			User D	Notaile:						
Assessor Name: Software Name:	Natalie Wheeler Stroma FSAP 201			Strom Softwa	are Vei	sion:		Versio	0027778 on: 1.0.4.6	
Address :	Flat 3, Hampshire s		roperty	Address	: Be Clea	an-Flat (3-1st floo	or		
1. Overall dwelling dim	·	, i cot								
			Are	a(m²)		Av. He	ight(m)		Volume(m	3)
Ground floor					(1a) x		2.4	(2a) =	93.77	(3a)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e	e)+(1n	1) 3	39.07	(4)			_		
Dwelling volume					(3a)+(3b))+(3c)+(3c	d)+(3e)+	.(3n) =	93.77	(5)
2. Ventilation rate:										
		econdar neating	у	other	_	total			m³ per hou	ır
Number of chimneys	0 +	0	+	0	=	0	X	40 =	0	(6a)
Number of open flues	0 +	0] + [0] = [0	X :	20 =	0	(6b)
Number of intermittent fa	ans					2	X	10 =	20	(7a)
Number of passive vents	S				Ī	0	x -	10 =	0	(7b)
Number of flueless gas	fires				Ē	0	x -	40 =	0	(7c)
					_			Air cr	nanges per ho	our —
Infiltration due to chimne	-					20		÷ (5) =	0.21	(8)
Number of storeys in	been carried out or is intend the dwelling (ns)	ea, proceed	i to (17), i	otnerwise (continue in	om (9) to	(16)		0	(9)
Additional infiltration	the awelling (113)						[(9)]	-1]x0.1 =	0	(10)
	0.25 for steel or timber	frame or	0.35 fo	r masoni	v constr	uction	[(0)	.,,	0	(11)
	present, use the value corres				•				<u> </u>	()
deducting areas of open	• , .	I = 1\ 0	4 (1)	1\	0					_
•	floor, enter 0.2 (unsea	iea) or 0.	1 (seale	ea), eise	enter U				0	(12)
If no draught lobby, er	vs and doors draught s	tripped							0	(13)
Window infiltration	vs and doors draught s	пррец		0.25 - [0.2	x (14) ÷ 1	001 =			0	(14)
Infiltration rate				(8) + (10)			+ (15) =		0	(15)
	, q50, expressed in cub	oic metre	s per ho	. , , ,	, , ,	, , ,	, ,	area	5	(17)
If based on air permeab	• • •		•	•	•	0110 01 0	лиоюро	arou	0.46	(18)
·	ies if a pressurisation test ha					is being u	sed		0.10	(```
Number of sides shelter	ed								2	(19)
Shelter factor				(20) = 1 -	[0.075 x (1	9)] =			0.85	(20)
Infiltration rate incorpora	ating shelter factor			(21) = (18) x (20) =				0.39	(21)
Infiltration rate modified	for monthly wind speed	d .		,				,	•	
Jan Feb	Mar Apr May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Monthly average wind s	peed from Table 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 = (2	22)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]	
,,		1 3.00	3.00		<u> </u>				J	

0.5	0.49	0.48	0.43	0.42	0.37	0.37	0.36	(22a)m _{0.39}	0.42	0.44	0.46]	
Calculate effe					1	1	0.00	0.00	0.12	0.11	0.10		
If mechanica	al ventila	ition:										0	(23
If exhaust air h	eat pump (using Appe	endix N, (2	3b) = (23a	a) × Fmv (e	equation (N	N5)) , othe	rwise (23b) = (23a)			0	(23
If balanced with	h heat reco	overy: effic	iency in %	allowing f	or in-use f	actor (from	Table 4h) =				0	(23
a) If balance	ed mecha	anical ve	ntilation	with hea	at recove	ery (MVI	HR) (24a	m = (22)	2b)m + (23b) × [1 – (23c)	÷ 100]	
(24a)m= 0	0	0	0	0	0	0	0	0	0	0	0		(24
b) If balance	ed mecha	anical ve	ntilation	without	heat rec	covery (N	ЛV) (24b)m = (22	2b)m + (23b)	r	1	
(24b)m= 0	0	0	0	0	0	0	0	0	0	0	0		(24
c) If whole h if (22b)r	nouse ex n < 0.5 ×			-	-				5 × (23b	o)			
24c)m= 0	0	0	0	0	0	0	0	0	0	0	0		(24
d) If natural	ventilation			•	•				0.51	•	•		
24d)m= 0.63	0.62	0.62	0.59	0.59	0.57	0.57	0.57	0.58	0.59	0.6	0.61		(24
Effective air	change	rate - er	ıter (24a	or (24b	o) or (24	c) or (24	d) in box	(25)	<u> </u>	<u> </u>	ļ.	l	
25)m= 0.63	0.62	0.62	0.59	0.59	0.57	0.57	0.57	0.58	0.59	0.6	0.61		(2
3. Heat losse ELEMENT	es and he Gros	·	oaramete Openin		Net Ar	ea	U-valı	ıe	AXU		k-value	e	ΑXk
	area	(m^2)	m		A ,r		W/m2		(W/I	K)	kJ/m²-l		kJ/K
Doors					1.87	Х	1	=	1.87				(26
Vindows Type	e 1				6.12	x1,	/[1/(1.4)+	0.04] =	8.11				(27
Nindows Type	e 2				2.3	x1,	/[1/(1.4)+	0.04] =	3.05				(27
Floor													`
					39.07	7 X	0.065	=	2.5395	<u> </u>			(28
Nalls	35.4	12	10.29	9	39.07 25.13	=	0.065 0.18	= [= [2.53955 4.52	<u>5</u> [(28
			10.29	9		x		=		5 [(28
Nalls Fotal area of ∈ Party wall			10.29	9	25.13	3 x		=		5 [] [(28
Fotal area of e Party wall			10.29)	25.13 74.49	3 x	0.18] = [4.52	5 [] [(28)
Fotal area of e Party wall Party ceiling	elements	, m² ows, use e	ffective wil	ndow U-va	25.13 74.49 39.62 39.07	3 x 9 x	0.18	= [4.52] [] []	paragraph	3.2	(28)
Fotal area of e Party wall Party ceiling for windows and it include the area	elements I roof winder	, m² ows, use e sides of in	ffective wi	ndow U-va	25.13 74.49 39.62 39.07	X 2 X dated using	0.18 0	= [= [/[(1/U-valu	4.52] [] []	paragraph		(28) (32) (32) (32)
Fotal area of e Party wall Party ceiling for windows and include the area Fabric heat los	elements I roof winder as on both ss, W/K =	ows, use e sides of in = S (A x	ffective wi	ndow U-va	25.13 74.49 39.62 39.07	X 2 X dated using	0.18	= [= [/[(1/U-valu + (32) =	4.52 0 re)+0.04] a	as given in		20.1	(28) (29) (31) (32) (32) (33)
Fotal area of earty wall Party ceiling for windows and include the area Fabric heat lost	elements I roof winder as on both as, W/K = Cm = S(ows, use e sides of in = S (A x (A x k)	ffective wi eternal wall	ndow U-va	25.13 74.49 39.62 39.07 alue calculatitions	3 × 3 × 2 × 7 ated using	0.18 0	= [= [/[(1/U-value) + (32) = ((28)	4.52 0 re)+0.04] a	as given in		20.1	(28)
Fotal area of earty wall Party ceiling for windows and include the area Fabric heat los Heat capacity Thermal mass	elements I roof winde as on both ss, W/K = Cm = S(ows, use e sides of in = S (A x (A x k)	ffective winternal wall U) P = Cm ÷	ndow U-va s and part	25.13 74.49 39.62 39.07 alue calculatitions	X 2 X dated using	0.18 0 1 formula 1. (26)(30)	= [= [/[(1/U-valu + (32) = ((28) Indica	4.52 0 re)+0.04] a .(30) + (32 tive Value	as given in 2) + (32a). : Medium	(32e) =	20.1	(3)
Fotal area of earty wall Party ceiling for windows and include the area Fabric heat los Heat capacity Thermal mass For design assess	elements I roof winder as on both ss, W/K = Cm = S(s parame	ows, use e sides of in = S (A x (A x k) ster (TMF	ffective winternal wall U) $P = Cm \div tails of the$	ndow U-va s and part	25.13 74.49 39.62 39.07 alue calculatitions	X 2 X dated using	0.18 0 1 formula 1. (26)(30)	= [= [/[(1/U-valu + (32) = ((28) Indica	4.52 0 re)+0.04] a .(30) + (32 tive Value	as given in 2) + (32a). : Medium	(32e) =	20.1	(3)
Party wall Party ceiling For windows and include the area Fabric heat los Heat capacity Thermal mass For design assess an be used inste	elements I roof winder as on both as, W/K = Cm = S(as parame asments where and of a december.	ows, use e sides of in = S (A x (A x k) eter (TMF ere the de tailed calcu	ffective winternal wall U) P = Cm ÷ tails of the ulation.	ndow U-ve ls and part - TFA) ir constructi	25.13 74.49 39.62 39.07 alue calculatitions n kJ/m²K ion are not	X 2 X dated using	0.18 0 1 formula 1. (26)(30)	= [= [/[(1/U-valu + (32) = ((28) Indica	4.52 0 re)+0.04] a .(30) + (32 tive Value	as given in 2) + (32a). : Medium	(32e) =	20.1	(3)
Party wall Party ceiling for windows and include the area Fabric heat los Heat capacity Thermal mass For design assess an be used inste	elements I roof winder as on both as, W/K = Cm = S(as parame asments where and of a decrease is S (L al bridging	ows, use e sides of in = S (A x (A x k) ter (TMF ere the de tailed calcu x Y) calc	ffective winternal wall U) P = Cm ÷ tails of the ulation. culated t	ndow U-va ls and part - TFA) ir constructi using Ap	25.13 74.49 39.62 39.07 alue calculatitions n kJ/m²K ion are not	X 2 X dated using	0.18 0 1 formula 1. (26)(30)	= [4.52 0 ne)+0.04] a .(30) + (32 tive Value e values of	as given in 2) + (32a). : Medium	(32e) =	20.1	(24) (3) (3) (3) (3) (3) (3) (3) (3)
Fotal area of earty wall Party ceiling For windows and include the area Fabric heat los Heat capacity Thermal mass For design assess an be used inste Thermal bridge f details of therma Total fabric he	elements If roof winder as on both ass, W/K = Cm = S(as parame assents where and of a december is S (L al bridging at loss	ows, use e sides of in = S (A x (A x k) ter (TMF ere the de tailed calcu x Y) calcu are not kn	ffective winternal wall U) P = Cm ÷ tails of the ulation. culated to	ndow U-vals and part - TFA) ir constructi using Ap	25.13 74.49 39.62 39.07 alue calculatitions n kJ/m²K ion are not	X 2 X dated using	0.18 0 1 formula 1. (26)(30)	= [= [/[(1/U-valu + (32) = ((28) Indica indicative	4.52 0 (30) + (32) tive Value e values of	as given in 2) + (32a). : Medium	(32e) =	20.1	(24) (3) (3) (3) (3) (3) (3) (3) (3)
Party wall Party ceiling For windows and initial include the area Fabric heat los Heat capacity Thermal mass For design assess can be used inste Thermal bridge If details of therma Total fabric head Jentilation head	elements I roof winder as on both ss, W/K = Cm = S(s parame sments wheread of a decrease : S (L al bridging eat loss at loss ca	ows, use e sides of in = S (A x (A x k) eter (TMF ere the de tailed calcu x Y) calcu are not kn	ffective winternal wall U) P = Cm ÷ tails of the ulation. culated to own (36) =	ndow U-vels and part - TFA) ir constructi using Ap	25.13 74.49 39.62 39.07 alue calculatitions n kJ/m²K ion are not opendix k	x 2 x dated using	0.18 0 formula 1 (26)(30)	= [4.52 0 (30) + (32) tive Value e values of (36) = = 0.33 × (2) + (32a).: Medium	(32e) =	20.1 0 250	(36)
Fotal area of exparty wall Party ceiling For windows and Finclude the area Fabric heat loss Heat capacity Thermal mass For design assess F	elements I roof winder as on both as, W/K = Cm = S(as parame asments where and of a decension	ows, use e sides of in = S (A x (A x k) ter (TMF ere the de tailed calcu x Y) calcu are not kn	ffective winternal wall U) P = Cm ÷ tails of the ulation. culated u own (36) = I monthly	ndow U-vals and part - TFA) ir constructi using Ap = 0.15 x (3	25.13 74.49 39.62 39.07 alue calculatitions h kJ/m²K ion are not pendix h	x 2 x detect using	0.18 0 formula 1. (26)(30) ecisely the	= [4.52 0 (30) + (32) tive Value e values of (36) = = 0.33 × (as given in 2) + (32a). : Medium TMP in T	(32e) = Sable 1f	20.1 0 250	(26 (3) (3) (3) (3) (3) (3) (3)
Fotal area of exparty wall Party ceiling For windows and Fabric heat loss Heat capacity Thermal mass For design assess can be used inste Thermal bridge f details of therma Fotal fabric heav Ventilation heav Jan 38)m= 19.37	elements I roof winder as on both ss, W/K = Cm = S(s parame sments where ad of a decent	ows, use e sides of in = S (A x (A x k) ster (TMF ere the de tailed calcu x Y) calcu are not kn alculated Mar 19.07	ffective winternal wall U) P = Cm ÷ tails of the ulation. culated to own (36) =	ndow U-vels and part - TFA) ir constructi using Ap	25.13 74.49 39.62 39.07 alue calculatitions n kJ/m²K ion are not opendix k	x 2 x dated using	0.18 0 formula 1 (26)(30)	= [4.52 0 (30) + (32) tive Value e values of (36) = = 0.33 × (2) + (32a).: Medium	(32e) =	20.1 0 250	(28 (29 (31 (32 (32
Fotal area of exparty wall Party ceiling For windows and Finclude the area Fabric heat lose Heat capacity Thermal mass For design assess Fan be used insteant Fotal fabric head Jan	elements I roof winder as on both ss, W/K = Cm = S(s parame sments where ad of a decent	ows, use e sides of in = S (A x (A x k) ster (TMF ere the de tailed calcu x Y) calcu are not kn alculated Mar 19.07	ffective winternal wall U) P = Cm ÷ tails of the ulation. culated u own (36) = I monthly	ndow U-vals and part - TFA) ir constructi using Ap = 0.15 x (3	25.13 74.49 39.62 39.07 alue calculatitions h kJ/m²K ion are not pendix h	x 2 x detect using	0.18 0 formula 1. (26)(30) ecisely the	= [= [/[(1/U-valu + (32) = ((28) Indica indicative (33) + (38)m Sep 17.87	4.52 0 (30) + (32) tive Value e values of (36) = = 0.33 × (25)m x (5 Nov 18.51	(32e) = Sable 1f	20.1 0 250	(26 (3) (3) (3) (3) (3) (3) (3)

