

APPENDIX A - SAP ASSESSMENTS -

SUSTAINABILITY STATEMENT

1-7 MILL LANE

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This Design submission has been carried out by an Authorised SAP Assessor. It has been prepared from plans and specifications and may not reflect the property as constructed.

Assessor Name	Mrs Azita Ghandizadeh	Dezfouli			Assessor	Number	2342	
Client								
Date Last Modified	17/09/2008							
Address	Unit 8, 1-7 Mill Lane	London,NW	6					
This draft SAP Worksh compliance by Buildin	eet report is for intern g Control	al purposes o	only and shou	ld not b	e accepted a	as evidence	of	
1. Overall dwelling dimensi	ons	A	Area (m²)	A	Average storey neight (m)		Volume (m³)	
Ground Floor			67.74 (1a)	×	2.45	=	165.96	(1)
First Floor			73.83 (2a)	×	2.52	=	186.05	(2)
Total floor area (1a)+(2a)+(3	a)+(4a)+(4b)+(4d)+(4f)+(4h)) =	141.57 (5)					
Dwelling volume			(1)+(2)+	+(3)+(4)+((4c)+(4e)+(4g)+	(4i) =	352.01	(6)
2. Ventilation rate				m³ pe	r bour			
Number of chimneys	[0	× 40 =		0 (7)			
Number of open flues		0	× 20 =		0 (8)			
Number of intermittent fans	or passive vents	0	× 10 =		0 (9)		<i>ž</i>	
Number of flueless gas fires Infiltration due to chimneys, <i>If a pressurisation test</i>	flues and fans =(7)+(8)+(9) has been carried out, proceed	0 +(9a) = d to box (19)	× 40 =		0 (9a) 0	Air cl ÷ box (6) =	hanges per hour	(10)
Number of storeys in	the dwelling		¢.		2 (11)			-
Additional infiltration	n				[(1	1) - 1] × 0.1 =	N/A	(12)
Structural infiltration	: 0.25 for steel or timber fran	ne or 0.35 for ma	usonry constructio	n			N/A	(13)
If suspended wooden	floor, enter 0.2 (unsealed) of	r 0.1 (sealed), els	se enter 0				N/A	(14)
If no draught lobby, e	enter 0.05, else enter 0						N/A	(15)
Percentage of window	ws and doors draught stripped	1		Ň	I/A (16)			
Enter 100 in box (16)) for new dwellings which are	to comply with	Building Regulati	ons				-
Window infiltration			0.25	5 - [0.2 × ((16) ÷ 100] =		N/A	(17)
Infiltration rate			(10)+(12))+(13)+(14	4)+(15)+(17) =		N/A	(18)





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If based on air permeability value then $[\pm c201 + (10) \text{ in box (19). otherwise (}]$	19) = (18) 0.25 (19)
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	3 (20)
(Enter 2 in box (20) for new dwellings where location is not shown)	
Shelter factor	$1 - [0.075 \times (20)] = 0.78 (21)$
Adjusted infiltration rate	$(19) \times (21) = 0.19$ (22)
Calculate effective air change rate for the applicable case	
a) If balanced whole house mechanical ventilation with heat recovery	(22) + 0.17 = 0.36 (23)
b) If balanced whole house mechanical ventilation without heat recovery	(22) + 0.5 = N/A (23a)
c) If whole house extract ventilation or positive input ventilation from outs $if(22) < 0.25$, then $(23b) = 0.5$; otherwise $(23b) =$	side N/A (23b)
d) If natural ventilition or whole house positive input ventilation from loft is(23) > 1 then $(24) = (22)$, otherwise $(24) = 0.5$	+ <i>((22))² × 0.51</i> N/A (24)
Effective air change rate - enter (23) or (23a) or (23b) or (24) in box (25)	0.36 (25)
3. Heat losses and heat loss parameter Area (m ²) ELEMENT 1.89 Doors 1.89 Windows * 18.90	$\begin{array}{c} x \\ x \\ x \\ x \\ \end{array} \begin{array}{c} 1.42 \\ \end{array} \begin{array}{c} \text{AXU (W/K)} \\ 5.67 \\ 26.75 \\ \end{array} \begin{array}{c} (26) \\ 26.75 \\ \end{array} \begin{array}{c} (27) \end{array}$
Above Unheated Basement Floor 72.27	0.15 = 10.84 (31)
Walls 109.73	\times 0.20 = 21.95 (29)
Roof 73.83	\times 0.15 = 11.07 (30)
Total area of elements ΣA , m ² 276.63	32)
* for windows and rooflights, use effective window U-value calculated as given	in paragraph 3.2
Fabric heat loss, W/K (26)+(27)+(27a)+(27b)+(2	8)+(29)+(29a)+(30)+(30a)+(31) = 76.28 (33)
Thermal bridges - Σ (Ix Ψ) calculated using Appendix K if details of thermal bridging are not known calculate $y \times (32)$ [see Appendix K]	22.13 (34)
Total fabric beat loss	(33)+(34) = 98.41 (35)
Ventilation heat loss	$(25) \times 0.33 \times (6) =$ 42.25 (36)
Unit loss coefficient W/K	(35)+(36) = 140.66 (37)
Heat loss controlouity W/K	$(37) \div (5) = 0.99$ (38)
ricat ioss paralifeira (riter), with r	kWh/veat
4. Water heating energy requirement	2589.68 (39)
Energy content of hot water used from Table 1 column (b)	

