Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.5.50 Printed on 14 December 2021 at 11:01:18

Project Information:

Assessed By: Jonathon Hill (STRO029949) **Building Type: Detached House**

Dwelling Details:

NEW DWELLING DESIGN STAGE Total Floor Area: 161.78m²

Site Reference: **Plot Reference:** Beech Hill Stores PLOT 2_Type A2

PLOT 2 Beech Hill Stores, Eddeys Lane, Headley Down, BORDON, GU35 8HU Address:

Client Details:

Name: Cimbrone Developments Ltd

Address: 43-45 Wellington Crescent, New Malden, KT3 3NE

This report covers items included within the SAP calculations.

It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas

Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER) 15.19 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER) 8.26 kg/m²

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE) 52.9 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE) 48.8 kWh/m²

2 Fabric U-values

Element **Average** Highest External wall 0.18 (max. 0.30) 0.20 (max. 0.70) OK Floor 0.20 (max. 0.25) 0.20 (max. 0.70) **OK** Roof 0.17 (max. 0.20) 0.18 (max. 0.35) OK 1.60 (max. 3.30) **Openings** 1.58 (max. 2.00) OK

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals 5.00 (design value)

OK Maximum 10.0

4 Heating efficiency

Main Heating system: Database: (rev 486, product index 018821):

Boiler systems with radiators or underfloor heating - mains gas

Brand name: Worcester Model: Greenstar 2000

Model qualifier: GR2300iW 30 C NG

(Combi)

Efficiency 89.0 % SEDBUK2009

Minimum 88.0 %

Secondary heating system: Room heaters - wood

Closed room heater Efficiency 65.0 %

Minimum 65.0 % OK

OK

OK

OK

Regulations Compliance Report

Cylinder insulation Hot water Storage:	No cylinder		
Controls	140 cyllidei		
ontrois			
Space heating controls	TTZC by plumbing and el	ectrical services	ОК
Hot water controls:	No cylinder thermostat		
Dallan intanla als	No cylinder		01/
Boiler interlock:	Yes		OK
ow energy lights		100.004	
Percentage of fixed lights with	n low-energy fittings	100.0%	
Minimum		75.0%	ОК
lechanical ventilation			
Not applicable			
Summertime temperature			
Overheating risk (Thames val	ley):	Slight	OK
ed on:			
Overshading:		Average or unknown	
Windows facing: North		6.89m²	
Windows facing: South		12.17m²	
Windows facing: East		0.48m²	
Roof windows facing: North		0.42m²	
Roof windows facing: South		1.12m²	
		4.00	
Ventilation rate:			
Key features			

Predicted Energy Assessment

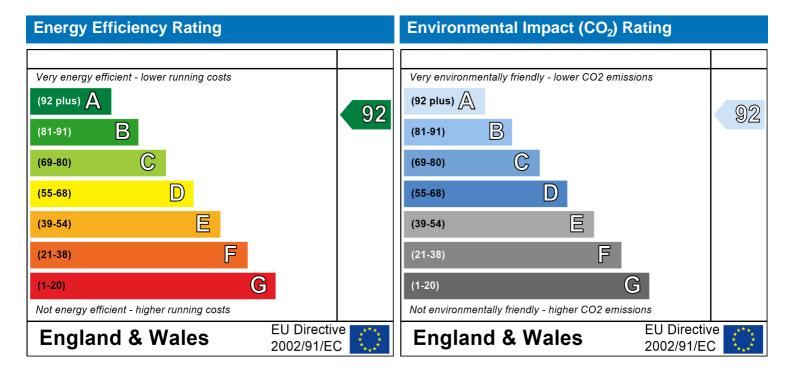


PLOT 2 Beech Hill Stores Eddeys Lane Headley Down BORDON GU35 8HU Dwelling type:
Date of assessment:
Produced by:
Total floor area:

Detached House 13 December 2021 Jonathon Hill 161.78 m²

This is a Predicted Energy Assessment for a property which is not yet complete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, an Energy Performance Certificate is required providing information about the energy performance of the completed property.

Energy performance has been assessed using the SAP 2012 methodology and is rated in terms of the energy use per square metre of floor area, energy efficiency based on fuel costs and environmental impact based on carbon dioxide (CO2) emissions.



The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.

The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO2) emissions. The higher the rating the less impact it has on the environment.

User Details:	
Assessor Name: Jonathon Hill Stroma Number: STF	RO029949
Software Name: Stroma FSAP 2012 Software Version: Vers	sion: 1.0.5.50
Property Address: PLOT 2_Type A2	
Address: PLOT 2 Beech Hill Stores, Eddeys Lane, Headley Down, BORDON, GU35	8HU
1. Overall dwelling dimensions:	
Area(m²) Av. Height(m)	Volume(m³)
Ground floor 67.13 (1a) x 2.6 (2a) :	= 174.54 (3a)
First floor 67.13 (1b) x 2.6 (2b)	= 174.54 (3b)
Second floor 27.52 (1c) x 2.12 (2c) =	= 58.34 (3c)
Total floor area TFA = $(1a)+(1b)+(1c)+(1d)+(1e)+(1n)$ 161.78 (4)	
Dwelling volume $(3a)+(3b)+(3c)+(3d)+(3e)+(3n) =$	407.42 (5)
2. Ventilation rate:	
main secondary other total heating heating	m³ per hour
Number of chimneys $0 + 0 = 0 \times 40 =$	0 (6a)
Number of open flues $0 + 0 + 0 = 0 \times 20 =$	0 (6b)
Number of intermittent fans x 10 =	30 (7a)
Number of passive vents 0 x 10 =	0 (7b)
Number of flueless gas fires 0 x 40 =	0 (7c)
Δir	changes per hour
Infiltration due to chimneys, flues and fans = $(6a)+(6b)+(7a)+(7b)+(7c) =$ 30 $\div (5) =$	0.07 (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)	0 (9)
Additional infiltration [(9)-1]x0.1	
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	0 (11)
deducting areas of openings); if equal user 0.35	
If suspended wooden floor, enter 0.2 (unsealed) or 0.1 (sealed), else enter 0	0 (12)
If no draught lobby, enter 0.05, else enter 0	0 (13)
Percentage of windows and doors draught stripped	0 (14)
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	5 (17)
If based on air permeability value, then $(18) = [(17) \div 20] + (8)$, otherwise $(18) = (16)$	0.32 (18)
Air permeability value applies if a pressurisation test has been done or a degree air permeability is being used	
Number of sides sheltered	0 (19)
Shelter factor $(20) = 1 - [0.075 \times (19)] =$	1 (20)
Infiltration rate incorporating shelter factor (21) = (18) x (20) =	0.32 (21)
Infiltration rate modified for monthly wind speed	
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov De	С
Monthly average wind speed from Table 7	

