.56 141.61 145.98 194.13 233.16 250.67 261.04 (95)  Monthly average external temperature from Table 8  (96)m= 4.3 4.9 6.5 8.9 11.7 14.6 16.6 16.4 14.1 10.6 7.1 4.2 (96)  Heat loss rate for mean internal temperature, Lm , W =[(39)m x [(93)m- (96)m]				0.71		0.58	0.45	0.4	7	0.64	0.8	0.88	0.91		(94)
Monthly average external temperature from Table 8  (96)m= 4.3 4.9 6.5 8.9 11.7 14.6 16.6 16.4 14.1 10.6 7.1 4.2  Heat loss rate for mean internal temperature, Lm , W =[(39)m x [(93)m- (96)m]]	Useful gains, hmGm	, W = (9 <sup>2</sup>	4)m x (84	4)m	_										
(96)m= 4.3 4.9 6.5 8.9 11.7 14.6 16.6 16.4 14.1 10.6 7.1 4.2 (96)  Heat loss rate for mean internal temperature, Lm , W =[(39)m x [(93)m- (96)m]	(95)m= 268.42 279.9	281.04	269.78	242.12	19	90.56	141.61	145.	.98	194.13	233.16	250.67	261.04		(95)
Heat loss rate for mean internal temperature, Lm , W =[(39)m x [(93)m- (96)m]	Monthly average exte	rnal tem	perature	from T	abl	e 8								: !	
	(96)m= 4.3 4.9	6.5	8.9	11.7	_	14.6	16.6	16.	.4	14.1	10.6	7.1	4.2		(96)
(97)m= 562.21 544.94 495.07 414.5 323.43 222.64 153.11 159.6 239.52 354.83 465.95 558.39 (97)					_			<del>- `</del>	<del>́ т</del>	<u> </u>				Ī	
	(97)m= 562.21 544.94	495.07	414.5	323.43	22	22.64	153.11	159	9.6	239.52	354.83	465.95	558.39		(97)

8)m= 218.58	178.1	159.23	104.2	60.5	0	0	0	0	90.52	155	221.23		
		-	-	-			Tota	l per year	(kWh/year	) = Sum(9	98)15,912 =	1187.36	(98
Space heati	ng require	ement in	kWh/m²	/year								33.92	(99
a. Energy re	quiremer	nts – Indi	vidual h	eating sy	/stems i	ncluding	micro-C	HP)					
Space heati	_			/I-		1					_		<b></b>
Fraction of s	•			• • •	mentary	system		(201) -			Ļ	0	(20
Fraction of s	•		•	` '			(202) = 1 - (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204) = (204)	, ,	(203)] =		Ļ	1	(20
Fraction of to		•	-				(204) = (20	02) <b>x</b> [1 —	(203)] =		L	1	(20
Efficiency of	•		•		a ovetom	. 0/					L	100	(20
Efficiency of	1						Δ	0	0-4	Nierr	L	0	
Jan Space heatii	Feb	Mar ement (c	Apr alculated	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	kWh/ye	ear
218.58	Ť	159.23	104.2	60.5	0	0	0	0	90.52	155	221.23		
:11)m = {[(98	8)m x (20	 )4)] } x 1	00 ÷ (20	l6)					<u>.                                    </u>	<u>I</u>	•		(21
218.58	178.1	159.23	104.2	60.5	0	0	0	0	90.52	155	221.23		
							Tota	I (kWh/yea	ar) =Sum(2	211) <sub>15,1012</sub>		1187.36	(21
Space heating				month									
$\{[(98)m \times (215)m = 0]$	(01)] } <b>x 1</b>	00 ÷ (20	8) 0	0	0	0	0	0	0	0	0		
13)111-	1 0				U	<u> </u>			ar) =Sum(2			0	(21
at <mark>er he</mark> atin	g										L		
ater heating				y systen	n:						_		<b>_</b>
Annual wate	•	•									Ĺ	1667.51	(64
raction of h	eat from	commur	ity CHP								<u>_</u>	1	(30
actor for ch	arging m	ethod fo	r commu	ınity wat	er heatii	ng						1	(30
Distribution I	oss facto	r (Table	12c) for	commu	nity heat	ing syst	em					1.1	(30
Nater heat f	rom CHP	)						(64) x (30	03a) x (30	5) x (306)	=	1834.27	(31
Electricity us	ed for he	at distrib	ution				0.01	× [(307a).	(307e) +	(310a)	(310e)] =	18.34	(31
nnual totals	S								k\	Wh/yeaı	r _	kWh/yea	<u></u>
pace heating	g fuel use	ed, main	system	1								1187.36	
ectricity for	pumps, f	ans and	electric l	keep-ho	:								
nechanical	ventilatio	n - balan	ced, ext	ract or p	ositive ir	nput fror	n outside	)			138.54		(23
otal electrici	ty for the	above, k	:Wh/yea	r			sum	of (230a).	(230g) =			138.54	(23
ectricity for	lighting										Ė	185.19	(23
ectricity ger	nerated b	y PVs									F	-972.66	<u> </u>
otal delivere		•	ses (211	) (221)	+ (231)	+ (232)	(237h)	_			L F	538.42	` (33
	9)		(	, ()	()	\/	( , )						1,5

	<b>Energy</b> kWh/year	Emission factor kg CO2/kWh	<b>Emissions</b> kg CO2/year
Space heating (main system 1)	(211) x	0.519 =	616.24 (261)
Space heating (secondary)	(215) x	0.519	0 (263)
Water heating from community system			
	Energy kWh/ye		Emissions kg CO2/year
CO2 from other sources of space and water hear Efficiency of heat source 1 (%)		eat (363) to (366) for the second fue	329 (367a)
CO2 associated with heat source 1	[(307b)+(310b)] x 100 ÷	(367b) x 0.52	289.36 (367)
Electrical energy for heat distribution	[(313) x	0.52	9.52 (372)
Total CO2 associated with community systems	(363)(366) +	(368)(372)	298.88 (373)
Electricity for pumps, fans and electric keep-hot	(231) x	0.519 =	71.9 (267)
Electricity for lighting	(232) x	0.519 =	96.11 (268)
Energy saving/generation technologies Item 1		0.519 =	-504.81 (269)
Total CO2, kg/year	s	um of (265)(271) =	578.32 (272)
Dwelling CO2 Emission Rate El rating (section 14)		272) ÷ (4) =	16.52 (273) 90 (274)

				User D	etails:						
Assessor Name:					Strom	a Num	ber:				
Software Name:	Stroma FS	AP 201	2		Softwa	are Vei	rsion:		Versio	on: 1.0.5.33	
					Address	Ţ,		SHP + F	Pγ		
Address :	Chester Roa	ad Hoste	el, 2 Che	ster Ro	ad, LON	DON, N	19 5BP				
Overall dwelling dime	nsions:			Δ	- (m- 2)		Av. Ha	: au la 4 / ma \		Valuma/ma3	<u> </u>
Ground floor					a(m²) 35.12	(1a) x		ight(m) .09	(2a) =	Volume(m³)	)    (3a)
Total floor area TFA = (1a	a)+(1b)+(1c)+(	(1d)+(1e	)+(1r		35.12	(4)			]` ′		` ′
Dwelling volume			, (	, L			)+(3c)+(3c	l)+(3e)+	.(3n) =	108.52	(5)
2. Ventilation rate:										100.02	
2. Ventuation rate.	main		econdar	у	other		total			m³ per hou	r
Number of chimneys	heating 0	ק + ר <u>ה</u>	eating 0	<b>]</b> + [	0	] = [	0	X 4	40 =	0	(6a)
Number of open flues	0	ī + Ē	0	Ī + Ē	0	j = [	0	x	20 =	0	(6b)
Number of intermittent far	ns						0	x -	10 =	0	(7a)
Number of passive vents						Ī	0	x -	10 =	0	(7b)
Number of flueless gas fin	res						0	X 4	40 =	0	(7c)
						_			A : I		
1.60		(0)	-	(-) - ( <del>-</del> 1-) - (		_				nanges per ho	_
Infiltration due to chimney  If a pressurisation test has be						continue fr	0 om (9) to (		÷ (5) =	0	(8)
Number of storeys in the	/		., ,				(2) 32 (			0	(9)
Additional infiltration								[(9)	-1]x0.1 =	0	(10)
Structural infiltration: 0.						•	uction			0	(11)
if both types of wall are pr deducting areas of openin			oonaing to	tne great	er wall are	a (atter					
If suspended wooden f	loor, enter 0.2	(unseale	ed) or 0	.1 (seale	ed), else	enter 0				0	(12)
If no draught lobby, ent	er 0.05, else e	enter 0								0	(13)
Percentage of windows	and doors dr	aught st	ripped							0	(14)
Window infiltration					0.25 - [0.2		_	(45)		0	(15)
Infiltration rate					(8) + (10)					0	(16)
Air permeability value, If based on air permeabili				•	•	•	etre of e	nvelope	area	2.5	(17)
Air permeability value applies	-						is heina u	sed		0.12	(18)
Number of sides sheltere		n toot nao	boon doi		groo an po	modelinty	io boiling at	30 <b>u</b>		0	(19)
Shelter factor					(20) = 1 -	0.075 x (1	19)] =			1	(20)
Infiltration rate incorporat	ing shelter fac	tor			(21) = (18	x (20) =				0.12	(21)
Infiltration rate modified for	or monthly win	d speed									_
Jan Feb	Mar Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Monthly average wind sp	eed from Tabl	e 7									
(22)m= 5.1 5	4.9 4.4	4.3	3.8	3.8	3.7	4	4.3	4.5	4.7	]	
Wind Factor (22a)m = (22	2)m ÷ 4										
	1.23 1.1	1.08	0.95	0.95	0.92	1	1.08	1.12	1.18	]	

djusted infiltr 0.16	0.16	0.15	0.14	0.13	0.12	0.12	0.12	0.12	0.13	0.14	0.15		
alculate effe		-	rate for t	he appli	cable ca	se	<u>!</u>	<u>I</u>	<u>!</u>		!	l	
If mechanica			l' N (0	01) (00	\ <b>-</b> (	(1		. (00)	\ (00 \			0.5	(2
If exhaust air h									)) = (23a)			0.5	(2
If balanced with		•	•	_					Ola \	00l-\ [	(00-)	75.65	(2
a) If balance	0.28	o.27	0.26	0.26	0.24	0.24	1R) (24a 0.24	0.25	2b)m + (2 0.26	23D) <b>×</b> [* 0.26	0.27	÷ 100] 	(2
b) If balance		<u> </u>	<u> </u>		<u> </u>	<u> </u>		<u> </u>			0.27		(-
b) ii balarice	0	0	0	0	0	0	0	0	0	0	0		(2
c) If whole h													•
,					•				.5 × (23b	)			
-c)m= 0	0	0	0	0	0	0	0	0	0	0	0		(2
d) If natural				•									
	n = 1, the	r ` í	<u> </u>		· `	<del></del>	· ·	<del></del>			1	ı	4.
d)m= 0	0	0	0	0	0	0	0	0	0	0	0		(
Effective air			<del>`</del>	` `	<del>_ ` </del>	<del>``</del>	<del> </del>	<del>`</del>				l	
)m= 0.28	0.28	0.27	0.26	0.26	0.24	0.24	0.24	0.25	0.26	0.26	0.27		(.
. Heat l <mark>osse</mark>	s and he	at loss	oaram <b>et</b> e	er:									
EMENT	Gros area		Openin m		Net Ar A ,r		U-valı W/m2		A X U (W/ł	<)	k-value kJ/m²-ł		X X k J/K
ors Type 1					2.13	х	1	=	2.13				(2
ors Type 2					0.72	х	1	<u> </u>	0.72				(
ors Type 3					0.99	x	1	_ =	0.99				(
ors Type 4					0.72	х	1	=	0.72				(:
ors Type 5					0.72	X	1	=	0.72				(
					0.63	x	1	=	0.63				(
ors Type 6					0.00		'						(
	∍ 1				1.08	= ,	/[1/( 1.2 )+	0.04] =	1.24				
ndows Type						x1			1.24 2.26				(:
ndows Type	e 2				1.08	x1,	/[1/( 1.2 )+	0.04] =					
ndows Type ndows Type ndows Type	e 2 e 3				1.08	x1, x1, x1, x1,	/[1/( 1.2 )+ /[1/( 1.2 )+	0.04] = 0.04] =	2.26				(
oors Type 6 ndows Type ndows Type ndows Type ndows Type ndows Type	e 2 e 3 e 4				1.08 1.97 1.42	x1. x1. x1. x1. x1.	/[1/( 1.2 )+ /[1/( 1.2 )+ /[1/( 1.2 )+	0.04] = 0.04] = 0.04] =	2.26				(2
ndows Type ndows Type ndows Type ndows Type ndows Type	e 2 e 3 e 4	1	3.08		1.08 1.97 1.42	x1. x1. x1. x1. x1. x1.	/[1/( 1.2 )+ /[1/( 1.2 )+ /[1/( 1.2 )+ /[1/( 1.2 )+	0.04] = 0.04] = 0.04] =	2.26 1.63 1.66			<b>-</b>	(:
ndows Type ndows Type ndows Type ndows Type ndows Type alls Type1	e 2 e 3 e 4 e 5		3.08	=	1.08 1.97 1.42 1.45 0.32	x1.	/[1/( 1.2 )+ /[1/( 1.2 )+ /[1/( 1.2 )+ /[1/( 1.2 )+ /[1/( 1.2 )+	0.04] = 0.04] = 0.04] = 0.04] =	2.26 1.63 1.66 0.37				(1)
ndows Type ndows Type ndows Type ndows Type	e 2 e 3 e 4 e 5	6			1.08 1.97 1.42 1.45 0.32 7.43	x1.	/[1/( 1.2 )+ /[1/( 1.2 )+ /[1/( 1.2 )+ /[1/( 1.2 )+ /[1/( 1.2 )+ 0.13	0.04] = 0.04] = 0.04] = 0.04] = = = = = = = = = = = = = = = = = = =	2.26 1.63 1.66 0.37 0.97				(2)
ndows Type ndows Type ndows Type ndows Type ndows Type alls Type1	e 2 e 3 e 4 e 5 10.5	6 5	2.79		1.08 1.97 1.42 1.45 0.32 7.43	x1.	/[1/( 1.2 )+ /[1/( 1.2 )+ /[1/( 1.2 )+ /[1/( 1.2 )+ /[1/( 1.2 )+ 0.13	0.04] = 0.04] = 0.04] = 0.04] = = = = = = = = = = = = = = = = = = =	2.26 1.63 1.66 0.37 0.97 0.69				(1)
ndows Type ndows Type ndows Type ndows Type alls Type1 alls Type2	e 2 e 3 e 4 e 5 10.5 8.00	5 3	2.79		1.08 1.97 1.42 1.45 0.32 7.43 5.27 17.53 7.29	x1.	/[1/( 1.2 )+ /[1/( 1.2 )+ /[1/( 1.2 )+ /[1/( 1.2 )+ /[1/( 1.2 )+ /[1/( 1.2 )+ 0.13 0.13	0.04] = 0.04] = 0.04] = 0.04] = = = = = = = = = = = = = = = = = = =	2.26 1.63 1.66 0.37 0.97 0.69 2.28				
ndows Type ndows Type ndows Type ndows Type alls Type1 alls Type2 alls Type3	2 2 3 4 4 5 5 10.5 8.00 19.4	6 5 3 2	2.79 1.97 2.14		1.08 1.97 1.42 1.45 0.32 7.43 5.27 17.53	x1.	/[1/( 1.2 )+ /[1/( 1.2 )+ /[1/( 1.2 )+ /[1/( 1.2 )+ /[1/( 1.2 )+ /[1/( 1.2 )+ 0.13 0.13	0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04] = 0.04]	2.26 1.63 1.66 0.37 0.97 0.69 2.28 0.95				(3)

(26)...(30) + (32) =

\*\* include the areas on both sides of internal walls and partitions

Fabric heat loss,  $W/K = S (A \times U)$ 

22.33

(33)