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Distribution loss from Table 1 column (c) If instantaneous water heating at point of use, enter "0" in boxes (40) to (45) For community heating use Table 1 (c) whether or not hot water tank is present		457.00	(40)
Water storage loss:			
a) If manufacturer's declared loss factor is known (kWh/day):		N/A	(41)
Temperature factor from Table 2b		N/A	(41a)
Energy lost from water storage, kWh/year	(41)×(41a)×365 =	N/A	(42)
b) If manufacturer's declared cylinder loss factor is not known:			
Cylinder volume (litres) including any solar storage within same cylinder		300.00	(43)
If community heating and no tank in dwelling, enter 110 litres in box (43)			
Otherwise, if no stored hot water (this includes instantaneous combi boilers), en	ter 'U' in box (43)	0.01	(44)
Hot water storage loss factor from Table 2 (kWh/litre/day)		0.01	(44)
If community heating and no tank in dwelling, use cylinder loss from Table 2 for	50 mm factory insulation in box (44)		
Volume factor from Table 2a	All A	0.74	(44a)
Temperature factor from Table 2b	and free and free	0.54	(44b)
		503.10	(45)
Energy lost from water storage, kwingear Enter (42) or (45) in box (46)	= COEX(448)X(448)X(440)	503.10	(46)
If cylinder contains dedicated solar storage, box $(47) = (46) \times [(43) - (H11)] / (43)$, e	1se(47) = (46)	251.55	(47)
Primary circuit loss from Table 3	W. sandar	360.00	(48)
Combi loss from Table 3a (enter "0" if no combi boiler)		0.00	(49)
Solar DHW input calculated using Appendix H (enter "0" if no solar collector)		668.40	(50)
Output from water heater, kWh/year	. (39)+(40)+(47)+(48)+(49)-(50) =	2989.83	(51)
Heat gains from water heating 0.25 × (include (47) in calculation of (52) only if cylinder is in the dwelling or he	[(39)+(49)]+0.8×[(40)+(47)+(48)] = ot water is from community heating	1502.26	(52)
5. Internal gains		Watts	
Lights, appliances, cooking and metabolic (Table 5)		767.17	(53)
Reduction of internal gains due to low energy lighting (calculated in Appendix L)		56.05	(53a)
Additional gains from Table 5a		42.24	(53b)
Water heating	(52) ÷ 8.76 =	171.49	(54)
Total internal gains	(53) + (53b) + (54) - (53a) =	924.85	(55)





