Regulations Compliance Report

Approved Document L1A 2010 edition	assessed by Stroma FSAF	2009 program. Version: 1.4.0.39

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Project Information		51		
Assessed By:	Gary Nicholls (STR	O003305)	Building Type:	End-terrace Flat
Dwelling Details:				
NEW DWELLING	DESIGN STAGE			
Site Reference :	Flat 5 139-147 Can	nden Road	Plot Reference:	BEC/SV/CAMDEN/0005
Address :	Flat 5, 139-147 Car	nden Road, London, NW1 9	HA	
Client Details:				
Name:	Studio V Architects			
Address :	224 West Hendon I	Broadway, Hendon, London,	NW9 7ED	
-	rs items included wite report of regulation	hin the SAP calculations.		
1 TER and DER				
	ting system: Natural g			
-	oxide Emission Rate (Dioxide Emission Rate	,	17.58 kg/m² 11.54 kg/m²	ОК
2 Fabric U-value			11.04 kg/m	UN
Element		Average	Highest	
External	wall	0.20 (max. 0.30)	0.20 (max. 0.70)	ОК
Party wa	I	0.00 (max. 0.20)	-	OK
Floor		(no floor)		
Roof Openings	2	0.13 (max. 0.20) 1.47 (max. 2.00)	0.13 (max. 0.35) 1.50 (max. 3.30)	OK OK
3 Design air per		1.47 (max. 2.00)	1.00 (max. 0.00)	ÖN
	permeability at 50 pas	cals	3.00	
Maximum	, , , , , , , , , , , , , , , , , , ,		10.0	OK
4 Heating efficie	ency			
Main Heati		Database: (rev 315, produc	ct index 016669):	
		Boiler system with radiators Brand name: Alpha Model: InTec 28X Model qualifier: (Combi boiler) Efficiency 88.2 % SEDBUK Minimum 88.0 %		ОК
Secondary	heating system:	None		
5 Cylinder insul	ation			
Hot water S	-	No cylinder		N/A
Solar water	-			
Dedicated s Minimum:	solar storage volume:	90 litres 62 litres		ОК
within the first state of the s				ÖK

Solar water heating

Regulations Compliance Report

6 Controls			
Space heating controls Hot water controls:	Time and temperature zo No cylinder	ne control	ОК
Boiler interlock:	Yes		ОК
Low energy lights			
Percentage of fixed lights wi	th low-energy fittings	100.0%	
Minimum		75.0%	OK
3 Mechanical ventilation			
Not applicable			
Summertime temperature			
Overheating risk (South Eas	t England):	Medium	OK
ased on:			
Overshading:		Average or unknown	
Windows facing: South East		16.8m ² , Overhang twice as wide	as window, ratio NaN
Windows facing: North East		6.56m ² , Overhang twice as wide	as window, ratio NaN
Ventilation rate:		4.00	
Blinds/curtains:			
		shutter closed 100% of da	ylight hours
0 Key features			
Design air permeablility		3.0 m³/m²h	
Doors U-value		1 W/m²K	
External Walls U-value		0.17 W/m²K	

SAP Input

Property Details:	Flat 5 139-147	Camden	Road										
Address: Located in: Region: UPRN: RRN: Date of assess Date of certific Assessment ty Transaction ty Related party of Thermal Mass Dwelling desig than 125 litres	ate: be: be: lisclosure: Parameter: ned to use l	E S O O N N N I I	Flat 5, 139-147 Camden Road, London, NW1 9HA England South East England na 0000-0000-0000-0000-0000 01 November 2011 01 November 2011 New dwelling design stage New dwelling No related party Indicative Value True										
Property descripti	on:												
Dwelling type: Detachment: Year Completed: Floor Location: Floor 0 Living area: Front of dwelling		E 2 F 7 3	lat nd-teri 011 Ioor a 8.43 m 8.85 m outh E	area: 1 ² (fraction 0.49		torey heigh 2.8 m	t:						
Opening types:													
Name: front door SE NE	Source: Manufacture Manufacture Manufacture	r	Sol Wir	pe: id ndows ndows		0.1, soft coat 0.1, soft coat		Fran Metal PVC-U PVC-U	J				
Name: front door SE NE	Gap: mm 16mm or mo 16mm or mo		Fra 0.8 0.8 0.8		g-value: 0 0.8 0.8	U-valu 1 1.5 1.5	ie: N 1 1		enings:				
Name: front door SE NE	Type-Nam	ie:	to o ext	cation: common area ernal wall ernal wall	Orient: North West South East North East		Width: 0 0 0	Heig 0 0 0	ht:				
Overshading:		А	veraae	e or unknown									
Opaque Elements	:	, .											
Type: External Elements external wall to common area flat roof Internal Elements Party Elements	Gross area: 94.08 3.08 2.52 20.86	Openir 23.36 1.68 0	ngs:	Net area: 70.72 1.4 2.52	U-value: 0.2 0.2 0.13	Ru value: 0 0.82 0	Curta False False	ain wall:	Kappa: N/A N/A N/A N/A				
Thermal bridges:													
Thermal bridges:			ser-de =0.04	fined y-value									

SAP Input

Ventilation:	
Pressure test: Ventilation: Number of chimneys: Number of open flues: Number of fans: Number of sides sheltered: Design q50:	Yes (As designed) Natural ventilation (extract fans) 0 2 2 3
Main heating system:	
Main heating system:	Central heating systems with radiators or underfloor heating Gas boilers and oil boilers Fuel: mains gas Info Source: Boiler Database Database: (rev 315, product index 016669) SEDBUK2009 90.0% Brand name: Alpha Model: InTec 28X Model qualifier: (Combi boiler) Systems with radiators Pump in heat space: Yes
Main heating Control:	
Main heating Control:	Time and temperature zone control Control code: 2110 Boiler interlock: Yes
Secondary heating system:	
Secondary heating system:	None
Water heating:	
Water heating:	From main heating system Water code: 901 Fuel :mains gas No hot water cylinder Flue Gas Heat Recovery System: Database (rev 315, product index 060002) Brand name: Zenex Model: GasSaver Model qualifier: GS-1 Solar panel: True aperture area: 2.5 Flat plate, glazed default values: False collector zero-loss efficiency: 0.8 collector heat loss coefficient: 3.175 orientation: South, 30° pitch overshading: None or Very Little (<20%) dedicated solar store volume: 90 litres (seperate store) solar powered pump: False
Others:	
Electricity tariff: In Smoke Control Area: Conservatory: Low energy lights: Terrain type: EPC language: Wind turbine: Photovoltaics:	standard tariff Unknown No conservatory 100% Dense urban English No None

Briary energy Consultants N. Barker 0203 091 3391 info@briaryenergy.co.uk

SAP Input

Assess Zero Carbon Home:

No

Assessor Name: Strom FSAP 2009 Stroma Number: STRO003305 Software Name: Stroma FSAP 2009 Stroma Variance Stat 5 139-147 Camden Road Coverall dwelling dimensions: Flat 5, 139-147 Camden Road, London, NW1 9H2 Coverall dwelling dimensions: Are Height(m) Volume(m) Ground floor Are Height(m) Volume(m) Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)+(1n) Tata 3 (i) Develing volume Cal-table(3b)+(3d)+(3d)+(3d)+(3d)+(3d)+(3d)+(3d)+(3d			User D	etails:					
Address :Flat 5, 139-147 Camden Road, London, NW1 9HA1. Overall divelling dimensions:Area(m?)Ave Height(m)Volume(m?)Ground floor78.43(ia) x2.8(ia) =219.6(ia)Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)+(1n)78.43(i)2.8(ia) =219.6(is)Dwelling volume(3a)+(3b)+(3c)+(3d)+(3c)+(3n) =219.6(is)(ia)(ia)+(3b)+(3c)+(3c)+(3c)+(3c)+(3c)+(3c)+(3c)+(3c		•		Software Ver	rsion:	Versio			
Area(m ²) Volume(m ³) Ground floor (2a) (2a) <th< td=""><td></td><td></td><td></td><td></td><td>39-147 Camder</td><td>n Road</td><td></td><td></td></th<>					39-147 Camder	n Road			
Area(m ²)Ave Height(m)Volume(m ²)Ground floor78.43(1a)2.8(2a)219.6(3a)Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)+(1n)78.43(4)(a)(a)Dwelling volume(3a)+(3b)+(3a)+(3a)+(3a)+(3a)+(3a)+(3a)+(3a)+(3a		· ·	den Road, Lond	don, NW1 9HA					
Ground floor78.43(1a) x2.19.6(3a)Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)+(1n)78.43(1a) x2.19.6(3a)Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)+(1n)78.43(1a) x2.19.6(3a)Output total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)+(1n)78.43(4)Output total floor area TFA = (1a)+(1b)+(1c)+(1e)+(1e)+(1a)+(1a)+(2a)+(3d)+(3d)+(3d)+(3d)+(3d)+(3d)+(3d)+(3d	1. Overall dwelling dimer	ISIONS:	Aroa	(m ²)	Ave Height(m)		Valuma(m3)		
Developme $(3)+(3)+(3)+(3)+(3)+(3)+(3)+(3)+(3)+(3)+$	Ground floor			· · ·			. ,	(3a)	
2. Ventilation rate:main heating heatingSecondary heating heatingothertotalm³ per hourNumber of chimneys 0 $+$ 0 $=$ 0 $x40$ 0 $(6a)$ Number of open flues 0 $+$ 0 $=$ 0 $x40$ 0 $(6a)$ Number of passive vents 0 $+$ 0 $=$ 0 $x10$ 0 $(7a)$ Number of passive vents 0 $x10$ 0 $(7a)$ 0 $x40$ 0 $(7c)$ Number of storesy as fires 0 $x40$ 0 $(7c)$ 0 $(7c)$ 0 $(7c)$ Infitration due to chimneys, flues and fans = $(6a)+(6b)+(7a)+(7c)$ = 20 $+$ (6) 0 $(7c)$ Number of storeys in the dwelling (ns)Additional infiltration (9) (9) (10) 0 (11) Number of storeys in the dwelling (ns)Additional infiltration: 0 (12) 0 (11) Number of storeys in the dwelling (ns) $Additional infiltration(9)(14)0(14)Number of storeys and a parsen, use the value corresponding to the greater wall area (atterdeducting reas of opaning); if equal ware 0.500(12)If suspended wooden floor, enter 0.2 (unsealed) or 0.1 (sealed), else enter 00(13)0(14)Percentage of windows and doors draught stripped000(13)Number of sides on which sheltered0000<$	Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)+	+(1n) 7	8.43 (4)					
main heatingSecondary heatingothertotalm³ per hourNumber of chimneys0+0=0<40 =	Dwelling volume			(3a)+(3b))+(3c)+(3d)+(3e)+	(3n) =	219.6	(5)	
heating 0heating 0 </td <td>2. Ventilation rate:</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	2. Ventilation rate:								
Number of chimneys 0 + 0 + 0 = 0 $x40$ 0 (66) Number of open flues 0 + 0 = 0 $x20$ 0 $(6b)$ Number of intermittent fans 2 $x10$ = 20 $(7a)$ Number of passive vents 0 $x10$ 0 $(7b)$ Number of flueless gas fires 0 $x40$ 0 $(7c)$ Air changes per hourInfiltration due to chimneys, flues and fans = $(6a)+(6b)+(7a)+(7c)$ = 20 $+(5)$ = 0.09 (8) If a presurisation test has been carried out or is intended, proceed to (17) , otherwise continue from (9) to (16) 0.9 (6) Number of storeys in the dwelling (ns) $((9)$ $((10)$ $((10)$ $((11))$ $((10)$ Structural infiltration 0.25 for steel or timber frame or 0.35 for masonry construction $((10)$ (11) (10) Structural infiltration in 0.25 for steel or timber frame or 0.35 for masonry construction (13) 0 (14) Percentage of windows and doors draught stripped $0.25 - [0.2 \times (14) \div 100] =$ 0 (13) Percentage of windows and doors draught stripped $0.25 - [0.2 \times (14) \div 100] =$ 0.21 (16) Air permeability value, q50, expressed in cubic metres per hour per square metre of envelope area 3 (17) If based on air permeability value, q50, expressed in cubic metres per hour per square metre of envelope area 3 (17) Air permeability value applies if a presurisation test has be				other	total		m ³ per hour		
Number of intermittent fans2 $x10 =$ 20(7a)Number of passive vents0 $x10 =$ 0(7b)Number of flueless gas fires0 $x40 =$ 0(7c)Air changes per hourInfiltration due to chinneys, flues and fans = (6a)+(6b)+(7a)+(7b)+(7c) =20 $+(6) =$ 0.09(8)Air changes per hourInfiltration due to chinneys, flues and fans = (6a)+(6b)+(7a)+(7c) =20 $+(6) =$ 0.09(9)Additional infiltration(19)Number of storeys in the dwelling (ns)Additional infiltration:0.25 for steel or timber frame or 0.35 for masonry constructionif both types of wall are present, use the value corresponding to the greater wall area (after deducting areas of openings); if equal use 0.35 (11)If suspended wooden floor, enter 0.2 (unsealed) or 0.1 (sealed), else enter 0O(12)If no draught lobby, enter 0.05, else enter 0O(13)Percentage of windows and doors draught strippedWindow infitration0.25 - [0.2 x (14) + 100] =O(14)Window infitrationAir permeability value, q50, expressed in cubic metres per hour per square metre of envelope areaAir permeability value, q50, expressed in cubic metres per hour per square metre of envelope areaAir permeability value, q50, expressed in cubic metres per hour per square metre	Number of chimneys			0 =	0 ×	40 =	0	(6a)	
Number of passive vents Number of gassive vents Number of flueless gas fires 0 x $10 = 0$ (7c) At $0 = 0$ (9c) At $0 = 0$ (10) At $0 = 0$ (11) At $0 = 0$ (12) If $0 = 0$ (13) Percentage of windows and doors draught stripped At $0 = 0$ (14) At $0 = 0$ (15) Infiltration rate At $0 = 0$ (16) At $0 = 0$ (17) At $0 = 0$ (18) At $0 = 0$ (19) At $0 = 0$ (19) At $0 = 0$ (19) At $0 = 0$ (10) At $0 = 0$ (10) At $0 = 0$ (10) At 0	Number of open flues	0 +	0 +	0 =	0 ×	20 =	0	(6b)	
Number of flueless gas fires $ \begin{array}{c} 0 \\ \text{Number of flueless gas fires \end{array} $ $ \begin{array}{c} 0 \\ 0 \\ 0 \end{array} $ $ \begin{array}{c} 0 \\ 0 \\ 0 \end{array} $ $ \begin{array}{c} 0 \\ 0 \\ 0 \end{array} $ $ \begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \end{array} $ $ \begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \end{array} $ $ \begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \end{array} $ $ \begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \end{array} $ $ \begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \end{array} $ $ \begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \end{array} $ $ \begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \end{array} $ $ \begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{array} $ $ \begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{array} $ $ \begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{array} $ $ \begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{array} $ $ \begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\$	Number of intermittent far	is		<u> </u>	2 ×	10 =	20	(7a)	
Air changes per hourInfiltration due to chimneys, flues and fans = (6a)+(6b)+(7a)+(7b) = 20 + (6) = 0.09 (8)If a pressurisation test has been carried out or is intended, proceed to (17), otherwise continue from (9) to (16)(9)(10)Number of storeys in the dwelling (ns) 0 0 (10)Additional infiltration $(9)-1)x0.1 =$ 0 (10)Structural infiltration: 0.25 for steel or timber frame or 0.35 for masonry construction 0 (11)if both types of wall are present, use the value corresponding to the greater wall area (after deducting areas of openings); if equal user 0.35 0 0 If no draught lobby, enter 0.05, else enter 0 0 0 (12) Percentage of windows and doors draught stripped 0 0 (13) Window infiltration rate $(8) + (10) + (11) + (12) + (13) + (15) =$ 0 (15) Infiltration rate $(8) + (10) + (11) + (12) + (13) + (15) =$ 0 (15) Air permeability value, q50, expressed in cubic metres per hour per square metre of envelope area 3 (17) Air permeability value, q50, expressed in cubic metres per hour per square metre of envelope area 3 (17) Air permeability value, q50, expressed in cubic metres per hour per square metre of envelope area 3 (17) Air permeability value applies if a pressurisation test has been done or a degree air permeability is being used 0.24 (18) Number of sides on which sheltered $(20) = 1 - [0.075 \times (19)] =$ 0.25 (20) Infiltration rate incorporating shel	Number of passive vents			Γ	0 ×	10 =	0	(7b)	
Infiltration due to chimneys, flues and fans = $(6a)+(6b)+(7a)+(7c) = 20 + (5) = 0.09$ (8) If a pressurisation test has been carried out or is intended, proceed to (17), otherwise continue from (9) to (16) Number of storeys in the dwelling (ns) Additional infiltration (9)-1y-0.1 = 0 (10) Structural infiltration: 0.25 for steel or timber frame or 0.35 for masonry construction if both types of wall are present, use the value corresponding to the greater wall area (after deducting areas of openings); if equal user 0.35 If suspended wooden floor, enter 0.2 (unsealed) or 0.1 (sealed), else enter 0 0 (12) If no draught lobby, enter 0.05, else enter 0 0 (14) Window 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 Air permeability value, af50, expressed in cubic metres per hour per square metre of envelope area Air permeability value applies if a pressurisation test has been done or a degree air permeability is being used Number of sides on which sheltered Shelter factor (20) = 1 - [0.075 x (19)] = 0.22 (21) Infiltration rate modified for monthly wind speed Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Monthly average wind speed from Table 7 (22)m 54 5.1 5.1 4.5 4.1 3.9 3.7 3.7 4.2 4.5 4.8 5.1 Wind Factor (22a)m = (22)m ÷ 4	Number of flueless gas fir	es		Γ	0 ×	40 =	0	(7c)	
Infiltration due to chimneys, flues and fans = $(6a)+(6b)+(7a)+(7c) = 20 + (5) = 0.09$ (8) If a pressurisation test has been carried out or is intended, proceed to (17), otherwise continue from (9) to (16) Number of storeys in the dwelling (ns) Additional infiltration (9)-1y-0.1 = 0 (10) Structural infiltration: 0.25 for steel or timber frame or 0.35 for masonry construction if both types of wall are present, use the value corresponding to the greater wall area (after deducting areas of openings); if equal user 0.35 If suspended wooden floor, enter 0.2 (unsealed) or 0.1 (sealed), else enter 0 0 (12) If no draught lobby, enter 0.05, else enter 0 0 (14) Window 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 Air permeability value, af50, expressed in cubic metres per hour per square metre of envelope area Air permeability value applies if a pressurisation test has been done or a degree air permeability is being used Number of sides on which sheltered Shelter factor (20) = 1 - [0.075 x (19)] = 0.22 (21) Infiltration rate modified for monthly wind speed Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Monthly average wind speed from Table 7 (22)m 54 5.1 5.1 4.5 4.1 3.9 3.7 3.7 4.2 4.5 4.8 5.1 Wind Factor (22a)m = (22)m ÷ 4				_		Air ch	anges per hou	_ ır	
If a pressurisation test has been carried out or is intended, proceed to (17), otherwise continue from (9) to (16) Number of storeys in the dwelling (ns) Additional infiltration $[(9)-1]\times 0.1 = 0$ (10) Structural infiltration: 0.25 for steel or timber frame or 0.35 for masonry construction if both types of wall are present, use the value corresponding to the greater wall area (after deducting areas of openings); if equal user 0.35 If suspended wooden floor, enter 0.2 (unsealed) or 0.1 (sealed), else enter 0 If no draught lobby, enter 0.05, else enter 0 Percentage of windows and doors draught stripped Window infiltration $0.25 - [0.2 \times (14) + 100] =$ Infiltration rate $(8) + (10) + (11) + (12) + (13) + (15) =$ Air permeability value, q50, expressed in cubic metres per hour per square metre of envelope area <i>3</i> (17) If based on air permeability value, then (18) = $(17) + 20] + (8)$, otherwise (18) = (16) Air permeability value applies if a pressurisation test has been done or a degree air permeability is being used Number of sides on which sheltered Shelter factor $(20) = 1 - [0.075 \times (19)] =$ Infiltration rate modified for monthly wind speed $\boxed{20} = 1 - [0.075 \times (19)] =$ $\boxed{21} = (35) = (22)$ $\boxed{22} = (21) = (35) = (22)$	Infiltration due to chimney	s, flues and fans = $(6a)$	+(6b)+(7a)+(7b)+(7	7c) =	20	r		-	