Heat capacity	Cm = S(	(Axk)						((28)	.(30) + (32	2) + (32a).	(32e) =	316.08	(34)
Thermal mass	parame	ter (TMF	P = Cm ÷	- TFA) ir	n kJ/m²K			Indica	tive Value	: Low		100	(35)
For design assess	sments wh	ere the de	tails of the	,			ecisely the	indicative	values of	TMP in Ta	able 1f	100	()
Thermal bridge	es : S (L	x Y) cal	culated i	using Ap	pendix I	K						13.75	(36)
if details of therma	al bridging	are not kn	own (36) =	= 0.05 x (3	1)								
Total fabric he	at loss							(33) +	(36) =			36.08	(37)
Ventilation hea	at loss ca	alculated	monthly	y				(38)m	= 0.33 × (	25)m x (5)		_	
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
(38)m= 10.07	9.96	9.84	9.28	9.17	8.61	8.61	8.5	8.84	9.17	9.4	9.62		(38)
Heat transfer of	coefficier	nt, W/K						(39)m	= (37) + (3	38)m			
(39)m= 46.15	46.04	45.92	45.36	45.25	44.69	44.69	44.58	44.92	45.25	45.48	45.7		
Heat loss para	meter (H	HLP), W/	m²K						Average = = (39)m ÷	Sum(39) <sub>1.</sub>	12 /12=	45.34	(39)
(40)m= 1.31	1.31	1.31	1.29	1.29	1.27	1.27	1.27	1.28	1.29	1.29	1.3		
Number of day	s in mor	nth (Tabl	le 1a)					,	Average =	Sum(40) <sub>1</sub>	12 /12=	1.29	(40)
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
(41)m= 31	28	31	30	31	30	31	31	30	31	30	31		(41)
4. Water heat	ing ener	rgy requi	rement:								kWh/y	ear:	
A													
if TFA > 13.9 if TFA £ 13.9 Annual averag Reduce the annual	9, N = 1 9, N = 1 e hot wa al average	+ 1.76 x ater usag hot water	ge in litre	es per da 5% if the o	ay Vd,av	erage = designed t	(25 x N)	+ 36		9) 64	.68		(42)
if TFA > 13.9 if TFA £ 13.9 Annual averag Reduce the annual not more that 125	P, N = 1 P, N = 1 e hot want average litres per p	+ 1.76 x ater usag hot water person per	ge in litre usage by a day (all w	es per da 5% if the d rater use, I	ay Vd,av welling is not and co	erage = designed (	(25 x N) to achieve	+ 36 a water us	se target o	9) 64	.68		, ,
if TFA > 13.9 if TFA £ 13.9 Annual averag Reduce the annual not more that 125  Jan	P, N = 1 P, N = 1 P hot was all average litres per p	+ 1.76 x ater usag hot water person per	ge in litre usage by a day (all w	es per da 5% if the d rater use, I	y Vd,av welling is not and co	erage = designed (	(25 x N) to achieve	+ 36		9) 64			, ,
if TFA > 13.9 if TFA £ 13.9 Annual averag Reduce the annual not more that 125  Jan Hot water usage in	P, N = 1 P, N = 1 Pe hot was all average litres per p Feb In litres per	+ 1.76 x  ater usage hot water person per  Mar day for ea	ge in litre usage by day (all w Apr ach month	es per da 5% if the da rater use, I May Vd,m = fa	ay Vd,av Iwelling is not and co	erage = designed to designed to designed to designed to design de	(25 x N) to achieve Aug (43)	+ 36 a water us Sep	oce target o	9) 64 Nov	.68 Dec		, ,
if TFA > 13.9 if TFA £ 13.9 Annual averag Reduce the annual not more that 125  Jan	P, N = 1 P, N = 1 P hot was all average litres per p	+ 1.76 x ater usag hot water person per	ge in litre usage by a day (all w	es per da 5% if the d rater use, I	y Vd,av welling is not and co	erage = designed (	(25 x N) to achieve	+ 36 a water us Sep	Oct	9) 64 Nov 68.56	.68  Dec  71.15	776 21	(43)
if TFA > 13.9 if TFA £ 13.9 Annual averag Reduce the annual not more that 125  Jan Hot water usage in	P, N = 1 P,	+ 1.76 x ater usage hot water person per Mar day for ea	ge in litre usage by a day (all was Apr ach month	es per da 5% if the da rater use, I May Vd,m = fac 60.8	y Vd,av lwelling is not and co Jun ctor from 1	erage = designed and designed a	(25 x N) to achieve  Aug (43)  60.8	+ 36 a water us Sep	Oct  65.98  Fotal = Su	9) 64 Nov 68.56 m(44) <sub>112</sub> =	.68  Dec  71.15	776.21	, ,
if TFA > 13.9 if TFA £ 13.9 Annual averag Reduce the annual not more that 125  Jan Hot water usage in  (44)m= 71.15	P, N = 1 P,	+ 1.76 x ater usage hot water person per Mar day for ea	ge in litre usage by a day (all was Apr ach month	es per da 5% if the da rater use, I May Vd,m = fac 60.8	y Vd,av lwelling is not and co Jun ctor from 1	erage = designed and designed a	(25 x N) to achieve  Aug (43)  60.8	+ 36 a water us  Sep  63.39  0 kWh/more 73.97	Oct  65.98  Fotal = Suuth (see Ta	9) 64 Nov 68.56 m(44) <sub>112</sub> = ables 1b, 1 94.1	.68  Dec  71.15  c, 1d)  102.19		(43)
if TFA > 13.9 if TFA £ 13.9 Annual averag Reduce the annual not more that 125  Jan Hot water usage in (44)m= 71.15  Energy content of (45)m= 105.52	P, N = 1 P, N = 1 P, N = 1 P hot was all average litres per p Peb In litres per Peb A series Peb	+ 1.76 x ater usage hot water person per Mar day for each 65.98 used - calconditions 95.23	Apr 63.39  culated mo 83.02	es per da 5% if the of 5% if th	Jun ctor from 5 58.22	erage = designed to designed t	(25 x N) to achieve  Aug (43)  60.8  73.1	+ 36 a water us  Sep  63.39 63.39 73.97	Oct  65.98  Fotal = Suuth (see Ta	9) 64 Nov 68.56 m(44)112 = ables 1b, 1	.68  Dec  71.15  c, 1d)  102.19	776.21	(43)
if TFA > 13.9 if TFA £ 13.9 Annual averag Reduce the annual not more that 125  Jan Hot water usage in (44)m= 71.15  Energy content of (45)m= 105.52  If instantaneous w	P, N = 1 P,	+ 1.76 x ater usage hot water person per Mar day for each 65.98 used - calconding at point	Apr ach month 63.39  culated mo 83.02	es per da 5% if the o ater use, I May Vd,m = fa 60.8 onthly = 4.	y Vd,av Iwelling is not and co Jun ctor from 7 58.22 190 x Vd,r 68.74	erage = designed to did)  Jul Table 1c x  58.22  m x nm x E  63.7  enter 0 in	(25 x N) to achieve  Aug (43)  60.8  73.1  boxes (46)	+ 36 a water us  Sep  63.39  63.97  73.97	Oct  65.98  Fotal = Su  th (see Ta  86.21  Fotal = Su	9) 64 Nov 68.56 m(44) <sub>112</sub> = ables 1b, 1 94.1 m(45) <sub>112</sub> =	.68  Dec  71.15  c, 1d)  102.19		(43)
if TFA > 13.9 if TFA £ 13.9 Annual averag Reduce the annual not more that 125  Jan Hot water usage in (44)m= 71.15  Energy content of (45)m= 105.52  If instantaneous w (46)m= 15.83	P, N = 1 P,	+ 1.76 x ater usage hot water person per Mar day for each 65.98 used - calconditions 95.23	Apr 63.39  culated mo 83.02	es per da 5% if the of 5% if th	Jun ctor from 5 58.22	erage = designed to designed t	(25 x N) to achieve  Aug (43)  60.8  73.1	+ 36 a water us  Sep  63.39 63.39 73.97	Oct  65.98  Fotal = Suuth (see Ta	9) 64 Nov 68.56 m(44) <sub>112</sub> = ables 1b, 1 94.1	.68  Dec  71.15  c, 1d)  102.19		(43)
if TFA > 13.9 if TFA £ 13.9 Annual averag Reduce the annual not more that 125  Jan Hot water usage in (44)m= 71.15  Energy content of (45)m= 105.52  If instantaneous w	P, N = 1 P,	+ 1.76 x  ater usage hot water person per  Mar day for each 65.98  used - calc 95.23  ng at point 14.28	ge in litre usage by a day (all we have month 63.39 culated month 83.02 of use (not 12.45	es per da 5% if the orater use, I May Vd,m = fa 60.8	y Vd,av lwelling is not and co Jun ctor from 7 58.22 190 x Vd,r 68.74	erage = designed to do	(25 x N) to achieve  Aug (43)  60.8  73.1  boxes (46)  10.96	+ 36 a water us Sep 63.39 68.39 73.97 10 to (61)	Oct  65.98  Fotal = Su  86.21  Fotal = Su  12.93	9) 64 Nov 68.56 m(44) <sub>112</sub> = ables 1b, 1 94.1 m(45) <sub>112</sub> =	.68  Dec  71.15  c, 1d)  102.19		(43)
if TFA > 13.9 if TFA £ 13.9 Annual averag Reduce the annual not more that 125  Jan Hot water usage in (44)m= 71.15  Energy content of (45)m= 105.52  If instantaneous w (46)m= 15.83 Water storage Storage volume	P, N = 1 P,	+ 1.76 x ater usage hot water person per Mar day for each 45.98  used - calconding at point 14.28	Apr Apr ach month 63.39  culated mo 83.02  of use (no	es per da 5% if the off ater use, I May Vd,m = far 60.8 onthly = 4. 79.66 o hot water 11.95	Jun ctor from 5 58.22 190 x Vd,r 68.74 10.31	erage = designed to designed t	(25 x N) to achieve  Aug (43)  60.8  73.1  boxes (46)  10.96  within sa	+ 36 a water us Sep 63.39 68.39 73.97 10 to (61)	Oct  65.98  Fotal = Su  86.21  Fotal = Su  12.93	9) 64 Nov 68.56 m(44) <sub>112</sub> = ables 1b, 1 94.1 m(45) <sub>112</sub> =	.68  Dec  71.15  c, 1d)  102.19  15.33		(43) (44) (45) (46)
if TFA > 13.9 if TFA £ 13.9 Annual averag Reduce the annual not more that 125  Jan Hot water usage in (44)m= 71.15  Energy content of (45)m= 105.52  If instantaneous w (46)m= 15.83 Water storage	P, N = 1 P,	ter usage hot water person per Mar day for ear 65.98  used - calconding at point 14.28  including and no talconding at point and	ge in litre usage by a day (all we have month 63.39 culated month 63.02 of use (not have many sounds in dw.)	es per da 5% if the of 5% if the of 60% May Vd,m = factor 60.8 79.66 11.95 Dolar or Water velling, e	Jun ctor from 5 58.22 190 x Vd,r 68.74 10.31	erage = designed to designed t	(25 x N) to achieve  Aug (43) 60.8  73.1  boxes (46) 10.96  within sa (47)	+ 36 a water us  Sep  63.39 73.97 71.11 ame vess	Oct  65.98  Fotal = Sunth (see Tail 86.21)  Fotal = Sunth (see Tail 86.21)  12.93	9) 64 Nov 68.56 m(44) <sub>112</sub> = 94.1 m(45) <sub>112</sub> = 14.12	.68  Dec  71.15  c, 1d)  102.19  15.33		(43) (44) (45) (46)
if TFA > 13.9 if TFA £ 13.9 Annual averag Reduce the annual not more that 125  Jan Hot water usage in (44)m= 71.15  Energy content of (45)m= 105.52  If instantaneous w (46)m= 15.83 Water storage Storage volum If community h Otherwise if no	P, N = 1 P,	+ 1.76 x  ater usage hot water person per Mar day for each of the second	Apr Apr Ach month 63.39  culated mo 83.02  of use (no 12.45  ag any so nk in dw er (this in	es per da 5% if the off May Vd,m = factors 60.8 onthly = 4. 79.66 o hot water 11.95 olar or Water velling, eacludes i	Jun ctor from 5 58.22 190 x Vd,r 68.74 10.31 //WHRS nter 110 nstantar	erage = designed to designed t	(25 x N) to achieve  Aug (43) 60.8  73.1  boxes (46) 10.96  within sa (47)	+ 36 a water us  Sep  63.39 73.97 71.11 ame vess	Oct  65.98  Fotal = Sunth (see Tail 86.21)  Fotal = Sunth (see Tail 86.21)  12.93	9) 64 Nov 68.56 m(44) <sub>112</sub> = 94.1 m(45) <sub>112</sub> = 14.12	.68  Dec  71.15  c, 1d)  102.19  15.33		(43) (44) (45) (46)
if TFA > 13.9 if TFA £ 13.9 Annual averag Reduce the annua not more that 125  Jan Hot water usage in (44)m= 71.15  Energy content of (45)m= 105.52  If instantaneous w (46)m= 15.83 Water storage Storage volum If community h Otherwise if no Water storage a) If manufact	P, N = 1 P,	+ 1.76 x  ater usage hot water person per  Mar day for each 65.98  used - calc 95.23  ng at point 14.28  including and no talc hot water eclared le	Apr ach month 63.39  culated mo 83.02  of use (no 12.45  ag any so ank in dw er (this in	es per da 5% if the off May Vd,m = factors 60.8 onthly = 4. 79.66 o hot water 11.95 olar or Water velling, eacludes i	Jun ctor from 5 58.22 190 x Vd,r 68.74 10.31 //WHRS nter 110 nstantar	erage = designed to designed t	(25 x N) to achieve  Aug (43) 60.8  73.1  boxes (46) 10.96  within sa (47)	+ 36 a water us  Sep  63.39 73.97 71.11 ame vess	Oct  65.98  Fotal = Sunth (see Tail 86.21)  Fotal = Sunth (see Tail 86.21)  12.93	9) 64 Nov 68.56 m(44) <sub>112</sub> = ables 1b, 1 94.1 m(45) <sub>112</sub> = 14.12	.68  Dec  71.15  c, 1d)  102.19  15.33		(43) (44) (45) (46)
if TFA > 13.9 if TFA £ 13.9 Annual averag Reduce the annual not more that 125  Jan Hot water usage in  (44)m= 71.15  Energy content of  (45)m= 105.52  If instantaneous w  (46)m= 15.83  Water storage Storage volum If community h Otherwise if no Water storage a) If manufact Temperature fa	P, N = 1 P,	ter usage hot water person per Mar day for ear 65.98 used - calc 95.23 ng at point 14.28 including and no talc hot water eclared lem Table	Apr ach month 63.39  culated mo 12.45  ag any so ank in dw er (this in	es per da 5% if the of 5% if the of 60% if the of May Vd,m = factor 60.8 79.66 of hot water 11.95 color or Water velling, each of the office of t	Jun ctor from 5 58.22 190 x Vd,r 68.74 10.31 //WHRS nter 110 nstantar	erage = designed to designed t	(25 x N) to achieve  Aug (43)  60.8  73.1  boxes (46)  10.96  within sa (47) ombi boil	+ 36 a water us  Sep  63.39 73.97 71.1 11.1 ame vess ers) ente	Oct  65.98  Fotal = Sunth (see Tail 86.21)  Fotal = Sunth (see Tail 86.21)  12.93	9) 64  Nov 68.56  m(44) <sub>112</sub> = ables 1b, 1 94.1  m(45) <sub>112</sub> = 14.12	.68  Dec  71.15  c, 1d)  102.19  15.33		(43) (44) (45) (46) (47)
if TFA > 13.9 if TFA £ 13.9 Annual averag Reduce the annua not more that 125  Jan Hot water usage in (44)m= 71.15  Energy content of (45)m= 105.52  If instantaneous w (46)m= 15.83 Water storage Storage volum If community h Otherwise if no Water storage a) If manufact	P, N = 1 P,	ter usage hot water person per Mar day for ear 65.98  used - calconditions of the second person per day for ear 14.28  14.28  including and no tale hot water eclared less than Table astorage	Apr ach month 63.39  culated mo 83.02  of use (no 12.45  ag any so ank in dw er (this in oss facto 2b , kWh/ye	es per da 5% if the of ater use, I May Vd,m = far 60.8 onthly = 4. 79.66 o hot water 11.95 olar or Water velling, eacludes in a cludes in a	Jun ctor from 5 58.22 190 x Vd,r 68.74 10.31 WHRS nter 110 nstantar	erage = designed to did)  Jul Table 1c x  58.22  m x nm x E  63.7  enter 0 in  9.56  storage 0 litres in neous con/day):	(25 x N) to achieve  Aug (43) 60.8  73.1  boxes (46) 10.96  within sa (47)	+ 36 a water us  Sep  63.39 73.97 71.1 11.1 ame vess ers) ente	Oct  65.98  Fotal = Sunth (see Tail 86.21)  Fotal = Sunth (see Tail 86.21)  12.93	9) 64 Nov 68.56 m(44) <sub>112</sub> = ables 1b, 1 94.1 m(45) <sub>112</sub> = 14.12	.68  Dec  71.15  c, 1d)  102.19  15.33		(43) (44) (45) (46) (47)

Hot water storage loss factor from	,	h/litre/da	ıy)				0.	02		(51)
If community heating see section	on 4.3								1	(==)
Volume factor from Table 2a  Temperature factor from Table 2	2h							03		(52) (53)
•				(47) (54)	· · · (EQ) · · · (I	F0)		.6	 	. ,
Energy lost from water storage, Enter (50) or (54) in (55)	kvvn/year			(47) X (51)	x (52) x (	53) =		03		(54) (55)
, , , , , ,	or acab month			((EG)m - (	EE\ + (41\r	~	1.	03	İ	(55)
Water storage loss calculated for	-		·	,, ,	55) × (41)r			T	1	(==)
(56)m= 32.01 28.92 32.01 If cylinder contains dedicated solar stora	30.98 32.01	30.98	32.01	32.01	30.98	32.01	30.98	32.01	liv L	(56)
(57)m= 32.01 28.92 32.01	30.98 32.01	30.98	32.01	32.01	30.98	32.01	30.98	32.01	]	(57)
` '		30.90	32.01	32.01	30.90	32.01	ļ		<u> </u> 	• •
Primary circuit loss (annual) from		<b>50</b> )	(50) - 00	·				0		(58)
Primary circuit loss calculated for (modified by factor from Table	,		. ,	, ,		r tharma	ctat)			
(59)m= 23.26 21.01 23.26	22.51 23.26	22.51	23.26	23.26	22.51	23.26	22.51	23.26	1	(59)
·	ļ				22.01	23.20	22.01	23.20	İ	(00)
Combi loss calculated for each	<del>```</del>	(60) ÷ 36	65 × (41)	)m				1	1	
(61)m= 0 0 0	0 0	0	0	0	0	0	0	0		(61)
Total heat required for water he	ating calculated	for eac	h month	(62)m =	0.85 × (	45)m +	(46)m +	(57)m +	(59)m + (61)r	n
(62)m= 160.79 142.21 150.51	136.52 134.94	122.24	118.98	128.37	127.46	141.48	147.59	157.46		(62)
Solar DHW input calculated using Appe	endix G or Appendix	H (negati	ve quantity	v) (enter '0	if no sola	r contribut	ion to wate	er heating)		
(add additional lines if FGHRS a	and/or WWHRS	applies	, see Ap	pendix (	<del>)</del> )					
(63)m= 0 0 0	0 0	0	0	0	0	0	0	0		(63)
Output from water heater										
(64)m= 160.79 142.21 150.51	136.52 134.94	122.24	118.98	128.37	127.46	141.48	147.59	157.46		
				Outp	out from wa	ater heate	r (annual)₁	12	1668.57	(64)
Heat gains from water heating,	kWh/month 0.2	5 ′ [0.85	× (45)m	+ (61)m	n] + 0.8 ×	(( <mark>46)m</mark>	+ (57)m	+ (59)m	]	
(65)m= 79.31 70.63 75.89	70.4 70.71	65.65	65.4	68.53	67.39	72.89	74.08	78.2		(65)
include (57)m in calculation o	f (65)m only if c	ylinder i	s in the o	dwelling	or hot w	ater is fr	om com	munity h	eating	
5. Internal gains (see Table 5	and 5a):									
Metabolic gains (Table 5), Watts	, S									
Jan Feb Mar	Apr May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
(66)m= 64.18 64.18 64.18	64.18 64.18	64.18	64.18	64.18	64.18	64.18	64.18	64.18		(66)
Lighting gains (calculated in App	pendix L. equati	ion L9 o	r L9a). a	lso see	Table 5				I	
(67)m= 9.99 8.87 7.22	5.46 4.08	3.45	3.73	4.84	6.5	8.25	9.63	10.27		(67)
Appliances gains (calculated in	Appendix I eq	uation I	13 or I 1:	3a) also	see Tal	ble 5	<u>!</u>		l	
(68)m= 109.48 110.62 107.76	101.66 93.97	86.74	81.91	80.77	83.63	89.73	97.42	104.65		(68)
Cooking gains (calculated in Ap							V		l	,
(69)m= 29.42 29.42 29.42	29.42 29.42	29.42	29.42	29.42	29.42	29.42	29.42	29.42	1	(69)
` '		29.42	29.42	29.42	29.42	23.42	29.42	29.42	İ	(00)
Pumps and fans gains (Table 5	· ·								1	(70)
(70)m= 0 0 0	0 0	0	0	0	0	0	0	0	l	(70)
Losses e.g. evaporation (negati			_						1	(74)
(71)m= -51.34 -51.34 -51.34	-51.34 -51.34	-51.34	-51.34	-51.34	-51.34	-51.34	-51.34	-51.34		(71)
Water heating gains (Table 5)									1	
(72)m= 106.59 105.1 102	97.78 95.04	91.18	87.91	92.11	93.6	97.96	102.89	105.11		(72)