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6. Solar gains		\$918) \$918)									
	Access factor Table 6d	1	Area m ²		Flux Table 6a		g Table 6b		FF Table 6c	Gains (W)	
West	0.77	×	8.82	×	48.00	x 0.9 x	0.63	×	0.70 =	129.38	(57)
East	0.77	× [10.08	×	48.00	x 0.9 x	0.63	×	0.70 =	147.87	(59)
Total solar gains:								[(5	56) + + (64)] =	277.25	(65)
Note: for new dwell	lings where oversi	hading is	not known,	the so	olar access fac	tor is '0.77'					
Total gains, W									(55) + (65) =	1202.11	(66)
Gain/loss ratio (GL	R)								(66) ÷ (37) =	8.55	(67)
Utilisation factor (1	Table 7, using GLI	R in box (67))					at least strength		0.88	(68)
Useful gains, W	1. Alternative states and the second states						Â		(66) × (68) =	1055.82	(69)
7. Mean internal to	emperature	8	. M.		Alter	W	M			°C	
Mean internal temp	erature of the livi	n g ar ea (T	Table 8)		đ.	A.	. M			18.88	(70)
Temperature adjust	ment from Table	te, where	appropriat	e	1 Barner	V.	A.		Such	0.00	(71)
Adjustment for gain R is obtained	ns from the 'respons	iveness' co	olumn of T	able 4	a or Table 4d			59) ÷ ((37)] - 4.0} × 0.2 × R =	0.70	(72)
Adjusted living roo	om temperature								(70) + (71) + (72) =	19.58	(73)
Temperature different	ence between zon	es (Table	9)							0.40	(74)
Living area fraction	n (0 to 1.0)							liv	ving room area ÷ (5) =	0.15	(75)
Rest-of-house fract	tion								1 - (75) =	0.85	(76)
Mean internal temp	berature								(73) - [(74) × (76)] =	19.24	(77)
8. Degree days										a da Baltana an Secto porta da cama	
Temperature rise fr	om gains								(69) ÷ (37) =	7.51	(78)
Base temperature									(77) - (78) =	11.73	(79)
Degree-days, use be	ox (79) and Table	10								1289.33	(80)
9. Space heating re	equirements										
Space heating requi	irement (useful), l	Wh/year						0.	$024 \times (80) \times (37) =$	4352.64	(81)
For range cooker b	oilers where effic	iency is o	btained fro	m the	Boiler Efficier	ncy Database	e or manufactur	rer's a	leclared value, multiply	the	

For range cooker boilers where efficiency is obtained from the Boiler Efficiency Database or manufacturer's declared value, multiply the result in box (81) by $(1 - \Phi_{cose}/\Phi_{water})$ where Φ_{case} is the heat emission from the case of the range cooker at fullload (in kW); and Φ_{water} is the heat transferred to water at full load (in kW). Φ_{case} and Φ_{water} are obtained from the database record for the range cooker boiler or manufacturer's declared value.





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9a. Energy requirements - individual heating systems, including mi Note: when space and water heating is provided by community h	icro-CHP eating use the al	ternative	worksheet 9b			
Space heating:						_
Fraction of heat from secondary/supplementary system (use value from	n Table 11, Tabi	le 12a or	Appendix F)		0.00	(82)
Efficiency of main heating system, %					110.00	(83)
(SEDBUK or from Table 4a or 4b, adjusted where appropriate by th	e amount shown	in the 'e	fficiency adjusti	nent' column of Tab	le 4c)	_
Efficiency of secondary/supplementary heating system, % (use value f	rom Table 4a or	Append	ix E)		0.00	(84)
Space heating fuel (main) requirement, kWh/year			[1- (82)] × (81) ×100 ÷ (83) = 3956.94	(85)
Space heating fuel (secondary), kWh/year			(8)	2) × (81) ×100 ÷ (84	.) = N/A	(85a)
Water heating:			-Million	Rs.		•
Efficiency of water heater, % (SEDBUK or from Table 4a or 4b, adjusted where appropriate by the	e amount shown	in the 'ej	ficienc <mark>y a</mark> djustn	nent' column of Tabl	104.76 le Ac)	(86)
Energy required for where heating, kWharear	and the second s		enti Maar	(51) × 100 ÷ (86) = 2853.93	(86a)
Electricity for pumps and fans:	l di			kWh/year		
each central heating pump, (Table 4f)	and the second sec		N	0.00	(87a)	
each boiler with a fan-assisted flue (Table 4f)	Date. Addres	ara di	Ø	0.00	(87b)	
varm air heating system fans (Table 4f)		Constant	~	0.00	(87c)	
nechanical ventilation -balanced, extract or positive input from outsid	de (Table 4f)			858.92	(87d)	
maintaining keep-hot facility for gas combi boiler (Table 4f)				0.00	(87e)	
nump for solar water heating (Table 4f)				75.00	(87f)	7
Total electricity for the above equipment, kWh/year		(8	37a)+(87b)+(87c	:)+(87d)+(87e)+(87i	f) = 933.92	(87)
10a. Fuel costs - individual heating systems	Fuel kWh/year		Fuel price (Table 12)		Fuel cost £/year	
Space heating - main system	(85)	×	1.63	×0.01 =	64.50	(88)
Space heating - secondary	(85a)	×	N/A	× 0.01 =	0.00	(89)
Water heating						
Water heating cost (electric, off-peak tariff)					_	
On-peak fraction (Table 13, or Appendix F for electric CPSUs)				0.00	(90)	
Off-peak fraction		1.0 - (9	90) =	1.00	(90a)	
On-peak cost	(86a) × (90)	×	Fuel price N/A	× 0.01 =	0.00] (91)