Additional infiltration[(9)-1]x0.1 =0(10)Structural infiltration: 0.25 for steel or timber frame or 0.35 for masonry construction if both types of wall are present, use the value corresponding to the greater wall area (after deducting areas of openings); if equal user 0.350(11)If suspended wooden floor, enter 0.2 (unsealed) or 0.1 (sealed), else enter 00(12)If no draught lobby, enter 0.05, else enter 00(13)Percentage of windows and doors draught stripped0(14)Window infiltration0.25 - [0.2 x (14) + 100] =(15)Infiltration rate(8) + (10) + (11) + (12) + (13) + (15) =(16)Air permeability value, q50, expressed in cubic metres per hour per square metre of envelope area3If based on air permeability value, then (18) = [(17) + 20]+(8), otherwise (18) = (16)0.24Air permeability value, applies if a pressurisation test has been done or a degree air permeability is being used(19)Number of sides on which sheltered2(19)Shelter factor(20) = 1 - [0.075 x (19)] =0.25Infiltration rate incorporating shelter factor(21) = (18) x (20) =0.2Infiltration rate modified for monthly wind speed013Monthly average wind speed from Table 70.20.2(22)me5.45.15.14.13.93.73.74.24.55.1Wind Factor (22a)m = (22)m ÷ 4000.2	•					. (0) –	0.03		
Structural infiltration: 0.25 for steel or timber frame or 0.35 for masonry constructionif both types of wall are present, use the value corresponding to the greater wall area (after deducting areas of openings); if equal user 0.35If suspended wooden floor, enter 0.2 (unsealed) or 0.1 (sealed), else enter 0If no draught lobby, enter 0.05, else enter 0Percentage of windows and doors draught strippedWindow infiltration0.25 - [0.2 x (14) ± 100] =Infiltration rate(8) + (10) + (11) + (12) + (13) + (15) =(16)Air permeability value, q50, expressed in cubic metres per hour per square metre of envelope area(17)If based on air permeability value, then (18) = [(17) ± 20]+(8), otherwise (18) = (16)Air permeability value applies if a pressurisation test has been done or a degree air permeability is being usedNumber of sides on which shelteredShelter factor(20) = 1 - [0.075 x (19)] =Infiltration rate modified for monthly wind speedJanJanAprMayJanFebMarAprMayJanFebMarAprMayJanFebMarAprMayJanFebMarAprMayJanFebMarAprMayJanFebMarAprMayJanFeb<	Number of storeys in the	e dwelling (ns)				Γ	0	(9)	
if both types of wall are present, use the value corresponding to the greater wall area (after deducting areas of openings); if equal user 0.35 If suspended wooden floor, enter 0.2 (unsealed) or 0.1 (sealed), else enter 0 If no draught lobby, enter 0.05, else enter 0 Percentage of windows and doors draught stripped Window infiltration nate $0.25 - [0.2 \times (14) \div 100] =$ 0 (14) Window infiltration $0.25 - [0.2 \times (14) \div 100] =$ 0 (15) Infiltration rate (8) + (10) + (11) + (12) + (13) + (15) = Air permeability value, q50, expressed in cubic metres per hour per square metre of envelope area If based on air permeability value, then $(18) = [(17) \div 20] + (8)$, otherwise $(18) = (16)$ $Air permeability value applies if a pressurisation test has been done or a degree air permeability is being used Number of sides on which sheltered Shelter factor (20) = 1 - [0.075 \times (19)] =0.2$ (21) Infiltration rate modified for monthly wind speed $\boxed{2 (21)}$ 1nfiltration rate modified for monthly wind speed $\boxed{2 (22)} = 1 - [0.075 \times (19)] =$ 0.2 (21) $\boxed{101}$ $\boxed{102}$ 10	Additional infiltration				[(9)	-1]x0.1 =	0	(10)	
deducting areas of openings); if equal user 0.35If suspended wooden floor, enter 0.2 (unsealed) or 0.1 (sealed), else enter 0If no draught lobby, enter 0.05, else enter 00Percentage of windows and doors draught stripped0Window infiltration $0.25 \cdot [0.2 \times (14) \div 100] =$ Infiltration rate(8) + (10) + (11) + (12) + (13) + (15) =Air permeability value, q50, expressed in cubic metres per hour per square metre of envelope area3If based on air permeability value, then $(18) = [(17) \div 20] + (8)$, otherwise $(18) = (16)$ 0.24Air permeability value applies if a pressurisation test has been done or a degree air permeability is being used2Number of sides on which sheltered2(19)Shelter factor(20) = 1 - [0.075 \times (19)] =0.2Infiltration rate modified for monthly wind speed0.21 = (18) × (20) =0.2Monthly average wind speed from Table 70.2(21)(22)me5.45.15.14.5Wind Factor (22a)m = (22)m ÷ 443.9	Structural infiltration: 0.2	25 for steel or timber fra	ame or 0.35 for	masonry constr	uction	[0	(11)	
If suspended wooden floor, enter 0.2 (unsealed) or 0.1 (sealed), else enter 00(12)If no draught lobby, enter 0.05, else enter 00(13)Percentage of windows and doors draught stripped0(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 area3(17)If based on air permeability value, then $(18) = [(17) \div 20] + (8)$, otherwise $(18) = (16)$ 0.24(18)Air permeability value applies if a pressurisation test has been done or a degree air permeability is being used2(19)Number of sides on which sheltered(20) = 1 - [0.075 x (19)] =0.2(21)Infiltration rate incorporating shelter factor(21) = (18) x (20) =0.2(21)Infiltration rate modified for monthly wind speed0(22) = (22)m + 4(22)m + 4Wind Factor (22a)m = (22)m ÷ 44.13.93.73.74.24.54.85.1			onding to the great	er wall area (after					
If no draught lobby, enter 0.05, else enter 00Percentage of windows and doors draught stripped0Window infiltration $0.25 - [0.2 \times (14) \div 100] =$ Infiltration rate(8) + (10) + (11) + (12) + (13) + (15) =Air permeability value, q50, expressed in cubic metres per hour per square metre of envelope area3If based on air permeability value, then (18) = [(17) \div 20]+(8), otherwise (18) = (16)0.24Air permeability value applies if a pressurisation test has been done or a degree air permeability is being used2Number of sides on which sheltered2Shelter factor(20) = 1 - [0.075 x (19)] =Infiltration rate modified for monthly wind speed0.2Infiltration rate modified for monthly wind speed0.2Monthly average wind speed from Table 7(22)me5.45.1Shelter (22a)m = (22)m ÷ 4			d) or 0.1 (seale	d), else enter 0		Г	0	7(12)	
Percentage of windows and doors draught stripped0Window infiltration $0.25 \cdot [0.2 \times (14) \div 100] =$ 0Infiltration rate $(8) + (10) + (11) + (12) + (13) + (15) =$ 0Air permeability value, q50, expressed in cubic metres per hour per square metre of envelope area3If based on air permeability value, then $(18) = [(17) \div 20] + (8)$, otherwise $(18) = (16)$ 0.24Air permeability value applies if a pressurisation test has been done or a degree air permeability is being used0Number of sides on which sheltered2(19)Shelter factor(20) = 1 - [0.075 \times (19)] =0.25Infiltration rate incorporating shelter factor(21) = (18) × (20) =0.2Infiltration rate modified for monthly wind speed0(21) = (18) × (20) =0.2Monthly average wind speed from Table 7(22)m = 5.4 5.1 5.1 4.5 4.1 Wind Factor (22a)m = (22)m $\div 4$ 4.5 4.8 5.1 5.1	•			2), 0.00 001 0		Γ		4	
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 area3(17)If based on air permeability value, then $(18) = [(17) \div 20]+(8)$, otherwise $(18) = (16)$ 0.24(18)Air permeability value applies if a pressurisation test has been done or a degree air permeability is being used0(19)Number of sides on which sheltered2(19)0.85(20)Shelter factor(20) = 1 - [0.075 x (19)] =0.25(20)Infiltration rate incorporating shelter factor(21) = (18) x (20) =0.2(21)Infiltration rate modified for monthly wind speed00.2(21)Monthly average wind speed from Table 7(22)m = 5.4 5.1 5.1 4.5 4.1 3.9 3.7 3.7 4.2 4.5 4.8 5.1 Wind Factor (22a)m = (22)m $\div 4$ 4.5 4.8 5.1 4.5 4.1 3.9 3.7 3.7 4.2 4.5 4.8 5.1			pped			Ĺ		4	
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 area3(17)If based on air permeability value, then $(18) = [(17) \div 20] + (8)$, otherwise $(18) = (16)$ 0.24(18)Air permeability value applies if a pressurisation test has been done or a degree air permeability is being used0.24(18)Number of sides on which sheltered2(19)0.85(20)Shelter factor(20) = 1 - [0.075 x (19)] =0.25(20)Infiltration rate incorporating shelter factor(21) = (18) x (20) =0.2(21)Infiltration rate modified for monthly wind speed0.2(21)(21)Monthly average wind speed from Table 75.15.14.13.93.73.74.24.54.85.1Wind Factor (22a)m = (22)m ÷ 4 <td between="" column="" seco<="" second="" td="" the=""><td>-</td><td></td><td></td><td>0.25 - [0.2 x (14) ÷ 1</td><td>00] =</td><td>ľ</td><td></td><td>4</td></td>	<td>-</td> <td></td> <td></td> <td>0.25 - [0.2 x (14) ÷ 1</td> <td>00] =</td> <td>ľ</td> <td></td> <td>4</td>	-			0.25 - [0.2 x (14) ÷ 1	00] =	ľ		4
Air permeability value, q50, expressed in cubic metres per hour per square metre of envelope area3(17)If based on air permeability value, then $(18) = [(17) \div 20] + (8)$, otherwise $(18) = (16)$ 0.24(18)Air permeability value applies if a pressurisation test has been done or a degree air permeability is being used0.24(18)Number of sides on which sheltered2(19)Shelter factor(20) = 1 - [0.075 x (19)] =0.85(20)Infiltration rate incorporating shelter factor(21) = (18) x (20) =0.2(21)Infiltration rate modified for monthly wind speed0.20.2(21)Monthly average wind speed from Table 72.13.73.74.24.54.85.1Wind Factor (22a)m = (22)m ÷ 444.13.93.73.74.24.54.85.1	Infiltration rate			(8) + (10) + (11) + (1	2) + (13) + (15) =	ľ		4	
Air permeability value applies if a pressurisation test has been done or a degree air permeability is being used	Air permeability value, o	50, expressed in cubic	metres per ho	ur per square m	etre of envelope	area		(17)	
Number of sides on which sheltered 2 (19)Shelter factor $(20) = 1 - [0.075 \times (19)] =$ 0.85 (20)Infiltration rate incorporating shelter factor $(21) = (18) \times (20) =$ 0.2 (21)Infiltration rate modified for monthly wind speed 0.2 (21) 0.2 (21)Infiltration rate modified for monthly wind speed 0.2 (21) 0.2 (21)Monthly average wind speed from Table 7 0.2 (22)m= 5.4 5.1 5.1 4.5 4.1 3.9 3.7 3.7 4.2 4.5 4.8 5.1 Wind Factor (22a)m = (22)m ÷ 4 0.2 0.2 0.2 0.2	If based on air permeabilit	ty value, then (18) = [(17)	÷ 20]+(8), otherwi	se (18) = (16)		Ì	0.24	(18)	
Shelter factor $(20) = 1 - [0.075 \times (19)] =$ (20) Infiltration rate incorporating shelter factor $(21) = (18) \times (20) =$ 0.2 (21) Infiltration rate modified for monthly wind speed $Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov DecMonthly average wind speed from Table 7(22)m = 5.4 5.1 5.1 4.5 4.1 3.9 3.7 3.7 4.2 4.5 4.8 5.1Wind Factor (22a)m = (22)m ÷ 4$	Air permeability value applies	if a pressurisation test has b	been done or a deg	ree air permeability	is being used	L		-	
Infiltration rate incorporating shelter factor (21) = (18) × (20) = 0.2 (21) Infiltration rate modified for monthly wind speed Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Monthly average wind speed from Table 7 (22)m= 5.4 5.1 5.1 4.5 4.1 3.9 3.7 3.7 4.2 4.5 4.8 5.1 Wind Factor (22a)m = (22)m ÷ 4 Image: Construct on the second s		sheltered				[2	(19)	
Infiltration rate modified for monthly wind speed $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$					9)] =	ļ	0.85	(20)	
JanFebMarAprMayJunJulAugSepOctNovDecMonthly average wind speed from Table 7 $(22)m=$ 5.4 5.1 5.1 4.5 4.1 3.9 3.7 3.7 4.2 4.5 4.8 5.1 Wind Factor (22a)m = (22)m $\div 4$	·	0		(21) = (18) x (20) =		L	0.2	(21)	
Monthly average wind speed from Table 7 $(22)m =$ 5.4 5.1 5.1 4.5 4.1 3.9 3.7 3.7 4.2 4.5 4.8 5.1 Wind Factor (22a)m = (22)m ÷ 4 Image: Comparison of the second s	Infiltration rate modified fo	r monthly wind speed	I		r	,			
$(22)m = \begin{bmatrix} 5.4 & 5.1 & 5.1 & 4.5 & 4.1 & 3.9 & 3.7 & 3.7 & 4.2 & 4.5 & 4.8 & 5.1 \end{bmatrix}$ Wind Factor (22a)m = (22)m ÷ 4	Jan Feb I	Mar Apr May	Jun Jul	Aug Sep	Oct Nov	Dec			
Wind Factor (22a)m = (22)m \div 4	Monthly average wind spe	ed from Table 7	i	ii	· · · · ·	·			
	(22)m= 5.4 5.1 §	5.1 4.5 4.1	3.9 3.7	3.7 4.2	4.5 4.8	5.1			
(22a)m= 1.35 1.27 1.27 1.12 1.02 0.98 0.92 0.92 1.05 1.12 1.2 1.27	Wind Factor (22a)m = (22)m ÷ 4							
	(22a)m= 1.35 1.27 1	.27 1.12 1.02	0.98 0.92	0.92 1.05	1.12 1.2	1.27			

