PREDICTED ENERGY ASSESSMENT

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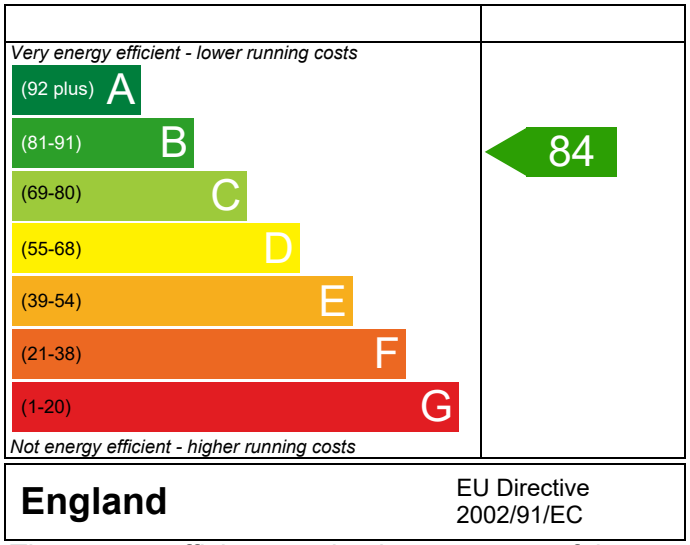
03-F15, Building 12

Dwelling type:	Flat, Semi-Detached
Date of assessment:	12/11/2019
Produced by:	Harry Davey
Total floor area:	76.28 m²
DRRN:	1919-3912-1903

This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

The energy performance has been assessed using the Government approved SAP2012 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO_2) emissions.

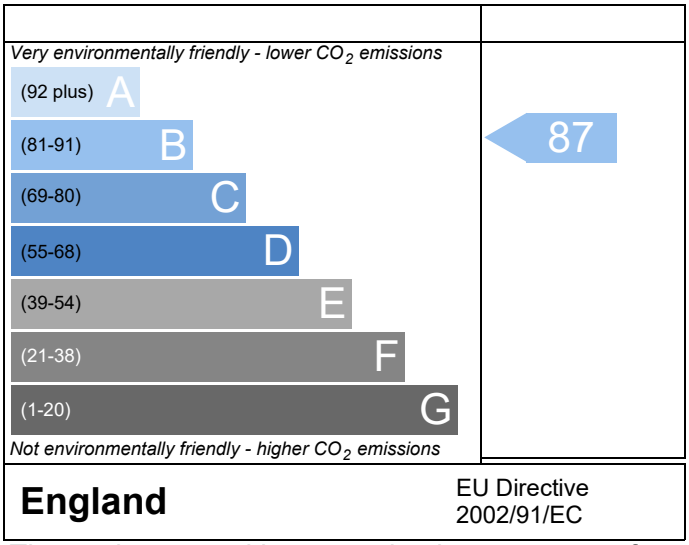
Energy Efficiency Rating



England EU Directive 2002/91/EC

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.

Environmental Impact (CO_2) Rating



England EU Directive 2002/91/EC

The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO_2) emissions. The higher the rating the less impact it has on the environment.

This report has been produced by an accredited Elmhurst member whose work is subject to quality assurance audits. The data used to produce the report has been verified by the Elmhurst members' portal.

FULL SAP CALCULATION PRINTOUT
Calculation Type: New Build (As Designed)

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Property Reference	TPB12 03-F15	**Issued on Date**	12/11/2019
Assessment Reference	001	**Prop Type Ref**	
Property	03-F15, Building 12		

SAP Rating	84 B	**DER**	16.88	**TER**	17.32
Environmental	87 B	**% DER<TER**	2.53		
CO_2 Emissions (t/year)	1.08	**DFEE**	37.33	**TFEE**	44.45
General Requirements Compliance	Pass	**% DFEE<TFEE**	16.02		

Assessor Details	Mr. Harry Davey, energytest, Tel: 01892 315466, hdavey@energy-test.co.uk	**Assessor ID**	R434-0001
Client			

FULL SAP CALCULATION PRINTOUT
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REGULATIONS COMPLIANCE REPORT - Approved Document L1A, 2013 Edition, England

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REGULATIONS COMPLIANCE REPORT - Approved Document L1A, 2013 Edition, England

DWELLING AS DESIGNED

Top-floor flat, total floor area 76 m²

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:Mains gas
Fuel factor:1.00 (mains gas)
Target Carbon Dioxide Emission Rate (TER) 17.32 kgCO□/m²
Dwelling Carbon Dioxide Emission Rate (DER) 16.88 kgCO□/m²OK
1b TFEE and DFEE
Target Fabric Energy Efficiency (TFEE)44.4 kWh/m²/yr
Dwelling Fabric Energy Efficiency (DFEE)37.3 kWh/m²/yrOK
2 Fabric U-values
Element         Average                 Highest
External wall   0.15 (max. 0.30)        0.23 (max. 0.70)          OK
Party wall      0.00 (max. 0.20)         -                        OK
Floor           (no floor)
Roof            0.10 (max. 0.20)        0.10 (max. 0.35)          OK
Openings        1.32 (max. 2.00)        1.40 (max. 3.30)          OK
2a Thermal bridging
Thermal bridging calculated from linear thermal transmittances for each junction
3 Air permeability
Air permeability at 50 pascals:         4.00 (design value)
Maximum                                 10.0                                    OK
4 Heating efficiency
Main heating system:                    Boiler system with radiators or underfloor - Mains gas
Data from database
Worcester Greenstar 37 CDi
Combi boiler
Efficiency: 89.4% SEDBUK2009
Minimum: 88.0%                                  OK

Secondary heating system:               None
5 Cylinder insulation
Hot water storage                       No cylinder
6 Controls
Space heating controls:                 Time and temperature zone control       OK


Hot water controls:                     No cylinder


Boiler interlock                        Yes                                     OK
7 Low energy lights
Percentage of fixed lights with low-energy fittings:100%
Minimum                                 75%                                     OK
8 Mechanical ventilation
Continuous extract system
Specific fan power:                     0.18
Maximum                                 0.7                                     OK
9 Summertime temperature
Overheating risk (Thames Valley):       Medium                                  OK
Based on:
Overshading:                            Average
Windows facing North East:              3.69 m², No overhang
Windows facing South East:              7.00 m², No overhang
Air change rate:                        1.80 ach
Blinds/curtains:                        Light-coloured curtain or roller blind, closed 100% of daylight hours
10 Key features
External wall U-value                   0.14 W/m²K
External wall U-value                   0.10 W/m²K
Party wall U-value                      0.00 W/m²K
Roof U-value                            0.10 W/m²K
Roof U-value                            0.10 W/m²K
Roof U-value                            0.10 W/m²K
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FULL SAP CALCULATION PRINTOUT
Calculation Type: New Build (As Designed)

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CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE 09 Jan 2014

SAP 2012 WORKSHEET FOR New Build (As Designed) (Version 9.92, January 2014)
CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE 09 Jan 2014

1. Overall dwelling dimensions

	Area (m2)		Storey height (m)		Volume (m3)	
Ground floor	76.2800 (1b)	x	2.4600 (2b)	=	187.6488	(1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	76.2800					(4)
Dwelling volume			(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	=	187.6488	(5)

2. Ventilation rate

	main heating		secondary heating		other		total	m3 per hour	
Number of chimneys	0	+	0	+	0	=	0 * 40 =	0.0000	(6a)
Number of open flues	0	+	0	+	0	=	0 * 20 =	0.0000	(6b)
Number of intermittent fans							0 * 10 =	0.0000	(7a)
Number of passive vents							0 * 10 =	0.0000	(7b)
Number of flueless gas fires							0 * 40 =	0.0000	(7c)

