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LIV INTERNATIONAL

LAND ADJACENT TO MIDDLEFIELD, LONDON, NW8 6NE

ENERGY OPTIONS REPORT

APRIL 2016

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1. EXECUTIVE SUMMARY

- 1.1 The following report presents an outline energy options appraisal for the proposed development at Land adjacent to Middlefield, London, NW8 6NE.
- 1.2 The Appraisal assesses the most appropriate renewable energy technologies for the project, total projected energy demand for the site and the proportion that might be met from appropriate renewable energy supplies.
- 1.3 The report includes:
 - Estimated total operational energy demand for the development based on indicated usage
 - This is 74325 kWh per year
 - A brief appraisal of the various renewable energy technologies and their applicability to this development.

By Technology

Solar Thermal

1.4 Solar Thermal systems were found to be unlikely to deliver the required 20% of energy supply due to the limited area of south facing roof in proportion to the scale of hot water demand. They could however contribute a small proportion towards the overall target.

Photovoltaics

1.5 Photovoltaic (PV) was found to be suitable to reduce CO₂ emissions by 20% of total energy demand.

Heat Pumps

1.6 Ground Source Heat Pump technologies could contribute a sizable proportion of the overall energy demands, but CO₂ savings would be unlikely to achieve the required reduction.



Wind Power

1.7 Small scale wind could provide some electrical supply in conjunction with other technologies but the practical output of such systems has been shown to fall short of theoretical power production.

Biomass

1.8 Biomass might be able to provide a significant contribution towards the 20% target, although storage of fuel would present a logistical barrier.

District Heating

1.9 There is no opportunity for district heating adjacent to this development.

Overall

1.10 SAP modelling has shown that the following technology would be the preferred option in contributing to the 20% CO₂ target.

3.4 kWp per property of Photovoltaic Panels:

- Total CO₂ displaced by the above = 4571 kgCO_2
- Total CO₂ emissions from development = 22201 kgCO₂
- Percentage displaced by the above = 20.59%



2. INTRODUCTION

- 2.1 Phlorum Ltd were commissioned to provide an energy options appraisal to act as part of a planning submission to London Borough of Camden for the proposed development.
- 2.2 The aim of this assessment is to show how a 20% reduction in the energy demands for the property, as expressed in CO₂, might be achieved from Renewable Energy Sources.

Method

- i. SAP assessments were carried out on the property to derive the energy performance against a preliminary Part L1a compliant building and services specification.
- ii. From this bassline, the impact of various renewable energy and low carbon technologies have been evaluated.
- 2.3 It is assumed that further detailed analysis will be carried out should the planning application be successful.



3. THE SITE

3.1 The proposed development is a three property terrace of 4 storey dwellings consisting of approximately 945m² of residential accommodation. The proposed site is in an established urban area and is surrounded by residential property of similar height.



4. ENERGY DEMAND AND CO₂ EMISSIONS

- 4.1 The properties have been assessed using SAP modelling to show compliance with Part L 2013.
- 4.2 This resulted in the following two scenarios for energy demands and CO₂ emissions.

Part L Compliance Standards

- Energy Consumption 74325 kWh per annum
- CO₂ Emissions 22201 kgCO₂ per annum

Specification

- 4.3 The Part L Compliance scenario is based on the following specification:
 - Thermal bridging;
 Use of Accredited Construction Details for Thermal Bridging Lintels achieve Psi Value of 0.05 W/mK
 - Air Permeability 5 $m^3/(h.m^2)$ at 50 Pa (with an air pressure test)

External walls

- Uvalue = 0.20 W/mK
- Party Wall cavity wall filled and sealed

Roof

• Uvalue = 0.16 W/mK

Ground Floor

- Uvalue = 0.16 W/mK
- Door Uvalues = 1.60 W/mK (whole area Uvalue including frame)
- Window rooflight Uvalues = 1.40 W/mk (whole area Uvalue including frame)



Lighting

• Internal lighting; Low energy light fittings are installed as follows; 100% light fittings

Heating

- Mains Gas Valliant Ecotec GB 656 boiler: radiator heating with full time and temperature zone control with boiler interlock, delayed start thermostat and flow temperature <= 35 degrees
- Secondary heating no specified

Hot water

- Cylinder 300 litres, 80mm insulation, pipes insulated, independent time and temperature control
- Water use is assumed to less than 125 litres per person per day in line with Part G

Ventilation

• 4 extract fans

Total Energy Demand & CO₂ Emissions

<u>Scenario – (Part L Compliance)</u>

- Thermal Consumption = 54038 kWh per year
- Non-thermal Consumption = 20287 kWh per year

Total Energy Demand = 74325 kWh per year CO₂ Emissions = 22201 kgCO₂ per year

- Appendix 1 provides a summary of SAP workings
- Appendix 2 provides SAP worksheets



5. OPTIONS FOR ENERGY SUPPLY

5.1 The remainder of the report explores how the CO₂ emissions might be reduced by 20% through the implementation of renewable energy technologies.

Bassline

5.2 74325 kWh and 22201 kgCO₂, from the previous selection, are taken as the bassline consumption and emission figures.

Solar Hot Water

- 5.3 We receive sufficient sunshine to provide up to 70% of our domestic hot water needs from a well designed solar thermal installation.
- 5.4 There are two main types of systems which could be considered the flat plate collectors or the evacuated tube collectors. Solar hot water system savings range from around 454 kilowatt hours (kWh)/year/m² for flat plate collectors to 582 kWh/year/m² for an evacuated tube system.
- 5.5 Panels for the solar system would be located on the roof close to the calorifiers. The additional roof loadings would require confirmation from Structural Engineers that the roofs would be capable of withstanding the weight imposed by the equipment. For this system all necessary pumping and control equipment would be located adjacent to the calorifiers.
- 5.6 The topography of a site and its immediate surroundings will influence the potential for solar water heating. Relevant factors such as overshading will compromise efficiencies, but as the buildings surrounding the site are of a similar height there appears to be little potential for overshading from the south by other buildings.
 - 1. Occupancy

The viability of solar thermal systems is very much influenced by predicted occupancy and use of the property during the summer months. As the property is likely to be fully occupied throughout the year, the demand for domestic hot water would be consistent and suitable for taking advantage of peak solar energy supply in the summer months.

2. Area of collectors



The area of south facing, sloping roof available for solar collectors is more than adequate to provide for the hot water demand of the properties.

- 5.7 The property was modelled using SAP 2012 software with the following specification of solar thermal panel;
 - 4.0m of south facing flat plate solar collector for each dwelling
- 5.8 This provided the following outcome.
- 5.9 12m² of solar thermal panels could produce 6.23% of energy demands in the property as assessed in kWh or 4.36% as assessed in CO₂ emissions.
- 5.10 Appendix 1 provides a summary of SAP workings, showing how the % reduction figures have been arrived at.
- 5.11 Appendix 2 shows SAP worksheet for Solar Hot Water modelling.
- 5.12 Further information on solar hot water systems and installers can be found at the; Solar Trade Association (www.solartradeassociation.org.uk).

Photovoltaics

- 5.13 Photovoltaic systems generate electricity from the sun with any excess generation having the potential to be sold to the National Grid. Ideally photovoltaic panels should face between south-east and south-west at an elevation of about 30-40 degrees.
- 5.14 The average installed cost is around £1,000 to £2,000 per kWp (KiloWatt Peak), with a 1kWp system generating 700 750 kWh of electricity per year and taking between 8 and 10m² of panel area.
- 5.15 SAP modelling has shown that 3.4kWp of Polycrystalline PV panels per property, would contribute 11.85% of total energy demands in kWh or 20.59% when measured in CO₂ emissions.
- 5.16 PV could play a significant role in achieving the 20% target.
- 5.17 Appendix 1 provides a summary of SAP workings, showing how the % reduction figures have been arrived at.



5.18 Appendix 2 shows SAP worksheet for Solar photovoltaic.

Heat Pump Technology

- 5.19 Ground source heat pumps are used to extract heat from the ground to provide space and water heating. Similarly, Air Source Heat Pumps are used to take heat from the air.
- 5.20 Heat pumps take in heat at a low temperature and release it at a higher temperature. The measure of efficiency is given by the Co-efficient of Performance (CoP), which is defined as the ratio of heat output divided by energy input.
- 5.21 Heat pumps provide water for heating and/or hot water service. The temperature of the water they supply varies between 35°C and 55°C although some models exist which can exceed this. This system is suitable for underfloor heating systems and for providing initial heating for a HWS calorifier. A Heat Pump system may also need to be supplemented by heating either from gas or electricity but this would depend on the system design.
- 5.22 For many heat pump systems, supplementary heating would be required in order to enable the HWS water to be stored at 65°C in order to comply with current Legionella requirements. Although this would again come down to the choice of system as some are capable of achieving higher temperatures.
- 5.23 While many heat pumps use electricity, the renewable energy component is considered as the heat extracted from the heat source (e.g. ground), less the primary energy input.
- 5.24 For this development heat pumps might be used to supply energy for hot water provision and space heating.

Ground Source Heat Pump

5.25 Modelling the property with SAP shows that 51.95% of energy demand could be delivered by GSHP with Co-efficient of Performance (CoP) = 3.2 when measured as kWh but only 16.52% when measured as CO₂.



- 5.26 This is because the ratio of renewable heat gained from GSHP to electricity used (~3.0:1) is similar to the ratio of CO_2 emitted from gas when compared with electricity (2.6:1). Therefore, while less kWh of electricity are consumed compared with kWh of gas in the baseline scenario, the emissions associated with the production of electricity almost outweigh the benefits.
- 5.27 While providing a proportion of total energy demand from heat pump technologies would be viable, achieving the 20% renewable target would be less well suited to this technology.
- 5.28 In addition, there would be difficulty in finding adequate heat sources due to the lack of ground area around the property. Given the physical restrictions of this site it is unlikely that these boreholes could be located within the development boundaries.
- 5.29 Appendix 1 provides a summary of SAP workings, showing how the % reduction figures have been arrived at.
- 5.30 Appendix 2 shows SAP worksheet for Ground Source Heat Pump modelling.

Air Source Heat Pump

- 5.31 Modelling the property with SAP shows that 44.80% of energy demand could be delivered by ASHP when measured as kWh but CO₂ emissions would increase by 4.09%.
- 5.32 This is because the ratio of renewable heat gained from ASHP to electricity used (~2.0:1) is less than the ratio of CO_2 emitted from gas when compared with electricity (2.6:1). Therefore, while less kWh of electricity is consumed compared with kWh of gas in the baseline scenario, the emissions associated with the production of electricity outweigh the benefits.
- 5.33 ASHP would not be suitable for this property.
- 5.34 Appendix 1 provides a summary of SAP workings, showing how the % reduction figures have been arrived at.
- 5.35 Appendix 2 shows SAP worksheet for Air Source Heat Pump modelling.
- 5.36 For further information on Ground Source Heat Pumps you could contact:



The National Energy Foundation

The National Energy Centre Davy Avenue Knowlhill Milton Keynes. MK5 8NG www.gshp.org.uk

The UK Heat Pump Network www.heatpumpnet.org.uk

The Heat Pump Association www.feta.co.uk/hpa/

Small Scale Wind

- 5.37 Wind energy is one of the most cost effective methods of renewable power generation. The electricity can either link to the grid or charge batteries. Wind turbines work best in open areas and are less viable in high density urban areas. Small turbines can be mounted on building roofs, although this would require the involvement of structural engineers to ensure turbine loads would be supported on the building structure.
- 5.38 Recent research has shown that the output from urban wind turbines generally doesn't fulfil theoretical potential. This should be considered if pursuing this technology.
- 5.39 Wind turbines are visible and as such provide a visible sign of a commitment to sustainable energy.
- 5.40 The viability of wind energy is largely determined by the wind speed and quality at a given site.
- 5.41 It is highly likely that localised turbulence in and around the site would produce yields significantly lower than those suggested on the Department of Energy & Climate Change website.
- 5.42 If this option was to be taken further, measurement of wind on site would have to be carried out rather than basing assessment on database figures.
- 5.43 It is extremely unlikely that wind turbines would make any meaningful contribution toward the 20% reduction in CO₂ emissions from this development.



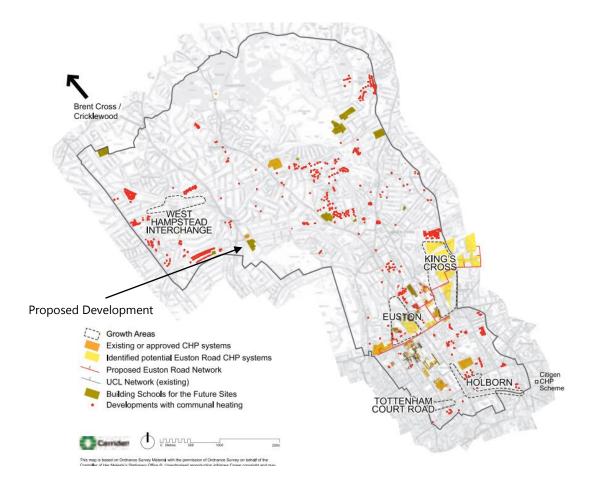
Biomass

- 5.44 Biomass can be burnt directly to provide heat in buildings. Wood can come in the form of logs, chips or pellets, with the latter having the greatest energy density and their associated boiler having the greatest controllability and potential for automatic feeding. Biomass is normally considered a carbon neutral fuel as the carbon dioxide emitted on burning has been recently absorbed from the atmosphere.
- 5.45 Biomass heating can theoretically be used in any building requiring heat however, there are some practicality issues in relation to storage of fuel.
- 5.46 SAP modelling provided the following outcome. It would provide 76% of total energy demand in kWh or provide a 41.04% reduction in CO₂.
- 5.47 20% of the total energy demand could be achieved by installing a biomass boiler.
- 5.48 A limiting factor for this development is likely to be space for the storage of biofuel.
- 5.49 It would appear from the site that storage fuel is likely to present a problem and biomass is unlikely to reduce CO₂ emissions by 20%.
- 5.50 Appendix 1 provides a summary of SAP workings, showing how the % reduction figures have been arrived at.
- 5.51 Appendix 2 shows SAP worksheet for Biomass modelling.

District Heating

5.52 There are no district heating mains in the vicinity of the development. The following map shows existing community heating sites. The arrow highlights the location of the proposed development.







6. CONCLUSION

6.1 The thermal and electrical demands of the project have been derived using SAP modelling and from this the outline viability of various RE technologies has been considered.

By Technology

Solar Thermal

6.2 Solar Thermal systems were found to be unlikely to deliver the required 20% of energy supply due to the limited area of south facing roof in proportion to the scale of hot water demand. They could however contribute a small proportion towards the overall target.

Photovoltaics

6.3 Photovoltaic (PV) was found to be suitable to reduce CO₂ emissions by 20% of total energy demand.

Heat Pumps

6.4 Ground Source Heat Pump technologies could contribute a sizable proportion of the overall energy demands, but CO₂ savings would be unlikely to achieve the required reduction.

Wind Power

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Biomass

6.6 Biomass might be able to provide a significant contribution towards the 20% target, although storage of fuel would present a logistical barrier.

District Heating

6.7 There is no opportunity for district heating adjacent to this development.



Overall

- 6.8 SAP modelling has shown that the following technology would be the preferred option in contributing to the 20% CO₂ target.
- 6.9 3.4 kWp per property of Photovoltaic Panels
 - Total CO_2 displaced by the above = 4571 kg CO_2
 - Total CO₂ emissions from development = 22201 kgCO₂
 - Percentage displaced by the above = 20.59%



7. ASSUMPTIONS

- 7.1 The outcomes of this report are based on the assumption that further detailed analysis will be carried out should the planning application be successful.
- 7.2 The calculation of energy demand has been based on Part L1A compliance.



8. **REFERENCES**

• SAP 2012 Modelling software London Borough of Camden Policy CS13 Appendix 1 SAP Workings

Part L Compliant

Survey reference	Total floor area	Main Heating 1 fuel requirement	Water Heating fuel requirement	Pumps and fans requirement	Lighting requirement	Electricity generated by PV	Total delivered energy	CO2 from Main Heating 1	CO2 from DHW	CO2 from pumps and fans		CO2 from lighting	Total regulated kg/year	CO2 from Appliances kg/m2/year	-	CO2 from Appliances kg/year	CO2 from Cooking kg/m2/yr	C		Net CO2 emissions	Total CO2 emissions	Total CO2 Reg & non reg
Left	339.84	16051.89	2937.12	75.0	0 840.67	N/A	19904.68	3467.21	634	.42	38.93	436.31	4576.86	i	8.54	2902.34	Ļ	0.58	195.41	22.59	22.59	7674.60
Mid	305.50	13134.65	2924.83	75.0	0 786.35	N/A	16920.83	2837.08	631	.76	38.93	408.11	3915.89		8.98	2741.89)	0.64	194.33	22.43	22.43	6852.11
Right	339.84	16051.89	2937.12	75.0	0 840.67	N/A	19904.68	3467.21	634	.42	38.93	436.31	4576.86		8.54	2902.34	Ļ	0.58	195.41	22.59	22.59	7674.60
Total	985.18	8 45238.43	8799.07	225.0	0 2467.68	0.0	0 56730.18	9771.50	1900	.60	116.78	1280.73	13069.60)	26.06	8546.56	5	1.79	585.14	67.60	67.60	22201.31
		elec conv	Energy fro	m cooking		Energy F	om Applian	ce						Tota	al Therm	al		Т	otal Non-t	hermal	Total kWh	1
			376.5087	-		5592.16									037.50				20287.49		74325.00	
			374.4288			5283.03																
		0.519	376.5087	,		5592.16	9															
		Total	1127.446	i		16467.3	7															

Part L Compliant

Part	L Compliant																						
	Survey reference	Total floor area		Main Heating 1 fuel requirement	Water Heating fuel requirement	Pumps and fans requirement		Electricity generated by PV Lighting requirement		Total delivered energy	CO2 from Main Heating 1	CO2 from DHW	CO2 from pumps and fans		CO2 from lighting	technologies		Total regulated kg/year	CO2 from Appliances kg/m2/year	1	CO2 from Appliances kg/vear	CO2 from Cooking kg/m2/yr	
	Left	2	00001	16051.89	2937.12		75.00	840.67 N/A		19904.68	3467.21	634.42	20	.93	436.31		0.00	4576.86	:	8.54	2902.34		0.5
	Mid			13134.65	2937.12		75.00	786.35 N/A		16920.83	2837.08	631.76		.93	430.31		0.00	3915.89		8.98	2902.34 2741.89		0.0
	Right			16051.89	2924.83		75.00	840.67 N/A		19904.68	3467.21	634.42		.93	436.31		0.00	4576.86		8.58 8.54	2902.34		0.0
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	Total	9	985.18	45238.43	8799.07	:	225.00	2467.68	0.00	56730.18	9771.50	1900.60	116	.78	1280.73		0.00	13069.60)	26.06	8546.56		1.7
				elec conv	Energy fro	m coo	oking	Ener	gy Fro	om Appliance	5								Tota	l Therm	al		
				0.519	376.5087			559	2.169										540	37.50			
				0.519	374.4288			528	3.031														
				0.519	376.5087			559	2.169														
				Total	1127.446			164	67.37														
Sola	r Thermal 4	m2																					
	Solar Left			16173.28	1199.14			840.6659 N/A		18338.09		259.0143	64.8		436.3056		0	4253.623	8 8	.5403	2902.34		0.5
	Solar Mid		305.5	13253.28	1190.903			786.3483 N/A		15355.53		257.2351	64.8	375	408.1148		0	3592.932	2 8	.9751	2741.89		0.6
	Solar Right	3	39.84	16173.28	1199.14		125	840.6659 N/A		18338.09	3493.429	259.0143	64.8	375	436.3056		0	4253.623	8 8	.5403	2902.34		0.5
	Total	9	985.18	45599.84	3589.18		375.00	2467.68	0.00	52031.70	9849.56	775.26	194	.63	1280.73		0.00	12100.18	3	26.06	8546.56		1.7
					Total CO2	Part L		Total CO2 PV		Difference	in CO2 fror	n Part L to P	٧	4	% Reductio	on				l Therm 89.02	al		
				Left	7674.60			7351.37		323.23					4.21								
				Mid	6852.11			6529.15		322.96					4.71					r	eduction ir	n kWh	1
				Right	7674.60			7351.37		323.23					4.21								
				č																9	% reduction	n in kV	Nh
				Total	22201.31			21231.89		969.42					4.37								

CO2 from Cooking kg/yr		Net CO2 emissions		Total CO2 emissions		Total CO2 Reg & non reg
0.58	195.41		22.59		22.59	7674.60
0.64	194.33		22.43		22.43	6852.11
0.58	195.41		22.59		22.59	7674.60
1.79	585.14		67.60		67.60	22201.31
	otal Non- 0287.49	the	rmal	Tot 74	al 325.00	

0.58	195.41	19.95	19.95	7351.37
0.64	194.33	20.08	20.08	6529.15
0.58	195.41	19.95	19.95	7351.37
1.79	585.14	59.97	59.97	21231.89

	Total Non-thermal 20437.49	Total 69626.51	
h	4698.4	8	

in kWh 6.321539

Part L Compliant

Survey reference	Total floor area	Main Heating 1 fuel requirement	Water Heating fuel requirement	Pumps and fans requirement	Lighting requirement	Electricity generated by PV		Total delivered energy	CO2 from Main Heating 1	CO2 from DHW		CO2 from pumps and fans		CO2 from lighting	ſ	20000	CO2 savings from energy saving	Total regulated kg/γear		CO2 from Appliances kg/m2/year		CO2 from Appliances kg/year	CO2 from Cooking kg/m2/yr
Left	339.84	16051.89	2937.12	75.00	840.6	7 N/A		19904.68	3467.21	63	34.42		38.93	43	36.31		0.00	457	6.86		8.54	2902.3	4
Mid	305.50	13134.65	2924.83	75.00	786.3	5 N/A		16920.83	2837.08	63	31.76		38.93	40	08.11		0.00	391	5.89		8.98	2741.8	9
Right	339.84	16051.89	2937.12	75.00	840.6	7 N/A		19904.68	3467.21	63	34.42		38.93	43	36.31		0.00	457	6.86		8.54	2902.3	4
Total	985.18	45238.43	8799.07	225.00	2467.6	8 0	.00	56730.18	9771.50	190	00.60	1	116.78	128	30.73		0.00	1306	9.60	2	26.06	8546.5	6
		elec conv	Energy froi	m cooking		Energy	Fror	m Applianc	e											Total	Therm	nal	
		0.519		-		5592.1														5403	37.50		
		0.519	374.4288			5283.0	031																
		0.519	376.5087			5592.1	169																
		Total	1127.446			16467	.37																

PV Panels 3.4kWp L & R & Mid

PV Left	339.84 16051.89 2937.117	75 840.6659	-2936.31 16968.37 346	7.209 634.4173 38.925	436.3056 -1523.94 3052.91	4 8.5403 2902.34
PV Mid	305.5 13134.65 2924.835	75 786.3483	-2936.31 13984.52 283	7.083 631.7643 38.925	408.1148 -1523.94 2391.94	4 8.9751 2741.89
PV Right	339.84 16051.89 2937.117	75 840.6659	-2936.31 16968.37 346	7.209 634.4173 38.925	436.3056 -1523.94 3052.91	4 8.5403 2902.34
Total	985.18 45238.43 8799.069	225 2467.68	-8808.92 47921.26 977	1.502 1900.599 116.775	1280.726 -4571.83 8497.77	2 26.0557 8546.564

7.50
reduction in kWł
% reduction in k
,

	CO3 from Cooking kalu	Net CO2 emissions	Total CO2 emissions		Total CO2 Reg & non reg
0.58	195.41	22	2.59	22.59	7674.60
0.64	194.33	22	2.43	22.43	6852.11
0.58	195.41	22	2.59	22.59	7674.60
1.79	585.14	67	7.60	67.60	22201.31
	otal Non-t 20287.49	herma		tal kWh 4325.00	

0.58	195.41	19.95	19.95	6150.66
0.64	194.33	19.49	19.49	5328.17
0.58	195.41	19.95	19.95	6150.66
1.7861	585.1446	59.3818	59.3818	17629.48

Total Non-thermal	Total
20287.49	74325.00

- Wh 8808.92
- kWh 11.85

Part L Compliant

	refere	Total floor area	Main Heating 1 fuel requirement	Water Heating fuel requirement	Pumps and fans requirement	Electricity generated by PV Lighting requirement		Total delivered energy	CO2 from Main Heating 1	CO2 from DHW	CO2 from pumps and fans	CO2 from lighting	CO2 savings from energy saving technologies		Total regulated kg/year	CO2 from Appliances kg/m2/year	CO2 from Appliances kg/year	CO2 from Cc kg/	Coo	Net CO2 emissions	Total CO2 emissions	Total CO2 Reg & non reg
	Left	339.84	16051.89	2937.12	75.00	840.67 N	/A	19904.68	3467.21	634.42	38.93	436.3	1 0.	.00	4576.86	8.54	2902.34	0.58	195.41	22.59	22.59	9 7674.60
	Mid		13134.65		75.00			16920.83	2837.08	631.76	38.93	408.1		.00	3915.89	8.98	2741.89		194.33	22.43	22.43	
I	Right	339.84	16051.89	2937.12	75.00	840.67 N	/A	19904.68	3467.21	634.42	38.93	436.3	1 0.	.00	4576.86	8.54	2902.34	0.58	195.41	22.59	22.59	7674.60
	Total	985.18	45238.43	8799.07	225.00	2467.68	0.00	56730.18	9771.50	1900.60	116.78	1280.7	30.	.00	13069.60	26.06	8546.56	1.79	585.14	67.60	67.60) 22201.31
			elec conv	Energy fron	n cooking	Er	nergy Fro	om Appliance	2						-	Total Thern	nal		Total Non-tl	nermal	Total	
				376.5087			592.169									54037.50			20287.49		74325.00)
			0.519	374.4288		5	283.031	L														
			0.519	376.5087		5	592.169)														
			Total	1127.446		1	6467.37	7														
Ground	Source Hea	t Pump																				
(GSHP Left	339.84	4382.011	1103.05	0	840.6659 N	/Α	6325.726	2274.263	572.4829	0	436.305	6	0	3283.052	8.5403	2902.34	0.58	195.41	19.95	19.95	5 6380.80
(GSHP Mid	305.5	3584.464	1094.378	0	786.3483 N	/Α	5465.191	1860.337	567.9824	0	408.114	8	0	2836.434	8.9751	2741.89	0.64	194.33	20.08	20.08	3 5772.66
(GSHP Right	339.84	4382.011	1103.05	0	840.6659 N	/A	6325.726	2274.263	572.4829	0	436.305	6	0	3283.052	8.5403	2902.34	0.58	195.41	19.95	19.95	5 6380.80
	Total	985.18	12348.49	3300.48	0.00	2467.68	0.00) 18116.64	6408.86	1712.95	0.00	1280.7	3 0.	.00	9402.54	26.06	8546.56	1.79	585.14	59.97	59.97	7 18534.25
				Total CO2 P	Part L	Total CO2 GS	HP	Difference	in CO2 from	n Part L to C	SHP	% Reduct	ion			Total Thern 15648.96	nal		Total Non-th 20062.49	nermal	Total 35711.46	5
			Left	7674.60		6380.80		1293.81				16.8	6									
			Mid	6852.11		5772.66		1079.45				15.7	5				reduction	in kWh		38613.54		
			Right	7674.60		6380.80		1293.81				16.8	6									
			Total	22201.31		18534.25		3667.06				16.5	2				% reductio	n in kWh		51.95		