Heat loss para	ameter (I	HLP), W	′m²K					(40)m	= (39)m ÷	- (4)			
(40)m= 1.36	1.36	1.35	1.33	1.33	1.32	1.32	1.31	1.32	1.33	1.34	1.35		
				l .		l .	l .		Average =	Sum(40) ₁ .	12 /12=	1.33	(40)
Number of day	<u> </u>	nth (Tab	le 1a)					ı		i			
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 hea	ting ene	rgy requi	rement:								kWh/ye	ar:	
Assumed occu if TFA > 13.9 if TFA £ 13.9	9, N = 1		[1 - exp	(-0.0003	349 x (TF	FA -13.9)2)] + 0.0	0013 x (¯	TFA -13		38		(42)
Annual average Reduce the annual not more that 125	ge hot wa al average	hot water	usage by	5% if the a	lwelling is	designed t			se target o		7.02		(43)
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Hot water usage i								·'	!				
(44)m= 73.72	71.04	68.36	65.68	63	60.32	60.32	63	65.68	68.36	71.04	73.72		
									Total = Su	m(44) ₁₁₂ =		804.23	(44)
Energy content of	f hot water	used - cal	culated me	onthly = 4.	190 x Vd,r	n x nm x C	OTm / 3600) kWh/mor	nth (see Ta	ables 1b, 1	c, 1d)		
(45)m= 109.33	95.62	98.67	86.02	82.54	71.23	66	75.74	76.64	89.32	97.5	105.88		
If instantaneous w	votor boot	ina at naint	of upo /pr	hat water	, ataragal	antar O in	haves (46		Total = Su	m(45) ₁₁₂ =	- [1054.47	(45)
If instantaneous w		· ·	,	ı	,.	ı	, ,	, , , I		1			(40)
(46)m= 16.4 Water storage	14.34 loss:	14.8	12.9	12.38	10.68	9.9	11.36	11.5	13.4	14.62	15.88		(46)
Storage volum) includir	ia anv so	olar or W	/WHRS	storage	within sa	ame ves	sel		0		(47)
If community h	•	•	•			Ū							` '
Otherwise if no	_			_			, ,	ers) ente	er '0' in (47)			
Water storage													
a) If manufact	turer's d	eclared I	oss facto	or is kno	wn (kWł	n/day):					0		(48)
Temperature f	actor fro	m Table	2b								0		(49)
Energy lost fro		_	-				(48) x (49)) =			0		(50)
b) If manufactHot water store			-										(51)
If community h	•			IC 2 (KVV)	ii/iiti C/GC	' y)					0		(31)
Volume factor	_										0		(52)
Temperature f	actor fro	m Table	2b								0		(53)
Energy lost fro	m wate	r storage	, kWh/ye	ear			(47) x (51)) x (52) x (53) =		0		(54)
Enter (50) or	(54) in (55)									0		(55)
Water storage	loss cal	culated t	or each	month			((56)m = ((55) × (41)	m				
(56)m= 0	0	0	0	0	0	0	0	0	0	0	0		(56)
If cylinder contains	s dedicate	d solar sto	rage, (57)	m = (56)m	x [(50) – (H11)] ÷ (5	0), else (5	7)m = (56)	m where (H11) is fro	m Appendi	хН	
(57)m= 0	0	0	0	0	0	0	0	0	0	0	0		(57)
Primary circuit	loss (ar	nnual) fro	m Table	 - 3							0		(58)
Primary circuit	•	•			59)m = ((58) ÷ 36	65 × (41)	m					
(modified by	/ factor f	rom Tab	le H5 if t	here is s	olar wat	ter heatii	ng and a	cylinde	r thermo	stat)			
(59)m= 0	0	0	0	0	0	0	0	0	0	0	0		(59)

Combi loss	calculated	for each	month (61)m -	$(60) \div 36$	35 × (41)	١m						
(61)m= 37.5		34.84	32.39	32.1	29.75	30.74	32.1	32.39	34.84	35.03	37.57]	(61)
` '		water h	eating ca	alculated	I for eacl	h month	(62)m =	0.85 × (ـــــــــــــــــــــــــــــــــــــ	(46)m +	<u> </u>	ı (59)m + (61)m	
(62)m= 146.8	-i	133.5	118.41	114.64	100.97	96.74	107.84	109.03	124.15	132.53	143.44		(62)
Solar DHW inp	ut calculated	using App	endix G or	· Appendix	: H (negati	ve quantity	/) (enter '0	if no sola	r contributi	on to wate	r heating)		
(add additio													
(63)m= 0	0	0	0	0	0	0	0	0	0	0	0		(63)
WWHRS -29.9	91 -26.31	-26.85	-22.16	-20.61	-17.03	-14.46	-17.49	-17.98	-22.18	-25.62	-28.89		(63) (G10)
Output from	water hea	iter											
(64)m= 116.9	98 102.01	106.65	96.25	94.03	83.94	82.28	90.35	91.05	101.97	106.91	114.55		_
•							Outp	ut from wa	ater heater	(annual)	12	1186.97	(64)
Heat gains	rom water	heating,	, kWh/m	onth 0.2	5 ´ [0.85	× (45)m	+ (61)m	ı] + 0.8 x	(<u>[(46)</u> m	+ (57)m	+ (59)m]	
(65)m= 45.7	4 39.97	41.52	36.7	35.47	31.12	29.63	33.21	33.58	38.41	41.18	44.6		(65)
include (5	7)m in cal	culation (of (65)m	only if c	ylinder is	s in the o	dwelling	or hot w	ater is fr	om com	munity h	neating	
5. Internal	gains (see	e Table 5	and 5a):									
Metabolic g	ai <u>ns (Table</u>	e <u>5), Wat</u>	.ts										
Jai		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
(66)m= 82.9	1 82.91	82.91	82.91	82.91	82.91	82.91	82.91	82.91	82.91	82.91	82.91		(66)
Lighting gai	ns (calcula	ted in Ar	opendix '	L, equati	ion L9 or	 r L9a), a	lso see	Fable 5				•	
(67)m= 26.5	7 23.6	19.19	14.53	10.86	9.17	9.91	12.88	17.28	21.95	25.61	27.31		(67)
Appliances	gains (calc	:ulated in	1 Append	dix L, eq	uation L	13 or L1	3a), alsc	see Tal	ble 5		ı	1	
(68)m= 177.9	91 179.76	175.11	165.2	152.7	140.95	133.1	131.25	135.91	145.81	158.31	170.06		(68)
Cooking gai	ns (calcula	ated in A	ppendix	L, equat	ion L15	or L15a)), also se	e Table	5			•	
	(5050					44.67	44.07	44.07	44.67	44.67	44.67	1	(69)
(69)m= 44.6	`	44.67	44.67	44.67	44.67	44.67	44.67	44.67	44.07	44.07	44.07		(03)
(69)m= 44.6 Pumps and	7 44.67	44.67		44.67	44.67	44.67	44.67	44.67	44.07	44.07	44.07		(09)
` '	7 44.67	44.67		44.67	3	3	3	3	3	3	3]	(70)
Pumps and	7 44.67 fans gains	44.67 (Table 5	5a) 3	3	3]	, ,
Pumps and (70)m= 3	7 44.67 fans gains 3 evaporation	44.67 (Table 5	5a) 3	3	3							 	, ,
Pumps and (70)m= 3 Losses e.g.	7 44.67 fans gains 3 evaporation 27 -55.27	44.67 s (Table 5 3 on (negat	5a) 3 tive value	3 es) (Tab	3 le 5)	3	3	3	3	3	3]	(70)
Pumps and (70)m= 3 Losses e.g. (71)m= -55.2	fans gains 3 evaporation 27 -55.27 ng gains (T	44.67 s (Table 5 3 on (negat	5a) 3 tive value	3 es) (Tab	3 le 5)	3	3	3	3	3	3]]]	(70)
Pumps and (70)m= 3 Losses e.g. (71)m= -55.2 Water heati	7 44.67 fans gains 3 evaporation 27 -55.27 ng gains (T 8 59.47	44.67 3 on (negat -55.27 Table 5) 55.8	5a) 3 tive value	3 es) (Tab -55.27	3 ole 5) -55.27	3 -55.27 39.82	-55.27 44.63	-55.27 46.64	3 -55.27	-55.27 57.19	-55.27 59.94		(70) (71)
Pumps and (70)m= 3 Losses e.g. (71)m= -55.2 Water heati (72)m= 61.4	7 44.67 fans gains 3 evaporation 27 -55.27 ng gains (Table 1) 8 59.47 nal gains =	44.67 3 on (negat -55.27 Table 5) 55.8	5a) 3 tive value	3 es) (Tab -55.27	3 ole 5) -55.27	3 -55.27 39.82	-55.27 44.63	-55.27 46.64	3 -55.27 51.62	-55.27 57.19	-55.27 59.94]]]	(70) (71)
Pumps and (70)m= 3 Losses e.g. (71)m= -55.2 Water heati (72)m= 61.4 Total interr	7 44.67 fans gains evaporation 27 -55.27 ng gains (Table 1) 8 59.47 nal gains = 27 338.14	44.67 (Table 5 3 on (negate -55.27 Table 5) 55.8	5a) 3 tive value -55.27	3 es) (Tab -55.27	3 ble 5) -55.27 43.22 (66)	3 -55.27 39.82 m + (67)m	3 -55.27 44.63 1+ (68)m+	3 -55.27 46.64 - (69)m + (3 -55.27 51.62 (70)m + (7'	3 -55.27 57.19 1)m + (72)	3 -55.27 59.94		(70) (71) (72)
Pumps and (70)m= 3 Losses e.g. (71)m= -55.2 Water heati (72)m= 61.4 Total interr (73)m= 341.2	7 44.67 fans gains 3 evaporation 27 -55.27 ng gains (Table 1) 8 59.47 nal gains = 27 338.14 ins:	44.67 3 on (negation -55.27 Table 5) 55.8 325.41	5a) 3 tive value -55.27 50.97	3 es) (Tab -55.27 47.67	3 ble 5) -55.27 43.22 (66) 268.65	3 -55.27 39.82 m + (67)m 258.14	3 -55.27 44.63 n + (68)m + 264.08	3 -55.27 46.64 - (69)m + (275.14	3 -55.27 51.62 (70)m + (7) 294.69	3 -55.27 57.19 1)m + (72) 316.43	3 -55.27 59.94 m 332.62		(70) (71) (72)
Pumps and (70)m= 3 Losses e.g. (71)m= -55.2 Water heati (72)m= 61.4 Total interr (73)m= 341.3 6. Solar ga	7 44.67 fans gains 3 evaporation 27 -55.27 ng gains (Table 1) 8 59.47 nal gains = 27 338.14 ins: re calculated	44.67 (Table 5 3 on (negate 5) 55.8 325.41 using solar actor	5a) 3 tive value -55.27 50.97	3 es) (Tab -55.27 47.67 286.55	3 ole 5) -55.27 43.22 (66) 268.65 and associ	39.82 39.82 m + (67)m 258.14	3 -55.27 44.63 1+ (68)m+ 264.08	3 -55.27 46.64 - (69)m + (275.14	3 -55.27 51.62 (70)m + (7) 294.69	3 -55.27 57.19 1)m + (72) 316.43	3 -55.27 59.94 m 332.62	Gains (W)	(70) (71) (72)
Pumps and (70)m= 3 Losses e.g. (71)m= -55.2 Water heati (72)m= 61.4 Total interr (73)m= 341.3 6. Solar gains a	fans gains a evaporation 27 -55.27 ng gains (Table 6d 3 evaporation 4 coss factorial example for a second control of the factorial example for a second control	44.67 3 on (negate -55.27 Table 5) 55.8 325.41 using solar	5a) 3 tive value -55.27 50.97 306.01 ar flux from Area m²	3 es) (Tab -55.27 47.67 286.55	3 ole 5) -55.27 43.22 (66) 268.65 and associ	39.82 39.82 39.82 258.14 iated equal	3 -55.27 44.63 1+ (68)m+ 264.08	3 -55.27 46.64 - (69)m + (275.14 envert to the g_	3 -55.27 51.62 (70)m + (7) 294.69	3 -55.27 57.19 1)m + (72) 316.43	3 -55.27 59.94 m 332.62		(70) (71) (72)
Pumps and (70)m= 3 Losses e.g. (71)m= -55.2 Water heati (72)m= 61.4 Total interr (73)m= 341.3 6. Solar gains a Orientation:	7 44.67 fans gains 3 evaporation 27 -55.27 ng gains (Table 6d x 0.77	44.67 3 on (negat -55.27 Table 5) 55.8 325.41 using solar	5a) 3 tive value -55.27 50.97 306.01 ar flux from Area m² 2.3	3 es) (Tab -55.27 47.67 286.55 Table 6a a	3 ole 5) -55.27 43.22 (66) 268.65 and associ Flu Tak	39.82 39.82 39.82 258.14 iated equality ble 6a	3 -55.27 44.63 n + (68)m + 264.08 tions to co	3 -55.27 46.64 - (69)m + (275.14 envert to the g_ able 6b	3 -55.27 51.62 (70)m + (7) 294.69 Teapplicab	3 -55.27 57.19 1)m + (72) 316.43 le orientat FF able 6c	3 -55.27 59.94 m 332.62 ion.	(W)	(70) (71) (72) (73)
Pumps and (70)m= 3 Losses e.g. (71)m= -55.2 Water heati (72)m= 61.4 Total interr (73)m= 341.3 6. Solar gains a Orientation: Southeast 0.9	7 44.67 fans gains 3 evaporation 27 -55.27 ng gains (Table 6d x 0.77	44.67 3 on (negation -55.27 Table 5) 55.8 325.41 using solar actor	5a) 3 tive value -55.27 50.97 306.01 ar flux from Area m² 2.3 2.3	3 es) (Tab -55.27 47.67 286.55 Table 6a a	3 ble 5) -55.27 43.22 (66) 268.65 and associ Flu Tak x 3 x 6	39.82 39.82 39.82 39.84 258.14 iated equal X ole 6a	3 -55.27 44.63 1+(68)m+ 264.08	3 -55.27 46.64 - (69)m + (275.14 envert to the g_ able 6b 0.35	3 -55.27 51.62 (70)m + (7') 294.69 re applicab Ta	3 -55.27 57.19 1)m + (72) 316.43 lle orientat FF able 6c 0.8	3 -55.27 59.94 m 332.62 ion.	(W)	(70) (71) (72) (73)
Pumps and (70)m= 3 Losses e.g. (71)m= -55.2 Water heati (72)m= 61.4 Total interr (73)m= 341.3 6. Solar gains a Orientation: Southeast 0.9 Southeast 0.9	fans gains a evaporation 7 44.67 fans gains 8 evaporation 9 7 -55.27 18 59.47 10 18 59.47 10 27 338.14 27 338.14 27 338.14 28 Access Fable 6d 20 0.77 20 0.77 21 0.77	44.67 3 on (negation -55.27 Table 5) 55.8 325.41 using solar actor	5a) 3 tive value -55.27 50.97 306.01 ar flux from Area m² 2.3 2.3	3 es) (Tab -55.27 47.67 286.55 Table 6a a 3 3 3	3 ble 5) -55.27 43.22 (66) 268.65 and associ Flu Tat x	3 -55.27 39.82 m + (67)m 258.14 iated equal X ble 6a 36.79 32.67	3 -55.27 44.63 1+(68)m+ 264.08 tions to co	3 -55.27 46.64 (69)m + (275.14 envert to the g_ able 6b 0.35 0.35	3 -55.27 51.62 (70)m + (7') 294.69 Ta x x	3 -55.27 57.19 1)m + (72) 316.43 le orientat FF able 6c 0.8 0.8	3 -55.27 59.94 m 332.62 ion.	(W) 16.42 27.97	(70) (71) (72) (73) (77)