Fotal internal			1	ı		(66)m + (67)r			· · · · · · · · · · · · · · · · · · ·				1	,—··
73)m= 268.32	266.85	259.22	247.16	235.35	223.	62 215.79	219.	.97	225.98	238.2	252.2	262.28		(73)
6. Solar gains				T-1-1- 0-										
Solar gains are o		ŭ				·	ations 1			e applica		ion.	Coino	
ا تا Drientation: ا 1	Access F Table 6d		Area m²			Flux Table 6a			g_ able 6b	-	FF Table 6c		Gains (W)	
Northeast <sub>0.9x</sub>	0.77	x	1.0	20	х Г	11.28	] <sub>x</sub> [		0.4	7 x [			. ,	(75
Northeast 0.9x	0.77	^ ^			x F	11.28	] ^   ] <sub>x</sub>		0.4	」^↓ フ <sub>×</sub> 「	0.7	╡ -	2.36 0.7	(75
Northeast 0.9x	0.77	^ ^			×	22.97	] ^   ] <sub>x</sub>		0.4	」^↓ フ <sub>×</sub> 「	0.7	<b>=</b>	4.81	(75
Northeast 0.9x	0.77	^ ^			×	22.97	] ^   ] <sub>x</sub>		0.4	」^↓ ] <sub>×</sub> [	0.7	=	1.43	(75
Northeast 0.9x	0.77	x			x [	41.38	] ^   ] <sub>x</sub>		0.4	_	0.7	_	8.67	(75
Northeast 0.9x	0.77	x			x $\lceil$	41.38	] x		0.4		0.7	= =	2.57	(75
Northeast <sub>0.9x</sub>	0.77	x			х	67.96	]		0.4		0.7	= =	14.24	(75
Northeast <sub>0.9x</sub>	0.77	x			x $\Gamma$	67.96	]		0.4		0.7	= =	4.22	(75
L   Northeast <sub>0.9x</sub>	0.77	x			x	91.35	]		0.4		0.7	= =	19.14	` (75
L   Northeast <sub>0.9x</sub>	0.77	X			x F	91.35	X		0.4		0.7	= =	5.67	— (75
Northeast <sub>0.9x</sub>	0.77	x		08	x	97.38	X		0.4	X	0.7		20.41	(75
Northeast 0.9x	0.77	x	0.5	32	x	97.38	Х		0.4	x	0.7		6.05	(75
lortheast <sub>0.9x</sub>	0.77	×	1.0	08	x	91.1	, ,		0.4	х	0.7		19.09	(75
Northeast <sub>0.9x</sub>	0.77	x	0.:	32	×	91.1	X		0.4	х	0.7	=	5.66	(75
Northeast <sub>0.9x</sub>	0.77	x	1.0	08	x	72.63	X		0.4	x	0.7	=	15.22	(75
Northeast <sub>0.9x</sub>	0.77	x	0.:	32	×	72,63	х		0.4	x	0.7		4.51	(75
Northeast 0.9x	0.77	x	1.0	08	x	50.42	x		0.4	x	0.7		10.57	(75
Northeast 0.9x	0.77	х	0.3	32	X	50.42	x		0.4	X	0.7	=	3.13	(7!
Northeast 0.9x	0.77	X	1.0	08	x	28.07	x		0.4	×	0.7	=	5.88	(75
Northeast 0.9x	0.77	x	0.:	32	x	28.07	x		0.4	×	0.7	<u> </u>	1.74	(75
lortheast <sub>0.9x</sub>	0.77	X	1.0	08	x	14.2	x		0.4	×	0.7		2.98	(75
Northeast <sub>0.9x</sub>	0.77	x	0.3	32	x	14.2	X		0.4	×	0.7	=	0.88	(75
Northeast <sub>0.9x</sub>	0.77	х	1.0	08	x	9.21	x		0.4	x	0.7	=	1.93	(75
Northeast <sub>0.9x</sub>	0.77	х	0.3	32	x	9.21	X		0.4	x	0.7	=	0.57	(75
Southeast 0.9x	0.77	х	1.9	97	x	36.79	X		0.4	x	0.7	=	14.06	(7
Southeast <sub>0.9x</sub>	0.77	х	1.9	97	x	62.67	x		0.4	x	0.7	=	23.96	(77
Southeast <sub>0.9x</sub>	0.77	х	1.9	97	x	85.75	X		0.4	x	0.7	=	32.78	(77
Southeast <sub>0.9x</sub>	0.77	х	1.9	97	x	106.25	X		0.4	x	0.7	=	40.62	(7
Southeast <sub>0.9x</sub>	0.77	x	1.9	97	х	119.01	x		0.4	x	0.7	=	45.49	(77
Southeast <sub>0.9x</sub>	0.77	x	1.9	97	х	118.15	X		0.4	×	0.7	=	45.16	(77
Southeast <sub>0.9x</sub>	0.77	X	1.9	97	х	113.91	x		0.4	x	0.7		43.54	(7
Southeast <sub>0.9x</sub>	0.77	X	1.9	97	x $\Box$	104.39	x		0.4	_ x [	0.7		39.9	(77
Southeast <sub>0.9x</sub>	0.77	x	1.9	97	х	92.85	x		0.4	x	0.7	=	35.49	(77
Southeast <sub>0.9x</sub>	0.77	×	1.9	97	x	69.27	i x		0.4	T x	0.7	=	26.48	(77

	_											_	_					_
Southea	ast 0.9x	0.77	X	1.9	7	X	4	4.07	X		0.4	X	L	0.7		=	16.85	(77)
Southea	ast 0.9x	0.77	X	1.9	7	X	3	1.49	X		0.4	X		0.7		=	12.04	(77)
Southwe	est <sub>0.9x</sub>	0.77	X	1.4	2	X	3	6.79			0.4	X		0.7		=	10.14	(79)
Southwe	est <sub>0.9x</sub>	0.77	X	1.4	5	X	3	6.79			0.4	X		0.7		=	10.35	(79)
Southwe	est <sub>0.9x</sub>	0.77	X	1.4	2	X	6	2.67			0.4	X		0.7		=	17.27	(79)
Southwe	est <sub>0.9x</sub>	0.77	X	1.4	5	X	6	2.67			0.4	X		0.7		=	17.63	(79)
Southwe	est <mark>o.9x</mark>	0.77	X	1.4	2	X	8	5.75	]		0.4	X		0.7		=	23.63	(79)
Southwe	est <sub>0.9x</sub>	0.77	X	1.4	5	X	8	5.75	]		0.4	x		0.7		=	24.13	(79)
Southwe	est <sub>0.9x</sub>	0.77	X	1.4	2	X	10	06.25			0.4	×		0.7		=	29.28	(79)
Southwe	est <mark>o.9x</mark>	0.77	X	1.4	5	X	10	06.25	]		0.4	X		0.7		=	29.89	(79)
Southwe	est <sub>0.9x</sub>	0.77	X	1.4	2	X	1	19.01	]		0.4	×		0.7		=	32.79	(79)
Southwe	est <sub>0.9x</sub>	0.77	X	1.4	5	X	1	19.01			0.4	×		0.7		=	33.48	(79)
Southwe	est <sub>0.9x</sub>	0.77	X	1.4	2	X	1	18.15	]		0.4	X	Ī	0.7		=	32.55	(79)
Southwe	est <sub>0.9x</sub>	0.77	x	1.4	5	X	1	18.15	]		0.4	X	Ī	0.7		=	33.24	(79)
Southwe	est <sub>0.9x</sub>	0.77	x	1.4	2	X	1	13.91	]		0.4	X	Ī	0.7		=	31.39	(79)
Southwe	est <sub>0.9x</sub>	0.77	x	1.4	5	X	1	13.91	]		0.4	X	Ī	0.7		=	32.05	(79)
Southwe	est <sub>0.9x</sub>	0.77	x	1.4	2	X	10	04.39	Ī		0.4	T	Ī	0.7		=	28.76	(79)
Southwe	est <sub>0.9x</sub>	0.77	X	1.4	5	X	10	04.39			0.4	X	Ī	0.7		=	29.37	(79)
Southwe	est <sub>0.9x</sub>	0.77	×	1.4	2	х	9	2.85	Ī.,		0.4	x	Ī	0.7	$\equiv$	-	25.58	(79)
Southwe	est <sub>0.9x</sub>	0.77	×	1.4	.5	Х	9	2.85	j /		0.4	x	Ī	0.7		=	26.12	(79)
Southwe	est <sub>0.9x</sub>	0.77	x	1.4	2	X	6	9.27	<b>i</b> /		0.4	X	Ī	0.7		=	19.09	(79)
Southwe	est <sub>0.9x</sub>	0.77	×	1.4	5	X	6	9.27	ĺ		0.4	X	Ī	0.7		=	19.49	(79)
Southwe	est <sub>0.9x</sub>	0.77	x	1.4	2	x	4	4.07	i		0.4	X	Ī	0.7		=	12.14	(79)
Southwe	est <sub>0.9x</sub>	0.77	x	1.4	5	Х	4	4.07	ĺ		0.4	X	Ī	0.7		=	12.4	(79)
Southwe	est <sub>0.9x</sub>	0.77	x	1.4	2	X	3	1.49	ĺ		0.4	_ x	Ī	0.7		=	8.68	(79)
Southwe	est <sub>0.9x</sub>	0.77	x	1.4	5	X	3	1.49	ĺ		0.4	×	Ī	0.7		=	8.86	(79)
	_												Ī					
Solar g	ains in y	watts, cal	culated	for eacl	n month	1			(83)n	n = Su	ım(74)m .	(82)ı	n				_	
(83)m=	37.62	65.1	91.78	118.25	136.58	1:	37.42	131.73	117	7.77	100.9	72.6	8	45.25	32.	80		(83)
Total g	ains – ir	nternal an	d solar	(84)m =	: (73)m	+ (8	83)m	, watts									1	
(84)m=	305.94	331.95	351	365.4	371.93	3	61.04	347.52	337	.74	326.88	310.	88	297.45	294	.36		(84)
7. Me	an inter	nal tempe	rature	(heating	seasor	1)												
Temp	erature	during he	ating p	eriods ir	the liv	ing	area f	from Tab	ole 9	, Th1	1 (°C)						21	(85)
Utilisa	tion fac	tor for gai	ns for l	iving are	a, h1,n	า (ร	ee Ta	ble 9a)										
	Jan	Feb	Mar	Apr	May		Jun	Jul	А	ug	Sep	0	ct	Nov	D	ес		
(86)m=	0.93	0.92	0.89	0.84	0.75		0.62	0.5	0.5	52	0.69	0.8	4	0.91	0.9	94		(86)
Mean	internal	temperat	ture in I	living are	ea T1 (f	ollo	w ste	ps 3 to 7	7 in 1	able	9c)							
(87)m=	18.66	18.89	19.29	19.82	20.31	$\overline{}$	20.7	20.88	20.	-	20.59	19.9	98	19.25	18.	62	]	(87)
Temp	erature	during he	ating p	eriods ir	rest of	dw.	ellina	from Ta	ble !	9 Th	n2 (°C)			'			•	
(88)m=	20.34	20.34	20.35	20.35	20.36	$\overline{}$	20.36	20.36	20.		20.36	20.3	36	20.35	20.	35	]	(88)
L	tion fac	tor for gai	ne for r	est of d	welling	h?	m (sc	L Table	02)					1			ı	
(89)m=	0.93	0.91	0.88	0.82	0.73	_	,111 (SE 0.58	0.44	9a) 0.4	<sub>47</sub>	0.65	0.8	2	0.9	0.9	93	]	(89)
()								L			00		_	1	3.0	-	I	(= =)

Mean	interna	петтрег	alule III	116 1621	oi aweiii	ng rz (n	UIIUW SIC	po o to	<i>i</i> III Tabi	10 00)				
(90)m=	18.14	18.37	18.76	19.29	19.77	20.14	20.29	20.27	20.03	19.45	18.73	18.11		(90)
			I				ı		f	fLA = Livin	g area ÷ (	4) =	0.68	(91)
Mean	interna	l temper	ature (fo	r the wh	ole dwel	llina) = fl	LA × T1	+ (1 – fL	A) × T2			•		
(92)m=	18.5	18.73	19.12	19.65	20.14	20.52	20.69	20.67	20.41	19.81	19.08	18.46		(92)
Apply	adjustn	nent to t	he mean	internal	temper	ature fro	m Table	4e, whe	ere appro	opriate	ļ.			
(93)m=	18.5	18.73	19.12	19.65	20.14	20.52	20.69	20.67	20.41	19.81	19.08	18.46		(93)
8. Sp	ace hea	ting requ	uirement					,						
			ernal ter or gains	•		ed at ste	ep 11 of	Table 9	b, so tha	it Ti,m=(	76)m an	d re-calc	ulate	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Utilisa	ation fac	tor for g	ains, hm	:										
94)m=	0.91	0.89	0.86	0.8	0.72	0.59	0.47	0.49	0.66	0.8	0.88	0.91		(94)
Usefu	ıl gains,	hmGm	, W = (94	4)m x (84	4)m					_	_			
95)m=	277.81	294.91	300.74	293.22	267.19	214.58	162.73	166.89	215.08	249.99	261.98	269.17		(95)
Montl	hly avera	age exte	rnal tem	perature	from Ta	able 8								
96)m=	4.3	4.9	6.5	8.9	11.7	14.6	16.6	16.4	14.1	10.6	7.1	4.2		(96)
Heat	loss rate	e for mea	an intern	al tempe	erature,	_m , W =	=[(39)m	x [(93)m	– (96)m	]				
97)m=	655.16	636.48	579.63	487.61	381.9	<b>2</b> 64.68	182.82	190.44	283.54	416.79	544.89	651.6		(97)
Space	<mark>e h</mark> eatin	g require	ement fo	r each m	nonth, k\	<mark>/\h</mark> /mon	th = 0.02	24 x [(97)	)m – (95	)m] x (4	1)m			
98)m=	280.75	229.54	207.49	139.96	05.04					4044				
		229.54	207.49	139.96	85.34	0	0	0	0	124.1	203.7	284.53		
		229.54	207.49	139.96	85.34	0	0		l per year				1 <mark>5</mark> 55.42	(98)
Space			ement in		<b>T</b>	0	9						1555.42 44.29	(98) (99)
	e heatin	g require		kWh/m²	/year			Tota	Il per year					=
a. En Spac	e heating	g require quiremen	ement in nts – Indi	kWh/m²	/year eating sy	ystems i	ncluding	Tota	Il per year				44.29	(99)
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Factor for charging method for community water	heating			1	(305)
Distribution loss factor (Table 12c) for community	heating system			1.05	(306)
Water heat from CHP		(64) x (303a) x (305) x (306)	=	1752	(310a)
Electricity used for heat distribution	0.01	× [(307a)(307e) + (310a)	.(310e)] =	17.52	(313)
Annual totals		kWh/yea	ır	kWh/year	 _
Space heating fuel used, main system 1				1555.42	
Electricity for pumps, fans and electric keep-hot					
mechanical ventilation - balanced, extract or pos	itive input from outsid	е	139.02		(230a) 
Total electricity for the above, kWh/year	sum	of (230a)(230g) =		139.02	(231)
Electricity for lighting				176.43	(232)
Electricity generated by PVs				-975.89	(233)
Total delivered energy for all uses (211)(221) +	(231) + (232)(237b)	=		894.97	(338)
12a. CO2 emissions – Individual heating systems	s including micro-CHF				
	<b>Energy</b> kWh/year	<b>Emission fac</b> kg CO2/kWh	ctor	Emissions kg CO2/yea	
Space heating (main system 1)	(211) x	0.519	=	807.26	(261)
Space heating (secondary) Water heating from community system	(215) x	0.519	= [	0	(263)
CO2 from other sources of space and water hear Efficiency of heat source 1 (%)	kW ting (not CHP)	ergy Emission kg CO2/line s repeat (363) to (366) for the	kWh	Emissions kg CO2/year	(367a)
CO2 associated with heat source 1	[(307b)+(310b)] x	100 ÷ (367b) x 0.52	=	276.38	(367)
Electrical energy for heat distribution	[(313) x	0.52	=	9.09	(372)
Total CO2 associated with community systems	(363)(3	66) + (368)(372)	=	285.47	(373)
Electricity for pumps, fans and electric keep-hot	(231) x	0.519	= [	72.15	(267)
Electricity for lighting	(232) x	0.519	=	91.57	(268)
Energy saving/generation technologies Item 1		0.519	= [	-506.49	(269)
Total CO2, kg/year		sum of (265)(271) =		749.96	(272)
Dwelling CO2 Emission Rate		(272) ÷ (4) =		21.35	(273)
El rating (section 14)			[	87	(274)
			•		