22201.31

Total

21292.65

908.66

Part L Compliant

Survey reference	ting 1 1 quirem	Water Heating fuel requirement	Pumps and fans	Electricity generated by PV Lighting requirement	Total delivered energy	CO2 from Main Heating 1	CO2 from I	CO2 from numps and fans	CO2 from lighting	CO2 savings from energy saving technologies	Total regulated kg/year	CO2 from Appliances kg/m2/year	CO2 from Appliances kg/year	C02	Coo	Net CO2 emissions	Total CO2 Reg & non reg Total CO2 emissions
Left	339.84 16051.89	2937.12	75.00	840.67 N/A	19904.68	3467.21	634.42	38.93	436.31	0.00	4576.86	8.54	2902.34	0.58	195.41	22.59	22.59 7674.60
Mid	305.50 13134.65		75.00	786.35 N/A	16920.83	2837.08	631.76	38.93		0.00	3915.89	8.98	2741.89		193.41	22.33	22.43 6852.11
Right	339.84 16051.89	2937.12	75.00	840.67 N/A	19904.68	3467.21	634.42	38.93		0.00		8.54	2902.34		195.41	22.59	22.59 7674.60
0				,													
Total	985.18 45238.43	8799.07	225.00	2467.68 0.00	56730.18	9771.50	1900.60	116.78	1280.73	0.00	13069.60	26.06	8546.56	1.79	585.14	67.60	67.60 22201.31
	alac conv	Energy from	cooking	Eporgy Fro	m Applianc	0						Total Thern		т	otal Non-th	ormal	Total
		376.5087	COOKINg	5592.169		C						54037.50	101		20287.49	lermai	74325.00
		374.4288		5283.031								54057.50			20207.45		74525.00
		376.5087		5592.169													
	Total	1127.446		16467.37													
Air Source Heat Pum	n																
ASHP Left	339.84 5341.597	2007.616	0	840.6659 N/A	8189.879	2772.289	1041.952	C	436.3056	0	4250.547	8.5403	2902.34	0.58	195.41	19.95	19.95 7348.29
ASHP Mid	305.5 4271.736			786.3483 N/A		2217.031			408.1148		3659.844	8.9751	2741.89		194.33	20.08	20.08 6596.07
ASHP Right	339.84 5341.597			840.6659 N/A		2772.289			436.3056		4250.547	8.5403	2902.34		195.41	19.95	19.95 7348.29
Total	985.18 14954.93	6008.87	0.00	2467.68 0.00	23431.48	7761.61	3118.60	0.00	1280.73	0.00	12160.94	26.06	8546.56	1.79	585.14	59.97	59.97 21292.65
		Total CO2 Pa	art L 🛛 🦷	Total CO2 ASHP	Difference	in CO2 fron	n Part L to A	SHP	% Reduction	ı		Total Thern 20963.80	nal		otal Non-th 20062.49	nermal	Total 41026.29
	Left	7674.60		7348.29	326.31				4.25								
	Mid	6852.11		6596.07	256.04				3.74			I	reduction	in kWh	:	33298.70	
	Right	7674.60		7348.29	326.31				4.25				/ roductio	n in k/M/h		44 90	

4.09

% reduction ir

n kWh 44	.80
----------	-----

Part L Compliant

	Survey reference	Total floor area		Main Heating 1 fuel requirement	iting fuel	Pumps and fans requirement	ting requir	Electricity generated by PV	Total delivered energy	CO2 from Main Heating 1	CO2 from DHW	CO2 from pumps and fans	CO2 from lighting	Total regulated kg/year	CO2 from Appliances kg/m2/year		CO2 from Cooking kg/m2/vr	CO2 from Cooking kg/yr	Net CO2 emissions	Total CO2 emissions		Total CO2 Reg & non reg
	Left		339.84	16051.89	2937.12	75.00	840.67	N/A	19904.68	3467.21	634.42	2 38.9	3 436.31	4576.86	8.54	2902.34	0.5	8 195.4	41 2	22.59	22.59	7674.60
	Mid			13134.65		75.00	786.35		16920.83	2837.08					8.98		0.6			22.43	22.43	6852.11
	Right		339.84	16051.89	2937.12	75.00	840.67	N/A	19904.68	3467.21	634.42	38.9	3 436.31	4576.86	8.54	2902.34	0.5	8 195.4	41 2	22.59	22.59	7674.60
	Total		985.18	45238.43	8799.07	225.00	2467.68	0.0	0 56730.18	9771.50	1900.60) 116.7	3 1280.73	13069.60	26.06	8546.56	1.7	9 585.	14 6	57.60	67.60	22201.31
				elec conv	Energy fron	n cooking	E	Energy Fi	rom Applianc	e					Total Ther	mal		Total No	on-thermal	Тс	otal	
					376.5087			5592.16							54037.50			20287.4	49	7	4325.00	
					374.4288			5283.03														
				0.519	376.5087			5592.16	9													
				Total	1127.446			16467.3	7													
Biomas	55																					
	Bio Left		339.84	20541.32	3194.518	30	840.6659 1	N/A	24606.5	801.1114	124.5862	2 15.5	7 436.3056	1377.573	8.5403	2902.34	0.5	8 195.4	41 1	9.95	19.95	4475.32
	Bio Mid				3172.275		786.3483			654.3807			7 408.1148		8.9751		0.6			20.08	20.08	4138.01
	Bio Right		339.84	20541.32	3194.518	30	840.6659 1	N/A	24606.5	801.1114	124.5862	2 15.5	7 436.3056	1377.573	8.5403	2902.34	0.5	8 195.	41 1	9.95	19.95	4475.32
	Total		985.18	57861.63	9561.31	90.00	2467.68	0.0	0 69980.62	2256.60	372.89	9 46.7	1 1280.73	3956.93	26.06	8546.56	1.7	9 585.	14 5	59.97	59.97	13088.64
					Total CO2 P	Part L	Total CO2 B	iomass	Difference	in CO2 fror	n Part L to	Biomass	% Reducti	on	Total Ther 67422.94			Total No 20152.4	on-thermal 49		otal 7575.43	
				Left	7674.60		4475.32		3199.28				41.69)								
				Mid	6852.11		4138.01		2714.10				39.61			reduction ir	kWh		-1325	50.44		
				Right	7674.60		4475.32		3199.28				41.69)								
				Total	22201.31		13088.64		9112.67				41.05	i		% reduction	in kWh		-1	7.83		

biomas % of energy demand 76.99 Appendix 2

SAP Worksheets



	Building	Regu	lation Co	mpliance		Page 1 of 6
Property Reference Survey Reference: Property:					Issued on Date: Prop Type Ref:	04.Apr.2016
SAP Rating: 87 B CO2	Emissions (t/year): eral Requirements Complianc		ER: 13.47 Pass FEE:48.84 Pass	TER: 13.48 TFEE:55.53	Percentage D Percentage D	ER <ter: %<br="" 0.05="">FEE<tfee: 12.06<="" th=""></tfee:></ter:>
CfSH Results Version:		ENE1 C	redits: N/A ENE	2 Credits: N/A E	NE7 Credits: N/A	CfSH Level: N/A
	Holmes, Tel: 0115 92317 Drive, West Bridgford, Not		NG2 7FS		Surveyo	r ID: 4477-0001
	nurst Energy Systems SAF 2, Regs Region: England (ed)
SUMMARY FOR INP	UT DATA FOR New Build	(As Desig	jned)			
1a TER and DER						
Fuel for main heati	ng:		Mains gas			
Fuel factor: Target Carbon Dio	xide Emission Rate (1		1.00 (main 13.48 kg/m			
	ioxide Emission Rate		13.40 kg/m			ОК
1b TFEE and DFE		(==::)	. er in sjin			
	gy Efficiency (TFEE)		55.53 kWh			
	ergy Efficiency (DFE	Ξ)	48.84 kWh	/m ²		OK
2 Fabric U-values		-				
	Element	Averag	е	Highest		
	External wall		nax. 0.30)	0.20 (max	. 0.70)	OK
	Party wall	· ·	nax. 0.20)	- 0.16 (max	0.70)	OK
	Floor Roof	· ·	nax. 0.25) nax. 0.20)	0.16 (max) 0.16 (max)		OK OK
	Openings		nax. 2.00)	1.60 (max		OK
2a Thermal bridgin				· ·	. ,.	
l hermal bridging c 3 Air permeability	alculated from linear t	thermal	transmittanc	es for each	junction	
Air permeability at	50 pascals:		5.00 (desig	ın value)		
Maximum	50 pascais.		10.0	jii value)		OK
4 Heating efficienc	у					
Main heating syste			•	em with radi	ators or underf	loor -
			Mains gas			
			Data from		B 656/4-5-H	
				88.7% SED		
			Minimum: 8		20112000	OK
Secondary heating			None			
5 Cylinder insulation	on					
Hot water storage				/linder loss: by DBSCG 2	2.55 kWh/day	OK
Primary pipework i	nsulated:		Yes			OK
6 Controls						
Space heating con					zone control	OK
Hot water controls:			Cylindersta			OK
Doilor interlect			•	nt timer for I	JHW	OK OK
Boiler interlock			Yes			
	6					
7 Low energy light	s d lights with low-energ	1V	100%			

Building R	egulation Compliance	Page 2 of 6
Minimum	75%	OK
8 Mechanical ventilation		
Not applicable		
9 Summertime temperature		
Overheating risk (Thames Valley):	Not significant	OK
Based On:	-	
Overshading:	Average	
Windows facing South:	39.60 m ² , No overhang	
Air change rate:	8.00 ach	
Blinds/curtains:	None	
10 Key features		
Party wall U-value	0.00 W/m ² K	



	Sur	nmary Informati	on			
Property Reference: L Survey Reference: 0' Property:				Issued or Prop Typ	n Date: 04.Ap be Ref:	r.2016
SAP Rating: 87 B CO2 Emis	ssions (t/vear):	3.79 DER: 13.47 Pass	TER: 13.48	Percei	ntage DER <ter< th=""><th>R: 0.05 %</th></ter<>	R: 0.05 %
Environmental:85 B General R	· · ·	Pass DFEE:48.84 Pass	TFEE:55.53		ntage DFEE <tf< th=""><th></th></tf<>	
CfSH Results Version:		ENE1 Credits: N/A ENE2	Credits: N/A EN	NE7 Credits:	N/A CfSH L	evel: N/A
	nes, Tel: 0115 923170 e, West Bridgford, Notti			S	urveyor ID: 4	477-0001
Software Version: Elmhurst SAP version: SAP 2012, Re						
SUMMARY FOR INPUT	OATA FOR New Build (As Designed)			F	Page 3 of 6
Orientation 1.0 Property Type 2.0 Number of Storeys 3.0 Date Built 3.0 Property Age Band 4.0 Sheltered Sides 5.0 Sunlight/Shade	South House, End-Tr 4 2016 2 Average or un					
6.0 Measurements						
	Heat Loss Perimeter	Internal Floor Area	Average Sto	rey Height		
Basement:	39.11	104.83	2.6	0		
1st Storey:	38.51	87.87	3.2			
2nd Storey:	32.77	73.57	3.0			
3rd Storey:	32.77	73.57	2.9			
7.0 Living Area	61.38		-	-		
8.0 Thermal Mass Parameter	Simple calcula	ation - Medium				
9.0 External Walls						
Description	Construction		U-Value	Kappa	Gross Area	Nett Area
Basement		ense plaster, lightweight ck, filled cavity, any outside	0.20		101.68	101.68
Main	-	ense plaster, lightweight ck, filled cavity, any outside	0.20		316.58	275.09
9.1 Party walls Description	Construction		Кар	pa A	Area	
Party Wall 1	Dense plaster blocks, cavity	both sides. lightweight aggr or cavity fill	regate	6	6.08	
10.0 External Roofs Description	Construction		U-Value	Kappa	Gross Area	Nett Area
Flat	Plasterboard,	insulated flat roof	0.16		104.83	100.99
10.1 Party Ceilings Description	Construction		Кар	pa A	Area	
Party Ceilings 1	Other			8	7.87	
g and 1		slab, carpeted			50.00	
11.0 HeatLoss Floors Description	Construction		U-Value	Карра	Area	

Basement

11.1 Party Floors

0.16

Slab on ground, screed over insulation

104.83

Page 4 of 6

Description			Constructi	on				Карра	Area		
2 1 and g			Precast co	oncrete pl	anks floor,	screed, ca	rpeted		236.00)	
12.0 Openir	0 71	_									
Description	Data Source	Туре	Glazing	(Blazing Gap	Argon Filled	d Sola	ar Trans F	Frame Type	Frame Fac	tor U value
Door	Manufacturer	Solid Door									1.60
Windows	Manufacturer	Window	Double glaz	ed				0.76		0.70	1.40
Rooflight	Manufacturer	Roof Window	Double glaz	ed				0.76		0.70	1.40
13.0 Openir		Lesstier		Orientetien	Ourtain Tu		Overhang	Wide		Osuat As	Curtain
Name	Opening Type	Location		Jrientation	Curtain Ty	pe	Ratio	Overhang	Width Height	Count Ar	Closed
Door	Solid Door	[2] Main	:	South						1.	89
Windows	Window	[2] Main		South	None		0.00			39	.60
RL	Roof Window	[1] Flat		Horizontal	None						84
		[1]								-	
14.0 Conser 15.0 Draugh			None 100								
16.0 Draugh			No								
17.0 Therma			Calculate	Bridges							
17.1 List of	00			0							
Source Type	e	Bridge Type							Length	Psi	Imported
Independen	tly assessed	E1 Steel linte	l with perfo	ated stee	l hase nlati	9			18.90	0.050	Yes
Table K1 - A	2	E3 Sill				0			18.00	0.040	Yes
Table K1 - A		E4 Jamb							70.20	0.050	Yes
Table K1 - A		E5 Ground flo	or (normal)						38.51	0.160	No
Table K1 - E		E22 Basemer	` '						39.11	0.070	No
Table K1 - A		E6 Intermedia		nin a dwe	lling				65.54	0.070	No
Table K1 - E		E15 Flat roof			iiiig				32.57	0.560	No
Table K1 - A		E16 Corner (i		71					26.00	0.090	No
Table K1 - A		E17 Corner (i	,	tornal arc	a arostor t	han avtorn	al area)		20.00	-0.090	No
Table K1 - A		E17 Comer (i E18 Party wa			a greater ti	lan externa	ai alea)		2.60	-0.090	Yes
Table K1 - Z		P1 Party wall		-					5.29	0.000	No
Table K1 - E		P2 Party wall			within a dwg	alling			10.74	0.000	No
Table K1 - E		P4 Party wall				-			5.37	0.240	No
						,			0.01	0.210	
18.0 Pressu Designe	0		Yes 5.00								
	y Tested ?		0.00								
As Built	•										
	s Designed ?										
	nical Ventilation		No								
Present	ical Ventilation	System	No								
	ed Installation										
	s open in hot w		Windows	ully open							
	entilation possit entilation	ble	Yes No								
Air chan			8.00								
	ical Ventilation	data Type	0.00								
Туре											
	erence Number	•									
Configu MV/HR [Duct Insulated										
	cturer SFP										
Duct Ty											
	Efficiency										
Wet Roo Brand, N											
	Open Fireplace	s, Flues									
		MH	IS SHS	Other	Total						
Number of (Chimneys	C)	0	0						
Number of c	open flues	C)	0	0						
Number of i	ntermittent fans	6			4						
Number of p	passive vents				0						
Number of f	flueless gas fire	S			0						
21.0 Cooling	g System		No								
	• •	buret Enorgy Syste	-			- han - Durain	Deale Lotte	and the state of		D	

22.0 Lighting Internal	
Total number of light fittings	20
Total number of L.E.L. fittings	20
Percentage of L.E.L. fittings	100.00
External External lights fitted	No
Light and motion sensors 23.0 Electricity Tariff	Standard
	Stanuaru
24.0 Heating Systems Main Heating 1 Description	Database
Percentage of Heat	100 %
Main Heating 2 Description	None
Percentage of Heat Community Heating	%
Secondary Heating	None
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery	No
Instantaneous System 1	
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage System	No
System Solar Panel	No
25.0 Main Heating 1	
Database Ref. No.	15993
Fuel Type	Mains gas
Main Heating	BGB
TestMethod	
SAP Code	102
Efficiency (Split Efficiences) %	
Efficiency (Split Efficiences) % In Winter	89.7
In Summer	79.0
Model Name	18.0
Manufacturer	
Controls	CBI Time and temperature zone control
PCDF Controls	0
Delayed Start Stat	Yes
Sap Code	2110
Burner Control	
Boiler Compensator	
HETAS approved System Oil Pump Inside	
FI Case	
FI Water	
Flue Type	Balanced
Smoke Control Area	
Fan Assisted Flue	Yes
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Underfloor Heating Flow Temperature	<= 35°C
Electric CPSU Temperature	
Combi boiler type	
Combi keep hot type	
Combi store type	
27.0 Community Heating	
Space Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value Controls	
SAP Code	
Water Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Charging Linked To Heat Use	
28.0 Secondary Heating	
Description	
SHS efficiency %	
SAP Code	

HETAS Approved System				
Smoke Control Area				
Test Method				
Manufacturer Model Name				
29.0 Water Heating Water use <= 125 litres/person/day	HWP From main heat	ing 1		
SAP Code	Yes 901			
	901			
Immersion Heater Summer Immersion				
Suplementary Immersion				
Immersion Only Heating Hot Water				
29.1 Flue Gas Heat Recovery System				
Database ID				
Brand Model				
Details				
29.2 Waste Water Heat Recovery				
System				
Total rooms with shower and/or bath				
30.0 Hot Water Cylinder	Hot Water Cylinder			
Cylinder Stat	Yes			
Cylinder In Heated Space	Yes			
Independent Time Control	Yes			
Insulation Type	Foam			
Insulation Thickness				
Cylinder Volume	300.00			
Loss (kwh/day)				
Pipes insulation	Fully insulated primary	/ pipework		
In Airing Cupboard				
31.0 Solar Panel				
Solar Panel Area				
Area Type				
Panel Type				
n0, a1, a2, A/G ratio				
Orientation				
Elevation				
Overshading				
Solar Storage Volume				
Pump electrically powered				
Combined Cylinder				
32.0 Thermal Store	None			
Thermal Store Pipework				
33.0 Photovoltaic Unit				
Apportioned KWh/Year				
34.0 Wind Turbines				
Terrain Type	Urban			
Wind Turbines				
Count				
Apportioned Kwh/year				
Rotor Diameter				
Hub Height				
35.0 Small-scale Hydro				
Electricity Generated				
Description Apportioned kWh/Year				
Recommendations				
None				
Further measures to achieve even higher				
standards				
Solar photovoltaic panels, 2.5 kWp	£5,000 - £8,000	£279	B 91	B 88



	Build	ing Regu	lation Cor	mpliance		Page 1 of 6
	eference: Mid erence: 01 Mid				Issued on Date: () Prop Type Ref:	4.Apr.2016
SAP Rating:	88 B CO2 Emissions (t/year): 86 B General Requirements Comp		ER: 12.82 Pass FEE:44.83 Pass	TER: 12.89 TFEE:51.30	Percentage DE Percentage DF	R <ter: %<br="" 0.54="">EE<tfee: 12.60<="" th=""></tfee:></ter:>
CfSH Results	/ersion:	ENE1 C	redits: N/A ENE	2 Credits: N/A E	NE7 Credits: N/A	CfSH Level: N/A
Surveyor: Address: Client:	Richard Holmes, Tel: 0115 92 Denton Drive, West Bridgford		NG2 7FS		Surveyor I	D: 4477-0001
	sion: Elmhurst Energy Systems SAP 2012, Regs Region: Engla					4)
SUMMARY	FOR INPUT DATA FOR New E	Build (As Desig	jned)			
1a TER and	DER					
Fuel for ma			Mains gas			
Fuel factor:			1.00 (mains			
	oon Dioxide Emission Rat arbon Dioxide Emission R		12.89 kg/m 12.82 kg/m			OK
1b TFEE ar			12.02 KY/11	1		
	ric Energy Efficiency (TFE	E)	51.30 kWh	/m ²		
	abric Energy Efficiency (D		44.83 kWh	/m²		OK
2 Fabric U-	values					
	Element	Averag	е	Highest		
	External wall	0.20 (m	nax. 0.30)	0.20 (max.	0.70)	OK
	Party wall		nax. 0.20)	-	/	ŌK
	Floor		nax. 0.25)	0.16 (max.		OK
	Roof		nax. 0.20)	0.16 (max.		OK
	Openings	1.41 (n	nax. 2.00)	1.60 (max.	3.30)	OK
2a Thermal						
	dging calculated from line	ear thermal	transmittanc	es for each	unction	
3 Air perme Air permeal	bility at 50 pascals:		5.00 (desig	n value)		
Maximum	unity at 50 pascals.		10.0 (desig	n value)		OK
4 Heating e	fficiency		10.0			
Main heatin			Boiler syste	em with radia	ators or underflo	oor -
			Mains gas			
			Data from o			
			Minimum: 8	88.7% SED	BUK2009	ОК
Secondary	heating system:		None	50.0 /6		ÖN
5 Cylinder i						
Hot water s			Nominal cv	linder loss:	2.55 kWh/day	
	-		Permitted b	by DBSCG 2		OK
	ework insulated:		Yes			OK
6 Controls	la a contra l		The Li			OK
	ing controls:				zone control	OK
Hot water c	UNITOIS.		Cylindersta	nt timer for [л Ш M	OK
Boiler interl	ock		Yes		JI I V V	OK
			100			.
	av liahts					
7 Low ener	gy lights e of fixed lights with low-er	nergy	100%			

Building Regulation Compliance Pag						
Minimum	75%	OK				
8 Mechanical ventilation						
Not applicable						
9 Summertime temperature						
Overheating risk (Thames Valley):	Not significant	OK				
Based On:	-					
Overshading:	Average					
Windows facing South:	36.96 m ² , No overhang					
Air change rate:	8.00 ach					
Blinds/curtains:	None					
10 Key features						
Party wall U-value	0.00 W/m ² K					



Summary Information

Property Ref Survey Ref Property:					Issued or Prop Typ	n Date: 04.Ap be Ref:	r.2016
•		ssions (t/year): Requirements Compliance:	3.22 DER: 12.82 Pass Pass DFEE: 44.83 Pass	TER: 12.89 TFEE:51.30		ntage DER <ter ntage DFEE<tf< th=""><th></th></tf<></ter 	
CfSH Results	Version:		ENE1 Credits: N/A ENE2	Credits: N/A E	NE7 Credits:	N/A CfSH L	evel: N/A
Surveyor: Address: Client:	Denton Driv	mes, Tel: 0115 9231707 e, West Bridgford, Notti	ngham, NG2 7FS			, 	477-0001
			2012 Calculator (Design Sart L1A 2013), Calculation				
SUMMARY	FOR INPUT I	DATA FOR New Build (As Designed)			Р	age 3 of 6
Orientation		South					
1.0 Property Ty	ре	House, Mid-Te	errace				
2.0 Number of		4					
3.0 Date Built	. .	2016					
3.0 Property Ag		0					
4.0 Sheltered S 5.0 Sunlight/Sh		2 Average or un	known				
6.0 Measureme		Average of un	KIIOWII				
0.0 Measureme	1113						
		Heat Loss Perimeter	Internal Floor Area	Average Sto	orey Height		
	Basement:	27.00	91.80	2.6	50		
	1st Storey:	27.00	68.72	3.2	20		
	2nd Storey:	27.00	72.49	3.0	00		
	3rd Storey:	27.00	72.49	2.9			
7.01	ora orange.		12.10	2.0			
7.0 Living Area		64.78					
8.0 Thermal Ma		Simple calcula	tion - Medium				
9.0 External Wa	alls	Construction			Kanna	Cross Area	Nott Aroo
Description			nse plaster, lightweight	U-Value	Kappa	Gross Area	Nett Area
Basement			ck, filled cavity, any outside	0.20		70.20	70.20
Dacomon		structure	in, milea eavity, any eaterae	0.20		10.20	10.20
			nse plaster, lightweight				
Main		, ,	k, filled cavity, any outside	0.20		245.70	206.85
		structure					
9.1 Party walls							
Description		Construction		Кар	pa A	rea	
		Dense plaster	both sides. lightweight aggr	enate			
Party Wall 1		blocks, cavity		egale	13	31.30	
		bioono, ouvry	or ouvity in				
10.0 External R	oofs						
Description		Construction		U-Value	Kappa	Gross Area	Nett Area
		Distant de la la	way data al flat w f	0.40		04.00	07.00
Flat		Plasterboard, i	nsulated flat roof	0.16		91.80	87.96
10.1 Party Ceili	ngs						
Description		Construction		Кар	opa A	Area	
D / C					-		
Party Ceilings 1		Other				7.87	
g and 1		Concrete floor	slab, carpeted		16	60.00	
11.0 HeatLoss	Floors						
Description		Construction		U-Value	Kappa	Area	
Basement		Slab on ground	d, screed over insulation	0.16		91.80	

11.1 Party Floors

Description			Constru	uction				Kappa	a	Area			
2 1 and g			Precas	t concrete pl	anks floor,	screed, car	peted		:	236.00)		
12.0 Opening Description	Types Data Source	Туре	Glazing	C	Blazing Gap	Argon Filled	l Sola	ar Trans	Frame Ty	/pe	Frame I	Factor	· U value
Door	Manufacturer	Solid Door											1.60
Windows	Manufacturer	Window	Double	glazed				0.76			0.7	0	1.40
Rooflight	Manufacturer	Roof Window	Double	glazed				0.76			0.7	0	1.40
13.0 Opening Name	s Opening Type	Locatior	n	Orientatior	Curtain Ty	/pe	Overhang		Width	Height	Count	Area	Curtai
					-		Ratio	Overhan	g	-			Closed
Door	Solid Door	[2] Main		South								1.89	
Windows	Window	[2] Main		South	None		0.00					36.9	6
RL	Roof Window	[1] Flat		Horizontal	None							3.84	
14.0 Conserva 15.0 Draught			None 100										
16.0 Draught			No										
17.0 Thermal			Calcula	ate Bridges									
17.1 List of Br	idges	Bridge Ture							ı	onath	Dei		mnorted
Source Type		Bridge Type							L	ength	Psi	I	mported
Independently	assessed	E1 Steel linte	l with pe	rforated stee	el base plat	e			1	7.70	0.05	50 `	res
Table K1 - Ap	proved	E3 Sill							1	6.80	0.04	0	res
Table K1 - Ap	proved	E4 Jamb							6	5.80	0.05	50 `	res
Table K1 - Ap	proved	E5 Ground flo	oor (norn	nal)					2	7.00	0.16	50 `	res
Table K1 - Ap	proved	E6 Intermedia	ate floor	within a dwe	lling				5	4.00	0.07	1 O'	No
Table K1 - De	fault	E15 Flat roof	with par	apet					2	7.00	0.56	1 03	No
Table K1 - Ap	proved	E18 Party wa	II betwee	en dwellings					4	6.80	0.06	50 `	res
Table K1 - De	fault	P1 Party wall	- Groun	d floor					1	0.58	0.16	1 03	No
Table K1 - De	fault	P2 Party wall	- Interm	ediate floor	within a dw	elling			2	1.48	0.00	00	No
18.0 Pressure Designed Property T As Built q Same As 19.0 Mechani	q50 Tested ? 50 Designed ?	1	Yes 5.00										
Mechanica Present	al Ventilation		No										
	Installation	oothor	Window	ws fully open									
	tilation possib		Yes										
Night Ven	tilation .		No										
	e rate al Ventilation	data Type	8.00										
Type MV Refere	ence Number												
Configura													
MVHR Du Manufactu	ct Insulated												
Duct Type													
MVHR Eff	iciency												
Wet Room Brand, Mo													
20.0 Fans, Op		s, Flues											
		M	IS SH		Total								
Number of Ch	-	(0	0								
Number of op		()	0	0								
Number of int					4								
Number of pa		_			0								
Number of flu	eless gas fire	S			0								
21.0 Cooling	System		No										
22.0 Lighting													
Internal Total r	number of ligh	nt fittinas	20										
Total r	number of L.E	L. fittings	20										
-	ntage of L.E.L	fittings	100.00										