Southeast 0.98	Southeast 0.9x		_								_						
Southeast 0, sk	Southeast 0 ss	Southea	ast _{0.9x}	0.77	X	2.3	3	X	1	19.01	x	0.35	X	0.8	=	53.11	(77)
Southeast 0, sk	Southeast 0 as	Southea	ast _{0.9x}	0.77	X	2.3	3	X	11	18.15	x	0.35	X	0.8	=	52.73	(77)
Southeast 0.9x	Southeast 0.9x	Southea	ast _{0.9x}	0.77	X	2.3	3	x	1	13.91	x	0.35	x	0.8	=	50.84	(77)
Southeast 0, sk	Southeast 0.3x	Southea	ast _{0.9x}	0.77	X	2.3	3	X	10	04.39	x	0.35	x	0.8	=	46.59	(77)
Southeast 0, sx	Southeast 0.9x	Southea	ast _{0.9x}	0.77	x	2.3	3	x	9	2.85	x	0.35	x	0.8	_ =	41.44	(77)
Southeast 0.9x	Southeast 0, sk	Southea	ast _{0.9x}	0.77	X	2.3	3	X	6	9.27	x	0.35	x	0.8	=	30.91	(77)
Northwest 0.9x	Northwest 0, 9x	Southea	ast 0.9x	0.77	x	2.3	3	x	4	4.07	x	0.35	x	0.8	=	19.67	(77)
Northwest 0.9x	Northwest 0, sk	Southea	ast _{0.9x}	0.77	x	2.3	3	x	3	1.49	x	0.35	×	0.8		14.05	(77)
Northwest 0.9x	Northwest 0.9x	Northwe	est _{0.9x}	0.77	x	6.1	2	x	1	1.28	x	0.35	x	0.8		13.4	(81)
Northwest 0.9x	Northwest 0.9x	Northwe	est 0.9x	0.77	x	6.1	2	X	2	2.97	x	0.35	×	0.8	=	27.27	(81)
Northwest 0.9x	Northwest 0.9x	Northwe	est _{0.9x}	0.77	X	6.1	2	x	4	1.38	x	0.35	×	0.8	_ =	49.14	(81)
Northwest 0.9x	Northwest 0.9x	Northwe	est _{0.9x}	0.77	X	6.1	2	x	6	7.96	x	0.35	×	0.8		80.7	(81)
Northwest 0,9x	Northwest 0.9x	Northwe	est _{0.9x}	0.77	x	6.1	2	x	9	1.35	×	0.35	×	0.8	-	108.48	(81)
Northwest 0,9x	Northwest 0.9x	Northwe	est _{0.9x}	0.77	X	6.1	2	x	9	7.38	x	0.35	×	0.8	_ =	115.65	(81)
Northwest 0.9x	Northwest 0.9x	Northwe	est _{0.9x}	0.77	X	6.1	2	x	9	91.1	x	0.35	×	0.8		108.18	(81)
Northwest 0.9x	Northwest 0.9x	Northwe	est _{0.9x}	0.77	x	6.1	2	x	7	2.63	x	0.35	×	0.8	=	86.25	(81)
Northwest 0.9x	Northwest 0.9x	Northwe	est _{0.9x}	0.77	X	6.1	2	x	5	0.42	x	0.35	×	0.8	= =	59.88	(81)
Northwest 0.9x	Solar gains in watts, calculated for each month (83)m = Sum(74)m(82)m	Northwe	est _{0.9x}	0.77	X	6.1	2	x	2	8.07	x	0.35	×	0.8	_ =	33.33	(81)
Solar gains in watts, calculated for each month (83)m = Sum(74)m(82)m [83)m = 29.82 55.24 87.41 128.12 161.59 168.38 159.02 132.83 101.31 64.24 36.53 24.99 (83) Total gains – internal and solar (84)m = (73)m + (83)m , watts (84)m = 371.09 393.38 412.82 434.13 448.13 437.02 417.16 396.91 376.45 358.93 352.95 357.61 (84) 7. Mean internal temperature (heating season) Temperature during heating periods in the living area from Table 9, Th1 (°C) Utilisation factor for gains for living area, h1,m (see Table 9a) Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec (86)m = 0.99 0.98 0.97 0.93 0.85 0.69 0.53 0.57 0.8 0.94 0.98 0.99 0.98 0.99 0.98 0.97 0.93 0.85 0.69 0.53 0.57 0.8 0.94 0.98 0.99 0.98 0.99 0.98 0.98 0.99 0.98 19.81 19.82 19.83 19.83 19.83 19.82 19.82 19.81 19.81 19.81 0.98 0.99	Solar gains in watts, calculated for each month (83)m = Sum(74)m(82)m (83)m= 29.82 55.24 87.41 128.12 161.59 168.38 159.02 132.83 101.31 64.24 36.53 24.99 (83) Total gains – internal and solar (84)m = (73)m + (83)m , watts (84)m= 371.09 393.38 412.82 434.13 448.13 437.02 417.16 396.91 376.45 358.93 352.95 357.61 (84) 7. Mean internal temperature (heating season) Temperature during heating periods in the living area from Table 9, Th1 (°C) 21 (85) 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= 0.99 0.98 0.97 0.93 0.85 0.69 0.53 0.57 0.8 0.94 0.98 0.99 (86) Mean internal temperature in living area T1 (follow steps 3 to 7 in Table 9c) (87)m= 19.79 19.92 20.15 20.47 20.76 20.93 20.98 20.98 20.87 20.53 20.11 19.77 (87) Temperature during heating periods in rest of dwelling from Table 9, Th2 (°C) (88)m= 19.79 19.8 19.8 19.8 19.81 19.82 19.83 19.83 19.83 19.83 19.82 19.82 19.81 19.81 (88) Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a) (89)m= 0.98 0.98 0.96 0.91 0.79 0.59 0.39 0.44 0.71 0.91 0.97 0.99 (89) Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c) (80)m= 18.24 18.42 18.76 19.22 19.59 19.79 19.82 19.82 19.82 19.81 18.72 18.22 (90) Mean internal temperature (for the whole dwelling) = fLA x T1 + (1 - fLA) x T2 (92)m= 19.04 19.19 19.47 19.86 20.19 20.38 20.42 20.42 20.31 19.93 19.43 19.01	Northwe	est _{0.9x}	0.77	x	6.1	2	X	<u> </u>	14.2	x	0.35	X	0.8	=	16.86	(81)
(83)m= 29.82 55.24 87.41 128.12 161.59 168.38 159.02 132.83 101.31 64.24 36.53 24.99 Total gains – internal and solar (84)m = (73)m + (83)m , watts (84)m= 371.09 393.38 412.82 434.13 448.13 437.02 417.16 396.91 376.45 358.93 352.95 357.61 (84) 7. Mean internal temperature (heating season) Temperature during heating periods in the living area from Table 9, Th1 (°C) Utilisation factor for gains for living area, h1,m (see Table 9a) Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec (86)m= 0.99 0.98 0.97 0.93 0.85 0.69 0.53 0.57 0.8 0.94 0.98 0.99 0.99 (86) Mean internal temperature in living area T1 (follow steps 3 to 7 in Table 9c) (87)m= 19.79 19.92 20.15 20.47 20.76 20.93 20.98 20.98 20.87 20.53 20.11 19.77 (87) Temperature during heating periods in rest of dwelling from Table 9, Th2 (°C) (88)m= 19.79 19.8 19.8 19.8 19.81 19.82 19.83 19.83 19.83 19.83 19.82 19.82 19.81 19.81 19.81 (88) Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a) (89)m= 0.98 0.98 0.96 0.91 0.79 0.59 0.39 0.44 0.71 0.91 0.97 0.99 (89) Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c) (90)m= 18.24 18.42 18.76 19.22 19.59 19.79 19.82 19.82 19.72 19.3 18.72 18.22 (90)	(83)m= 29.82 55.24 87.41 128.12 161.59 168.38 159.02 132.83 101.31 64.24 36.53 24.99 Total gains – internal and solar (84)m = (73)m + (83)m , watts (84)m= 371.09 393.38 412.82 434.13 448.13 437.02 417.16 396.91 376.45 358.93 352.95 357.61 (84) 7. Mean internal temperature (heating season) Temperature during heating periods in the living area from Table 9, Th1 (°C) Utilisation factor for gains for living area, h1,m (see Table 9a) Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec (86)m= 0.99 0.98 0.97 0.93 0.85 0.69 0.53 0.57 0.8 0.94 0.98 0.99 (86) Mean internal temperature in living area T1 (follow steps 3 to 7 in Table 9c) (87)m= 19.79 19.92 20.15 20.47 20.76 20.93 20.98 20.98 20.97 20.53 20.11 19.77 (87) Temperature during heating periods in rest of dwelling from Table 9, Th2 (°C) (88)m= 19.79 19.8 19.8 19.81 19.82 19.83 19.83 19.83 19.83 19.82 19.82 19.81 19.81 (88) Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a) (89)m= 0.98 0.98 0.96 0.91 0.79 0.59 0.39 0.44 0.71 0.91 0.97 0.99 (89) Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c) (89)m= 18.24 18.42 18.76 19.22 19.59 19.79 19.82 19.82 19.72 19.3 18.72 18.22 (90) Mean internal temperature (for the whole dwelling) = fLA × T1 + (1 – fLA) × T2 (92)m= 19.04 19.19 19.47 19.86 20.19 20.38 20.42 20.42 20.31 19.93 19.43 19.01	Northwe	est _{0.9x}	0.77	x	6.1	2	X	9	9.21	x	0.35	×	0.8	= =	10.94	(81)
(83)m= 29.82 55.24 87.41 128.12 161.59 168.38 159.02 132.83 101.31 64.24 36.53 24.99 Total gains – internal and solar (84)m = (73)m + (83)m , watts (84)m= 371.09 393.38 412.82 434.13 448.13 437.02 417.16 396.91 376.45 358.93 352.95 357.61 (84) 7. Mean internal temperature (heating season) Temperature during heating periods in the living area from Table 9, Th1 (°C) Utilisation factor for gains for living area, h1,m (see Table 9a) Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec (86)m= 0.99 0.98 0.97 0.93 0.85 0.69 0.53 0.57 0.8 0.94 0.98 0.99 0.99 (86) Mean internal temperature in living area T1 (follow steps 3 to 7 in Table 9c) (87)m= 19.79 19.92 20.15 20.47 20.76 20.93 20.98 20.98 20.87 20.53 20.11 19.77 (87) Temperature during heating periods in rest of dwelling from Table 9, Th2 (°C) (88)m= 19.79 19.8 19.8 19.8 19.81 19.82 19.83 19.83 19.83 19.83 19.82 19.82 19.81 19.81 19.81 (88) Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a) (89)m= 0.98 0.98 0.96 0.91 0.79 0.59 0.39 0.44 0.71 0.91 0.97 0.99 (89) Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c) (90)m= 18.24 18.42 18.76 19.22 19.59 19.79 19.82 19.82 19.72 19.3 18.72 18.22 (90)	(83)m= 29.82 55.24 87.41 128.12 161.59 168.38 159.02 132.83 101.31 64.24 36.53 24.99 Total gains – internal and solar (84)m = (73)m + (83)m , watts (84)m= 371.09 393.38 412.82 434.13 448.13 437.02 417.16 396.91 376.45 358.93 352.95 357.61 (84) 7. Mean internal temperature (heating season) Temperature during heating periods in the living area from Table 9, Th1 (°C) Utilisation factor for gains for living area, h1,m (see Table 9a) Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec (86)m= 0.99 0.98 0.97 0.93 0.85 0.69 0.53 0.57 0.8 0.94 0.98 0.99 (86) Mean internal temperature in living area T1 (follow steps 3 to 7 in Table 9c) (87)m= 19.79 19.92 20.15 20.47 20.76 20.93 20.98 20.98 20.97 20.53 20.11 19.77 (87) Temperature during heating periods in rest of dwelling from Table 9, Th2 (°C) (88)m= 19.79 19.8 19.8 19.81 19.82 19.83 19.83 19.83 19.83 19.82 19.82 19.81 19.81 (88) Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a) (89)m= 0.98 0.98 0.96 0.91 0.79 0.59 0.39 0.44 0.71 0.91 0.97 0.99 (89) Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c) (89)m= 18.24 18.42 18.76 19.22 19.59 19.79 19.82 19.82 19.72 19.3 18.72 18.22 (90) Mean internal temperature (for the whole dwelling) = fLA × T1 + (1 – fLA) × T2 (92)m= 19.04 19.19 19.47 19.86 20.19 20.38 20.42 20.42 20.31 19.93 19.43 19.01		_								1		_	<u> </u>			
(83)m= 29.82 55.24 87.41 128.12 161.59 168.38 159.02 132.83 101.31 64.24 36.53 24.99 Total gains – internal and solar (84)m = (73)m + (83)m , watts (84)m= 371.09 393.38 412.82 434.13 448.13 437.02 417.16 396.91 376.45 358.93 352.95 357.61 (84) 7. Mean internal temperature (heating season) Temperature during heating periods in the living area from Table 9, Th1 (°C) Utilisation factor for gains for living area, h1,m (see Table 9a) Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec (86)m= 0.99 0.98 0.97 0.93 0.85 0.69 0.53 0.57 0.8 0.94 0.98 0.99 0.99 (86) Mean internal temperature in living area T1 (follow steps 3 to 7 in Table 9c) (87)m= 19.79 19.92 20.15 20.47 20.76 20.93 20.98 20.98 20.87 20.53 20.11 19.77 (87) Temperature during heating periods in rest of dwelling from Table 9, Th2 (°C) (88)m= 19.79 19.8 19.8 19.8 19.81 19.82 19.83 19.83 19.83 19.83 19.82 19.82 19.81 19.81 19.81 (88) Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a) (89)m= 0.98 0.98 0.96 0.91 0.79 0.59 0.39 0.44 0.71 0.91 0.97 0.99 (89) Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c) (90)m= 18.24 18.42 18.76 19.22 19.59 19.79 19.82 19.82 19.72 19.3 18.72 18.22 (90)	(83)m= 29.82 55.24 87.41 128.12 161.59 168.38 159.02 132.83 101.31 64.24 36.53 24.99 Total gains – internal and solar (84)m = (73)m + (83)m , watts (84)m= 371.09 393.38 412.82 434.13 448.13 437.02 417.16 396.91 376.45 358.93 352.95 357.61 (84) 7. Mean internal temperature (heating season) Temperature during heating periods in the living area from Table 9, Th1 (°C) Utilisation factor for gains for living area, h1,m (see Table 9a) Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec (86)m= 0.99 0.98 0.97 0.93 0.85 0.69 0.53 0.57 0.8 0.94 0.98 0.99 (86) Mean internal temperature in living area T1 (follow steps 3 to 7 in Table 9c) (87)m= 19.79 19.92 20.15 20.47 20.76 20.93 20.98 20.98 20.97 20.53 20.11 19.77 (87) Temperature during heating periods in rest of dwelling from Table 9, Th2 (°C) (88)m= 19.79 19.8 19.8 19.81 19.82 19.83 19.83 19.83 19.83 19.82 19.82 19.81 19.81 (88) Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a) (89)m= 0.98 0.98 0.96 0.91 0.79 0.59 0.39 0.44 0.71 0.91 0.97 0.99 (89) Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c) (89)m= 18.24 18.42 18.76 19.22 19.59 19.79 19.82 19.82 19.72 19.3 18.72 18.22 (90) Mean internal temperature (for the whole dwelling) = fLA × T1 + (1 – fLA) × T2 (92)m= 19.04 19.19 19.47 19.86 20.19 20.38 20.42 20.42 20.31 19.93 19.43 19.01	Solar o	ains in	watts cal	culated	for each	n montl	h			(83)m	n = Sum(74)m .	(82)m				
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Temperature during heating periods in the living area from Table 9, Th1 (°C) 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= 0.99 0.98 0.97 0.93 0.85 0.69 0.53 0.57 0.8 0.94 0.98 0.99 (86) Mean internal temperature in living area T1 (follow steps 3 to 7 in Table 9c) (87)m= 19.79 19.92 20.15 20.47 20.76 20.93 20.98 20.98 20.87 20.53 20.11 19.77 (87) Temperature during heating periods in rest of dwelling from Table 9, Th2 (°C) (88)m= 19.79 19.8 19.8 19.8 19.81 19.82 19.83 19.83 19.83 19.82 19.82 19.81 19.81 19.81 (88) Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a) (89)m= 0.98 0.98 0.96 0.91 0.79 0.59 0.39 0.44 0.71 0.91 0.97 0.99 (89) Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c) (90)m= 18.24 18.42 18.76 19.22 19.59 19.79 19.82 19.82 19.72 19.3 18.72 18.22 (90) fLA = Living area + (4) = 0.51 (91)	Temperature during heating periods in the living area from Table 9, Th1 (°C) 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= 0.99 0.98 0.97 0.93 0.85 0.69 0.53 0.57 0.8 0.94 0.98 0.99 (86) Mean internal temperature in living area T1 (follow steps 3 to 7 in Table 9c) (87)m= 19.79 19.92 20.15 20.47 20.76 20.93 20.98 20.98 20.98 20.87 20.53 20.11 19.77 (87) Temperature during heating periods in rest of dwelling from Table 9, Th2 (°C) (88)m= 19.79 19.8 19.8 19.8 19.81 19.82 19.83 19.83 19.83 19.82 19.82 19.82 19.81 19.81 (88) Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a) (89)m= 0.98 0.98 0.96 0.91 0.79 0.59 0.39 0.44 0.71 0.91 0.97 0.99 (89) Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c) (90)m= 18.24 18.42 18.76 19.22 19.59 19.79 19.82 19.82 19.72 19.3 18.72 18.22 (90) Mean internal temperature (for the whole dwelling) = fLA x T1 + (1 – fLA) x T2 (92)m= 19.04 19.19 19.47 19.86 20.19 20.38 20.42 20.42 20.31 19.93 19.43 19.01	Total g	ains – ir	55.24 nternal an	87.41 nd solar	128.12 (84)m =	: (73)m	+ (8	83)m	, watts			I		<u> </u>]	
Utilisation factor for gains for living area, h1,m (see Table 9a) Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec	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= 0.99 0.98 0.97 0.93 0.85 0.69 0.53 0.57 0.8 0.94 0.98 0.99 (86) Mean internal temperature in living area T1 (follow steps 3 to 7 in Table 9c) (87)m= 19.79 19.92 20.15 20.47 20.76 20.93 20.98 20.98 20.98 20.87 20.53 20.11 19.77 (87) Temperature during heating periods in rest of dwelling from Table 9, Th2 (°C) (88)m= 19.79 19.8 19.8 19.8 19.81 19.82 19.83 19.83 19.83 19.82 19.82 19.81 19.81 19.81 (88) Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a) (89)m= 0.98 0.98 0.96 0.91 0.79 0.59 0.39 0.44 0.71 0.91 0.97 0.99 (89) Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c) (90)m= 18.24 18.42 18.76 19.22 19.59 19.79 19.82 19.82 19.72 19.3 18.72 18.22 (90) ### FLA = Living area ÷ (4) = 0.51 (91) Mean internal temperature (for the whole dwelling) = fLA x T1 + (1 – fLA) x T2 (92)m= 19.04 19.19 19.47 19.86 20.19 20.38 20.42 20.42 20.31 19.93 19.43 19.01	Total games (84)m=	ains — ir 371.09	55.24 nternal an 393.38	87.41 nd solar 412.82	128.12 (84)m = 434.13	: (73)m 448.13	1 + (8	83)m	, watts			I		<u> </u>]	
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec	Total ga (84)m= [ains – ir 371.09 an inter	55.24 Internal and 393.38 Inal temperature	87.41 nd solar 412.82 erature (128.12 (84)m = 434.13 (heating	(73)m 448.13 seaso	1 + (8 3 43	83)m 37.02	, watts 417.16	396	.91 376.45	I		<u> </u>	21	(84)
(86)m= 0.99 0.98 0.97 0.93 0.85 0.69 0.53 0.57 0.8 0.94 0.98 0.99 (86) Mean internal temperature in living area T1 (follow steps 3 to 7 in Table 9c) (87)m= 19.79 19.92 20.15 20.47 20.76 20.93 20.98 20.98 20.87 20.53 20.11 19.77 (87) Temperature during heating periods in rest of dwelling from Table 9, Th2 (°C) (88)m= 19.79 19.8 19.8 19.8 19.81 19.82 19.83 19.83 19.83 19.82 19.82 19.81 19.81 (88) Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a) (89)m= 0.98 0.98 0.96 0.91 0.79 0.59 0.39 0.44 0.71 0.91 0.97 0.99 (89) Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c) (90)m= 18.24 18.42 18.76 19.22 19.59 19.79 19.82 19.82 19.72 19.3 18.72 18.22 (90) fLA = Living area ÷ (4) = 0.51 (91)	(86)m= 0.99 0.98 0.97 0.93 0.85 0.69 0.53 0.57 0.8 0.94 0.98 0.99 (86) Mean internal temperature in living area T1 (follow steps 3 to 7 in Table 9c) (87)m= 19.79 19.92 20.15 20.47 20.76 20.93 20.98 20.98 20.87 20.53 20.11 19.77 (87) Temperature during heating periods in rest of dwelling from Table 9, Th2 (°C) (88)m= 19.79 19.8 19.8 19.8 19.81 19.82 19.83 19.83 19.83 19.82 19.82 19.82 19.81 19.81 (88) Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a) (89)m= 0.98 0.98 0.96 0.91 0.79 0.59 0.39 0.44 0.71 0.91 0.97 0.99 (89) Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c) (90)m= 18.24 18.42 18.76 19.22 19.59 19.79 19.82 19.82 19.72 19.3 18.72 18.22 (90) Mean internal temperature (for the whole dwelling) = fLA x T1 + (1 - fLA) x T2 (92)m= 19.04 19.19 19.47 19.86 20.19 20.38 20.42 20.42 20.31 19.93 19.43 19.01 (92)	Total garage (84)m= [7. Mean Temper	ains – ir 371.09 an inter erature	55.24 Internal and 393.38 Inal temper during he	87.41 and solar 412.82 erature (eating po	128.12 (84)m = 434.13 (heating eriods in	448.13 seaso the liv	n)	83)m 37.02 area f	watts 417.16 from Tab	396	.91 376.45	I		<u> </u>	21	(84)
(87)m= 19.79 19.92 20.15 20.47 20.76 20.93 20.98 20.98 20.87 20.53 20.11 19.77 (87) Temperature during heating periods in rest of dwelling from Table 9, Th2 (°C) (88)m= 19.79 19.8 19.8 19.81 19.82 19.83 19.83 19.83 19.82 19.82 19.81 19.81 19.81 Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a) (89)m= 0.98 0.98 0.96 0.91 0.79 0.59 0.39 0.44 0.71 0.91 0.97 0.99 (89) Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c) (90)m= 18.24 18.42 18.76 19.22 19.59 19.79 19.82 19.82 19.72 19.3 18.72 18.22 (90) fLA = Living area ÷ (4) = 0.51 (91)	(87)m= 19.79 19.92 20.15 20.47 20.76 20.93 20.98 20.98 20.87 20.53 20.11 19.77 (87) Temperature during heating periods in rest of dwelling from Table 9, Th2 (°C) (88)m= 19.79 19.8 19.8 19.81 19.82 19.83 19.83 19.83 19.82 19.82 19.81 19.81 19.81 (88) Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a) (89)m= 0.98 0.98 0.96 0.91 0.79 0.59 0.39 0.44 0.71 0.91 0.97 0.99 (89) Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c) (90)m= 18.24 18.42 18.76 19.22 19.59 19.79 19.82 19.82 19.72 19.3 18.72 18.22 (90) Mean internal temperature (for the whole dwelling) = fLA x T1 + (1 - fLA) x T2 (92)m= 19.04 19.19 19.47 19.86 20.19 20.38 20.42 20.42 20.31 19.93 19.43 19.01 (92)	7. Med Tempo	ains – in 371.09 an inter erature ation fac	55.24 Internal and 393.38 Inal temper during he tor for gain	87.41 and solar 412.82 erature (eating points for li	128.12 (84)m = 434.13 (heating eriods in	= (73)m 448.13 seaso the livea, h1,r	n) ving	83)m 37.02 area f ee Ta	watts 417.16 from Tabble 9a)	396 ole 9	.91 376.45 , Th1 (°C)	358.9	3 352.95	357.61	21	(84)