Stroma Number:   Stroma FSAP 2012   Software Version:   Version: 1.0.5.33			User D	Details:						
Chester Road Hostel, 2 Chester Road, LONDON, N19 5BP   1. Overall divelling dimensions		Stroma FSAP 2012						Versic	on: 1.0.5.33	
Area(m²)   Av. Height(m)   Volume(m³)							SHP + F	Pγ		
Area(m²)   Av. Height(m)   Volume(m²)   (3a)		·	ester Ro	ad, LONI	DON, N	19 5BP				
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)+(1n)   25   (4)   25   (3a)   (3a)+(3b)+(3c)+(3d)+(3e)+(3n)   (77.25   (5)   (5)   (5)   (5)   (5)   (7.25   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (5)   (6)   (5)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (6)   (	1. Overall dwelling dime	nsions:	۸ro	o(m²\		۸۰, U.	iaht/m\		Volumo/m³	١
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)+(1n)   25   (4)   25   (4)   25   (4)   25   (4)   25   (4)   25   (4)   25   (4)   25   (4)   25   (4)   25   (4)   25   (5)   25   (5)   25   (5)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25   (6)   25	Ground floor		Are	<u> </u>	(1a) x			](2a) =		_
Dwelling volume   Ga)+(3b)+(3c)+(3d)+(3e)+(3n) =   77.25   (5)		a)+(1b)+(1c)+(1d)+(1 <u>b)</u> + (1	n)				.00	_(==,/	77.20	(0.07)
2. Ventilation rate:    Main   Meating   Meati	·	x)	''/	25		)+(3c)+(3c	d)+(3e)+	(3n) =	77.05	7(5)
Number of chimneys					(00)1(00	)1(00)1(00	1) 1 (00) 1	.(01) =	77.25	(5)
Number of chimneys	2. Ventilation rate:	main seconda	rv	other		total			m³ per hou	r
Number of open flues 0 + 0 + 0 = 0 x20 = 0 (6b)  Number of intermittent fans  Number of passive vents 0 x10 = 0 (7a)  Number of flueless gas fires  Air changes per hour  Infiltration due to chimneys, flues and fans = (6a)+(6b)+(7a)+(7b)+(7c) = 0 + (5b) = 0 (8)  If a pressurisation test has been carried out or is intended, proceed to (17), otherwise continue from (9) to (16)  Number of storeys in the dwelling (ns)  Additional infiltration: 0.25 for steel or timber frame or 0.35 for masonry construction  if both types of wall are present, use the value corresponding to the greater wall area (after deducting areas of openings); if equal user 0.35  If suspended wooden floor, enter 0.2 (unsealed) or 0.1 (sealed), else enter 0  Percentage of windows and doors draught stripped  Window infiltration  0.25 - [0.2 x (14) + 100] = 0 (15)  Infiltration rate (8) + (10) + (11) + (12) + (13) + (15) = 0 (15)  Air permeability value, q50, expressed in cubic metres per hour per square metre of envelope area  If based on air permeability value, then (18) = ((17) + 20)+(8), otherwise (18) = (16)  Air permeability value, applies if a pressurisation test has been done or a degree air permeability is being used  Number of sides sheltered  Q (19)  Shelter factor (20) = 1 - (0.075 x (19)) = 1 (20)  Infiltration rate modified for monthly wind speed  An Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  Monthly average wind speed from Table 7	Number of objection	heating heating	, –		1 _ [			40 -	-	_
Number of intermittent fans    0	•		<b>⊣</b> ⊨							╡``
Number of passive vents    0	·		J ˙ L	0	] - F	0			0	╡`
Air changes per hour  Infiltration due to chirmneys, flues and fans = (68)+(6b)+(7a)+(7b)+(7c) =		1S			Ĺ	0			0	(7a)
Air changes per hour  Infiltration due to chirnneys, flues and fans = (6e)+(6b)+(7a)+(7b)+(7c) = 0 + (6 = 0 (8) (8) (8) (9 + 16) (17), otherwise continue from (9) to (16) (17), otherwise (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18) enter (18)	·				L	0	X '	10 =	0	(7b)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(7a)+(7b)+(7c) =	Number of flueless gas fin	res				0	X 4	40 =	0	(7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(7a)+(7b)+(7c) =								Air ch	anges ner ho	our
Number of storeys in the dwelling (ns)  Additional infiltration  Structural infiltration: 0.25 for steel or timber frame or 0.35 for masonry construction  if both types of wall are present, use the value corresponding to the greater wall area (after deducting areas of openings); if equal user 0.35  If suspended wooden floor, enter 0.2 (unsealed) or 0.1 (sealed), else enter 0  Quitable of the greater of the greater of the greater wall area (after deducting areas of openings); if equal user 0.35  If no draught lobby, enter 0.05, else enter 0  Quitable of the greater of the greater wall area (after deducting areas of openings); if equal user 0.35  If suspended wooden floor, enter 0.2 (unsealed) or 0.1 (sealed), else enter 0  Quitable of the greater wall area (after deducting areas of openings); if equal user 0.35  If on draught lobby, enter 0.05, else enter 0  Quitable of the greater wall area (after deducting areas of openings); if equal user 0.35  If suspended wooden floor, enter 0.2 (unsealed) or 0.1 (sealed), else enter 0  Quitable of the greater wall area (after deducting area (after deducting areas of openings); if equal user 0.35  If suspended wooden floor, enter 0.2 (unsealed) or 0.1 (sealed), else enter 0  Quitable of the greater wall area (after deduction)  Quitable of the greater wall area (after deduction)  Quitable of the greater wall area (after deduction)  Quitable of the greater wall area (after deduction)  Quitable of the greater wall area (after deduction)  Quitable of the greater wall area (after deduction)  Quitable of the greater wall area (after deduction)  Quitable of the greater wall area (after deduction)  Quitable of the greater wall area (after defleter wa	Infiltration due to chimne	(c. fluos and fans — (62)+(6b)+(	7a)±(7h)±(	(7c) -	_					_
Number of storeys in the dwelling (ns)   Additional infiltration   (10)   (10)					ontinue fr			<del>-</del> (5) =	0	(6)
Structural infiltration: 0.25 for steel or timber frame or 0.35 for masonry construction  if both types of wall are present, use the value corresponding to the greater wall area (after deducting areas of openings); if equal user 0.35  If suspended wooden floor, enter 0.2 (unsealed) or 0.1 (sealed), else enter 0  O  (12)  If no draught lobby, enter 0.05, else enter 0  Percentage of windows and doors draught stripped  Window infiltration  0.25 - [0.2 × (14) ± 100] =  (15)  Infiltration rate  (8) ± (10) ± (11) ± (12) ± (13) ± (15) =  Air permeability value, q50, expressed in cubic metres per hour per square metre of envelope area  If based on air permeability value, then (18) = [(17) ± 20]±(8), otherwise (18) = (16)  Air permeability value applies if a pressurisation test has been done or a degree air permeability is being used  Number of sides sheltered  Shelter factor  (20) = 1 - [0.075 × (19)] =  1 (20)  Infiltration rate modified for monthly wind speed  Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  Monthly average wind speed from Table 7									0	(9)
if both types of wall are present, use the value corresponding to the greater wall area (after deducting areas of openings); if equal user 0.35  If suspended wooden floor, enter 0.2 (unsealed) or 0.1 (sealed), else enter 0  If no draught lobby, enter 0.05, else enter 0  Percentage of windows and doors draught stripped  Window infiltration  0.25 - [0.2 × (14) ÷ 100] = 0  Infiltration rate  (8) + (10) + (11) + (12) + (13) + (15) = 0  If based on air permeability value, q50, expressed in cubic metres per hour per square metre of envelope area  If based on air permeability value, then (18) = [(17) ÷ 20]+(8), otherwise (18) = (16)  Air permeability value applies if a pressurisation test has been done or a degree air permeability is being used  Number of sides sheltered  Shelter factor  (20) = 1 - [0.075 × (19)] = 0  Infiltration rate modified for monthly wind speed  Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  Monthly average wind speed from Table 7	Additional infiltration						[(9)	-1]x0.1 =	0	(10)
If suspended wooden floor, enter 0.2 (unsealed) or 0.1 (sealed), else enter 0  If no draught lobby, enter 0.05, else enter 0  Percentage of windows and doors draught stripped  Window infiltration  Infiltration rate  Air permeability value, q50, expressed in cubic metres per hour per square metre of envelope area  If based on air permeability value, then (18) = [(17) ÷ 20]+(8), otherwise (18) = (16)  Air permeability value applies if a pressurisation test has been done or a degree air permeability is being used  Number of sides sheltered  Shelter factor  (20) = 1 - [0.075 × (19)] =  Infiltration rate modified for monthly wind speed  Monthly average wind speed from Table 7					•	uction			0	(11)
If no draught lobby, enter 0.05, else enter 0  Percentage of windows and doors draught stripped  Window infiltration  0.25 - $[0.2 \times (14) \div 100] =$ 0 (15)  Infiltration rate  (8) + (10) + (11) + (12) + (13) + (15) =  0 (16)  Air permeability value, q50, expressed in cubic metres per hour per square metre of envelope area  If based on air permeability value, then (18) = $[(17) \div 20] + (8)$ , otherwise (18) = (16)  Air permeability value applies if a pressurisation test has been done or a degree air permeability is being used  Number of sides sheltered  Shelter factor  (20) = 1 - $[0.075 \times (19)] =$ 1 (20)  Infiltration rate incorporating shelter factor  (21) = (18) × (20) =  0.12 (21)  Monthly average wind speed from Table 7			o the grea	ter wall area	a (after					
Percentage of windows and doors draught stripped  Window infiltration $0.25 - [0.2 \times (14) \div 100] =$ Infiltration rate $(8) + (10) + (11) + (12) + (13) + (15) =$ O  (16)  Air permeability value, q50, expressed in cubic metres per hour per square metre of envelope area  If based on air permeability value, then $(18) = [(17) \div 20] + (8)$ , otherwise $(18) = (16)$ Air permeability value applies if a pressurisation test has been done or a degree air permeability is being used  Number of sides sheltered  Shelter factor $(20) = 1 - [0.075 \times (19)] =$ Infiltration rate incorporating shelter factor $(21) = (18) \times (20) =$ Unfiltration rate modified for monthly wind speed  Monthly average wind speed from Table 7	If suspended wooden f	loor, enter 0.2 (unsealed) or (	).1 (seale	ed), else	enter 0				0	(12)
Window infiltration $0.25 - [0.2 \times (14) \div 100] = 0$ (15) Infiltration rate $(8) + (10) + (11) + (12) + (13) + (15) = 0$ (16) Air permeability value, q50, expressed in cubic metres per hour per square metre of envelope area If based on air permeability value, then $(18) = [(17) \div 20] + (8)$ , otherwise $(18) = (16)$ $0.12$ (18)  Air permeability value applies if a pressurisation test has been done or a degree air permeability is being used  Number of sides sheltered Shelter factor $(20) = 1 - [0.075 \times (19)] = 0.12$ (20) Infiltration rate incorporating shelter factor $(21) = (18) \times (20) = 0.12$ (21) Infiltration rate modified for monthly wind speed  Monthly average wind speed from Table 7	If no draught lobby, ent	er 0.05, else enter 0							0	(13)
Infiltration rate $(8) + (10) + (11) + (12) + (13) + (15) = 0$ (16)  Air permeability value, q50, expressed in cubic metres per hour per square metre of envelope area  If based on air permeability value, then $(18) = [(17) \div 20] + (8)$ , otherwise $(18) = (16)$ 0.12 (18)  Air permeability value applies if a pressurisation test has been done or a degree air permeability is being used  Number of sides sheltered  Shelter factor $(20) = 1 - [0.075 \times (19)] = 1$ (20)  Infiltration rate incorporating shelter factor $(21) = (18) \times (20) = 1$ 0.12 (21)  Infiltration rate modified for monthly wind speed  Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  Monthly average wind speed from Table 7	<u> </u>	and doors draught stripped							0	(14)
Air permeability value, q50, expressed in cubic metres per hour per square metre of envelope area  If based on air permeability value, then (18) = [(17) ÷ 20]+(8), otherwise (18) = (16)  Air permeability value applies if a pressurisation test has been done or a degree air permeability is being used  Number of sides sheltered  Shelter factor  (20) = 1 - [0.075 × (19)] =				•		•	. (45)		0	╡`′
If based on air permeability value, then (18) = [(17) ÷ 20]+(8), otherwise (18) = (16)  Air permeability value applies if a pressurisation test has been done or a degree air permeability is being used  Number of sides sheltered  Shelter factor  (20) = 1 - [0.075 x (19)] = 0.12 (21)  Infiltration rate incorporating shelter factor  (21) = (18) x (20) = 0.12 (21)  Infiltration rate modified for monthly wind speed  Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  Monthly average wind speed from Table 7		aEO avaraged in aubic matr		. , . ,		, , ,		oroo		=
Air permeability value applies if a pressurisation test has been done or a degree air permeability is being used  Number of sides sheltered  Shelter factor  (20) = 1 - [0.075 x (19)] = 1 (20)  Infiltration rate incorporating shelter factor  (21) = (18) x (20) = 0.12 (21)  Infiltration rate modified for monthly wind speed  Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  Monthly average wind speed from Table 7	•		•	•	•	etre or e	rivelope	area		=
Shelter factor $ (20) = 1 - [0.075 \times (19)] = 1 $ [100] Infiltration rate incorporating shelter factor $ (21) = (18) \times (20) = 1 $ [110] Infiltration rate modified for monthly wind speed  Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  Monthly average wind speed from Table 7	·					is being u	sed		0.12	(10)
Infiltration rate incorporating shelter factor  Infiltration rate modified for monthly wind speed  Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  Monthly average wind speed from Table 7	Number of sides sheltere	d							0	(19)
Infiltration rate modified for monthly wind speed  Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  Monthly average wind speed from Table 7						19)] =			1	(20)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec  Monthly average wind speed from Table 7	·			(21) = (18)	x (20) =				0.12	(21)
Monthly average wind speed from Table 7		<del></del>	1	1 .		l _		_	1	
			Jul	Aug	Sep	Oct	Nov	Dec		
(22)m= 5.1 5 4.9 4.4 4.3 3.8 3.8 3.7 4 4.3 4.5 4.7	<del> </del>		T	T		T	T		1	
	(22)m= 5.1 5	4.9   4.4   4.3   3.8	3.8	3.7	4	4.3	4.5	4.7		
Wind Factor (22a)m = (22)m ÷ 4	Wind Factor (22a)m = (22	2)m ÷ 4								
(22a)m= 1.27 1.25 1.23 1.1 1.08 0.95 0.95 0.92 1 1.08 1.12 1.18	(22a)m= 1.27 1.25	1.23 1.1 1.08 0.95	0.95	0.92	1	1.08	1.12	1.18		

\ , <u> </u>	0.16 0.15	0.14	0.13	0.12	0.12	0.12	0.12	0.13	0.14	0.15	]	
	ctive air chang	e rate for t	he appli	cable ca	se		!					_
	al ventilation:	and the NL (6	201-) (00-		C (1	MEN - 11 -		\ (00-)			0.5	(2
	eat pump using A							) = (23a)			0.5	(2
	h heat recovery: e							21.) (	001 ) [	4 (00	75.65	(2
· ·	ed mechanical		1		<del>- ` ` </del>	<del>- ^ ` </del>	ŕ	<del>r Ó Ó</del>	<del></del>	<del>`</del>	:) ÷ 100] T	(2
4a)m= 0.28	0.28 0.27		0.26	0.24	0.24	0.24	0.25	0.26	0.26	0.27		(2
· —	ed mechanical		1		<del>, , ,</del>	<del>-                                    </del>	<del>í `</del>	<del>r Ó</del>		1 0	7	11
(4b)m= 0	0 0	0	0	0	0	0	0	0	0	0		(2
•	nouse extract v n < 0.5 × (23b)		•	•				.5 × (23b	)	_	_	
4c)m= 0	0 0	0	0	0	0	0	0	0	0	0		(2
,	ventilation or v n = 1, then (24		•					0.5]				
4d)m= 0	0 0	0	0	0	0	0	0	0	0	0	]	(2
Effective air	change rate -	enter (24a	a) or (24h	o) or (24	c) or (24	d) in bo	(25)				_	
5)m= 0.28	0.28 0.27	0.26	0.26	0.24	0.24	0.24	0.25	0.26	0.26	0.27		(:
Heat losse	s and heat los	s naramet	er.					_				
LEMENT	Gross area (m²)	Openin		Net Ar A ,r		U-valı W/m2		A X U (W/ł	<)	k-valu kJ/m²·		X k J/K
oo <mark>rs Ty</mark> pe 1				2.13	x	1	= [	2.13				(:
oo <mark>rs Ty</mark> pe 2				0.35	x	1	] = [	0.35				(:
oors Type 3				0.99	X	1	=	0.99	Ħ			(:
/indows Type	<del>2</del> 1			0.7	x1.	/[1/( 1.2 )+	0.04] =	0.8	5			(:
									=			
indows Type	⊋2			1.96	x1.	/[1/( 1.2 )+	0.04] =	2.24				(
				1.96 0.32	_	/[1/( 1.2 )+ /[1/( 1.2 )+	L	2.24 0.37	$\exists$			
/indows Type		3.5	$\neg$		x1		L					(
/indows Type /alls Type1	e 3	3.5		0.32	x1.	/[1/( 1.2 )+	0.04] =	0.37				(2
/indows Type /alls Type1 /alls Type2	10.07	2.95		0.32 6.57	x10 x x x x	/[1/( 1.2 )+ 0.13 0.13	0.04] = [	0.37 0.85 1.3				
/indows Type /alls Type1 /alls Type2 /alls Type3	10.07 12.98 1.87	2.95		0.32 6.57 10.03	x1. x x x x	0.13 0.13 0.13	0.04] = [	0.37 0.85 1.3 0.24				
/indows Type /indows Type /alls Type1 /alls Type2 /alls Type3 /alls Type4 oof	10.07 12.98 1.87 2.9	2.95		0.32 6.57 10.03 1.87 2.9	x1. x x x x x x	0.13 0.13 0.13 0.13	0.04] = [	0.37 0.85 1.3 0.24 0.38				
indows Type alls Type1 alls Type2 alls Type3 alls Type4	10.07 12.98 1.87 2.9 25	2.95		0.32 6.57 10.03 1.87 2.9	x1. x x x x x x	0.13 0.13 0.13	0.04] = [	0.37 0.85 1.3 0.24				
indows Type alls Type1 alls Type2 alls Type3 alls Type4 oof otal area of e	10.07 12.98 1.87 2.9 25 elements, m <sup>2</sup>	2.95 0 0	5	0.32 6.57 10.03 1.87 2.9 25	x1. x x x x x x x x	0.13 0.13 0.13 0.13 0.13	0.04] = [	0.37 0.85 1.3 0.24 0.38 2.5	[] [] [] [] [] [] [] [] [] [] [] [] [] [	paragrap	h 3.2	
indows Type alls Type1 alls Type2 alls Type3 alls Type4 oof otal area of e	10.07 12.98 1.87 2.9 25	2.98 0 0 0 ce effective w	indow U-va	0.32 6.57 10.03 1.87 2.9 25 52.82 alue calcul	x1. x x x x x x x x	0.13 0.13 0.13 0.13 0.13	0.04] = [	0.37 0.85 1.3 0.24 0.38 2.5	[ ] [ ] [ ] [ss given in	ı paragrap	h 3.2	
l'indows Type l'alls Type1 l'alls Type2 l'alls Type3 l'alls Type4 oof otal area of e	10.07 12.98 1.87 2.9 25 Elements, m <sup>2</sup>	2.95 0 0 0 see effective was of internal was	indow U-va	0.32 6.57 10.03 1.87 2.9 25 52.82 alue calcul	x1. x x x x x x x x x x alated using	0.13 0.13 0.13 0.13 0.13	0.04] = [	0.37 0.85 1.3 0.24 0.38 2.5		ı paragrap	h 3.2	
l'indows Type  l'alls Type1  l'alls Type2  l'alls Type3  l'alls Type4  oof  otal area of e for windows and include the area abric heat los	10.07 12.98 1.87 2.9 25 Elements, m <sup>2</sup> I roof windows, us as on both sides of	2.95 0 0 0 ce effective was finternal was	indow U-va	0.32 6.57 10.03 1.87 2.9 25 52.82 alue calcul	x1. x x x x x x x x x x alated using	0.13 0.13 0.13 0.13 0.13 0.13	0.04] = [	0.37 0.85 1.3 0.24 0.38 2.5				
indows Type alls Type1 alls Type2 alls Type3 alls Type4 oof otal area of e or windows and include the area abric heat los	10.07  12.98  1.87  2.9  25  Elements, m²  I roof windows, uses on both sides of ses, W/K = S (A	2.95 0 0 0 see effective was of internal was a x U)	indow U-va	0.32 6.57 10.03 1.87 2.9 25 52.82 alue calculatitions	x1. x x x x x x x x x x x x x x x x x x x	0.13 0.13 0.13 0.13 0.13 0.13	0.04] = [	0.37 0.85 1.3 0.24 0.38 2.5	2) + (32a).		12.16	
indows Types alls Type1 alls Type2 alls Type3 alls Type4 oof otal area of earth of the area abric heat lose eat capacity nermal mass	10.07  12.98  1.87  2.9  25  Elements, m <sup>2</sup> I roof windows, us as on both sides of ses, W/K = S (A Cm = S(A x k))	2.95 0 0 0 see effective what internal was a x U) ) MP = Cm -	indow U-va	0.32 6.57 10.03 1.87 2.9 25 52.82 alue calcul titions	x1 x x x x x x x x alated using	0.13 0.13 0.13 0.13 0.13 0.13 0.14 0.15 0.17 0.17 0.19	0.04] = [	0.37 0.85 1.3 0.24 0.38 2.5 (30) + (32) tive Value:	2) + (32a). : Low	(32e) =	12.16 225	