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Off-peak cost		(86a) × (90a) ×	N/A	× 0.01 =	0.00	(91a)
Water heating cost (oth	er fuel)	(86a)	× 1.63	× 0.01 =	46.52	(91b
Pump and fan energy	cost	(87)	× 7.12	× 0.01 =	66.49	(92)
Energy for lighting (ca	lculated in Appendix L)	996.49	× 7.12	× 0.01 =	70.95	(93)
Additional standing cl	arges (Table 12)			-	34.00	(94)
Renewable and energy	-saving technologies (Appendices M and	IN)				
Energy produced or	saved, kWh/year	N/A (9	5)			
Cost of energy prod	uced or saved, £/year	(95)	× N/A	× 0.01 =	N/A	(95a)
Energy consumed b	y the technology, kWh/year	N/A (9	6)			
Cost of energy cons	umed, £/year	(96)	× N/A	×0.01 =	N/A	(96a
Special features (App	eədix Q)					
Energy produced or Cost of energy proc Energy consumed t	saved, kWh/year luced or saved, £/year ly the technology, kWh/year	(s1) (s1) (s2) (s2) (s2) (s2)	1) × 7.12 2)] × 0.01 =	51.90	(sla)
Cost of energy cons	sumed, £/year	(s2)	× N/A	×0.01 =	N/A	(s2a)
Total energy cost	(88)+(89)+(91)-	+(91a)+(91b)+(92)+(9	93)+(94)-(95a)+(96a)	-(s1a)+(s2a) =	230.56	(97)
11a. SAP rating - indi	vidual heating systems					
Energy cost deflator (S	AP 2005)				0.91	(98)
Energy cost factor (EC	F)		{[(97) × (98)] - 30.	$0\} \div \{(5) + 45.0\} =$	0.96	(99)
SAP rating (Table 14)					86.55	(100
SAP band					В	
12a. Carbon dioxide e	missions rate for individual heating syste	ms (including micro	-CHP) and commun	ity beating without C		
Individual heating sys	tem:	Energy kWh/year	Emiss kg C	ion factor O2/kWh	Emissions kgCO2/year	
Space heating main	from box (85)	3956.94	×	0.194 =	767.65	(101
Space heating second	ndary from box (85a)	N/A	×	N/A =	0.00	(102
Energy for water he	eating from box (86a)	2853.93	×	0.194 =	553.66	(103
Community scheme:						

Efficiency of community boilers % use actual efficiency if known, or value in Table 4a

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N/A

(104)