		Air changes per hour	
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(7a)+(7b)+(7c) =	0.0000 / (5) =	0.0000	(8)
Pressure test		Yes	
Measured/design AP50		4.0000	
Infiltration rate		0.2000	(18)
Number of sides sheltered		2	(19)
Shelter factor	(20) = 1 - [0.075 x (19)] =	0.8500	(20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) =	0.1700	(21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Wind speed	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000	(22)
Wind factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750	(22a)
Adj infilt rate	0.2168	0.2125	0.2083	0.1870	0.1828	0.1615	0.1615	0.1573	0.1700	0.1828	0.1913	0.1998	(22b)
Mechanical extract ventilation - centralised													
If mechanical ventilation:												0.5000	(23a)
Effective ac	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	(25)

3. Heat losses and heat loss parameter

Element	Gross m2	Openings m2	NetArea m2	U-value W/m2K	A x U W/K	K-value kJ/m2K	A x K kJ/K	
Window (Uw = 1.30)			10.6900	1.2357	13.2101			(27)
Door to corridor			1.8900	1.4000	2.6460			(26)
External Wall	16.7500	5.1500	11.6000	0.1700	1.9720			(29a)
Sheltered Wall	6.4600	1.8900	4.5700	0.2343	1.0707			(29a)
Timber frame wall	27.5800	5.5400	22.0400	0.1400	3.0856			(29a)
0.72	10.3600		10.3600	0.1000	1.0360			(29a)
pitched joist	59.9100		59.9100	0.1000	5.9910			(30)
Flat roof	9.0800		9.0800	0.1000	0.9080			(30)
dormer roof	3.1100		3.1100	0.1000	0.3110			(30)
Total net area of external elements Aum(A, m2)			133.2500					(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	30.2304			(33)
Party Wall			37.4000	0.0000	0.0000			(32)
Party Floor 1			76.2800					(32d)

Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K	250.0000	(35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)	11.4692	(36)
Total fabric heat loss (33) + (36) =	41.6996	(37)

Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(38)m	30.9621	30.9621	30.9621	30.9621	30.9621	30.9621	30.9621	30.9621	30.9621	30.9621	30.9621	30.9621	(38)
Heat transfer coeff	72.6616	72.6616	72.6616	72.6616	72.6616	72.6616	72.6616	72.6616	72.6616	72.6616	72.6616	72.6616	(39)
Average = Sum(39)m / 12 =												72.6616	(39)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
HLP	0.9526	0.9526	0.9526	0.9526	0.9526	0.9526	0.9526	0.9526	0.9526	0.9526	0.9526	0.9526	(40)
HLP (average)												0.9526	(40)
Days in month	31	28	31	30	31	30	31	31	30	31	30	31	(41)

4. Water heating energy requirements (kWh/year)

Assumed occupancy	2.3885	(42)
Average daily hot water use (litres/day)	90.9266	(43)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Daily hot water use	100.0193	96.3822	92.7452	89.1081	85.4710	81.8340	81.8340	85.4710	89.1081	92.7452	96.3822	100.0193	(44)

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CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE 09 Jan 2014

Energy conte	148.3257	129.7266	133.8663	116.7079	111.9840	96.6336	89.5453	102.7545	103.9817	121.1807	132.2782	143.6455	(45)
Energy content (annual)										Total = Sum(45)m =		1430.6300	(45)
Distribution loss (46)m = 0.15 x (45)m													
	22.2489	19.4590	20.0799	17.5062	16.7976	14.4950	13.4318	15.4132	15.5973	18.1771	19.8417	21.5468	(46)
Water storage loss:													
Total storage loss													
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(56)
If cylinder contains dedicated solar storage													
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(57)
Combi loss	50.9589	44.3622	47.2619	43.9437	43.5551	40.3565	41.7017	43.5551	43.9437	47.2619	47.5310	50.9589	(61)
Total heat required for water heating calculated for each month													
	199.2846	174.0889	181.1282	160.6516	155.5391	136.9901	131.2470	146.3096	147.9255	168.4426	179.8092	194.6045	(62)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63)
								Solar input (sum of months) = Sum(63)m =				0.0000	(63)
Output from w/h													
	199.2846	174.0889	181.1282	160.6516	155.5391	136.9901	131.2470	146.3096	147.9255	168.4426	179.8092	194.6045	(64)
									Total per year (kWh/year) = Sum(64)m =			1976.0207	(64)
Heat gains from water heating, kWh/month													
	62.0580	54.2247	56.3260	49.7913	48.1234	42.2198	40.1992	45.0547	45.5599	52.1081	55.8652	60.5019	(65)

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5. Internal gains (see Table 5 and 5a)

Metabolic gains (Table 5), Watts

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(66)m	119.4245	119.4245	119.4245	119.4245	119.4245	119.4245	119.4245	119.4245	119.4245	119.4245	119.4245	119.4245	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5													
	20.2230	17.9619	14.6076	11.0589	8.2667	6.9791	7.5411	9.8022	13.1565	16.7052	19.4975	20.7851	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5													
	211.4907	213.6853	208.1549	196.3815	181.5196	167.5515	158.2200	156.0254	161.5557	173.3292	188.1911	202.1592	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5													
	34.9424	34.9424	34.9424	34.9424	34.9424	34.9424	34.9424	34.9424	34.9424	34.9424	34.9424	34.9424	(69)
Pumps, fans	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	(70)
Losses e.g. evaporation (negative values) (Table 5)													
	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	(71)
Water heating gains (Table 5)													
	83.4113	80.6915	75.7070	69.1546	64.6820	58.6386	54.0312	60.5573	63.2776	70.0377	77.5906	81.3197	(72)
Total internal gains													
	376.9524	374.1660	360.2969	338.4223	316.2957	294.9966	281.6197	288.2123	299.8172	321.8995	347.1065	366.0913	(73)

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6. Solar gains

[Jan]	Area m2	Solar flux Table 6a W/m2	g Specific data or Table 6b	FF Specific data or Table 6c	Access factor Table 6d	Gains W	
Northeast	3.6900	11.2829	0.6300	0.7000	0.7700	12.7239	(75)
Southeast	7.0000	36.7938	0.6300	0.7000	0.7700	78.7127	(77)

Solar gains	91.4366	159.9768	230.1132	303.9379	357.6105	362.5791	346.4211	305.2239	255.4974	179.8352	110.2897	77.7527	(83)
Total gains	468.3890	534.1428	590.4101	642.3602	673.9062	657.5757	628.0408	593.4362	555.3146	501.7347	457.3962	443.8440	(84)

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7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)												21.0000	(85)
Utilisation factor for gains for living area, nil,m (see Table 9a)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
tau	72.9026	72.9026	72.9026	72.9026	72.9026	72.9026	72.9026	72.9026	72.9026	72.9026	72.9026	72.9026	
alpha	5.8602	5.8602	5.8602	5.8602	5.8602	5.8602	5.8602	5.8602	5.8602	5.8602	5.8602	5.8602	
util living area													
	0.9977	0.9945	0.9850	0.9516	0.8554	0.6772	0.5042	0.5546	0.8072	0.9676	0.9947	0.9983	(86)
MIT	20.2389	20.3419	20.5014	20.6969	20.8585	20.9347	20.9507	20.9487	20.9027	20.6948	20.4220	20.2088	(87)
Th 2	20.1231	20.1231	20.1231	20.1231	20.1231	20.1231	20.1231	20.1231	20.1231	20.1231	20.1231	20.1231	(88)
util rest of house													
	0.9969	0.9927	0.9799	0.9349	0.8101	0.5967	0.4063	0.4534	0.7367	0.9530	0.9927	0.9978	(89)
MIT 2	19.0972	19.2472	19.4780	19.7535	19.9624	20.0425	20.0540	20.0530	20.0150	19.7552	19.3645	19.0532	(90)
Living area fraction									fLA = Living area / (4) =			0.2425	(91)
MIT	19.3741	19.5127	19.7262	19.9823	20.1797	20.2589	20.2715	20.2702	20.2303	19.9830	19.6210	19.3335	(92)
Temperature adjustment												0.0000	
adjusted MIT	19.3741	19.5127	19.7262	19.9823	20.1797	20.2589	20.2715	20.2702	20.2303	19.9830	19.6210	19.3335	(93)