(87)m= 19.79 19.92 20.15 20.47 20.76 20.93 20.98 20.98 20.87 20.53 20.11 19.77 (87) Temperature during heating periods in rest of dwelling from Table 9, Th2 (°C) (88)m= 19.79 19.8 19.8 19.81 19.82 19.83 19.83 19.83 19.82 19.82 19.81 19.81 19.81 Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a) (89)m= 0.98 0.98 0.96 0.91 0.79 0.59 0.39 0.44 0.71 0.91 0.97 0.99 (89) Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c) (90)m= 18.24 18.42 18.76 19.22 19.59 19.79 19.82 19.82 19.72 19.3 18.72 18.22 (90) fLA = Living area ÷ (4) = 0.51 (91)	(87)m= 19.79 19.92 20.15 20.47 20.76 20.93 20.98 20.98 20.87 20.53 20.11 19.77 (87) Temperature during heating periods in rest of dwelling from Table 9, Th2 (°C) (88)m= 19.79 19.8 19.8 19.81 19.82 19.83 19.83 19.83 19.82 19.82 19.81 19.81 19.81 (88) Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a) (89)m= 0.98 0.98 0.96 0.91 0.79 0.59 0.39 0.44 0.71 0.91 0.97 0.99 (89) Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c) (90)m= 18.24 18.42 18.76 19.22 19.59 19.79 19.82 19.82 19.72 19.3 18.72 18.22 (90) Mean internal temperature (for the whole dwelling) = fLA x T1 + (1 - fLA) x T2 (92)m= 19.04 19.19 19.47 19.86 20.19 20.38 20.42 20.42 20.31 19.93 19.43 19.01 (92)	Total g (84)m= 7. Mea Tempo Utilisa	ains – ir 371.09 an inter erature ation fac Jan	55.24 Internal and 393.38 Inal temper during heater for gains Feb	87.41 and solar 412.82 erature (eating poins for li	128.12 (84)m = 434.13 (heating eriods in ving are Apr	= (73)m 448.13 seaso the livea, h1,r May	n) ring m (s	83)m 37.02 area f ee Ta Jun	watts 417.16 from Tabble 9a) Jul	396 ole 9	.91 376.45 , Th1 (°C) ug Sep	358.9	3 352.95 t Nov	357.61 Dec	21	(84)
Temperature during heating periods in rest of dwelling from Table 9, Th2 (°C) (88)m= 19.79 19.8 19.8 19.81 19.82 19.83 19.83 19.83 19.82 19.82 19.81 19.81 (88) Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a) (89)m= 0.98 0.98 0.96 0.91 0.79 0.59 0.39 0.44 0.71 0.91 0.97 0.99 (89) Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c) (90)m= 18.24 18.42 18.76 19.22 19.59 19.79 19.82 19.82 19.72 19.3 18.72 18.22 (90) FLA = Living area ÷ (4) = 0.51 (91)	Temperature during heating periods in rest of dwelling from Table 9, Th2 (°C) (88)m= 19.79 19.8 19.8 19.8 19.8 19.8 19.83 19.83 19.83 19.83 19.82 19.82 19.82 19.81 19.81 (88) Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a) (89)m= 0.98 0.98 0.98 0.96 0.91 0.79 0.59 0.39 0.44 0.71 0.91 0.97 0.99 (89) Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c) (90)m= 18.24 18.42 18.76 19.22 19.59 19.79 19.82 19.82 19.72 19.3 18.72 18.22 (90) Mean internal temperature (for the whole dwelling) = fLA × T1 + (1 - fLA) × T2 (92)m= 19.04 19.19 19.47 19.86 20.19 20.38 20.42 20.42 20.31 19.93 19.43 19.01 (92)	Total g (84)m= 7. Mea Tempo Utilisa (86)m=	ains – ir 371.09 an inter erature ation fac Jan 0.99	55.24 Internal and 393.38 Inal temper during her tor for gain Feb 0.98	87.41 and solar 412.82 erature (eating poins for li Mar 0.97	128.12 (84)m = 434.13 (heating eriods in ving are Apr 0.93	e (73)m 448.13 seaso the livea, h1,r May 0.85	n) ving m (s	83)m 37.02 area f ee Ta Jun 0.69	watts 417.16 from Tab ble 9a) Jul 0.53	396 ole 9	.91 376.45 , Th1 (°C) ug Sep	358.9	3 352.95 t Nov	357.61 Dec	21	(84)
(88)m= 19.79 19.8 19.8 19.8 19.81 19.82 19.83 19.83 19.83 19.82 19.82 19.81 19.81 (88) Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a) (89)m= 0.98 0.98 0.96 0.91 0.79 0.59 0.39 0.44 0.71 0.91 0.97 0.99 (89) Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c) (90)m= 18.24 18.42 18.76 19.22 19.59 19.79 19.82 19.82 19.72 19.3 18.72 18.22 (90) fLA = Living area ÷ (4) = 0.51 (91)	(88)m= 19.79 19.8 19.8 19.81 19.82 19.83 19.83 19.83 19.82 19.82 19.81 19.81 19.81 Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a) (89)m= 0.98 0.98 0.96 0.91 0.79 0.59 0.39 0.44 0.71 0.91 0.97 0.99 (89) Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c) (90)m= 18.24 18.42 18.76 19.22 19.59 19.79 19.82 19.82 19.72 19.3 18.72 18.22 (90) Mean internal temperature (for the whole dwelling) = fLA x T1 + (1 - fLA) x T2 (92)m= 19.04 19.19 19.47 19.86 20.19 20.38 20.42 20.42 20.31 19.93 19.43 19.01 (92)	Total g (84)m= 7. Met Tempo Utilisa (86)m= Mean	ains – ir 371.09 an inter erature tion fac Jan 0.99 interna	55.24 Internal and 393.38 Inal temperal tor for gain Feb 0.98 Itemperal	87.41 and solar 412.82 erature (eating points for limits for limit	128.12 (84)m = 434.13 (heating eriods in ving are 0.93 iving are iving are 1.93	e (73)m 448.13 seaso the livea, h1,r May 0.85	n) ring m (s	area fee Ta Jun 0.69	watts 417.16 from Tak ble 9a) Jul 0.53 ps 3 to 7	396 ole 9 A 0.5	.91 376.45 , Th1 (°C) ug Sep 57 0.8	Oct 0.94	3 352.95 t Nov 0.98	357.61 Dec 0.99	21	(84)
Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a) (89)m= 0.98 0.98 0.96 0.91 0.79 0.59 0.39 0.44 0.71 0.91 0.97 0.99 Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c) (90)m= 18.24 18.42 18.76 19.22 19.59 19.79 19.82 19.82 19.72 19.3 18.72 18.22 (90) fLA = Living area ÷ (4) = 0.51 (91)	Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a) (89)m= 0.98 0.98 0.96 0.91 0.79 0.59 0.39 0.44 0.71 0.91 0.97 0.99 (89) Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c) (90)m= 18.24 18.42 18.76 19.22 19.59 19.79 19.82 19.82 19.72 19.3 18.72 18.22 (90) Mean internal temperature (for the whole dwelling) = fLA × T1 + (1 – fLA) × T2 (92)m= 19.04 19.19 19.47 19.86 20.19 20.38 20.42 20.42 20.31 19.93 19.43 19.01 (92)	Total g (84)m= 7. Met Tempo Utilisa (86)m= Mean (87)m=	ains – ir 371.09 an inter erature tion fact Jan 0.99 interna 19.79	55.24 Internal and 393.38 Inal temperaturing here. 19.92	erature (eating poins for limited management) Mar 0.97 ture in l 20.15	128.12 (84)m = 434.13 (heating eriods in ving are Apr 0.93 iving are 20.47	e (73)m 448.13 seaso the livea, h1,r May 0.85 ea T1 (120.76	n) (state of the least of the l	83)m 37.02 area f ee Ta Jun 0.69 w ste	watts 417.16 from Tak ble 9a) Jul 0.53 ps 3 to 7	396 DIE 9 A 0.5 7 in T 20.	.91 376.45 , Th1 (°C) ug Sep 57 0.8 Table 9c) 98 20.87	Oct 0.94	3 352.95 t Nov 0.98	357.61 Dec 0.99	21	(84)
(89)m= 0.98 0.98 0.96 0.91 0.79 0.59 0.39 0.44 0.71 0.91 0.97 0.99 (89) Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c) (90)m= 18.24 18.42 18.76 19.22 19.59 19.79 19.82 19.82 19.72 19.3 18.72 18.22 (90) fLA = Living area ÷ (4) = 0.51 (91)	(89)m= 0.98 0.98 0.96 0.91 0.79 0.59 0.39 0.44 0.71 0.91 0.97 0.99 (89) Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c) (90)m= 18.24 18.42 18.76 19.22 19.59 19.79 19.82 19.82 19.72 19.3 18.72 18.22 (90) Mean internal temperature (for the whole dwelling) = fLA × T1 + (1 - fLA) × T2 (92)m= 19.04 19.19 19.47 19.86 20.19 20.38 20.42 20.42 20.31 19.93 19.43 19.01 (92)	Total g (84)m= 7. Mea Tempo Utilisa (86)m= Mean (87)m= Tempo	ains – ir 371.09 an inter erature ation fac Jan 0.99 interna 19.79 erature	55.24 Internal and 393.38 Internal temper during here tor for gain Feb 0.98 Itemperates 19.92 Itemperates during here	erature (eating poins for limited in leading points and leading points are in leading po	128.12 (84)m = 434.13 (heating eriods in Apr 0.93 iving are 20.47 eriods in a control of the con	e (73)m 448.13 seaso n the liv ea, h1,r May 0.85 ea T1 (20.76	n) ring m (s follo	area free Ta Jun 0.69 w stee 20.93	watts 417.16 from Table 9a) Jul 0.53 ps 3 to 7 20.98 from Ta	396 A 0.57 in T 20.	.91 376.45 , Th1 (°C) ug Sep 57 0.8 Table 9c) 98 20.87 9, Th2 (°C)	Oct 0.94	3 352.95 Nov 0.98 20.11	Dec 0.99	21	(84)
Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c) (90)m= 18.24 18.42 18.76 19.22 19.59 19.79 19.82 19.82 19.72 19.3 18.72 18.22 (90) fLA = Living area ÷ (4) = 0.51 (91)	Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c) (90)m= $\begin{bmatrix} 18.24 & 18.42 & 18.76 & 19.22 & 19.59 & 19.79 & 19.82 & 19.82 & 19.72 & 19.3 & 18.72 & 18.22 & (90) \\ & & & & & & & & & & & & & & & & & & $	Total graph (84)m= [7. Mean (86)m= [Mean (87)m= [Tempo (88)m= [ains – ir 371.09 an inter erature tion fac Jan 0.99 interna 19.79 erature 19.79	55.24 Internal and 393.38 Internal temper during here tor for gain Feb 0.98 Itemperates 19.92 Itempera	erature (eating poins for limited in leading	128.12 (84)m = 434.13 (heating eriods in Apr 0.93 iving are 20.47 eriods in 19.81	e (73)m 448.13 seaso n the liv ea, h1,r May 0.85 ea T1 (20.76 n rest o	n) ring m (s follo	83)m 37.02 area f ee Ta Jun 0.69 w ste 20.93 velling	watts 417.16 from Table 9a) Jul 0.53 ps 3 to 7 20.98 from Ta	396 A 0.5 7 in T 20.	.91 376.45 , Th1 (°C) ug Sep 57 0.8 Table 9c) 98 20.87 9, Th2 (°C)	Oct 0.94	3 352.95 Nov 0.98 20.11	Dec 0.99	21	(84)
(90)m= 18.24 18.42 18.76 19.22 19.59 19.79 19.82 19.82 19.72 19.3 18.72 18.22 (90) fLA = Living area ÷ (4) = 0.51 (91)	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Total g (84)m= 7. Met Tempo Utilisa (86)m= Mean (87)m= Tempo (88)m= Utilisa	ains – ir 371.09 an inter erature tion fac Jan 0.99 interna 19.79 erature 19.79	55.24 Internal and 393.38 Inal temper during he tor for gain Feb 0.98 I tempera 19.92 I during he 19.8 Itor for gain tor for gain tempera 19.92	erature (eating poins for limber in leading poins for limber in leading poins for right limber in leading po	128.12 (84)m = 434.13 (heating eriods in Eving are 20.47 eriods in 19.81 est of dv	e (73)m 448.13 seaso the lives, h1,r May 0.85 ea T1 (120.76 to rest of 19.82 welling,	n) ring m (s follo 2 f dw 1, h2,	83)m 37.02 area f ee Ta Jun 0.69 w ste 20.93 velling 19.83	watts 417.16 from Take ble 9a) Jul 0.53 ps 3 to 7 20.98 from Take 19.83	396 A 0.5 7 in T 20. 19. 9a)	.91 376.45 , Th1 (°C) ug Sep 57 0.8 Table 9c) 98 20.87 9, Th2 (°C) 83 19.82	Oct 0.94 20.53	3 352.95 Nov 0.98 2 19.81	Dec 0.99 19.77		(84) (85) (86) (87) (88)
$fLA = Living area \div (4) = 0.51$ (91)	Mean internal temperature (for the whole dwelling) = $fLA \times T1 + (1 - fLA) \times T2$ (92)m= 19.04 19.19 19.47 19.86 20.19 20.38 20.42 20.42 20.31 19.93 19.43 19.01 (92)	Total g (84)m= 7. Met Tempo Utilisa (86)m= Mean (87)m= Tempo (88)m= Utilisa	ains – ir 371.09 an inter erature tion fac Jan 0.99 interna 19.79 erature 19.79	55.24 Internal and 393.38 Inal temper during he tor for gain Feb 0.98 I tempera 19.92 I during he 19.8 Itor for gain tor for gain tempera 19.92	erature (eating poins for limber in leading poins for limber in leading poins for right limber in leading po	128.12 (84)m = 434.13 (heating eriods in Eving are 20.47 eriods in 19.81 est of dv	e (73)m 448.13 seaso the lives, h1,r May 0.85 ea T1 (120.76 to rest of 19.82 welling,	n) ring m (s follo 2 f dw 1, h2,	83)m 37.02 area f ee Ta Jun 0.69 w ste 20.93 velling 19.83	watts 417.16 from Take ble 9a) Jul 0.53 ps 3 to 7 20.98 from Take 19.83	396 A 0.5 7 in T 20. 19. 9a)	.91 376.45 , Th1 (°C) ug Sep 57 0.8 Table 9c) 98 20.87 9, Th2 (°C) 83 19.82	Oct 0.94 20.53	3 352.95 Nov 0.98 2 19.81	Dec 0.99 19.77		(84) (85) (86) (87) (88)
	Mean internal temperature (for the whole dwelling) = $fLA \times T1 + (1 - fLA) \times T2$ (92)m= 19.04 19.19 19.47 19.86 20.19 20.38 20.42 20.42 20.31 19.93 19.43 19.01 (92)	Total g (84)m= [7. Met Tempo Utilisa (86)m= [Mean (87)m= [Tempo (88)m= [Utilisa (89)m= [ains – ir 371.09 an inter erature tion fac Jan 0.99 interna 19.79 erature 19.79 tion fac 0.98 interna	55.24 Internal and 393.38 Inal temper during her tor for gain 19.92 Industry temperary during her 19.8 Internal and 19.8 Internal and 19.92 Intern	erature (eating poins for limited in leating poins for limited in leating poins for rough limited in leating poins for ro	128.12 (84)m = 434.13 (heating eriods in ving are 20.47 eriods in 19.81 est of do 0.91 he rest	e (73)m 448.13 seaso the lives, h1,r May 0.85 ea T1 (120.76 to rest of 19.82 welling, 10.79	n) ring m (s follo 2 f dw 1 1 1 1 1 1 1 1 1 1 1 1 1	83)m 37.02 area f ee Ta Jun 0.69 w ste 20.93 velling 19.83 ,m (se 0.59	watts 417.16 from Tak ble 9a) Jul 0.53 ps 3 to 7 20.98 from Ta 19.83 ee Table 0.39	396 A 0.57 in T 20. able 9 19. 9a) 0.4	.91 376.45 , Th1 (°C) ug Sep 57 0.8 Table 9c) 98 20.87 9, Th2 (°C) 83 19.82	Oct 0.94 20.53	3 352.95 Nov 0.98 2 19.81	Dec 0.99 19.77		(84) (85) (86) (87) (88)
Magazinternal temperature (for the whole dwelling) fl A v T4 v (4 - fl A) v T2	(92)m= 19.04 19.19 19.47 19.86 20.19 20.38 20.42 20.42 20.31 19.93 19.43 19.01 (92)	Total g (84)m= 7. Mea Tempe Utilisa (86)m= Mean (87)m= Tempe (88)m= Utilisa (89)m= Mean	ains – ir 371.09 an inter erature tion fac Jan 0.99 interna 19.79 erature 19.79 tion fac 0.98 interna	55.24 Internal and 393.38 Inal temper during her tor for gain 19.92 I temperal 19.8	erature (eating poins for line 19.8 ins for rough)	128.12 (84)m = 434.13 (heating eriods in ving are 20.47 eriods in 19.81 est of do 0.91 he rest	e (73)m 448.13 seaso n the liv ea, h1,r May 0.85 ea T1 (20.76 n rest o 19.82 welling 0.79 of dwel	n) ring m (s follo 2 f dw 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	83)m 37.02 area f ee Ta Jun 0.69 w ste 20.93 velling 19.83 m (se 0.59	watts 417.16 From Table 9a) Jul 0.53 ps 3 to 7 20.98 from Table 19.83 ee Table 0.39 pollow ste	396 A 0.8 7 in T 20. able 9 0.4 0.9 0.4	.91 376.45 , Th1 (°C) ug Sep 67 0.8 Table 9c) 98 20.87 9, Th2 (°C) 83 19.82 14 0.71 1 to 7 in Tabl 82 19.72	Oct 0.94 20.53 19.82 0.91 e 9c) 19.3	3 352.95 1 Nov 0.98 2 19.81 0.97	Dec 0.99 19.77 19.81 0.99		(84) (85) (86) (87) (88) (89)
wear internal temperature (for the whole dwelling) = $1LA \times 1.1 + (1 - 1LA) \times 1.2$		Total g (84)m= 7. Mea Tempe Utilisa (86)m= Mean (87)m= Tempe (88)m= Utilisa (89)m= Mean	ains – ir 371.09 an inter erature tion fac Jan 0.99 interna 19.79 erature 19.79 tion fac 0.98 interna	55.24 Internal and 393.38 Inal temper during her tor for gain 19.92 I temperal 19.8	erature (eating poins for line 19.8 ins for rough)	128.12 (84)m = 434.13 (heating eriods in ving are 20.47 eriods in 19.81 est of do 0.91 he rest	e (73)m 448.13 seaso n the liv ea, h1,r May 0.85 ea T1 (20.76 n rest o 19.82 welling 0.79 of dwel	n) ring m (s follo 2 f dw 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	83)m 37.02 area f ee Ta Jun 0.69 w ste 20.93 velling 19.83 m (se 0.59	watts 417.16 From Table 9a) Jul 0.53 ps 3 to 7 20.98 from Table 19.83 ee Table 0.39 pollow ste	396 A 0.8 7 in T 20. able 9 0.4 0.9 0.4	.91 376.45 , Th1 (°C) ug Sep 67 0.8 Table 9c) 98 20.87 9, Th2 (°C) 83 19.82 14 0.71 1 to 7 in Tabl 82 19.72	Oct 0.94 20.53 19.82 0.91 e 9c) 19.3	3 352.95 1 Nov 0.98 2 19.81 0.97	Dec 0.99 19.77 19.81 0.99		(84) (85) (86) (87) (88) (89)
(92)m= 19.04 19.19 19.47 19.86 20.19 20.38 20.42 20.42 20.31 19.93 19.43 19.01 (92)	Apply adjustment to the mean internal temperature from Table 4e, where appropriate	Total g (84)m= 7. Met Tempo Utilisa (86)m= Mean (87)m= [Tempo (88)m= Utilisa (89)m= Mean (90)m=	ains – ir 371.09 an inter erature tion fac Jan 0.99 interna 19.79 erature 19.79 tion fac 0.98 interna 18.24	55.24 Internal and 393.38 Inal temper during he tor for gain 19.92 Itemperation 19.8 Itemperation 19.8 Itemperation 19.8 Itemperation 19.8 Itemperation 18.42	erature (eating poins for line 19.8 ins for rough) and solar ture in land ture in the 18.76	128.12 (84)m = 434.13 (heating eriods in a seriods in a seriod in a	e (73)m 448.13 seaso the lives, h1,r May 0.85 ea T1 (120.76 to rest of 19.82 welling, 19.59 of dwelling, 19.59	n) ring m (s follo 2 f dw 1 1 1 1 1 1 1 1 1	83)m 37.02 area f ee Ta Jun 0.69 w ste 20.93 velling 19.83 ,m (se 0.59 T2 (fo	watts 417.16 from Take ble 9a) Jul 0.53 ps 3 to 7 20.98 from Take 19.83 pe Table 0.39 bllow steen 19.82	396 A 0.5 7 in T 20. 9a) 0.4 19.	.91 376.45 , Th1 (°C) ug Sep 67 0.8 Table 9c) 98 20.87 9, Th2 (°C) 83 19.82 14 0.71 1 to 7 in Tabl 82 19.72	Oct 0.94 20.53 19.82 0.91 e 9c) 19.3	3 352.95 1 Nov 0.98 2 19.81 0.97	Dec 0.99 19.77 19.81 0.99		(84) (85) (86) (87) (88) (89)
		Total g (84)m= 7. Mea Tempo Utilisa (86)m= Mean (87)m= Tempo (88)m= Utilisa (89)m= Mean (90)m= Mean	ains – ir 371.09 an inter erature ation fac Jan 0.99 interna 19.79 erature 19.79 ation fac 0.98 interna 18.24	55.24 Internal and 393.38 Internal temper during her tor for gain 19.92 Internal temper during her 19.8 Internal temper during	erature (eating poins for limits for rough) eating poins for limits for limits for rough) eating poins for rough) eating poins for rough) ture in to 18.76	128.12 (84)m = 434.13 (heating eriods in Apr 0.93 iving are 20.47 eriods in 19.81 est of do 0.91 he rest of 19.22 r the wh	e (73)m 448.13 seaso the lives, h1,r May 0.85 ea T1 (for 20.76 to rest or 19.82 welling, 0.79 of dwelling, 19.59	n) ring m (s follo 2 f dw 1 h, h2,	83)m 37.02 area f ee Ta Jun 0.69 bw ste 20.93 velling 9.83 m (se 0.59 T2 (fo 9.79	watts 417.16 from Table 9a) Jul 0.53 ps 3 to 7 20.98 from Ta 19.83 pe Table 0.39 pollow ste 19.82	396 A	.91 376.45 , Th1 (°C) ug Sep 57 0.8 able 9c) 98 20.87 9, Th2 (°C) 83 19.82 44 0.71 5 to 7 in Tabl 82 19.72 f - fLA) × T2	Oct 0.94 20.53 19.82 0.91 e 9c) 19.3	3 352.95 Nov 0.98 2 19.81 0.97 18.72 ving area ÷ (-	Dec 0.99 19.77 19.81 0.99 18.22 4) =		(84) (85) (86) (87) (88) (89) (90) (91)
		Total g (84)m= [7. Met Tempo Utilisa (86)m= [Mean (87)m= [Utilisa (89)m= [Mean (90)m= [Mean (90)m= [ains – ir 371.09 an inter erature stion fact Jan 0.99 interna 19.79 erature 19.79 stion fact 0.98 interna 18.24 interna 19.04	55.24 Internal and 393.38 Internal temper during he tor for gain 19.92 Internal 19.8 Internal 19.92 Internal 19.19 Internal 19.19	erature (eating poins for limber of	128.12 (84)m = 434.13 (heating eriods in ving are 20.47 eriods in 19.81 est of do 0.91 he rest 19.22 r the wh 19.86	e (73)m 448.13 seaso the lives, h1,r May 0.85 ea T1 (the control of the con	n) ring m (s follo 2 f dw 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	83)m 37.02 area f ee Ta Jun 0.69 w ste 20.93 velling 19.83 m (se 0.59 T2 (fc 19.79 g) = fl 20.38	watts 417.16 from Tak ble 9a) Jul 0.53 ps 3 to 7 20.98 from Ta 19.83 ee Table 0.39 bllow ste 19.82 A × T1 20.42	396 A 0.5 7 in 7 20. 9a) 0.4 + (1 20.	.91 376.45 , Th1 (°C) ug Sep 57 0.8 Table 9c) 98 20.87 9, Th2 (°C) 83 19.82 14 0.71 1 to 7 in Tabl 82 19.72 f - fLA) × T2 42 20.31	358.9 Oct 0.94 20.53 19.82 0.91 e 9c) 19.3 fLA = Li	3 352.95 Nov 0.98 2 19.81 0.97 18.72 ving area ÷ (Dec 0.99 19.77 19.81 0.99 18.22 4) =		(84) (85) (86) (87) (88) (89) (90) (91)