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Energy for space heating (1	87*)×100 ÷(104) =	N/A	×	N/A	=	N/A	(105)
Energy for water heating (8	87b [★]) × 100 ÷ (104) =	N/A	×	N/A	=	N/A	(106)
Space and water heating		[(101) + (102) + (1	03)] or [[(105) + (106)] =		1321.31	(107)
Electricity for pumps and fans from box (87) o	r (88*)	933.92	×	0.422	=	394.11	(108)
Energy for lighting from Appendix L		996.49	×	0.422	=	420.52	(109)
Energy produced or saved in dwelling (Append	dices M and N)	(95) or (95*)	×	N/A	=	0.00	(110)
Energy consumed by the above technology (Ap	ppendices M and N)	(96) or (96*)	×	N/A	=	0.00	(111)
Energy produced or saved in dwelling (Append	dix Q)	(s1) or (s1*)	×	0.422	=	307.64	(s1a)
Energy consumed by the above technology (A	ppendix Q)	(s2) or (s2*)	×	N/A	=	0.00	(s2a)
Total CO2 kg/year	(107)+(10	08) + (109) - (110) + (1	111) - (s	sla) 🕈 (s 2a)	=	1828.30	(112)
Carbon dioxide emissions rate				(112)÷(5)	=	12.91	(113)
EI rating	40 _	particular and a second se			1	86.87	
EI band	al and a second s	A.	A		1	В	
13a. Primary energy, for individual heating	systems (including micr	o-CHP) and commu	nity heat	ing without CHP	AMEN/97		
10000 (0000)	-905030-		1000		1.200 as		
	•	Fnorth	APP .	Primary energy	of White.	Primary energy	v
Individual heating system:		Energy kWh/year		Primary energy factor	1990a.	Primary energy (kWh/year)	Ŷ
Individual heating system: Space heating main from box (85)		Energy kWh/year 3956.94	×	Primary energy factor 1.150	<u>م</u>	Primary energy (kWh/year) 4550.49	y
Individual heating system: Space heating main from box (85) Space heating secondary from box (85a)		Energy kWh/year 3956.94 N/A	××	Primary energy factor 1.150 N/A	= = ~	Primary energy (kWh/year) 4550.49 0.00	y
Individual heating system: Space heating main from box (85) Space heating secondary from box (85a) Energy for water heating from box (86a)		Energy kWh/year 3956.94 N/A 2853.93	× × ×	Primary energy factor 1.150 N/A 1.150	= = =	Primary energy (kWh/year) 4550.49 0.00 3282.02	y
Individual heating system: Space heating main from box (85) Space heating secondary from box (85a) Energy for water heating from box (86a) Community scheme:		Energy kWh/year 3956.94 N/A 2853.93	× × ×	Primary energy factor 1.150 N/A 1.150	= = ::::::::::::::::::::::::::::::::::	Primary energy (kWh/year) 4550.49 0.00 3282.02	y
Individual heating system: Space heating main from box (85) Space heating secondary from box (85a) Energy for water heating from box (86a) Community scheme: Efficiency of community boilers % use actual efficiency if known, or value it	in Table 4a	Energy kWh/year 3956.94 N/A 2853.93 (104)	× × ×	Primary energy factor 1.150 N/A 1.150	- - -	Primary energy (kWh/year) 4550.49 0.00 3282.02	y
Individual heating system: Space heating main from box (85) Space heating secondary from box (85a) Energy for water heating from box (86a) Community scheme: Efficiency of community boilers % use actual efficiency if known, or value it Energy for space heating	n Table 4a (87*) × 100 ÷ (104) =	Energy kWh/year 3956.94 N/A 2853.93 (104) N/A	× × ×	Primary energy factor 1.150 N/A 1.150 N/A	= = =	Primary energy (kWh/year) 4550.49 0.00 3282.02	y
Individual heating system: Space heating main from box (85) Space heating secondary from box (85a) Energy for water heating from box (86a) Community scheme: Efficiency of community boilers % use actual efficiency if known, or value it Energy for space heating ()	n Table 4a (87*) × 100 ÷ (104) = 87b*) × 100 ÷ (104) =	Energy kWh/year 3956.94 N/A 2853.93 (104) N/A N/A	× × × ×	Primary energy factor 1.150 N/A 1.150	=	Primary energy (kWh/year) 4550.49 0.00 3282.02 N/A N/A	y