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8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9960	0.9911	0.9770	0.9317	0.8134	0.6097	0.4231	0.4707	0.7462	0.9501	0.9911	0.9971	(94)
Useful gains	466.5373	529.3638	576.8255	598.4979	548.1252	400.9412	265.7554	279.3465	414.3842	476.7135	453.3165	442.5419	(95)
Ext temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000	(96)
Heat loss rate W													
	1095.3090	1061.7798	961.0393	805.2613	616.1487	411.1851	266.7743	281.2175	445.4401	681.7872	909.7952	1099.6218	(97)
Month fracti	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000	(97a)
Space heating kWh													
	467.8061	357.7835	285.8551	148.8696	50.6094	0.0000	0.0000	0.0000	0.0000	152.5748	328.6646	488.8674	(98)
Space heating												2281.0306	(98)
Space heating per m2											(98) / (4) =	29.9034	(99)

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CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE 09 Jan 2014

8c. Space cooling requirement

Not applicable

9a. Energy requirements - Individual heating systems, including micro-CHP

Fraction of space heat from secondary/supplementary system (Table 11)												0.0000	(201)
Fraction of space heat from main system(s)												1.0000	(202)
Efficiency of main space heating system 1 (in %)												93.3000	(206)
Efficiency of secondary/supplementary heating system, %												0.0000	(208)
Space heating requirement												2444.8346	(211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	467.8061	357.7835	285.8551	148.8696	50.6094	0.0000	0.0000	0.0000	0.0000	152.5748	328.6646	488.8674	(98)
Space heating efficiency (main heating system 1)	93.3000	93.3000	93.3000	93.3000	93.3000	0.0000	0.0000	0.0000	0.0000	93.3000	93.3000	93.3000	(210)
Space heating fuel (main heating system)	501.3999	383.4764	306.3827	159.5602	54.2438	0.0000	0.0000	0.0000	0.0000	163.5315	352.2665	523.9736	(211)
Water heating requirement	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(215)
Water heating													
Water heating requirement	199.2846	174.0889	181.1282	160.6516	155.5391	136.9901	131.2470	146.3096	147.9255	168.4426	179.8092	194.6045	(64)
Efficiency of water heater												80.2000	(216)
(217)m	87.0260	86.7252	86.0946	84.7597	82.4644	80.2000	80.2000	80.2000	80.2000	84.7028	86.4500	87.1742	(217)
Fuel for water heating, kWh/month	228.9945	200.7363	210.3828	189.5376	188.6136	170.8106	163.6496	182.4309	184.4457	198.8630	207.9920	223.2364	(219)
Water heating fuel used												2349.6930	(219)
Annual totals kWh/year													
Space heating fuel - main system												2444.8346	(211)
Space heating fuel - secondary												0.0000	(215)
Electricity for pumps and fans:													
(MEVCentralised, Database: in-use factor = 1.3000, SFP = 0.2340)													
mechanical ventilation fans (SFP = 0.2340)												53.5700	(230a)
central heating pump												30.0000	(230c)
main heating flue fan												45.0000	(230e)
Total electricity for the above, kWh/year												128.5700	(231)
Electricity for lighting (calculated in Appendix L)												357.1447	(232)
Total delivered energy for all uses												5280.2423	(238)

12a. Carbon dioxide emissions - Individual heating systems including micro-CHP

	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year	
Space heating - main system 1	2444.8346	0.2160	528.0843	(261)
Space heating - secondary	0.0000	0.0000	0.0000	(263)
Water heating (other fuel)	2349.6930	0.2160	507.5337	(264)
Space and water heating			1035.6179	(265)
Pumps and fans	128.5700	0.5190	66.7278	(267)
Energy for lighting	357.1447	0.5190	185.3581	(268)
Total CO2, kg/year			1287.7039	(272)
Dwelling Carbon Dioxide Emission Rate (DER)			16.8800	(273)

16 CO2 EMISSIONS ASSOCIATED WITH APPLIANCES AND COOKING AND SITE-WIDE ELECTRICITY GENERATION TECHNOLOGIES

DER		16.8800	ZC1
Total Floor Area	TFA	76.2800	
Assumed number of occupants	N	2.3885	
CO2 emission factor in Table 12 for electricity displaced from grid	EF	0.5190	
CO2 emissions from appliances, equation (L14)		16.4296	ZC2
CO2 emissions from cooking, equation (L16)		2.3115	ZC3
Total CO2 emissions		35.6211	ZC4
Residual CO2 emissions offset from biofuel CHP		0.0000	ZC5
Additional allowable electricity generation, kWh/m²/year		0.0000	ZC6
Resulting CO2 emissions offset from additional allowable electricity generation		0.0000	ZC7
Net CO2 emissions		35.6211	ZC8

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CALCULATION OF TARGET EMISSIONS 09 Jan 2014

SAP 2012 WORKSHEET FOR New Build (As Designed) (Version 9.92, January 2014)
CALCULATION OF TARGET EMISSIONS 09 Jan 2014

1. Overall dwelling dimensions

	Area (m2)		Storey height (m)		Volume (m3)	
Ground floor	76.2800 (1b)	x	2.4600 (2b)	=	187.6488	(1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	76.2800					(4)
Dwelling volume			(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	=	187.6488	(5)

2. Ventilation rate

	main heating		secondary heating		other		total	m3 per hour	
Number of chimneys	0	+	0	+	0	=	0 * 40 =	0.0000	(6a)
Number of open flues	0	+	0	+	0	=	0 * 20 =	0.0000	(6b)
Number of intermittent fans							3 * 10 =	30.0000	(7a)
Number of passive vents							0 * 10 =	0.0000	(7b)
Number of flueless gas fires							0 * 40 =	0.0000	(7c)

		Air changes per hour	
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(7a)+(7b)+(7c) =	30.0000 / (5) =	0.1599	(8)
Pressure test		Yes	
Measured/design AP50		5.0000	
Infiltration rate		0.4099	(18)
Number of sides sheltered		2	(19)
Shelter factor	(20) = 1 - [0.075 x (19)] =	0.8500	(20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) =	0.3484	(21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Wind speed	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000	(22)
Wind factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750	(22a)
Adj infilt rate	0.4442	0.4355	0.4268	0.3832	0.3745	0.3310	0.3310	0.3223	0.3484	0.3745	0.3919	0.4094	(22b)
Effective ac	0.5987	0.5948	0.5911	0.5734	0.5701	0.5548	0.5548	0.5519	0.5607	0.5701	0.5768	0.5838	(25)

3. Heat losses and heat loss parameter

Element	Gross m2	Openings m2	NetArea m2	U-value W/m2K	A x U W/K	K-value kJ/m2K	A x K kJ/K	
TER Opaque door			1.8900	1.0000	1.8900			(26)
TER Opening Type (Uw = 1.40)			10.6900	1.3258	14.1723			(27)
External Wall	16.7500	5.1500	11.6000	0.1800	2.0880			(29a)
Sheltered Wall	6.4600	1.8900	4.5700	0.1800	0.8226			(29a)
Timber frame wall	27.5800	5.5400	22.0400	0.1800	3.9672			(29a)
0.72	10.3600		10.3600	0.1800	1.8648			(29a)
pitched joist	59.9100		59.9100	0.1300	7.7883			(30)
Flat roof	9.0800		9.0800	0.1300	1.1804			(30)
dormer roof	3.1100		3.1100	0.1300	0.4043			(30)
Total net area of external elements Aum(A, m2)			133.2500					(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		34.1779			(33)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							250.0000	(35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							8.0630	(36)
Total fabric heat loss					(33) + (36) =		42.2409	(37)

Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(38)m	37.0713	36.8341	36.6015	35.5093	35.3050	34.3537	34.3537	34.1776	34.7201	35.3050	35.7184	36.1506	(38)
Heat transfer coeff	79.3122	79.0750	78.8425	77.7503	77.5459	76.5947	76.5947	76.4185	76.9611	77.5459	77.9593	78.3915	(39)
Average = Sum(39)m / 12 =												77.7493	(39)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
HLP	1.0398	1.0366	1.0336	1.0193	1.0166	1.0041	1.0041	1.0018	1.0089	1.0166	1.0220	1.0277	(40)
HLP (average)												1.0193	(40)
Days in month	31	28	31	30	31	30	31	31	30	31	30	31	(41)

4. Water heating energy requirements (kWh/year)

Assumed occupancy		2.3885 (42)
Average daily hot water use (litres/day)		90.9266 (43)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Daily hot water use	100.0193	96.3822	92.7452	89.1081	85.4710	81.8340	81.8340	85.4710	89.1081	92.7452	96.3822	100.0193	(44)
Energy conte	148.3257	129.7266	133.8663	116.7079	111.9840	96.6336	89.5453	102.7545	103.9817	121.1807	132.2782	143.6455	(45)
Energy content (annual)										Total = Sum(45)m =		1430.6300	(45)
Distribution loss (46)m = 0.15 x (45)m	22.2489	19.4590	20.0799	17.5062	16.7976	14.4950	13.4318	15.4132	15.5973	18.1771	19.8417	21.5468	(46)
Water storage loss:													

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CALCULATION OF TARGET EMISSIONS 09 Jan 2014

Total storage loss													
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(56)
If cylinder contains dedicated solar storage													
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(57)
Combi loss	50.9589	44.3622	47.2619	43.9437	43.5551	40.3565	41.7017	43.5551	43.9437	47.2619	47.5310	50.9589	(61)
Total heat required for water heating calculated for each month													
	199.2846	174.0889	181.1282	160.6516	155.5391	136.9901	131.2470	146.3096	147.9255	168.4426	179.8092	194.6045	(62)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63)
								Solar input (sum of months) = Sum(63)m =				0.0000	(63)
Output from w/h													
	199.2846	174.0889	181.1282	160.6516	155.5391	136.9901	131.2470	146.3096	147.9255	168.4426	179.8092	194.6045	(64)
									Total per year (kWh/year) = Sum(64)m =			1976.0207	(64)
Heat gains from water heating, kWh/month													
	62.0580	54.2247	56.3260	49.7913	48.1234	42.2198	40.1992	45.0547	45.5599	52.1081	55.8652	60.5019	(65)

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5. Internal gains (see Table 5 and 5a)

Metabolic gains (Table 5), Watts	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(66)m	119.4245	119.4245	119.4245	119.4245	119.4245	119.4245	119.4245	119.4245	119.4245	119.4245	119.4245	119.4245	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5													
	20.2230	17.9619	14.6076	11.0589	8.2667	6.9791	7.5411	9.8022	13.1565	16.7052	19.4975	20.7851	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5													
	211.4907	213.6853	208.1549	196.3815	181.5196	167.5515	158.2200	156.0254	161.5557	173.3292	188.1911	202.1592	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5													
	34.9424	34.9424	34.9424	34.9424	34.9424	34.9424	34.9424	34.9424	34.9424	34.9424	34.9424	34.9424	(69)
Pumps, fans	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	(70)
Losses e.g. evaporation (negative values) (Table 5)													
	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	(71)
Water heating gains (Table 5)													
	83.4113	80.6915	75.7070	69.1546	64.6820	58.6386	54.0312	60.5573	63.2776	70.0377	77.5906	81.3197	(72)
Total internal gains													
	376.9524	374.1660	360.2969	338.4223	316.2957	294.9966	281.6197	288.2123	299.8172	321.8995	347.1065	366.0913	(73)

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6. Solar gains

[Jan]	Area m2	Solar flux Table 6a W/m2	g Specific data or Table 6b	FF Specific data or Table 6c	Access factor Table 6d	Gains W	
Northeast	3.6900	11.2829	0.6300	0.7000	0.7700	12.7239	(75)
Southeast	7.0000	36.7938	0.6300	0.7000	0.7700	78.7127	(77)

Solar gains	91.4366	159.9768	230.1132	303.9379	357.6105	362.5791	346.4211	305.2239	255.4974	179.8352	110.2897	77.7527	(83)
Total gains	468.3890	534.1428	590.4101	642.3602	673.9062	657.5757	628.0408	593.4362	555.3146	501.7347	457.3962	443.8440	(84)

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7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)												21.0000	(85)
Utilisation factor for gains for living area, nil,m (see Table 9a)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
tau	66.7895	66.9898	67.1874	68.1312	68.3108	69.1591	69.1591	69.3186	68.8299	68.3108	67.9485	67.5739	
alpha	5.4526	5.4660	5.4792	5.5421	5.5541	5.6106	5.6106	5.6212	5.5887	5.5541	5.5299	5.5049	
util living area													
	0.9978	0.9949	0.9869	0.9583	0.8746	0.7028	0.5289	0.5792	0.8286	0.9717	0.9951	0.9983	(86)
MIT	19.9230	20.0676	20.2949	20.5898	20.8337	20.9645	20.9939	20.9901	20.9104	20.5975	20.2077	19.8996	(87)
Th 2	20.0503	20.0529	20.0554	20.0673	20.0695	20.0799	20.0799	20.0818	20.0759	20.0695	20.0650	20.0603	(88)
util rest of house													
	0.9970	0.9933	0.9823	0.9431	0.8310	0.6187	0.4224	0.4703	0.7584	0.9584	0.9931	0.9978	(89)
MIT 2	18.6109	18.8235	19.1549	19.5825	19.9051	20.0560	20.0776	20.0777	20.0042	19.6011	19.0376	18.5840	(90)
Living area fraction										fLA = Living area / (4) =		0.2425	(91)
MIT	18.9291	19.1253	19.4314	19.8268	20.1303	20.2764	20.2998	20.2990	20.2240	19.8427	19.3214	18.9031	(92)
Temperature adjustment												0.0000	
adjusted MIT	18.9291	19.1253	19.4314	19.8268	20.1303	20.2764	20.2998	20.2990	20.2240	19.8427	19.3214	18.9031	(93)

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8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9957	0.9910	0.9783	0.9383	0.8343	0.6377	0.4484	0.4968	0.7710	0.9542	0.9909	0.9968	(94)
Useful gains	466.3972	529.3173	577.5811	602.7235	562.2099	419.3166	281.5865	294.8350	428.1551	478.7508	453.2514	442.4137	(95)
Ext temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000	(96)
Heat loss rate W													
	1160.2695	1124.8624	1019.5432	849.5616	653.7352	434.7789	283.3852	297.9528	471.3081	716.7362	952.7699	1152.5950	(97)
Month fracti	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000	(97a)
Space heating kWh													
	516.2410	400.2064	328.8198	177.7234	68.0948	0.0000	0.0000	0.0000	0.0000	177.0612	359.6533	528.3749	(98)
Space heating												2556.1748	(98)
Space heating per m2											(98) / (4) =	33.5104	(99)

8c. Space cooling requirement

Not applicable

FULL SAP CALCULATION PRINTOUT
Calculation Type: New Build (As Designed)

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CALCULATION OF TARGET EMISSIONS 09 Jan 2014