Total fa	abric hea	at loss							(33) +	(36) =		Г	20.08	(37)
Ventila	tion hea	t loss ca	alculated	d monthl	٧					. ,	25)m x (5)	L	20.00	(``
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
(38)m=	7.17	7.09	7.01	6.61	6.53	6.13	6.13	6.05	6.29	6.53	6.69	6.85		(38)
Heat tra	ansfer c	oefficier	nt, W/K	Į.			Į.		(39)m	= (37) + (37)	38)m	<u>!</u>		
(39)m=	27.25	27.17	27.09	26.69	26.61	26.22	26.22	26.14	26.37	26.61	26.77	26.93		
Heat lo	ss para	meter (H	HLP), W	/m²K						Average = = (39)m ÷	Sum(39) <sub>1.</sub>	12 /12=	26.67	(39)
(40)m=	1.09	1.09	1.08	1.07	1.06	1.05	1.05	1.05	1.05	1.06	1.07	1.08		
Numbe	r of day	s in mor	nth (Tab	le 1a)				•	,	Average =	Sum(40) <sub>1</sub> .	12 /12=	1.07	(40)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
(41)m=	31	28	31	30	31	30	31	31	30	31	30	31		(41)
								•						
4 Wa	ter heat	ing ener	av reau	irement:								kWh/ye	ar.	
	tor riout	9 00.	9) 1044									Terring C		
	ed occu			· [4 _ a.u.n	( 0 000	) 40 v /TF	-	\0\1 · 0 (	2042 v /	TEA 40		09		(42)
	A > 13.8 A £ 13.9		+ 1.76 X	[1 - ехр	(-0.0003	349 X (11	-A -13.9	)2)] + 0.0	JU13 X (	IFA - 13.	9)			
		•	ater usa	ge in litre	es per da	y Vd,av	erage =	(25 x N)	+ 36		60	.05		(43)
						_	-	to achieve	a water us	se target o	f			
not more	that 125	litres per p	person per	r day (all w	rater use, i	hot and co	la)	$\triangle$						
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Hot wate	_	i litres per	day for ea		va,m = ta	ctor from T		(43)						
(44)m=	<b>6</b> 6.06	63.66	61.25	58.85	56.45	54.05	54.05	56.45	58.85	61.25	63.66	66.06		<b>—</b> ,,,,
Energy o	content of	hot water	used - cal	culated mo	onthly $= 4$ .	190 x Vd,r	n x nm x E	OTm / 3600			m(44) <sub>112</sub> = ables 1b, 1		720.62	(44)
(45)m=	97.96	85.68	88.41	77.08	73.96	63.82	59.14	67.86	68.67	80.03	87.36	94.87		
										Total = Su	m(45) <sub>112</sub> =	= [	944.85	(45)
It instant	aneous w	ater heatıı		of use (no	not water	r storage),	enter 0 in	boxes (46,	) to (61)	T				
(46)m=	14.69 storage	12.85	13.26	11.56	11.09	9.57	8.87	10.18	10.3	12	13.1	14.23		(46)
	•		includir	na anv sa	olar or W	/WHRS	storane	within sa	ame ves	امء		0		(47)
•		, ,		•		nter 110	_		A1110 VOO	001		0		(47)
	•	•			•			ombi boil	ers) ente	er '0' in (	47)			
	storage			(1)					,	(	,			
a) If m	anufact	urer's de	eclared I	oss facto	or is kno	wn (kWh	n/day):					0		(48)
Tempe	rature fa	actor fro	m Table	2b								0		(49)
Energy	lost fro	m water	storage	, kWh/ye	ear			(48) x (49)	) =		1	10		(50)
				-		or is not								
		-			e 2 (kW	h/litre/da	ay)				0.	02		(51)
	nunity n e factor i	•	ee secti	on 4.3								00		(50)
			oie ∠a m Table	2b								.6		(52) (53)
•				, kWh/ye	aar			(47) x (51)	\ v (52\ v (	53) -				` '
			_	, KVVII/y	Jai			(Tr) A (31)	, ^ (JE) X (	00) –	J 1.	03		(54)
Enter	(50) or (	54) in (5	5)								1	03		(55)

Water storage loss c	alculated	for each	month			((56)m = (	55) × (41)	m				
(56)m= 32.01 28.92	32.01	30.98	32.01	30.98	32.01	32.01	30.98	32.01	30.98	32.01		(56)
If cylinder contains dedica	ted solar sto	orage, (57)	m = (56)m	x [(50) – (	H11)] ÷ (5	0), else (5	7)m = (56)	m where (	H11) is fro	m Append	ix H	
(57)m= 32.01 28.92	32.01	30.98	32.01	30.98	32.01	32.01	30.98	32.01	30.98	32.01		(57)
Primary circuit loss (a	annual) fro	om Table	3							0		(58)
Primary circuit loss c	•			59)m = (	(58) ÷ 36	65 × (41)	m				•	
(modified by factor	from Tab	le H5 if t	here is s	solar wat	ter heatii	ng and a	cylinde	r thermo	stat)			
(59)m= 23.26 21.01	23.26	22.51	23.26	22.51	23.26	23.26	22.51	23.26	22.51	23.26		(59)
Combi loss calculate	d for each	month (	(61)m =	(60) ÷ 36	65 × (41)	)m						
(61)m= 0 0	0	0	0	0	0	0	0	0	0	0		(61)
Total heat required for	r water h	eating ca	alculated	I for eacl	h month	(62)m =	0.85 × (	(45)m +	(46)m +	(57)m +	(59)m + (61)m	
(62)m= 153.24 135.6	143.69	130.57	129.24	117.31	114.42	123.14	122.17	135.31	140.86	150.15		(62)
Solar DHW input calculate	d using App	endix G o	Appendix	H (negati	ve quantity	/) (enter '0	' if no sola	r contribut	ion to wate	er heating)	'	
(add additional lines	f FGHRS	and/or \	WWHRS	applies	, see Ap	pendix (	3)					
(63)m= 0 0	0	0	0	0	0	0	0	0	0	0		(63)
Output from water he	ater		_	-	-	-	-	-	-	-		
(64)m= 153.24 135.6	143.69	130.57	129.24	117.31	114.42	123.14	122.17	135.31	140.86	150.15		
					•	Outp	out from wa	ater heate	r (annual)	12	1595.69	(64)
Heat gains from water	r heating	, kWh/m	onth 0.2	5 [0.85	× (45)m	+ (61)m	n] + 0.8 x	((46)m	+ (57)m	+ (59)m	1	
(65)m= 76.79 68.43	73.62	68.42	68.81	64.02	63.89	66.79	65.63	70.83	71.04	75 77		(65)
			00.0	07.02	03.09	00.79	65.63	70.03	71.84	75.77		(00)
in <mark>clude</mark> (57)m in ca	lculation			_							eating	(00)
include (57)m in ca		of (65)m	only if c	_							eating	(00)
<u> </u>	ee Table 5	of (65)m	only if c	_							eating	(66)
5. Internal gains (se	ee Table 5	of (65)m	only if c	_							eating	(00)
5. Internal gains (se	ee Table 5	of (65)m and 5a	only if c	ylinder i	s in the o	dwelling	or hot w	ater is fr	om com	munity h	eating	(66)
5. Internal gains (so Metabolic gains (Tab	le 5), Wat Mar 54.43	of (65)m 5 and 5a tts Apr 54.43	only if constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the consta	Jun 54.43	Jul 54.43	Aug 54.43	Sep	ater is fr	om com	munity h	eating	
5. Internal gains (so Metabolic gains (Tab Jan Feb (66)m= 54.43 54.43	le 5), Wat Mar 54.43	of (65)m 5 and 5a tts Apr 54.43	only if constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the constant of the consta	Jun 54.43	Jul 54.43	Aug 54.43	Sep	ater is fr	om com	munity h	eating	
5. Internal gains (so Metabolic gains (Tab Jan Feb (66)m= 54.43 54.43 Lighting gains (calcu	Mar 54.43 atted in A	of (65)m 5 and 5a tts Apr 54.43 ppendix 4.69	May 54.43 L, equati	Jun 54.43 ion L9 of 2.96	Jul 54.43 r L9a), a 3.2	Aug 54.43 Iso see	Sep 54.43 Table 5 5.58	Oct 54.43	Nov 54.43	Dec 54.43	eating	(66)
5. Internal gains (some second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second	Mar 54.43 atted in A	of (65)m 5 and 5a tts Apr 54.43 ppendix 4.69	May 54.43 L, equati	Jun 54.43 ion L9 of 2.96	Jul 54.43 r L9a), a 3.2	Aug 54.43 Iso see	Sep 54.43 Table 5 5.58	Oct 54.43	Nov 54.43	Dec 54.43	eating	(66)
5. Internal gains (some section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of the section of t	Mar 54.43 ated in Al 6.2 culated ir 84.94	of (65)m 5 and 5a tts Apr 54.43 ppendix 4.69 Appendix 80.14	May 54.43 L, equati 3.51 dix L, eq 74.07	Jun 54.43 ion L9 o 2.96 uation L 68.37	Jul 54.43 r L9a), a 3.2 13 or L1 64.56	Aug 54.43 lso see 4.16 3a), also 63.67	Sep 54.43 Table 5 5.58 See Ta 65.93	Oct 54.43  7.09 ble 5 70.73	Nov 54.43	Dec 54.43	eating	(66) (67)
5. Internal gains (see Metabolic gains (Tabolic gains (Tabolic gains (Tabolic gains (Tabolic gains (66)m= 54.43 54.43   Lighting gains (calcumate (67)m= 8.58 7.62   Appliances gains (calcumate (68)m= 86.3 87.2	Mar 54.43 ated in Al 6.2 culated ir 84.94	of (65)m 5 and 5a tts Apr 54.43 ppendix 4.69 Appendix 80.14	May 54.43 L, equati 3.51 dix L, eq 74.07	Jun 54.43 ion L9 o 2.96 uation L 68.37	Jul 54.43 r L9a), a 3.2 13 or L1 64.56	Aug 54.43 lso see 4.16 3a), also 63.67	Sep 54.43 Table 5 5.58 See Ta 65.93	Oct 54.43  7.09 ble 5 70.73	Nov 54.43	Dec 54.43	eating	(66) (67)
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Metabolic gains (Tab  Jan Feb  (66)m= 54.43 54.43  Lighting gains (calcu (67)m= 8.58 7.62  Appliances gains (ca (68)m= 86.3 87.2  Cooking gains (calcu (69)m= 28.44 28.44  Pumps and fans gain (70)m= 0 0  Losses e.g. evaporate	Mar 54.43 ated in Al 6.2 culated ir 84.94 lated in A 28.44 s (Table 9 10 10 10 10 10 10 10 10 10 10 10 10 10	of (65)m 5 and 5a tts Apr 54.43 ppendix 4.69 n Append 80.14 ppendix 28.44 5a) 0 tive valu	only if company if company if company if company if company if company is seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a seen as a se	Jun 54.43 ion L9 of 2.96 uation L 68.37 ion L15 28.44	Jul 54.43 r L9a), a 3.2 13 or L1 64.56 or L15a) 28.44	Aug 54.43 lso see 4.16 3a), also 63.67 , also se 28.44	Sep 54.43 Table 5 5.58 See Ta 65.93 ee Table 28.44	Oct 54.43  7.09 ble 5  70.73  5  28.44	Nov 54.43 8.27 76.8	Dec 54.43 8.82 82.5	eating	(66) (67) (68) (69) (70)
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Metabolic gains (Tab  Jan Feb  (66)m= 54.43 54.43  Lighting gains (calcu (67)m= 8.58 7.62  Appliances gains (ca (68)m= 86.3 87.2  Cooking gains (calcu (69)m= 28.44 28.44  Pumps and fans gain (70)m= 0 0  Losses e.g. evaporat (71)m= -43.54 -43.54  Water heating gains	Mar 54.43 ated in A 6.2 culated in A lated in A 28.44 s (Table 9 -43.54 (Table 5) 98.95	of (65)m 5 and 5a tts Apr 54.43 ppendix 4.69 Appendix 28.44 ppendix 28.44 5a) 0 tive valu -43.54	only if construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of the construction of th	Jun 54.43 ion L9 o 2.96 uation L 68.37 ion L15 28.44  0 le 5) -43.54	Jul 54.43 r L9a), a 3.2 13 or L1 64.56 or L15a) 28.44	Aug 54.43 lso see 4.16 3a), also 63.67 o, also see 28.44 0	Sep 54.43 Table 5 5.58 See Ta 65.93 ee Table 28.44  0	Oct 54.43  7.09 ble 5 70.73 5 28.44  0 -43.54	Nov 54.43 8.27 76.8 28.44 0 -43.54	Dec 54.43 8.82 82.5 28.44 0	eating	(66) (67) (68) (69) (70)
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Solar gains are calculated using solar flux from Table 6a and associated equations to convert to the applicable orientation.

Orienta		Access Fa	ctor	Area m²			Flux Table 6a			g_ Table 6b	-	FF Table 6c			Gains (W)	
East	0.9x	0.77	X	1.9	6	X	19.64		x	0.4	x [	0.7		= [	7.47	(76)
East	0.9x	0.77	X	1.9	6	x	38.42		X	0.4	x [	0.7		= [	14.61	(76)
East	0.9x	0.77	X	1.9	6	x	63.27		X	0.4	x [	0.7		= [	24.06	(76)
East	0.9x	0.77	X	1.9	6	x	92.28		X	0.4	x [	0.7		= [	35.1	(76)
East	0.9x	0.77	X	1.9	6	X	113.09		x	0.4	x [	0.7		= [	43.01	(76)
East	0.9x	0.77	X	1.9	6	X	115.77		X	0.4	x [	0.7		= [	44.03	(76)
East	0.9x	0.77	X	1.9	6	X	110.22		x	0.4	x [	0.7		= [	41.92	(76)
East	0.9x	0.77	X	1.9	6	x	94.68		x	0.4	x	0.7		= [	36.01	(76)
East	0.9x	0.77	X	1.9	6	x	73.59		x	0.4	x [	0.7		=	27.99	(76)
East	0.9x	0.77	X	1.9	6	x	45.59		x	0.4	x [	0.7		=	17.34	(76)
East	0.9x	0.77	X	1.9	6	x	24.49		x	0.4	x [	0.7		= [	9.31	(76)
East	0.9x	0.77	X	1.9	6	x	16.15		X	0.4	x	0.7		=	6.14	(76)
West	0.9x	0.77	X	0.7	7	x	19.64		x	0.4	x [	0.7		=	2.67	(80)
West	0.9x	0.77	X	0.3	2	x	19.64		x	0.4	x	0.7		=	1.22	(80)
West	0.9x	0.77	X	0.7	7	x	38.42		X	0.4	x	0.7		=	5.22	(80)
West	0.9x	0.77	X	0.3	2	X	38.42		Х	0.4	Х	0.7		=	2.39	(80)
West	0.9x	0.77	X	0.7		x	63.27	7	х	0.4	х	0.7		-	8.59	(80)
West	0.9x	0.77	X	0.3	2	x	63.27		×	0.4	x	0.7		= [	3.93	(80)
West	0.9x	0.77	x	0.7	7	x	92.28		x	0.4	x	0.7		= [	12.53	(80)
West	0.9x	0.77	x	0.3	2	x	92.28		X	0.4	х	0.7		= [	5.73	(80)
West	0.9x	0.77	x	0.7	7	x	113.09	7	x	0.4	х	0.7		=	15.36	(80)
West	0.9x	0.77	×	0.3	2	х	113.09	╗	x	0.4	х	0.7		=	7.02	(80)
West	0.9x	0.77	×	0.7	7	x	115.77		x	0.4	×	0.7		= [	15.72	(80)
West	0.9x	0.77	X	0.3	2	x	115.77		x	0.4	x	0.7		= [	7.19	(80)
West	0.9x	0.77	X	0.7	7	x	110.22		x	0.4	x	0.7		=	14.97	(80)
West	0.9x	0.77	X	0.3	2	x	110.22		x	0.4	x	0.7		=	6.84	(80)
West	0.9x	0.77	X	0.7	7	x	94.68		x	0.4	x	0.7		=	12.86	(80)
West	0.9x	0.77	X	0.3	2	x	94.68		x	0.4	x	0.7		= [	5.88	(80)
West	0.9x	0.77	X	0.7	7	x	73.59		x	0.4	x	0.7		= [	10	(80)
West	0.9x	0.77	X	0.3	2	x	73.59		x	0.4	x	0.7		= [	4.57	(80)
West	0.9x	0.77	x	0.7	7	x	45.59	$\exists$	x	0.4	×	0.7		=	6.19	(80)
West	0.9x	0.77	X	0.3	2	x	45.59		x	0.4	x	0.7		= [	2.83	(80)
West	0.9x	0.77	X	0.7	7	x	24.49		x	0.4	_ x	0.7		= [	3.33	(80)
West	0.9x	0.77	x	0.3	2	x	24.49	$\exists$	x	0.4	×	0.7		=	1.52	(80)
West	0.9x	0.77	x	0.7	7	x	16.15		x	0.4	×	0.7		=	2.19	(80)
West	0.9x	0.77	X	0.3	2	x	16.15		x	0.4	_ x [	0.7		= [	1	(80)
Solor	oina in	wette cold		for oach	n mont	h			2)m	- Cum(74)m				•		_
(83)m=	11.36	watts, calc	36.59	53.36	65.39	$\neg$	66.94 63.73	Ť	54.7	= Sum(74)m . 5 42.55	26.36	14.16	9.3	34	ı	(83)
							83)m , watts									• •
(84)m=	248.78		266	272.55	274.79		66.51 256.6		251.6	67 244.54	238.71	238.34	241	.81	ı	(84)