Page	Б	of	6
гауе	0	U	0

External	
External lights fitted	No
Light and motion sensors	
23.0 Electricity Tariff	Standard
24.0 Heating Systems	Detelore
Main Heating 1 Description	Database
Percentage of Heat	100 %
Main Heating 2	None
Description	
Percentage of Heat	%
Community Heating	Neve
Secondary Heating Water Heating	None Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery	No
Instantaneous System 1	
Waste Water Heat Recovery	No
Instantaneous System 2 Waste Water Heat Recovery Storage	No
System	INU
Solar Panel	No
25.0 Main Heating 1	
Database Ref. No.	15993
Fuel Type	Mains gas
Main Heating	BGB
TestMethod SAP Code	102
Efficiency (Split Efficiences) %	
Efficiency (Split Efficiences) %	
In Winter	89.7
In Summer	79.0
Model Name	
Manufacturer Controls	CPI Time and temperature zero control
PCDF Controls	CBI Time and temperature zone control 0
Delayed Start Stat	Yes
Sap Code	2110
Burner Control	
Boiler Compensator	
HETAS approved System	
Oil Pump Inside FI Case	
FI Water	
Flue Type	Balanced
Smoke Control Area	
Fan Assisted Flue	Yes
Is MHS Pumped	Pump in heated space
Heat Emitter Underfloor Heating	Radiators
Flow Temperature	<= 35°C
Electric CPSU Temperature	
Combi boiler type	
Combi keep hot type	
Combi store type	
27.0 Community Heating Space Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Controls	
SAP Code	
Water Community Heating PCDF Index	
Distribution Loss	
Distribution Loss Value	
Charging Linked To Heat Use	
28.0 Secondary Heating	
Description	
SHS efficiency %	
SAP Code	
HETAS Approved System Smoke Control Area	
Test Method	
Manufacturer	
Model Name	

29.0 Water Heating	HWP From main heatin	ig 1		
Water use <= 125 litres/person/day	Yes			
SAP Code	901			
Immersion Heater				
Summer Immersion				
Suplementary Immersion				
Immersion Only Heating Hot Water				
29.1 Flue Gas Heat Recovery System				
Database ID				
Brand Model				
Details				
29.2 Waste Water Heat Recovery				
System				
Total rooms with shower and/or bath				
30.0 Hot Water Cylinder	Hot Water Cylinder			
Cylinder Stat	Yes			
Cylinder In Heated Space	Yes			
Independent Time Control	Yes			
Insulation Type	Foam			
Insulation Thickness				
Cylinder Volume	300.00			
Loss (kwh/day)	Talls for a defendencier and	a far an an air		
Pipes insulation	Fully insulated primary	pipework		
In Airing Cupboard				
31.0 Solar Panel				
Solar Panel Area				
Area Type				
Panel Type n0, a1, a2, A/G ratio				
Orientation				
Elevation				
Overshading				
Solar Storage Volume				
Pump electrically powered				
Combined Cylinder				
32.0 Thermal Store	None			
Thermal Store Pipework	NULLE			
33.0 Photovoltaic Unit				
Apportioned KWh/Year				
34.0 Wind Turbines				
Terrain Type	Urban			
Wind Turbines	orban			
Count				
Apportioned Kwh/year				
Rotor Diameter				
Hub Height				
35.0 Small-scale Hydro				
Electricity Generated				
Description				
Apportioned kWh/Year				
Recommendations				
None				
Further measures to achieve even higher				
standards				
Solar photovoltaic panels, 2.5 kWp	£5,000 - £8,000	£279	B 91	B 90
	20,000 20,000	~2.0	201	200



	Buildi	n <mark>g Reg</mark> u	lation Co	mpliance		Page 1 of 6
Property Reference Survey Reference Property:					Issued on Date: (Prop Type Ref:	04.Apr.2016
SAP Rating: 87 B CC	2 Emissions (t/year): neral Requirements Complia		ER: 13.47 Pass FEE:48.84 Pass		Percentage DE Percentage DF	ER <ter: %<="" 0.05="" th=""></ter:>
CfSH Results Version:	· ·		redits: N/A ENE		NE7 Credits: N/A	CfSH Level: N/A
	rd Holmes, Tel: 0115 923 n Drive, West Bridgford, I		NG2 7FS		Surveyor	ID: 4477-0001
	nhurst Energy Systems S 12, Regs Region: Englar					ed)
SUMMARY FOR IN	PUT DATA FOR New Bu	iild (As Desiç	gned)			
1a TER and DER						
Fuel for main hea	ting:		Mains gas			
Fuel factor:	oxide Emission Rate		1.00 (main 13.48 kg/m			
	Dioxide Emission Rate		13.46 kg/m 13.47 kg/m			ОК
1b TFEE and DFI			10.17 Ng/11	•		011
Target Fabric Ene	ergy Efficiency (TFE	Ξ)	55.53 kWh	1/m ²		
	nergy Efficiency (DF	EE)	48.84 kWh	1/m ²		OK
2 Fabric U-values	5					
	Element	Averag	je	Highest		
	External wall	0.20 (n	nax. 0.30)	0.20 (max	. 0.70)	OK
	Party wall		nax. 0.20)	-	/	ŌK
	Floor		nax. 0.25)	0.16 (max		OK
	Roof		nax. 0.20)	0.16 (max		OK
	Openings	1.41 (n	nax. 2.00)	1.60 (max	. 3.30)	OK
2a Thermal bridgi	ing					
	calculated from linea	ar thermal	transmittanc	es for each	junction	
3 Air permeability						
Air permeability a	t 50 pascals:		5.00 (desig	gn value)		ОК
Maximum 4 Heating efficien	<u></u>		10.0			UK
Main heating syst			Boilor syst	om with radi	ators or underfl	oor -
Main neating syst	.cm.		Mains gas			001 -
			Data from	database		
			Vaillant ec	oTEC VU G	B 656/4-5-H	
				88.7% SED	BUK2009	
• · · · ·			Minimum:	88.0%		OK
Secondary heatin			None			
5 Cylinder insulat			Nominal	dinder less:	2 EE WWb/dov	
Hot water storage	;			by DBSCG 2	2.55 kWh/day	OK
Primary pipework	insulated:		Yes	by 00000 2	2.00	OK
6 Controls						
Space heating co			Time and t	emperature	zone control	OK
Hot water controls	S:		Cylindersta	at		OK
- - - - -			•	nt timer for I	DHW	OK
Boiler interlock	4-		Yes			OK
7 Low energy ligh			4000/			
	ed lights with low-ene	eigy	100%			
ittings:						

Building R	Page 2 of 6	
Minimum	75%	OK
8 Mechanical ventilation		
Not applicable		
9 Summertime temperature		
Overheating risk (Thames Valley):	Not significant	OK
Based On:	-	
Overshading:	Average	
Windows facing South:	39.60 m ² , No overhang	
Air change rate:	8.00 ach	
Blinds/curtains:	None	
10 Key features		
Party wall U-value	0.00 W/m ² K	



Property Reference: Right Survey Reference: 01 Right

Issued on Date: 04.Apr.2016 Prop Type Ref:

Property:	g			
SAP Rating: 87 B CO2 Em Environmental:85 B General	· · ·	3.79 DER: 13.47 Pass Pass DFEE: 48.84 Pass		ercentage DER <ter: %<br="" 0.05="">ercentage DFEE<tfee: %<="" 12.06="" th=""></tfee:></ter:>
CfSH Results Version:		ENE1 Credits: N/A EN	E2 Credits: N/A ENE7 Cre	dits: N/A CfSH Level: N/A
5	mes, Tel: 0115 923170 ve, West Bridgford, Notti			Surveyor ID: 4477-0001
Software Version: Elmhurs SAP version: SAP 2012, R				
SUMMARY FOR INPUT	DATA FOR New Build (As Designed)		Page 3 of 6
Orientation 1.0 Property Type	South House, End-T	errace		
2.0 Number of Storeys3.0 Date Built	4 2016			
3.0 Property Age Band4.0 Sheltered Sides5.0 Sunlight/Shade	2 Average or un	known		
6.0 Measurements				
	Heat Loss Perimeter	Internal Floor Area	Average Storey Heig	ght
Basement:	39.11	104.83	2.60	
1st Storey:	38.51	87.87	3.20	
2nd Storey:	32 77	73 57	3.00	

	2nd Storey:	32.77	73.57	3.0	00		
	3rd Storey:	32.77	73.57	2.9	90		
7.0 Living Area	a	61.38					
8.0 Thermal M	lass Parameter	Simple calcula	tion - Medium				
9.0 External W	/alls						
Description		Construction Cavity wall; de	nse plaster, lightweight	U-Value	Kappa	Gross Area	Nett Area
Basement		structure	k, filled cavity, any outside	0.20		101.68	101.68
Main		-	nse plaster, lightweight k, filled cavity, any outside	0.20		316.58	275.09
9.1 Party walls	3						
Description		Construction		Кар	opa A	Area	
Party Wall 1		Dense plaster blocks, cavity o	both sides. lightweight aggre or cavity fill	egate	6	6.08	
10.0 External F	Roofs						
Description		Construction		U-Value	Kappa	Gross Area	Nett Area
Flat		Plasterboard, i	nsulated flat roof	0.16		104.83	100.99
10.1 Party Cei Description	lings	Construction		Кар	pa A	Area	
Party Ceilings	1	Other			8	7.87	
g and 1		Concrete floor	slab, carpeted		16	60.00	
11.0 HeatLoss	Floors						
Description		Construction		U-Value	Kappa	Area	
Basement		Slab on ground	d, screed over insulation	0.16		104.83	

Description			Construct	ion				Kappa	Area		
2 1 and g			Precast c	oncrete pl	anks floor,	screed, ca	rpeted		236.00		
12.0 Openir	0 71	_							_		
Description	Data Source	Туре	Glazing	(Blazing Gap	Argon Filled	d Sola	ar Trans F	rame Type	Frame Fac	tor U value
Door	Manufacturer	Solid Door									1.60
Windows	Manufacturer	Window	Double gla	zed				0.76		0.70	1.40
Rooflight	Manufacturer	Roof Window	Double gla	zed				0.76		0.70	1.40
13.0 Openir Name	ngs Opening Type	Location		Orientation	Curtain Ty	20	Overhang	Wide	Width Height		Curtain
Name	Opening Type	Location	I	Onentation	Curtain Ty	þe	Ratio	Overhang		Journe Al	Closed
Door	Solid Door	[2] Main		South						1.	89
Windows	Window	[2] Main		South	None		0.00			39	.60
RL	Roof Window	[1] Flat		Horizontal	None					3.	84
14.0 Consei	rvatory		None								
15.0 Draugh			100								
16.0 Draugh	nt Lobby		No								
17.0 Therma	0 0		Calculate	Bridges							
17.1 List of Source Type	0	Bridge Type							Length	Psi	Imported
Independen	tly assessed	E1 Steel linte	I with perfo	rated stee	l base plat	e			18.90	0.050	Yes
Table K1 - A	•	E3 Sill							18.00	0.040	Yes
Table K1 - A	Approved	E4 Jamb							70.20	0.050	Yes
Table K1 - A	Approved	E5 Ground flo	oor (norma)					38.51	0.160	No
Table K1 - D	Default	E22 Baseme	nt floor						39.11	0.070	No
Table K1 - A	Approved	E6 Intermedia	ate floor wi	thin a dwe	lling				65.54	0.070	No
Table K1 - D	Default	E15 Flat roof	with parap	et	•				32.57	0.560	No
Table K1 - A	Approved	E16 Corner (I							26.00	0.090	No
Table K1 - A		E17 Corner (i	,	nternal are	a areater t	han externa	al area)		2.60	-0.090	No
Table K1 - A		E18 Party wa			J		,		23.40	0.060	Yes
Table K1 - D	••	P1 Party wall		-					5.29	0.160	No
Table K1 - D		P2 Party wall			within a dw	ellina			10.74	0.000	No
Table K1 - D		P4 Party wall				Ũ			5.37	0.240	No
18.0 Pressu	ire Testina		Yes								
Designe	0		5.00								
	/ Tested ?										
As Built											
	s Designed ?	n									
	ical Ventilation		No								
Present		-									
	ed Installation		\A/instance	f							
	s open in hot w entilation possil		Yes	fully open							
Night Ve			No								
Air chan	nge rate		8.00								
	ical Ventilation	data Type									
Type MV Refe	erence Number										
Configui											
0	Duct Insulated										
	cturer SFP										
Duct Ty											
Wet Roc	Efficiency										
Brand, N											
	Open Fireplace										
		MH			Total						
Number of C	•	C		0	0						
Number of c	•	C)	0	0						
	ntermittent fans	3			4						
•	bassive vents				0						
	lueless gas fire	S			0						
21.0 Cooling		hurst Eporav Sveta	No								

22.0 Lighting Internal	
Total number of light fittings	20
Total number of L.E.L. fittings	20
Percentage of L.E.L. fittings	100.00
External External lights fitted	No
Light and motion sensors 23.0 Electricity Tariff	Standard
	Stanuaru
24.0 Heating Systems Main Heating 1 Description	Database
Percentage of Heat	100 %
Main Heating 2 Description	None
Percentage of Heat Community Heating	%
Secondary Heating	None
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery	No
Instantaneous System 1	
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage System	No
System Solar Panel	No
25.0 Main Heating 1	
Database Ref. No.	15993
Fuel Type	Mains gas
Main Heating	BGB
TestMethod	
SAP Code	102
Efficiency (Split Efficiences) %	
Efficiency (Split Efficiences) % In Winter	89.7
In Summer	79.0
Model Name	18.0
Manufacturer	
Controls	CBI Time and temperature zone control
PCDF Controls	0
Delayed Start Stat	Yes
Sap Code	2110
Burner Control	
Boiler Compensator	
HETAS approved System Oil Pump Inside	
FI Case	
FI Water	
Flue Type	Balanced
Smoke Control Area	
Fan Assisted Flue	Yes
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Underfloor Heating Flow Temperature	<= 35°C
Electric CPSU Temperature	
Combi boiler type	
Combi keep hot type	
Combi store type	
27.0 Community Heating	
Space Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value Controls	
SAP Code	
Water Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Charging Linked To Heat Use	
28.0 Secondary Heating	
Description	
SHS efficiency %	
SAP Code	

HETAS Approved System				
Smoke Control Area				
Test Method				
Manufacturer Model Name				
29.0 Water Heating Water use <= 125 litres/person/day	HWP From main heat	ing 1		
SAP Code	Yes 901			
	901			
Immersion Heater Summer Immersion				
Suplementary Immersion				
Immersion Only Heating Hot Water				
29.1 Flue Gas Heat Recovery System				
Database ID				
Brand Model				
Details				
29.2 Waste Water Heat Recovery				
System				
Total rooms with shower and/or bath				
30.0 Hot Water Cylinder	Hot Water Cylinder			
Cylinder Stat	Yes			
Cylinder In Heated Space	Yes			
Independent Time Control	Yes			
Insulation Type	Foam			
Insulation Thickness				
Cylinder Volume	300.00			
Loss (kwh/day)				
Pipes insulation	Fully insulated primary	/ pipework		
In Airing Cupboard				
31.0 Solar Panel				
Solar Panel Area				
Area Type				
Panel Type				
n0, a1, a2, A/G ratio				
Orientation				
Elevation				
Overshading				
Solar Storage Volume				
Pump electrically powered				
Combined Cylinder				
32.0 Thermal Store	None			
Thermal Store Pipework				
33.0 Photovoltaic Unit				
Apportioned KWh/Year				
34.0 Wind Turbines				
Terrain Type	Urban			
Wind Turbines				
Count				
Apportioned Kwh/year				
Rotor Diameter				
Hub Height				
35.0 Small-scale Hydro				
Electricity Generated				
Description Apportioned kWh/Year				
Recommendations				
None				
Further measures to achieve even higher				
standards				
Solar photovoltaic panels, 2.5 kWp	£5,000 - £8,000	£279	B 91	B 88



	Build	ing Regu	lation Co	mpliance		Page 1 of 6
	ference: Left erence: Solar Left				ssued on Date: 04./ Prop Type Ref:	Apr.2016
	8 B CO2 Emissions (t/year): 6 B General Requirements Comp		ER: 12.52 Pass FEE:48.84 Pass	TER: 13.48 TFEE:55.53	Percentage DER< Percentage DFEE	
CfSH Results V	ersion:	ENE1 C	redits: N/A ENE	2 Credits: N/A ENE	7 Credits: N/A CfS	H Level: N/A
	Richard Holmes, Tel: 0115 92 Denton Drive, West Bridgford,		NG2 7FS		Surveyor ID:	4477-0001
	on: Elmhurst Energy Systems SAP 2012, Regs Region: Engla					
SUMMARY F	OR INPUT DATA FOR New B	suild (As Desig	jned)			
1a TER and	DER					
Fuel for mai	n heating:		Mains gas			
Fuel factor:			1.00 (main			
U U	on Dioxide Emission Rat	· · ·	13.48 kg/m			
	rbon Dioxide Emission R	ate (DER)	12.52 kg/m	2		OK
1b TFEE an		Ξ)		/m ²		
	ic Energy Efficiency (TFE		55.53 kWh 48.84 kWh			OK
2 Fabric U-v	bric Energy Efficiency (D		40.04 KVVI)	/111-		UN
		Δ	-	L li ede e - t		
	Element	Averag		Highest		
	External wall	· ·	nax. 0.30)	0.20 (max. 0	.70)	OK
	Party wall	· ·	nax. 0.20)	-	70)	OK
	Floor Roof	· ·	nax. 0.25) nax. 0.20)	0.16 (max. 0 0.16 (max. 0		OK OK
	Openings	· ·	nax. 2.00)	1.60 (max. 3	/	OK
2a Thermal Thermal brid	bridging Iging calculated from line	ar thermal t	transmittanc	es for each iu	nction	
3 Air permea						
Air permeab	ility at 50 pascals:		5.00 (desig	jn value)		
Maximum			10.0			OK
4 Heating ef						
Main heating	g system:			em with radiate	ors or underfloor	-
			Mains gas	databasa		
			Data from	database	856/4 - 5-H	
				88.7% SEDBU		
			Minimum:			OK
Secondarv ł	neating system:		None			
5 Cylinder ir						
Hot water st				linder loss: 2.		
				by DBSCG 2.8	6	OK
	work insulated:		Yes			OK
Solar water			150 1:4			
Dedicated s Minimum:	olar storage volume:		150 litres			ОК
6 Controls			88 litres			
Space heati	na controls:		Time and t	emperature zo	ne control	OK
			Cylindersta			OK
Hot water co			Cymraerate	A 6		
Hot water co			Independe	nt timer for DH	IW	OK

Building Re	Page 2 of 6	
7 Low energy lights		
Percentage of fixed lights with low-energy	100%	
fittings:		
Minimum	75%	OK
8 Mechanical ventilation		
Not applicable		
9 Summertime temperature		
Overheating risk (Thames Valley):	Not significant	OK
Based On:		
Overshading:	Average	
Windows facing South:	39.60 m ² , No overhang	
Air change rate:	8.00 ach	
Blinds/curtains:	None	
10 Key features		
Party wall U-value Solar water heating	0.00 W/m ² K	



104.83

	Sur	nmary Informati	on			
Property Reference: L Survey Reference: Se Property:				Issued on Prop Typ	n Date: 04.Ap ne Ref:	r.2016
SAP Rating: 88 B CO2 Emis	ssions (t/vear):	3.46 DER: 12.52 Pass	TER: 13.48	Percer	ntage DER <ter< th=""><th>R: 7.09 %</th></ter<>	R: 7.09 %
Environmental:86 B General R	· · /	Pass DFEE:48.84 Pass	TFEE:55.53		ntage DFEE <tf< th=""><th></th></tf<>	
CfSH Results Version:		ENE1 Credits: N/A ENE2	Credits: N/A EN	NE7 Credits:	N/A CfSH L	evel: N/A
	nes, Tel: 0115 923170 e, West Bridgford, Notti			Si	urveyor ID: 4	477-0001
Software Version: Elmhurst SAP version: SAP 2012, Re						
SUMMARY FOR INPUT	OATA FOR New Build (As Designed)			F	Page 3 of 6
Orientation 1.0 Property Type 2.0 Number of Storeys 3.0 Date Built 3.0 Property Age Band 4.0 Sheltered Sides 5.0 Sunlight/Shade	South House, End-T 4 2016 2 Average or un					
6.0 Measurements	Average of un	KIIOWII				
	Heat Loss Perimeter	Internal Floor Area	Average Sto	rev Height		
Deservet			Ū	, ,		
Basement:	39.11	104.83	2.6			
1st Storey:	38.51	87.87	3.2			
2nd Storey:	32.77	73.57	3.0			
3rd Storey:	32.77	73.57	2.9	0		
7.0 Living Area	61.38	Care Marshaue				
8.0 Thermal Mass Parameter	Simple calcula	ation - Medium				
9.0 External Walls Description	Construction		U-Value	Kappa	Gross Area	Nett Area
Basement		ense plaster, lightweight ck, filled cavity, any outside	0.20		101.68	101.68
Main	-	ense plaster, lightweight ck, filled cavity, any outside	0.20		316.58	275.09
9.1 Party walls Description	Construction		Кар	pa A	vrea	
Party Wall 1		both sides. lightweight aggr or cavity fill			6.08	
10.0 External Roofs Description	Construction		U-Value	Kappa	Gross Area	Nett Area
Flat		insulated flat roof	0.16	· FF	104.83	100.99
10.1 Party Ceilings Description	Construction		Кар	pa A	Irea	
Porty Coilings 1	Other			0	7 97	
Party Ceilings 1 g and 1		slab, carpeted			7.87 60.00	
11.0 HeatLoss Floors Description	Construction		U-Value	Kappa	Area	

Basement

11.1 Party Floors

0.16

Slab on ground, screed over insulation

Description			Construct	ion				Kappa	Area		
2 1 and g			Precast c	oncrete pl	anks floor,	screed, ca	rpeted		236.00		
12.0 Openir	0 71	_							_		
Description	Data Source	Туре	Glazing	(Blazing Gap	Argon Filled	d Sola	ar Trans F	rame Type	Frame Fac	tor U value
Door	Manufacturer	Solid Door									1.60
Windows	Manufacturer	Window	Double gla	zed				0.76		0.70	1.40
Rooflight	Manufacturer	Roof Window	Double gla	zed				0.76		0.70	1.40
13.0 Openir Name	ngs Opening Type	Location		Orientation	Curtain Ty	20	Overhang	Wide	Width Height		Curtain
Name	Opening Type	Location	I	Onentation	Curtain Ty	þe	Ratio	Overhang		Journe Al	Closed
Door	Solid Door	[2] Main		South						1.	89
Windows	Window	[2] Main		South	None		0.00			39	.60
RL	Roof Window	[1] Flat		Horizontal	None					3.	84
14.0 Consei	rvatory		None								
15.0 Draugh			100								
16.0 Draugh	nt Lobby		No								
17.0 Therma	0 0		Calculate	Bridges							
17.1 List of Source Type	0	Bridge Type							Length	Psi	Imported
Independen	tly assessed	E1 Steel linte	I with perfo	rated stee	l base plat	e			18.90	0.050	Yes
Table K1 - A	•	E3 Sill							18.00	0.040	Yes
Table K1 - A	Approved	E4 Jamb							70.20	0.050	Yes
Table K1 - A	Approved	E5 Ground flo	oor (norma)					38.51	0.160	No
Table K1 - D	Default	E22 Baseme	nt floor						39.11	0.070	No
Table K1 - A	Approved	E6 Intermedia	ate floor wi	thin a dwe	lling				65.54	0.070	No
Table K1 - D	Default	E15 Flat roof	with parap	et	•				32.57	0.560	No
Table K1 - A	Approved	E16 Corner (I							26.00	0.090	No
Table K1 - A		E17 Corner (i	,	nternal are	a areater t	han externa	al area)		2.60	-0.090	No
Table K1 - A		E18 Party wa			J		,		23.40	0.060	Yes
Table K1 - D	••	P1 Party wall		-					5.29	0.160	No
Table K1 - D		P2 Party wall			within a dw	ellina			10.74	0.000	No
Table K1 - D		P4 Party wall				Ũ			5.37	0.240	No
18.0 Pressu	ire Testina		Yes								
Designe	0		5.00								
	/ Tested ?										
As Built											
	s Designed ?	n									
	ical Ventilation		No								
Present		-									
	ed Installation		\A/instance	f							
	s open in hot w entilation possil		Yes	fully open							
Night Ve			No								
Air chan	nge rate		8.00								
	ical Ventilation	data Type									
Type MV Refe	erence Number										
Configui											
0	Duct Insulated										
	cturer SFP										
Duct Ty											
Wet Roc	Efficiency										
Brand, N											
	Open Fireplace										
		MH			Total						
Number of C	•	(0	0						
Number of c	•	C)	0	0						
	ntermittent fans	3			4						
•	bassive vents				0						
	lueless gas fire	S			0						
21.0 Cooling		hurst Eporav Sveta	No								

22.0 Lighting Internal	
Total number of light fittings	20
Total number of L.E.L. fittings	20
Percentage of L.E.L. fittings	100.00
External External lights fitted	No
Light and motion sensors	
23.0 Electricity Tariff	Standard
24.0 Heating Systems Main Heating 1	Database
Description	Database
Percentage of Heat	100 %
Main Heating 2	None
Description	
Percentage of Heat	%
Community Heating	None
Secondary Heating Water Heating	None Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery	No
Instantaneous System 1	
Waste Water Heat Recovery	No
Instantaneous System 2	No
Waste Water Heat Recovery Storage System	INU
Solar Panel	Yes
25.0 Main Heating 1	
Database Ref. No.	15993
Fuel Type	Mains gas
Main Heating	BGB
TestMethod SAP Code	102
Efficiency (Split Efficiences) %	102
Efficiency (Split Efficiences) %	
In Winter	89.7
In Summer	79.0
Model Name	
Manufacturer	CDI Time and temperature zero control
Controls PCDF Controls	CBI Time and temperature zone control 0
Delayed Start Stat	Yes
Sap Code	2110
Burner Control	
Boiler Compensator	
HETAS approved System	
Oil Pump Inside FI Case	
FI Water	
Flue Type	Balanced
Smoke Control Area	
Fan Assisted Flue	Yes
Is MHS Pumped Heat Emitter	Pump in heated space Radiators
Underfloor Heating	i taulatoro
Flow Temperature	<= 35°C
Electric CPSU Temperature	
Combi boiler type	
Combi keep hot type	
Combi store type	
27.0 Community Heating Space Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Controls	
SAP Code Water Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Charging Linked To Heat Use	
28.0 Secondary Heating	
Description	
SHS efficiency % SAP Code	

HETAS Approved System				
Smoke Control Area				
Test Method				
Manufacturer				
Model Name				
29.0 Water Heating	HWP From main heating	1		
Water use <= 125 litres/person/day	Yes			
SAP Code	901			
Immersion Heater				
Summer Immersion				
Suplementary Immersion				
Immersion Only Heating Hot Water 29.1 Flue Gas Heat Recovery System				
Database ID				
Brand Model				
Details				
29.2 Waste Water Heat Recovery				
System				
Total rooms with shower and/or bath				
30.0 Hot Water Cylinder	Hot Water Cylinder			
Cylinder Stat	Yes			
Cylinder In Heated Space	Yes			
Independent Time Control Insulation Type	Yes Foam			
Insulation Thickness	Foam			
Cylinder Volume	300.00			
Loss (kwh/day)				
Pipes insulation	Fully insulated primary pi	pework		
In Airing Cupboard				
31.0 Solar Panel				
Solar Panel Area	4.00			
Area Type	Aperture			
Panel Type	Flat plate, glazed			
n0, a1, a2, A/G ratio	0.75, 6.00, 0.0050, 0.90			
Orientation	South 30°			
Elevation Overshading	None Or Little			
Solar Storage Volume	150.00			
Pump electrically powered	Yes			
Combined Cylinder	Yes			
32.0 Thermal Store	None			
Thermal Store Pipework				
33.0 Photovoltaic Unit				
Apportioned KWh/Year				
34.0 Wind Turbines				
Terrain Type	Urban			
Wind Turbines Count				
Apportioned Kwh/year				
Rotor Diameter				
Hub Height				
35.0 Small-scale Hydro				
Electricity Generated				
Description				
Apportioned kWh/Year				
Recommendations				
None				
Eurther moonurse to eshieve ever history				
Further measures to achieve even higher standards	I			
Solar photovoltaic panels, 2.5 kWp	£5,000 - £8,000	£279	B 91	B 89