9a. Energy requirements - Individual heating systems, including micro-CHP

Fraction of space heat from secondary/supplementary system (Table 11)												0.0000	(201)
Fraction of space heat from main system(s)												1.0000	(202)
Efficiency of main space heating system 1 (in %)												93.4000	(206)
Efficiency of secondary/supplementary heating system, %												0.0000	(208)
Space heating requirement												2736.8038	(211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement													
	516.2410	400.2064	328.8198	177.7234	68.0948	0.0000	0.0000	0.0000	0.0000	177.0612	359.6533	528.3749	(98)
Space heating efficiency (main heating system 1)													
	93.4000	93.4000	93.4000	93.4000	93.4000	0.0000	0.0000	0.0000	0.0000	93.4000	93.4000	93.4000	(210)
Space heating fuel (main heating system)													
	552.7205	428.4865	352.0555	190.2820	72.9067	0.0000	0.0000	0.0000	0.0000	189.5730	385.0678	565.7119	(211)
Water heating requirement													
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(215)
Water heating													
Water heating requirement													
	199.2846	174.0889	181.1282	160.6516	155.5391	136.9901	131.2470	146.3096	147.9255	168.4426	179.8092	194.6045	(64)
Efficiency of water heater												80.3000	(216)
(217)m	87.3404	87.0798	86.5341	85.3059	83.1280	80.3000	80.3000	80.3000	80.3000	85.1769	86.7626	87.4397	(217)
Fuel for water heating, kWh/month													
	228.1701	199.9187	209.3143	188.3242	187.1080	170.5979	163.4458	182.2038	184.2160	197.7562	207.2427	222.5586	(219)
Water heating fuel used												2340.8561	(219)
Annual totals kWh/year													
Space heating fuel - main system												2736.8038	(211)
Space heating fuel - secondary												0.0000	(215)
Electricity for pumps and fans:													
central heating pump												30.0000	(230c)
main heating flue fan												45.0000	(230e)
Total electricity for the above, kWh/year												75.0000	(231)
Electricity for lighting (calculated in Appendix L)												357.1447	(232)
Total delivered energy for all uses												5509.8047	(238)

12a. Carbon dioxide emissions - Individual heating systems including micro-CHP

	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year	
Space heating - main system 1	2736.8038	0.2160	591.1496	(261)
Space heating - secondary	0.0000	0.0000	0.0000	(263)
Water heating (other fuel)	2340.8561	0.2160	505.6249	(264)
Space and water heating			1096.7745	(265)
Pumps and fans	75.0000	0.5190	38.9250	(267)
Energy for lighting	357.1447	0.5190	185.3581	(268)
Total CO2, kg/m2/year			1321.0577	(272)
Emissions per m2 for space and water heating			14.3783	(272a)
Fuel factor (mains gas)			1.0000	
Emissions per m2 for lighting			2.4300	(272b)
Emissions per m2 for pumps and fans			0.5103	(272c)
Target Carbon Dioxide Emission Rate (TER) = (14.3783 * 1.00) + 2.4300 + 0.5103, rounded to 2 d.p.			17.3200	(273)

FULL SAP CALCULATION PRINTOUT
Calculation Type: New Build (As Designed)

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Property Reference	TPB12 03-F15	**Issued on Date**	12/11/2019
Assessment Reference	001	**Prop Type Ref**	
Property	03-F15, Building 12		

SAP Rating	84 B	**DER**	16.88	**TER**	17.32
Environmental	87 B	**% DER<TER**	2.53		
CO_2 Emissions (t/year)	1.08	**DFEE**	37.33	**TFEE**	44.45
General Requirements Compliance	Pass	**% DFEE<TFEE**	16.02		

Assessor Details	Mr. Harry Davey, energytest, Tel: 01892 315466, hdavey@energy-test.co.uk	**Assessor ID**	R434-0001
Client			

CALCULATION OF FABRIC ENERGY EFFICIENCY 09 Jan 2014

SAP 2012 WORKSHEET FOR New Build (As Designed) (Version 9.92, January 2014)
CALCULATION OF FABRIC ENERGY EFFICIENCY 09 Jan 2014

1. Overall dwelling dimensions

	Area (m2)		Storey height (m)		Volume (m3)	
Ground floor	76.2800 (1b)	x	2.4600 (2b)	=	187.6488	(1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	76.2800					(4)
Dwelling volume			(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	=	187.6488	(5)

2. Ventilation rate

	main heating		secondary heating		other		total		m3 per hour	
Number of chimneys	0	+	0	+	0	=	0 * 40	=	0.0000	(6a)
Number of open flues	0	+	0	+	0	=	0 * 20	=	0.0000	(6b)
Number of intermittent fans							3 * 10	=	30.0000	(7a)
Number of passive vents							0 * 10	=	0.0000	(7b)
Number of flueless gas fires							0 * 40	=	0.0000	(7c)

			Air changes per hour	
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(7a)+(7b)+(7c) =		30.0000 / (5) =	0.1599	(8)
Pressure test			Yes	
Measured/design AP50			4.0000	
Infiltration rate			0.3599	(18)
Number of sides sheltered			2	(19)
Shelter factor		(20) = 1 - [0.075 x (19)] =	0.8500	(20)
Infiltration rate adjusted to include shelter factor		(21) = (18) x (20) =	0.3059	(21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Wind speed	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000	(22)
Wind factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750	(22a)
Adj infilt rate	0.3900	0.3824	0.3747	0.3365	0.3288	0.2906	0.2906	0.2830	0.3059	0.3288	0.3441	0.3594	(22b)
Effective ac	0.5761	0.5731	0.5702	0.5566	0.5541	0.5422	0.5422	0.5400	0.5468	0.5541	0.5592	0.5646	(25)

3. Heat losses and heat loss parameter

Element	Gross m2	Openings m2	NetArea m2	U-value W/m2K	A x U W/K	K-value kJ/m2K	A x K kJ/K	
Window (Uw = 1.30)			10.6900	1.2357	13.2101			(27)
Door to corridor			1.8900	1.4000	2.6460			(26)
External Wall	16.7500	5.1500	11.6000	0.1700	1.9720			(29a)
Sheltered Wall	6.4600	1.8900	4.5700	0.2343	1.0707			(29a)
Timber frame wall	27.5800	5.5400	22.0400	0.1400	3.0856			(29a)
0.72	10.3600		10.3600	0.1000	1.0360			(29a)
pitched joist	59.9100		59.9100	0.1000	5.9910			(30)
Flat roof	9.0800		9.0800	0.1000	0.9080			(30)
dormer roof	3.1100		3.1100	0.1000	0.3110			(30)
Total net area of external elements Aum(A, m2)			133.2500					(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		30.2304			(33)
Party Wall			37.4000	0.0000	0.0000			(32)
Party Floor 1			76.2800					(32d)

Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K	250.0000	(35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)	11.4692	(36)
Total fabric heat loss (33) + (36) =	41.6996	(37)

Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(38)m	35.6717	35.4888	35.3095	34.4676	34.3100	33.5767	33.5767	33.4409	33.8592	34.3100	34.6287	34.9619	(38)

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CALCULATION OF FABRIC ENERGY EFFICIENCY 09 Jan 2014

Heat transfer coeff

	77.3712	77.1884	77.0091	76.1671	76.0096	75.2763	75.2763	75.1405	75.5587	76.0096	76.3283	76.6615 (39)
Average = Sum(39)m / 12 =												76.1664 (39)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
HLP	1.0143	1.0119	1.0096	0.9985	0.9965	0.9868	0.9868	0.9851	0.9905	0.9965	1.0006	1.0050	(40)
HLP (average)												0.9985	(40)
Days in month													
	31	28	31	30	31	30	31	31	30	31	30	31	(41)

4. Water heating energy requirements (kWh/year)

Assumed occupancy 2.3885 (42)
Average daily hot water use (litres/day) 90.9266 (43)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Daily hot water use													
	100.0193	96.3822	92.7452	89.1081	85.4710	81.8340	81.8340	85.4710	89.1081	92.7452	96.3822	100.0193	(44)
Energy conte	148.3257	129.7266	133.8663	116.7079	111.9840	96.6336	89.5453	102.7545	103.9817	121.1807	132.2782	143.6455	(45)
Energy content (annual)										Total = Sum(45)m =		1430.6300	(45)
Distribution loss (46)m = 0.15 x (45)m													
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(46)
Water storage loss:													
Total storage loss													
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(56)
If cylinder contains dedicated solar storage													
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(57)
Primary loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(59)
Heat gains from water heating, kWh/month													
	31.5192	27.5669	28.4466	24.8004	23.7966	20.5346	19.0284	21.8353	22.0961	25.7509	28.1091	30.5247	(65)