(93)m= 19.0 ⁴	19.19	19.47	19.86	20.19	20.38	20.42	20.42	20.31	19.93	19.43	19.01		(93)
8. Space he	eating requ	uirement											
Set Ti to the			•		ed at ste	ep 11 of	Table 9	o, so tha	t Ti,m=(76)m an	d re-calc	culate	
the utilisation	on factor for	or gains	using Ta	ble 9a		,			,	,		•	
Jar		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Utilisation f		ains, hm				1			1			•	
(94)m= 0.98	0.97	0.95	0.91	0.81	0.64	0.46	0.51	0.75	0.92	0.97	0.98		(94)
Useful gain	<u> </u>	·	`			г			т			1	
(95)m= 363.6		394.2	394.88	363.56	278.05	192.81	200.72	281.34	328.97	341.66	351.42		(95)
Monthly av		1					•					I	
(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 ra	_											Ī	
(97)m= 783.1		685.47	571.64	441.49	296.87	196.32	205.94	320.73	485.24	644.75	778.52		(97)
Space heat	-ř		i			1	`	``	- 			Ī	
(98)m= 312.0	7 251.75	216.7	127.27	57.98	0	0	0	0	116.27	218.23	317.76		,
							Tota	l per year	(kWh/yeaı	r) = Sum(9	8) _{15,912} =	1618.02	(98)
Space heat	ing require	ement in	kWh/m²	² /year								41.41	(99)
9a. Energy r	eguiremer	nts – Indi	ividual h	eating sy	vstems i	ncluding	ı micro-C	CHP)					
Space hea		no ma	rradai ii	oamig o		rioraanig	, , , , , , ,	,					
Fraction of	•	at from s	econdar	v/supple	mentary	system						0	(201)
Fraction of	•				,	•	(202) = 1	- (201) =				1	(202)
	•		-	. ,			(204) = (2		(203)] =				╡゛
Fraction of		•	-				(204) - (2	02) 🗶 [1 —	(203)] =			1	(204)
Efficiency of	t main spa	ace heat	ing syste	em 1								89.5	(206)
Efficiency of	f seconda	ry/suppl	ementar	y heating	g system	າ, %						0	(208)
Jar	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	kWh/yea	ar
Space heat	ing require	ement (c	alculate	d above))								
312.0	7 251.75	216.7	127.27	57.98	0	0	0	0	116.27	218.23	317.76		
(211)m = {[(9	98)m x (20)4)] } x 1	00 ÷ (20	06)		•	•		•	•	•	•	(211)
348.6	i `	242.13	142.2	64.78	0	0	0	0	129.91	243.83	355.04		
	-1		Į.			Į.	Tota	l (kWh/yea	ar) =Sum(2	1 211) _{15,1012}	<u> </u>	1807.85	(211)
Space heat	ina fuel (s	econdar	v) kWh/	month									J
$= \{[(98) \text{m x} ($	•		• •										
(215)m= 0	0	0	0	0	0	0	0	0	0	0	0		
	I	<u>!</u>				<u> </u>	Tota	l I (kWh/yea	ar) =Sum(2	L 215) _{15.1012}	<u>. </u>	0	(215)
Water heati	na]` '
Output from	_	ter (calc	ulated a	hove)									
116.9		106.65	96.25	94.03	83.94	82.28	90.35	91.05	101.97	106.91	114.55		
Efficiency of	water hea	iter										89.5	(216)
(217)m= 89.5	89.5	89.5	89.5	89.5	89.5	89.5	89.5	89.5	89.5	89.5	89.5		」 (217)
Fuel for water		<u> </u>	<u> </u>										
(219)m = (6)	•												
(219)m= 130.7		119.16	107.54	105.06	93.79	91.93	100.95	101.73	113.94	119.45	127.99		
	•	•					Tota	I = Sum(2	19a) ₁₁₂ =		-	1326.22	(219)
Annual tota	ls								k'	Wh/year	•	kWh/year	_
Space heating	ng fuel use	ed, main	system	1						•		1807.85]
											ļ	-	_