4.4

4.3

3.8

3.8

3.7

4.3

4

4.5

4.7

4.9

(22)m=

5.1

5

Wind Factor (22	a)m =	(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		
A 1: 4 1: 5:14 4:	. ,	, II .					(04.)	(00.)				ı	
Adjusted infiltrati	on rate	e (allowi	ng for sr 0.36	o.35	0.31	speed) = 0.31	(21a) x	(22a)m 0.32	0.35	0.36	0.38		
Calculate effecti	-	-			l	1	0.3	0.32	0.35	0.36	0.36		
If mechanical		-		• •								0	(23a)
If exhaust air heat	t pump ι	using Appe	endix N, (2	3b) = (23a	a) × Fmv (equation (I	N5)) , othe	rwise (23b) = (23a)			0	(23b)
If balanced with h	eat reco	very: effic	iency in %	allowing f	or in-use f	factor (fron	n Table 4h	ı) =				0	(23c)
a) If balanced	mecha	anical ve	entilation	with he	at recov	ery (MVI	HR) (24a	a)m = (22)	2b)m + ((23b) × [1 – (23c)	÷ 100]	
(24a)m= 0	0	0	0	0	0	0	0	0	0	0	0		(24a)
b) If balanced			ı		i	 	- ^ ` ` - 	í `	 		1	I	(5.41.)
(24b)m= 0	0	0	0	0	0	0	0	0	0	0	0		(24b)
c) If whole hou				•	•				E (22k	۵١			
if (22b)m < (24c)m= 0	0.5 x	(23b), t	nen (240	(23L) = (23L)), otner	0	$C_0 = (22)$	0) III + 0.	.5 × (23L) 0	0		(24c)
d) If natural ve													(= :0)
if (22b)m =									0.5]				
(24d)m= 0.59	0.58	0.58	0.56	0.56	0.55	0.55	0.54	0.55	0.56	0.57	0.57		(24d)
Effective air ch	nange	rate - er	nter (24a) or (24b	o) or (24	c) or (24	d) in bo	x (25)	-	-	-		
(25)m= 0.59	0.58	0.58	0.56	0.56	0.55	0.55	0.54	0.55	0.56	0.57	0.57		(25)
3. Heat losses	and he	eat loss r	paramete	ōt.									
	a	at 1000 p	Jaiaiiiott	J									
ELEMENT	Gros area	SS	Openin m	gs	Net Ar A ,		U-val W/m2		A X U (W/		k-value kJ/m²-ł		A X k kJ/K
	Gros	SS	Openin	gs		m²			_	K)			
ELEMENT	Gros	SS	Openin	gs	ı, A	m ²	W/m2	2K	(W/	K)			kJ/K
ELEMENT Doors Type 1	Gros area	SS	Openin	gs	A ,ı	m² x	W/m2	2K = = =	(W/ 3.285	K)			kJ/K (26)
ELEMENT Doors Type 1 Doors Type 2	Gros area	SS	Openin	gs	A ,ı 2.19	m ²	1.5 1.5	2K = = = 0.04] =	(W/ 3.285 2.34	K)			kJ/K (26) (26)
ELEMENT Doors Type 1 Doors Type 2 Windows Type 1	Gros area	SS	Openin	gs	A ,1 2.19 1.56 6.89	m ² x x x x 1 x 1 x 1	W/m2 1.5 1.5 /[1/(1.6)+	2K = = = = = = = = = =	(W/ 3.285 2.34 10.36	K)			(26) (26) (27)
ELEMENT Doors Type 1 Doors Type 2 Windows Type 1 Windows Type 2	Gros area	SS	Openin	gs	A ,1 2.19 1.56 6.89	m ²	W/m ² 1.5 1.5 /[1/(1.6)+ /[1/(1.6)+	= = = = = = = = = = = = = = = = = = =	(W/ 3.285 2.34 10.36 18.3	K)			kJ/K (26) (26) (27) (27)
ELEMENT Doors Type 1 Doors Type 2 Windows Type 1 Windows Type 2 Windows Type 3	Gros area	SS	Openin	gs	A ,1 2.19 1.56 6.89 12.17	m ²	W/m ² 1.5 1.5 /[1/(1.6)+ /[1/(1.6)+	EK = = -0.04 =	(W/ 3.285 2.34 10.36 18.3 0.72	K)			kJ/K (26) (26) (27) (27) (27)
Doors Type 1 Doors Type 2 Windows Type 1 Windows Type 2 Windows Type 3 Rooflights Type	Gros area	SS	Openin	gs	A ,1 2.19 1.56 6.89 12.17 0.48	m² x x x1 x1 x1 x1	W/m ² 1.5 1.5 /[1/(1.6)+ /[1/(1.6)+ /[1/(1.6) +	EK = = -0.04 =	(W/ 3.285 2.34 10.36 18.3 0.72 0.672	K)			kJ/K (26) (26) (27) (27) (27) (27b)
ELEMENT Doors Type 1 Doors Type 2 Windows Type 1 Windows Type 2 Windows Type 3 Rooflights Type Rooflights Type	Gros area	ss (m²)	Openin	gs ²	A ,1 2.19 1.56 6.89 12.17 0.48 0.42 1.12	m²	W/m2 1.5 1.5 /[1/(1.6)+ /[1/(1.6)+ /[1/(1.6) + /[1/(1.6) +	eK = = = = = = = = = = = = = = = = = = =	(W/ 3.285 2.34 10.36 18.3 0.72 0.672	K) 			(26) (26) (27) (27) (27) (27b) (27b)
ELEMENT Doors Type 1 Doors Type 2 Windows Type 1 Windows Type 2 Windows Type 3 Rooflights Type Rooflights Type Floor	Gros area	ss (m²)	Openin m	gs ²	A ,1 2.19 1.56 6.89 12.17 0.48 0.42 1.12 67.13	m² x x x x x x x x x x x x x x x x x x x	W/m2 1.5 1.5 /[1/(1.6)+ /[1/(1.6)+ /[1/(1.6) + /[1/(1.6) + /[1/(1.6) +	2K = = = = = = = = = = = = = = = = = = =	(W/ 3.285 2.34 10.36 18.3 0.72 0.672 1.792	K) 			(26) (26) (27) (27) (27) (27b) (28)
ELEMENT Doors Type 1 Doors Type 2 Windows Type 1 Windows Type 2 Windows Type 3 Rooflights Type Rooflights Type Floor Walls Type 1	Gros area 2 3 1 1 1 1 1 1 1 1 1 1 1 1	ss (m²)	Openin m	gs ²	A ,1 2.19 1.56 6.89 12.17 0.48 0.42 1.12 67.13	m² x x x1	W/m2 1.5 1.5 /[1/(1.6)+ /[1/(1.6)+ /[1/(1.6) + /[1/(1.6) + /[1/(1.6) + 0.2 0.18	2K = = = = = = = = = =	(W/ 3.285 2.34 10.36 18.3 0.72 0.672 1.792 13.426 27.27	K) 			kJ/K (26) (26) (27) (27) (27b) (27b) (28)
ELEMENT Doors Type 1 Doors Type 2 Windows Type 1 Windows Type 2 Windows Type 3 Rooflights Type Rooflights Type Floor Walls Type1 Walls Type2	Gros area 2 3 1 1 1 1 1 1 1 1 1 1 1 1	77 4 9	23.29 0	gs ²	A ,1 2.19 1.56 6.89 12.17 0.48 0.42 1.12 67.13 151.4	m² x x x x x x x x x x x x x x x x x x x	W/m2 1.5 1.5 /[1/(1.6)+ /[1/(1.6)+ /[1/(1.6)+ /[1/(1.6) + /[1/(1.6) + 0.2 0.18	2K = = = = = = = = = =	(W/ 3.285 2.34 10.36 18.3 0.72 0.672 1.792 13.426 27.27 3.95	K) 			kJ/K (26) (27) (27) (27b) (27b) (28) (29)
ELEMENT Doors Type 1 Doors Type 2 Windows Type 2 Windows Type 3 Rooflights Type Rooflights Type Floor Walls Type1 Walls Type2 Roof Type1	Gros area 2 3 1 1 2 174.: 19.7 36.9	77 - 4 - 9 - 5	23.29 0	gs ²	A ,1 2.19 1.56 6.89 12.17 0.48 0.42 1.12 67.13 151.4 19.74	m²	W/m2 1.5 1.5 /[1/(1.6)+ /[1/(1.6)+ /[1/(1.6)+ /[1/(1.6) + /[1/(1.6) + 0.2 0.18 0.2	2K = = = = = = = =	(W/ 3.285 2.34 10.36 18.3 0.72 0.672 1.792 13.426 27.27 3.95 5.92	K) 			kJ/K (26) (26) (27) (27) (27b) (27b) (28) (29) (29) (30)
ELEMENT Doors Type 1 Doors Type 2 Windows Type 2 Windows Type 2 Windows Type 3 Rooflights Type Rooflights Type Floor Walls Type1 Walls Type2 Roof Type1 Roof Type2	Gros area 2 3 1 2 174.: 19.7 36.9 42.1 ments	77 74 9 5 , m ²	23.29 0 1.54	gs 2	A ,1 2.19 1.56 6.89 12.17 0.48 0.42 1.12 67.13 151.4 19.74 36.99 40.66 340.7	m²	W/m2 1.5 1.5 /[1/(1.6)+ /[1/(1.6)+ /[1/(1.6) + /[1/(1.6) + /[1/(1.6) + 0.2 0.18 0.2 0.18	EK = = = = = = = = =	(W/ 3.285 2.34 10.36 18.3 0.72 0.672 1.792 13.426 27.27 3.95 5.92 7.31	K)	kJ/m²-ŀ		kJ/K (26) (27) (27) (27b) (27b) (28) (29) (30) (30)
Doors Type 1 Doors Type 2 Windows Type 2 Windows Type 2 Windows Type 3 Rooflights Type Rooflights Type Floor Walls Type1 Walls Type2 Roof Type1 Roof Type2 Total area of ele	Gros area 2 174.7 19.7 36.9 42.1 ments of windo	oss (m²) 77 4 9 5 ows, use esides of in	23.29 0 1.54 effective winternal wall	gs 2	A ,1 2.19 1.56 6.89 12.17 0.48 0.42 1.12 67.13 151.4 19.74 36.99 40.66 340.7	m²	W/m2 1.5 1.5 /[1/(1.6)+ /[1/(1.6)+ /[1/(1.6) + /[1/(1.6) + /[1/(1.6) + 0.2 0.18 0.2 0.18	2K =	(W/ 3.285 2.34 10.36 18.3 0.72 0.672 1.792 13.426 27.27 3.95 5.92 7.31	K)	kJ/m²-ŀ		kJ/K (26) (27) (27) (27b) (27b) (28) (29) (30) (30)
ELEMENT Doors Type 1 Doors Type 2 Windows Type 2 Windows Type 3 Rooflights Type Rooflights Type Floor Walls Type1 Walls Type2 Roof Type1 Roof Type2 Total area of ele * for windows and ro ** include the areas	Gros area 2 3 1 2 174.: 19.7 36.9 42.1 ments of windo on both , W/K =	5S (m²) 77 4 9 5 , m² cows, use e sides of in = S (A x	23.29 0 1.54 effective winternal wall	gs 2	A ,1 2.19 1.56 6.89 12.17 0.48 0.42 1.12 67.13 151.4 19.74 36.99 40.66 340.7	m²	W/m2 1.5 1.5 /[1/(1.6)+ /[1/(1.6)+ /[1/(1.6) + /[1/(1.6) + /[1/(1.6) + 0.2 0.18 0.2 0.18 0.18	2K = = -0.04 =	(W/ 3.285 2.34 10.36 18.3 0.72 0.672 1.792 13.426 27.27 3.95 5.92 7.31	K)	kJ/m²-l	3.2	kJ/K (26) (27) (27) (27b) (27b) (28) (29) (30) (31)
ELEMENT Doors Type 1 Doors Type 2 Windows Type 2 Windows Type 2 Windows Type 3 Rooflights Type Rooflights Type Floor Walls Type1 Walls Type1 Walls Type2 Roof Type1 Roof Type2 Total area of ele * for windows and ro ** include the areas Fabric heat loss,	Gros area 2 3 174.7 36.9 42.1 ments of winder on both on both of winder on w	5S (m²) 4 19 5 , m² cws, use e sides of in = S (A x A x k)	23.29 0 1.54 effective winternal walk	gs 2 9 Indow U-vals and pan	A ,1 2.19 1.56 6.89 12.17 0.48 0.42 1.12 67.13 151.4 19.74 36.99 40.67 340.7	m ²	W/m2 1.5 1.5 /[1/(1.6)+ /[1/(1.6)+ /[1/(1.6) + /[1/(1.6) + /[1/(1.6) + 0.2 0.18 0.2 0.18 0.18	2K =	(W/ 3.285 2.34 10.36 18.3 0.72 0.672 1.792 13.426 27.27 3.95 5.92 7.31	K)	kJ/m²-l	3.2	kJ/K (26) (27) (27) (27b) (27b) (28) (29) (30) (31)