5. Internal gains (see Table 5 and 5a)

Metabolic gains (Table 5), Watts

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(66)m	119.4245	119.4245	119.4245	119.4245	119.4245	119.4245	119.4245	119.4245	119.4245	119.4245	119.4245	119.4245	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5													
	20.2230	17.9619	14.6076	11.0589	8.2667	6.9791	7.5411	9.8022	13.1565	16.7052	19.4975	20.7851	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5													
	211.4907	213.6853	208.1549	196.3815	181.5196	167.5515	158.2200	156.0254	161.5557	173.3292	188.1911	202.1592	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5													
	34.9424	34.9424	34.9424	34.9424	34.9424	34.9424	34.9424	34.9424	34.9424	34.9424	34.9424	34.9424	(69)
Pumps, fans	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(70)
Losses e.g. evaporation (negative values) (Table 5)													
	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	(71)
Water heating gains (Table 5)													
	42.3645	41.0222	38.2347	34.4450	31.9847	28.5203	25.5758	29.3486	30.6891	34.6114	39.0404	41.0278	(72)
Total internal gains													
	332.9056	331.4967	319.8245	300.7128	280.5983	261.8783	250.1642	254.0035	264.2287	283.4732	305.5563	322.7994	(73)

6. Solar gains

[Jan]	Area m2	Solar flux Table 6a W/m2	g Specific data or Table 6b	FF Specific data or Table 6c	Access factor Table 6d	Gains W	
Northeast	3.6900	11.2829	0.6300	0.7000	0.7700	12.7239	(75)
Southeast	7.0000	36.7938	0.6300	0.7000	0.7700	78.7127	(77)

Solar gains	91.4366	159.9768	230.1132	303.9379	357.6105	362.5791	346.4211	305.2239	255.4974	179.8352	110.2897	77.7527	(83)
Total gains	424.3422	491.4735	549.9377	604.6506	638.2088	624.4574	596.5853	559.2274	519.7261	463.3084	415.8460	400.5520	(84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C) 21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
tau	68.4650	68.6272	68.7870	69.5473	69.6915	70.3704	70.3704	70.4976	70.1073	69.6915	69.4005	69.0989	
alpha	5.5643	5.5751	5.5858	5.6365	5.6461	5.6914	5.6914	5.6998	5.6738	5.6461	5.6267	5.6066	
util living area													
	0.9986	0.9966	0.9902	0.9660	0.8893	0.7226	0.5463	0.6022	0.8515	0.9791	0.9969	0.9990	(86)
MIT	19.9038	20.0491	20.2772	20.5726	20.8236	20.9613	20.9933	20.9888	20.9001	20.5733	20.1819	19.8773	(87)
Th 2	20.0714	20.0734	20.0754	20.0846	20.0863	20.0943	20.0943	20.0958	20.0912	20.0863	20.0828	20.0792	(88)
util rest of house													
	0.9982	0.9954	0.9867	0.9532	0.8490	0.6394	0.4386	0.4919	0.7858	0.9689	0.9956	0.9987	(89)
MIT 2	19.0657	19.2121	19.4401	19.7357	19.9652	20.0762	20.0925	20.0925	20.0351	19.7416	19.3526	19.0456	(90)
Living area fraction									fLA = Living area / (4) =			0.2425	(91)
MIT	19.2690	19.4151	19.6431	19.9386	20.1734	20.2908	20.3110	20.3099	20.2448	19.9433	19.5537	19.2473	(92)
Temperature adjustment												0.0000	
adjusted MIT	19.2690	19.4151	19.6431	19.9386	20.1734	20.2908	20.3110	20.3099	20.2448	19.9433	19.5537	19.2473	(93)

8. Space heating requirement

FULL SAP CALCULATION PRINTOUT
Calculation Type: New Build (As Designed)

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CALCULATION OF FABRIC ENERGY EFFICIENCY 09 Jan 2014

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9976	0.9943	0.9846	0.9507	0.8534	0.6586	0.4649	0.5189	0.7983	0.9669	0.9946	0.9983	(94)
Useful gains	423.3335	488.6715	541.4661	574.8236	544.6372	411.2603	277.3590	290.1839	414.9224	447.9691	413.6041	399.8566	(95)
Ext temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000	(96)
Heat loss rate W													
	1158.1667	1120.3945	1012.1376	840.7816	644.0588	428.3846	279.3503	293.7885	464.2964	710.1817	950.5720	1153.5504	(97)
Month fracti	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000	(97a)
Space heating kWh													
	546.7159	424.5179	350.1796	191.4897	73.9697	0.0000	0.0000	0.0000	0.0000	195.0862	386.6168	560.7482	(98)
Space heating												2729.3240	(98)
Space heating per m2											(98) / (4) =	35.7803	(99)

8c. Space cooling requirement

Calculated for June, July and August. See Table 10b

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Ext. temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000	
Heat loss rate W													
	0.0000	0.0000	0.0000	0.0000	0.0000	707.5969	557.0444	571.0675	0.0000	0.0000	0.0000	0.0000	(100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.9053	0.9542	0.9377	0.0000	0.0000	0.0000	0.0000	(101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	640.5787	531.5095	535.4788	0.0000	0.0000	0.0000	0.0000	(102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	819.3279	784.9748	742.9723	0.0000	0.0000	0.0000	0.0000	(103)
Month fracti	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.0000	0.0000	(103a)
Space cooling kWh													
	0.0000	0.0000	0.0000	0.0000	0.0000	128.6994	188.5782	154.3751	0.0000	0.0000	0.0000	0.0000	(104)
Space cooling												471.6527	(104)
Cooled fraction											fC = cooled area / (4) =	1.0000	(105)
Intermittency factor (Table 10b)													
	0.0000	0.0000	0.0000	0.0000	0.0000	0.2500	0.2500	0.2500	0.0000	0.0000	0.0000	0.0000	(106)
Space cooling kWh													
	0.0000	0.0000	0.0000	0.0000	0.0000	32.1749	47.1445	38.5938	0.0000	0.0000	0.0000	0.0000	(107)
Space cooling												117.9132	(107)
Space cooling per m2												1.5458	(108)
Energy for space heating												35.7803	(99)
Energy for space cooling												1.5458	(108)
Total												37.3261	(109)
Dwelling Fabric Energy Efficiency (DFEE)												37.3	(109)

FULL SAP CALCULATION PRINTOUT
Calculation Type: New Build (As Designed)

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CALCULATION OF TARGET FABRIC ENERGY EFFICIENCY 09 Jan 2014

SAP 2012 WORKSHEET FOR New Build (As Designed) (Version 9.92, January 2014)
CALCULATION OF TARGET FABRIC ENERGY EFFICIENCY 09 Jan 2014

1. Overall dwelling dimensions

	Area (m2)		Storey height (m)		Volume (m3)	
Ground floor	76.2800 (1b)	x	2.4600 (2b)	=	187.6488	(1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	76.2800					(4)
Dwelling volume			(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	=	187.6488	(5)

2. Ventilation rate

	main heating		secondary heating		other		total	m3 per hour	
Number of chimneys	0	+	0	+	0	=	0 * 40 =	0.0000	(6a)
Number of open flues	0	+	0	+	0	=	0 * 20 =	0.0000	(6b)
Number of intermittent fans							3 * 10 =	30.0000	(7a)
Number of passive vents							0 * 10 =	0.0000	(7b)
Number of flueless gas fires							0 * 40 =	0.0000	(7c)

		Air changes per hour	
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(7a)+(7b)+(7c) =	30.0000 / (5) =	0.1599	(8)
Pressure test		Yes	
Measured/design AP50		5.0000	
Infiltration rate		0.4099	(18)
Number of sides sheltered		2	(19)
Shelter factor	(20) = 1 - [0.075 x (19)] =	0.8500	(20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) =	0.3484	(21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Wind speed	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000	(22)
Wind factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750	(22a)
Adj infilt rate	0.4442	0.4355	0.4268	0.3832	0.3745	0.3310	0.3310	0.3223	0.3484	0.3745	0.3919	0.4094	(22b)
Effective ac	0.5987	0.5948	0.5911	0.5734	0.5701	0.5548	0.5548	0.5519	0.5607	0.5701	0.5768	0.5838	(25)