Adjust	ed infiltr	ation rat	e (allowi	ng for sh	nelter an	d wind s	peed) =	(21a) x	(22a)m					
	0.28	0.26	0.26	0.23	0.21	0.2	0.19	0.19	0.22	0.23	0.25	0.26		
		c <i>tive air</i> al ventila	change i	rate for t	he appli	cable ca	se							(22.0)
			using Appe	endix N. (2	3b) = (23a	a) x Fmv (e	equation (N	N5)), othe	rwise (23b	(23a) = (23a)			0	(23a) (23b)
			overy: effici							(200)			0	(230) (23c)
			-		-					2h)m + (23P) ^ [-	1 – (23c)	0	(230)
(24a)m=	r			0				0	$\frac{1}{0}$			1 - (230)	- 100j	(24a)
			anical ve	_	-	-					_	Ů		
(24b)m=				0				0			230)	0	1	(24b)
										0	0	0		(=)
			tract ven ‹ (23b), t		-	-				5 x (23t))			
(24c)m=	<u> </u>	0		0	0		0		0		0	0		(24c)
	_		on or wh	-	-								l	
,			en (24d)		•	•				0.5]				
(24d)m=	0.54	0.53	0.53	0.53	0.52	0.52	0.52	0.52	0.52	0.53	0.53	0.53		(24d)
Effe	ctive air	change	rate - en	iter (24a) or (24t	o) or (24	c) or (24	d) in boy	(25)				1	
(25)m=	0.54	0.53	0.53	0.53	0.52	0.52	0.52	0.52	0.52	0.53	0.53	0.53		(25)
2 1 10	et lesses				~ **			1	1		•	•	1	
		s and ne Gros	eat loss p			Net Ar	00	U-valı	10	AXU		k-value		A X k
ELEN		area		Openin m		A,r		W/m2		(W/	K)	kJ/m ² ·l		J/K
Doors						1.68	x	1	=	1.68				(26)
Windo	ws Type	e 1				16.8	x1.	/[1/(1.5)+	0.04] =	23.77	=			(27)
Windo	ws Type	2				6.56	x1.	/[1/(1.5)+	0.04] =	9.28	=			(27)
Walls -	Type1	94.0)8	23.30	5	70.72	2 x	0.2	=	14.14	ا آ			(29)
Walls		3.00		1.68		1.4	x	0.17		0.24	╡╏		\dashv	(29)
Roof	.) 0 =	2.5		0		2.52		0.13		0.24	╡╏			(30)
	aroa of c	elements		0				0.13		0.33				
			, 111-			99.68					— , r			(31)
Party v				ffa ati ya yui		20.86		0	=	0				(32)
			ows, use e sides of in				ated using	normula 1	/[(1/ U-vai t	le)+0.04j a	as given in	paragraph	1 3.2	
Fabric	heat los	ss, W/K :	= S (A x	U)				(26)(30)) + (32) =				49.45	(33)
Heat c	apacity	Cm = S((Axk)						((28).	(30) + (32	2) + (32a).	(32e) =	14664.18	(34)
Therm	al mass	parame	ter (TMF	? = Cm ÷	- TFA) ir	n kJ/m²K			Indica	tive Value	: Medium		250	(35)
		•	ere the de					ecisely the	e indicative	e values of	TMP in Ta	able 1f		
			tailed calcu											
	-		x Y) cale		• •	•	<						3.99	(36)
	s of therma abric he		are not kn	own (36) =	= 0.15 x (3	1)			(22)	· (36) =				
				monthl							'OE) m v (E'		53.44	(37)
venua		1	alculated			lun	lul	<u> </u>	r	$= 0.33 \times ($	<u> </u>	i _	1	
(38)m=	Jan 39.01	Feb 38.71	Mar 38.71	Apr 38.16	May 37.83	Jun 37.68	Jul 37.54	Aug 37.54	Sep 37.91	Oct 38.16	Nov 38.43	Dec 38.71		(38)
				50.10	57.00	57.00	57.54	07.04				50.71	l	
				01.0	04.07	01.10	00.07	00.07	r	= (37) + (100)	· ·	00.44	1	
(39)m=	92.44	92.14	92.14	91.6	91.27	91.12	90.97	90.97	91.35	91.6	91.86	92.14	04.00	(20)
										Average =	3um(39)1	12 / 12=	91.63	(39)