Individual heating system: Space heating main from box (85) Space heating secondary from box (85a) Energy for water heating from box (86a) Community scheme: Efficiency of community boilers % use actual efficiency if known, or value if Energy for space heating Energy for water heating Energy for water heating Space and water heating	in Table 4a (87^*) × 100 ÷ (104) = $87b^*$) × 100 ÷ (104) =	Energy kWh/year 3956.94 N/A 2853.93 (104) N/A N/A	× × ×	Primary energy factor 1.150 N/A 1.150 N/A 1.150	=	N/A N/A 7832.50	y
Individual heating system: Space heating main from box (85) Space heating secondary from box (85a) Energy for water heating from box (86a) Community scheme: Efficiency of community boilers % use actual efficiency if known, or value if Energy for space heating (a) Space and water heating Electricity for pumps and fans from box (87)	n Table 4a (87*) × 100 ÷ (104) = 87b*) × 100 ÷ (104) = or (88*)	Energy kWh/year 3956.94 N/A 2853.93 (104) N/A N/A 933.92	× × × ×	Primary energy factor 1.150 N/A 1.150 N/A N/A N/A 2.800	-	Primary energy (kWh/year) 4550.49 0.00 3282.02 N/A N/A 7832.50 2614.96	y .
Individual heating system: Space heating main from box (85) Space heating secondary from box (85a) Energy for water heating from box (86a) Community scheme: Efficiency of community boilers % use actual efficiency if known, or value in Energy for space heating (Energy for water heating (Space and water heating (Space and water heating Electricity for pumps and fans from box (87) Energy for lighting from Appendix L	n Table 4a (87*) × 100 ÷ (104) = 87b*) × 100 ÷ (104) = or (88*)	Energy kWh/year 3956.94 N/A 2853.93 (104) (104) N/A N/A 933.92 996.49	× × × ×	Primary energy factor 1.150 N/A 1.150 N/A N/A N/A 2.800 2.800	-	Primary energy (kWh/year) 4550.49 0.00 3282.02 N/A N/A N/A 7832.50 2614.96 2790.16	y
Individual heating system: Space heating main from box (85) Space heating secondary from box (85a) Energy for water heating from box (86a) Community scheme: Efficiency of community boilers % use actual efficiency if known, or value if Energy for space heating Energy for water heating Energy for water heating Energy for space heating Energy for space heating Energy for water heating Electricity for pumps and fans from box (87) Energy for lighting from Appendix L Energy produced or saved in dwelling (Appendix C)	n Table 4a (87*) × 100 ÷ (104) = 87b*) × 100 ÷ (104) = or (88*) addices M and N)	Energy kWh/year 3956.94 N/A 2853.93 (104) (104) N/A N/A 933.92 996.49 (95) or (95*)	× × × × ×	Primary energy factor 1.150 N/A 1.150 N/A N/A 2.800 2.800 N/A N/A	-	Primary energy (kWh/year) 4550.49 0.00 3282.02 N/A N/A N/A 7832.50 2614.96 2790.16 0.00	
Individual heating system: Space heating main from box (85) Space heating secondary from box (85a) Energy for water heating from box (86a) Community scheme: Efficiency of community boilers % use actual efficiency if known, or value if Energy for space heating (i) Energy for water heating (i) Energy for space heating (i) Energy for water heating (i) Space and water heating Electricity for pumps and fans from box (87) Energy produced or saved in dwelling (Appendit) Energy consumed by the above technology (A	in Table 4a $(87^*) \times 100 \div (104) =$ $(87^*) \times 100 \div (104) =$ or (88*) idices M and N) appendices M and N)	Energy kWh/year 3956.94 N/A 2853.93 (104) N/A N/A 933.92 996.49 (95) or (95*) (96) or (95*)	× × × × × × ×	Primary energy factor 1.150 N/A 1.150 N/A N/A 2.800 2.800 N/A N/A N/A N/A		Primary energy (kWh/year) 4550.49 0.00 3282.02 N/A N/A 7832.50 2614.96 2790.16 0.00 0.00	Y