3. Heat losses and heat loss parameter

Element	Gross m2	Openings m2	NetArea m2	U-value W/m2K	A x U W/K	K-value kJ/m2K	A x K kJ/K	
TER Opaque door			1.8900	1.0000	1.8900			(26)
TER Opening Type (Uw = 1.40)			10.6900	1.3258	14.1723			(27)
External Wall	16.7500	5.1500	11.6000	0.1800	2.0880			(29a)
Sheltered Wall	6.4600	1.8900	4.5700	0.1800	0.8226			(29a)
Timber frame wall	27.5800	5.5400	22.0400	0.1800	3.9672			(29a)
0.72	10.3600		10.3600	0.1800	1.8648			(29a)
pitched joist	59.9100		59.9100	0.1300	7.7883			(30)
Flat roof	9.0800		9.0800	0.1300	1.1804			(30)
dormer roof	3.1100		3.1100	0.1300	0.4043			(30)
Total net area of external elements Aum(A, m2)			133.2500					(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		34.1779			(33)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							250.0000	(35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							8.0630	(36)
Total fabric heat loss					(33) + (36) =		42.2409	(37)

Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(38)m	37.0713	36.8341	36.6015	35.5093	35.3050	34.3537	34.3537	34.1776	34.7201	35.3050	35.7184	36.1506	(38)
Heat transfer coeff	79.3122	79.0750	78.8425	77.7503	77.5459	76.5947	76.5947	76.4185	76.9611	77.5459	77.9593	78.3915	(39)
Average = Sum(39)m / 12 =												77.7493	(39)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
HLP	1.0398	1.0366	1.0336	1.0193	1.0166	1.0041	1.0041	1.0018	1.0089	1.0166	1.0220	1.0277	(40)
HLP (average)												1.0193	(40)
Days in month	31	28	31	30	31	30	31	31	30	31	30	31	(41)

4. Water heating energy requirements (kWh/year)

Assumed occupancy	2.3885	(42)
Average daily hot water use (litres/day)	90.9266	(43)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Daily hot water use	100.0193	96.3822	92.7452	89.1081	85.4710	81.8340	81.8340	85.4710	89.1081	92.7452	96.3822	100.0193	(44)
Energy conte	148.3257	129.7266	133.8663	116.7079	111.9840	96.6336	89.5453	102.7545	103.9817	121.1807	132.2782	143.6455	(45)
Energy content (annual)										Total = Sum(45)m =		1430.6300	(45)
Distribution loss (46)m = 0.15 x (45)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(46)
Water storage loss:													

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CALCULATION OF TARGET FABRIC ENERGY EFFICIENCY 09 Jan 2014

Total storage loss
0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 (56)
If cylinder contains dedicated solar storage
0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 (57)
Primary loss 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 (59)
Heat gains from water heating, kWh/month
31.5192 27.5669 28.4466 24.8004 23.7966 20.5346 19.0284 21.8353 22.0961 25.7509 28.1091 30.5247 (65)

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5. Internal gains (see Table 5 and 5a)

Metabolic gains (Table 5), Watts

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(66)m	119.4245	119.4245	119.4245	119.4245	119.4245	119.4245	119.4245	119.4245	119.4245	119.4245	119.4245	119.4245	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5													
	20.2230	17.9619	14.6076	11.0589	8.2667	6.9791	7.5411	9.8022	13.1565	16.7052	19.4975	20.7851	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5													
	211.4907	213.6853	208.1549	196.3815	181.5196	167.5515	158.2200	156.0254	161.5557	173.3292	188.1911	202.1592	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5													
	34.9424	34.9424	34.9424	34.9424	34.9424	34.9424	34.9424	34.9424	34.9424	34.9424	34.9424	34.9424	(69)
Pumps, fans	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(70)
Losses e.g. evaporation (negative values) (Table 5)													
	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	-95.5396	(71)
Water heating gains (Table 5)													
	42.3645	41.0222	38.2347	34.4450	31.9847	28.5203	25.5758	29.3486	30.6891	34.6114	39.0404	41.0278	(72)
Total internal gains													
	332.9056	331.4967	319.8245	300.7128	280.5983	261.8783	250.1642	254.0035	264.2287	283.4732	305.5563	322.7994	(73)

---

6. Solar gains

[Jan]	Area m2	Solar flux Table 6a W/m2	g Specific data or Table 6b	FF Specific data or Table 6c	Access factor Table 6d	Gains W	
Northeast	3.6900	11.2829	0.6300	0.7000	0.7700	12.7239	(75)
Southeast	7.0000	36.7938	0.6300	0.7000	0.7700	78.7127	(77)

Solar gains	91.4366	159.9768	230.1132	303.9379	357.6105	362.5791	346.4211	305.2239	255.4974	179.8352	110.2897	77.7527	(83)
Total gains	424.3422	491.4735	549.9377	604.6506	638.2088	624.4574	596.5853	559.2274	519.7261	463.3084	415.8460	400.5520	(84)

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7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C) 21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
tau	66.7895	66.9898	67.1874	68.1312	68.3108	69.1591	69.1591	69.3186	68.8299	68.3108	67.9485	67.5739	
alpha	5.4526	5.4660	5.4792	5.5421	5.5541	5.6106	5.6106	5.6212	5.5887	5.5541	5.5299	5.5049	
util living area													
	0.9986	0.9966	0.9905	0.9674	0.8941	0.7306	0.5547	0.6106	0.8572	0.9799	0.9969	0.9990	(86)
MIT	19.8683	20.0153	20.2472	20.5512	20.8100	20.9571	20.9923	20.9873	20.8919	20.5552	20.1566	19.8455	(87)
Th 2	20.0503	20.0529	20.0554	20.0673	20.0695	20.0799	20.0799	20.0818	20.0759	20.0695	20.0650	20.0603	(88)
util rest of house													
	0.9982	0.9955	0.9871	0.9549	0.8545	0.6466	0.4441	0.4978	0.7919	0.9699	0.9957	0.9987	(89)
MIT 2	19.0130	19.1616	19.3939	19.7004	19.9387	20.0597	20.0779	20.0781	20.0148	19.7100	19.3128	18.9984	(90)
Living area fraction									fLA = Living area / (4) =			0.2425	(91)
MIT	19.2204	19.3687	19.6008	19.9068	20.1500	20.2773	20.2996	20.2986	20.2276	19.9150	19.5175	19.2038	(92)
Temperature adjustment												0.0000	
adjusted MIT	19.2204	19.3687	19.6008	19.9068	20.1500	20.2773	20.2996	20.2986	20.2276	19.9150	19.5175	19.2038	(93)

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8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9976	0.9943	0.9850	0.9523	0.8584	0.6658	0.4711	0.5254	0.8041	0.9678	0.9946	0.9982	(94)
Useful gains	423.3264	488.6956	541.6650	575.7962	547.8188	415.7741	281.0723	293.8195	417.9336	448.3949	413.6197	399.8490	(95)
Ext temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000	(96)
Heat loss rate W													
	1183.3717	1144.1090	1032.9033	855.7790	655.2629	434.8535	283.3722	297.9225	471.5837	722.3375	968.0567	1176.1740	(97)
Month fracti	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000	(97a)
Space heating kWh													
	565.4737	440.4378	365.4813	201.5876	79.9384	0.0000	0.0000	0.0000	0.0000	203.8133	399.1947	577.5858	(98)
Space heating												2833.5125	(98)
Space heating per m2											(98) / (4) =	37.1462	(99)