Heat lo	oss para	meter (H	HLP), W/	/m²K					(40)m	= (39)m ÷	(4)			
(40)m=	1.18	1.17	1.17	1.17	1.16	1.16	1.16	1.16	1.16	1.17	1.17	1.17		
Numbe	er of day	rs in mor	nth (Tab	le 1a)		-				Average =	Sum(40)₁.	₁₂ /12=	1.17	(40)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
(41)m=	31	28	31	30	31	30	31	31	30	31	30	31		(41)
							1			1				
4. Wa	iter heat	ing enei	gy requi	irement:								kWh/ye	ear:	
Accum		ipancy, I	NI.									10		(40)
if TF		9, N = 1		[1 - exp	(-0.0003	849 x (TF	FA -13.9)2)] + 0.0	0013 x (⁻	TFA -13.		43		(42)
			ater usad	ae in litre	es per da	ay Vd.av	erage =	(25 x N)	+ 36		91	.97		(43)
Reduce	the annua	l average	hot water	usage by	5% if the a	lwelling is	designed	to achieve		se target o				
not more	e that 125	litres per j	person per	r day (all w r	ater use, l	not and co	ld) 1	1	r	1	· · · · ·			
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Hot wate	-		ay for ea	r	Vd,m = fa	ctor from 1	i able 1c x I	(43)						
(44)m=	101.17	97.49	93.81	90.13	86.45	82.77	82.77	86.45	90.13	93.81	97.49	101.17		-
Energy o	content of	hot water	used - cal	culated m	onthly $= 4$.	190 x Vd,r	m x nm x D	0Tm / 3600			m(44) ₁₁₂ = ables 1b, 1		1103.63	(44)
(45)m=	150.39	131.53	135.73	118.33	113.54	97.98	90.79	104.18	105.43	122.86	134.12	145.64		
lf instant	aneous w	ater heatii	ng at point	of use (no	hot water	r storage),	enter 0 in	boxes (46		Total = Su	m(45) ₁₁₂ =		1450.5	(45)
(46)m=	22.56	19.73	20.36	17.75	17.03	14.7	13.62	15.63	15.81	18.43	20.12	21.85		(46)
Water	storage	loss:												
a) If ma	anufactu	irer's de	clared lo	oss facto	r is knov	vn (kWh	/day):					0		(47)
Tempe	rature fa	actor fro	m Table	2b								0		(48)
0,			•	, kWh/ye				(47) x (48)) =			0		(49)
			•		s factor is olar stor									(50)
,			·	0 ,	enter 110	0						0		(50)
								enter '0' in	box (50)					
			,		e 2 (kW		,					0		(51)
		from Tal				1/1116/06	(y)					0		(51)
			m Table	2h								0 0		(52) (53)
•				_~ , kWh/ye	aar			((50) x (51) y (52) y	(53) -				(54)
•••		54) in (5	-	,, y	541) X (02) X	(00) –		0 0		(55)
	, ,	, ,		for each	month			((56)m = (55) × (41)	m		-		
(56)m=	0	0	0	0	0	0	0	0	0	0	0	0		(56)
	-	-	-	-	-		-	-	-	-	-	m Append	ix H	(00)
				- · ·			1	r ·	· · ·					(57)
(57)m=	0	0	0	0	0	0	0	0	0	0	0	0		
	•	•	,	om Table			(0		(58)
	•					,	• •	65 × (41)		* *!= ~ ***	at at)			
(moc (59)m=		0						ng and a			stat) 0	0		(59)
Combi		culated	for each	month ((61)m =	(60) · 24	35 - (11)m		1				
(61)m=	22.37	20.21	22.37	21.65	22.37	(60) - 36 21.65	22.37	22.37	21.65	22.37	21.65	22.37		(61)
	22.31	20.21	22.31	21.00	22.31	21.00	22.31	22.31	21.00	22.31	21.05	22.31		(01)

Total h	neat req	uired for	water h	eating	calculate	ed fo	or eac	h month	(62)	m =	0.85 × (45)m -	+ (46)m +	(57)m +	(59)m + (61)m	
(62)m=	172.76	151.73	158.1	139.9	3 135.91	1	19.62	113.16	126	.55	127.08	145.23	155.76	168.01		(62)
Solar DI	HW input	calculated	using Ap	oendix G	or Append	ix H	(negati	ve quantity	/) (ent	er '0'	if no solai	r contrib	ution to wate	er heating)	-	
(add a	dditiona	al lines if	FGHRS	and/o	r WWHR	S a	pplies	, see Ap	penc	dix C	3)			-		
(63)m=	-26.02	-42.3	-68.39	-93.5	3 -117.46	5 -1	20.86	-120.43	-103	.33	-77.7	-55.01	-30.94	-21.56		(63)
Output	t from w	ater hea	ter													
(64)m=	111.23	85.04	74.21	42.8	18.45		0	0	23.	14	46.67	79.64	98.36	110.64		
									-	Outp	out from wa	ater heat	er (annual)	12	690.18	(64)
Heat g	jains fro	om water	heating	, kWh/	month 0.	25 ´	[0.85	× (45)m	+ (6	51)m	n] + 0.8 x	(46)n	n + (57)m	+ (59)m]	
(65)m=	55.6	48.78	50.72	44.76	43.34	;	37.99	35.78	40.	23	40.47	46.44	50.01	54.02		(65)
inclu	ude (57))m in calo	culation	of (65)	m only if	cyli	nder i	s in the a	dwell	ing	or hot w	ater is	from com	munity h	neating	
5. Int	ternal a	ains (see	e Table	5 and 5	ia):					-				-	-	
		ns (Table														
wictab	Jan	Feb	Mar		May	,	Jun	Jul	A	ug	Sep	Oct	Nov	Dec]	
(66)m=	121.62	-	121.62	121.6		-	21.62	121.62	121	-	121.62	121.62		121.62		(66)
Liahtin	a dains	(calcula	ted in A	ppendi	x L. equa	tior	n L9 o	r L9a), a	lso s	ee -	Table 5		-		1	
(67)m=	19.27	17.11	13.92	10.54		_	6.65	7.18	9.3		12.54	15.92	18.58	19.8		(67)
		ins (calc													1	
(68)m=	216.13	· ·	212.72	200.6		<u> </u>	71.23	161.69	159		165.1	177.13	192.32	206.59]	(68)
		s (calcula			_								1		I	
(69)m=	35.16	35.16	35.16	35.16		-	35.16	35.16	35.		35.16	35.16	35.16	35.16]	(69)
					00.10	<u> </u>	50.10	00.10		10	00.10	00.10	00.10	00.10	l	()
(70)m=		ins gains	10	5a) 10	10		10	10	1	0	10	10	10	10	1	(70)
								10		0	10	10	10	10	l	(10)
	s e.g. e	vaporatio	on (nega	-97.3		_	5) -97.3	-97.3	-97		-97.3	-97.3	-97.3	-97.3	1	(71)
(71)m=				-97.3	-97.5		-97.5	-97.3	-97	.5	-97.3	-97.5	-97.5	-97.3		(11)
		gains (T	r		50.00	Т.		40.00		~~	50.0	00.40	00.45	70.04	1	(70)
(72)m=		72.6	68.17	62.16	58.26	;	52.76	48.09	54.		56.2	62.43	_	72.61		(72)
		l gains =						· · ·	r È	·	. ,	-	(71)m + (72)		1	(70)
(73)m=	379.61	377.57	364.3	342.8	7 321.12	3	00.12	286.45	292	.35	303.32	324.96	349.83	368.49		(73)
	lar gain			an fluiss fre	m Tabla G		4 00000	iotod oguo	tiona	•• ••	nuart to th		able orientat	ion		
		Access F	0	Are		anc	Flu	•	10115	10 00		e applica	FF		Gains	
Onenia		Table 6d		m				ble 6a		Т	g_ able 6b		Table 6c		(W)	
Northea	ast <mark>0.9x</mark>	0.77)		6.56	x	1	1.51	x		0.8	x	0.8	=	33.49	(75)
Northea	ast <mark>0.9x</mark>	0.77	>		6.56	x	2	23.55	x		0.8	x	0.8	=	68.53	(75)
Northea	ast <mark>0.9x</mark>	0.77	>		6.56	x	4	1.13	×		0.8	× [0.8	=	119.66	(75)
Northea	ast <mark>0.9x</mark>	0.77	>		6.56	x		67.8	×		0.8	× [0.8	=	197.26	(75)
Northea	ast <mark>0.9x</mark>	0.77	>	:	6.56	x	8	39.77	×		0.8		0.8	=	261.17	(75)
Northea	ast <mark>0.9x</mark>	0.77	,		6.56	x	9	97.5	×		0.8		0.8	=	283.68	(75)
Northea	ast <mark>0.9x</mark>	0.77	,		6.56	x	g	92.98	×		0.8		0.8	=	270.52	(75)
Northea	ast <mark>0.9x</mark>	0.77)		6.56	x	7	75.42	×		0.8	× [0.8	=	219.43	(75)