an be used ir													
	ridges : S (L				-	K						19.36	(36
	ermal bridging c heat loss	are not kn	own (36) =	= 0.05 x (3	1)			(33) +	(36) =			444.50	
	heat loss c	alculatod	l monthly	M				` '	, ,	25)m x (5)		114.56	(37
Ja		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	1	
38)m= 78.6	_	77.79	75.74	75.36	73.58	73.58	73.25	74.27	75.36	76.14	76.95		(38
′	fer coefficie							<u> </u>	= (37) + (37)	<u> </u>		J	
39)m= 193.		192.35	190.3	189.92	188.14	188.14	187.81	188.82	189.92	190.69	191.5	1	
100.	102.70	102.00	100.0	100.02	100.11	100.11	107.01	<u> </u>		Sum(39) ₁ .		190.3	(39
leat loss p	oarameter (l	HLP), W/	/m²K						= (39)m ÷				
40)m= 1.1	19 1.19	1.19	1.18	1.17	1.16	1.16	1.16	1.17	1.17	1.18	1.18		_
Jumber of	days in mo	nth (Tabl	le 1a)						Average =	Sum(40) _{1.}	12 /12=	1.18	(40
Ja	- 1	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec]	
41)m= 31	1 28	31	30	31	30	31	31	30	31	30	31		(41
<u></u>												-	
4. Water h	heating ene	rav reaui	irement:								kWh/ye	ear:	
ssumed o	occupancy.	N I											11
			[4 0)(0		140 v /TI	-	\2\1 · 0 /	1042 v /	TEA 42		95	J	(-
if TFA > 1	13.9, N = 1		[1 - exp	(-0.0003	349 x (TF	FA -13.9)2)] + 0.0	0013 x (ΓFA -13.		95	I	(4
if TFA > 1	13.9, N = 1 13.9, N = 1	+ 1.76 x							ΓFA -13.	.9)]	
if TFA > 1 if TFA £ 1 nnual ave reduce the ar	13.9, N = 1 13.9, N = 1 erage hot wannual average	+ 1.76 x ater usag	ge in litre usage by	es per da 5% if the d	ay Vd,av Iwelling is	erage =	(25 x N)	+ 36		9)	95]	
if TFA > 1 if TFA £ 1 nnual ave educe the ar	13.9, N = 1 13.9, N = 1 erage hot w	+ 1.76 x ater usag	ge in litre usage by	es per da 5% if the d	ay Vd,av Iwelling is	erage =	(25 x N)	+ 36		9)]	
if TFA > ' if TFA £ ' .nnual ave leduce the ar ot more that	13.9, N = 1 13.9, N = 1 erage hot wannual average 125 litres per	+ 1.76 x ater usag hot water person per	ge in litre usage by day (all w	es per da 5% if the d vater use, f	ay Vd,av welling is not and co Jun	erage = designed i bld) Jul	(25 x N) to achieve	+ 36		9)]	
if TFA > ' if TFA £ ' annual ave deduce the ar ot more that	13.9, N = 1 13.9, N = 1 erage hot wannual average 125 litres per	+ 1.76 x ater usag hot water person per	ge in litre usage by day (all w Apr ach month	es per da 5% if the d vater use, f	ay Vd,av welling is not and co Jun	erage = designed i bld) Jul	(25 x N) to achieve	+ 36 a water us Sep	se target o	9)	4.3		
if TFA > 'if TFA £ ' Innual ave deduce the areot more that Jacot water usa	13.9, N = 1 13.9, N = 1 erage hot wannual average is 125 litres per an Feb age in litres pe	+ 1.76 x ater usag hot water person per	ge in litre usage by day (all w	es per da 5% if the d vater use, f	ay Vd,av welling is not and co Jun	erage = designed i bld) Jul	(25 x N) to achieve	+ 36 a water us	se target o	9)	4.3		(4
if TFA > 1 if TFA £ 1 innual ave reduce the ar of more that Ja reduction water usas 14)m= 114.	13.9, N = 1 13.9, N = 1 erage hot wannual average 125 litres per an Feb age in litres pe	+ 1.76 x ater usage hot water person per Mar r day for ear 106.38	ge in litre usage by day (all w Apr ach month	es per da 5% if the d vater use, I May Vd,m = fac 98.04	ay Vd,av lwelling is not and co Jun ctor from 1	rerage = designed in did) Jul Table 1c x 93.87	(25 x N) to achieve Aug (43) 98.04	+ 36 a water us Sep	Oct 106.38 Total = Su	9) Nov 110.55 m(44)112 =	4.3 Dec 114.73	1251.55	(4
if TFA > f if TFA £ f annual ave beduce the ar of more that Ja dot water usa 14)m= 114. Inergy conter	13.9, N = 1 13.9, N = 1 erage hot wannual average 125 litres per an Feb age in litres pe	+ 1.76 x ater usage hot water person per Mar r day for ear 106.38	ge in litre usage by day (all w Apr ach month 102.21	es per da 5% if the day atter use, P May $Vd, m = factor 98.04$ Onthly = 4.	ay Vd,av lwelling is not and co Jun ctor from 1 93.87	rerage = designed in did) Jul Table 1c x 93.87	(25 x N) to achieve Aug (43) 98.04	+ 36 a water us Sep 102.21	Oct 106.38 Total = Sunth (see Tail	Nov 110.55 m(44)12 = ables 1b, 1	4.3 Dec 114.73 c, 1d)	1251.55	(4
if TFA > f if TFA £ f annual ave reduce the ar of more that Ja reduce the ar of more that 14)m= 114. Intergy conter	13.9, N = 1 13.9, N = 1 erage hot wannual average 125 litres per an Feb age in litres pe	+ 1.76 x ater usage hot water person per Mar r day for ear 106.38	ge in litre usage by day (all w Apr ach month	es per da 5% if the d vater use, I May Vd,m = fac 98.04	ay Vd,av lwelling is not and co Jun ctor from 1	rerage = designed in did) Jul Table 1c x 93.87	(25 x N) to achieve Aug (43) 98.04	+ 36 a water us Sep 102.21 6 kWh/mor 119.27	Oct 106.38 Total = Su 1th (see Ta	9) Nov 110.55 m(44) ₁₁₂ = ables 1b, 1 151.73	4.3 Dec 114.73 c, 1d) 164.77	1251.55	(4
if TFA > f if TFA £ f nnual ave educe the ar of more that Ja of water usa; 4)m= 114. nergy conter 5)m= 170.	13.9, N = 1 13.9, N = 1 erage hot wannual average 125 litres per an Feb age in litres pe	+ 1.76 x ater usag hot water person per Mar r day for ea 106.38 used - calc 153.55	ge in litre usage by day (all w Apr ach month 102.21 culated me 133.87	es per da 5% if the day 5% if the day 5% if the day 5% 5% 5% 5% 5% 5% 5% 5%	y Vd,av welling is not and co Jun ctor from 7 93.87 190 x Vd,r	erage = designed to designed t	(25 x N) to achieve Aug (43) 98.04 07m / 3600 117.86	+ 36 a water us Sep 102.21 6 kWh/mor 119.27	Oct 106.38 Total = Su 1th (see Ta	Nov 110.55 m(44)12 = ables 1b, 1	4.3 Dec 114.73 c, 1d) 164.77		(4
if TFA > f if TFA £ f nnual ave educe the are of more that Ja of water usa 4)m= 114. nergy conter 5)m= 170. instantaneou	13.9, N = 1 148.8 148.8 148.8	+ 1.76 x ater usag hot water person per Mar r day for ea 106.38 used - calc 153.55	ge in litre usage by day (all w Apr ach month 102.21 culated me 133.87	es per da 5% if the day 5% if the day 5% if the day 5% 5% 5% 5% 5% 5% 5% 5%	y Vd,av welling is not and co Jun ctor from 7 93.87 190 x Vd,r	erage = designed to designed t	(25 x N) to achieve Aug (43) 98.04 07m / 3600 117.86	+ 36 a water us Sep 102.21 6 kWh/mor 119.27	Oct 106.38 Total = Su 1th (see Ta	9) Nov 110.55 m(44) ₁₁₂ = ables 1b, 1 151.73	4.3 Dec 114.73 c, 1d) 164.77		(4
if TFA > f if TFA £ f nnual ave educe the ar of more that Ja of water usa; 4)m= 114. nergy conter 5)m= 170. instantaneous 6)m= 25.5	13.9, N = 1 148.8 148.8 152 22.32	+ 1.76 x ater usage hot water person per Mar 106.38 106.38 used - calculated the calculated	ge in litre usage by day (all w Apr ach month 102.21 culated me 133.87	es per da 5% if the d vater use, h May Vd,m = fact 98.04 onthly = 4. 128.45	y Vd,av welling is not and co Jun ctor from 7 93.87 190 x Vd,r 110.84	erage = designed in did) Jul Table 1c x 93.87 m x nm x E 102.71 enter 0 in	(25 x N) to achieve Aug (43) 98.04 27m / 3600 117.86 boxes (46)	+ 36 a water us Sep 102.21 0 kWh/mor 119.27 0 to (61)	Oct 106.38 Total = Sunth (see Tail 139) Total = Sunth 139	Nov 110.55 m(44) ₁₁₂ = ables 1b, 1 151.73 m(45) ₁₁₂ =	4.3 Dec 114.73		(4
if TFA > f if TFA £ f nnual ave educe the are of more that Ja of water usa 4)m= 114. nergy conter 5)m= 170. instantaneous 6)m= 25.5 /ater stora	13.9, N = 1 148.8 148.8 152 22.32	+ 1.76 x ater usage hot water person per Mar r day for each 106.38 used - calconditions 153.55 ing at point 23.03	ge in litre usage by day (all w Apr ach month 102.21 culated me 133.87 of use (no	es per da 5% if the da rater use, h May Vd,m = fac 98.04 128.45 hot water 19.27	y Vd,av lwelling is not and co Jun ctor from 1 93.87 190 x Vd,r 110.84	erage = designed in designed i	(25 x N) to achieve Aug (43) 98.04 117.86 boxes (46) 17.68	+ 36 a water us Sep 102.21 0 kWh/mor 119.27 0 to (61) 17.89	Oct 106.38 Total = Su 139 Total = Su 20.85	9) Nov 110.55 m(44) ₁₁₂ = ables 1b, 1 151.73 m(45) ₁₁₂ = 22.76	4.3 Dec 114.73		(4)
if TFA > f if TFA £ f nnual ave educe the are of more that Ja of water usa 4)m= 114. nergy conter 5)m= 170. instantaneous fater stora torage vol communit	13.9, N = 1 148.9 145.1 148.8 152	+ 1.76 x ater usage hot water person per Mar r day for each 106.38 used - calconding at point 23.03 including and no talconding at a point and no talconding at a point and no talconding an	ge in litre usage by day (all w Apr ach month 102.21 culated me 133.87 of use (no 20.08 ag any se ank in dw	es per da 5% if the d vater use, f May Vd,m = fac 98.04 128.45 o hot water 19.27 colar or W velling, e	y Vd,av welling is not and co Jun ctor from 1 93.87 190 x Vd,r 110.84 storage), 16.63	erage = designed in designed i	(25 x N) to achieve Aug (43) 98.04 117.86 boxes (46) 17.68 within sa (47)	+ 36 a water us Sep 102.21 0 kWh/mor 119.27 0 to (61) 17.89 ame ves	Oct 106.38 Total = Su 139 Total = Su 20.85	9) Nov 110.55 m(44)112 = ables 1b, 1 151.73 m(45)112 = 22.76	4.3 Dec 114.73 = c, 1d) 164.77 =		(44
if TFA > f if TFA £ f nnual ave educe the are of more that Ja of water usa 4)m= 114. nergy conter 5)m= 170. instantaneous dater stora torage vol community therwise i	13.9, N = 1 148.8 148.8 152	+ 1.76 x ater usage hot water person per Mar r day for each 106.38 used - calconding at point 23.03 including and no talconding at a point and no talconding at a point and no talconding an	ge in litre usage by day (all w Apr ach month 102.21 culated me 133.87 of use (no 20.08 ag any se ank in dw	es per da 5% if the d vater use, f May Vd,m = fac 98.04 128.45 o hot water 19.27 colar or W velling, e	y Vd,av welling is not and co Jun ctor from 1 93.87 190 x Vd,r 110.84 storage), 16.63	erage = designed in designed i	(25 x N) to achieve Aug (43) 98.04 117.86 boxes (46) 17.68 within sa (47)	+ 36 a water us Sep 102.21 0 kWh/mor 119.27 0 to (61) 17.89 ame ves	Oct 106.38 Total = Su 139 Total = Su 20.85	9) Nov 110.55 m(44)112 = ables 1b, 1 151.73 m(45)112 = 22.76	4.3 Dec 114.73 = c, 1d) 164.77 =		(44
if TFA > f if TFA £ f innual ave educe the are of more that Ja of water usa; (4)m= 114. Interpretation of the storage voluments of the storage v	13.9, N = 1 148.8 148.8 148.8 148.8 152	+ 1.76 x ater usage hot water person per Mar r day for ear 106.38 106.38 153.55 Ing at point 23.03 including and no tall hot water and tall tall tall tall tall tall tall tal	ge in litre usage by day (all w Apr ach month 102.21 culated me 133.87 of use (no 20.08 ag any so ank in dw er (this in	es per da 5% if the d vater use, f May Vd,m = fac 98.04 128.45 hot water 19.27 clar or W velling, e	y Vd,av welling is not and co Jun ctor from 1 93.87 190 x Vd,r 110.84 r storage), 16.63 /WHRS nter 110	rerage = designed in designed	(25 x N) to achieve Aug (43) 98.04 117.86 boxes (46) 17.68 within sa (47)	+ 36 a water us Sep 102.21 0 kWh/mor 119.27 0 to (61) 17.89 ame ves	Oct 106.38 Total = Su 139 Total = Su 20.85	9) Nov 110.55 m(44)112 = ables 1b, 1 151.73 m(45)112 = 22.76 47)	4.3 Dec 114.73 c, 1d) 164.77 24.71		(4)
if TFA > f if TFA £ f innual ave leduce the are of more that Ja lot water usas 14)m= 114. Inergy conter 15)m= 170. Instantaneous Vater stora Storage vol communit Otherwise i Vater stora a) If manuf	13.9, N = 1 148.8 145.52 146.8 152 152 152 152 153 153 153 153 153 153 153 153 153 153	+ 1.76 x ater usage hot water person per Mar 106.38 106.38 153.55 153.55 199 at point 23.03 includinate hot water person per person per person per person per person per person	ge in litre usage by day (all w Apr ach month 102.21 culated me 133.87 of use (no 20.08 and any se ank in dw er (this in	es per da 5% if the d vater use, f May Vd,m = fac 98.04 128.45 hot water 19.27 clar or W velling, e	y Vd,av welling is not and co Jun ctor from 1 93.87 190 x Vd,r 110.84 r storage), 16.63 /WHRS nter 110	rerage = designed in designed	(25 x N) to achieve Aug (43) 98.04 117.86 boxes (46) 17.68 within sa (47)	+ 36 a water us Sep 102.21 0 kWh/mor 119.27 0 to (61) 17.89 ame ves	Oct 106.38 Total = Su 139 Total = Su 20.85	9) Nov 110.55 m(44) ₁₁₂ = ables 1b, 1 151.73 m(45) ₁₁₂ = 22.76	4.3 Dec 114.73 c, 1d) 164.77 24.71 0		(4) (4) (4) (4) (4) (4) (4) (4)
if TFA > if TFA £ in	13.9, N = 1 148.8 145.5 148.8 148.8 152	ater usage hot water person per Mar 106.38 106.38 153.55 153.55 169 at point 23.03 1 including and no tale hot water eclared learn Table	ge in litre usage by day (all w Apr ach month 102.21 culated me 133.87 for use (no 20.08 and any se ank in dw er (this in cus factor 2b	es per da 5% if the d rater use, f May Vd,m = fac 98.04 128.45 o hot water 19.27 colar or W relling, e ncludes in or is known	y Vd,av welling is not and co Jun ctor from 1 93.87 190 x Vd,r 110.84 r storage), 16.63 /WHRS nter 110	erage = designed in designed i	(25 x N) to achieve Aug (43) 98.04 117.86 boxes (46) 17.68 within sa (47) pmbi boil	+ 36 a water us Sep 102.21 0 kWh/mor 119.27 0 to (61) 17.89 ame ves ers) ente	Oct 106.38 Total = Su 139 Total = Su 20.85	9) Nov 110.55 m(44) ₁₁₂ = ables 1b, 1 151.73 m(45) ₁₁₂ = 22.76	4.3 Dec 114.73 = c, 1d) 164.77 = 24.71 0		(4- (4- (4- (4- (4- (4-
if TFA > f if TFA £ f annual ave Reduce the ar of more that Ja dot water usa 44)m= 114. Energy conter 45)m= 170. instantaneous Vater stora Storage vol f communit Otherwise i Vater stora a) If manuf Temperatur Energy lost	13.9, N = 1 148.8 145.1 148.8 152	ater usage hot water person per Mar 106.38 106.38 153.55 153.55 169 at point 23.03 1 including and no tale hot water eclared learn Table or storage	ge in litre usage by day (all w Apr ach month 102.21 culated me 133.87 of use (no 20.08 and in dw er (this ir oss facto 2b c, kWh/ye	es per da 5% if the d yater use, h May Vd,m = fact 98.04 128.45 phot water 19.27 colar or W yelling, e ncludes in or is knowear	y Vd,av welling is not and co Jun ctor from 7 93.87 190 x Vd,r 110.84 r storage), 16.63 /WHRS nter 110 nstantar	erage = designed in designed i	(25 x N) to achieve Aug (43) 98.04 117.86 boxes (46) 17.68 within sa (47)	+ 36 a water us Sep 102.21 0 kWh/mor 119.27 0 to (61) 17.89 ame ves ers) ente	Oct 106.38 Total = Su 139 Total = Su 20.85	9) Nov 110.55 m(44) ₁₁₂ = ables 1b, 1 151.73 m(45) ₁₁₂ = 22.76	4.3 Dec 114.73 c, 1d) 164.77 24.71 0		(4- (4- (4- (4- (4- (4-
if TFA > fif TFA £ finnual ave Reduce the arrot more that Jadot water usage 144)m= 114. Energy conter 145)m= 170. Finstantaneous 146)m= 25.5 Vater stora 150 therwise in the Vater stora 150 and 150 manufactures in the perature 150 of the peratures in the perature 150 of the peratures in the perature in the peratures	13.9, N = 1 148.8 145.5 148.8 148.8 152	ater usage hot water person per Mar 106.38 106.38 123.03 153.55 163.65 1	ge in litre usage by day (all w Apr ach month 102.21 culated me 133.87 of use (no 20.08 and any se ank in dw er (this in oss facto 2b cylinder	es per da 5% if the d vater use, h May Vd,m = fac 98.04 128.45 o hot water 19.27 olar or W velling, e ncludes in or is known ear loss factor	y Vd,av welling is not and co Jun ctor from 1 93.87 190 x Vd,r 110.84 16.63 /WHRS nter 110 nstantar wn (kWh	rerage = designed in designed	(25 x N) to achieve Aug (43) 98.04 117.86 boxes (46) 17.68 within sa (47) pmbi boil	+ 36 a water us Sep 102.21 0 kWh/mor 119.27 0 to (61) 17.89 ame ves ers) ente	Oct 106.38 Total = Su 139 Total = Su 20.85	9) Nov 110.55 m(44) ₁₁₂ = ables 1b, 1 151.73 m(45) ₁₁₂ = 22.76	4.3 Dec 114.73 = c, 1d) 164.77 = 24.71 0		(44) (44) (44) (44) (50)
if TFA > f if TFA £ f annual ave Reduce the ar of more that Ja dot water usa 44)m= 114. Energy conter 45)m= 170. Finistantaneous Vater stora Storage vol f communit Otherwise i Vater stora a) If manuf Temperatur Energy lost b) If manuf Hot water s f communit contends f communit f emperatur Energy lost b) If manuf Hot water s f communit	13.9, N = 1 14.9,	ater usage hot water person per Mar 106.38 106.38 153.55 153.55 169 at point 23.03 1 including and no tale hot water eclared learn Table of factor frices sections	ge in litre usage by day (all w Apr ach month 102.21 culated me 133.87 for use (no 20.08 ag any so ank in dw er (this in cuss facto 2b cylinder com Table	es per da 5% if the d vater use, h May Vd,m = fac 98.04 128.45 o hot water 19.27 olar or W velling, e ncludes in or is known ear loss factor	y Vd,av welling is not and co Jun ctor from 1 93.87 190 x Vd,r 110.84 16.63 /WHRS nter 110 nstantar wn (kWh	rerage = designed in designed	(25 x N) to achieve Aug (43) 98.04 117.86 boxes (46) 17.68 within sa (47) pmbi boil	+ 36 a water us Sep 102.21 0 kWh/mor 119.27 0 to (61) 17.89 ame ves ers) ente	Oct 106.38 Total = Su 139 Total = Su 20.85	9) Nov 110.55 m(44) ₁₁₂ = ables 1b, 1 151.73 m(45) ₁₁₂ = 22.76	4.3 Dec 114.73 c, 1d) 164.77 24.71 0 0 0		(44 (45 (46 (47 (48 (49 (50
if TFA > fif TFA \$\frac{1}{2} if TFA \$\frac{1}	13.9, N = 1 13.9,	ater usage hot water person per Mar 106.38 106.38 123.03 153.55 163.65 164 165 165 165 165 165 165 165 165 165 165	ge in litre usage by day (all w Apr ach month 102.21 culated me 20.08 ag any se ank in dw er (this in cyclinder cyclinder cyclinder com Table on 4.3	es per da 5% if the d vater use, h May Vd,m = fac 98.04 128.45 o hot water 19.27 olar or W velling, e ncludes in or is known ear loss factor	y Vd,av welling is not and co Jun ctor from 1 93.87 190 x Vd,r 110.84 16.63 /WHRS nter 110 nstantar wn (kWh	rerage = designed in designed	(25 x N) to achieve Aug (43) 98.04 117.86 boxes (46) 17.68 within sa (47) ombi boil	+ 36 a water us Sep 102.21 0 kWh/mor 119.27 0 to (61) 17.89 ame ves ers) ente	Oct 106.38 Total = Su 139 Total = Su 20.85	9) Nov 110.55 m(44) ₁₁₂ = ables 1b, 1 151.73 m(45) ₁₁₂ = 22.76	4.3 Dec 114.73 c, 1d) 164.77 24.71 0 0 0		(42 (43 (44 (45 (46 (47 (48 (49 (50 (51 (52