7 Me	ean inter	nal temr	erature	(heating	season	١								
		·		·		•	from Tab	ole 9 Th	1 (°C)				21	(85)
	ation fac	Ū	٠.			Ū		)ic 0, 111	. ( 0)				21	(00)
Otilise	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
(86)m=	0.9	0.89	0.85	0.79	0.69	0.55	0.42	0.44	0.62	0.78	0.87	0.91		(86)
, ,	intornal	tompor	atura in	living or	00 T1 (fc	llow eto	ps 3 to 7	L Tabl	0.00					
(87)m=	19.31	19.47	19.79	20.21	20.58	20.84	20.95	20.94	20.77	20.34	19.79	19.29		(87)
					l	<u> </u>	l							, ,
(88)m=	20.45	20.46	20.46	20.47	20.47	20.48	from Ta	20.48	20.47	20.47	20.46	20.46		(88)
					<u>l</u>		<u>l</u>							,
(89)m=	0.89	or for g	0.84	0.78	0.67	n2,m (se 0.52	e Table 0.38	9a) <sub>0.4</sub>	0.59	0.77	0.86	0.9		(89)
					<u>l</u>		<u>l</u>			<u> </u>	0.00	0.9		(00)
						<del>- ` `</del>	ollow ste	·						(00)
(90)m=	18.87	19.02	19.33	19.75	20.11	20.35	20.44	20.43	20.29	19.88	19.34	18.85		(90)
										LA = LIVIII	g area ÷ (4	+) =	0.84	(91)
				1	r		LA × T1		A) × T2					
	19.24	19.4	19.72	20.14	20.51	20.77	20.87	20.86	20.7	20.27	19.72	19.22		(92)
	_				· ·		m Table			_				(02)
(93)m=	19.24	19.4	19.72	20.14	20.51	20.77	20.87	20.86	20.7	20.27	19.72	19.22		(93)
	ace hea			mn a ratuu	ro obtoin	ad at at	on 11 of	Toble O	o o tho	4 Ti m /	76\m on	d ro colo	vuloto	
	tilisation					ieu ai sii	ep i i oi	i able 9	o, so ma	ıt 11,111=(	rojili ali	d re-calc	sulate	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Utilisa	ation fac	tor for g	ains, hm	1:								ļ.		
(94)m=	0.88	0.86	0.83	0.77	0.67	0.54	0.41	0.43	0.6	0.76	0.84	0.88		(94)
Usefu	ıl gains,	hmGm ,	W = (94	4)m x (8	4)m									
(95)m=	218.25	222.32	220.22	208.85	184.65	142.87	105.23	108.67	146.76	181.29	201.1	213.65		(95)
	hly avera			<del>i                                     </del>	i —	i				1		ı		(0.0)
(96)m=	4.3	4.9	6.5	8.9	11.7	14.6	16.6	16.4	14.1	10.6	7.1	4.2		(96)
				299.99			=[(39)m :		<u> </u>	ī	227.70	404.50		(97)
(97)m=	407.24	394.09	358.04	<u> </u>	234.37	161.71	111.86	116.5	174	257.32	337.79	404.53		(97)
(98)m=	140.61	115.42	102.54	65.62	36.99	0	th = 0.02	0 0	0 0	56.57	98.41	142.02		
(00)=	110.01	110.12	102.01	00.02	00.00					l	) = Sum(9		758.17	(98)
Cana	a b a a tin			L(\A/b) /100 3	2/1.00#			rota	i poi youi	(KVVIII) your	) = Odin(o	O/15,912 —		=
·	e heatin	• •			•								30.33	(99)
			nts – Indi	ividual h	eating sy	ystems i	ncluding	micro-C	HP)					
-	e heating ion of sp	_	it from s	econdar	y/supple	mentary	system						0	(201)
Fract	ion of sp	ace hea	it from m	nain syst	em(s)			(202) = 1 -	- (201) =				1	(202)
Fract	ion of to	tal heatii	ng from	main sys	stem 1			(204) = (2	02) × [1 –	(203)] =			1	(204)
Effici	ency of r	nain spa	ace heat	ing syste	em 1								100	(206)
Effici	ency of s	checonda	n //aumali				0.4							= (222)
	cricy or c	beconida	ry/Suppi	ementar	y heating	g systen	า, %						0	(208)

	_					_	-	
Jan Feb Mar Apr May	Jun 、	Jul Aug	Sep	Oct	Nov	Dec	kWh/ye	ar
Space heating requirement (calculated above)			1		ı		Ī	
140.61 115.42 102.54 65.62 36.99	0	0 0	0	56.57	98.41	142.02		
$(211)m = \{[(98)m \times (204)] \} \times 100 \div (206)$				-0 - <del>-</del> -	00.44	440.00	I	(211)
140.61 115.42 102.54 65.62 36.99	0	0 0	0 al (kWh/yea	56.57	98.41	142.02	750.47	7(211)
Space heating fuel (secondary), kWh/month		Tota	ii (KVVII/yCc	ar) =0am(2	- 1 1/15,1012		758.17	(211)
$= \{[(98) \text{m x } (201)] \} \times 100 \div (208)$								
(215)m= 0 0 0 0 0	0	0 0	0	0	0	0		
	•	Tota	l (kWh/yea	ar) =Sum(2	215) <sub>15,1012</sub>	=	0	(215)
Water heating						'		_
Water heating from separate community system: Annual water heating requirement							1595.69	(64)
- '								╡`
Fraction of heat from community CHP							1	(303a)
Factor for charging method for community wate	· ·						1	(305)
Distribution loss factor (Table 12c) for communi	ty heating	system					1.1	(306)
Water heat from CHP			(64) x (30	)3a) x (30	5) x (306) :	=	1755.26	(310a)
Electricity used for heat distribution		0.01	× [(307a).	(307e) +	· (310a)(	[310e)] =	17.55	(313)
Annual totals				k'	Wh/year		kWh/year	-
Space heating fuel used, main system 1							758.17	
Electricity for pumps, fans and electric keep-hot								
mechanical ventilation - balanced, extract or po	sitive inpu	t from outside	е			98.96		(230a)
Total electricity for the above, kWh/year		sum	of (230a).	(230g) =			98.96	(231)
Electricity for lighting							151.5	(232)
Electricity generated by PVs							-695.34	(233)
Total delivered energy for all uses (211)(221) +	(231) + (	232)(237b)	=				313.29	(338)
12a. CO2 emissions – Individual heating system	ns includir	na micro-CHF	)					
		<u> </u>			ion foo	4	- Emissions	
	Enerç	J <b>y</b>			<b>ion fac</b> 2/kWh	tor	Emissions	
Space heating (main system 1)		<b>jy</b> ⁄ear		kg CO	2/kWh	tor	kg CO2/ye	ar ¬
Space heating (main system 1) Space heating (secondary)	Enerç kWh/y	<b>3y</b> ⁄ear ×		kg CO	2/kWh	,	kg CO2/ye	ar (261)
Space heating (secondary)	<b>Energ</b> kWh/y	<b>3y</b> ⁄ear ×		kg CO	2/kWh	=	kg CO2/ye	ar ¬
	Enerç kWh/y	gy /ear × ×		0.5	2/kWh	= =	kg CO2/yea	ar (261)
Space heating (secondary)	Enerç kWh/y	gy /ear × ×	ergy	0.5 0.5	2/kWh 19 19 mission	=   =   factor	kg CO2/yea	ar (261)
Space heating (secondary) Water heating from community system	Enerç kWh/y (211) (215)	gy /ear × × Enc kW		0.5 0.5	2/kWh	=   =   factor	kg CO2/yea	ar (261)
Space heating (secondary)  Water heating from community system  CO2 from other sources of space and water heating	Energ kWh/y (211) (215)	gy /ear × × Enc kW	ergy h/year	0.5 0.5	2/kWh 19 19 mission g CO2/k	= =     factor   Wh	kg CO2/yes	ar (261)
Space heating (secondary)  Water heating from community system  CO2 from other sources of space and water heating	Energ kWh/y (211) (215)	gy /ear × Enc kW	ergy h/year s repeat (3	kg CO:  0.5  0.5  E kg  63) to (360	2/kWh 19 19 mission g CO2/k	= =     factor   Wh	kg CO2/ye	(261) (263)
Space heating (secondary)  Water heating from community system  CO2 from other sources of space and water heating efficiency of heat source 1 (%)	Energ kWh/y (211) (215)	ear  Enc kW  CHP)  using two fuels	ergy h/year s repeat (3	kg CO:  0.5  0.5  E kg  63) to (360	2/kWh 19 19 mission g CO2/k 6) for the s	= = factor Wh	kg CO2/yes 393.49 0 Emissions kg CO2/year 329 276.89	(261) (263) (263)
Space heating (secondary)  Water heating from community system  CO2 from other sources of space and water heating from the source 1 (%)  CO2 associated with heat source 1	Energ kWh/y (211) (215)	ear  Enc  kW  CHP)  using two fuels  107b)+(310b)] x  [(313) x	ergy h/year s repeat (3 100 ÷ (367	kg CO:  0.5  0.5  E kg  63) to (366  b) x	2/kWh 19 19 mission g CO2/k 6) for the s	=     factor   Wh   econd fuel	kg CO2/yes 393.49 0 Emissions kg CO2/year  329 276.89 9.11	(261) (263) (263) (367a) (367) (372)
Space heating (secondary)  Water heating from community system  CO2 from other sources of space and water heating efficiency of heat source 1 (%)  CO2 associated with heat source 1  Electrical energy for heat distribution	Energ kWh/y (211) (215)	Enc kW CHP) vising two fuels (37b)+(310b)] x (363)(363)(363)	ergy h/year s repeat (3	kg CO:  0.5  0.5  E kg  63) to (366  b) x	2/kWh 19 19 mission g CO2/k 6) for the s 0.52 0.52	=     factor   Wh   econd fuel   =	kg CO2/yes 393.49 0 Emissions kg CO2/year  329 276.89 9.11	(261) (263) (263) (367a) (367)

Electricity for lighting	(232) x	0.519 =	78.63	(268)
Energy saving/generation technologies				_
Item 1		0.519 =	-360.88	(269)
Total CO2, kg/year		sum of (265)(271) =	448.6	(272)
Dwelling CO2 Emission Rate		(272) ÷ (4) =	17.94	(273)
El rating (section 14)			91	(274)

			User D	Details: _						
Assessor Name: Software Name:	Stroma FSAP		on: 1.0.5.33							
Address :	Chester Road H			Address ad, LON	The state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the s		OIII + I	V		
1. Overall dwelling dime	nsions:									
Ground floor				<b>a(m²)</b> 19.68	(1a) x		ight(m) .09	(2a) =	Volume(m³	) (3a)
Total floor area TFA = (1a	a)+(1b)+(1c)+(1d)+	+(1e)+(1r			(4)			]` '		`
Dwelling volume		( - ) (	′ L	10.00		)+(3c)+(3c	d)+(3e)+	.(3n) =	153.51	(5)
2. Ventilation rate:									100.01	
2. Verillation rate.	main	secondar	у	other		total			m³ per hou	r
Number of chimneys	heating 0 +	heating 0	+ [	0	] = [	0	X 4	40 =	0	(6a)
Number of open flues	0 +	0	j + þ	0	j = [	0	x	20 =	0	(6b)
Number of intermittent fa	ns				, F	0	x ·	10 =	0	(7a)
Number of passive vents					F	0	x ·	10 =	0	(7b)
Number of flueless gas fi	res				Ē	0	X 4	40 =	0	(7c)
					_					
		(0) (0) (7			_				nanges per ho	_
Infiltration due to chimne					continue fr	0 om (9) to (		÷ (5) =	0	(8)
Number of storeys in the		, , , , , , , , , , , , , , , , , , , ,	(,,			(2) 32 (	, , ,		0	(9)
Additional infiltration							[(9)	-1]x0.1 =	0	(10)
Structural infiltration: 0 if both types of wall are pi					•	uction			0	(11)
deducting areas of openir	ngs); if equal user 0.35									_
If suspended wooden f	•	•	.1 (seale	ed), else	enter 0				0	(12)
If no draught lobby, en Percentage of windows	•								0	(13)
Window infiltration	o and accre araag.	потрос		0.25 - [0.2	x (14) ÷ 1	00] =			0	(15)
Infiltration rate				(8) + (10)	+ (11) + (1	12) + (13) -	+ (15) =		0	(16)
Air permeability value,	•		•	•	•	etre of e	envelope	area	2.5	(17)
If based on air permeabil  Air permeability value applie	•					is heina u	sad has		0.12	(18)
Number of sides sheltere	•	it has been don	io oi a ao	groo an po	modelinty	io being a	304		0	(19)
Shelter factor				(20) = 1 -	[0.0 <b>75</b> x (1	19)] =			1	(20)
Infiltration rate incorporat	•			(21) = (18	) x (20) =				0.12	(21)
Infiltration rate modified for		i	Jul	T Aug	Con	Oct	Nov	Doo	1	
L		lay Jun	Jui	Aug	Sep	Oct	Nov	Dec		
Monthly average wind sp (22)m= 5.1 5	4.9 4.4 4.3	3 3.8	3.8	3.7	4	4.3	4.5	4.7	]	
		ı	ı	1		I	1	1	J	
Wind Factor $(22a)m = (22a)m = 1.27$	<del>·                                      </del>	0.95	0.95	0.92	1	1.08	1.12	1.18	1	
(224)111= 1.21 1.25	1.23 1.1 1.0	0.95	0.95	0.92	_ '	1.00	1.12	1.10	J	

Adjusted infiltration rate (allowing for sh	elter and wind sp	peed) = (21a) x	(22a)m				
0.16 0.16 0.15 0.14	0.13 0.12	0.12 0.12	0.12 0.13	0.14	0.15		
Calculate effective air change rate for the	ne applicable cas	e	•	•		•	¬,,,,
If mechanical ventilation:  If exhaust air heat pump using Appendix N, (2)	3h) = (23a) x Fmy (eq	ruation (N5)) other	rwise (23h) = (23	a)		0.5	(23a)
If balanced with heat recovery: efficiency in %				*/		0.5	(23b) (23c)
a) If balanced mechanical ventilation	-			⊦ (23h) <b>x</b> [	 1 <i>– (2</i> 3c)	73.95 ÷ 1001	(230)
(24a)m= 0.29 0.29 0.28 0.27	0.26 0.25	0.25 0.25	0.26 0.26	<del>``                                   </del>	0.28		(24a)
b) If balanced mechanical ventilation	without heat reco	overy (MV) (24b	)m = (22b)m ·	(23b)	•	<u> </u>	
(24b)m= 0 0 0 0	0 0	0 0	0 0	0	0		(24b)
c) If whole house extract ventilation of	r positive input ve	entilation from c	outside	•		•	
if $(22b)m < 0.5 \times (23b)$ , then $(24c)$	e) = (23b); otherwi	ise (24c) = (22b	o) m + 0.5 × (2	3b)		1	
(24c)m = 0 0 0 0	0 0	0 0	0 0	0	0		(24c)
d) If natural ventilation or whole hous if (22b)m = 1, then (24d)m = (22b)							
(24d)m= 0 0 0 0	0 0	0 0	0 0	0	0		(24d)
Effective air change rate - enter (24a)	or (24b) or (24c)	or (24d) in box	x (25)			ı	
(25)m= 0.29 0.29 0.28 0.27	0.26 0.25	0.25 0.25	0.26 0.26	0.27	0.28		(25)
3. Heat losses and heat loss parameter	er:			_		_	
ELEMENT Gross Opening					k-value		
area (m²)	A ,m <sup>2</sup>	2 W/m2	K (\	V/K)	kJ/m²-ł	K kJ/	
Doors Type 1	2.13	x 1	= 2.	3			(26)
Doors Type 2	0.7	X 1	= 0.	7			(26)
Doors Type 3	0.96	x 1	9.0	16			(26)
Doors Type 4	0.7	x 1	= 0.	7			(26)
Doors Type 5	0.7	X 1	= 0.	7			(26)
Windows Type 1	1.1	x1/[1/( 1.2 )+		6			(27)
Windows Type 2	0.19	x1/[1/( 1.2 )+		===			(27)
Windows Type 3	2.01	14/[4// 4/9 \ 1					
		x1/[1/( 1.2 )+		3			(27)
Windows Type 4	1.46	x1/[1/( 1.2 )+	0.04] = 1.6				(27)
Windows Type 5	1.46	x1/[1/( 1.2 )+ x1/[1/( 1.2 )+	0.04] = 1.6	57			(27) (27)
Windows Type 5 Windows Type 6		x1/[1/(1.2)+ x1/[1/(1.2)+ x1/[1/(1.2)+	0.04] = $1.60.04$ ] = $1.60.04$ ] = $1.6$	57			(27) (27) (27)
Windows Type 5 Windows Type 6 Windows Type 7	1.46	x1/[1/( 1.2 )+ x1/[1/( 1.2 )+	0.04] = $1.60.04$ ] = $1.60.04$ ] = $1.6$	57 3			(27) (27) (27) (27)
Windows Type 5 Windows Type 6 Windows Type 7 Walls Type1  12.36  4.44	1.46	x1/[1/(1.2)+ x1/[1/(1.2)+ x1/[1/(1.2)+	0.04] = $1.60.04$ ] = $1.60.04$ ] = $1.6$	3 3 7			(27) (27) (27)
Windows Type 5 Windows Type 6 Windows Type 7 Walls Type1 12.36 4.44 Walls Type2 5.87 0	1.46 0.99 0.32	x1/[1/(1.2)+ x1/[1/(1.2)+ x1/[1/(1.2)+ x1/[1/(1.2)+	0.04] = $1.60.04$ ] = $1.60.04$ ] = $1.70.04$ ] = $0.6$	3 3 3 7			(27) (27) (27) (27)
Windows Type 5         Windows Type 6         Windows Type 7         Walls Type1       12.36         Walls Type2       5.87         Walls Type3       5.84	1.46 0.99 0.32 7.92	x1/[1/(1.2)+ x1/[1/(1.2)+ x1/[1/(1.2)+ x1/[1/(1.2)+ x1/[1/(1.2)+	0.04] = $1.60.04$ ] = $1.60.04$ ] = $1.60.04$ ] = $0.6= 1.6$	3 3 3 7 3 6			(27) (27) (27) (27) (27)
Windows Type 5         Windows Type 6         Windows Type 7         Walls Type1       12.36         Walls Type2       5.87         Walls Type3       5.84         Walls Type4       2.81	1.46 0.99 0.32 7.92 5.87	x1/[1/(1.2)+ x1/[1/(1.2)+ x1/[1/(1.2)+ x1/[1/(1.2)+ x 0.13 x 0.13	0.04] = 1.0 $0.04] = 1.0$ $0.04] = 1.0$ $0.04] = 0.0$ $0.04] = 0.0$ $0.04] = 0.0$	3 3 3 7 3 3 6 6			(27) (27) (27) (27) (29) (29)
Windows Type 5         Windows Type 6         Windows Type 7         Walls Type1       12.36         Walls Type2       5.87         Walls Type3       5.84         Walls Type4       2.81         Walls Type5       8.5	1.46 0.99 0.32 7.92 5.87 5.84	x1/[1/(1.2)+ x1/[1/(1.2)+ x1/[1/(1.2)+ x1/[1/(1.2)+ x 0.13 x 0.13	0.04] = 1.6 $ 0.04] = 1.6 $ $ 0.04] = 1.7 $ $ 0.04] = 0.3 $ $ = 1.6 $ $ = 0.7$	3 3 3 7 3 3 6 6			(27) (27) (27) (27) (29) (29) (29)
Windows Type 5         Windows Type 6         Windows Type 7         Walls Type1       12.36         Walls Type2       5.87         Walls Type3       5.84         Walls Type4       2.81	1.46 0.99 0.32 7.92 5.87 5.84 2.81	x1/[1/(1.2)+ x1/[1/(1.2)+ x1/[1/(1.2)+ x1/[1/(1.2)+ x 0.13 x 0.13 x 0.13 x 0.13	$ \begin{array}{cccc} 0.04] &=& & & & & & \\ 0.04] &=& & & & & \\ 0.04] &=& & & & & \\ 0.04] &=& & & & \\ 0.04] &=& & & & \\ &=& & & & \\ &=& & & & \\ &=& & & & \\ &=& & & & \\ &=& & & & \\ &=& & & & \\ &=& & & \\ &=& & & & \\ &=& & & \\ &=& & & \\ &=& & & \\ &=& & & \\ &=& & & \\ &=& & & \\ &=& & & \\ &=& & & \\ &=& & & \\ &=& & & \\ &=& & & \\ &=& & & \\ &=& & & \\ &=& & & \\ &=& & & \\ &=& & & \\ &=& & & \\ &=& & & \\ &=& & & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& & \\ &=& &$	3 3 3 7 3 3 6 6 6 6 7			(27) (27) (27) (27) (29) (29) (29) (29)