Water heating fuel used			1326.22
Electricity for pumps, fans and electric keep-hot			_
central heating pump:		30	(2300
boiler with a fan-assisted flue		45	(230e
Total electricity for the above, kWh/year	sum of (230	a)(230g) =	75 (231)
Electricity for lighting			187.67 (232)
10a. Fuel costs - individual heating systems:			
	Fuel kWh/year	Fuel Price (Table 12)	Fuel Cost £/year
Space heating - main system 1	(211) x	3.48 x 0.01	= 62.91 (240)
Space heating - main system 2	(213) x	0 x 0.01	= 0 (241)
Space heating - secondary	(215) x	13.19 x 0.01	0 (242)
Water heating cost (other fuel)	(219)	3.48 × 0.01	= 46.15 (247)
Pumps, fans and electric keep-hot	(231)	13.19 × 0.01	9.89 (249)
(if off-peak tariff, list each of (230a) to (230g) sepa Energy for lighting	arately as applicable and app (232)	oly fuel price according to	
Additional standing charges (Table 12)			120 (251)
Appendix Q items: repeat lines (253) and (254) as	s needed		
Appendix Q items: repeat lines (253) and (254) as Total energy cost (245)(247)	s needed 7) + (250)(254) =		263.71 (255)
			263.71 (255)
Total energy cost (245)(247)			263.71 (255) 0.42 (256)
Total energy cost 11a. SAP rating - individual heating systems Energy cost deflator (Table 12)			
Total energy cost 11a. SAP rating - individual heating systems Energy cost deflator (Table 12)	7) + (250)(254) =		0.42 (256)
Total energy cost 11a. SAP rating - individual heating systems Energy cost deflator (Table 12) Energy cost factor (ECF) [(255) x (257)	7) + (250)(254) = 56)] ÷ [(4) + 45.0] =		0.42 (256) 1.32 (257)
Total energy cost 11a. SAP rating - individual heating systems Energy cost deflator (Table 12) Energy cost factor (ECF) SAP rating (Section 12)	7) + (250)(254) = 56)] ÷ [(4) + 45.0] =	Emission factor kg CO2/kWh	0.42 (256) 1.32 (257)
Total energy cost 11a. SAP rating - individual heating systems Energy cost deflator (Table 12) Energy cost factor (ECF) SAP rating (Section 12)	7) + (250)(254) = 56)] ÷ [(4) + 45.0] = s including micro-CHP Energy		0.42 (256) 1.32 (257) 81.62 (258) Emissions
Total energy cost 11a. SAP rating - individual heating systems Energy cost deflator (Table 12) Energy cost factor (ECF) [(255) x (255) x (2	7) + (250)(254) = 56)] ÷ [(4) + 45.0] = s including micro-CHP Energy kWh/year	kg CO2/kWh	0.42 (256) 1.32 (257) 81.62 (258) Emissions kg CO2/year
Total energy cost 11a. SAP rating - individual heating systems Energy cost deflator (Table 12) Energy cost factor (ECF) [(255) x (25) SAP rating (Section 12) 12a. CO2 emissions - Individual heating system Space heating (main system 1)	7) + (250)(254) = 56)] ÷ [(4) + 45.0] = s including micro-CHP Energy kWh/year (211) x	kg CO2/kWh 0.216 =	0.42 (256) 1.32 (257) 81.62 (258) Emissions kg CO2/year 390.49 (261)
Total energy cost 11a. SAP rating - individual heating systems Energy cost deflator (Table 12) Energy cost factor (ECF) SAP rating (Section 12) 12a. CO2 emissions – Individual heating system Space heating (main system 1) Space heating (secondary)	7) + (250)(254) = 56)] ÷ [(4) + 45.0] = s including micro-CHP Energy kWh/year (211) x (215) x	kg CO2/kWh 0.216 = 0.519 =	0.42 (256) 1.32 (257) 81.62 (258) Emissions kg CO2/year 390.49 (261) 0 (263)
Total energy cost 11a. SAP rating - individual heating systems Energy cost deflator (Table 12) Energy cost factor (ECF) SAP rating (Section 12) 12a. CO2 emissions - Individual heating system Space heating (main system 1) Space heating (secondary) Water heating	7) + (250)(254) = 56)] ÷ [(4) + 45.0] = s including micro-CHP Energy kWh/year (211) x (215) x (219) x	kg CO2/kWh 0.216 = 0.519 =	0.42 (256) 1.32 (257) 81.62 (258) Emissions kg CO2/year 390.49 (261) 0 (263) 286.46 (264)
Total energy cost 11a. SAP rating - individual heating systems Energy cost deflator (Table 12) Energy cost factor (ECF) SAP rating (Section 12) 12a. CO2 emissions - Individual heating system Space heating (main system 1) Space heating (secondary) Water heating Space and water heating	7) + (250)(254) = 56)] ÷ [(4) + 45.0] = s including micro-CHP Energy kWh/year (211) x (215) x (219) x (261) + (262) + (263) + (264) =	kg CO2/kWh 0.216 = 0.519 = 0.216 =	0.42 (256) 1.32 (257) 81.62 (258) Emissions kg CO2/year 390.49 (261) 0 (263) 286.46 (264) 676.96 (265)
Total energy cost 11a. SAP rating - individual heating systems Energy cost deflator (Table 12) Energy cost factor (ECF) [(255) x (255) x (2	7) + (250)(254) = 56)] ÷ [(4) + 45.0] = s including micro-CHP Energy kWh/year (211) x (215) x (219) x (261) + (262) + (263) + (264) = (231) x (232) x	kg CO2/kWh 0.216 = 0.519 = 0.519 =	0.42 (256) 1.32 (257) 81.62 (258) Emissions kg CO2/year 390.49 (261) 0 (263) 286.46 (264) 676.96 (265) 38.93 (267)
Total energy cost 11a. SAP rating - individual heating systems Energy cost deflator (Table 12) Energy cost factor (ECF) [(255) x (255) x (2	7) + (250)(254) = 56)] ÷ [(4) + 45.0] = s including micro-CHP Energy kWh/year (211) x (215) x (219) x (261) + (262) + (263) + (264) = (231) x (232) x sun	kg CO2/kWh 0.216 = 0.519 = 0.519 = 0.519 =	0.42 (256) 1.32 (257) 81.62 (258) Emissions kg CO2/year 390.49 (261) 0 (263) 286.46 (264) 676.96 (265) 38.93 (267) 97.4 (268)
Total energy cost 11a. SAP rating - individual heating systems Energy cost deflator (Table 12) Energy cost factor (ECF) [(255) x (25) SAP rating (Section 12) 12a. CO2 emissions - Individual heating system Space heating (main system 1) Space heating (secondary) Water heating Space and water heating Electricity for pumps, fans and electric keep-hot Electricity for lighting Total CO2, kg/year	7) + (250)(254) = 56)] ÷ [(4) + 45.0] = s including micro-CHP Energy kWh/year (211) x (215) x (219) x (261) + (262) + (263) + (264) = (231) x (232) x sun	kg CO2/kWh 0.216 = 0.519 = 0.519 = 0.519 = 0.519 = 0.519 =	0.42 (256) 1.32 (257) 81.62 (258) Emissions kg CO2/year 390.49 (261) 0 (263) 286.46 (264) 676.96 (265) 38.93 (267) 97.4 (268) 813.29 (272)