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Northeast 0.9x	0.77	Тх	6.5	6	x	5	1.24	×	0.8	x	0.8		149.1	(75)
Northeast 0.9x	0.77	x T	6.5		x		29.6	x	0.8		0.8	╡_	86.12	(75)
Northeast 0.9x	0.77	x	6.5		x		4.52	x	0.8	x	0.8		42.26	(75)
Northeast 0.9x	0.77		6.5		x		9.36	l x	0.8		0.8	- _	27.23	(75)
Southeast 0.9x	0.77		16.		x		7.39	x	0.8		0.8	-	278.58	(77)
Southeast 0.9x	0.77		16.		x		3.74	×	0.8		0.8		474.9	(77)
Southeast 0.9x	0.77	۲ × ۲	16.		x		4.22	 x	0.8	۲ × ۲	0.8		627.5	(77)
Southeast 0.9x	0.77	۲ × آ	16.		x)3.49	 x	0.8	_ _ x	0.8	=	771.11	(77)
Southeast 0.9x	0.77	۲ × ۲	16.		x		13.34	x	0.8	- x	0.8		844.49	(77)
Southeast 0.9x	0.77	۲ × ۲	16.		x		15.04	 x	0.8	۲ × آ	0.8	=	857.21	(77)
Southeast 0.9x	0.77	۲ ×	16.		x		12.79	x	0.8	- x	0.8		840.42	(77)
Southeast 0.9x	0.77	۲ × ۲	16.		x)5.34	x	0.8	- x	0.8	=	784.91	(77)
Southeast 0.9x	0.77	۲ × ۲	16.		x)2.9	x	0.8	۲ × آ	0.8	=	692.19	(77)
Southeast 0.9x	0.77	۲ ×	16.		x		2.36	x	0.8	- x	0.8		539.19	(77)
Southeast 0.9x	0.77	۲ × ۲	16.		x		4.83	l X	0.8	- X	0.8		334	(77)
Southeast 0.9x	0.77	۲ × آ	16.		x		1.95	 x	0.8	_ _ x	0.8	=	238.06	(77)
L	0							J	010		0.0			
Solar gains in	watts, calcu	ulated	for each	h mont	h			(83)m	i = Sum(74)m .	.(82)m				
(83)m= 312.07		7.16	968.37	1105.6		40.89	1110.94	1004	1.33 841.29	625.3	376.26	265.3		(83)
Total gains – ir	nternal and	solar	(84)m =	= (73)m	י ו + (מ	83)m	, watts	1			- !		1	
(84)m= 691.68	921 11	11.46	1311.24	1426.7	8 14	441.01	1397.39	1296	6.68 1144.61	950.2	6 726.09	633.78		(84)
7. Mean inter	nal tempera	ature (heating	seaso	n)									
7. Mean inter Temperature			Ŭ		<i>.</i>	area f	rom Tat	ole 9	, Th1 (°C)				21	(85)
	during heat	ting pe	eriods ir	n the liv	/ing			ole 9	. Th1 (°C)				21	(85)
Temperature	during heat	ting pe	eriods ir	n the liv	/ing m (s			<u> </u>	Th1 (°C) ug Sep	Oct	Nov	Dec	21	(85)
Temperature Utilisation fac	during hea tor for gain: Feb	ting pe s for li	eriods in ving are	h the live a, h1,i	/ing m (s /	ee Ta	ble 9a)	<u> </u>	ug Sep	Oct 0.83	Nov 0.97	Dec 0.99	21	(85)
Temperature Utilisation fac Jan	during heat tor for gain Feb 0.96 C	ting pe s for li Mar 0.89	eriods in ving are Apr 0.76	n the livea, h1,i May 0.58	/ing m (s /	ee Ta Jun ^{0.4}	ble 9a) Jul 0.27	A 0.2	ug Sep 9 0.52				21	
Temperature Utilisation fac Jan (86)m= 0.99	during hea tor for gain: Feb 0.96 C I temperatu	ting pe s for li Mar 0.89	eriods in ving are Apr 0.76	n the livea, h1,i May 0.58	/ing m (s /	ee Ta Jun ^{0.4}	ble 9a) Jul 0.27	A 0.2	ug Sep 9 0.52 able 9c)		0.97		21	
Temperature Utilisation fac Jan (86)m= 0.99 Mean interna (87)m= 20	during hear tor for gains Feb 0.96 0 I temperatu 20.3 2	ting pe s for li Mar 0.89 re in li 0.62	eriods in ving are Apr 0.76 iving are 20.85	n the liv ea, h1,i May 0.58 ea T1 (20.97	/ing m (s /	ee Ta Jun 0.4 w ste 21	ble 9a) Jul 0.27 ps 3 to 7 21	A 0.2 7 in T 2	ug Sep 9 0.52 fable 9c) 1 20.98	0.83	0.97	0.99	21	(86)
Temperature Utilisation fac Jan (86)m= 0.99 Mean interna	during heat tor for gains Feb 0.96 c I temperatu 20.3 2 during heat	ting pe s for li Mar 0.89 re in li 0.62	eriods in ving are Apr 0.76 iving are 20.85	n the liv ea, h1,i May 0.58 ea T1 (20.97	/ing m (s / (follo	ee Ta Jun 0.4 w ste 21	ble 9a) Jul 0.27 ps 3 to 7 21	A 0.2 7 in T 2	ug Sep 9 0.52 able 9c) 1 20.98 9, Th2 (°C)	0.83	0.97 20.31	0.99	21	(86)
Temperature Utilisation fac Jan (86)m= 0.99 Mean interna (87)m= 20 Temperature (88)m= 19.94	during hear tor for gains Feb 0.96 0 I temperatu 20.3 20 during hear 19.94 19	ting personance of the second	eriods in ving are Apr 0.76 iving are 20.85 eriods in 19.95	n the liv ea, h1,i May 0.58 ea T1 (20.97 n rest c 19.95	/ing m (s / / (follo f dw 1	ee Ta Jun 0.4 ww ste 21 velling 9.95	ble 9a) Jul 0.27 ps 3 to 7 21 from Ta 19.95	Ai 0.2 7 in T 2 able 9 19.	ug Sep 9 0.52 able 9c) 1 20.98 9, Th2 (°C)	0.83	0.97 20.31	0.99	21]]	(86) (87)
Temperature Utilisation fac Jan (86)m= 0.99 Mean interna (87)m= 20 Temperature (88)m= 19.94 Utilisation fac	during hear tor for gains Feb 0.96 0 I temperatu 20.3 2 during hear 19.94 1	ting personance of the second	eriods in ving are Apr 0.76 iving are 20.85 eriods in 19.95	n the liv ea, h1,i May 0.58 ea T1 (20.97 n rest c 19.95	/ing m (s / / (follo of dw 1 , h2,	ee Ta Jun 0.4 ww ste 21 velling 9.95	ble 9a) Jul 0.27 ps 3 to 7 21 from Ta 19.95	Ai 0.2 7 in T 2 able 9 19.	ug Sep 29 0.52 Table 9c) 1 20.98 0, Th2 (°C) 95 19.95	0.83	0.97 20.31	0.99]]	(86) (87)
Temperature Utilisation fac Jan (86)m= 0.99 Mean interna (87)m= 20 Temperature (88)m= 19.94 Utilisation fac (89)m= 0.99	during hear tor for gains Feb 0.96 0 I temperatu 20.3 2 during hear 19.94 1 tor for gains 0.95 0	ting personal strain st	eriods in ving are Apr 0.76 iving are 20.85 eriods in 19.95 est of dv 0.72	a the lives, h1, 1 May 0.58 ea T1 (20.97 a rest o 19.95 welling 0.52	/ing m (s / / ifollo f dw , h2, , h2,	ee Ta Jun 0.4 ww ste 21 velling 9.95 ,m (se 0.34	ble 9a) Jul 0.27 ps 3 to 7 21 from Ta 19.95 re Table 0.2	A 0.2 7 in T 2 19. 9a) 0.2	ug Sep 29 0.52 Table 9c) 1 20.98 0, Th2 (°C) 95 19.95 1 0.45	0.83	0.97 2 20.31 5 19.95	0.99 19.98 19.94]]	(86) (87) (88)
Temperature Utilisation fac Jan (86)m= 0.99 Mean interna (87)m= 20 Temperature (88)m= 19.94 Utilisation fac (89)m= 0.99 Mean interna	during hear tor for gains Feb 0.96 0 I temperatu 20.3 2 during hear 19.94 1 tor for gains 0.95 0 I temperatu	ting personal strain st	eriods ir ving are Apr 0.76 iving are 20.85 eriods ir 19.95 est of dv 0.72 he rest of	a the liv ea, h1,i May 0.58 ea T1 (20.97 a rest c 19.95 welling 0.52 of dwe	m (s / / follo of dw 1 , h2, (lling	ee Ta Jun 0.4 ww ste 21 velling 9.95 ,m (se 0.34 T2 (fo	ble 9a) Jul 0.27 ps 3 to 7 21 from Ta 19.95 te Table 0.2 bllow ste	A 0.2 7 in T 2 19. 9a) 0.2 eps 3	ug Sep 9 0.52 able 9c) 1 20.98 9, Th2 (°C) 95 19.95 1 0.45 to 7 in Table	0.83 20.82 19.95 0.78 e 9c)	0.97 20.31 19.95 0.96	0.99 19.98 19.94 0.99]]]	(86) (87) (88) (89)
Temperature Utilisation fac Jan (86)m= 0.99 Mean interna (87)m= 20 Temperature (88)m= 19.94 Utilisation fac (89)m= 0.99	during hear tor for gains Feb 0.96 0 I temperatu 20.3 2 during hear 19.94 1 tor for gains 0.95 0 I temperatu	ting personal strain st	eriods in ving are Apr 0.76 iving are 20.85 eriods in 19.95 est of dv 0.72	a the lives, h1, 1 May 0.58 ea T1 (20.97 a rest o 19.95 welling 0.52	m (s / / follo of dw 1 , h2, (lling	ee Ta Jun 0.4 ww ste 21 velling 9.95 ,m (se 0.34	ble 9a) Jul 0.27 ps 3 to 7 21 from Ta 19.95 re Table 0.2	A 0.2 7 in T 2 19. 9a) 0.2	ug Sep 1 0.52 1 20.98 20, Th2 (°C) 95 19.95 1 0.45 1 0.45 1 0.45 1 0.45	0.83 20.82 19.95 0.78 9 9c) 19.77	0.97 20.31 19.95 0.96	0.99 19.98 19.94 0.99 18.62	 	(86) (87) (88) (89) (90)
Temperature Utilisation fac Jan (86)m= 0.99 Mean interna (87)m= 20 Temperature (88)m= 19.94 Utilisation fac (89)m= 0.99 Mean interna (90)m= 18.64	during hear tor for gains Feb 0.96 0 I temperatu 20.3 2 during hear 19.94 1 tor for gains 0.95 0 I temperatu 19.07 1	ting personality of the second	eriods in ving are Apr 0.76 iving are 20.85 eriods in 19.95 est of dv 0.72 he rest of 19.8	a the lives, h1, 1 May 0.58 ea T1 (20.97 a rest of 19.95 welling 0.52 of dwe 19.92	/ing m (s / / follo 	ee Ta Jun 0.4 w ste 21 velling 9.95 ,m (se 0.34 T2 (fo 9.95	ble 9a) Jul 0.27 ps 3 to 7 21 from Ta 19.95 re Table 0.2 ollow ste 19.95	A 0.2 1 in T 2 bble § 19. 9a) 0.2 eps 3 19.	ug Sep 9 0.52 able 9c) 1 20.98 9, Th2 (°C) 95 19.95 1 0.45 to 7 in Table 95 19.94	0.83 20.82 19.95 0.78 9 9c) 19.77	0.97 20.31 19.95 0.96	0.99 19.98 19.94 0.99 18.62	21 	(86) (87) (88) (89)