Energy lost from 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 ca	culated fo	or each	month			((56)m = (55) × (41)r	n				
(56)m= 0 0	0	0	0	0	0	0	0	0	0	0		(56)
If cylinder contains dedicate	d solar stor	age, (57)r	m = (56)m	x [(50) – (H11)] ÷ (5	0), else (5	7)m = (56)	m where (H11) is fro	m Append	ix H	
(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 loss ca	lculated fo	or each	month (59)m = ((58) ÷ 36	65 × (41)	m					
(modified by factor f	rom Table	e H5 if t	here is s	olar wat	er heatii	ng and a	cylinde	thermo	stat)		ı	
(59)m = 0 0	0	0	0	0	0	0	0	0	0	0		(59)
Combi loss calculated	for each	month ((61)m =	(60) ÷ 36	65 × (41))m						
(61)m= 23.6 21.29	23.51	22.68	23.38	22.55	23.25	23.33	22.61	23.44	22.77	23.57		(61)
Total heat required for	water he	ating ca	alculated	for eac	h month	(62)m =	0.85 × (45)m +	(46)m +	(57)m +	(59)m + (61)m	
(62)m= 193.73 170.09	177.06	156.55	151.83	133.39	125.96	141.19	141.88	162.44	174.5	188.34		(62)
Solar DHW input calculated	using Appe	endix G or	Appendix	H (negati	ve quantity	/) (enter '0	' if no sola	contribut	on to wate	er heating)		
(add additional lines if	FGHRS a	and/or V	VWHRS	applies	, see Ap	pendix (3)					
(63)m= 0 0	0	0	0	0	0	0	0	0	0	0		(63)
Output from water hea	iter						•					
(64)m= 193.73 170.09	177.06	156.55	151.83	133.39	125.96	141.19	141.88	162.44	174.5	188.34		
<u> </u>						Outp	out from wa	ater heate	r (annual)₁	12	1916.97	(64)
Heat gains from water	haatina	L VA/II. /		- ′ [0 0=	(45)	(= .)			, \			
rical gains nom water	nealing,	KVVn/mo	onth U.2:	ა [0.85	× (45)m	⊢+ (61)m	า] + 0.8 x	: [(46)m	+ (57)m	+ (59)m		
(65)m= 62.47 54.8	56.93	50.18	48.56	42.49	× (45)m 39.96	+ (61)m 45.02	1] + 0.8 x 45.31	52.08	+ (57)m 56.14	+ (59)m 60.68]	(65)
	56.93	50.18	48.56	42.49	39.96	45.02	45.31	52.08	56.14	60.68		(65)
(65)m= 62.47 54.8 include (57)m in cal	56.93 culation o	50.18 of (65)m	48.56 only if c	42.49	39.96	45.02	45.31	52.08	56.14	60.68		(65)
include (57)m in calconding (55). Internal gains (see	56.93 culation of Table 5	50.18 of (65)m and 5a)	48.56 only if c	42.49	39.96	45.02	45.31	52.08	56.14	60.68		(65)
include (57)m in calconding (55). Internal gains (see Metabolic gains (Table	56.93 culation of Table 5	50.18 of (65)m and 5a)	48.56 only if c	42.49 ylinder i	39.96 s in the o	45.02 dwelling	45.31 or hot w	52.08 ater is fr	56.14 om com	60.68		(65)
(65)m= 62.47 54.8 include (57)m in calcompanion (55). Internal gains (see	56.93 culation of Table 5	50.18 of (65)m and 5a)	48.56 only if c	42.49	39.96	45.02	45.31	52.08	56.14	60.68 munity h		(65)
(65)m= 62.47 54.8 include (57)m in calconduction in calco	56.93 culation of the Table 5 Culation o	50.18 of (65)m and 5a) s Apr 177.08	48.56 only if colors May 177.08	42.49 ylinder is Jun 177.08	39.96 s in the o	45.02 dwelling Aug 177.08	45.31 or hot w Sep 177.08	52.08 ater is fr	56.14 om com	60.68 munity h		
include (57)m in calculations (55)m= 62.47 54.8 include (57)m in calculations (52)m in calculations (57)m in calculations (58)m include (58)m inclu	56.93 culation of Table 5 e 5), Watte Mar 177.08	50.18 of (65)m and 5a) s Apr 177.08 pendix l	48.56 only if controls: May 177.08 L, equati	Jun 177.08	39.96 s in the o Jul 177.08 r L9a), a	45.02 dwelling Aug 177.08 lso see	45.31 or hot w Sep 177.08 Table 5	52.08 ater is fr	56.14 om com	60.68 munity h		
(65)m= 62.47 54.8 include (57)m in calculation in calcula	56.93 culation of a Table 5 to 5), Watte Mar 177.08 tted in Ap 56.27	50.18 of (65)m and 5a s Apr 177.08 pendix 1 42.6	48.56 only if c : May 177.08 L, equati 31.84	42.49 ylinder is Jun 177.08 ion L9 of 26.88	39.96 s in the o	45.02 dwelling Aug 177.08 lso see 37.76	45.31 or hot w Sep 177.08 Table 5 50.68	52.08 ater is fr Oct 177.08	56.14 om com Nov 177.08	60.68 munity h		(66)
include (57)m in calculation include (57)m include (57)m in calculation in calculation include (57)m in calculation	56.93 culation of Table 5 5 5), Watt Mar 177.08 tted in Ap 56.27 culated in	50.18 of (65)m and 5a) s Apr 177.08 pendix I 42.6 Append	48.56 only if c : May 177.08 L, equati 31.84 dix L, eq	Jun 177.08 ion L9 of 26.88 uation L	39.96 s in the o Jul 177.08 r L9a), a 29.05	45.02 dwelling Aug 177.08 lso see 37.76 3a), also	45.31 or hot w Sep 177.08 Table 5 50.68	52.08 ater is fr Oct 177.08 64.35 ble 5	56.14 om com Nov 177.08	60.68 munity h		(66) (67)
include (57)m in calculation (65)m= 62.47 54.8 include (57)m in calculation (57)m in calculation (58)m= 62.47 54.8 include (57)m in calculation (58)m= 62.47 54.8 include (57)m in calculation (58)m= 62.47 157.08 177.08 1	56.93 culation of Table 5 5), Watte Mar 177.08 tted in Ap 56.27 culated in 489.28	50.18 of (65)m and 5a)s Apr 177.08 pendix I 42.6 Append 461.6	48.56 only if c): May 177.08 L, equati 31.84 dix L, eq 426.67	Jun 177.08 ion L9 of 26.88 uation L 393.84	39.96 s in the o Jul 177.08 r L9a), a 29.05 13 or L1 371.9	45.02 dwelling 177.08 lso see 37.76 3a), also	45.31 or hot w Sep 177.08 Table 5 50.68 o see Tal 379.74	52.08 ater is fr Oct 177.08 64.35 ble 5 407.42	56.14 om com Nov 177.08	60.68 munity h		(66)
include (57)m in calculations (65)m= 62.47 54.8 include (57)m in calculations (5. Internal gains (see Metabolic gains (Table Jan Feb (66)m= 177.08 177.08 177.08 Lighting gains (calculations) 69.19 Appliances gains (calculations) 69.19 Appliances gains (calculations) 69.19 Cooking gains (calculations) 62.28 Cooking gains (calculations)	56.93 culation of a Table 5 e 5), Watte Mar 177.08 tted in Ap 56.27 culated in 489.28 ated in Ap	50.18 of (65)m and 5a s Apr 177.08 pendix I 42.6 Append 461.6	48.56 only if c): May 177.08 L, equati 31.84 dix L, eq 426.67 L, equat	Jun 177.08 ion L9 of 26.88 uation L 393.84 ion L15	39.96 s in the of Jul 177.08 r L9a), a 29.05 13 or L1 371.9 or L15a)	45.02 dwelling 177.08 lso see 37.76 3a), also 366.74	45.31 or hot w Sep 177.08 Table 5 50.68 o see Tal 379.74 ee Table	52.08 ater is fr Oct 177.08 64.35 ole 5 407.42 5	56.14 om com Nov 177.08 75.1	60.68 munity h Dec 177.08 80.06		(66) (67) (68)
include (57)m in calculation include (58)m include (57)m in calculation include (58)m include (58)m include (59)m include (59)m include (59)m include (57)m include (58)m include (5	56.93 culation of Table 5 e 5), Watt Mar 177.08 tted in Ap 56.27 culated in 489.28 ated in Ap 55.66	50.18 of (65)m and 5a s Apr 177.08 pendix 1 42.6 Append 461.6 opendix 55.66	48.56 only if c): May 177.08 L, equati 31.84 dix L, eq 426.67	Jun 177.08 ion L9 of 26.88 uation L 393.84	39.96 s in the o Jul 177.08 r L9a), a 29.05 13 or L1 371.9	45.02 dwelling 177.08 lso see 37.76 3a), also	45.31 or hot w Sep 177.08 Table 5 50.68 o see Tal 379.74	52.08 ater is fr Oct 177.08 64.35 ble 5 407.42	56.14 om com Nov 177.08	60.68 munity h		(66) (67)
include (57)m in calculation include (58)m include (57)m include (56)m include (57)m include (59)m include (57)m include (59)m include (58)m include (59)m include (55.66 includ	56.93 culation of Table 5 5), Watt Mar 177.08 tted in Ap 56.27 culated in 489.28 ated in Ap 55.66 c (Table 5	50.18 of (65)m and 5a) s Apr 177.08 pendix I 42.6 Append 461.6 pendix 55.66 a)	48.56 only if colors May 177.08 L, equati 31.84 dix L, equati 426.67 L, equati 55.66	Jun 177.08 ion L9 of 26.88 uation L 393.84 ion L15 55.66	39.96 s in the o Jul 177.08 r L9a), a 29.05 13 or L1 371.9 or L15a) 55.66	45.02 dwelling 177.08 lso see 37.76 3a), also 366.74), also se 55.66	45.31 or hot w Sep 177.08 Table 5 50.68 o see Tal 379.74 ee Table 55.66	52.08 ater is fr Oct 177.08 64.35 ble 5 407.42 5 55.66	56.14 om com Nov 177.08 75.1 442.35	Dec 177.08 80.06 475.18		(66) (67) (68) (69)
include (57)m in calculation include (58)m include (58)m include (59)m include (59)m include (55.66 include (56.93 culation of a Table 5 e 5), Watt Mar 177.08 tted in Ap 56.27 culated in 489.28 ated in Ap 55.66 c (Table 5	50.18 of (65)m and 5a s Apr 177.08 pendix 42.6 Appendix 461.6 pendix 55.66 a) 10	48.56 only if control May 177.08 L, equati 31.84 dix L, equati 426.67 L, equati 55.66	Jun 177.08 ion L9 of 26.88 uation L 393.84 ion L15 55.66	39.96 s in the of Jul 177.08 r L9a), a 29.05 13 or L1 371.9 or L15a)	45.02 dwelling 177.08 lso see 37.76 3a), also 366.74	45.31 or hot w Sep 177.08 Table 5 50.68 o see Tal 379.74 ee Table	52.08 ater is fr Oct 177.08 64.35 ole 5 407.42 5	56.14 om com Nov 177.08 75.1	60.68 munity h Dec 177.08 80.06		(66) (67) (68)