Walls Type8	19.4	7	1.95		17.52	<u>x</u>	0.13	=	2.28				(29)
Roof	49.6	8	0		49.68	x	0.1		4.97				(30)
Total area of el	lements	, m²			123.0	7							(31)
* for windows and ** include the area		•				ated using	formula 1	/[(1/U-valu	ie)+0.04] a	as given in	paragraph	1 3.2	
Fabric heat los	s, W/K =	= S (A x	U)				(26)(30)	) + (32) =				26.67	(33)
Heat capacity (	Cm = S(	Axk)						((28)	.(30) + (32	2) + (32a).	(32e) =	447.12	(34)
Thermal mass	parame	ter (TMF	c = Cm ÷	- TFA) ir	n kJ/m²K			Indica	tive Value	: Low		100	(35)
For design assess can be used instea				construct	ion are no	t known pr	ecisely the	e indicative	values of	TMP in Ta	able 1f		
Thermal bridge	s : S (L	x Y) cal	culated (	using Ap	pendix l	<						18.46	(36)
if details of therma		are not kn	own (36) =	= 0.05 x (3	1)			(22)	(20)				¬,,,,,,
Total fabric hea		aloulotos	l manthl	,					(36) =	25\m v (5)		45.13	(37)
Ventilation hea	Feb	Mar		May	Jun	Jul	Διια	Sep	Oct	25)m x (5) Nov	Dec	]	
(38)m= 14.67	14.51	14.36	Apr 13.56	13.41	12.61	12.61	Aug 12.46	12.93	13.41	13.72	14.04		(38)
Heat transfer c			10.00	10.11	12.01	12.01	12.10		= (37) + (37)	l .	1 1.0 1	l	(55)
(39)m= 59.8	59.64	59.48	58.69	58.53	57.74	57.74	57.58	58.06	58.53	58.85	59.17	]	
Heat loss para	meter (F	LP), W	/m²K						Average = = (39)m ÷	Sum(39) <sub>1.</sub>	12 /12=	58.65	(39)
(40)m= 1.2	1.2	1.2	1.18	1.18	1.16	1.16	1.16	1.17	1.18	1.18	1.19		
					7				Average =	Sum(40) <sub>1.</sub>	12 /12=	1.18	(40)
Number of day		<u> </u>	· ·						0.1			1	
Jan   31	Feb 28	Mar 31	Apr 30	May 31	Jun 30	Jul 31	Aug 31	Sep 30	Oct 31	Nov 30	Dec 31		(41)
(41)m= 31	20	31	30	31	30	31	31	30	31	30	31		(41)
4 20/ 4 1 4											1.30/1./		
4. Water heat	ing ener	gy requ	irement:								kWh/ye	ear:	
Assumed occu if TFA > 13.9			[1 - exp	(-0.0003	349 x (TF	FA -13.9	)2)] + 0.0	0013 x ( <sup>-</sup>	ΓFA -13.		68		(42)
if TFA £ 13.9	•						(O.E. N.I.)	00				1	
Annual average Reduce the annual									se target o		.12		(43)
not more that 125	litres per µ	person pei	r day (all w	ater use, l	hot and co	ld)							
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Hot water usage in	litres per	day for ea	ach month	Vd,m = fa	ctor from T	Table 1c x	(43)						
(44)m= 81.53	78.56	75.6	72.63	69.67	66.7	66.7	69.67	72.63	75.6	78.56	81.53		_
Energy content of	hot water	used - cal	culated mo	onthly = $4$ .	190 x Vd,r	m x nm x [	OTm / 3600			m(44) <sub>112</sub> = ables 1b, 1		889.39	(44)
(45)m= 120.9	105.74	109.12	95.13	91.28	78.77	72.99	83.76	84.76	98.78	107.82	117.09		
If instantaneous w	ater heatii	ng at point	of use (no	hot water	storage),	enter 0 in	boxes (46		Total = Su	m(45) <sub>112</sub> =	=	1166.14	(45)
(46)m= 18.14	15.86	16.37	14.27	13.69	11.82	10.95	12.56	12.71	14.82	16.17	17.56	]	(46)
Water storage			<u> </u>									J	. ,
Storage volume	e (litres)	includir	ng any so	olar or W	/WHRS	storage	within sa	ame ves	sel		0		(47)
If community h	•			•			` '	oral onto	on (O) ! /	47)			

Otherwise if no stored hot water (this includes instantaneous combi boilers) enter '0' in (47)

Water storage loss:			1
a) If manufacturer's declared loss factor is known (kWh/day):		0	(48)
Temperature factor from Table 2b	(40) v (40)	0	(49)
Energy lost from water storage, kWh/year b) If manufacturer's declared cylinder loss factor is not known	$(48) \times (49) =$	110	(50)
Hot water storage loss factor from Table 2 (kWh/litre/day)		0.02	(51)
If community heating see section 4.3			
Volume factor from Table 2a Temperature factor from Table 2b		1.03	(52)
·	(47) v (54) v (52) v (52)	0.6	(53)
Energy lost from water storage, kWh/year Enter (50) or (54) in (55)	(47) x (51) x (52) x (53) =	1.03	(54) (55)
Water storage loss calculated for each month	$((56)m = (55) \times (41)m$	1.00	[ (33)
(56)m= 32.01 28.92 32.01 30.98 32.01 30.98 32.01	32.01 30.98 32.01	30.98 32.01	(56)
If cylinder contains dedicated solar storage, (57)m = (56)m x [(50) – (H11)] ÷ (			` ′
(57)m= 32.01 28.92 32.01 30.98 32.01 30.98 32.01	32.01 30.98 32.01	30.98 32.01	(57)
		0	(58)
Primary circuit loss (annual) from Table 3 Primary circuit loss calculated for each month (59)m = (58) ÷ 3	65 × (41)m		[ (33)
(modified by factor from Table H5 if there is solar water hear	` '	stat)	
(59)m= 23.26 21.01 23.26 22.51 23.26 22.51 23.26	23.26 22.51 23.26	22.51 23.26	(59)
Combi loss calculated for each month (61)m = (60) $\div$ 365 × (4	I)m		
(61)m =	0 0 0	0 0	(61)
Total heat required for water heating calculated for each mont	$1(62)m = 0.85 \times (45)m +$	(46)m + (57)m +	(59)m + (61)m
(62)m= 176.18 155.67 164.39 148.62 146.56 132.26 128.27	139.03 138.25 154.05	161.32 172.37	(62)
Solar DHW input calculated using Appendix G or Appendix H (negative quant	ty) (enter '0' if no solar contribut	on to water heating)	
(add additional lines if FGHRS and/or WWHRS applies, see A	opendix G)		
			1
(63)m= 0 0 0 0 0 0	0 0 0	0 0	(63)
(63)m= 0 0 0 0 0 0 0  Output from water heater	0 0 0	0 0	(63)
	0     0       139.03     138.25       154.05	0 0 161.32 172.37	(63)
Output from water heater		161.32 172.37	(63)
Output from water heater (64)m= 176.18 155.67 164.39 148.62 146.56 132.26 128.27  Heat gains from water heating, kWh/month 0.25 ´ [0.85 × (45)]	139.03 138.25 154.05  Output from water heate	161.32 172.37 r (annual) <sub>112</sub>	1816.98 (64)
Output from water heater (64)m= 176.18 155.67 164.39 148.62 146.56 132.26 128.27	139.03 138.25 154.05  Output from water heate	161.32 172.37 r (annual) <sub>112</sub>	1816.98 (64)
Output from water heater (64)m= 176.18 155.67 164.39 148.62 146.56 132.26 128.27  Heat gains from water heating, kWh/month 0.25 ´ [0.85 × (45)]	139.03 138.25 154.05  Output from water heate n + (61)m] + 0.8 x [(46)m  72.07 70.98 77.06	161.32 172.37 r (annual) <sub>112</sub> + (57)m + (59)m 78.65 83.15	1816.98 (64)
Output from water heater (64)m= 176.18 155.67 164.39 148.62 146.56 132.26 128.27  Heat gains from water heating, kWh/month 0.25 ′ [0.85 × (45)) (65)m= 84.42 75.1 80.5 74.43 74.57 68.99 68.49	139.03 138.25 154.05  Output from water heate n + (61)m] + 0.8 x [(46)m  72.07 70.98 77.06	161.32 172.37 r (annual) <sub>112</sub> + (57)m + (59)m 78.65 83.15	1816.98 (64)
Output from water heater (64)m= 176.18 155.67 164.39 148.62 146.56 132.26 128.27  Heat gains from water heating, kWh/month 0.25 ´ [0.85 × (45)th (65)m= 84.42 75.1 80.5 74.43 74.57 68.99 68.49 include (57)m in calculation of (65)m only if cylinder is in the	139.03 138.25 154.05  Output from water heate n + (61)m] + 0.8 x [(46)m  72.07 70.98 77.06	161.32 172.37 r (annual) <sub>112</sub> + (57)m + (59)m 78.65 83.15	1816.98 (64)
Output from water heater  (64)m= 176.18 155.67 164.39 148.62 146.56 132.26 128.27  Heat gains from water heating, kWh/month 0.25 ´ [0.85 × (45)t (65)m= 84.42 75.1 80.5 74.43 74.57 68.99 68.49 include (57)m in calculation of (65)m only if cylinder is in the 5. Internal gains (see Table 5 and 5a):  Metabolic gains (Table 5), Watts  Jan Feb Mar Apr May Jun Jul	139.03 138.25 154.05  Output from water heate n + (61)m] + 0.8 x [(46)m 72.07 70.98 77.06  dwelling or hot water is fr	161.32 172.37 r (annual) <sub>112</sub> + (57)m + (59)m 78.65 83.15 om community h	1816.98 (64) [1] [65] [65] [65]
Output from water heater  (64)m= 176.18 155.67 164.39 148.62 146.56 132.26 128.27  Heat gains from water heating, kWh/month 0.25 ′ [0.85 × (45)) (65)m= 84.42 75.1 80.5 74.43 74.57 68.99 68.49  include (57)m in calculation of (65)m only if cylinder is in the 5. Internal gains (see Table 5 and 5a):  Metabolic gains (Table 5), Watts	139.03 138.25 154.05  Output from water heate n + (61)m] + 0.8 x [(46)m 72.07 70.98 77.06  dwelling or hot water is fr	161.32 172.37 r (annual) <sub>112</sub> + (57)m + (59)m 78.65 83.15 rom community h	1816.98 (64)
Output from water heater  (64)m= 176.18 155.67 164.39 148.62 146.56 132.26 128.27  Heat gains from water heating, kWh/month 0.25 ´ [0.85 × (45)t (65)m= 84.42 75.1 80.5 74.43 74.57 68.99 68.49  include (57)m in calculation of (65)m only if cylinder is in the final state of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the f	139.03 138.25 154.05  Output from water heate n + (61)m] + 0.8 x [(46)m 72.07 70.98 77.06  dwelling or hot water is fr  Aug Sep Oct 84.03 84.03 84.03  also see Table 5	161.32 172.37 r (annual) <sub>112</sub> + (57)m + (59)m 78.65 83.15 om community h  Nov Dec 84.03 84.03	1816.98 (64)  [1] [65] [66]
Output from water heater  (64)m= 176.18 155.67 164.39 148.62 146.56 132.26 128.27  Heat gains from water heating, kWh/month 0.25 ′ [0.85 × (45)) (65)m= 84.42 75.1 80.5 74.43 74.57 68.99 68.49  include (57)m in calculation of (65)m only if cylinder is in the final data of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the first state of the fir	139.03 138.25 154.05  Output from water heate n + (61)m] + 0.8 x [(46)m 72.07 70.98 77.06  dwelling or hot water is from the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second sec	161.32 172.37 r (annual) <sub>112</sub> + (57)m + (59)m 78.65 83.15 om community h	1816.98 (64) [1] [65] [65] [65]
Output from water heater  (64)m= 176.18 155.67 164.39 148.62 146.56 132.26 128.27  Heat gains from water heating, kWh/month 0.25 ′ [0.85 × (45)) (65)m= 84.42 75.1 80.5 74.43 74.57 68.99 68.49  include (57)m in calculation of (65)m only if cylinder is in the final pains (see Table 5 and 5a):  Metabolic gains (Table 5), Watts  Jan Feb Mar Apr May Jun Jul (66)m= 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.03 84.0	139.03 138.25 154.05  Output from water heate n + (61)m] + 0.8 x [(46)m 72.07 70.98 77.06  dwelling or hot water is from the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second sec	161.32 172.37 r (annual) <sub>112</sub> + (57)m + (59)m 78.65 83.15 rom community h  Nov Dec 84.03 84.03	1816.98 (64)  [
Output from water heater  (64)m= 176.18 155.67 164.39 148.62 146.56 132.26 128.27  Heat gains from water heating, kWh/month 0.25 ´ [0.85 × (45)t (65)m= 84.42 75.1 80.5 74.43 74.57 68.99 68.49  include (57)m in calculation of (65)m only if cylinder is in the include (57)m in calculation of (65)m only if cylinder is in the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s	139.03 138.25 154.05  Output from water heate n + (61)m] + 0.8 x [(46)m 72.07 70.98 77.06  dwelling or hot water is fr  Aug Sep Oct 84.03 84.03 84.03  also see Table 5 6.68 8.97 11.39 13a), also see Table 5 108.01 111.84 119.99	161.32 172.37 r (annual) <sub>112</sub> + (57)m + (59)m 78.65 83.15 om community h  Nov Dec 84.03 84.03	1816.98 (64)  [1] [65] [66]
Output from water heater  (64)m= 176.18 155.67 164.39 148.62 146.56 132.26 128.27  Heat gains from water heating, kWh/month 0.25 ′ [0.85 × (45)) (65)m= 84.42 75.1 80.5 74.43 74.57 68.99 68.49  include (57)m in calculation of (65)m only if cylinder is in the final state of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the f	139.03	161.32 172.37 r (annual) <sub>112</sub> + (57)m + (59)m 78.65 83.15 om community h  Nov Dec 84.03 84.03  13.29 14.17	1816.98 (64)  [] (65)  neating  (66)  (67)
Output from water heater  (64)m= 176.18 155.67 164.39 148.62 146.56 132.26 128.27  Heat gains from water heating, kWh/month 0.25 ′ [0.85 × (45))  (65)m= 84.42 75.1 80.5 74.43 74.57 68.99 68.49  include (57)m in calculation of (65)m only if cylinder is in the final original include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include include incl	139.03 138.25 154.05  Output from water heate n + (61)m] + 0.8 x [(46)m 72.07 70.98 77.06  dwelling or hot water is fr  Aug Sep Oct 84.03 84.03 84.03  also see Table 5 6.68 8.97 11.39 13a), also see Table 5 108.01 111.84 119.99	161.32 172.37 r (annual) <sub>112</sub> + (57)m + (59)m 78.65 83.15 rom community h  Nov Dec 84.03 84.03	1816.98 (64)  [
Output from water heater  (64)m= 176.18 155.67 164.39 148.62 146.56 132.26 128.27  Heat gains from water heating, kWh/month 0.25 ′ [0.85 × (45)) (65)m= 84.42 75.1 80.5 74.43 74.57 68.99 68.49  include (57)m in calculation of (65)m only if cylinder is in the final state of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the first of the f	139.03	161.32 172.37 r (annual) <sub>112</sub> + (57)m + (59)m 78.65 83.15 om community h  Nov Dec 84.03 84.03  13.29 14.17	1816.98 (64)  [] (65)  neating  (66)  (67)