8c. Space cooling requirement

Calculated for June, July and August. See Table 10b

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Ext. temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000	
Heat loss rate W													
	0.0000	0.0000	0.0000	0.0000	0.0000	719.9899	566.8006	580.7807	0.0000	0.0000	0.0000	0.0000	(100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.8978	0.9494	0.9320	0.0000	0.0000	0.0000	0.0000	(101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	646.4046	538.1241	541.2942	0.0000	0.0000	0.0000	0.0000	(102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	819.3279	784.9748	742.9723	0.0000	0.0000	0.0000	0.0000	(103)
Month fracti	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.0000	0.0000	(103a)
Space cooling kWh													

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CALCULATION OF TARGET FABRIC ENERGY EFFICIENCY 09 Jan 2014

	0.0000	0.0000	0.0000	0.0000	0.0000	124.5048	183.6569	150.0484	0.0000	0.0000	0.0000	0.0000 (104)
Space cooling												458.2102 (104)
Cooled fraction											fC = cooled area / (4) =	1.0000 (105)
Intermittency factor (Table 10b)												
	0.0000	0.0000	0.0000	0.0000	0.0000	0.2500	0.2500	0.2500	0.0000	0.0000	0.0000	0.0000 (106)
Space cooling kWh												
	0.0000	0.0000	0.0000	0.0000	0.0000	31.1262	45.9142	37.5121	0.0000	0.0000	0.0000	0.0000 (107)
Space cooling												114.5525 (107)
Space cooling per m2												1.5017 (108)
Energy for space heating												37.1462 (99)
Energy for space cooling												1.5017 (108)
Total												38.6479 (109)
Target Fabric Energy Efficiency (TFEE)												44.4 (109)

BASIC COMPLIANCE REPORT
Calculation Type: New Build (As Designed)

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Property Reference	TPB12 03-F15	**Issued on Date**	12/11/2019
Assessment Reference	001	**Prop Type Ref**	
Property	03-F15, Building 12		

SAP Rating	84 B	**DER**	16.88	**TER**	17.32
Environmental	87 B	**% DER<TER**	2.53		
CO_2 Emissions (t/year)	1.08	**DFEE**	37.33	**TFEE**	44.45
General Requirements Compliance	Pass	**% DFEE<TFEE**	16.02		

Assessor Details	Mr. Harry Davey, energytest, Tel: 01892 315466, hdavey@energy-test.co.uk	**Assessor ID**	R434-0001
Client			

SUMARY FOR INPUT DATA FOR New Build (As Designed)

Criterion 1 – Achieving the TER and TFEE rate

1a TER and DER

Fuel for main heating	Mains gas		
Fuel factor	1.00 (mains gas)		
Target Carbon Dioxide Emission Rate (TER)	17.32	$kgCO_2/m^2$	
Dwelling Carbon Dioxide Emission Rate (DER)	16.88	$kgCO_2/m^2$	Pass
	-0.44 (-2.5%)	$kgCO_2/m^2$	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	44.45	$kWh/m^2/yr$	
Dwelling Fabric Energy Efficiency (DFEE)	37.33	$kWh/m^2/yr$	
	-7.1 (-16.0%)	$kWh/m^2/yr$	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.23 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Roof	0.10 (max. 0.20)	0.10 (max. 0.35)	Pass
Openings	1.32 (max. 2.00)	1.40 (max. 3.30)	Pass

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	4.00 (design value)	
Maximum	10.0	Pass

Limiting System Efficiencies

4 Heating efficiency

Main heating system	Boiler system with radiators or underfloor - Mains gas Data from database Worcester Greenstar 37 CDi Combi boiler Efficiency: 89.4% SEDBUK2009 Minimum: 88.0%	Pass
Secondary heating system	None	

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5 Cylinder insulation

Hot water storage	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control	Pass
Hot water controls	No cylinder	
Boiler interlock	Yes	Pass

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100	%	
Minimum	75	%	Pass

8 Mechanical ventilation

Continuous extract system		
Specific fan power	0.18	
Maximum	0.7	Pass

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (Thames Valley)	Medium	Pass

Based on:

Overshading	Average
Windows facing North East	3.69 m², No overhang
Windows facing South East	7.00 m², No overhang
Air change rate	1.80 ach
Blinds/curtains	Light-coloured curtain or roller blind, closed 100% of daylight hours

Criterion 4 – Building performance consistent with DER and DFEE rate

Party Walls

Type	U-value		
Filled Cavity with Edge Sealing	0.00	W/m²K	Pass

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals	4.00 (design value)	
Maximum	10.0	Pass

10 Key features

External wall U-value	0.14	W/m²K
External wall U-value	0.10	W/m²K
Party wall U-value	0.00	W/m²K
Roof U-value	0.10	W/m²K
Roof U-value	0.10	W/m²K
Roof U-value	0.10	W/m²K

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

BLOCK COMPLIANCE
Calculation Type: New Build (As Designed)

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Block Reference	TP Bd 12	**Issued on Date**	12/11/2019
Block Name			
Assessor Details	Mr. Harry Davey, energytest, Tel: 01892 315466, hdavey@energy-test.co.uk	**Assessor ID**	R434-0001
Client			

Block Compliance Report - DER

Block Reference: TP Bd 12		**Block Name:**		
Property-Assessment Reference	**Multiplier**	**Floor Area (m^2)**	**DER ($kgCO_2/m^2$)**	**TER ($kgCO_2/m^2$)**
TPB12 00-F1-001	1	54.15	-67.48	19.85
TPB12 00-F2-001	1	59.47	18.07	17.93
TPB12 00-F3-001	1	104.68	15.98	16.14
TPB12 00-F4-001	1	55.38	20.16	20.03
TPB12 01-F5-001	1	54.15	18.51	18.12
TPB12 01-F6-001	1	71.45	15.04	14.97
TPB12 01-F7-001	1	75.65	15.08	15.17
TPB12 01-F8-001	1	71.07	17.53	17.42
TPB12 02-F9-001	1	54.15	17.98	17.72
TPB12 02-F10-001	1	71.45	15.04	15.05
TPB12 02-F11-001	1	75.65	15.17	15.22
TPB12 02-F12-001	1	71.07	17.19	17.11
TPB12 03-F13-001	1	54.04	19.51	19.58
TPB12 03-F14-001	1	76.28	16.41	16.86
TPB12 03-F15-001	1	76.28	16.88	17.32
TPB12 03-F16-001	1	54.04	20.46	20.50
Totals:	16	1078.96	191.53	279.00
Average DER = 12.78 $kgCO_2/m^2$			PASS	
Average TER = 17.20 $kgCO_2/m^2$				

BLOCK COMPLIANCE
Calculation Type: New Build (As Designed)

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Block Compliance Report - DFEE

Block Reference: TP Bd 12		Block Name:		
Property-Assessment Reference	**Multiplier**	**Floor Area (m^2)**	**DFEE ($kWh/m^2/yr$)**	**TFEE ($kWh/m^2/yr$)**
TPB12 00-F1-001	1	54.15	43.76	50.16
TPB12 00-F2-001	1	59.47	36.83	42.09
TPB12 00-F3-001	1	104.68	38.96	45.58
TPB12 00-F4-001	1	55.38	45.39	52.23
TPB12 01-F5-001	1	54.15	38.62	42.47
TPB12 01-F6-001	1	71.45	29.63	33.11
TPB12 01-F7-001	1	75.65	29.59	33.52
TPB12 01-F8-001	1	71.07	39.23	44.41
TPB12 02-F9-001	1	54.15	35.11	39.10
TPB12 02-F10-001	1	71.45	27.78	31.51
TPB12 02-F11-001	1	75.65	29.68	33.40
TPB12 02-F12-001	1	71.07	37.04	41.86
TPB12 03-F13-001	1	54.04	41.82	48.85
TPB12 03-F14-001	1	76.28	35.32	42.13
TPB12 03-F15-001	1	76.28	37.33	44.45
TPB12 03-F16-001	1	54.04	45.88	53.53
Totals:	16	1078.96	591.96	678.37
Average DFEE = 36.55 $kWh/m^2/yr$			PASS	
Average TFEE = 41.93 $kWh/m^2/yr$				