Temperature Utilisation fac Jan (86)m= 0.99 Mean interna (87)m= 20 Temperature (88)m= 19.94 Utilisation fac (89)m= 0.99 Mean interna (90)m= 18.64 Mean interna	during hear tor for gains Feb 1 0.96 0 I temperatu 20.3 2 during hear 19.94 1 tor for gains 0.95 0 I temperatu 19.07 1 I temperatu	ting pe s for li Mar 0.89 re in li 0.62 ting pe 9.94 s for re 0.87 re in t 9.51 re (for	eriods in ving are Apr 0.76 iving are 20.85 eriods in 19.95 est of dv 0.72 he rest of 19.8	a the lives ea, h1, 1 May 0.58 ea T1 (20.97 a rest of 19.95 of dwe 19.92 ole dw	ving m (s / / / / / / / / / / / / / / / / / / /	ee Ta Jun 0.4 ww ste 21 velling 9.95 m (se 0.34 T2 (fc 9.95 g) = fl	ble 9a) Jul 0.27 ps 3 to 7 21 from Ta 19.95 ee Table 0.2 bllow ste 19.95	A 0.2 7 in T 2 ble § 19. 0.2 9a) 0.2 9a) 19. + (1	ug Sep 9 0.52 able 9c) 1 20.98 9, Th2 (°C) 95 19.95 1 0.45 to 7 in Table 95 19.94 f - fLA) × T2	0.83 20.82 19.95 0.78 e 9c) 19.77 A = Liv	0.97 2 20.31 5 19.95 0.96 7 19.09 ving area ÷ (4	0.99 19.98 19.94 0.99 18.62	 	(86) (87) (88) (89) (90) (91)
Temperature Utilisation fac Jan (86)m= 0.99 Mean interna (87)m= 20 Temperature (88)m= 19.94 Utilisation fac (89)m= 0.99 Mean interna (90)m= 18.64 Mean interna (92)m= 19.31	during heat tor for gains Feb 0.96 1 20.3 20.3 20.3 20 during heat 19.94 19.94 19.95 0.95 1 tor for gains 0.95 1 19.07 1 19.68 2	ting pe s for li Mar 0.89 re in li 0.62 ting pe 9.94 s for re 0.87 re in t 9.51 re (for 0.06	eriods in ving are Apr 0.76 iving are 20.85 eriods in 19.95 est of dv 0.72 he rest of 19.8	a the lives, h1, 1 May 0.58 ea T1 (20.97 a rest of 19.95 welling 0.52 of dwe 19.92 ole dw 20.44	ving m (s / follo f dw 1 , h2, 0 lling 1 rellin 2	ee Ta Jun 0.4 w ste 21 velling 9.95 ,m (se 0.34 T2 (fc 9.95 g) = fl 20.47	ble 9a) Jul 0.27 ps 3 to 7 21 from Ta 19.95 re Table 0.2 bllow ste 19.95 -A × T1 20.47	A 0.2 1 in T 2 ible § 19. 0.2 9a) 0.2 eps 3 19. + (1 20.	ug Sep 9 0.52 able 9c) 1 20.98 0, Th2 (°C) 95 19.95 1 0.45 to 7 in Table 95 19.94 f - fLA) × T2 47 20.46	0.83 20.82 19.95 0.78 e 9c) 19.77 A = Li ¹ 20.25	0.97 20.31 19.95 0.96 / 19.09 /ing area ÷ (4	0.99 19.98 19.94 0.99 18.62	 	(86) (87) (88) (89) (90)
Temperature Utilisation fac Jan (86)m= 0.99 Mean interna (87)m= 20 Temperature (88)m= 19.94 Utilisation fac (89)m= 0.99 Mean interna (90)m= 18.64 Mean interna (92)m= 19.31 Apply adjustn	during heat tor for gains Feb 0.96 0.96 1 20.3 2 during heat 19.94 1 tor for gains 0.95 0 1 tor for gains 0.95 1 19.94 1 19.95 1 19.07 1 19.07 1 19.08 2 nent to the	ting pe s for li Mar 0.89 re in li 0.62 ting pe 9.94 s for re 0.87 re in t 9.51 re (for 0.06	eriods in ving are Apr 0.76 iving are 20.85 eriods in 19.95 est of dv 0.72 he rest of 19.8	the lives a, h1, i May 0.58 ea T1 (20.97 n rest c 19.95 welling 0.52 of dwe 19.92 ole dw 20.44	ving m (s / / / / / / / / / / / / / / / / / / /	ee Ta Jun 0.4 ww ste 21 velling 9.95 m (se 0.34 T2 (fc 9.95 g) = fl 20.47 ure fro	ble 9a) Jul 0.27 ps 3 to 7 21 from Ta 19.95 e Table 0.2 bllow ste 19.95 _A × T1 20.47 m Table	A 0.2 7 in T 2 ble (19. 9a) 0.2 eps 3 19. + (1 20. + 4e,	ug Sep 9 0.52 able 9c) 1 20.98 9, Th2 (°C) 95 19.95 1 0.45 to 7 in Table 95 19.94 f - fLA) × T2 47 20.46 where approx	0.83 20.82 19.95 0.78 e 9c) 19.77 A = Li ¹ 20.25	0.97 20.31 19.95 0.96 7 19.09 7 19.09 7 19.69	0.99 19.98 19.94 0.99 18.62 +) =	 	(86) (87) (88) (89) (90) (91)
Temperature Utilisation fac Jan (86)m= 0.99 Mean interna (87)m= 20 Temperature (88)m= 19.94 Utilisation fac (89)m= 0.99 Mean interna (90)m= 18.64 Mean interna (92)m= 19.31 Apply adjustn (93)m= 19.16	during heat tor for gains Feb 1 0.96 0 I temperatu 20.3 2 during heat 19.94 1 tor for gains 0.95 0 I temperatu 19.94 1 tor for gains 0.95 0 I temperatu 19.07 1 I temperatu 1 19.68 2 nent to the 1 19.53 1	ting pe s for li Mar 0.89 re in li 0.62 ting pe 9.94 s for re 0.87 re in t 9.51 re (for 0.06 mean 9.91	eriods in ving are Apr 0.76 iving are 20.85 eriods in 19.95 est of dv 0.72 he rest 19.8 r the wh 20.32 internal	a the lives, h1, 1 May 0.58 ea T1 (20.97 a rest of 19.95 welling 0.52 of dwe 19.92 ole dw 20.44	ving m (s / / / / / / / / / / / / / / / / / / /	ee Ta Jun 0.4 w ste 21 velling 9.95 ,m (se 0.34 T2 (fc 9.95 g) = fl 20.47	ble 9a) Jul 0.27 ps 3 to 7 21 from Ta 19.95 re Table 0.2 bllow ste 19.95 -A × T1 20.47	A 0.2 1 in T 2 ible § 19. 0.2 9a) 0.2 eps 3 19. + (1 20.	ug Sep 9 0.52 able 9c) 1 20.98 9, Th2 (°C) 95 19.95 1 0.45 to 7 in Table 95 19.94 f - fLA) × T2 47 20.46 where approx	0.83 20.82 19.95 0.78 e 9c) 19.77 A = Liv 20.29 priate	0.97 20.31 19.95 0.96 7 19.09 7 19.09 7 19.69	0.99 19.98 19.94 0.99 18.62 +) = 19.29	 	(86) (87) (88) (89) (90) (91) (92)
Temperature Utilisation fac Jan (86)m= 0.99 Mean interna (87)m= 20 Temperature (88)m= 19.94 Utilisation fac (89)m= 0.99 Mean interna (90)m= 18.64 Mean interna (92)m= 19.31 Apply adjustn	during heat tor for gains Feb 1 0.96 0 I temperatu 20.3 2 during heat 19.94 1 tor for gains 0.95 0 I temperatu 19.94 1 tor for gains 0.95 0 I temperatu 19.07 1 I temperatu 1 19.68 2 nent to the 1 19.53 1 ting require 1	ting personal strain st	eriods in ving are Apr 0.76 iving are 20.85 eriods in 19.95 est of dv 0.72 he rest 19.8 r the wh 20.32 internal 20.17	a the live ea, h1, 1 May 0.58 ea T1 (20.97 a rest of 19.95 welling 0.52 of dwe 19.92 ole dw 20.44 tempe 20.29	ving m (s / / / / / / / / / / / / / / / / / / /	ee Ta Jun 0.4 ww ste 21 velling 9.95 m (se 0.34 T2 (fc 9.95 g) = fl 20.47 ire fro 20.32	ble 9a) Jul 0.27 ps 3 to 7 21 from Ta 19.95 re Table 0.2 bllow ste 19.95 _A × T1 20.47 m Table 20.32	A 0.2 7 in T 2 ble § 19. 0.2 eps 3 19. + (1 20. 4e, 20.	ug Sep 9 0.52 able 9c) 1 20.98 9, Th2 (°C) 95 19.95 1 0.45 to 7 in Table 95 19.94 ft - fLA) × T2 47 20.46 where approx 32 20.31	0.83 20.82 19.95 0.78 e 9c) 19.77 A = Liv 20.25 priate 20.14	0.97 20.31 3 19.95 0.96 7 19.09 7 19.09 7 19.69 9 19.69	0.99 19.98 19.94 0.99 18.62 19.29 19.29 19.14	0.5	(86) (87) (88) (89) (90) (91) (92)
Temperature Utilisation fac Jan (86)m= 0.99 Mean interna (87)m= 20 Temperature (88)m= 19.94 Utilisation fac (89)m= 0.99 Mean interna (90)m= 18.64 Mean interna (92)m= 19.31 Apply adjustn (93)m= 19.16 8. Space hea	during heat tor for gains Feb 1 0.96 0 I temperatu 20.3 2 during heat 19.94 1 tor for gains 0.95 0 I temperatu 19.94 1 tor for gains 0.95 0 I temperatu 19.07 1 I temperatu 1 19.68 2 nent to the 1 19.53 1 ting require 1 mean intern 1	ting personal strain st	eriods in ving are Apr 0.76 iving are 20.85 eriods in 19.95 est of dv 0.72 he rest of 19.8 r the wh 20.32 internal 20.17	a the live ea, h1, 1 May 0.58 ea T1 (20.97 a rest of 19.95 welling 0.52 of dwe 19.92 ole dw 20.44 tempe 20.29	ving m (s / / follo ffollo f dw 1 1 , h2, (1 1 1 1 2 elling 2 2 eratu 2 2 ined	ee Ta Jun 0.4 ww ste 21 velling 9.95 m (se 0.34 T2 (fc 9.95 g) = fl 20.47 ire fro 20.32	ble 9a) Jul 0.27 ps 3 to 7 21 from Ta 19.95 re Table 0.2 bllow ste 19.95 _A × T1 20.47 m Table 20.32	A 0.2 7 in T 2 ble § 19. 0.2 eps 3 19. + (1 20. 4e, 20.	ug Sep 9 0.52 able 9c) 1 20.98 9, Th2 (°C) 95 19.95 1 0.45 to 7 in Table 95 19.94 ft - fLA) × T2 47 20.46 where approx 32 20.31	0.83 20.82 19.95 0.78 e 9c) 19.77 A = Liv 20.25 priate 20.14	0.97 20.31 3 19.95 0.96 7 19.09 7 19.09 7 19.69 9 19.69	0.99 19.98 19.94 0.99 18.62 19.29 19.29 19.14	0.5	(86) (87) (88) (89) (90) (91) (92)