	Buildi	ng Regu	lation Co	mpliance		Page 1 of 6
Property Refe Survey Refer Property:	erence: Mid rence: Solar Mid				Issued on Date: 04 Prop Type Ref:	l.Apr.2016
	B CO2 Emissions (t/year): B General Requirements Compl		ER: 11.76 Pass FEE:44.83 Pass		Percentage DER Percentage DFE	
CfSH Results Ver	rsion:	ENE1 C	redits: N/A ENE	2 Credits: N/A EN	IE7 Credits: N/A C	fSH Level: N/A
	Richard Holmes, Tel: 0115 923 Denton Drive, West Bridgford,		NG2 7FS		Surveyor ID): 4477-0001
Software Versio SAP version: SA	n: Elmhurst Energy Systems 3 AP 2012, Regs Region: Engla	SAP2012 Cal nd (Part L1A :	culator (Desigr 2013), Calcula	n System) versio tion Type: New	on 3.05r04 Build (As Designed)	
SUMMARY FO	OR INPUT DATA FOR New B	uild (As Desig	jned)			
1a TER and	DER					
Fuel for main	heating:		Mains gas			
Fuel factor:		·	1.00 (main			
•	on Dioxide Emission Rate	. ,	12.89 kg/m			014
	bon Dioxide Emission Ra	ate (DER)	11.76 kg/m	ו ²		OK
1b TFEE and			54 00 LVM/	12		
	Energy Efficiency (TFE		51.30 kWh			
	ric Energy Efficiency (DF	-EE)	44.83 kWh	ı/m²		OK
2 Fabric U-va						
	Element	Averag	е	Highest		
	External wall	0.20 (n	nax. 0.30)	0.20 (max.	0.70)	OK
	Party wall	· ·	nax. 0.20)	-	,	OK
	Floor	0.16 (n	nax. 0.25)	0.16 (max.	0.70)	OK
	Roof		nax. 0.20)	0.16 (max.		OK
	Openings	1.41 (n	nax. 2.00)	1.60 (max.	3.30)	OK
2a Thermal b	oridging					
Thermal bridg	ging calculated from line	ar thermal	transmittanc	es for each j	unction	
3 Air permea						
	lity at 50 pascals:		5.00 (desię	gn value)		
Maximum			10.0			OK
4 Heating eff	-					
Main heating	system:		•		ators or underfloo	or -
			Mains gas			
			Data from			
			Efficiency: Minimum:	88.7% SEDE	3UK2009	ОК
Sacondary	eating system:		None	00.070		
5 Cylinder in	eating system:		NULE			
Hot water sto			Nominal o	linder loss: 2	2.55 kWh/day	
				by DBSCG 2		OK
Primary pipe	work insulated:		Yes	.,		OK
Solar water h						
	lar storage volume:		150 litres			
Minimum:	-		87 litres			OK
6 Controls						_
Space heatin				emperature z	zone control	OK
Hot water co	ntrols:		Cylindersta			OK
				ent timer for D	HW	OK OK
Boiler interloo			Yes			

Building Re	Page 2 of 6	
7 Low energy lights		
Percentage of fixed lights with low-energy	100%	
fittings:		
Minimum	75%	OK
8 Mechanical ventilation		
Not applicable		
9 Summertime temperature		
Overheating risk (Thames Valley):	Not significant	OK
Based On:		
Overshading:	Average	
Windows facing South:	36.96 m ² , No overhang	
Air change rate:	8.00 ach	
Blinds/curtains:	None	
10 Key features		
Party wall U-value Solar water heating	0.00 W/m ² K	



Issued on Date: 04.Apr.2016

Percentage DER<TER:

N/A

Surveyor ID:

Percentage DFEE<TFEE: 12.60 %

CfSH Level:

8.76 %

N/A

4477-0001

Prop Type Ref:

TER: 12.89

TFEE:51.30

N/A ENE7 Credits:

ENE2 Credits:

Summary Information

Property Reference: Mid Survey Reference: Solar Mid Property: 88 B CO2 Emissions (t/year): 2.89 DER: 11.76 Pass SAP Rating: Environmental:87 B General Requirements Compliance: Pass DFEE:44.83 Pass CfSH Results Version: ENE1 Credits: N/A Surveyor: Richard Holmes, Tel: 0115 9231707 Denton Drive, West Bridgford, Nottingham, NG2 7FS Address: Client: Software Version: Elmhurst Energy Systems SAP2012 Calculator (Design System) version 3.05r04 SAP version: SAP 2012, Regs Region: England (Part L1A 2013), Calculation Type: New Build (As Designed)

SUMMARY FOR INPUT DATA FOR New Build (As Designed) Page 3 of 6 Orientation South 1.0 Property Type House, Mid-Terrace 2.0 Number of Storeys 4 3.0 Date Built 2016 3.0 Property Age Band 4.0 Sheltered Sides 2 5.0 Sunlight/Shade Average or unknown 6.0 Measurements Heat Loss Perimeter Internal Floor Area Average Storey Height 91 80 2 60 Basement⁻ 27 00 1st Storey: 27.00 68.72 3.20 27.00 72.49 2nd Storev: 3.00 3rd Storey: 27.00 72.49 2.90 7.0 Living Area 64.78 8.0 Thermal Mass Parameter Simple calculation - Medium 9.0 External Walls Description Construction **U-Value** Kappa Gross Area Nett Area Cavity wall; dense plaster, lightweight Basement aggregate block, filled cavity, any outside 0.20 70.20 70.20 structure Cavity wall; dense plaster, lightweight Main aggregate block, filled cavity, any outside 0.20 245.70 206.85 structure 9.1 Party walls Description Construction Kappa Area Dense plaster both sides. lightweight aggregate Party Wall 1 131.30 blocks, cavity or cavity fill 10.0 External Roofs Construction **U-Value** Description Kappa Gross Area Nett Area Flat Plasterboard, insulated flat roof 0.16 91.80 87.96 10.1 Party Ceilings Description Construction Kappa Area Party Ceilings 1 Other 87.87 160.00 g and 1 Concrete floor slab, carpeted 11.0 HeatLoss Floors Construction **U-Value** Description Kappa Area Slab on ground, screed over insulation Basement 0.16 91.80

Description			Constru	uction				Kappa	a	Area			
2 1 and g			Precas	t concrete pl	anks floor,	screed, car	peted		:	236.00)		
12.0 Opening Description	Types Data Source	Туре	Glazing	C	Blazing Gap	Argon Filled	l Sola	ar Trans	Frame Ty	/pe	Frame I	Factor	· U value
Door	Manufacturer	Solid Door											1.60
Windows	Manufacturer	Window	Double	glazed				0.76			0.7	0	1.40
Rooflight	Manufacturer	Roof Window	Double	glazed				0.76			0.7	0	1.40
13.0 Opening Name	s Opening Type	Locatior	n	Orientatior	Curtain Ty	/pe	Overhang		Width	Height	Count	Area	Curtai
					-		Ratio	Overhan	g	-			Closed
Door	Solid Door	[2] Main		South								1.89	
Windows	Window	[2] Main		South	None		0.00					36.9	6
RL	Roof Window	[1] Flat		Horizontal	None							3.84	
14.0 Conserva 15.0 Draught			None 100										
16.0 Draught			No										
17.0 Thermal			Calcula	ate Bridges									
17.1 List of Br	idges	Bridge Ture							1	onath	Dei		mnorted
Source Type		Bridge Type							L	ength	Psi	I	mported
Independently	assessed	E1 Steel linte	l with pe	rforated stee	el base plat	e			1	7.70	0.05	50 `	res
Table K1 - Ap	proved	E3 Sill							1	6.80	0.04	0	res
Table K1 - Ap	proved	E4 Jamb							6	5.80	0.05	50 `	res
Table K1 - Ap	proved	E5 Ground fle	oor (norn	nal)					2	7.00	0.16	50 `	res
Table K1 - Ap	proved	E6 Intermedia	ate floor	within a dwe	lling				5	4.00	0.07	1 O'	No
Table K1 - De	fault	E15 Flat roof	with par	apet					2	7.00	0.56	1 03	No
Table K1 - Ap	proved	E18 Party wa	II betwee	en dwellings					4	6.80	0.06	50 `	res
Table K1 - De	fault	P1 Party wall	- Groun	d floor					1	0.58	0.16	1 03	No
Table K1 - De	fault	P2 Party wall	- Interm	ediate floor	within a dw	elling			2	1.48	0.00	00	No
18.0 Pressure Designed Property T As Built q Same As 19.0 Mechani	q50 Tested ? 50 Designed ?	1	Yes 5.00										
Mechanica Present	al Ventilation		No										
	Installation	oothor	Window	ws fully open									
	tilation possib		Yes										
Night Ven	tilation .		No										
	e rate al Ventilation	data Type	8.00										
Type MV Refere	ence Number												
Configura													
MVHR Du Manufactu	ct Insulated												
Duct Type													
MVHR Eff	iciency												
Wet Room Brand, Mo													
20.0 Fans, Op		s, Flues											
		M	IS SH		Total								
Number of Ch	-	(0	0								
Number of op		()	0	0								
Number of int					4								
Number of pa		_			0								
Number of flu	eless gas fire	S			0								
21.0 Cooling	System		No										
22.0 Lighting													
Internal Total r	number of ligh	nt fittinas	20										
Total r	number of L.E	L. fittings	20										
-	ntage of L.E.L	fittings	100.00										

Page	5	of	6
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External	
External lights fitted	No
Light and motion sensors	Standard
23.0 Electricity Tariff	Standard
24.0 Heating Systems Main Heating 1	Database
Description	
Percentage of Heat	100 %
Main Heating 2	None
Description Percentage of Heat	%
Community Heating	/0
Secondary Heating	None
Water Heating	Main Heating 1
Flue Gas Heat Recovery System Waste Water Heat Recovery	No No
Instantaneous System 1	NO
Waste Water Heat Recovery	No
Instantaneous System 2	
Waste Water Heat Recovery Storage	No
System Solar Panel	Yes
25.0 Main Heating 1	
Database Ref. No.	15993
Fuel Type	Mains gas
Main Heating	BGB
TestMethod SAP Code	102
Efficiency (Split Efficiences) %	
Efficiency (Split Efficiences) %	
In Winter	89.7
In Summer Model Name	79.0
Manufacturer	
Controls	CBI Time and temperature zone control
PCDF Controls	0
Delayed Start Stat	Yes
Sap Code Burner Control	2110
Boiler Compensator	
HETAS approved System	
Oil Pump Inside	
FI Case FI Water	
Flue Type	Balanced
Smoke Control Area	
Fan Assisted Flue	Yes
Is MHS Pumped Heat Emitter	Pump in heated space Radiators
Underfloor Heating	Raulators
Flow Temperature	<= 35°C
Electric CPSU Temperature	
Combi boiler type	
Combi keep hot type Combi store type	
27.0 Community Heating	
Space Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value Controls	
SAP Code	
Water Community Heating	
PCDF Index	
Distribution Loss Distribution Loss Value	
Charging Linked To Heat Use	
28.0 Secondary Heating	
Description	
SHS efficiency %	
SAP Code	
HETAS Approved System Smoke Control Area	
Test Method	
Manufacturer	
Model Name	

29.0 Water Heating Water use <= 125 litres/person/day SAP Code Immersion Heater Summer Immersion Suplementary Immersion Immersion Only Heating Hot Water 29.1 Flue Gas Heat Recovery System Database ID Brand Model Details 29.2 Waste Water Heat Recovery	HWP From main heatir Yes 901	ng 1		
System Total rooms with shower and/or bath				
30.0 Hot Water Cylinder	Hot Water Cylinder			
Cylinder Stat	Yes			
Cylinder In Heated Space	Yes			
Independent Time Control	Yes			
Insulation Type	Foam			
Insulation Thickness				
Cylinder Volume	300.00			
Loss (kwh/day)	Fully inculated winters			
Pipes insulation In Airing Cupboard	Fully insulated primary	pipework		
31.0 Solar Panel				
Solar Panel Area	4.00			
Area Type	Aperture			
Panel Type	Flat plate, glazed			
n0, a1, a2, A/G ratio	0.75, 6.00, 0.0050, 0.9	D		
Orientation	South			
Elevation	30°			
Overshading	None Or Little			
Solar Storage Volume	150.00			
Pump electrically powered	Yes			
Combined Cylinder	Yes			
32.0 Thermal Store	None			
Thermal Store Pipework				
33.0 Photovoltaic Unit Apportioned KWh/Year				
34.0 Wind Turbines				
Terrain Type	Urban			
Wind Turbines	ensan			
Count				
Apportioned Kwh/year				
Rotor Diameter				
Hub Height				
35.0 Small-scale Hydro				
Electricity Generated				
Description Apportioned kWh/Year				
Recommendations None				
Further measures to achieve even higher	r			
standards				
Solar photovoltaic panels, 2.5 kWp	£5,000 - £8,000	£279	A 92	B 91



	Build	ing Regu	lation Co	mpliance		Page 1 of 6
	ference: Right erence: Solar Right				Issued on Date: (Prop Type Ref:)4.Apr.2016
-	8 B CO2 Emissions (t/year): 6 B General Requirements Comp		ER: 12.52 Pass FEE:48.84 Pass		•	R<ter:< b=""> 7.09 % EE<tfee:< b=""> 12.06 9</tfee:<></ter:<>
CfSH Results V	ersion:	ENE1 C	redits: N/A ENE	2 Credits: N/A E	NE7 Credits: N/A	CfSH Level: N/A
Surveyor: Address: Client:	Richard Holmes, Tel: 0115 92 Denton Drive, West Bridgford,		NG2 7FS		Surveyor	ID: 4477-0001
	ion: Elmhurst Energy Systems SAP 2012, Regs Region: Engla					d)
SUMMARY F	FOR INPUT DATA FOR New B	uild (As Desig	jned)			
1a TER and	DER					
Fuel for mai	n heating:		Mains gas			
Fuel factor:	on Dioxide Emission Rat		1.00 (main 13.48 kg/n			
•	rbon Dioxide Emission Rat	· · ·	12.52 kg/n			ОК
1b TFEE an			<u></u>	·		
	ic Energy Efficiency (TFE		55.53 kWh			
	bric Energy Efficiency (D	FEE)	48.84 kWh	/m ²		OK
2 Fabric U-v						
	Element	Averag	е	Highest		
	External wall	· ·	nax. 0.30)	0.20 (max	. 0.70)	OK
	Party wall Floor	· ·	nax. 0.20)	- 0.16 (max	0.70)	OK OK
	Roof		nax. 0.25) nax. 0.20)	0.16 (max 0.16 (max		OK
	Openings		nax. 2.00)	1.60 (max		OK
2a Thermal				· · ·		
3 Air perme	dging calculated from line	ar thermal	transmittanc	es for each	junction	
	bility at 50 pascals:		5.00 (desig	n value)		
Maximum	inty at 00 paboalo.		10.00 (000) 10.0	gir value)		OK
4 Heating ef	fficiency					
Main heating	g system:		•	em with radi	ators or underfle	oor -
			Mains gas			
			Data from		B 656/4-5-H	
				88.7% SED		
			Minimum:			OK
	neating system:		None			
5 Cylinder ir			Nie wei in i	Paralan I		
Hot water st	orage			/linder loss: by DBSCG 2	2.55 kWh/day	OK
Primary nine	ework insulated:		Yes		2.00	OK
Solar water						-
Dedicated s	olar storage volume:		150 litres			* · ·
Minimum:			88 litres			OK
6 Controls	na controla		Time card (OK
Space heati Hot water co			Cylindersta		zone control	OK
I IOL WALEI OL				nt timer for l	DHW	OK
			maspondo			OK

Building Regulation Compliance Page 2 o						
7 Low energy lights						
Percentage of fixed lights with low-energy	100%					
fittings:						
Minimum	75%	OK				
8 Mechanical ventilation						
Not applicable						
9 Summertime temperature						
Overheating risk (Thames Valley):	Not significant	OK				
Based On:						
Overshading:	Average					
Windows facing South:	39.60 m ² , No overhang					
Air change rate:	8.00 ach					
Blinds/curtains:	None					
10 Key features						
Party wall U-value Solar water heating	0.00 W/m ² K					



Property Reference: Right Survey Reference: Solar Right

Issued on Date: 04.Apr.2016 Prop Type Ref:

Property:	ierence: Solal Right						F	ropiy	pe Ref:		
	88 B CO2 Emissions (t/year): 86 B General Requirements Compliance:		DER: 12. DFEE:48.			TER: TFEE:				ER <ter: FEE<tfee< th=""><th></th></tfee<></ter: 	
CfSH Results	Version:	ENE	1 Credits: 1	N/A	ENE2	Credits:	N/A ENE7	Credits:	N/A	CfSH Leve	I: N/A
Surveyor: Address: Client:	Richard Holmes, Tel: 0115 923170 Denton Drive, West Bridgford, Notti		n, NG2 7I	FS				S	Surveyo	r ID: 447	7-0001
	sion: Elmhurst Energy Systems SAP2 SAP 2012, Regs Region: England (P									ed)	

SUMMARY FOR INPUT DATA FOR New Build (As Designed) Page 3 of 6 Orientation South 1.0 Property Type House, End-Terrace 2.0 Number of Storeys 4 3.0 Date Built 2016 3.0 Property Age Band 4.0 Sheltered Sides 2 5.0 Sunlight/Shade Average or unknown 6.0 Measurements Heat Loss Perimeter Internal Floor Area Average Storey Height 39 11 104 83 2 60 Basement: 1st Storey: 38.51 87.87 3.20 2nd Storey: 32.77 73.57 3.00 3rd Storey: 32.77 73.57 2.90 7.0 Living Area 61.38 Simple calculation - Medium 8.0 Thermal Mass Parameter 9.0 External Walls Description Construction **U-Value** Kappa Gross Area Nett Area Cavity wall; dense plaster, lightweight Basement aggregate block, filled cavity, any outside 0.20 101.68 101.68 structure Cavity wall; dense plaster, lightweight Main aggregate block, filled cavity, any outside 0.20 316.58 275.09 structure 9.1 Party walls Description Construction Kappa Area Dense plaster both sides. lightweight aggregate 66.08 Party Wall 1 blocks, cavity or cavity fill 10.0 External Roofs Construction **U-Value** Description Kappa Gross Area Nett Area Flat Plasterboard, insulated flat roof 0.16 104.83 100.99 10.1 Party Ceilings Description Construction Kappa Area Party Ceilings 1 Other 87.87 160.00 g and 1 Concrete floor slab, carpeted 11.0 HeatLoss Floors Construction **U-Value** Description Kappa Area

Basement

11.1 Party Floors

0.16

104.83

Slab on ground, screed over insulation

Description			Construct	ion				Kappa	Area		
2 1 and g			Precast c	oncrete pl	anks floor,	screed, ca	rpeted		236.00		
12.0 Openir	0 71	_							_		
Description	Data Source	Туре	Glazing	(Blazing Gap	Argon Filled	d Sola	ar Trans F	rame Type	Frame Fac	tor U value
Door	Manufacturer	Solid Door									1.60
Windows	Manufacturer	Window	Double gla	zed				0.76		0.70	1.40
Rooflight	Manufacturer	Roof Window	Double gla	zed				0.76		0.70	1.40
13.0 Openir Name	ngs Opening Type	Location		Orientation	Curtain Ty	20	Overhang	Wide	Width Height		Curtain
Name	Opening Type	Location	I	Onentation	Curtain Ty	þe	Ratio	Overhang		Journe Al	Closed
Door	Solid Door	[2] Main		South						1.	89
Windows	Window	[2] Main		South	None		0.00			39	.60
RL	Roof Window	[1] Flat		Horizontal	None					3.	84
14.0 Consei	rvatory		None								
15.0 Draugh			100								
16.0 Draugh	nt Lobby		No								
17.0 Therma	0 0		Calculate	Bridges							
17.1 List of Source Type	0	Bridge Type							Length	Psi	Imported
Independen	tly assessed	E1 Steel linte	I with perfo	rated stee	l base plat	e			18.90	0.050	Yes
Table K1 - A	•	E3 Sill							18.00	0.040	Yes
Table K1 - A	Approved	E4 Jamb							70.20	0.050	Yes
Table K1 - A	Approved	E5 Ground flo	oor (norma)					38.51	0.160	No
Table K1 - D	Default	E22 Baseme	nt floor						39.11	0.070	No
Table K1 - A	Approved	E6 Intermedia	ate floor wi	thin a dwe	lling				65.54	0.070	No
Table K1 - D	Default	E15 Flat roof	with parap	et	•				32.57	0.560	No
Table K1 - A	Approved	E16 Corner (I							26.00	0.090	No
Table K1 - A		E17 Corner (i	,	nternal are	a areater t	han externa	al area)		2.60	-0.090	No
Table K1 - A		E18 Party wa			J		,		23.40	0.060	Yes
Table K1 - D	••	P1 Party wall		-					5.29	0.160	No
Table K1 - D		P2 Party wall			within a dw	ellina			10.74	0.000	No
Table K1 - D		P4 Party wall				Ũ			5.37	0.240	No
18.0 Pressu	ire Testina		Yes								
Designe	0		5.00								
	/ Tested ?										
As Built											
	s Designed ?	n									
	ical Ventilation		No								
Present		-									
	ed Installation		\A/instance	f							
	s open in hot w entilation possil		Yes	fully open							
Night Ve			No								
Air chan	nge rate		8.00								
	ical Ventilation	data Type									
Type MV Refe	erence Number										
Configui											
0	Duct Insulated										
	cturer SFP										
Duct Ty											
Wet Roc	Efficiency										
Brand, N											
	Open Fireplace										
		MH			Total						
Number of C	•	(0	0						
Number of c	•	C)	0	0						
	ntermittent fans	3			4						
•	bassive vents				0						
	lueless gas fire	S			0						
21.0 Cooling		hurst Eporav Sveta	No								

22.0 Lighting Internal	
Total number of light fittings	20
Total number of L.E.L. fittings	20
Percentage of L.E.L. fittings	100.00
External External lights fitted	No
Light and motion sensors	
23.0 Electricity Tariff	Standard
24.0 Heating Systems Main Heating 1	Database
Description	Database
Percentage of Heat	100 %
Main Heating 2	None
Description	
Percentage of Heat	%
Community Heating	None
Secondary Heating Water Heating	None Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery	No
Instantaneous System 1	
Waste Water Heat Recovery	No
Instantaneous System 2	No
Waste Water Heat Recovery Storage System	INU
Solar Panel	Yes
25.0 Main Heating 1	
Database Ref. No.	15993
Fuel Type	Mains gas
Main Heating	BGB
TestMethod SAP Code	102
Efficiency (Split Efficiences) %	102
Efficiency (Split Efficiences) %	
In Winter	89.7
In Summer	79.0
Model Name	
Manufacturer	CDI Time and temperature zero control
Controls PCDF Controls	CBI Time and temperature zone control 0
Delayed Start Stat	Yes
Sap Code	2110
Burner Control	
Boiler Compensator	
HETAS approved System	
Oil Pump Inside FI Case	
FI Water	
Flue Type	Balanced
Smoke Control Area	
Fan Assisted Flue	Yes
Is MHS Pumped Heat Emitter	Pump in heated space Radiators
Underfloor Heating	i taulatoro
Flow Temperature	<= 35°C
Electric CPSU Temperature	
Combi boiler type	
Combi keep hot type	
Combi store type	
27.0 Community Heating Space Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Controls	
SAP Code Water Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Charging Linked To Heat Use	
28.0 Secondary Heating	
Description	
SHS efficiency % SAP Code	

HETAS Approved System				
Smoke Control Area				
Test Method				
Manufacturer				
Model Name				
29.0 Water Heating	HWP From main heating	1		
Water use <= 125 litres/person/day	Yes			
SAP Code	901			
Immersion Heater				
Summer Immersion				
Suplementary Immersion				
Immersion Only Heating Hot Water 29.1 Flue Gas Heat Recovery System				
Database ID				
Brand Model				
Details				
29.2 Waste Water Heat Recovery				
System				
Total rooms with shower and/or bath				
30.0 Hot Water Cylinder	Hot Water Cylinder			
Cylinder Stat	Yes			
Cylinder In Heated Space	Yes			
Independent Time Control Insulation Type	Yes Foam			
Insulation Thickness	Foam			
Cylinder Volume	300.00			
Loss (kwh/day)				
Pipes insulation	Fully insulated primary pi	pework		
In Airing Cupboard				
31.0 Solar Panel				
Solar Panel Area	4.00			
Area Type	Aperture			
Panel Type	Flat plate, glazed			
n0, a1, a2, A/G ratio	0.75, 6.00, 0.0050, 0.90			
Orientation	South 30°			
Elevation Overshading	None Or Little			
Solar Storage Volume	150.00			
Pump electrically powered	Yes			
Combined Cylinder	Yes			
32.0 Thermal Store	None			
Thermal Store Pipework				
33.0 Photovoltaic Unit				
Apportioned KWh/Year				
34.0 Wind Turbines				
Terrain Type	Urban			
Wind Turbines Count				
Apportioned Kwh/year				
Rotor Diameter				
Hub Height				
35.0 Small-scale Hydro				
Electricity Generated				
Description				
Apportioned kWh/Year				
Recommendations				
None				
Eurther moonurse to eshieve ever history				
Further measures to achieve even higher standards	I			
Solar photovoltaic panels, 2.5 kWp	£5,000 - £8,000	£279	B 91	B 89