Looper		(anaratia	n (nogot	بامد میان	oo\ /Tol	مام	E\							
(71)m=	-67.23	/aporatio -67.23	n (negai	-67.23	es) (Tai	_	67.23 -67.23	-67	.23 -67.23	-67.23	3 -67.23	-67.23		(71)
, ,		ļ. ļ		-07.23	-07.23	<u> </u>	07.23	-67	.23   -07.23	-07.23	-07.23	-07.23		(71)
(72)m=	113.47	gains (T	108.2	103.37	100.23	Τ.	5.81 92.06	96.	87 98.58	103.5	3 109.23	111.77		(72)
` '		ļ. l		103.37	100.23	s		l	3)m + (69)m + (					(12)
	321.87	gains =		295.06	279.73	T 2/	<u> </u>	r `	<u>, , , , , , , , , , , , , , , , , , , </u>		1			(73)
(73)m=	lar gain	320.13	310.46	295.06	219.13	21	64.77 254.93	259	.77 207.59	283.10	301	314.08		(73)
			using sola	r flux from	Table 6a	and	associated equa	tions	to convert to th	e applic	able orientat	ion.		
		Access F	•	Area			Flux		g_		FF		Gains	
	-	Table 6d		m²			Table 6a		Table 6b		Table 6c		(W)	
North	0.9x	0.77	X	2.0	)1	X	10.63	X	0.4	X	0.7	=	4.15	(74)
North	0.9x	0.77	X	1.4	16	X	10.63	X	0.4	X	0.7	=	3.01	(74)
North	0.9x	0.77	X	1.4	ŀ6	X	10.63	X	0.4	X	0.7	=	3.01	(74)
North	0.9x	0.77	X	2.0	)1	X	20.32	X	0.4	X	0.7	=	7.93	(74)
North	0.9x	0.77	X	1.4	ŀ6	X	20.32	X	0.4	X	0.7	=	5.76	(74)
North	0.9x	0.77	X	1.4	ŀ6	X	20.32	X	0.4	X	0.7	=	5.76	(74)
North	0.9x	0.77	Х	2.0	)1	X	34.53	/ X	0.4	X	0.7	=	13.47	(74)
North	0.9x	0.77	x	1.4	6	X	34.53	х	0.4	X	0.7	_	9.78	(74)
North	0.9x	0.77	x	1.4	16	Х	34.53	x	0.4	X	0.7	=	9.78	(74)
North	0.9x	0.77	x	2.0	)1	x	55.46	x	0.4	x	0.7	=	21.63	(74)
North	0.9x	0.77	x	1.4	6	X	55.46	×	0.4	x	0.7	=	15.71	(74)
North	0.9x	0.77	x	1.4	16	x	55.46	х	0.4	x	0.7	=	15.71	(74)
North	0.9x	0.77	х	2.0	)1	х	74.72	x	0.4	x	0.7	=	29.14	(74)
North	0.9x	0.77	х	1.4	ŀ6	X	74.72	X	0.4	X	0.7	=	21.17	(74)
North	0.9x	0.77	X	1.4	16	X	74.72	X	0.4	X	0.7	=	21.17	(74)
North	0.9x	0.77	X	2.0	)1	x	79.99	x	0.4	X	0.7	=	31.2	(74)
North	0.9x	0.77	X	1.4	16	X	79.99	X	0.4	X	0.7	=	22.66	(74)
North	0.9x	0.77	X	1.4	16	X	79.99	X	0.4	X	0.7	=	22.66	(74)
North	0.9x	0.77	X	2.0	)1	x	74.68	x	0.4	X	0.7	=	29.13	(74)
North	0.9x	0.77	X	1.4	ŀ6	x	74.68	X	0.4	X	0.7	=	21.16	(74)
North	0.9x	0.77	X	1.4	16	X	74.68	X	0.4	X	0.7	=	21.16	(74)
North	0.9x	0.77	X	2.0	)1	x	59.25	x	0.4	X	0.7	=	23.11	(74)
North	0.9x	0.77	X	1.4	16	X	59.25	X	0.4	X	0.7	=	16.78	(74)
North	0.9x	0.77	X	1.4	16	X	59.25	X	0.4	X	0.7	=	16.78	(74)
North	0.9x	0.77	X	2.0	)1	X	41.52	X	0.4	X	0.7	=	16.19	(74)
North	0.9x	0.77	X	1.4	ŀ6	x	41.52	x	0.4	X	0.7	=	11.76	(74)
North	0.9x	0.77	X	1.4	16	x	41.52	x	0.4	x	0.7	=	11.76	(74)
North	0.9x	0.77	X	2.0	)1	x	24.19	x	0.4	X	0.7	=	9.43	(74)
North	0.9x	0.77	X	1.4	ŀ6	x	24.19	x	0.4	X	0.7	=	6.85	(74)
North	0.9x	0.77	Х	1.4	16	X	24.19	x	0.4	X	0.7	=	6.85	(74)

	_		_		_						_		_
North	0.9x	0.77	X	2.01	X	13.12	X	0.4	X	0.7	=	5.12	(74)
North	0.9x	0.77	X	1.46	X	13.12	x	0.4	X	0.7	=	3.72	(74)
North	0.9x	0.77	X	1.46	X	13.12	X	0.4	X	0.7	=	3.72	(74)
North	0.9x	0.77	X	2.01	x	8.86	x	0.4	X	0.7	=	3.46	(74)
North	0.9x	0.77	X	1.46	x	8.86	x	0.4	X	0.7	=	2.51	(74)
North	0.9x	0.77	X	1.46	X	8.86	X	0.4	X	0.7	=	2.51	(74)
East	0.9x	0.77	X	0.99	x	19.64	x	0.4	X	0.7	=	3.77	(76)
East	0.9x	0.77	X	0.99	x	38.42	x	0.4	X	0.7	=	7.38	(76)
East	0.9x	0.77	X	0.99	x	63.27	x	0.4	X	0.7	=	12.15	(76)
East	0.9x	0.77	X	0.99	x	92.28	x	0.4	X	0.7	=	17.73	(76)
East	0.9x	0.77	X	0.99	x	113.09	x	0.4	X	0.7	] =	21.73	(76)
East	0.9x	0.77	X	0.99	x	115.77	x	0.4	X	0.7	] =	22.24	(76)
East	0.9x	0.77	x	0.99	x	110.22	x	0.4	x	0.7	=	21.17	(76)
East	0.9x	0.77	X	0.99	x	94.68	x	0.4	X	0.7	=	18.19	(76)
East	0.9x	0.77	X	0.99	x	73.59	x	0.4	X	0.7	=	14.14	(76)
East	0.9x	0.77	X	0.99	x	45.59	x	0.4	X	0.7	=	8.76	(76)
East	0.9x	0.77	x	0.99	x	24.49	x	0.4	x	0.7	=	4.7	(76)
East	0.9x	0.77	X	0.99	X	16.15	Х	0.4	X	0.7	=	3.1	(76)
South	0.9x	0.77	x	1.1	x	46.75	x	0.4	x	0.7	=	9.98	(78)
South	0.9x	0.77	x	0.19	х	46.75	×	0.4	x	0.7	] =	1.72	(78)
South	0.9x	0.77	X	0.32	X	46.75	X	0.4	x	0.7	] =	2.9	(78)
South	0.9x	0.77	x	1.1	x	76.57	Х	0.4	x	0.7	=	16.34	(78)
South	0.9x	0.77	X	0.19	x	76 <mark>.57</mark>	X	0.4	x	0.7	=	2.82	(78)
South	0.9x	0.77	X	0.32	х	76.57	x	0.4	x	0.7	] =	4.75	(78)
South	0.9x	0.77	X	1.1	x	97.53	x	0.4	X	0.7	=	20.82	(78)
South	0.9x	0.77	X	0.19	X	97.53	X	0.4	X	0.7	=	3.6	(78)
South	0.9x	0.77	X	0.32	x	97.53	x	0.4	X	0.7	=	6.06	(78)
South	0.9x	0.77	X	1.1	x	110.23	x	0.4	X	0.7	=	23.53	(78)
South	0.9x	0.77	X	0.19	x	110.23	X	0.4	X	0.7	=	4.06	(78)
South	0.9x	0.77	X	0.32	x	110.23	x	0.4	X	0.7	=	6.84	(78)
South	0.9x	0.77	X	1.1	x	114.87	x	0.4	X	0.7	=	24.52	(78)
South	0.9x	0.77	X	0.19	x	114.87	x	0.4	X	0.7	=	4.24	(78)
South	0.9x	0.77	X	0.32	x	114.87	x	0.4	X	0.7	=	7.13	(78)
South	0.9x	0.77	X	1.1	X	110.55	x	0.4	X	0.7	=	23.6	(78)
South	0.9x	0.77	X	0.19	X	110.55	x	0.4	X	0.7	=	4.08	(78)
South	0.9x	0.77	X	0.32	x	110.55	x	0.4	X	0.7	=	6.86	(78)
South	0.9x	0.77	x	1.1	x	108.01	x	0.4	x	0.7	] =	23.05	(78)
South	0.9x	0.77	x	0.19	x	108.01	x	0.4	x	0.7	=	3.98	(78)
South	0.9x	0.77	×	0.32	x	108.01	x	0.4	x	0.7	] =	6.71	(78)
South	0.9x	0.77	x	1.1	x	104.89	x	0.4	x	0.7	] =	22.39	(78)
South	0.9x	0.77	X	0.19	X	104.89	x	0.4	X	0.7	=	3.87	(78)

South 0.9x 0.77	X	0.3	2	x 1	04.89	x [	0.4	x	0.7	=	6.51	(78)
South 0.9x 0.77	×	1.1	1	x 1	01.89	x	0.4	x	0.7	=	21.75	(78)
South 0.9x 0.77	×	0.1	9	x 1	01.89	x	0.4	x	0.7	=	3.76	(78)
South 0.9x 0.77	X	0.3	32	x 1	01.89	x [	0.4	x	0.7	=	6.33	(78)
South 0.9x 0.77	×	1.1	1	X	82.59	x	0.4	x	0.7	=	17.63	(78)
South 0.9x 0.77	×	0.1	9	X	82.59	x	0.4	x	0.7	=	3.04	(78)
South 0.9x 0.77	×	0.3	32	X	82.59	x [	0.4	x	0.7	=	5.13	(78)
South 0.9x 0.77	×	1.1	1	X	55.42	x	0.4	x	0.7	=	11.83	(78)
South 0.9x 0.77	×	0.1	9	X	55.42	x [	0.4	x	0.7	=	2.04	(78)
South 0.9x 0.77	X	0.3	32	X	55.42	] x [	0.4	x	0.7	=	3.44	(78)
South 0.9x 0.77	X	1.1	1	x	40.4	] x [	0.4	x	0.7	=	8.62	(78)
South 0.9x 0.77	X	0.1	9	x	40.4	] x [	0.4	x	0.7	=	1.49	(78)
South 0.9x 0.77	X	0.3	32	x	40.4	x	0.4	x	0.7	=	2.51	(78)
Solar gains in watts, c	alculated	for each	n month			(83)m =	= Sum(74)m .	(82)m			i	
(83)m= 28.55 50.74	75.66	105.22	129.09	133.29	126.35	107.6	85.68	57.7	34.57	24.2		(83)
Total gains – internal a	and solar	(84)m =	= (73)m	+ (83)m	, watts					_		
(84)m= 350.42 370.87	386.12	400.28	408.82	398.06	381.29	367.4	4 353.27	340.86	335.57	338.29		(84)
7. Mean internal tem	perature	(heating	season							_		
Temperature during I	neating p	eriods ir	n the li <mark>vi</mark>	ng area	from Tal	ble 9,	Th1 (°C)				21	(85)
Utilisation factor for g	ains for li	iving are	ea, h1,m	see Ta	able 9a)							
Jan Feb	Mar	Apr	May	Jun	Jul	Au	g Sep	Oct	Nov	Dec		
(86)m= 0.95 0.94	0.92	0.89	0.81	0.69	0.57	0.6	0.76	0.89	0.94	0.96		(86)
Mean internal temper	rature in I	living are	ea T1 (fo	ollow ste	eps 3 to	7 in Ta	able 9c)					
(87)m= 18.65 18.84	19.21	19.73	20.25	20.67	20.86	20.8		19.91	19.21	18.62		(87)
Temperature during I	heating n	eriods in	rest of	dwelling	from Ta	ahla 0	Th2 (°C)				l	
(88)m= 20.4 20.4	20.4	20.41	20.41	20.42	20.42	20.4		20.41	20.41	20.4		(88)
· · · L	<u> </u>			<u> </u>		<u> </u>			1			, ,
Utilisation factor for g	<del>'                                    </del>			<del>- ` `</del>	1	т	0.70	0.07	I 0.00	0.05		(90)
(89)m= 0.95 0.94	0.92	0.87	0.79	0.66	0.51	0.54	0.73	0.87	0.93	0.95		(89)
Mean internal temper	rature in t	the rest	of dwell	ing T2 (1	ollow ste	eps 3 t	to 7 in Tab	e 9c)			•	
(90)m= 18.17 18.36	18.73	19.25	19.75	20.15	20.33	20.3	1 20.03	19.43	18.74	18.15		(90)
							t	LA = Livir	ng area ÷ (	4) =	0.48	(91)
Mean internal temper	rature (fo	r the wh	ole dwe	llina) = 1	LA × T1	+ (1 –	- fLA) × T2					
(92)m= 18.41 18.6	18.96	19.48	19.99	20.4	20.59	20.50	<del></del>	19.66	18.97	18.38		(92)
Apply adjustment to t	the mean	internal	temper	ature fro	m Table	4e, w	 /here appro	priate		<u> </u>		
(93)m= 18.41 18.6	18.96	19.48	19.99	20.4	20.59	20.50		19.66	18.97	18.38		(93)
8. Space heating req	uirement											
Set Ti to the mean in		nperatur	e obtair	ned at st	ep 11 of	Table	9b, so tha	t Ti,m=(	76)m an	d re-calc	ulate	
the utilisation factor f	or gains ι	using Ta	ble 9a								ı	
Jan Feb	Mar	Apr	May	Jun	Jul	Au	g Sep	Oct	Nov	Dec		
Utilisation factor for g					1						I	(0.0)
(94)m= 0.93 0.92	0.9	0.85	0.78	0.66	0.53	0.56	0.73	0.86	0.91	0.94		(94)
Useful gains, hmGm	W = (94)	1)m x (84	4)m									
(95)m= 327.36 341.91	347.12	342.1	318.32	261.55	200.69	204.	7 256.59	291.63	306.82	317.64		(95)

Mont	hly aver:	ane exte	rnal tem	nerature	e from Ta	ahle 8								
(96)m=	4.3	4.9	6.5	8.9	11.7	14.6	16.6	16.4	14.1	10.6	7.1	4.2		(96)
Heat	loss rate	e for me	an intern	al tempe	erature,	Lm , W =	=[(39)m :	x [(93)m	– (96)m	]	!			
(97)m=	843.55	816.81	741.31	621.24	485.29	335.02	230.11	239.71	358.52	530.31	698.29	838.89		(97)
•		<del></del>	i	i	i			24 x [(97)	` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` `	<del>í - `</del>	r –			
(98)m=	384.05	319.13	293.27	200.98	124.23	0	0	0 Tata	0	177.57	281.86	387.81	2168.91	7(08)
Total per year (kWh/year) = Sum(98) <sub>15912</sub> = Space heating requirement in kWh/m²/year												43.66	(98)	
·		•				retome i	neludina	micro-C	,ND/			L	40.00	
	e heatir		ils – Illul	iviuuai ii	ealing s	ysterns i	riciualing	i illicio-c	<i>/</i>					
-		_	at from s	econdar	y/supple	mentary	system						0	(201)
Fract	ion of sp	ace hea	at from m	nain syst	tem(s)			(202) = 1 -	- (201) <b>=</b>				1	(202)
Fract	ion of to	tal heati	ng from	main sys	stem 1			(204) = (20	02) <b>x</b> [1 –	(203)] =			1	(204)
Effici	ency of r	main spa	ace heat	ing syste	em 1							[	100	(206)
Effici	ency of s	seconda	ry/suppl	ementar	y heating	g systen	า, %						0	(208)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	kWh/y	ear
Spac			· `		d above		l . /							
	384.05	319.13	293.27	200.98	124.23	0	0	0	0	177.57	281.86	387.81		
(211)r	n = {[(98 384.05	)m x (20 319.13	4)] } x 1	00 ÷ (20 200.98	124.23	0	0	0	0	177.57	281.86	387.81		(211)
	304.03	319.13	293.21	200.90	124.25	U				ar) =Sum(2			2168.91	(211)
Spac	e heatin	a fuel (s	econdar	y), kWh/	month							L		``
		•	00 ÷ (20	• •										
(215)m=	0	0	0	0	0	0	0	0	0	0	0	0		
								Tota	I (kWh/yea	ar) =Sum(2	215) <sub>15,1012</sub>	-	0	(215)
	heating	-	narata c	ommunit	ty syster	٥.								
			requirer		ty Syster								1816.98	(64)
Fract	ion of he	eat from	commur	nity CHP	•								1	(303a)
Facto	or for cha	arging m	ethod fo	r comm	unity wat	er heati	ng					Ī	1	(305)
Distribution loss factor (Table 12c) for community heating system												1.05	(306)	
Water heat from CHP (64) x (303a) x (305) x (306) =											1907.83	(310a)		
Electricity used for heat distribution $0.01 \times [(307a)(307e) + (310a)(310e)] =$											19.08	(313)		
Annual totals kWh/year											kWh/yea	ır		
Space	heating	fuel use	ed, main	system	1								2168.91	
Electri	city for p	oumps, f	ans and	electric	keep-ho	t								
mech	nanical v	entilatio	n - balan	iced, ext	ract or p	ositive i	nput fron	n outside	e			215		(230a)
								cum	of (220a)	(220~)		1		(004)
Total 6	electricity	y for the	above, k	kWh/yea	ır			Suili	UI (230a).	(230g) =			215	(231)
	city for li	•	above, ł	kWh/yea	ır			Sum	OI (230a).	(230g) =		[ [	215	(231)

Electricity generated by PVs -1381.65 (233)Total delivered energy for all uses (211)...(221) + (231) + (232)...(237b) = 1245.66 (338)12a. CO2 emissions - Individual heating systems including micro-CHP **Energy Emission factor Emissions** kg CO2/kWh kWh/year kg CO2/year (211) x Space heating (main system 1) (261)0.519 1125.66 Space heating (secondary) (215) x 0.519 (263)0 Water heating from community system **Emission factor Emissions Energy** kWh/year kg CO2/kWh kg CO2/year CO2 from other sources of space and water heating (not CHP) Efficiency of heat source 1 (%) If there is CHP using two fuels repeat (363) to (366) for the second fuel (367a) 329 CO2 associated with heat source 1  $[(307b)+(310b)] \times 100 \div (367b) \times$ 0.52 300.96 (367)Electrical energy for heat distribution [(313) x]0.52 9.9 (372)Total CO2 associated with community systems (363)...(366) + (368)...(372)(373)310.86 (231) x Electricity for pumps, fans and electric keep-hot 0.519 111.59 (267)(232) x Electricity for lighting 0.519 126.33 (268)Energy saving/generation technologies Item 1 (269)0.519 -717.08 sum of (265)...(271) = Total CO2, kg/year (272)957.36 **Dwelling CO2 Emission Rate**  $(272) \div (4) =$ 19.27 (273)

El rating (section 14)

(274)

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