include (57)m in calculation (55)m= 62.47 54.8 include (57)m in calculation (52)m in calculation (52)m in calculation (53)m (54)m (55)m (56)m (56)m (57)m (5	56.93 culation of Table 5 5), Watte Mar 177.08 Ited in Ap 56.27 culated in Ap 489.28 ated in Ap 55.66 G (Table 5 10 on (negati	50.18 of (65)m and 5a) s Apr 177.08 pendix I 42.6 Appendix 6 pendix 55.66 a) 10 ive value	48.56 only if colors May 177.08 L, equati 31.84 dix L, equati 426.67 L, equati 55.66	Jun 177.08 ion L9 of 26.88 uation L 393.84 ion L15 55.66	39.96 s in the of Jul 177.08 r L9a), a 29.05 13 or L1 371.9 or L15a) 55.66	45.02 dwelling 177.08 lso see 37.76 3a), also 366.74), also se 55.66	45.31 or hot w Sep 177.08 Table 5 50.68 o see Tal 379.74 ee Table 55.66	52.08 ater is fr Oct 177.08 64.35 ble 5 407.42 5 55.66	56.14 om com Nov 177.08 75.1 442.35 55.66	60.68 munity h Dec 177.08 80.06 475.18 55.66		(66) (67) (68) (69)
include (57)m in calculation include (57)m include (56)m include (57)m include (57)m include (57)m include (58)m include (58)m include (58)m include (58)m include (55.66 include (59)m include (55.66 include (55.66 include (57)m inc	56.93 culation of the Table 5 5), Watte	50.18 of (65)m and 5a) s Apr 177.08 pendix I 42.6 Appendix 6 pendix 55.66 a) 10 ive value	48.56 only if control May 177.08 L, equati 31.84 dix L, equati 426.67 L, equati 55.66	Jun 177.08 ion L9 of 26.88 uation L 393.84 ion L15 55.66	39.96 s in the o Jul 177.08 r L9a), a 29.05 13 or L1 371.9 or L15a) 55.66	45.02 dwelling 177.08 lso see 37.76 3a), also 366.74), also se 55.66	45.31 or hot w Sep 177.08 Table 5 50.68 o see Tal 379.74 ee Table 55.66	52.08 ater is fr Oct 177.08 64.35 ble 5 407.42 5 55.66	56.14 om com Nov 177.08 75.1 442.35	Dec 177.08 80.06 475.18		(66) (67) (68) (69)
include (57)m in calculation (55)m= 62.47 54.8 include (57)m in calculation (55). Internal gains (see Metabolic gains (Table Jan Feb (66)m= 177.08 177.08 177.08 Lighting gains (calculation (67)m= 77.9 69.19 Appliances gains (calculation (68)m= 497.12 502.28 Cooking gains (calculation (69)m= 55.66 55.66 Pumps and fans gains (70)m= 10 10 Losses e.g. evaporation (71)m= -118.06 -118.06 Water heating gains (70)m= 118.06 -118.06	56.93 culation of the Table 5 e 5), Watte	50.18 of (65)m and 5a s Apr 177.08 pendix 42.6 Appendix 55.66 a) 10 iive value -118.06	48.56 only if colors May 177.08 L, equati 31.84 dix L, equat 426.67 L, equat 55.66 10 es) (Tab	Jun 177.08 ion L9 of 26.88 uation L 393.84 ion L15 55.66 10 le 5)	39.96 s in the of Jul 177.08 r L9a), a 29.05 13 or L1 371.9 or L15a) 55.66	45.02 dwelling 177.08 lso see 37.76 3a), also 366.74), also se 55.66	45.31 or hot w Sep 177.08 Table 5 50.68 o see Tall 379.74 ee Table 55.66 10 -118.06	52.08 ater is fr Oct 177.08 64.35 ole 5 407.42 5 55.66 10	56.14 om com Nov 177.08 75.1 442.35 55.66 10 -118.06	60.68 munity h Dec 177.08 80.06 475.18 55.66 10		(66) (67) (68) (69) (70) (71)
include (57)m in calculation include (57)m include (57)m include (58)m include (57)m include (58)m include (57)m include (58)m include (59)m include (55.66 include (57)m include (57.66 include (56.93 culation of Table 5 5), Watte Mar 177.08 Ited in Ap 56.27 culated in Ap 56.27 culated in Ap 55.66 at (Table 5 10 on (negation of the color) 76.52	50.18 of (65)m and 5a) s Apr 177.08 pendix I 42.6 Appendix 6 pendix 55.66 a) 10 ive value	48.56 only if colors May 177.08 L, equati 31.84 dix L, equati 426.67 L, equati 55.66	Jun 177.08 ion L9 of 26.88 uation L 393.84 ion L15 55.66 10 le 5) -118.06	39.96 s in the of Jul 177.08 r L9a), a 29.05 13 or L1 371.9 or L15a) 55.66 10 -118.06	45.02 dwelling Aug 177.08 lso see 37.76 3a), also 366.74), also se 55.66 10 -118.06	45.31 or hot w Sep 177.08 Table 5 50.68 o see Tal 379.74 ee Table 55.66 10 -118.06	52.08 ater is fr Oct 177.08 64.35 ble 5 407.42 5 55.66 10 -118.06	56.14 om com Nov 177.08 75.1 442.35 55.66 10 -118.06	60.68 munity h Dec 177.08 80.06 475.18 55.66 10 -118.06		(66) (67) (68) (69)
include (57)m in calculation (55)m = 62.47 54.8 include (57)m in calculation (55) Internal gains (see 65) Metabolic gains (Table Jan Feb 66)m = 177.08 177.08 Lighting gains (calculation (67)m = 77.9 69.19 Appliances gains (calculation (68)m = 497.12 502.28 Cooking gains (calculation (69)m = 55.66 55.66 Pumps and fans gains (70)m = 10 10 Losses e.g. evaporation (71)m = -118.06 -118.06 Water heating gains (72)m = 83.96 81.55 Total internal gains = 10 10 10 Total internal gains = 10 10 10 10 Total internal gains = 10 10 10 10 10 Total internal gains = 10 10 10 10 10 10 10 10	56.93 culation of the Table 5 55), Watte	50.18 of (65)m and 5a) s Apr 177.08 pendix 42.6 Appendix 55.66 a) 10 ive value -118.06	48.56 only if colors May 177.08 L, equati 31.84 dix L, equati 426.67 L, equati 55.66 10 es) (Tab -118.06	Jun 177.08 fon L9 of 26.88 uation L 393.84 ion L15 55.66 10 le 5) -118.06	39.96 s in the of Jul 177.08 r L9a), a 29.05 13 or L1 371.9 or L15a) 55.66 10 -118.06 53.71 m + (67)m	45.02 dwelling Aug 177.08 lso see 37.76 3a), also 366.74), also se 55.66 10 -118.06	45.31 or hot w Sep 177.08 Table 5 50.68 o see Tal 379.74 ee Table 55.66 10 -118.06 62.93 + (69)m + (52.08 ater is fr Oct 177.08 64.35 ble 5 407.42 5 55.66 10 -118.06 70 70)m + (7	56.14 om com Nov 177.08 75.1 442.35 55.66 10 -118.06 77.98 1)m + (72)	60.68 munity h Dec 177.08 80.06 475.18 55.66 10 -118.06 81.56 m		(66) (67) (68) (69) (70) (71)
include (57)m in calculation include (57)m include (57)m include (58)m include (57)m include (58)m include (57)m include (58)m include (59)m include (55.66 include (57)m include (57.66 include (56.93 culation of Table 5 5), Watte Mar 177.08 Ited in Ap 56.27 culated in Ap 56.27 culated in Ap 55.66 at (Table 5 10 on (negation of the color) 76.52	50.18 of (65)m and 5a s Apr 177.08 pendix 42.6 Appendix 55.66 a) 10 iive value -118.06	48.56 only if colors May 177.08 L, equati 31.84 dix L, equat 426.67 L, equat 55.66 10 es) (Tab	Jun 177.08 ion L9 of 26.88 uation L 393.84 ion L15 55.66 10 le 5) -118.06	39.96 s in the of Jul 177.08 r L9a), a 29.05 13 or L1 371.9 or L15a) 55.66 10 -118.06	45.02 dwelling Aug 177.08 lso see 37.76 3a), also 366.74), also se 55.66 10 -118.06	45.31 or hot w Sep 177.08 Table 5 50.68 o see Tal 379.74 ee Table 55.66 10 -118.06	52.08 ater is fr Oct 177.08 64.35 ble 5 407.42 5 55.66 10 -118.06	56.14 om com Nov 177.08 75.1 442.35 55.66 10 -118.06	60.68 munity h Dec 177.08 80.06 475.18 55.66 10 -118.06		(66) (67) (68) (69) (70) (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)	
North 0.9	x 0.77	X	6.89	x	10.63	x	0.63	x	0.7] =	22.39	(74)
North 0.9	× 0.77	X	6.89	x	20.32	х	0.63	х	0.7] =	42.79	(74)
North 0.9	× 0.77	X	6.89	x	34.53	х	0.63	x	0.7] =	72.71	(74)
North 0.9	× 0.77	X	6.89	x	55.46	x	0.63	x	0.7	=	116.79	(74)
North 0.9	× 0.77	X	6.89	x	74.72	х	0.63	x	0.7	=	157.33	(74)
North 0.9	× 0.77	X	6.89	x	79.99	х	0.63	х	0.7] =	168.42	(74)
North 0.9	× 0.77	X	6.89	x	74.68	x	0.63	x	0.7	<u> </u>	157.24	(74)
North 0.9	× 0.77	X	6.89	x	59.25	x	0.63	x	0.7] =	124.75	(74)
North 0.9	x 0.77	X	6.89	x	41.52	x	0.63	x	0.7] =	87.42	(74)
North 0.9	x 0.77	X	6.89	x	24.19	x	0.63	X	0.7	=	50.94	(74)
North 0.9	x 0.77	X	6.89	x	13.12	X	0.63	X	0.7	=	27.62	(74)
North 0.9	x 0.77	X	6.89	x	8.86	x	0.63	x	0.7	=	18.67	(74)
East 0.9	x 0.77	X	0.48	x	19.64	X	0.63	x	0.7	=	2.88	(76)
East 0.9	x 0.77	X	0.48	x	38.42	X	0.63	X	0.7	=	5.64	(76)
East 0.9	x 0.77	X	0.48	x	63.27	x	0.63	x	0.7	=	9.28	(76)
East 0.9	x 0.77	X	0.48	x	92.28	X	0.63	X	0.7	=	13.54	(76)
East 0.9	x 0.77	X	0.48	x	113.09	X	0.63	X	0.7	=	16.59	(76)
East 0.9	x 0.77	X	0.48	x	115.77	x	0.63	X	0.7	=	16.98	(76)
East 0.9	x 0.77	X	0.48	x	110.22	X	0.63	X	0.7	=	16.17	(76)
East 0.9	x 0.77	X	0.48	x	94.68	X	0.63	x	0.7	=	13.89	(76)
East 0.9	x 0.77	X	0.48	x	73.59	x	0.63	x	0.7	=	10.8	(76)
East 0.9	x 0.77	X	0.48	x	45.59	x	0.63	X	0.7	=	6.69	(76)
East 0.9	× 0.77	X	0.48	x	24.49	x	0.63	x	0.7] =	3.59	(76)
East 0.9	x 0.77	X	0.48	x	16.15	x	0.63	x	0.7	=	2.37	(76)
South 0.9	× 0.77	X	12.17	x	46.75	x	0.63	x	0.7] =	173.89	(78)
South 0.9	× 0.77	X	12.17	x	76.57	x	0.63	X	0.7	=	284.78	(78)
South 0.9	× 0.77	X	12.17	x	97.53	x	0.63	x	0.7] =	362.76	(78)
South 0.9	× 0.77	X	12.17	x	110.23	x	0.63	X	0.7	=	410	(78)
South 0.9	× 0.77	X	12.17	x	114.87	x	0.63	X	0.7] =	427.24	(78)
South 0.9	x 0.77	X	12.17	x	110.55	x	0.63	x	0.7	=	411.16	(78)
South 0.9	x 0.77	X	12.17	x	108.01	x	0.63	x	0.7	=	401.73	(78)
South 0.9	x 0.77	X	12.17	x	104.89	x	0.63	x	0.7	=	390.14	(78)
South 0.9	x 0.77	X	12.17	x	101.89	x	0.63	x	0.7	=	378.94	(78)
South 0.9	x 0.77	X	12.17	x	82.59	x	0.63	x	0.7	=	307.16	(78)
South 0.9	x 0.77	X	12.17	x	55.42	x	0.63	x	0.7	=	206.11	(78)
South 0.9	x 0.77	X	12.17	x	40.4	x	0.63	x	0.7] =	150.25	(78)
Rooflights 0.9	x 1	X	0.42	x	18.63	x	0.63	x	0.7] =	3.11	(82)
Rooflights 0.9	x 1	X	1.12	x	37.5	x	0.63	x	0.7] =	16.67	(82)
Rooflights 0.9	x 1	X	0.42	×	36.69	x	0.63	x	0.7	=	6.12	(82)