ENET Credits: N/A ENE2 Credits: N/A ENE7 Credits: N/A Surveyor: Richard Holmes, Tel: 0115 9231707 Denton Drive, West Bridgford, Nottingham, NG2 7FS Surveyor Software Version: Elmhurst Energy Systems SAP2012 Calculator (Design System) version 3.05r04 SAP version: SAP 2012, Regs Region: England (Part L1A 2013), Calculation Type: New Build (As Design) SUMMARY FOR INPUT DATA FOR New Build (As Designed) Ta TER and DER Fuel for main heating: 1.00 (mains gas) Fuel factor: 1.00 (mains gas) Target Carbon Dioxide Emission Rate (TER) 13.48 kg/m2 Dwelling Carbon Dioxide Emission Rate (DER) 8.98 kg/m2 To TFEE and DFEE 55.53 kWh/m2 Target Fabric Energy Efficiency (TFEE) 55.53 kWh/m2 Dwelling Fabric Energy Efficiency (DFEE) 48.84 kWh/m2 2 Fabric U-values Element Average Element Average Highest External wall 0.20 (max. 0.20) - Roof 0.16 (max. 0.20) - Nort Coldiant domes, for each junction 3 Air permeability at 50 pascals: 5.00 (design value) Maximum 10.0 4 Maximum 10	
SAP Rating: 93 A C02 Emissions (t/year): 2.18 DER: 8.98 Pass TER: 13.48 Percentage D Environmental:91 B General Requirements Compliance: Pass DFEE:48.84 Pass TER: 13.48 Percentage D CISH Results Version: ENE1 Credits: N/A ENE2 Credits: N/A ENE2 Credits: N/A ENE7 Credits: N/A Surveyor Address: Denton Drive, West Bridgford, Nottingham, NG2 7FS Surveyor Client: Software Version: Elmhurst Energy Systems SAP2012 Calculator (Design System) version 3.05r04 SAP version: SAP 2012, Regs Region: England (Part L1A 2013), Calculation Type: New Build (As Design SUMMARY FOR INPUT DATA FOR New Build (As Designed) Target Carbon Dioxide Emission Rate (TER) 13.48 kg/m2 Dwelling Carbon Dioxide Emission Rate (DER) 8.98 kg/m2 There and DFEE Target Carbon Dioxide Emission Rate (DER) 8.98 kg/m2 There and DFEE Target Fabric Energy Efficiency (DFEE) 55.53 kWh/m2 Develing Carbon Dioxide Emission Rate (DER) 0.20 (max. 0.70) Party wall 0.20 (max. 0.30) 0.20 (max. 0.70) Party wall 0.00 (max. 0.20) - Precentage D Element Average Highest - - Arget Fabric Energy Efficiency (DFEE) 5.00 (design value) - - <t< th=""><th>FEE<tfee: 12.06<br="">CfSH Level: N/</tfee:></th></t<>	FEE <tfee: 12.06<br="">CfSH Level: N/</tfee:>
Surveyor: Richard Holmes, Tel: 0115 9231707 Surveyor Address: Denton Drive, West Bridgford, Nottingham, NG2 7FS Surveyor Software Version: Elmhurst Energy Systems SAP2012 Calculator (Design System) version 3.05r04 SAP version: SAP 2012, Regs Region: England (Part L1A 2013), Calculation Type: New Build (As Design SUMMARY FOR INPUT DATA FOR New Build (As Designed) Ta TER and DER Fuel for main heating: 1.00 (mains gas) Target Carbon Dioxide Emission Rate (TER) 13.48 kg/m2 Dwelling Carbon Dioxide Emission Rate (DER) 8.98 kg/m2 The TEE and DFEE 55.53 kWh/m2 Dwelling Fabric Energy Efficiency (DFEE) 48.84 kWh/m2 2 Fabric U-values Element Average Element Average Highest External wall 0.20 (max. 0.20) - Floor 0.16 (max. 0.25) 0.16 (max. 0.30) Openings 1.441 (max. 2.00) 1.60 (max. 3.30) 2a Thermal bridging Fuermeability Atorage Aft permeability 5.00 (design value) Mains gas Mar parmeability at 50 pascals: 5.00 (design value) Mains gas Main heating system: Boiler system with radiators or underf	
Address: Denton Drive, West Bridgford, Nottingham, NG2 7FS Client: Software Version: Elmhurst Energy Systems SAP2012 Calculator (Design System) version 3.05r04 SAP version: SAP 2012, Regs Region: England (Part L1A 2013), Calculation Type: New Build (As Designed) SUMMARY FOR INPUT DATA FOR New Build (As Designed) Ta TER and DER Fuel for main heating: Mains gas Target Carbon Dioxide Emission Rate (TER) 13.48 kg/m ² Dwelling Carbon Dioxide Emission Rate (DER) 8.98 kg/m ² 1b TFEE and DFEE Target Fabric Energy Efficiency (TFEE) 55.53 kWh/m ² Dwelling Fabric Energy Efficiency (DFEE) 48.84 kWh/m ² 2 Fabric U-values Element Average Highest External wall 0.20 (max. 0.30) 0.20 (max. 0.70) Party wall 0.00 (max. 0.20) -16 (max. 0.70) Roof 0.16 (max. 0.20) 0.16 (max. 0.70) Roof 0.16 (max. 0.20) 1.60 (max. 3.30) 2a Thermal bridging Thermal bridging Calculated from linear thermal transmittances for each junction 3 Air permeability Air permeability 450 pascals: 5.00 (design value) Maximum 10.0 4 Heating efficiency Main heating system: Boiler system with radiators or underf Mains gas Data from database Vaillant ecoTEC VU GB 656/4-5-H Efficiency: 88.7% SEDBUK2009 Minimum: 88.0% Secondary heating system: None 5 Cylinder insulation Hot water storage Primary pipework insulated: Yes	· ID· 1177_000
SAP version: SAP 2012, Regs Région: England (Part L1A 2013), Calculation Type: New Build (As Designed) Target For INPUT DATA FOR New Build (As Designed) Ta TER and DER Fuel for main heating: Mains gas Target Carbon Dioxide Emission Rate (TER) 13.48 kg/m ² Dwelling Carbon Dioxide Emission Rate (DER) 8.98 kg/m ² To TFEE and DFEE Target Fabric Energy Efficiency (TFEE) 55.53 kWh/m ² Puwelling Fabric Energy Efficiency (DFEE) 48.84 kWh/m ² Target Fabric U-values Element Average Highest External wall 0.20 (max. 0.30) 0.20 (max. 0.70) Party wall 0.00 (max. 0.20) - Floor 0.16 (max. 0.20) - Floor 0.16 (max. 0.20) 0.16 (max. 0.30) Carthermal bridging Thermal bridging Thermal bridging calculated from linear thermal transmittances for each junction 3 Air permeability Air permeability at 50 pascals: 5.00 (design value) Maximum 10.0 4 Heating efficiency Main heating system: Boiler system with radiators or underf Mains gas Data from database Vaillant ecoTEC VU GB 656/4-5-H Efficiency: 88.7% SEDBUK2009 Minimum: 88.0% None 5 Cylinder insulation Primary pipework insulated: Yes	U. 4477-000
1a TER and DER Fuel for main heating: Mains gas Fuel factor: 1.00 (mains gas) Target Carbon Dioxide Emission Rate (TER) 13.48 kg/m² Dwelling Carbon Dioxide Emission Rate (DER) 8.98 kg/m² 1b TFEE and DFEE 55.53 kWh/m² Target Fabric Energy Efficiency (TFEE) 55.53 kWh/m² Dwelling Fabric Energy Efficiency (DFEE) 48.84 kWh/m² 2 Fabric U-values Element Average Element Average Highest External wall 0.20 (max. 0.30) 0.20 (max. 0.70) Party wall 0.00 (max. 0.20) - Floor 0.16 (max. 0.25) 0.16 (max. 0.35) Openings 1.41 (max. 2.00) 1.60 (max. 3.30) 2a Thermal bridging Thermeability Air permeability Air permeability 5.00 (design value) 10.0 4 Heating efficiency Boiler system with radiators or underf Mains gas Data from database Vaillant ecoTEC VU GB 656/4-5-H Efficiency: 88.0% None Secondary heating system: Secondary heating system: None None 5 Cylinder insulat	əd)
Fuel for main heating: Mains gas Fuel factor: 1.00 (mains gas) Target Carbon Dioxide Emission Rate (TER) 13.48 kg/m² Dwelling Carbon Dioxide Emission Rate (DER) 8.98 kg/m² 1b TFEE and DFEE 55.53 kWh/m² Target Fabric Energy Efficiency (TFEE) 55.53 kWh/m² Dwelling Fabric Energy Efficiency (DFEE) 48.84 kWh/m² 2 Fabric U-values Element Average Highest External wall 0.20 (max. 0.30) 0.20 (max. 0.70) Party wall 0.00 (max. 0.20) - Floor 0.16 (max. 0.20) 0.16 (max. 0.70) Roof 0.16 (max. 0.20) 0.16 (max. 0.30) Quenting Calculated from linear thermal transmittances for each junction 3 3 Air permeability 5.00 (design value) Maximum 10.0 4 4 Heating efficiency Boiler system with radiators or underf Mains gas Data from database Vaillant ecoTEC VU GB 656/4-5-H Efficiency 88.7% SEDBUK2009 Mainmum 10.0 5 Cylinder insulation None 5 Cylinder insulation Nominal cylinder loss: 2.55 kWh/day	
Target Carbon Dioxide Emission Rate (TER) 13.48 kg/m² Dwelling Carbon Dioxide Emission Rate (DER) 8.98 kg/m² 1b TFEE and DFEE 55.53 kWh/m² Target Fabric Energy Efficiency (DFEE) 48.84 kWh/m² 2 Fabric U-values Element Average Element Average Highest External wall 0.20 (max. 0.30) 0.20 (max. 0.70) Party wall 0.00 (max. 0.20) - Floor 0.16 (max. 0.20) - Floor 0.16 (max. 0.20) 0.16 (max. 0.35) Openings 1.41 (max. 2.00) 1.60 (max. 3.30) 2a Thermal bridging 5.00 (design value) 10.0 Air permeability at 50 pascals: 5.00 (design value) Maximum 10.0 4 4 4 Heating efficiency Boiler system with radiators or underf Main heating system: Boiler system with radiators or underf Mains gas Data from database Vaillant ecoTEC VU GB 656/4-5-H Efficiency: 88.7% SEDBUK2009 Minimum: 88.0% Secondary heating system: Secondary heating system: None 5 5 Cylinder insulation	
Target Fabric Energy Efficiency (TFEE) 55.53 kWh/m² Dwelling Fabric Energy Efficiency (DFEE) 48.84 kWh/m² 2 Fabric U-values Element Average Highest External wall 0.20 (max. 0.30) 0.20 (max. 0.70) Party wall 0.00 (max. 0.20) - Floor 0.16 (max. 0.25) 0.16 (max. 0.70) Roof 0.16 (max. 0.20) 0.16 (max. 0.35) Openings 1.41 (max. 2.00) 1.60 (max. 3.30) 2a Thermal bridging Thermal bridging calculated from linear thermal transmittances for each junction 3 Air permeability 5.00 (design value) Maximum 10.0 4 Heating efficiency Boiler system with radiators or underf Mains gas Data from database Vaillant ecoTEC VU GB 656/4-5-H Efficiency: 88.7% SEDBUK2009 Minimum: 88.0% None 5 Cylinder insulation Nominal cylinder loss: 2.55 kWh/day Hot water storage Nominal cylinder loss: 2.55 kWh/day Primary pipework insulated: Yes	OK
ElementAverageHighestExternal wall0.20 (max. 0.30)0.20 (max. 0.70)Party wall0.00 (max. 0.20)-Floor0.16 (max. 0.25)0.16 (max. 0.70)Roof0.16 (max. 0.20)0.16 (max. 0.35)Openings1.41 (max. 2.00)1.60 (max. 3.30) 2a Thermal bridging Thermal bridging calculated from linear thermal transmittances for each junction 3 Air permeability Air permeabilityAir permeabilityAir permeability10.0 4 Heating efficiency Boiler system with radiators or underf Mains gas Data from database Vaillant ecoTEC VU GB 656/4-5-H Efficiency: 88.7% SEDBUK2009 Minimum: 88.0%Secondary heating system:None 5 Cylinder insulation Hot water storageNominal cylinder loss: 2.55 kWh/day Permitted by DBSCG 2.86Primary pipework insulated:Yes	ОК
External wall0.20 (max. 0.30)0.20 (max. 0.70)Party wall0.00 (max. 0.20)-Floor0.16 (max. 0.25)0.16 (max. 0.70)Roof0.16 (max. 0.20)0.16 (max. 0.35)Openings1.41 (max. 2.00)1.60 (max. 3.30) 2a Thermal bridging Thermal bridging calculated from linear thermal transmittances for each junction 3 Air permeability Air permeabilityAir permeabilityBoiler system with radiators or underfMains gasData from databaseVaillant ecoTEC VU GB 656/4-5-HEfficiency:<	
Party wall0.00 (max. 0.20)-Floor0.16 (max. 0.25)0.16 (max. 0.70)Roof0.16 (max. 0.20)0.16 (max. 0.35)Openings1.41 (max. 2.00)1.60 (max. 3.30) 2a Thermal bridging Thermal bridging calculated from linear thermal transmittances for each junction 3 Air permeability 5.00 (design value)Maximum10.0 4 Heating efficiency Boiler system with radiators or underf Mains gas Data from database Vaillant ecoTEC VU GB 656/4-5-H Efficiency: 88.7% SEDBUK2009 Minimum: 88.0%Secondary heating system:None 5 Cylinder insulation Nominal cylinder loss: 2.55 kWh/day Permitted by DBSCG 2.86Primary pipework insulated:Yes	
Floor0.16 (max. 0.25)0.16 (max. 0.70)Roof0.16 (max. 0.20)0.16 (max. 0.35)Openings1.41 (max. 2.00)1.60 (max. 3.30) 2a Thermal bridging Thermal bridging calculated from linear thermal transmittances for each junction 3 Air permeability Air permeabilityAir permeabilityMaximum10.0 4 Heating efficiency Main heating system:Boiler system with radiators or underf Mains gas Data from database Vaillant ecoTEC VU GB 656/4-5-H Efficiency: 88.7% SEDBUK2009 Minimum: 88.0%None 5 Cylinder insulation Hot water storageNominal cylinder loss: 2.55 kWh/day Permitted by DBSCG 2.86Primary pipework insulated:	OK
Roof Openings0.16 (max. 0.20)0.16 (max. 0.35) (max. 3.30) 2a Thermal bridging Thermal bridging calculated from linear thermal transmittances for each junction 3 Air permeability Air permeability at 50 pascals:5.00 (design value) 10.0Maximum10.0 4 Heating efficiency Main heating system:Boiler system with radiators or underf Mains gas Data from database Vaillant ecoTEC VU GB 656/4-5-H Efficiency: 88.7% SEDBUK2009 Minimum: 88.0%Secondary heating system:None 5 Cylinder insulation Hot water storageNominal cylinder loss: 2.55 kWh/day Permitted by DBSCG 2.86Primary pipework insulated:Yes	OK OK
Openings1.41 (max. 2.00)1.60 (max. 3.30) 2a Thermal bridging Thermal bridging calculated from linear thermal transmittances for each junction 3 Air permeability Air permeability at 50 pascals:5.00 (design value) 10.0Maximum10.0 4 Heating efficiency Main heating system:Boiler system with radiators or underf Mains gas Data from database Vaillant ecoTEC VU GB 656/4-5-H Efficiency: 88.7% SEDBUK2009 Minimum: 88.0%Secondary heating system:None 5 Cylinder insulation Hot water storageNominal cylinder loss: 2.55 kWh/day Permitted by DBSCG 2.86Primary pipework insulated:Yes	OK
Thermal bridging calculated from linear thermal transmittances for each junction 3 Air permeability Air permeability Air permeability at 50 pascals: 5.00 (design value) Maximum 10.0 4 Heating efficiency Main heating system: Boiler system with radiators or underf Mains gas Data from database Vaillant ecoTEC VU GB 656/4-5-H Efficiency: 88.7% SEDBUK2009 Minimum: 88.0% Secondary heating system: None 5 Cylinder insulation Nominal cylinder loss: 2.55 kWh/day Hot water storage Nominal cylinder loss: 2.55 kWh/day Primary pipework insulated: Yes	OK
3 Air permeability Air permeability Air permeability at 50 pascals: Maximum 10.0 4 Heating efficiency Main heating system: Boiler system with radiators or underf Mains gas Data from database Vaillant ecoTEC VU GB 656/4-5-H Efficiency: 88.7% SEDBUK2009 Minimum: 88.0% Secondary heating system: None 5 Cylinder insulation Hot water storage Primary pipework insulated:	
Maximum10.04 Heating efficiencyBoiler system with radiators or underf Mains gas Data from database Vaillant ecoTEC VU GB 656/4-5-H Efficiency: 88.7% SEDBUK2009 Minimum: 88.0%Secondary heating system:None5 Cylinder insulation Hot water storageNominal cylinder loss: 2.55 kWh/day Permitted by DBSCG 2.86 Yes	
4 Heating efficiency Main heating system: Boiler system with radiators or underf Mains gas Data from database Vaillant ecoTEC VU GB 656/4-5-H Efficiency: 88.7% SEDBUK2009 Minimum: 88.0% None 5 Cylinder insulation Nominal cylinder loss: 2.55 kWh/day Primary pipework insulated: Yes	
Main heating system:Boiler system with radiators or underf Mains gas Data from database Vaillant ecoTEC VU GB 656/4-5-H Efficiency: 88.7% SEDBUK2009 Minimum: 88.0%Secondary heating system:None5 Cylinder insulation Hot water storageNominal cylinder loss: 2.55 kWh/day Permitted by DBSCG 2.86Primary pipework insulated:Yes	OK
Mains gas Data from database Vaillant ecoTEC VU GB 656/4-5-H Efficiency: 88.7% SEDBUK2009 Minimum: 88.0% Secondary heating system: None 5 Cylinder insulation Hot water storage Nominal cylinder loss: 2.55 kWh/day Permitted by DBSCG 2.86	
Data from databaseVaillant ecoTEC VU GB 656/4-5-HEfficiency: 88.7% SEDBUK2009Minimum: 88.0%Secondary heating system:None5 Cylinder insulationHot water storagePrimary pipework insulated:Yes	100r -
Vaillant ecoTEC VU GB 656/4-5-H Efficiency: 88.7% SEDBUK2009 Minimum: 88.0%Secondary heating system:None5 Cylinder insulation Hot water storageNominal cylinder loss: 2.55 kWh/day Permitted by DBSCG 2.86Primary pipework insulated:Yes	
Efficiency: 88.7% SEDBUK2009 Minimum: 88.0% Secondary heating system: None 5 Cylinder insulation Hot water storage Nominal cylinder loss: 2.55 kWh/day Permitted by DBSCG 2.86 Primary pipework insulated: Yes	
Secondary heating system:None5 Cylinder insulationNominal cylinder loss: 2.55 kWh/day Permitted by DBSCG 2.86Primary pipework insulated:Yes	
5 Cylinder insulationHot water storageNominal cylinder loss: 2.55 kWh/day Permitted by DBSCG 2.86Primary pipework insulated:Yes	OK
Hot water storageNominal cylinder loss: 2.55 kWh/dayPrimary pipework insulated:Permitted by DBSCG 2.86	
Permitted by DBSCG 2.86 Primary pipework insulated: Yes	
	OK OK
	UN
Space heating controls: Time and temperature zone control	OK
Hot water controls: Cylinderstat	OK
Independent timer for DHW	OK
Boiler interlock Yes	OK
7 Low energy lights Percentage of fixed lights with low-energy 100% fittings:	

Building Regulation Compliance						
 Minimum	75%	OK				
8 Mechanical ventilation						
Not applicable						
9 Summertime temperature						
Overheating risk (Thames Valley):	Not significant	OK				
Based On:						
Overshading:	Average					
Windows facing South:	39.60 m ² , No overhang					
Air change rate:	8.00 ach					
Blinds/curtains:	None					
10 Key features						
Party wall U-value Photovoltaic array	0.00 W/m ² K					



Property Reference: Left	
Survey Reference PV/Left	

Issued on Date: 04.Apr.2016 Prop Type Ref:

Survey Reference: Property:	PV Left			Prop Typ	be Ref:	
SAP Rating: 93 A CO2 E Environmental:91 B Genera	missions (t/year): al Requirements Complianc	2.18 DER: 8.98 Pass e: Pass DFEE: 48.84 Pass	TER: 13.48 TFEE:55.53		ntage DER <tef ntage DFEE<tf< th=""><th></th></tf<></tef 	
CfSH Results Version:		ENE1 Credits: N/A ENE2	Credits: N/A El	NE7 Credits:	N/A CfSH L	evel: N/A
	lolmes, Tel: 0115 92317 rive, West Bridgford, Not			S	urveyor ID: 4	477-0001
		P2012 Calculator (Design (Part L1A 2013), Calculat				
SUMMARY FOR INPU	T DATA FOR New Build	(As Designed)			F	Page 3 of 6
Orientation 1.0 Property Type 2.0 Number of Storeys 3.0 Date Built 3.0 Property Age Band 4.0 Sheltered Sides 5.0 Sunlight/Shade	South House, End- 4 2016 2 Average or u					
6.0 Measurements						
	Heat Loss Perimeter	Internal Floor Area	Average Sto	rey Height		
Basement	:: 39.11	104.83	2.6	0		
1st Storey	: 38.51	87.87	3.2	0		
2nd Storey	: 32.77	73.57	3.0	0		
3rd Storey	32.77	73.57	2.9	0		
7.0 Living Area	61.38					
8.0 Thermal Mass Parameter	er Simple calcu	Ilation - Medium				
9.0 External Walls Description	Construction Cavity wall; o	dense plaster, lightweight	U-Value	Kappa	Gross Area	Nett Area
Basement	structure	ock, filled cavity, any outside	0.20		101.68	101.68
Main		dense plaster, lightweight ock, filled cavity, any outside	0.20		316.58	275.09
9.1 Party walls Description	Construction	1	Кар	pa /	Area	

Description	Construction	Kap	Kappa Area				
Party Wall 1	Dense plaster both sides. lightweight aggr blocks, cavity or cavity fill	Dense plaster both sides. lightweight aggregate blocks, cavity or cavity fill					
10.0 External Roofs Description	Construction	U-Value	Kappa	Gross Area	Nett Area		
Flat	Plasterboard, insulated flat roof	asterboard, insulated flat roof 0.16					
10.1 Party Ceilings Description	Construction	Кар	opa A	vrea			
Party Ceilings 1 g and 1	Other Concrete floor slab, carpeted	87.87 160.00					
11.0 HeatLoss Floors Description	Construction	U-Value Kappa Area					
Basement	Slab on ground, screed over insulation	0.16		104.83			
11 1 Dantes Elagua							

Description			Construct	ion				Kappa	Area		
2 1 and g			Precast c	oncrete pl	anks floor,	screed, ca	rpeted		236.00		
12.0 Openir	0 71	_							_		
Description	Data Source	Туре	Glazing	(Blazing Gap	Argon Filled	d Sola	ar Trans F	rame Type	Frame Fac	tor U value
Door	Manufacturer	Solid Door									1.60
Windows	Manufacturer	Window	Double gla	zed				0.76		0.70	1.40
Rooflight	Manufacturer	Roof Window	Double gla	zed				0.76		0.70	1.40
13.0 Openir Name	ngs Opening Type	Location		Orientation	Curtain Ty	20	Overhang	Wide	Width Height		Curtain
Name	Opening Type	Location	I	Onentation	Curtain Ty	þe	Ratio	Overhang		Journe Al	Closed
Door	Solid Door	[2] Main		South						1.	89
Windows	Window	[2] Main		South	None		0.00			39	.60
RL	Roof Window	[1] Flat		Horizontal	None					3.	84
14.0 Consei	rvatory		None								
15.0 Draugh			100								
16.0 Draugh	nt Lobby		No								
17.0 Therma	0 0		Calculate	Bridges							
17.1 List of Source Type	0	Bridge Type							Length	Psi	Imported
Independen	tly assessed	E1 Steel linte	I with perfo	rated stee	l base plat	e			18.90	0.050	Yes
Table K1 - A	•	E3 Sill							18.00	0.040	Yes
Table K1 - A	Approved	E4 Jamb							70.20	0.050	Yes
Table K1 - A	Approved	E5 Ground flo	oor (norma)					38.51	0.160	No
Table K1 - D	Default	E22 Baseme	nt floor						39.11	0.070	No
Table K1 - A	Approved	E6 Intermedia	ate floor wi	thin a dwe	lling				65.54	0.070	No
Table K1 - D	Default	E15 Flat roof	with parap	et	•				32.57	0.560	No
Table K1 - A	Approved	E16 Corner (I							26.00	0.090	No
Table K1 - A		E17 Corner (i	,	nternal are	a areater t	han externa	al area)		2.60	-0.090	No
Table K1 - A		E18 Party wa			J		,		23.40	0.060	Yes
Table K1 - D	••	P1 Party wall		-					5.29	0.160	No
Table K1 - D		P2 Party wall			within a dw	ellina			10.74	0.000	No
Table K1 - D		P4 Party wall				Ũ			5.37	0.240	No
18.0 Pressu	ire Testina		Yes								
Designe	0		5.00								
	/ Tested ?										
As Built											
	s Designed ?	n									
	ical Ventilation		No								
Present		-									
	ed Installation		\A/instance	f							
	s open in hot w entilation possil		Yes	fully open							
Night Ve			No								
Air chan	nge rate		8.00								
	ical Ventilation	data Type									
Type MV Refe	erence Number										
Configui											
0	Duct Insulated										
	cturer SFP										
Duct Ty											
Wet Roc	Efficiency										
Brand, N											
	Open Fireplace										
		MH			Total						
Number of C	•	(0	0						
Number of c	•	C)	0	0						
	ntermittent fans	3			4						
•	bassive vents				0						
	lueless gas fire	S			0						
21.0 Cooling		hurst Eporav Sveta	No								

22.0 Lighting Internal	
Total number of light fittings	20
Total number of L.E.L. fittings	20
Percentage of L.E.L. fittings	100.00
External External lights fitted	No
Light and motion sensors 23.0 Electricity Tariff	Standard
	Stanuaru
24.0 Heating Systems Main Heating 1 Description	Database
Percentage of Heat	100 %
Main Heating 2 Description	None
Percentage of Heat Community Heating	%
Secondary Heating	None
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery	No
Instantaneous System 1	
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage System	No
System Solar Panel	No
25.0 Main Heating 1	
Database Ref. No.	15993
Fuel Type	Mains gas
Main Heating	BGB
TestMethod	
SAP Code	102
Efficiency (Split Efficiences) %	
Efficiency (Split Efficiences) % In Winter	89.7
In Summer	79.0
Model Name	18.0
Manufacturer	
Controls	CBI Time and temperature zone control
PCDF Controls	0
Delayed Start Stat	Yes
Sap Code	2110
Burner Control	
Boiler Compensator	
HETAS approved System Oil Pump Inside	
FI Case	
FI Water	
Flue Type	Balanced
Smoke Control Area	
Fan Assisted Flue	Yes
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Underfloor Heating Flow Temperature	<= 35°C
Electric CPSU Temperature	
Combi boiler type	
Combi keep hot type	
Combi store type	
27.0 Community Heating	
Space Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value Controls	
SAP Code	
Water Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Charging Linked To Heat Use	
28.0 Secondary Heating	
Description	
SHS efficiency %	
SAP Code	

HETAS Approv	ved System					
Smoke Control	Area					
Test Method						
Manufacturer Model Name						
29.0 Water Heating	r		HWP From main heating 1			
Water use <= 125 litres/person/day			Yes			
SAP Code	20 00, pore		901			
Immersion Hea	ter					
Summer Imme						
Suplementary						
Immersion Onl						
29.1 Flue Gas Hea Database ID	t Recovery S	ystem				
Brand Model						
Details						
29.2 Waste Water	Heat Recove	ry				
System						
Total rooms wi						
30.0 Hot Water Cy	linder		Hot Water Cylinder			
Cylinder Stat Cylinder In Hea	ated Space		Yes Yes			
Independent Ti			Yes			
Insulation Type			Foam			
Insulation Thic						
Cylinder Volum			300.00			
Loss (kwh/day)	1					
Pipes insulation In Airing Cupbo			Fully insulated primary pipework			
31.0 Solar Panel	Daru					
Solar Panel Ar	22					
Area Type	24					
Panel Type						
n0, a1, a2, A/G	ratio					
Orientation						
Elevation						
Overshading Solar Storage V	/olume					
Pump electrica						
Combined Cyli						
32.0 Thermal Store	9		None			
Thermal Store						
33.0 Photovoltaic l			One Dwelling			
Apportioned K PV Cells kW Peak		Elevatio	n Overeheding			
PV Cells KVV Peak	Onentation	Elevalio	n Overshading			
3.40	South	30°	None Or			
0110	Count		Little			
24.0 Wind Turbing						
34.0 Wind Turbine Terrain Type	5		Urban			
Wind Turbines						
Count						
Apportioned K						
Rotor Diameter	•					
Hub Height	vdro					
35.0 Small-scale Hydro Electricity Generated						
Description	Sidiod					
Apportioned kV	Vh/Year					
Recommendations						
None						
Further measures	to achieve ev	en higher				
standards						
None						