	Energy kWh/year	Primary factor		P. Energy kWh/year	
Space heating (main system 1)	(211) x	1.22	=	2205.57	(261)
Space heating (secondary)	(215) x	3.07	=	0	(263)
Energy for water heating	(219) x	1.22	=	1617.99	(264)
Space and water heating	(261) + (262) + (263) + (264) =			3823.56	(265)
Electricity for pumps, fans and electric keep-hot	(231) x	3.07	=	230.25	(267)
Electricity for lighting	(232) x	0	=	576.16	(268)
'Total Primary Energy	sum	of (265)(271) =		4629.97	(272)
Primary energy kWh/m²/year	(272	2) ÷ (4) =		118.5	(273)

			User D	etails: _						
Assessor Name:	Natalie Wheeler			Strom:	a Num	ber:		STRC	0027778	
Software Name:	Stroma FSAP 201	12		Softwa					on: 1.0.4.6	
		Р	roperty i	Address	Be Clea	an-Flat 3	3-1st floo	or		
Address :	Flat 3, Hampshire s	street								
1. Overall dwelling dime	nsions:									
			Area	a(m²)		Av. He	ight(m)	_	Volume(m ³	<u> </u>
Ground floor			3	9.07	(1a) x	2	2.4	(2a) =	93.77	(3a)
Total floor area TFA = (1a	a)+(1b)+(1c)+(1d)+(1e	e)+(1r	n) 3	9.07	(4)					
Dwelling volume					(3a)+(3b))+(3c)+(3c	d)+(3e)+	(3n) =	93.77	(5)
2. Ventilation rate:										
		econdar neating	у	other		total			m³ per hou	ır
Number of chimneys	0 +	0	+	0] = [0	X	40 =	0	(6a)
Number of open flues	0 +	0	Ī + Ē	0	j = F	0	X	20 =	0	(6b)
Number of intermittent far	ns				, <u> </u>	2	X	10 =	20	
Number of passive vents					<u> </u>	0	x	10 =	0	(7b)
·	roo				Ļ			40 =		Ⅎ``
Number of flueless gas fi	ies					0	^	40 =	0	(7c)
								Air cl	hanges per ho	our
Infiltration due to chimney	ys, flues and fans = (6	Sa)+(6b)+(7	'a)+(7b)+(7c) =	Г	20		÷ (5) =	0.21	(8)
If a pressurisation test has b	een carried out or is intend	ed, procee	d to (17), d	otherwise o	ontinue fr	om (9) to				
Number of storeys in the	ne dwelling (ns)								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	esent, use the value corres	sponding to	the great	er wall are	a (after					
If suspended wooden f	• / /	led) or 0	.1 (seale	ed), else	enter 0				0	(12)
If no draught lobby, ent	ter 0.05, else enter 0								0	(13)
Percentage of windows	s and doors draught s	tripped							0	(14)
Window infiltration				0.25 - [0.2	x (14) ÷ 1	00] =			0	(15)
Infiltration rate				(8) + (10)	+ (11) + (1	2) + (13)	+ (15) =		0	(16)
Air permeability value,	q50, expressed in cub	oic metre	s per ho	our per s	quare m	etre of e	envelope	area	5	(17)
If based on air permeabil	ity value, then (18) = [(1	17) ÷ 20]+(8	B), otherwi	ise (18) = (16)				0.46	(18)
Air permeability value applie		s been dor	ne or a deg	gree air pe	meability	is being u	sed			_
Number of sides sheltere	d			(20) = 1 -	n n75 v (1	Q\1 -			2	(19)
Shelter factor	ing aboltor factor			(20) = 13 (21) = (18)		3)] =			0.85	(20)
Infiltration rate incorporat	-	d		(21) - (10)	X (20) -				0.39	(21)
Infiltration rate modified for		1	Jul	۸۰۰۵	Con	Oct	Nov	Doo	7	
	Mar Apr May	Jun	Jui	Aug	Sep	Oct	INOV	Dec		
Monthly average wind sp		2.0	2.0	2.7	4	4.0	1 7	4 7	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									
(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		

0.5	ation rat	0.48	0.43	0.42	0.37	0.37	0.36	0.39	0.42	0.44	0.46]	
Calculate effe		•	rate for t	he appli	cable ca	se					ļ	J	
If mechanic							.=					0	(23
If exhaust air h		0 11		, ,	,	. `	,, .	,) = (23a)			0	(23
If balanced wit		•	•	Ū		`		,				0	(23
a) If balance	1					- 		ŕ	 		<u>` </u>	· ÷ 100] 1	(0.
24a)m= 0	0	0	0	0	. 0	0	0	0	0	0	0		(24
b) If balance						- 	- ^ `	´`	 			1	(2
24b)m= 0	0	0	0	0	. ,	0	0	0	0	0	0	J	(2
c) If whole h	nouse ex n < 0.5 ×			•	•				5 v (23h	.\			
$\frac{11(220)1}{24c)m=0}$	0.5 7	0	0	0	0	0	0	0	0	0	0	1	(2
d) If natural			·									J	,_
,	n = 1, the				•				0.5]				
24d)m= 0.63	0.62	0.62	0.59	0.59	0.57	0.57	0.57	0.58	0.59	0.6	0.61]	(2
Effective air	change	rate - er	iter (24a	or (24b	o) or (24	c) or (24	d) in box	(25)	•		•	•	
25)m= 0.63	0.62	0.62	0.59	0.59	0.57	0.57	0.57	0.58	0.59	0.6	0.61]	(2
2. Hoot loos	o ond bd	est logo r	aramata	~ P.								•	
3. Heat losse		•			Not Am		امدالا		A V I I		المديدات		A V I.
LEMENT	Gros area		Openin m		Net Ar A ,r		U-valı W/m2		A X U (W/I	〈)	k-value kJ/m²-l		A X k kJ/K
Ooors					1.87	x	1		1.87	, 			(2
Vindows Type	e 1				6.12	x1,	/[1/(1.4)+	0.04] =	8.11				(2
Vindows Type	e 2				2.3	x ₁ ,	/[1/(1.4)+	0.04] =	3.05				(2
loor					39.07	, x	0.065	[2.53955	<u> </u>			(2
Valls	35.4	12	10.29	<u> </u>	25.13	=	0.18	<u> </u>	4.52			7 H	(2
otal area of e	<u> </u>				74.49	=	00						` (3
arty wall		,			39.62	=	0		0	— [(3
Party ceiling					39.07	=				L		-	(3
for windows and	d roof wind	ows use e	ffective wi	ndow H-va			ı formula 1	/[(1/Ll-valu	ie)+0 041 a	L Is aiven in	naragranh		(3
* include the are						atou uomg	romaia i	/[(// O Talla	0,10.01,0	o givoii iii	paragrapi	7 0.2	
abric heat lo	ss, W/K :	= S (A x	U)				(26)(30)	+ (32) =				20.1	(3
	Cm = S((Axk)						((28)	.(30) + (32	2) + (32a).	(32e) =	0	(3
leat capacity	parame	ter (TMF	P = Cm ÷	- TFA) ir	n kJ/m²K			Indica	tive Value	Medium		250	(3
		4									ahla 1f		_
hermal mass				construct	ion are not	t known pr	ecisely the	e indicative	values of	IMP in Ta	able II		
Thermal mass for design assess an be used inste	ead of a de	tailed calc	ulation.				ecisely the	indicative	values of	IMP in Ta	able II	40.07	
Thermal mass for design asses an be used inste Thermal bridg	ead of a dea es : S (L	tailed calci x Y) cal	ulation. culated (using Ap	pendix ł		ecisely the	indicative	values of	IMP In Ta	able II	13.67	(3
hermal mass or design asses an be used inste hermal bridg details of therm	ead of a de es : S (L al bridging	tailed calci x Y) cal	ulation. culated (using Ap	pendix ł		ecisely the		values of (36) =	IMP In 18	име п		
hermal mass or design asses an be used inste hermal bridg details of thermal otal fabric he	ead of a deleas: S (L al bridging eat loss	tailed calcu x Y) cal are not kn	ulation. culated (own (36) =	using Ap = 0.15 x (3	pendix ł		ecisely the	(33) +				13.67	
Thermal mass for design assess an be used inste Thermal bridg details of thermal Total fabric he	ead of a deleas: S (L al bridging eat loss	tailed calcu x Y) cal are not kn	ulation. culated to	using Ap = 0.15 x (3	pendix ł			(33) + (38)m	(36) =				
Thermal mass For design asses an be used inste Thermal bridg details of therma Total fabric he Ventilation hea	ead of a deleas: S (Leal bridging eat loss cat	tailed calcu x Y) cal- are not kn	ulation. culated (own (36) =	using Ap = 0.15 x (3	ppendix k	<	Aug	(33) +	(36) = = 0.33 × (25)m x (5))		(3
Thermal mass for design assess an be used instead fabric hermal bridg details of thermal fotal fabric hermal fabri	es : S (L al bridging eat loss at loss ca Feb	x Y) calconnected x Y) calconn	ulation. culated to own (36) = I monthly	using Ap = 0.15 x (3 / May	ppendix ł 1) Jun	Jul	Aug	(33) + (38)m Sep 17.87	(36) = = 0.33 × (Oct 18.24	25)m x (5) Nov 18.51	Dec		(3
Thermal mass for design assessan be used instead for thermal bridged details of thermal fotal fabric hermal fabric	es : S (L al bridging eat loss at loss ca Feb	x Y) calconnected x Y) calconn	ulation. culated to own (36) = I monthly	using Ap = 0.15 x (3 / May	ppendix ł 1) Jun	Jul	Aug	(33) + (38)m Sep 17.87	(36) = = 0.33 × (25)m x (5) Nov 18.51	Dec		(3

Heat loss para	ameter (I	HLP), W	′m²K					(40)m	= (39)m ÷	- (4)			
(40)m= 1.36	1.36	1.35	1.33	1.33	1.32	1.32	1.31	1.32	1.33	1.34	1.35		
				l .		l .	l .		Average =	Sum(40) ₁ .	12 /12=	1.33	(40)
Number of day	<u> </u>	nth (Tab	le 1a)					ı		i			
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 hea	ting ene	rgy requi	rement:								kWh/ye	ar:	
Assumed occu if TFA > 13.9 if TFA £ 13.9	9, N = 1		[1 - exp	(-0.0003	349 x (TF	FA -13.9)2)] + 0.0	0013 x (¯	TFA -13		38		(42)
Annual average Reduce the annual not more that 125	ge hot wa al average	hot water	usage by	5% if the a	lwelling is	designed t			se target o		7.02		(43)
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Hot water usage i								·'	!				
(44)m= 73.72	71.04	68.36	65.68	63	60.32	60.32	63	65.68	68.36	71.04	73.72		
									Total = Su	m(44) ₁₁₂ =		804.23	(44)
Energy content of	f hot water	used - cal	culated me	onthly = 4.	190 x Vd,r	n x nm x C	OTm / 3600) kWh/mor	nth (see Ta	ables 1b, 1	c, 1d)		
(45)m= 109.33	95.62	98.67	86.02	82.54	71.23	66	75.74	76.64	89.32	97.5	105.88		
If instantaneous w	votor boot	ina at naint	of upo /pr	hat water	, ataragal	antar O in	haves (46		Total = Su	m(45) ₁₁₂ =	- [1054.47	(45)
If instantaneous w		· ·	,	ı	,.	ı	, ,	, , , I		1	 1		(40)
(46)m= 16.4 Water storage	14.34 loss:	14.8	12.9	12.38	10.68	9.9	11.36	11.5	13.4	14.62	15.88		(46)
Storage volum) includir	ia anv so	olar or W	/WHRS	storage	within sa	ame ves	sel		0		(47)
If community h	•	•	•			Ū							` '
Otherwise if no	_			_			, ,	ers) ente	er '0' in (47)			
Water storage													
a) If manufact	turer's d	eclared I	oss facto	or is kno	wn (kWł	n/day):					0		(48)
Temperature f	actor fro	m Table	2b								0		(49)
Energy lost fro		_	-				(48) x (49)) =			0		(50)
b) If manufactHot water store			-										(51)
If community h	•			IC 2 (KVV)	ii/iiti C/GC	' y)					0		(31)
Volume factor	_										0		(52)
Temperature f	actor fro	m Table	2b								0		(53)
Energy lost fro	m wate	r storage	, kWh/ye	ear			(47) x (51)) x (52) x (53) =		0		(54)
Enter (50) or	(54) in (55)									0		(55)
Water storage	loss cal	culated t	or each	month			((56)m = ((55) × (41)	m				
(56)m= 0	0	0	0	0	0	0	0	0	0	0	0		(56)
If cylinder contains	s dedicate	d solar sto	rage, (57)	m = (56)m	x [(50) – (H11)] ÷ (5	0), else (5	7)m = (56)	m where (H11) is fro	m Appendi	хН	
(57)m= 0	0	0	0	0	0	0	0	0	0	0	0		(57)
Primary circuit	loss (ar	nnual) fro	m Table	 - 3							0		(58)
Primary circuit	•	•			59)m = ((58) ÷ 36	65 × (41)	m					
(modified by	/ factor f	rom Tab	le H5 if t	here is s	olar wat	ter heatii	ng and a	cylinde	r thermo	stat)			
(59)m= 0	0	0	0	0	0	0	0	0	0	0	0		(59)