Utilisation factor for gains, hm:

(94)m=	0.98	0.94	0.86	0.73	0.54	0.36	0.22	0.24	0.47	0.79	0.96	0.99		(94)
Usefu	ıl gains,	hmGm	, W = (94	4)m x (84	4)m									
(95)m=	679.14	870.18	960.63	955.7	765.68	518.92	311.18	311.11	541.35	746.81	696.96	624.67		(95)
Month	nly aver	age exte	ernal tem	perature	e from Ta	able 8	-	-	_		-			
(96)m=	4.5	5	6.8	8.7	11.7	14.6	16.9	16.9	14.3	10.8	7	4.9		(96)
Heat	loss rate	e for mea	an intern	al tempe	erature,	Lm , W =	=[(39)m :	x [(93)m	— (96)m]	-			
(97)m=	1355.37	1338.49	1207.93	1050.41	784.13	521.01	311.31	311.3	548.81	855.66	1152.34	1312.32		(97)
Space	e heatin	g require	ement fo	r each n	nonth, k	Wh/mon	th = 0.02	24 x [(97)m – (95)m] x (4	1)m			
(98)m=	503.12	314.71	183.99	68.19	13.73	0	0	0	0	80.99	327.87	511.61		
								Tota	al per year	(kWh/yea	r) = Sum(9	8)15,912 =	2004.22	(98)
Space	e heatin	g require	ement in	kWh/m²	/year								25.55	(99)
9a. En	ergy rec	luiremer	nts – Indi	ividual h	eating s	ystems i	ncluding	j micro-C	CHP)					
•	e heatir	-												_
Fracti	on of sp	ace hea	at from s	econdar	y/supple	mentary	y system						0	(201)
Fracti	on of sp	ace hea	at from m	nain syst	em(s)			(202) = 1	– (201) =				1	(202)
Fracti	on of to	tal heati	ng from	main sys	stem 1			(204) = (2	02) × [1 –	(203)] =			1	(204)
Efficie	ency of r	main spa	ace heat	ing syste	em 1								89.1	(206)
Efficie	ency of s	seconda	ry/suppl	ementar	y heatin	g system	n, %						0	(208)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	kWh/yea	ar
Space		g require	ement (c		,		1						,	
	503.12	314.71	183.99	68.19	13.73	0	0	0	0	80.99	327.87	511.61		
(211)m	n = {[(98)m x (20	94)] + (21	l0)m } x	100 ÷ (2						<u>.</u>			(211)
	564.67	353.21	206.5	76.53	15.41	0	0	0	0	90.9	367.98	574.2		
I								Tota	al (kWh/yea	ar) =Sum(2	211) _{15,1012}		2249.4	(211)
Space	e heatin	g fuel (s	econdar	y), kWh/	month									_
•			14) m } x	• •										
(215)m=	0	0	0	0	0	0	0	0	0	0	0	0		
I								Tota	al (kWh/yea	ar) =Sum(2	215) _{15,1012}		0	(215)
Water	heating	1												_
		•	ter (calc	ulated a	bove)	-	-	-	-		-			
-	111.23	85.04	74.21	42.81	18.45	0	0	23.14	46.67	79.64	98.36	110.64		
Efficier	ncy of w	ater hea	iter					-	-		-		86.9	(216)
(217)m=	88.69	88.62	88.46	88.24	87.83	0	0	86.9	86.9	88	88.58	88.7		(217)
		-	kWh/mo											
. ,) ÷ (217)		21.01	0		26.62	E2 71	00.51	111.04	104 70		
(219)m=	125.4	95.95	83.89	48.52	21.01	0	0	26.62	53.71 al = Sum(2	90.51	111.04	124.73	704.00	
A	1404-1							TUL	– Sun(2				781.39	(219)
	I l totals heating		ed, main	system	1					K	Wh/year		kWh/year 2249.4	7
•	-			5,50011	•									4
water	neating	fuel use	d										781.39	

Electricity for pumps, fans and electric keep-hot

Briary energy Consultants N. Barker 0203 091 3391 info@briaryenergy.co.uk	eet: New dwelling	g design stage	9		
central heating pump:			130]	(230c)
boiler with a fan-assisted flue			45]	(230e)
pump for solar water heating			75]	(230g)
Total electricity for the above, kWh/year	sum of (230a)(230g) =		250	(231)
Electricity for lighting				340.28	(232)
12a. CO2 emissions – Individual heating systems	s including micro-CHP				
	Energy kWh/year	Emission fac kg CO2/kWh	ctor	Emissions kg CO2/yea	
Space heating (main system 1)	(211) x	0.198	=	445.38	(261)
Space heating (secondary)	(215) x	0	=	0	(263)
Water heating	(219) x	0.198	=	154.72	(264)
Space and water heating	(261) + (262) + (263) + (264)) =		600.1	(265)
Electricity for pumps, fans and electric keep-hot	(231) x	0.517	=	129.25	(267)
Electricity for lighting	(232) x	0.517	=	175.92	(268)
Total CO2, kg/year		sum of (265)(271) =		905.27	(272)
Dwelling CO2 Emission Rate		(272) ÷ (4) =		11.54	(273)
El rating (section 14)				90	(274)

Predicted Energy Assessment

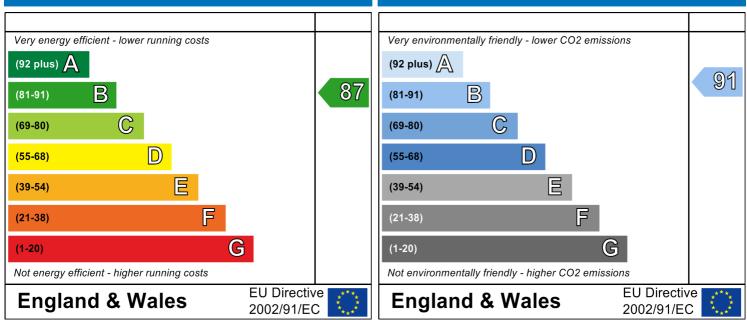
Flat 5 139-147 Camden Road London NW1 9HA Dwelling type: Date of assessment: Produced by: Total floor area: End-terrace Mid floor Flat 01 November 2011 Gary Nicholls 78.43 m²

Environmental Impact (CO₂) Rating

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 2009 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.

Energy Efficiency Rating



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 carbonn dioxide (CO2) emissions. The higher the rating the less impact it has on the environment.