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Mrs Azita Ghandizadeh Dezfouli

2342 **Assessor Number**

This draft SAP Worksheet report is for internal purposes only and should not be accepted as evidence of compliance by Building Control 2.800 2041.20 (s1) or (s1*) = Energy produced or saved in dwelling (Appendix Q) × N/A -0.00 Energy consumed by the above technology (Appendix Q) (s2) or (s2*) × 11196.43 Primary energy kWh/year 79.09

Primary energy kWh/m²/year









This Design submission has been carried out by an Authorised SAP Assessor. It has been prepared from plans and specifications and may not reflect the property as constructed.

Assessor Name	Mrs Azita Ghandizadeh Dezfouli		Assesso	r Number	2342	
Client						
Date Last Modified	17/09/2008					
Address	Unit 12, 1-7 Mill Lane, London, I	NW6				
This draft SAP Works compliance by Buildir	heet report is for internal purpose ng Control	es only and shou	ld not be accepted	as evidence	of	
1. Overall dwelling dimens	ions	Area (m²)	Average store height (m)	y Y	Volume (m³)	
Ground Floor		56.32 (la)	× 2.60	=	146.43	(1)
Total floor area (1a)+(2a)+(3a)+(4a)+(4b)+(4d)+(4f)+(4h) =	56.32 (5)				
Dwelling volume		(1)+(2)+	(3)+(4)+(4c)+(4e)+(4g)+(4i) =	146.43	(6)
2. Ventilation rate			m³ per hour			
Number of chimneys	0	× 40 =	0 (7)			
Number of open flues	0	× 20 =	0 (8)			
Number of intermittent fans	or passive vents 0	× 10 =	0 (9)			
Number of flueless gas fires	0	× 40 =	0 (9a)		.a	
Infiltration due to channeys If a pressurfsation test Number of storeys in	, flues and fins, =(7)+(8)+(9)+(9a) = thas been carried out, proceed to box (19) in the dwelling	X	0	Air : ÷ box (6) =	hanges per hour	(10)
Additional infiltration	n		, in the second s	(11) - 1] × 0.1 =	N/A	(12)
Structural infiltration	n: 0.25 for steel or timber frame or 0.35 for	r masonry construction	n		N/A	(13)
If suspended woode	n floor, enter 0.2 (unsealed) or 0.1 (sealed)	, else enter 0			N/A	(14)
If no draught lobby,	enter 0.05, else enter 0				N/A	(15)
Percentage of windo	ows and doors draught stripped		N/A (16)			
Enter 100 in box (10	5) for new dwellings which are to comply w	ith Building Regulation	ons			
Window infiltration		0.25	5 - [0.2 × (16) ÷ 100] =		N/A	(17)
Infiltration rate		(10)+(12)	+(13)+(14)+(15)+(17)	=	N/A	(18)
If based on air permeability Air permeability value ap	value, then $[\div QQ] + (10)$ in box (19), plies if a pressurisation test has been done	otherwise (19) = (18) or a degree air perme	eability is being used		0.25	(19)





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Number of sides on which sheltered			3 (20)
(Enter 2 in box (20) for new dwellings wi	here location is not shown)		
Shelter factor		1 - [0.075 × (20)] =	0.78 (21)
Adjusted infiltration rate		(19) × (21) =	0.19 (22)
Calculate effective air change rate for the	e applicable case		
a) If balanced whole house mecha	anical ventilation with heat recovery	(22) + 0.17 =	0.36 (23)
b) If balanced whole house mech	anical ventilation without heat recovery	(22) + 0.5 =	N/A (23a)
c) If whole house extract ventilati if (22) < 0.	on or positive input ventilation from outside $.25$, then $(23b) = 0.5$; otherwise $(23b) = 0.25 + 0.25$	(22)	N/A (23b)
d) If natural ventilation or whole $if(22) > 1$	house positive input ventilation from loft 4k = (24) = (22), otherwise $(24) = 0.5 + [(22)]$	2 ~ 10 51	N/A (24)
ty (44) = - ، Effective air change rate - enter (23) 0	r (23a) or (23b) or (24) in box (25)		0.36 (25)
. Heat losses and next loss par amount	Δrea (m²)	• • • • • • • • • • • • • • • • • • •	AXU (W/K)
ELEMENT Windows*	7.56 ×	1.42 =	10.70 (27)
Doors	1.89 ×	3.00 =	5.67 (26)
Walls	29,86 ×	0.20 =	5.97 (29)
Total area of elements ΣA , m ²	39.31 (32)	n. I	
* for windows and rooflights, use effec	tive window U-value calculated as given in para	graph 3.2	
Fabric heat loss, W/K	(26)+(27)+(27a)+(27b)+(28)+(29)	+(29a)+(30)+(30a)+(31) =	22.34 (33)
Thermal bridges - Σ (lx Ψ) calculated using	ng Appendix K		3.14 (34)
if details of thermal bridging are not k	nown calculate y× (32) [see Appendix K] ana eni	ter in box (34)	
Total fabric heat loss		(33)+(34) =	
Ventilation heat loss		$(25) \times 0.33 \times (6) =$	17.58 (30)
Heat loss coefficient, W/K		(35)+(36) =	43.06 (37)
Heat loss parameter (HLP), W/m ² K		(37) ÷ (5) =	0.76 (38)
4. Water heating energy requirement		kWb/year	an an Anna an A Anna an Anna an
Energy content of hot water used from T	able 1 column (b)		1525.62 (39)
Distribution loss from Table 1 column (If instantaneous water heating at point For community heating use Table 1 (;) nt of use, enter "0" in boxes (40) to (45) 'c) whether or not hot water tank is present		269.23 (40)
Water storage loss:			
a) If manufacturer's declared loss factor	is known (kWh/day):		N/A (41)
The second secon			N/A (41a)

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