Combi	loss cal	loulated	for each	month ((61)m =	(60) ÷ 36	e5 √ (41	/m						
(61)m=	37.57	32.7	34.84	32.39	32.1	29.75	30.74	32.1	32.39	34.84	35.03	37.57	1	(61)
L						<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>		J (59)m + (61)m	
(62)m=	146.89	128.31	133.5	118.41	114.64	100.97	96.74	107.84	109.03	124.15	132.53	143.44		(62)
L		calculated			Appendix	x H (negativ		l					l	
						applies,						·		
(63)m=	0	0	0	0	0	0	0	0	0	0	0	0		(63)
WWHRS	-29.91	-26.31	-26.85	-22.16	-20.61	-17.03	-14.46	-17.49	-17.98	-22.18	-25.62	-28.89	ı	(63) (G10)
Output	from wa	ater hea	ter											
(64)m=	116.98	102.01	106.65	96.25	94.03	83.94	82.28	90.35	91.05	101.97	106.91	114.55	<u></u>	
-		-	-	-				Outp	out from w	ater heater	r (annual) ₁	12	1186.97	(64)
Heat ga	ains fror	n water	heating,	, kWh/m	onth 0.2	5 ′ [0.85	× (45)m	ı + (61)n	1] + 0.8 >	x [(46)m	+ (57)m	+ (59)m	1]	
(65)m=	45.74	39.97	41.52	36.7	35.47	31.12	29.63	33.21	33.58	38.41	41.18	44.6		(65)
inclu	de (57)r	n in calc	culation (of (65)m	only if c	cylinder is	s in the	dwelling	or hot w	ater is fr	om com	munity h	neating	
5. Inte	ernal ga	ins (see	Table 5	5 and 5a)):									
Metabo	olic gain	s (Table	5), Wat	ts										
[Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
(66)m=	69.09	69.09	69.09	69.09	69.09	69.09	69.09	69.09	69.09	69.09	69.09	69.09		(66)
Lighting	g gains	(calcula	ted in Ar	opendix '	L, equat	tion L9 or	r L9a), a	lso see	Table 5				•	
(67)m=	10.63	9.44	7.68	5.81	4.34	3.67	3.96	5.15	6.91	8.78	10.25	10.92		(67)
Appliar	nces gai	ns (calc	ulated in	1 Append	dix L, eq	uation L	13 or L1	3a), also	see Ta	ble 5				
(68)m=	119.2	120.44	117.32	110.69	102.31	94.44	89.18	87.94	91.06	97.69	106.07	113.94		(68)
Cookin	g gains	(calcula	ted in A	ppendix	L, equat	tion L15	or L15a), also se	e Table	5			'	
(69)m=	29.91	29.91	29.91	29.91	29.91	29.91	29.91	29.91	29.91	29.91	29.91	29.91		(69)
Pumps	and far	ns gains	(Table 5	<u></u> 5а)									•	
(70)m=	3	3	3	3	3	3	3	3	3	3	3	3		(70)
Losses	e.g. ev	aporatic	n (negat	tive valu	es) (Tab	ole 5)							•	
(71)m=	-55.27	-55.27	-55.27	-55.27	-55.27	-55.27	-55.27	-55.27	-55.27	-55.27	-55.27	-55.27		(71)
Water h	neating	gains (T	able 5)			•			,			•	•	
(72)m=	61.48	59.47	55.8	50.97	47.67	43.22	39.82	44.63	46.64	51.62	57.19	59.94		(72)
Total in	nternal	gains =	:			(66)	m + (67)r	ı + (68)m -	+ (69)m + ((70)m + (7	1)m + (72))m	•	
(73)m=	238.04	236.08	227.53	214.2	201.06	188.05	179.69	184.45	191.34	204.82	220.23	231.53		(73)
6. Sol	ar gains	s:												
Solar ga	ains are c	alculated	using sola	r flux from	Table 6a	and associ	iated equa	itions to co	nvert to th	ie applicab	le orientat	ion.		
Orienta		Access F Table 6d		Area m²		Flu Tab	ıx ble 6a	Т	g_ able 6b	T	FF able 6c		Gains (W)	
Southea	ast 0.9x	0.77	x	2.3	3	x 3	36.79	x	0.35	х	0.8	=	16.42	(77)
Southea	ast 0.9x	0.77	x	2.3	3	x 6	62.67	x	0.35	x	0.8	=	27.97	(77)
Southea	ast 0.9x	0.77	X	2.3	3	x 8	35.75	x	0.35	_ x _	0.8		38.27	(77)
Southea														

		_						,			_				_
Southeast _{0.9x}	0.77	X	2.3	3	X	1	19.01	X	(0.35	X	0.8	=	53.11	(77)
Southeast _{0.9x}	0.77	X	2.3	3	X	1	18.15	X	(0.35	X	0.8	=	52.73	(77)
Southeast _{0.9x}	0.77	X	2.3	3	X	1	13.91	X	(0.35	X	0.8	=	50.84	(77)
Southeast _{0.9x}	0.77	X	2.3	3	X	1	04.39	X	(0.35	X	0.8	=	46.59	(77)
Southeast _{0.9x}	0.77	X	2.3	3	X	9	92.85	X	(0.35	×	0.8	=	41.44	(77)
Southeast _{0.9x}	0.77	X	2.3	3	X	6	9.27	X	(0.35	×	0.8	=	30.91	(77)
Southeast 0.9x	0.77	X	2.3	3	x	4	14.07	X	(0.35	X	0.8	=	19.67	(77)
Southeast _{0.9x}	0.77	x	2.3	3	X	3	31.49	x	(0.35	×	0.8	=	14.05	(77)
Northwest 0.9x	0.77	X	6.1	2	x	1	1.28	x	(0.35	x	0.8	=	13.4	(81)
Northwest 0.9x	0.77	x	6.1	2	X	2	22.97	x	(0.35	×	0.8	=	27.27	(81)
Northwest 0.9x	0.77	x	6.1	2	X	4	11.38	X	(0.35	×	0.8	=	49.14	(81)
Northwest _{0.9x}	0.77	x	6.1	2	x	6	67.96	X	(0.35	×	0.8	=	80.7	(81)
Northwest _{0.9x}	0.77	x	6.1	2	x	9	91.35	x	(0.35	×	0.8	=	108.48	(81)
Northwest _{0.9x}	0.77	×	6.1	2	x	9	97.38	x	(0.35	×	0.8	_ =	115.65	(81)
Northwest _{0.9x}	0.77	x	6.1	2	x	,	91.1	x	(0.35	×	0.8	=	108.18	(81)
Northwest _{0.9x}	0.77	x	6.1	2	x	7	72.63	x	(0.35	×	0.8	=	86.25	(81)
Northwest _{0.9x}	0.77	×	6.1	2	x	5	50.42	x	(0.35	×	0.8	_ =	59.88	(81)
Northwest _{0.9x}	0.77	×	6.1	2	x	2	28.07	x	(0.35	×	0.8	=	33.33	(81)
Northwest _{0.9x}	0.77	×	6.1	2	X		14.2	x	(0.35	×	0.8	=	16.86	(81)
Northwest 0.9x	0.77	x	6.1	2	X	,	9.21	х	(0.35	×	0.8	=	10.94	(81)
Solar gains in watts, calculated for each month (83)m = Sum(74)m(82)m															
(83)m= 29.82		7.41	128.12	161.59	$\overline{}$	68.38	159.02	132	-	101.31	64.24	36.53	24.99]	(83)
Total gains – internal and solar (84)m = (73) m + (83) m , watts															
(84)m= 267.86	291.32 3	14.94	342.31	362.64	3	56.43	338.71	317	.29 2	292.65	269.0	7 256.76	256.53		(84)
7. Mean inter	nal tempera	ature (heating	seaso	n)				•			•			
Temperature	•	`				area	from Tal	ole 9	, Th1	(°C)				21	(85)
Utilisation fac	•	•			_				,	,					
Jan	T T	Mar	Apr	May	Ť	Jun	Jul	А	ug	Sep	Oct	Nov	Dec		
(86)m= 1	0.99	0.99	0.97	0.91	+	0.78	0.63	0.6	-	0.89	0.98	0.99	1		(86)
Mean interna	l temperatu	ıre in I	ivina ara	ea T1 /	follo	w ste	ns 3 to 7	7 in T	ahle (9c)			•		
(87)m= 19.56	 	9.95	20.3	20.65	$\overline{}$	20.88	20.97	20.		20.78	20.35	19.9	19.54]	(87)
							<u>ļ</u>						I	J	
Temperature (88)m= 19.79		ting pe	19.81	19.82	$\overline{}$	eiiing 9.83	19.83	19.		19.82	19.82	19.81	19.81	1	(88)
	L L		Į.					ļ		10.02	10.02	10.01	10.01	J	()
Utilisation fac	 				$\overline{}$				-, T	0.00	0.07	1 0 00		1	(00)
(89)m= 1	0.99	0.98	0.96	0.87		0.69	0.48	0.5	04	0.82	0.97	0.99	1		(89)
Mean interna					Ť	,		eps 3			9c)		,	1	
(90)m= 17.91	18.1 1	8.47	18.99	19.46	1	9.75	19.82	19.	81	19.64	19.07		17.89		(90)
										fL	_A = Liv	ving area ÷ (4) =	0.51	(91)
Mean interna	ıl temperatu	ıre (foı	the wh	ole dw	ellin	g) = f	LA × T1	+ (1	– fLA) × T2					
(92)m= 18.76	, , , , , , , , , , , , , , , , , , , 	9.23	19.66	20.07	$\overline{}$	20.33	20.41	20		20.22	19.73	19.18	18.74		(92)
Apply adjustr	nent to the	mean	internal	tempe	ratu	re fro	m Table	4e,	where	appro	priate	•	-	•	

							1			1		ı	
(93)m= 18.76	18.92	19.23	19.66	20.07	20.33	20.41	20.4	20.22	19.73	19.18	18.74		(93)
8. Space hea													
Set Ti to the return the utilisation			•		ed at st	ep 11 of	Table 9	b, so tha	ıt Ti,m=(76)m an	d re-calc	culate	
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Utilisation fac				iviay	<u> </u>	<u> </u>	l mag	СОР		1101	200		
(94)m= 0.99	0.99	0.98	0.95	0.88	0.73	0.56	0.61	0.85	0.96	0.99	0.99		(94)
Useful gains,	hmGm	, W = (94	4)m x (84	4)m	ļ	<u>!</u>			<u>!</u>	!		l	
(95)m= 266.17	288.46	308.99	326.61	320.35	261.41	188.45	194.01	248.26	259.47	253.99	255.19		(95)
Monthly 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	for mea	an intern	al tempe	erature,	Lm , W =	=[(39)m	x [(93)m	– (96)m]	-			
(97)m= 768.22	742.79	672.4	561.29	435.18	294.64	195.74	205.06	316.08	474.75	631.46	763.95		(97)
Space heatin					Wh/mon	th = 0.02	24 x [(97)m – (95)m] x (4		,	ı	
(98)m= 373.52	305.31	270.37	168.97	85.43	0	0	0	0	160.17	271.78	378.52		_
							Tota	l per year	(kWh/yea	r) = Sum(9	8) _{15,912} =	2014.08	(98)
Space heatin	g require	ement in	kWh/m²	/year								51.55	(99)
9a. Energy red	uiremer	nts – Indi	vidual h	eating s	ystems i	ncluding	micro-C	CHP)					
Space heatir	ng:					_							
Fraction of sp	ace hea	at from se	econdar	y/supple	mentary	system						0	(201)
Fraction of sp	ace hea	at from m	nain syst	em(s)			(202) = 1	- (201) =				1	(202)
Fraction of total heating from main system 1 (204) = (202) × [1 – (203)] =								1	(204)				
Efficiency of main space heating system 1									89.5	(206)			
Efficiency of secondary/supplementary heating system, %									0	(208)			
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	kWh/yea	```
Space heatin			•		l	Jul	Aug	Оср	000	1407	Dec	KVVII/yC	AI
373.52	305.31	270.37	168.97	85.43	0	0	0	0	160.17	271.78	378.52		
(211)m = {[(98)m x (20	L 4\ \ \ x 1	00 ÷ (20	16)	<u> </u>	<u> </u>	<u> </u>	ļ	<u> </u>	<u> </u>			(211)
417.35	341.13	302.09	188.79	95.46	0	0	0	0	178.96	303.67	422.93		(=)
					<u> </u>	<u> </u>	Tota	l I (kWh/yea	ar) =Sum(2	L 211) _{1 - 5 10 - 1} :	<u>. </u>	2250.37	(211)
Space heatin	a fuel (s	econdar	v) k\//h/	month									
$= \{[(98) \text{m x } (20)]$	•		• •										
(215)m= 0	0	0	0	0	0	0	0	0	0	0	0		
					l	l	Tota	l (kWh/yea	ar) =Sum(2	215) _{15,1012}	=	0	(215)
Water heating	I										!		_
Output from w	ater hea	ter (calc	ulated a	oove)								ı	
116.98	102.01	106.65	96.25	94.03	83.94	82.28	90.35	91.05	101.97	106.91	114.55		_
Efficiency of w	ater hea	iter										89.5	(216)
(217)m= 89.5	89.5	89.5	89.5	89.5	89.5	89.5	89.5	89.5	89.5	89.5	89.5		(217)
Fuel for water	•												
(219)m = (64)				105.00	02.70	04.00	100.05	104 70	142.04	140.45	107.00		
(219)m= 130.71	113.98	119.16	107.54	105.06	93.79	91.93	100.95	101.73 I = Sum(2	113.94 19a) =	119.45	127.99	1206.00	7(240)
Ammiral tatala							TUIA	– Juiii(Z		Mb 6		1326.22	(219)
Annual totals Space heating	fuel use	ed. main	system	1					K	Wh/yeaı		kWh/year 2250.37	7
		,											┙

					_
Water heating fuel used				1326.22	
Electricity for pumps, fans and electric keep-hot					
central heating pump:			30]	(230c)
boiler with a fan-assisted flue			45]	(230e)
Total electricity for the above, kWh/year		75	(231)		
Electricity for lighting				187.67	(232)
12a. CO2 emissions – Individual heating systems	s including micro-CHP				
	Energy	Emission fa		Emissions	
	kWh/year	kg CO2/kWh		kg CO2/yea	ar
Space heating (main system 1)	(211) x	0.216	=	kg CO2/yea	ar](261)
Space heating (main system 1) Space heating (secondary)	•				_
	(211) x	0.216	=	486.08	(261)
Space heating (secondary)	(211) x (215) x	0.216 0.519 0.216	=	486.08	(261)
Space heating (secondary) Water heating	(211) x (215) x (219) x	0.216 0.519 0.216	=	486.08 0 286.46	(261) (263) (264)
Space heating (secondary) Water heating Space and water heating	(211) x (215) x (219) x (261) + (262) + (263) + (264) =	0.216	= = =	486.08 0 286.46 772.54	(261) (263) (264) (265)
Space heating (secondary) Water heating Space and water heating Electricity for pumps, fans and electric keep-hot	(211) x (215) x (219) x (261) + (262) + (263) + (264) = (231) x (232) x	0.216 0.519 0.216	= = =	486.08 0 286.46 772.54 38.93	(261) (263) (264) (265) (267)

El rating (section 14)

(274)

SAP 2012 Overheating Assessment

Calculated by Stroma FSAP 2012 program, produced and printed on 18 May 2017

Property Details: Be Clean-Flat 3-1st floor

Dwelling type: Flat Located in: England

Region: South East England

Cross ventilation possible: Yes
Number of storeys: 1

Front of dwelling faces: North East

Overshading:Average or unknownOverhangs:as detailed belowThermal mass parameter:Indicative Value Medium

Night ventilation: False

Blinds, curtains, shutters:

Ventilation rate during hot weather (ach): 3 (Windows open half the time)

Overheating Details:

Summer ventilation heat loss coefficient: 92.83 (P1)

Transmission heat loss coefficient: 33.8

Summer heat loss coefficient: 126.6 (P2)

Overhangs:

Orientation: Ratio: Z_overhangs:

North West (Lounge terrace toors) 0.78 South East (Bedroom) 0.57 0.64

Solar shadina:

Orientation:	Z blinds:	Solar access:	Overhangs:	Z summer:	
North West (Lounge to	erralce doors)	0.9	0.78	0.68	(P8)
South East (Bedroom)	1	0.9	0.64	0.54	(P8)

Orientation	Area	Flux	g _	FF	Shading	Gains
North West (Lounge terrace)	doors).12	105.45	0.35	0.8	0.68	110.48
South East (Bedroom) 0.9 x	< 2.3	126.97	0.35	0.8	0.54	39.55
					Total	150.03 (P3/P4)

Internal gains:

	June	July	August	
Internal gains	265.65	255.14	261.08	
Total summer gains	426.51	405.17	386.85	(P5)
Summer gain/loss ratio	3.37	3.2	3.06	(P6)
Mean summer external temperature (South East England)	15.4	17.4	17.5	
Thermal mass temperature increment	0.25	0.25	0.25	
Threshold temperature	19.02	20.85	20.81	(P7)
Likelihood of high internal temperature	Not significant	Slight	Slight	

Assessment of likelihood of high internal temperature: Slight