	Building	Regu	lation Co	mpliance	;		Page 1 of
Property Reference: Survey Reference: F Property:						on Date: () Гуре Ref:	4.Apr.2016
	issions (t/year): Requirements Compliance		ER: 7.83 Pass FEE:44.83 Pass	TER: 12.8 TFEE:51.3		centage DE	R <ter: 39.2<br="">EE<tfee: 12.6<="" th=""></tfee:></ter:>
CfSH Results Version:		ENE1 C	redits: N/A ENE	2 Credits: N/A	ENE7 Credi	ts: N/A	CfSH Level: N
	Imes, Tel: 0115 923170 /e, West Bridgford, Not		NG2 7FS			Surveyor I	D: 4477-000
Software Version: Elmhurs SAP version: SAP 2012, R							4)
SUMMARY FOR INPUT	DATA FOR New Build	(As Desig	ned)				
1a TER and DER Fuel for main heating: Fuel factor:			Mains gas 1.00 (main				
Target Carbon Dioxide Dwelling Carbon Diox 1b TFEE and DFEE			12.89 kg/m 7.83 kg/m ²				OK
Target Fabric Energy Dwelling Fabric Energy 2 Fabric U-values)	51.30 kWh 44.83 kWh				OK
			•	llighaat			
E	Element External wall		nax. 0.30)	Highest 0.20 (ma	x. 0.70)		OK
	Party wall Floor	· ·	nax. 0.20) nax. 0.25)	- 0.16 (ma	v 0 70)		OK OK
	Roof		ax. 0.23)	0.16 (ma			OK
	Openings		nax. 2.00)	1.60 (ma	,		OK
2a Thermal bridging Thermal bridging calc	ulated from linear t	hermal t	ransmittanc	es for eac	n junctio	า	
3 Air permeability							
	Air permeability at 50 pascals:			5.00 (design value)			ОК
Maximum 4 Heating efficiency			10.0				UK
Main heating system:			Boiler syst	em with ra	diators o	r underflo	or -
			Mains gas				
			Data from			151	
			Vaillant ecoTEC VU GE Efficiency: 88.7% SED			-	
			Minimum:		0001120		OK
Secondary heating sy	stem:		None				
5 Cylinder insulation							
Hot water storage			Nominal cylinder loss: 2.55 kWh/day Permitted by DBSCG 2.86				OK OK
Primary pipework insu 6 Controls	liateo:		Yes				UN
Space heating control	s:		Time and t	emperatur	e zone c	ontrol	OK
Hot water controls:			Cylindersta		0.10 0		OK
			Independe		DHW		OK
Boiler interlock			Yes				OK
7 Low energy lights Percentage of fixed lig fittings:	ghts with low-energ	у	100%				

Building R	Page 2 of 6	
 Minimum	75%	ОК
8 Mechanical ventilation		
Not applicable		
9 Summertime temperature		
Overheating risk (Thames Valley):	Not significant	OK
Based On:		
Overshading:	Average	
Windows facing South:	36.96 m ² , No overhang	
Air change rate:	8.00 ach	
Blinds/curtains:	None	
10 Key features		
Party wall U-value Photovoltaic array	0.00 W/m ² K	



Property Reference:	Mid			lesued on	Date: 04 Ap	r 2016			
Survey Reference: P				Issued on Date: 04.Apr.2016 Prop Type Ref:					
Property:									
SAP Rating: 94 A CO2 Emi Environmental:92 A General F		1.61 DER: 7.83 Pass Pass DFEE: 44.83 Pass	TER: 12.89 TFEE:51.30		ntage DER <ter ntage DFEE<tf< td=""><td></td></tf<></ter 				
CfSH Results Version:		ENE1 Credits: N/A ENE2	Credits: N/A El	NE7 Credits:	N/A CfSH Lo	evel: N/A			
5	mes, Tel: 0115 923170 e, West Bridgford, Notti			Su	urveyor ID: 4	477-0001			
Software Version: Elmhurst SAP version: SAP 2012, R					Designed)				
SUMMARY FOR INPUT I	DATA FOR New Build (As Designed)			Р	age 3 of 6			
Orientation	South								
1.0 Property Type	House, Mid-Te	errace							
2.0 Number of Storeys	4								
3.0 Date Built	2016								
3.0 Property Age Band 4.0 Sheltered Sides	2								
5.0 Sunlight/Shade	Average or un	known							
6.0 Measurements									
	Heat Loss Perimeter	Internal Floor Area	Average Sto	orey Height					
Basement:	27.00	27.00 91.80							
1st Storey:	27.00	68.72	3.20						
2nd Storey:	27.00	72.49	3.00						
3rd Storey:	27.00	72.49	2.9	90					
7.0 Living Area	64.78								
8.0 Thermal Mass Parameter	Simple calcula	tion - Medium							
9.0 External Walls									
Description	Construction		U-Value	Kappa	Gross Area	Nett Area			
	•	nse plaster, lightweight							
Basement	aggregate blo structure	ck, filled cavity, any outside	0.20		70.20	70.20			
	Cavity wall; de	nse plaster, lightweight							
Main	aggregate bloo structure	aggregate block, filled cavity, any outside			245.70	206.85			
	Structure								
9.1 Party walls Description	Construction		Kan		102				
Description					Kappa Area				
Party Wall 1		Dense plaster both sides. lightweight aggrublocks, cavity or cavity fill			regate 131.30				
10.0 External Roofs Description	Construction		U-Value	Карра	Gross Area	Nett Area			
Flat	Plasterboard,	insulated flat roof	0.16		91.80	87.96			
10.1 Party Ceilings									
Description Construction			Kappa Area						
Party Ceilings 1 Other			87.87						
g and 1	Concrete floor	slab, carpeted		16	0.00				
11.0 HeatLoss Floors									
Description	Construction		U-Value	Карра	Area				
Basement	Slab on groun	d, screed over insulation	0.16		91.80				
11.1 Dorty Flooro									

Description			Constru	uction				Карра	a	Area			
2 1 and g			Precas	t concrete pl	anks floor,	screed, car	peted		:	236.00)		
12.0 Opening Description	Types Data Source	Туре	Glazing	C	Blazing Gap	Argon Filled	l Sola	ar Trans	Frame Ty	/pe	Frame I	Factor	· U value
Door	Manufacturer	Solid Door											1.60
Windows	Manufacturer	Window	Double	glazed				0.76			0.7	0	1.40
Rooflight	Manufacturer	Roof Window	Double	glazed				0.76			0.7	0	1.40
13.0 Opening Name	s Opening Type	Locatior	n	Orientatior	Curtain Ty	/pe	Overhang		Width	Height	Count	Area	Curtai
					-		Ratio	Overhan	g	-			Closed
Door	Solid Door	[2] Main		South								1.89	
Windows	Window	[2] Main		South	None		0.00					36.9	6
RL	Roof Window	[1] Flat		Horizontal	None							3.84	
14.0 Conserva 15.0 Draught			None 100										
16.0 Draught			No										
17.0 Thermal			Calcula	ate Bridges									
17.1 List of Br	idges	Bridge Ture							1	onath	Dei		mnorted
Source Type		Bridge Type							L	ength	Psi	I	mported
Independently	assessed	E1 Steel linte	l with pe	rforated stee	el base plat	e			1	7.70	0.05	50 `	res
Table K1 - Ap	proved	E3 Sill							1	6.80	0.04	0	res
Table K1 - Ap	proved	E4 Jamb							6	5.80	0.05	50 `	res
Table K1 - Ap	proved	E5 Ground flo	oor (norn	nal)					2	7.00	0.16	50 `	res
Table K1 - Ap	proved	E6 Intermedia	ate floor	within a dwe	lling				5	4.00	0.07	1 O'	No
Table K1 - De	fault	E15 Flat roof	with par	apet					2	7.00	0.56	1 03	No
Table K1 - Ap	proved	E18 Party wa	II betwee	en dwellings					4	6.80	0.06	50 `	res
Table K1 - De	fault	P1 Party wall	- Groun	d floor					1	0.58	0.16	1 03	No
Table K1 - De	fault	P2 Party wall	- Interm	ediate floor	within a dw	elling			2	1.48	0.00	00	No
18.0 Pressure Designed Property T As Built q Same As 19.0 Mechani	q50 Tested ? 50 Designed ?	1	Yes 5.00										
Mechanica Present	al Ventilation		No										
	Installation	oothor	Window	ws fully open									
	tilation possib		Yes										
Night Ven	tilation .		No										
	e rate al Ventilation	data Type	8.00										
Type MV Refere	ence Number												
Configura													
MVHR Du Manufactu	ct Insulated												
Duct Type													
MVHR Eff	iciency												
Wet Room Brand, Mo													
20.0 Fans, Op		s, Flues											
		M	IS SH		Total								
Number of Ch	-	(0	0								
Number of op		()	0	0								
Number of int					4								
Number of pa		_			0								
Number of flu	eless gas fire	S			0								
21.0 Cooling	System		No										
22.0 Lighting													
Internal Total r	number of ligh	nt fittinas	20										
Total r	number of L.E	L. fittings	20										
-	ntage of L.E.L	fittings	100.00										

Page	Б	of	6
гауе	0	U	0

External	
External lights fitted	No
Light and motion sensors	
23.0 Electricity Tariff	Standard
24.0 Heating Systems	Detelore
Main Heating 1 Description	Database
Percentage of Heat	100 %
Main Heating 2	None
Description	
Percentage of Heat	%
Community Heating	Neve
Secondary Heating Water Heating	None Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery	No
Instantaneous System 1	
Waste Water Heat Recovery	No
Instantaneous System 2 Waste Water Heat Recovery Storage	No
System	INU
Solar Panel	No
25.0 Main Heating 1	
Database Ref. No.	15993
Fuel Type	Mains gas
Main Heating	BGB
TestMethod SAP Code	102
Efficiency (Split Efficiences) %	
Efficiency (Split Efficiences) %	
In Winter	89.7
In Summer	79.0
Model Name	
Manufacturer Controls	CPI Time and temperature zero control
PCDF Controls	CBI Time and temperature zone control 0
Delayed Start Stat	Yes
Sap Code	2110
Burner Control	
Boiler Compensator	
HETAS approved System	
Oil Pump Inside FI Case	
FI Water	
Flue Type	Balanced
Smoke Control Area	
Fan Assisted Flue	Yes
Is MHS Pumped	Pump in heated space
Heat Emitter Underfloor Heating	Radiators
Flow Temperature	<= 35°C
Electric CPSU Temperature	
Combi boiler type	
Combi keep hot type	
Combi store type	
27.0 Community Heating Space Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Controls	
SAP Code	
Water Community Heating PCDF Index	
Distribution Loss	
Distribution Loss Value	
Charging Linked To Heat Use	
28.0 Secondary Heating	
Description	
SHS efficiency %	
SAP Code	
HETAS Approved System Smoke Control Area	
Test Method	
Manufacturer	
Model Name	

SAP Code Immersion He Summer Imme Suplementary	125 litres/persi eater ersion Immersion Ily Heating Hot at Recovery Sy	Water ystem	HWP From main heating 1 Yes 901
Total rooms w	ith shower and	l/or bath	
30.0 Hot Water C			Hot Water Cylinder
Cylinder Stat	yiiriadi		Yes
Cylinder In He	ated Shace		Yes
Independent 7			Yes
Insulation Typ			Foam
Insulation Thi			1 dani
Cylinder Volur			300.00
Loss (kwh/day			
Pipes insulation			Fully insulated primary pipework
In Airing Cupb			r diy nodiated printary pipework
31.0 Solar Panel			
Solar Panel A	rea		
Area Type	ica		
Panel Type			
n0, a1, a2, A/	G ratio		
Orientation			
Elevation			
Overshading			
Solar Storage	Volume		
Pump electric			
Combined Cy			
32.0 Thermal Stor			None
Thermal Store			None
33.0 Photovoltaic			One Dwelling
Apportioned K			She Dwelling
PV Cells kW Peal		Elevatio	on Overshading
FV Cells KW Fear	Conentation	Lievalic	Ji Oversnaulity
2.40	Courth	30°	None Or
3.40	South	30	Little
34.0 Wind Turbine	es		
Terrain Type			Urban
Wind Turbines	S		
Count			
Apportioned K	(wh/year		
Rotor Diamete	er		
Hub Height			
35.0 Small-scale	Hydro		
Electricity Ger			
Description			
Apportioned k	Wh/Year		
Recommendation			
None	-		
Further measures	to achieve eve	an hiahar	
standards		siringilei	
None			

None



Building Re	gulation Compliance Page	1 of 6
Property Reference: Right Survey Reference: PV Right ^{Property:}	Issued on Date: 04.Apr.20 Prop Type Ref:)16
	•	33.36 % 12.06 %
CfSH Results Version: ENI	1 Credits: N/A ENE2 Credits: N/A ENE7 Credits: N/A CfSH Level:	N/A
Surveyor: Richard Holmes, Tel: 0115 9231707 Address: Denton Drive, West Bridgford, Nottingha Client:	n, NG2 7FS Surveyor ID: 4477	-0001
Software Version: Elmhurst Energy Systems SAP2012 SAP version: SAP 2012, Regs Region: England (Part L		
SUMMARY FOR INPUT DATA FOR New Build (As Do	signed)	
1a TER and DER Fuel for main heating: Fuel factor: Target Carbon Dioxide Emission Rate (TER)	Mains gas 1.00 (mains gas) 13.48 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DEF	0)K
1b TFEE and DFEE Target Fabric Energy Efficiency (TFEE) Dwelling Fabric Energy Efficiency (DFEE) 2 Fabric U-values	55.53 kWh/m ² 48.84 kWh/m ²)K
Element Ave	age Highest	
External wall 0.20	(max. 0.30) 0.20 (max. 0.70) C)K)K
Floor 0.16 Roof 0.16	(max. 0.25) 0.16 (max. 0.70) C (max. 0.20) 0.16 (max. 0.35) C	OK OK OK
2a Thermal bridging		
Thermal bridging calculated from linear therm	al transmittances for each junction	
3 Air permeability Air permeability at 50 pascals: Maximum	5.00 (design value) 10.0 C	Ж
4 Heating efficiency Main heating system:	Boiler system with radiators or underfloor -	
	Mains gas Data from database Vaillant ecoTEC VU GB 656/4-5-H Efficiency: 88.7% SEDBUK2009 Minimum: 88.0%	Ж
Secondary heating system:	None	
5 Cylinder insulation		
Hot water storage)K)K
Primary pipework insulated: 6 Controls	Yes C	//\
Space heating controls: Hot water controls:	Cylinderstat C Independent timer for DHW	DK DK DK
Boiler interlock 7 Low energy lights Percentage of fixed lights with low-energy	Yes 0	OK
fittings:	10070	

Building Re	Page 2 of 6	
 Minimum	75%	OK
8 Mechanical ventilation		
Not applicable		
9 Summertime temperature		
Overheating risk (Thames Valley):	Not significant	OK
Based On:		
Overshading:	Average	
Windows facing South:	39.60 m ² , No overhang	
Air change rate:	8.00 ach	
Blinds/curtains:	None	
10 Key features		
Party wall U-value Photovoltaic array	0.00 W/m ² K	



Property Reference: Right

Issued on Date: 04.Apr.2016 Prop Type Ref:

Survey Reference: P Property:	V Right		Prop Type Ref:							
SAP Rating: 93 A CO2 Emis Environmental:91 B General R		2.18 DER: 8.98 Pass Pass DFEE: 48.84 Pass	TER: 13.48 TFEE:55.53		ntage DER <te ntage DFEE<t< th=""><th></th></t<></te 					
CfSH Results Version:		ENE1 Credits: N/A ENE2	Credits: N/A E	NE7 Credits:	N/A CfSH I	Level: N/A				
	nes, Tel: 0115 923170 e, West Bridgford, Notti			S	urveyor ID:	4477-0001				
Software Version: Elmhurst SAP version: SAP 2012, Re										
SUMMARY FOR INPUT	DATA FOR New Build (As Designed)			I	Page 3 of 6				
Orientation 1.0 Property Type 2.0 Number of Storeys 3.0 Date Built 3.0 Property Age Band 4.0 Sheltered Sides 5.0 Sunlight/Shade	South House, End-To 4 2016 2 Average or un									
6.0 Measurements										
	Heat Loss Perimeter	Internal Floor Area	Average St	orey Height						
Basement:	39.11	104.83	2.	60						
1st Storey:	38.51	87.87	3.	20						
2nd Storey:	32.77	73.57	3.	00						
3rd Storey:	32.77	73.57	2.	90						
7.0 Living Area	61.38									
8.0 Thermal Mass Parameter	Simple calcula	tion - Medium								
9.0 External Walls										
Description		ense plaster, lightweight	U-Value	Kappa	Gross Area	Nett Area				
Basement	aggregate bloo	ck, filled cavity, any outside	0.20		101.68	101.68				

Main	structure Cavity wall; dense plaster, lightweight aggregate block, filled cavity, any outside structure	0.20		316.58	275.09
9.1 Party walls Description	Construction	Kap		Area	
Description			γμα γ		
Party Wall 1	Dense plaster both sides. lightweight aggre blocks, cavity or cavity fill	egate	6	6.08	
10.0 External Roofs					
Description	Construction	U-Value	Kappa	Gross Area	Nett Area
Flat	Plasterboard, insulated flat roof	0.16		104.83	100.99
10.1 Party Ceilings					
Description	Construction	Kap	opa A	Area	
Party Ceilings 1	Other		8	7.87	
g and 1	Concrete floor slab, carpeted		16	60.00	
11.0 HeatLoss Floors					
Description	Construction	U-Value	Kappa	Area	
Basement	Slab on ground, screed over insulation	0.16		104.83	

Description			Construct	ion				Kappa	Area		
2 1 and g			Precast c	oncrete pl	anks floor,	screed, ca	rpeted		236.00		
12.0 Openir	0 71	_							_		
Description	Data Source	Туре	Glazing	(Blazing Gap	Argon Filled	d Sola	ar Trans F	rame Type	Frame Fac	tor U value
Door	Manufacturer	Solid Door									1.60
Windows	Manufacturer	Window	Double gla	zed				0.76		0.70	1.40
Rooflight	Manufacturer	Roof Window	Double gla	zed				0.76		0.70	1.40
13.0 Openir Name	ngs Opening Type	Location		Orientation	Curtain Ty	20	Overhang	Wide	Width Height		Curtain
Name	Opening Type	Location	I	Onentation	Curtain Ty	þe	Ratio	Overhang		Journe Al	Closed
Door	Solid Door	[2] Main		South						1.	89
Windows	Window	[2] Main		South	None		0.00			39	.60
RL	Roof Window	[1] Flat		Horizontal	None					3.	84
14.0 Consei	rvatory		None								
15.0 Draugh			100								
16.0 Draugh	nt Lobby		No								
17.0 Therma	0 0		Calculate	Bridges							
17.1 List of Source Type	0	Bridge Type							Length	Psi	Imported
Independen	tly assessed	E1 Steel linte	I with perfo	rated stee	l base plat	e			18.90	0.050	Yes
Table K1 - A	•	E3 Sill							18.00	0.040	Yes
Table K1 - A	Approved	E4 Jamb							70.20	0.050	Yes
Table K1 - A	Approved	E5 Ground flo	oor (norma)					38.51	0.160	No
Table K1 - D	Default	E22 Baseme	nt floor						39.11	0.070	No
Table K1 - A	Approved	E6 Intermedia	ate floor wi	thin a dwe	lling				65.54	0.070	No
Table K1 - D	Default	E15 Flat roof	with parap	et	•				32.57	0.560	No
Table K1 - A	Approved	E16 Corner (I							26.00	0.090	No
Table K1 - A		E17 Corner (i	,	nternal are	a areater t	han externa	al area)		2.60	-0.090	No
Table K1 - A		E18 Party wa			J		,		23.40	0.060	Yes
Table K1 - D	••	P1 Party wall		-					5.29	0.160	No
Table K1 - D		P2 Party wall			within a dw	ellina			10.74	0.000	No
Table K1 - D		P4 Party wall				Ũ			5.37	0.240	No
18.0 Pressu	ire Testina		Yes								
Designe	0		5.00								
	/ Tested ?										
As Built											
	s Designed ?	n									
	ical Ventilation		No								
Present		-									
	ed Installation		\A/instance	f							
	s open in hot w entilation possil		Yes	fully open							
Night Ve			No								
Air chan	nge rate		8.00								
	ical Ventilation	data Type									
Type MV Refe	erence Number										
Configui											
0	Duct Insulated										
	cturer SFP										
Duct Ty											
Wet Roc	Efficiency										
Brand, N											
	Open Fireplace										
		MH			Total						
Number of C	•	(0	0						
Number of c	•	C)	0	0						
	ntermittent fans	3			4						
•	bassive vents				0						
	lueless gas fire	S			0						
21.0 Cooling		hurst Eporav Sveta	No								

22.0 Lighting Internal	
Total number of light fittings	20
Total number of L.E.L. fittings	20
Percentage of L.E.L. fittings	100.00
External External lights fitted	No
Light and motion sensors 23.0 Electricity Tariff	Standard
	Stanuaru
24.0 Heating Systems Main Heating 1 Description	Database
Percentage of Heat	100 %
Main Heating 2 Description	None
Percentage of Heat Community Heating	%
Secondary Heating	None
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery	No
Instantaneous System 1	
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage System	No
System Solar Panel	No
25.0 Main Heating 1	
Database Ref. No.	15993
Fuel Type	Mains gas
Main Heating	BGB
TestMethod	
SAP Code	102
Efficiency (Split Efficiences) %	
Efficiency (Split Efficiences) % In Winter	89.7
In Summer	79.0
Model Name	18.0
Manufacturer	
Controls	CBI Time and temperature zone control
PCDF Controls	0
Delayed Start Stat	Yes
Sap Code	2110
Burner Control	
Boiler Compensator	
HETAS approved System Oil Pump Inside	
FI Case	
FI Water	
Flue Type	Balanced
Smoke Control Area	
Fan Assisted Flue	Yes
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Underfloor Heating Flow Temperature	<= 35°C
Electric CPSU Temperature	
Combi boiler type	
Combi keep hot type	
Combi store type	
27.0 Community Heating	
Space Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value Controls	
SAP Code	
Water Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Charging Linked To Heat Use	
28.0 Secondary Heating	
Description	
SHS efficiency %	
SAP Code	

HETAS Approv	ved System		
Smoke Control	Area		
Test Method			
Manufacturer Model Name			
29.0 Water Heating	a		HWP From main heating 1
Water use <= 1		on/day	Yes
SAP Code	,pore	, or i, addy	901
Immersion Hea	ater		
Summer Imme			
Suplementary			
Immersion Onl			
29.1 Flue Gas Hea Database ID	at Recovery S	ystem	
Brand Model			
Details			
29.2 Waste Water	Heat Recove	ry	
System			
Total rooms wi		d/or bath	
30.0 Hot Water Cy	linder		Hot Water Cylinder
Cylinder Stat Cylinder In Hea	ated Snace		Yes Yes
Independent Ti			Yes
Insulation Type			Foam
Insulation Thic			
Cylinder Volum			300.00
Loss (kwh/day))		
Pipes insulation In Airing Cupbo			Fully insulated primary pipework
31.0 Solar Panel	Jaiu		
Solar Panel Ar	ea		
Area Type	ca		
Panel Type			
n0, a1, a2, A/G	i ratio		
Orientation			
Elevation			
Overshading Solar Storage V	Volume		
Pump electrica			
Combined Cyli			
32.0 Thermal Store	Э		None
Thermal Store			
33.0 Photovoltaic l			One Dwelling
Apportioned K PV Cells kW Peak		Elevatio	on Oversheding
PV Cells KVV Peak	Onentation	Elevatio	on Overshading
3.40	South	30°	None Or
0110	0000		Little
24.0 Wind Turbing			
34.0 Wind Turbine Terrain Type	5		Urban
Wind Turbines			
Count			
Apportioned K			
Rotor Diameter	r		
Hub Height 35.0 Small-scale H	ludro		
Electricity Gen			
Description	ciulou		
Apportioned kV	Vh/Year		
Recommendations			
None			
Further measures	to achieve ev	en higher	
standards			
None			



Building	Regu	ation Cor	mplia	nce					Page 1	of 6
Property Reference: Left Survey Reference: GSHP Left Property:							n Date pe Ref		vpr.201	6
SAP Rating: 88 B CO2 Emissions (t/year): Environmental:89 B General Requirements Compliance:		R: 9.66 Pass EE:48.84 Pass		20.04 :55.53			entage D entage D		ER: 51 TFEE: 12	.79 % 2.06 %
CfSH Results Version:	ENE1 Cr	edits: N/A ENE	2 Credits:	N/A E	NE7 C	redits:	N/A	CfSH	Level:	N/A
Surveyor: Richard Holmes, Tel: 0115 9231707 Address: Denton Drive, West Bridgford, Nottir Client:		NG2 7FS				ç	Surveyc	or ID:	4477-0	001
Software Version: Elmhurst Energy Systems SAP2 SAP version: SAP 2012, Regs Region: England (Pa	012 Calo art L1A 2	culator (Design 2013), Calculat	n Systen tion Typ	n) versi e: New	ion 3.0 / Build	05r04 I (As	4 Desigr	ned)		
SUMMARY FOR INPUT DATA FOR New Build (A	As Desig	ned)								
1a TER and DER Fuel for main heating: Fuel factor:		Electricity 1.55 (electi								
Target Carbon Dioxide Emission Rate (TE Dwelling Carbon Dioxide Emission Rate (I		20.04 kg/m 9.66 kg/m ²							Ok	<
1b TFEE and DFEE Target Fabric Energy Efficiency (TFEE) Dwelling Fabric Energy Efficiency (DFEE)	1	55.53 kWh 48.84 kWh							Oł	<
2 Fabric U-values	_									
Element A	Average	e	High	est						
		ax. 0.30)	0.20	(max	. 0.70	D)			Ok	
,	•	ax. 0.20)	-	,	o - 7	•			Ok	
		ax. 0.25)		(max.		'			Ok	
		ax. 0.20) ax. 2.00)		(max. (max.					Ok Ok	
2a Thermal bridging			(1-		•				
Thermal bridging calculated from linear th 3 Air permeability	ermai t	ransmittanc	es for	eacn	Junct	lion				
Air permeability at 50 pascals:		5.00 (desig	ın valu	e)						
Maximum		10.0	jii valu	0)					Ok	<
4 Heating efficiency		10.0								
Main heating system:		Heat pump Electric	with r	adiato	ors o	r un	derflo	or -		
		Vaillant geo 103/2	other	RM ex	clusi	ive ´	10 kW	VWS	S	
Secondary heating system:		None								
5 Cylinder insulation		N	-							
Hot water storage 6 Controls		No cylinder	r							
Space heating controls: Hot water controls:		Time and to No cylinder		ature	zone	e co	ntrol		Ok	<
7 Low energy lights Percentage of fixed lights with low-energy	,	100%								
fittings: Minimum 9 Machanical ventilation		75%							Ok	<
8 Mechanical ventilation Not applicable										
9 Summertime temperature Overheating risk (Thames Valley):		Not signific	ant						٥k	 <
Based On:										

Building Regulation Compliance								
Overshading: Windows facing South: Air change rate: Blinds/curtains:	Average 39.60 m ² , No overhang 8.00 ach None							
10 Key features Party wall t	J-value 0.00 W/m ² K							



Property Reference: Left Survey Reference: GSHP Left

Issued on Date: 04.Apr.2016 Prop Type Ref:

SAP Rating: 88 B CO2 Emiss Environmental:89 B General R		2.77 DER: 9.66 Pass DFEE: 48.8		: 20.04 E: 55.53		ntage DER<		.79 ° .06 °
CfSH Results Version:		ENE1 Credits: N/	A ENE2 Credit	: N/A ENE7	Credits:	N/A CfS	6H Level:	N/A
,	nes, Tel: 0115 9231707 , West Bridgford, Notting	gham, NG2 7F	5		Su	irveyor ID:	4477-00	001
Software Version: Elmhurst	Energy Systems SAP20	12 Calculator (Design Syste	m) version	3 05r04			
SAP version: SAP 2012, Re						Designed)		
	gs Region: England (Par	rt L1A 2013), C				Designed)	Page 3 c	of 6
SAP version: SAP 2012, Re	gs Region: England (Par	rt L1A 2013), C				Designed)	Page 3 c	of 6
SAP version: SAP 2012, Re	gs Region: England (Par ATA FOR New Build (As	rt L1A 2013), C s Designed)				Designed)	Page 3 c	of 6
SAP version: SAP 2012, Re SUMMARY FOR INPUT D Orientation 1.0 Property Type	gs Region: England (Par ATA FOR New Build (As South	rt L1A 2013), C s Designed)				Designed)	Page 3 c	of 6
SAP version: SAP 2012, Re SUMMARY FOR INPUT D Orientation 1.0 Property Type 2.0 Number of Storeys	gs Region: England (Par ATA FOR New Build (As South House, End-Terr	rt L1A 2013), C s Designed)				Designed)	Page 3 c	of 6
SAP version: SAP 2012, Re SUMMARY FOR INPUT D Orientation 1.0 Property Type 2.0 Number of Storeys 3.0 Date Built	gs Region: England (Par ATA FOR New Build (As South House, End-Terr 4	rt L1A 2013), C s Designed)				Designed)	Page 3 c	of 6
SAP version: SAP 2012, Re SUMMARY FOR INPUT D Orientation	gs Region: England (Par ATA FOR New Build (As South House, End-Terr 4	rt L1A 2013), C s Designed)				Designed)	Page 3 c	of 6