Rooflights 0.9x		_					7		_				(oo)
<u>L</u>	1	×	1.1		X	71.32	X	0.63	×	0.7	=	31.7	(82)
Rooflights 0.9x	1	X	0.4		X	67.99	X	0.63	×	0.7	=	11.33	(82)
Rooflights 0.9x	1	×	1.1		X	114.1	X	0.63	×	0.7	=	50.72	(82)
Rooflights 0.9x	1	X	0.4	==	X	121.67	X	0.63	×	0.7	=	20.28	(82)
Rooflights 0.9x	1	X	1.1	2	X	163.8	X	0.63	X	0.7	=	72.81	(82)
Rooflights 0.9x	1	X	0.4	2	X	175.93	X	0.63	X	0.7	=	29.33	(82)
Rooflights 0.9x	1	X	1.1	2	X	200.12	X	0.63	X	0.7	=	88.96	(82)
Rooflights _{0.9x}	1	X	0.4	2	X	193.56	X	0.63	X	0.7	=	32.27	(82)
Rooflights _{0.9x}	1	X	1.1	2	X	204.97	X	0.63	X	0.7	=	91.12	(82)
Rooflights 0.9x	1	X	0.4	2	X	178.64	X	0.63	X	0.7	=	29.78	(82)
Rooflights 0.9x	1	X	1.1	2	X	195.07	X	0.63	X	0.7	=	86.71	(82)
Rooflights 0.9x	1	X	0.4	2	X	134.3	X	0.63	X	0.7	=	22.39	(82)
Rooflights 0.9x	1	X	1.1	2	X	167.69	X	0.63	X	0.7	=	74.54	(82)
Rooflights 0.9x	1	X	0.4	2	X	85.46	X	0.63	x	0.7	=	14.25	(82)
Rooflights 0.9x	1	X	1.1	2	X	131.62	X	0.63	x	0.7		58.51	(82)
Rooflights 0.9x	1	×	0.4	2	X	44.9	X	0.63	x	0.7	=	7.48	(82)
Rooflights 0.9x	1	x	1.1	2	X	83.59	X	0.63	x	0.7	=	37.16	(82)
Rooflights 0.9x	1	x	0.4	2	X	23.1	X	0.63	x	0.7	=	3.85	(82)
Rooflights 0.9x	1	×	1.1	2	X	46.35	j x	0.63	x	0.7	_	20.61	(82)
Rooflights 0.9x	1	×	0.4	2	X	15.49	X	0.63	×	0.7	_	2.58	(82)
Rooflights 0.9x	1	×	1.1	2	X	31.13	X	0.63	×	0.7	=	13.84	(82)
L							_						
Solar gains in	watte calc	ulated	for each	n month	1		(83)m	n = Sum(74)m .	(82)m				
(83)m= 218.93		06.81	633.42	719.44		19.95 691.63	625		409.4	3 261.78	187.71		(83)
Total gains – i	nternal and	d solar	 (84)m =	: (73)m	+ (B3)m , watts		<u>!</u>		_!	ļ.		
(84)m= 1002.6	1148.72 12	253.56	1332	1367.9	13	324.37 1270.99	121	5.41 1167.95	1075.8	7 981.9	949.19		(84)
7. Mean inter	nal temper	aturo (heating	20220	2)								
						area from Tal	hla 0	Th1 (°C)				21	(85)
Utilisation fac	•	•			_		DIC 3	, 1111 (0)				21	(00)
Jan		Mar	Apr	May	Ť	Jun Jul	Τ_Λ	ug Sep	Oct	Nov	Dec		
(86)m= 0.96		0.92	0.88	0.81	+	0.69 0.56	0.5		0.89	0.95	0.97		(86)
	<u> </u>	Ļ	!						0.03	0.93	0.97		(00)
Mean interna	 			<u> </u>	$\overline{}$	i	1					1	(0=)
(87)m= 18.54	18.81 1	19.22	19.76	20.27	2	20.68 20.87	20.	84 20.54	19.89	19.12	18.49		(87)
Temperature	during hea	ating pe	eriods in	rest of	dw	elling from Ta	able 9	9, Th2 (°C)					
(88)m= 19.92	19.93 1	19.93	19.94	19.94	1	9.95 19.95	19.	95 19.95	19.94	19.94	19.93		(88)
Utilisation fac	ctor for gain	ns for r	est of dy	welling,	h2.	m (see Table	9a)						
(89)m= 0.96		0.91	0.86	0.77	$\overline{}$	0.62 0.45	0.4	19 0.7	0.87	0.94	0.96		(89)
Mean interna	l temnerati	ıre in t	he rest :	of dwel	lina	T2 (follow sta	one 3	to 7 in Tahl	P 9c)			•	
(90)m= 16.65		17.63	18.41	19.11	Ť	9.65 19.86	19.		18.6	17.5	16.58		(90)
(12)	1					1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1			ving area ÷ (0.1	(91)
					منالد	م/ ال ۸ T1	. /4	fl A) TO		•			 ` ′

Mean internal temperature (for the whole dwelling) = $fLA \times T1 + (1 - fLA) \times T2$

(92)m=	16.83	17.2	17.78	18.54	19.22	19.74	19.96	19.93	19.59	18.72	17.65	16.76		(92)
Apply a	adjustm	ent to th	he mean	internal	temper	ature fro	m Table	4e, whe	ere appro	priate				
(93)m=	16.68	17.05	17.63	18.39	19.07	19.59	19.81	19.78	19.44	18.57	17.5	16.61		(93)
8. Spa	ce heat	ing requ	uirement											
						ed at ste	ep 11 of	Table 9l	b, so tha	t Ti,m=(76)m an	d re-calc	ulate	
the util	isation	factor fo	or gains	using Ta	ble 9a						,		l	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
	- 1	Ť	ains, hm					г			1		l	
(94)m=	0.93	0.91	0.88	0.82	0.73	0.59	0.44	0.47	0.67	0.83	0.91	0.94		(94)
			W = (94)	<u> </u>		1		1					1	(0-)
` '		1045.68	1098.36	1091.08	997.1	781.35	553.91	572.86	778.17	892.84	893.39	892.91		(95)
			rnal tem					1					1	(2.2)
(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)
_						i	-` /		– (96)m		1			(07)
` ′			2141.68		1400.58	939.56	603.2	635.19	1008	1513.7	1983.51	2377.03		(97)
)m – (95		 		l	
(98)m= 1	1083.07	871.54	776.23	514.2	300.19	0	0	0	0	461.92	784.89	1104.19		_
								Tota	l per year	(kWh/yeai	r) = Sum(9	8) _{15,912} =	5896.23	(98)
Space	heating	g require	ement in	kWh/m²	/year								36.45	(99)
9a. Ene	rgy reg	uiremen	nts – Indi	vidual h	eating s	ystems i	ncluding	micro-C	CHP)					
	heatin				<u> </u>	,			,					
•		_	it from se	econdar	y/supple	mentary	system						0.1	(201)
Fractio	n of sp	ace hea	it from m	ain syst	em(s)			(202) = 1	- (201) =			i	0.9	(202)
Fractio	n of tot	al heatir	ng from i	main sys	stem 1			(204) = (2	02) × [1 –	(203)] =		i	0.9	(204)
			ace heati	•								i I	92.9	(206)
	•	•	ry/supple			a evetor	0/-					l I	65	(208)
Г	'					_		<u> </u>			T			┛`
Ĺ	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	kWh/ye	ar
· -			ement (c							404.00	T 704.00			
Ľ	1083.07	871.54	776.23	514.2	300.19	0	0	0	0	461.92	784.89	1104.19		
` ′ –			4)] } x 1	<u> </u>							1		l	(211)
	1049.26	844.34	752	498.14	290.82	0	0	0	0	447.5	760.39	1069.72		_
								Tota	I (kWh/yea	ar) =Sum(2	211) _{15,1012}	<u>=</u>	5712.17	(211)
•	•	,	econdar	, , .	month									
· · · · · ·	<u> </u>		00 ÷ (20								,		ı	
(215)m=	166.63	134.08	119.42	79.11	46.18	0	0	0	0	71.06	120.75	169.87		_
								Tota	I (kWh/yea	ar) =Sum(2	215) _{15,1012}	<u>=</u>	907.11	(215)
Water h	_													
			ter (calc						l		T		l	
	193.73	170.09	177.06	156.55	151.83	133.39	125.96	141.19	141.88	162.44	174.5	188.34		٦.
Efficiend	.										1		88	(216)
(217)m=	89.58	89.56	89.51	89.41	89.21	88	88	88	88	89.36	89.52	89.59		(217)
		0.	kWh/mo											
(219)m=		n x 100 189.93) ÷ (217) 197.82	m 175.09	170.2	151.58	143.13	160.45	161.23	181.79	194.93	210.22		
(219)111=	Z10.Z1	103.33	131.02	175.09	170.2	131.38	143.13		161.23 Il = Sum(21		194.93	210.22	0.450.00	7(2(5)
								rota	ıı – Suili(2	(3a) ₁₁₂ =			2152.63	(219)