6.0 Measurements

6.0 Measurements						
	Heat Loss Perimeter	Internal Floor Area	Average Sto	orey Height		
Basement:	39.11	104.83	2.6	50		
1st Storey:	38.51	87.87	3.2	20		
2nd Storey:	32.77	73.57	3.0	00		
3rd Storey:	32.77	73.57	2.9	90		
7.0 Living Area	61.38					
8.0 Thermal Mass Parameter	Simple calculat	tion - Medium				
9.0 External Walls						
Description	Construction	en en la sterre Park (en l'als (U-Value	Kappa	Gross Area	Nett Area
Basement	aggregate bloc structure	nse plaster, lightweight k, filled cavity, any outside	0.20		101.68	101.68
Main		nse plaster, lightweight k, filled cavity, any outside	0.20		316.58	275.09
9.1 Party walls						
Description	Construction		Kap	opa A	rea	
Party Wall 1	Dense plaster blocks, cavity c	both sides. lightweight aggr or cavity fill	egate	6	6.08	
10.0 External Roofs						
Description	Construction		U-Value	Kappa	Gross Area	Nett Area
Flat	Plasterboard, i	nsulated flat roof	0.16		104.83	100.99
10.1 Party Ceilings Description	Construction		Кар	opa A	vrea	
Party Ceilings 1	Other			8	7.87	
g and 1	Concrete floor	slab, carpeted		16	60.00	
11.0 HeatLoss Floors						
Description	Construction		U-Value	Kappa	Area	
Basement	Slab on ground	d, screed over insulation	0.16		104.83	
11.1 Party Floors						

Description			Construct	ion				Kappa	Area		
2 1 and g			Precast c	oncrete pl	anks floor,	screed, ca	rpeted		236.00		
12.0 Openir	0 71	_							_		
Description	Data Source	Туре	Glazing	(Blazing Gap	Argon Filled	d Sola	ar Trans F	rame Type	Frame Fac	tor U value
Door	Manufacturer	Solid Door									1.60
Windows	Manufacturer	Window	Double gla	zed				0.76		0.70	1.40
Rooflight	Manufacturer	Roof Window	Double gla	zed				0.76		0.70	1.40
13.0 Openir Name	ngs Opening Type	Location		Orientation	Curtain Ty	20	Overhang	Wide	Width Height		Curtain
Name	Opening Type	Location	I	Onentation	Curtain Ty	þe	Ratio	Overhang		Journe Al	Closed
Door	Solid Door	[2] Main		South						1.	89
Windows	Window	[2] Main		South	None		0.00			39	.60
RL	Roof Window	[1] Flat		Horizontal	None					3.	84
14.0 Consei	rvatory		None								
15.0 Draugh			100								
16.0 Draugh	nt Lobby		No								
17.0 Therma	0 0		Calculate	Bridges							
17.1 List of Source Type	0	Bridge Type							Length	Psi	Imported
Independen	tly assessed	E1 Steel linte	I with perfo	rated stee	l base plat	e			18.90	0.050	Yes
Table K1 - A	•	E3 Sill							18.00	0.040	Yes
Table K1 - A	Approved	E4 Jamb							70.20	0.050	Yes
Table K1 - A	Approved	E5 Ground flo	oor (norma)					38.51	0.160	No
Table K1 - D	Default	E22 Baseme	nt floor						39.11	0.070	No
Table K1 - A	Approved	E6 Intermedia	ate floor wi	thin a dwe	lling				65.54	0.070	No
Table K1 - D	Default	E15 Flat roof	with parap	et	•				32.57	0.560	No
Table K1 - A	Approved	E16 Corner (I							26.00	0.090	No
Table K1 - A		E17 Corner (i	,	nternal are	a areater t	han externa	al area)		2.60	-0.090	No
Table K1 - A		E18 Party wa			J		,		23.40	0.060	Yes
Table K1 - D	••	P1 Party wall		-					5.29	0.160	No
Table K1 - D		P2 Party wall			within a dw	ellina			10.74	0.000	No
Table K1 - D		P4 Party wall				Ũ			5.37	0.240	No
18.0 Pressu	ire Testina		Yes								
Designe	0		5.00								
	/ Tested ?										
As Built											
	s Designed ?	n									
	ical Ventilation		No								
Present		-									
	ed Installation		\A/instance	f							
	s open in hot w entilation possil		Yes	fully open							
Night Ve			No								
Air chan	nge rate		8.00								
	ical Ventilation	data Type									
Type MV Refe	erence Number										
Configui											
0	Duct Insulated										
	cturer SFP										
Duct Ty											
Wet Roc	Efficiency										
Brand, N											
	Open Fireplace										
		MH			Total						
Number of C	•	(0	0						
Number of c	•	C)	0	0						
	ntermittent fans	3			4						
•	bassive vents				0						
	lueless gas fire	S			0						
21.0 Cooling		hurst Eporav Sveta	No								

22.0 Lighting Internal	
Total number of light fittings	20
Total number of L.E.L. fittings	20
Percentage of L.E.L. fittings	100.00
External External lights fitted	No
Light and motion sensors	Chandrad
23.0 Electricity Tariff	Standard
24.0 Heating Systems	Patahaaa
Main Heating 1 Description	Database
Percentage of Heat	100 %
Main Heating 2 Description	None
Percentage of Heat	%
Community Heating Secondary Heating	None
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery	No
Instantaneous System 1	
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage	No
System	
Solar Panel	No
25.0 Main Heating 1 Database Ref. No.	100083
Fuel Type	Electricity
Main Heating	PER
TestMethod	
SAP Code	221
Efficiency (Split Efficiences) %	
Efficiency (Split Efficiences) %	
In Winter	436.1
In Summer	202.5
Model Name	
Manufacturer Controls	CHD Time and temperature zone control
PCDF Controls	0
Delayed Start Stat	•
Sap Code	2207
Burner Control	
Boiler Compensator	
HETAS approved System	
Oil Pump Inside	
FI Case FI Water	
Flue Type	
Smoke Control Area	
Fan Assisted Flue	
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Underfloor Heating	0540
Flow Temperature	<= 35°C
Electric CPSU Temperature Combi boiler type	
Combi keep hot type	
Combi store type	
27.0 Community Heating	
Space Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Controls SAP Code	
Water Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Charging Linked To Heat Use	
28.0 Secondary Heating	
Description	
SHS efficiency %	
SAP Code	

HETAS Approved System Smoke Control Area Test Method Manufacturer Model Name				
 29.0 Water Heating Water use <= 125 litres/person/day SAP Code Immersion Heater Summer Immersion Suplementary Immersion Immersion Only Heating Hot Water 29.1 Flue Gas Heat Recovery System Database ID Brand Model Details 29.2 Waste Water Heat Recovery 	HWP From main hea Yes 901	ting 1		
System Total rooms with shower and/or bath 30.0 Hot Water Cylinder Cylinder Stat	Internal Store			
Cylinder In Heated Space Independent Time Control Insulation Type Insulation Thickness	Measured Loss			
Cylinder Volume Loss (kwh/day) Pipes insulation In Airing Cupboard	175.00 2.00			
31.0 Solar Panel Solar Panel Area Area Type Panel Type n0, a1, a2, A/G ratio Orientation Elevation Overshading Solar Storage Volume Pump electrically powered Combined Cylinder				
 32.0 Thermal Store Thermal Store Pipework 33.0 Photovoltaic Unit Apportioned KWh/Year 34.0 Wind Turbines 				
Vind Turbines Terrain Type Wind Turbines Count Apportioned Kwh/year Rotor Diameter Hub Height 35.0 Small-scale Hydro	Urban			
Electricity Generated Description Apportioned kWh/Year Recommendations				
None Further measures to achieve even higher				
standards Solar photovoltaic panels, 2.5 kWp	£5,000 - £8,000	£279	A 92	A 92



Building	g Regu	llation Col	mpliance			Page 1 of 6
Property Reference: Mid Survey Reference: GSHP Mid Property:				Issued or Prop Typ	n Date: 04.A be Ref:	pr.2016
SAP Rating: 89 B CO2 Emissions (t/year): Environmental:90 B General Requirements Compliance		ER: 9.28 Pass FEE:44.83 Pass	TER: 19.08 TFEE:51.30		ntage DER <ti ntage DFEE<t< td=""><td>ER: 51.36 % IFEE: 12.60 %</td></t<></ti 	ER: 51.36 % IFEE: 12.60 %
CfSH Results Version:		Credits: N/A ENE	2 Credits: N/A	ENE7 Credits:		Level: N/A
Surveyor: Richard Holmes, Tel: 0115 92317 Address: Denton Drive, West Bridgford, No Client: Client:	ttingham,				urveyor ID:	4477-0001
Software Version: Elmhurst Energy Systems SAF SAP version: SAP 2012, Regs Region: England						
SUMMARY FOR INPUT DATA FOR New Build	(As Desig	gned)				
1a TER and DER						
Fuel for main heating:		Electricity				
Fuel factor:		1.55 (elect				
Target Carbon Dioxide Emission Rate (19.08 kg/m				ОК
Dwelling Carbon Dioxide Emission Rate	(DEK)	9.28 kg/m ²				
Target Fabric Energy Efficiency (TFEE)		51.30 kWh	/m ²			
Dwelling Fabric Energy Efficiency (DFEI	E)	44.83 kWh				OK
2 Fabric U-values	,					
Element	Averag	je	Highest			
External wall	0.20 (n	nax. 0.30)	0.20 (max	. 0.70)		OK
Party wall		nax. 0.20)	-	,		OK
Floor	· ·	nax. 0.25)	0.16 (max			OK
Roof		nax. 0.20)	0.16 (max	,		OK OK
Openings	1.41 (1	nax. 2.00)	1.60 (max	. 3.30)		
2a Thermal bridging	thormol	tranomittana	oo far aaab	iunation		
Thermal bridging calculated from linear 3 Air permeability	inemai	transmittanc	es for each	Junction		
Air permeability at 50 pascals:		5.00 (desig	n value)			
Maximum		10.0	,,			OK
4 Heating efficiency						
Main heating system:		Heat pump Electric	with radiat	ors or und	lerfloor -	
			oTHERM ex	clusive 1	0 kW VWS	6
Secondary heating system:		103/2 None				
5 Cylinder insulation						
Hot water storage		No cylinde	r			
6 Controls		-				
Space heating controls:			emperature	zone con	itrol	OK
Hot water controls:		No cylinde	r			
7 Low energy lights Percentage of fixed lights with low-energy	ду	100%				
fittings: Minimum		75%				ОК
8 Mechanical ventilation						
Not applicable						
9 Summertime temperature						
Overheating risk (Thames Valley):		Not signific	ant			OK
Based On:						

Building Regulation Compliance	Building	g Regulation	Compliance
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Overshading: Windows facing South: Air change rate: Blinds/curtains:

Average 36.96 m², No overhang 8.00 ach None

10 Key features

Party wall U-value

 $0.00 \text{ W/m}^2\text{K}$



Property Reference: Mid Survey Reference: GSHP Mid

Issued on Date: 04.Apr.2016 Prop Type Ref:

Property:								-					
SAP Rating: Environmenta	89 B CO2 Emissions (al:90 B General Require			DER: DFEE			TER: TFEE:			entage D entage D			51.36 % 12.60 %
CfSH Results	S Version:		ENE	E1 Credit	s: N/A	ENE2	2 Credits:	N/A ENE7	Credits:	N/A	CfSH	Level:	N/A
Surveyor: Address: Client:	Richard Holmes, T Denton Drive, Wes			m, NG2	2 7FS				S	Surveyo	r ID:	4477	-0001
	ersion: Elmhurst Energ n: SAP 2012, Regs Re	, ,			``	0	,	,			ed)		
SUMMARY	Y FOR INPUT DATA I	FOR New Build	(As De	esigned	I)							Page	3 of 6
Orientation 1.0 Property 7 2.0 Number o 3.0 Date Built	of Storeys	South House, Mid-T 4 2016	errace										

4.0 Sheltered Sides 5.0 Sunlight/Shade 6.0 Measurements

3.0 Property Age Band

2

Average or unknown

6.0 Measurements							
	Heat Loss Perimeter	Internal Floor Area	Average Sto	orey Height			
Basement:	27.00	91.80	2.6	50			
1st Storey:	27.00	68.72	3.2	20			
2nd Storey:	27.00	72.49	3.0				
3rd Storey:	27.00	72.49	2.90				
7.0 Living Area	64.78						
8.0 Thermal Mass Parameter	Simple calcula	tion - Medium					
9.0 External Walls Description	Construction Cavity wall: de	nse plaster, lightweight	U-Value	Kappa	Gross Area	Nett Area	
Basement	aggregate bloc structure	ck, filled cavity, any outside	0.20		70.20	70.20	
Main		nse plaster, lightweight ck, filled cavity, any outside	0.20		245.70	206.85	
9.1 Party walls Description	Construction		Kap		Area		
Party Wall 1		both sides. lightweight aggre or cavity fill			31.30		
10.0 External Roofs Description	Construction		U-Value	Kappa	Gross Area	Nett Area	
Flat	Plasterboard, i	insulated flat roof	0.16		91.80	87.96	
10.1 Party Ceilings Description	Construction		Kap	opa A	Area		
Party Ceilings 1	Other			8	7.87		
g and 1	Concrete floor	slab, carpeted		16	60.00		
11.0 HeatLoss Floors Description	Construction		U-Value	Карра	Area		
Basement	Slab on ground	d, screed over insulation	0.16		91.80		

Description			Constru	uction				Kappa	a	Area			
2 1 and g			Precas	t concrete pl	anks floor,	screed, car	peted		:	236.00)		
12.0 Opening Description	Types Data Source	Туре	Glazing	C	Blazing Gap	Argon Filled	l Sola	ar Trans	Frame Ty	/pe	Frame I	Factor	· U value
Door	Manufacturer	Solid Door											1.60
Windows	Manufacturer	Window	Double	glazed				0.76			0.7	0	1.40
Rooflight	Manufacturer	Roof Window	Double	glazed				0.76			0.7	0	1.40
13.0 Opening Name	s Opening Type	Locatior	n	Orientatior	Curtain Ty	/pe	Overhang		Width	Height	Count	Area	Curtai
					-		Ratio	Overhan	g	-			Closed
Door	Solid Door	[2] Main		South								1.89	
Windows	Window	[2] Main		South	None		0.00					36.9	6
RL	Roof Window	[1] Flat		Horizontal	None							3.84	
14.0 Conserva 15.0 Draught			None 100										
16.0 Draught			No										
17.0 Thermal			Calcula	ate Bridges									
17.1 List of Br	idges	Bridge Ture							ı	onath	Dei		mnorted
Source Type		Bridge Type							L	ength	Psi	I	mported
Independently	assessed	E1 Steel linte	l with pe	rforated stee	el base plat	e			1	7.70	0.05	50 `	res
Table K1 - Ap	proved	E3 Sill							1	6.80	0.04	0	res
Table K1 - Ap	proved	E4 Jamb							6	5.80	0.05	50 `	res
Table K1 - Ap	proved	E5 Ground flo	oor (norn	nal)					2	7.00	0.16	50 `	res
Table K1 - Ap	proved	E6 Intermedia	ate floor	within a dwe	lling				5	4.00	0.07	1 O'	No
Table K1 - De	fault	E15 Flat roof	with par	apet					2	7.00	0.56	1 03	No
Table K1 - Ap	proved	E18 Party wa	II betwee	en dwellings					4	6.80	0.06	50 `	res
Table K1 - De	fault	P1 Party wall	- Groun	d floor					1	0.58	0.16	1 03	No
Table K1 - De	fault	P2 Party wall	- Interm	ediate floor	within a dw	elling			2	1.48	0.00	00	No
18.0 Pressure Designed Property T As Built q Same As 19.0 Mechani	q50 Tested ? 50 Designed ?	1	Yes 5.00										
Mechanica Present	al Ventilation		No										
	Installation	oothor	Window	ws fully open									
	tilation possib		Yes										
Night Ven	tilation .		No										
	e rate al Ventilation	data Type	8.00										
Type MV Refere	ence Number												
Configura													
MVHR Du Manufactu	ct Insulated												
Duct Type													
MVHR Eff	iciency												
Wet Room Brand, Mo													
20.0 Fans, Op		s, Flues											
		M	IS SH		Total								
Number of Ch	-	(0	0								
Number of op		()	0	0								
Number of int					4								
Number of pa		_			0								
Number of flu	eless gas fire	S			0								
21.0 Cooling	System		No										
22.0 Lighting													
Internal Total r	number of ligh	nt fittinas	20										
Total r	number of L.E	L. fittings	20										
-	ntage of L.E.L	fittings	100.00										

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External	
External lights fitted	No
Light and motion sensors	
23.0 Electricity Tariff	Standard
24.0 Heating Systems	
Main Heating 1	Database
Description	
Percentage of Heat	100 %
Main Heating 2 Description	None
Percentage of Heat	%
Community Heating	70
Secondary Heating	None
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery	No
Instantaneous System 1 Waste Water Heat Recovery	No
Instantaneous System 2	110
Waste Water Heat Recovery Storage	No
System	
Solar Panel	No
25.0 Main Heating 1	
Database Ref. No.	100083
Fuel Type	Electricity
Main Heating TestMethod	PER
SAP Code	221
Efficiency (Split Efficiences) %	
Efficiency (Split Efficiences) %	
In Winter	434.5
In Summer	202.5
Model Name	
Manufacturer Controls	CUD Time and temperature zone central
PCDF Controls	CHD Time and temperature zone control 0
Delayed Start Stat	•
Sap Code	2207
Burner Control	
Boiler Compensator	
HETAS approved System	
Oil Pump Inside FI Case	
FI Water	
Flue Type	
Smoke Control Area	
Fan Assisted Flue	
Is MHS Pumped	Pump in heated space
Heat Emitter Underfloor Heating	Radiators
Flow Temperature	<= 35°C
Electric CPSU Temperature	
Combi boiler type	
Combi keep hot type	
Combi store type	
27.0 Community Heating	
Space Community Heating PCDF Index	
Distribution Loss	
Distribution Loss Value	
Controls	
SAP Code	
Water Community Heating	
PCDF Index	
Distribution Loss Distribution Loss Value	
Charging Linked To Heat Use	
28.0 Secondary Heating	
Description	
SHS efficiency %	
SAP Code	
HETAS Approved System	
Smoke Control Area Test Method	
Manufacturer	
Model Name	

29.0 Water Heating Water use <= 125 litres/person/day SAP Code Immersion Heater Summer Immersion Suplementary Immersion Immersion Only Heating Hot Water 29.1 Flue Gas Heat Recovery System Database ID Brand Model Details 29.2 Waste Water Heat Recovery System	HWP From main heati Yes 901	ng 1		
Total rooms with shower and/or bath 30.0 Hot Water Cylinder Cylinder Stat Cylinder In Heated Space	Internal Store			
Independent Time Control Insulation Type Insulation Thickness Cylinder Volume	Measured Loss 175.00			
Loss (kwh/day) Pipes insulation In Airing Cupboard	2.00			
31.0 Solar Panel Solar Panel Area Area Type Panel Type n0, a1, a2, A/G ratio Orientation Elevation Overshading Solar Storage Volume Pump electrically powered Combined Cylinder				
 32.0 Thermal Store Thermal Store Pipework 33.0 Photovoltaic Unit Apportioned KWh/Year 34.0 Wind Turbines Terrain Type Wind Turbines Count 	Urban			
Apportioned Kwh/year Rotor Diameter Hub Height 35.0 Small-scale Hydro Electricity Generated Description Apportioned kWh/Year Recommendations				
None Further measures to achieve even higher				
standards Solar photovoltaic panels, 2.5 kWp	£5,000 - £8,000	£279	A 93	A 93



Building	g Regu	lation Col	nplian	ce		Page 1 of 6
Property Reference: Right Survey Reference: GSHP Right Property:				Issued o Prop Ty		04.Apr.2016
SAP Rating: 88 B CO2 Emissions (t/year): Environmental:89 B General Requirements Compliand		ER: 9.66 Pass FEE:48.84 Pass	TER: 20 TFEE:55		•	ER <ter: %<="" 51.79="" th=""></ter:>
CfSH Results Version:	ENE1 C	redits: N/A ENE	2 Credits:	N/A ENE7 Credits:	N/A	CfSH Level: N/A
Surveyor: Richard Holmes, Tel: 0115 92317 Address: Denton Drive, West Bridgford, No Client:	ttingham,				-	ID: 4477-0001
Software Version: Elmhurst Energy Systems SAI SAP version: SAP 2012, Regs Region: England						ed)
SUMMARY FOR INPUT DATA FOR New Build	l (As Desię	gned)				
1a TER and DER						
Fuel for main heating:		Electricity	n: = :+, .)			
Fuel factor: Target Carbon Dioxido Emission Pate (1.55 (elect 20.04 kg/m				
Target Carbon Dioxide Emission Rate (Dwelling Carbon Dioxide Emission Rate		9.66 kg/m ²				ОК
1b TFEE and DFEE		9.00 kg/m				
Target Fabric Energy Efficiency (TFEE)		55.53 kWh	/m ²			
Dwelling Fabric Energy Efficiency (DFE	E)	48.84 kWh	-			OK
2 Fabric U-values	/					
Element	Averag	16	Highes	t		
External wall	-		•	nax. 0.70)		OK
Party wall		nax. 0.30) nax. 0.20)	0.20 (I -	lax. 0.70)		OK
Floor	· ·	nax. 0.25)	0.16 (n	nax. 0.70)		OK
Roof	· ·	nax. 0.20)		nax. 0.35)		OK
Openings	1.41 (n	nax. 2.00)	1.60 (n	nax. 3.30)		OK
2a Thermal bridging						
Thermal bridging calculated from linear	thermal	transmittanc	es for ea	ach junction		
3 Air permeability		E 00 (dooid				
Air permeability at 50 pascals: Maximum		5.00 (desig 10.0	in value)			ОК
4 Heating efficiency		10.0				
Main heating system:		Heat pump	with rac	liators or un	derfloo	r -
3 - ,		Electric				
			oTHERN	1 exclusive '	10 kW '	VWS
		103/2				
Secondary heating system:		None				
5 Cylinder insulation			-			
Hot water storage 6 Controls		No cylinde				
Space heating controls:		Time and t	emperat	ure zone co	ntrol	OK
Hot water controls:		No cylinde	•			
7 Low energy lights Percentage of fixed lights with low-energy	ду	100%				
fittings: Minimum		750/				OK
8 Mechanical ventilation		75%				
Not applicable						
9 Summertime temperature						
Overheating risk (Thames Valley):		Not signific	ant			OK
Based On:		5				

	Building Regulation Compliance	Page 2 of 6
Overshading: Windows facing South: Air change rate: Blinds/curtains:	Average 39.60 m ² , No overhang 8.00 ach None	
10 Key features Party wall t	J-value 0.00 W/m ² K	



Property Reference: Right Survey Reference: GSHP Right

Issued on Date: 04.Apr.2016 Prop Type Ref:

Property:	C										
SAP Rating: Environmenta	88 B CO2 Emissions (t/year): I:89 B General Requirements Compliance		DER: 9.66		TER: TFEE:			entage D entage D			51.79 % 12.06 %
CfSH Results	Version:	ENE	E1 Credits: N/A	ENE	2 Credits:	N/A ENE7	Credits:	N/A	CfSH	Level:	N/A
Surveyor: Address: Client:	Richard Holmes, Tel: 0115 923170 Denton Drive, West Bridgford, Nott		m, NG2 7FS				S	Surveyo	or ID:	4477	-0001
	rsion: Elmhurst Energy Systems SAP: : SAP 2012, Regs Region: England (F								ed)		
SUMMAR	FOR INPUT DATA FOR New Build (As De	esigned)							Page	3 of 6
Orientation	South										

1.0 Property Type	House, End-Te	errace				
2.0 Number of Storeys	4					
3.0 Date Built	2016					
3.0 Property Age Band						
4.0 Sheltered Sides	2					
5.0 Sunlight/Shade	Average or un	known				
6.0 Measurements						
	Heat Loss Perimeter	Internal Floor Area	Average Sto	orey Height		
Basement:	39.11	104.83	2.6	60		
1st Storey:	38.51	87.87	3.2	20		
2nd Storey:	32.77	73.57	3.0	0		
3rd Storey:	32.77	73.57	2.9	0		
7.0 Living Area	61.38					
8.0 Thermal Mass Parameter	Simple calcula	tion - Medium				
9.0 External Walls						
Description	Construction		U-Value	Kappa	Gross Area	Nett Area
_		nse plaster, lightweight				
Basement		ck, filled cavity, any outside	0.20		101.68	101.68
	structure	and a location. Park to a lark t				
Main		nse plaster, lightweight	0.00		040 50	075.00
Main	structure	ck, filled cavity, any outside	0.20		316.58	275.09
	Siluciule					
9.1 Party walls						
Description	Construction		Кар	pa A	\rea	
	Dense plaster	both sides. lightweight aggre	egate			
Party Wall 1	blocks, cavity		0	6	6.08	
10.0 External Roofs				14	<u> </u>	N 1 <i>U</i> A
Description	Construction		U-Value	Kappa	Gross Area	Nett Area
Flat	Plasterboard i	insulated flat roof	0.16		104.83	100.99
			0.10		101.00	
10.1 Party Ceilings	O					
Description	Construction		Kap	pa P	Area	
Party Ceilings 1	Other			8	7.87	
g and 1	Concrete floor	slab, carpeted		16	60.00	
		, ,				
11.0 HeatLoss Floors	Construction		U-Value	Kanna	Aroa	
Description	Construction		U-value	Kappa	Area	
Basement	Slab on ground	d, screed over insulation	0.16		104.83	

Description			Construct	ion				Kappa	Area		
2 1 and g			Precast c	oncrete pl	anks floor,	screed, ca	rpeted		236.00		
12.0 Openir	0 71	_							_		
Description	Data Source	Туре	Glazing	(Blazing Gap	Argon Filled	d Sola	ar Trans F	rame Type	Frame Fac	tor U value
Door	Manufacturer	Solid Door									1.60
Windows	Manufacturer	Window	Double gla	zed				0.76		0.70	1.40
Rooflight	Manufacturer	Roof Window	Double gla	zed				0.76		0.70	1.40
13.0 Openir Name	ngs Opening Type	Location		Orientation	Curtain Ty	20	Overhang	Wide	Width Height		Curtain
Name	Opening Type	Location	I	Onentation	Curtain Ty	þe	Ratio	Overhang		Journe Al	Closed
Door	Solid Door	[2] Main		South						1.	89
Windows	Window	[2] Main		South	None		0.00			39	.60
RL	Roof Window	[1] Flat		Horizontal	None					3.	84
14.0 Consei	rvatory		None								
15.0 Draugh			100								
16.0 Draugh	nt Lobby		No								
17.0 Therma	0 0		Calculate	Bridges							
17.1 List of Source Type	0	Bridge Type							Length	Psi	Imported
Independen	tly assessed	E1 Steel linte	I with perfo	rated stee	l base plat	e			18.90	0.050	Yes
Table K1 - A	•	E3 Sill							18.00	0.040	Yes
Table K1 - A	Approved	E4 Jamb							70.20	0.050	Yes
Table K1 - A	Approved	E5 Ground flo	oor (norma)					38.51	0.160	No
Table K1 - D	Default	E22 Baseme	nt floor						39.11	0.070	No
Table K1 - A	Approved	E6 Intermedia	ate floor wi	thin a dwe	lling				65.54	0.070	No
Table K1 - D	Default	E15 Flat roof	with parap	et	•				32.57	0.560	No
Table K1 - A	Approved	E16 Corner (I							26.00	0.090	No
Table K1 - A		E17 Corner (i	,	nternal are	a areater t	han externa	al area)		2.60	-0.090	No
Table K1 - A		E18 Party wa			J		,		23.40	0.060	Yes
Table K1 - D	••	P1 Party wall		-					5.29	0.160	No
Table K1 - D		P2 Party wall			within a dw	ellina			10.74	0.000	No
Table K1 - D		P4 Party wall				Ũ			5.37	0.240	No
18.0 Pressu	ire Testina		Yes								
Designe	0		5.00								
	/ Tested ?										
As Built											
	s Designed ?	n									
	ical Ventilation		No								
Present		-									
	ed Installation		\A/instance	f							
	s open in hot w entilation possil		Yes	fully open							
Night Ve			No								
Air chan	nge rate		8.00								
	ical Ventilation	data Type									
Type MV Refe	erence Number										
Configui											
0	Duct Insulated										
	cturer SFP										
Duct Ty											
Wet Roc	Efficiency										
Brand, N											
	Open Fireplace										
		MH			Total						
Number of C	•	(0	0						
Number of c	•	C)	0	0						
	ntermittent fans	3			4						
•	bassive vents				0						
	lueless gas fire	S			0						
21.0 Cooling		hurst Eporav Sveta	No								