Annual totals		kWh/war	kWb/roor
Space heating fuel used, main system	n 1	kWh/year	kWh/year 5712.17
Space heating fuel used, secondary			907.11
Water heating fuel used			2152.63
Electricity for pumps, fans and electric	keep-hot		
central heating pump:		120	(230c)
boiler with a fan-assisted flue		45	(230e)
Total electricity for the above, kWh/ye	ar sum of (23	0a)(230g) =	165 (231)
Electricity for lighting			550.28 (232)
Electricity generated by PVs			-1727.24 (233)
Total delivered energy for all uses (21	1)(221) + (231) + (232)(237b) =		7759.95 (338)
10a. Fuel costs - individual heating s	ystems:		
	Fuel kWh/year	Fuel Price (Table 12)	Fuel Cost £/year
Space heating - main system 1	(211) x	3.48 x 0.01 =	198.78 (240)
Space heating - main system 2	(213) x	0 x 0.01 =	0 (241)
Space heating - secondary	(215) x	4.23 × 0.01 =	38.37 (242)
Water heating cost (other fuel)	(219)	3.48 × 0.01 =	74.91 (247)
Pumps, fans and electric keep-hot	(231)	13.19 x 0.01 =	21.76 (249)
(if off-peak tariff, list each of (230a) to Energy for lighting	(230g) separately as applicable and ap	oply fuel price according to 13.19 × 0.01 =	
Additional standing charges (Table 12	2)		120 (251)
	one of (233) to (235) x)	13.19 × 0.01 =	-227.82 (252)
Appendix Q items: repeat lines (253) a	and (254) as needed		
Total energy cost	(245)(247) + (250)(254) =		298.59 (255)
11a. SAP rating - individual heating s	systems		
Energy cost deflator (Table 12)			0.42 (256)
Energy cost factor (ECF)	$[(255) \times (256)] \div [(4) + 45.0] =$		0.61 (257)
SAP rating (Section 12)			91.54 (258)
12a. CO2 emissions – Individual hea	iting systems including micro-CHP		
	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year
Space heating (main system 1)	(211) x	0.216 =	1233.83 (261)
Space heating (secondary)	(215) x	0.019 =	17.24 (263)
Water heating	(219) x	0.216 =	464.97 (264)
Space and water heating	(261) + (262) + (263) + (264) =	=	1716.03 (265)

Electricity for pumps, fans and electric keep-hot	(231) x	0.519 =	85.64 (267)
Electricity for lighting	(232) x	0.519 =	285.59 (268)
Energy saving/generation technologies Item 1		0.519 =	-896.44 (269)
Total CO2, kg/year		sum of (265)(271) =	1190.82 (272)
CO2 emissions per m ²		(272) ÷ (4) =	7.36 (273)
EI rating (section 14)			92 (274)

13a. Primary Energy

	Energy kWh/year	Primary factor	P. Energy kWh/year
Space heating (main system 1)	(211) x	1.22	6968.85 (261)
Space heating (secondary)	(215) x	1.04 =	943.4 (263)
Energy for water heating	(219) x	1.22	2626.21 (264)
Space and water heating	(261) + (262) + (263) + (264) =		10538.45 (265)
Electricity for pumps, fans and electric keep-hot	(231) x	3.07	506.55 (267)
Electricity for lighting	(232) x	0 =	1689.35 (268)
Energy saving/generation technologies			
Item 1		3.07	-5302.63 (269)
'Total Primary Energy	sum	of (265)(271) =	7431.72 (272)
Primary energy kWh/m²/year	(272	?) ÷ (4) =	45.94 (273)