22.0 Lighting Internal	
Total number of light fittings	20
Total number of L.E.L. fittings	20
Percentage of L.E.L. fittings	100.00
External External lights fitted	No
Light and motion sensors	Chandrad
23.0 Electricity Tariff	Standard
24.0 Heating Systems	Patahaaa
Main Heating 1 Description	Database
Percentage of Heat	100 %
Main Heating 2 Description	None
Percentage of Heat	%
Community Heating Secondary Heating	None
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery	No
Instantaneous System 1	
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage	No
System	
Solar Panel	No
25.0 Main Heating 1 Database Ref. No.	100083
Fuel Type	Electricity
Main Heating	PER
TestMethod	
SAP Code	221
Efficiency (Split Efficiences) %	
Efficiency (Split Efficiences) %	
In Winter	436.1
In Summer	202.5
Model Name	
Manufacturer Controls	CHD Time and temperature zone control
PCDF Controls	0
Delayed Start Stat	•
Sap Code	2207
Burner Control	
Boiler Compensator	
HETAS approved System	
Oil Pump Inside	
FI Case FI Water	
Flue Type	
Smoke Control Area	
Fan Assisted Flue	
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Underfloor Heating	0540
Flow Temperature	<= 35°C
Electric CPSU Temperature Combi boiler type	
Combi keep hot type	
Combi store type	
27.0 Community Heating	
Space Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Controls SAP Code	
Water Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Charging Linked To Heat Use	
28.0 Secondary Heating	
Description	
SHS efficiency %	
SAP Code	

HETAS Approved System Smoke Control Area Test Method Manufacturer Model Name				
 29.0 Water Heating Water use <= 125 litres/person/day SAP Code Immersion Heater Summer Immersion Suplementary Immersion Immersion Only Heating Hot Water 29.1 Flue Gas Heat Recovery System Database ID Brand Model Details 29.2 Waste Water Heat Recovery 	HWP From main hea Yes 901	ting 1		
System Total rooms with shower and/or bath 30.0 Hot Water Cylinder Cylinder Stat	Internal Store			
Cylinder In Heated Space Independent Time Control Insulation Type Insulation Thickness	Measured Loss			
Cylinder Volume Loss (kwh/day) Pipes insulation In Airing Cupboard	175.00 2.00			
31.0 Solar Panel Solar Panel Area Area Type Panel Type n0, a1, a2, A/G ratio Orientation Elevation Overshading Solar Storage Volume Pump electrically powered Combined Cylinder				
 32.0 Thermal Store Thermal Store Pipework 33.0 Photovoltaic Unit Apportioned KWh/Year 34.0 Wind Turbines 				
Vind Turbines Terrain Type Wind Turbines Count Apportioned Kwh/year Rotor Diameter Hub Height 35.0 Small-scale Hydro	Urban			
Electricity Generated Description Apportioned kWh/Year Recommendations				
None Further measures to achieve even higher				
standards Solar photovoltaic panels, 2.5 kWp	£5,000 - £8,000	£279	A 92	A 92



Building	Regu	lation Co	omp	oliar	nce					Page	1 of 6
Property Reference: Left Survey Reference: ASHP Left Property:								n Date pe Ref		vpr.20	016
SAP Rating: 85 B CO2 Emissions (t/year): Environmental:86 B General Requirements Compliance		ER: 12.51 Pas FEE:48.84 Pas		TER: 2 TFEE:				entage [entage [37.56 % 12.06 %
CfSH Results Version:	ENE1 C	redits: N/A EN	IE2 Ci	redits:	N/A El	NE7 C	redits:	N/A	CfSH	I Level:	N/A
Surveyor: Richard Holmes, Tel: 0115 923170 Address: Denton Drive, West Bridgford, Not Client:		NG2 7FS					S	Surveyo	or ID:	4477	-0001
Software Version: Elmhurst Energy Systems SAP SAP version: SAP 2012, Regs Region: England (I									ned)		
SUMMARY FOR INPUT DATA FOR New Build	(As Desig	jned)									
1a TER and DER Fuel for main heating: Fuel factor: Target Carbon Dioxide Emission Rate (T	ER)	Electricity 1.55 (elec 20.04 kg/r	ctrici	ity)							
Dwelling Carbon Dioxide Emission Rate		12.51 kg/i								C	OK
Target Fabric Energy Efficiency (TFEE) Dwelling Fabric Energy Efficiency (DFEE	E)	55.53 kW 48.84 kW								C	ОК
2 Fabric U-values											
Element	Averag	е		lighe							
External wall	•	nax. 0.30)	C).20 (max.	0.7	0))K
Party wall	•	nax. 0.20)	-			0.7	^)K
Floor	•	nax. 0.25)			max.		,)K
Roof Openings	•	nax. 0.20) nax. 2.00)			max. max.		,)K)K
2a Thermal bridging											
Thermal bridging calculated from linear t	hermal	transmittan	ces	for e	each j	unc	tion				
3 Air permeability			:								
Air permeability at 50 pascals:		5.00 (des	ign	value))					C	Ж
Maximum 4 Heating officioney		10.0									
4 Heating efficiency Main heating system:		Heat pum Electric	ıp w	rith ra	diato	ors o	r un	derflo	or -		
		Mitsubish				5kW	/				
Secondary heating system:		PUHZ-W8 None	50 V		.)-D3						
5 Cylinder insulation						~ ~					
Hot water storage		Measured					JU K/	/vn/da	ay	ſ	Ж
Primary pipowork inculated		Permitted Yes	ру	DR2	062	.00					DK DK
Primary pipework insulated: 6 Controls		165									
Space heating controls:		Time and	terr	nera	atur≏	70n4	<u>م</u> م د	ntrol		C	ЭK
Hot water controls:		Cylinders		ipere		20110)K
		Independ		timer	for D	ЭНΜ	/)K
7 Low energy lights			-								
Percentage of fixed lights with low-energ	у	100%									
fittings:	-										
Minimum		75%									ЭК
8 Mechanical ventilation											
Not applicable											

Building	Regulation Compliance	Page 2 of 6
9 Summertime temperature Overheating risk (Thames Valley): Based On:	Not significant	ОК
Overshading:	Average	
Windows facing South: Air change rate:	39.60 m ² , No overhang 8.00 ach	
Blinds/curtains:	None	
10 Key features Party wall U-value	0.00 W/m²K	



Property Reference: Left Survey Reference: ASHP Left

Issued on Date: 04.Apr.2016 Prop Type Ref:

N/A

Page 3 of 6

Property: SAP Rating: 85 B CO2 Emissions (t/year): 3.61 DER: 12.51 Pass **TER:** 20.04 Percentage DER<TER: 37.56 % Environmental:86 B General Requirements Compliance: Pass DFEE:48.84 Pass TFEE:55.53 Percentage DFEE<TFEE: 12.06 % CfSH Results Version: ENE1 Credits: N/A ENE2 Credits: N/A ENE7 Credits: CfSH Level: N/A Richard Holmes, Tel: 0115 9231707 Surveyor ID: 4477-0001 Surveyor: Address: Denton Drive, West Bridgford, Nottingham, NG2 7FS Client: Software Version: Elmhurst Energy Systems SAP2012 Calculator (Design System) version 3.05r04 SAP version: SAP 2012, Regs Region: England (Part L1A 2013), Calculation Type: New Build (As Designed)

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

Orientation	South					
1.0 Property Type	House, End-Te	errace				
2.0 Number of Storeys	4					
3.0 Date Built	2016					
3.0 Property Age Band 4.0 Sheltered Sides	2					
5.0 Sunlight/Shade	Average or unl	known				
6.0 Measurements						
	Heat Loss Perimeter	Internal Floor Area	Average Sto	orey Height		
Basement:	39.11	104.83	2.6	60		
1st Storey:	38.51	87.87	3.2	20		
2nd Storey:	32.77	73.57	3.0	00		
3rd Storey:	32.77	73.57	2.9	90		
7.0 Living Area	61.38					
8.0 Thermal Mass Parameter	Simple calcula	tion - Medium				
9.0 External Walls						
Description	Construction		U-Value	Kappa	Gross Area	Nett Area
Description		nse plaster, lightweight	0.00		404.00	404.00
Basement	aggregate bloc	k, filled cavity, any outside	0.20		101.68	101.68
		nse plaster, lightweight				
Main	•	k, filled cavity, any outside	0.20		316.58	275.09
9.1 Party walls						
Description	Construction		Kap	opa A	Area	
Party Wall 1	Dense plaster blocks, cavity o	both sides. lightweight aggre or cavity fill	egate	6	6.08	
10.0 External Roofs						
Description	Construction		U-Value	Kappa	Gross Area	Nett Area
Flat	Plasterboard, i	nsulated flat roof	0.16		104.83	100.99
10.1 Party Ceilings						
Description	Construction		Kap	opa A	Area	
Party Ceilings 1	Other			8	7.87	
a. a.a.d. 4	Concrete floor	slab, carpeted		16	60.00	
g and 1		•				
11.0 HeatLoss Floors Description	Construction		U-Value	Kappa	Area	

Description			Construct	tion				Kappa	Area		
2 1 and g			Precast c	oncrete pl	anks floor,	screed, ca	rpeted		236.00		
12.0 Openir	0 71	_							_		
Description	Data Source	Туре	Glazing	(Blazing Gap	Argon Filled	d Sola	ar Trans F	rame Type	Frame Fac	tor U value
Door	Manufacturer	Solid Door									1.60
Windows	Manufacturer	Window	Double gla	zed				0.76		0.70	1.40
Rooflight	Manufacturer	Roof Window	Double gla	zed				0.76		0.70	1.40
13.0 Openir Name	ngs Opening Type	Location		Oriontation	Curtain Ty	20	Overhang	Wide	Width Height (Curtain
Name	Opening Type	Location		Onentation	Curtain Ty	þe	Ratio	Overhang			Closed
Door	Solid Door	[2] Main		South						1.	89
Windows	Window	[2] Main		South	None		0.00			39	.60
RL	Roof Window	[1] Flat		Horizontal	None					3.	84
14.0 Conse	nyatony		None								
15.0 Draugh			100								
16.0 Draugh	0		No								
17.0 Therma	al Bridging		Calculate	Bridges							
17.1 List of	0										
Source Type	e	Bridge Type							Length	Psi	Imported
Independen	tly assessed	E1 Steel linte	l with porfo	urated stee	l haso nlati	0			18.90	0.050	Yes
Table K1 - A	•	E3 Sill	r with perio		i base plat	6			18.00	0.030	Yes
	••	E4 Jamb							70.20	0.040	Yes
Table K1 - A	••		or (normal	I)					38.51	0.050	No
Table K1 - A	••	E5 Ground flo	`)							
Table K1 - E		E22 Basemer		ula :	lline er				39.11	0.070	No
Table K1 - A	••	E6 Intermedia			liing				65.54	0.070	No
Table K1 - E		E15 Flat roof		et					32.57	0.560	No
Table K1 - A		E16 Corner (i	normal) inverted - internal area greater than external area)					26.00	0.090	No	
Table K1 - A	••				a greater ti	nan externa	al area)		2.60	-0.090	No
Table K1 - ApprovedE18 Party wa			-					23.40	0.060	Yes	
Table K1 - E		P1 Party wall							5.29	0.160	No
Table K1 - E		P2 Party wall				Ũ			10.74	0.000	No
Table K1 - [Jefault	P4 Party wall	- Roof (Ins	ulation at	celling leve	el)			5.37	0.240	No
18.0 Pressu	0		Yes								
Designe	a q50 v Tested ?		5.00								
As Built	,										
	s Designed ?										
19.0 Mecha	inical Ventilatio	า									
	ical Ventilation	System	No								
Present	ed Installation										
	s open in hot w	reather	Windows	fully open							
Cross ve	entilation possil		Yes	, , ,							
	entilation		No								
Air chan	ige rate	doto Turo	8.00								
Туре		uala Type									
	erence Number										
Configu											
	Duct Insulated										
Duct Ty	cturer SFP										
	Efficiency										
Wet Roo	oms										
Brand, N		-									
20.0 Fans, (Open Fireplace	s, Flues M⊦	IS SHS	Other	Total						
Number of (Chimpove	IVIF C		0 0	0						
Number of (•				-						
Number of a	open flues	С	,	0	0 4						
		b			4 0						
	bassive vents	•			-						
	ilueless gas fire	5			0						
21.0 Cooline	• •	hurst Eporav Sveto	No								

22.0 Lighting	
Internal Total number of light fittings	20
Total number of L.E.L. fittings	20
Percentage of L.E.L. fittings	100.00
External	100.00
External lights fitted	No
Light and motion sensors	
23.0 Electricity Tariff	Standard
24.0 Heating Systems	
Main Heating 1	Database
Description	
Percentage of Heat	100 %
Main Heating 2	None
Description	
Percentage of Heat	%
Community Heating	
Secondary Heating	None
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery	No
Instantaneous System 1	
Waste Water Heat Recovery	No
Instantaneous System 2	NI-
Waste Water Heat Recovery Storage	INO
System	No
Solar Panel	No
25.0 Main Heating 1 Database Ref. No.	100061
	100061
Fuel Type Main Heating	Electricity PET
TestMethod	FLI
SAP Code	224
Efficiency (Split Efficiences) %	
Efficiency (Split Efficiences) %	
In Winter	351.3
In Summer	198.9
Model Name	
Manufacturer	
Controls	CHD Time and temperature zone control
PCDF Controls	0
Delayed Start Stat	
Sap Code	2207
Burner Control	
Boiler Compensator	
HETAS approved System	
Oil Pump Inside FI Case	
FI Water	
Flue Type	
Smoke Control Area	
Fan Assisted Flue	
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Underfloor Heating	
Flow Temperature	Normal (> 45°C)
Electric CPSU Temperature	
Combi boiler type	
Combi keep hot type	
Combi store type	
27.0 Community Heating	
Space Community Heating PCDF Index	
Distribution Loss	
Distribution Loss Distribution Loss Value	
Controls	
SAP Code	
Water Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Charging Linked To Heat Use	
28.0 Secondary Heating	
Description	
SHS efficiency %	
SAP Code	

HETAS Approved System Smoke Control Area Test Method Manufacturer Model Name				
29.0 Water Heating Water use <= 125 litres/person/day SAP Code Immersion Heater Summer Immersion Suplementary Immersion Immersion Only Heating Hot Water 29.1 Flue Gas Heat Recovery System Database ID Brand Model	HWP From main heatin Yes 901	ng 1		
Details 29.2 Waste Water Heat Recovery System Total rooms with shower and/or bath				
30.0 Hot Water Cylinder	Hot Water Cylinder			
Cylinder Stat	Yes			
Cylinder In Heated Space	Yes			
Independent Time Control	Yes			
Insulation Type Insulation Thickness	Measured Loss			
Cylinder Volume	175.00			
Loss (kwh/day)	2.00			
Pipes insulation	Fully insulated primary	pipework		
In Airing Cupboard				
31.0 Solar Panel				
Solar Panel Area				
Area Type				
Panel Type n0, a1, a2, A/G ratio				
Orientation				
Elevation				
Overshading				
Solar Storage Volume				
Pump electrically powered				
Combined Cylinder				
32.0 Thermal Store	None			
Thermal Store Pipework				
33.0 Photovoltaic Unit Apportioned KWh/Year				
34.0 Wind Turbines				
Terrain Type	Urban			
Wind Turbines				
Count				
Apportioned Kwh/year				
Rotor Diameter				
Hub Height				
35.0 Small-scale Hydro Electricity Generated				
Description				
Apportioned kWh/Year				
Recommendations				
None				
Further measures to achieve even higher standards				
Solar water heating	£4,000 - £6,000	£119	B 86	B 88
Solar photovoltaic panels, 2.5 kWp	£5,000 - £8,000	£279	B 90	B 91



	Building	Regu	lation Co	mplia	ince				Page	1 of 6
Property Reference: M Survey Reference: AS Property:							d on E Type	Date: 04. Ref:	Apr.2	016
SAP Rating: 86 B CO2 Emiss Environmental:87 B General Re			ER: 11.98 Pass FEE:44.83 Pass		: 19.08 E:51.30			age DER< age DFEE		37.21 ° 12.60 °
CfSH Results Version:		ENE1 C	redits: N/A ENE	E2 Credits	: N/A E	NE7 Cree	dits:	N/A Cfs	SH Level:	N/A
	nes, Tel: 0115 923170 , West Bridgford, Not		NG2 7FS				Sur	veyor ID:	4477	7-0001
Software Version: Elmhurst E SAP version: SAP 2012, Reg								signed)		
SUMMARY FOR INPUT D	ATA FOR New Build	(As Desig	ined)							
1a TER and DER										
Fuel for main heating:			Electricity							
Fuel factor:			1.55 (elect							
Target Carbon Dioxide			19.08 kg/n	n ²						
Dwelling Carbon Dioxid	le Emission Rate	(DER)	11.98 kg/n	n ²					(ЭК
1b TFEE and DFEE										
Target Fabric Energy E			51.30 kWh							
Dwelling Fabric Energy	Efficiency (DFEE)	44.83 kWh	n/m²					(ЭК
2 Fabric U-values										
Ele	ement	Averag	е	High	nest					
Evi	ternal wall	-	nax. 0.30)	•) (max.	0 70)			(ЭК
	rty wall	•	ax. 0.30)	-	(max.	0.70)				DK DK
Flo		•	ax. 0.20)	0.16	(max.	0 70)				DK DK
Ro		•	ax. 0.20)		6 (max.	,				DK DK
	enings		nax. 2.00)		(max.	,				DK
2a Thermal bridging	•		,		۰.	,				
Thermal bridging calcul	atod from linear t	hormal	ranemittand	oos for	oach	iunctio	n			
3 Air permeability		lenna	lansinitant	563 101	each	junctic	л Л			
Air permeability at 50 pa	ascals:		5.00 (desig	an valı	ID)					
Maximum	430413.		10.0	grivan	10)				(ЭК
4 Heating efficiency			10.0							
Main heating system:			Heat pump	o with	radiato	ors or	unde	rfloor -		
			Electric			- 1.3.47				
			Mitsubishi		-	-				
Secondary beating ayot	om:		PUHZ-W8	эүпа	(2)-03					
Secondary heating syst 5 Cylinder insulation	lem.		None							
Hot water storage			Measured	cylind	or loss	. 2 00	۱ ۲ /۷/۲	veb/d		
not water storage			Permitted					wuay	(ЭК
Primary pipework insula	atod.		Yes	םם עם	0002					DK DK
6 Controls			103							
Space heating controls:			Time and t	temne	rature	70no -	contr	ol	(ЭК
Hot water controls:	•		Cylindersta		aure	20110	Joint) CK
			Independe		er for I	ЭНW				ЭK
7 Low energy lights										
Percentage of fixed ligh	nts with low-energ	v	100%							
fittings:										
Minimum			75%						(ЭК
8 Mechanical ventilation	n									
Not applicable										

Building R	Page 2 of 6	
9 Summertime temperature Overheating risk (Thames Valley): Based On:	Not significant	ОК
Overshading: Windows facing South:	Average 36.96 m ² , No overhang	
Air change rate:	8.00 ach	
Blinds/curtains: 10 Key features	None	
Party wall U-value	0.00 W/m ² K	



Property Reference:	Mid	
Survey Reference:	ASHP	Mid

Issued on Date: 04.Apr.2016 Prop Type Ref:

Property:												
SAP Rating: Environmental	86 B CO2 Emissions (t/year): 87 B General Requirements Compliance		DER: 1 DFEE:4			TER: TFEE:			ntage D ntage D			37.21 % 12.60 %
CfSH Results	Version:	ENE	E1 Credits:	N/A	ENE2	Credits:	N/A ENE	7 Credits:	N/A	CfSH	Level:	N/A
Surveyor: Address: Client:	Richard Holmes, Tel: 0115 92317 Denton Drive, West Bridgford, No		m, NG2 ⁻	7FS				S	urveyo	r ID:	4477	-0001
	sion: Elmhurst Energy Systems SAI SAP 2012, Regs Region: England			``	0	,	,			ed)		
SUMMARY	FOR INPUT DATA FOR New Build	(As De	esigned)								Page	3 of 6
Orientation	South											
1.0 Property T		errace										

1.0 Property Type	House, Mid-Te	errace				
2.0 Number of Storeys	4					
3.0 Date Built	2016					
3.0 Property Age Band	_					
4.0 Sheltered Sides	2	L				
5.0 Sunlight/Shade	Average or un	known				
6.0 Measurements						
	Heat Loss Perimeter	Internal Floor Area	Average Sto	orey Height		
Basement:	27.00	91.80	2.6	60		
1st Storey:	27.00	68.72	3.2	20		
2nd Storey:	27.00	72.49	3.0	00		
3rd Storey:	27.00	72.49	2.9	90		
7.0 Living Area	64.78					
8.0 Thermal Mass Parameter	Simple calcula	ation - Medium				
9.0 External Walls						
Description	Construction		U-Value	Kappa	Gross Area	Nett Area
		ense plaster, lightweight			70.00	70.00
Basement		ck, filled cavity, any outside	0.20		70.20	70.20
	structure	une alestea liabturiabt				
Main		Cavity wall; dense plaster, lightweight aggregate block, filled cavity, any outside			045 70	200 05
Main					245.70	206.85
	structure					
9.1 Party walls Description	Construction		Кар	ina d	Area	
Description				pu /	lica	
Party Wall 1		Dense plaster both sides. lightweight aggre			31.30	
,	blocks, cavity	or cavity fill				
10.0 External Roofs						
Description	Construction		U-Value	Kappa	Gross Area	Nett Area
Flat	Plasterboard,	insulated flat roof	0.16		91.80	87.96
10.1 Party Ceilings						
Description	Construction	Construction			Area	
	Other					
Party Ceilings 1		8	7.87			
g and 1	Concrete floor	slab, carpeted		16	60.00	
11.0 HeatLoss Floors						
Description	Construction		U-Value	Kappa	Area	
Basement	Slab on groun	d, screed over insulation	0.16		91.80	

Description			Constru	uction				Kappa	a	Area			
2 1 and g			Precas	t concrete pl	anks floor,	screed, car	peted		:	236.00)		
12.0 Opening Description	Types Data Source	Туре	Glazing	C	Blazing Gap	Argon Filled	l Sola	ar Trans	Frame Ty	/pe	Frame I	Factor	· U value
Door	Manufacturer	Solid Door											1.60
Windows	Manufacturer	Window	Double	glazed				0.76			0.7	0	1.40
Rooflight	Manufacturer	Roof Window	Double	glazed				0.76			0.7	0	1.40
13.0 Opening Name	s Opening Type	Locatior	n	Orientatior	Curtain Ty	/pe	Overhang		Width	Height	Count	Area	Curtai
					-		Ratio	Overhan	g	-			Closed
Door	Solid Door	[2] Main		South								1.89	
Windows	Window	[2] Main		South	None		0.00					36.9	6
RL	Roof Window	[1] Flat		Horizontal	None							3.84	
14.0 Conserva 15.0 Draught			None 100										
16.0 Draught			No										
17.0 Thermal			Calcula	ate Bridges									
17.1 List of Br	idges	Bridge Ture							1	onath	Dei		mnorted
Source Type		Bridge Type							L	ength	Psi	I	mported
Independently	assessed	E1 Steel linte	l with pe	rforated stee	el base plat	e			1	7.70	0.05	50 `	res
Table K1 - Ap	proved	E3 Sill							1	6.80	0.04	0	res
Table K1 - Ap	proved	E4 Jamb							6	5.80	0.05	50 `	res
Table K1 - Ap	proved	E5 Ground flo	oor (norn	nal)					2	7.00	0.16	50 `	res
Table K1 - Ap	proved	E6 Intermedia	ate floor	within a dwe	lling				5	4.00	0.07	1 O'	No
Table K1 - De	fault	E15 Flat roof	with par	apet					2	7.00	0.56	1 03	No
Table K1 - Ap	proved	E18 Party wa	II betwee	en dwellings					4	6.80	0.06	50 `	res
Table K1 - De	fault	P1 Party wall	- Groun	d floor					1	0.58	0.16	1 03	No
Table K1 - De	fault	P2 Party wall	- Interm	ediate floor	within a dw	elling			2	1.48	0.00	00	No
18.0 Pressure Designed Property T As Built q Same As 19.0 Mechani	q50 Tested ? 50 Designed ?	1	Yes 5.00										
Mechanica Present	al Ventilation		No										
	Installation	oothor	Window	ws fully open									
	tilation possib		Yes										
Night Ven	tilation .		No										
	e rate al Ventilation	data Type	8.00										
Type MV Refere	ence Number												
Configura													
MVHR Du Manufactu	ct Insulated												
Duct Type													
MVHR Eff	iciency												
Wet Room Brand, Mo													
20.0 Fans, Op		s, Flues											
		M	IS SH		Total								
Number of Ch	-	(0	0								
Number of op		()	0	0								
Number of int					4								
Number of pa		_			0								
Number of flu	eless gas fire	S			0								
21.0 Cooling	System		No										
22.0 Lighting													
Internal Total r	number of ligh	nt fittinas	20										
Total r	number of L.E	L. fittings	20										
-	ntage of L.E.L	fittings	100.00										

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г	ay	e	0	UI.	υ

External External lights fitted	No
Light and motion sensors	
23.0 Electricity Tariff	Standard
24.0 Heating Systems	
Main Heating 1	Database
Description	
Percentage of Heat	100 %
Main Heating 2 Description	None
Percentage of Heat	%
Community Heating	
Secondary Heating	None
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery Instantaneous System 1	No
Waste Water Heat Recovery	No
Instantaneous System 2	
Waste Water Heat Recovery Storage	No
System	AL.
Solar Panel	No
25.0 Main Heating 1 Database Ref. No.	100061
Fuel Type	Electricity
Main Heating	PET
TestMethod	
SAP Code	224
Efficiency (Split Efficiences) %	
Efficiency (Split Efficiences) % In Winter	356.8
In Summer	330.0 198.9
Model Name	100.0
Manufacturer	
Controls	CHD Time and temperature zone control
PCDF Controls	0
Delayed Start Stat Sap Code	2207
Burner Control	2201
Boiler Compensator	
HETAS approved System	
Oil Pump Inside	
FI Case	
FI Water	
Flue Type Smoke Control Area	
Fan Assisted Flue	
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Underfloor Heating	Normal (1590)
Flow Temperature Electric CPSU Temperature	Normal (> 45°C)
Combi boiler type	
Combi keep hot type	
Combi store type	
27.0 Community Heating	
Space Community Heating	
PCDF Index	
Distribution Loss Distribution Loss Value	
Controls	
SAP Code	
Water Community Heating	
PCDF Index	
Distribution Loss Distribution Loss Value	
Charging Linked To Heat Use	
28.0 Secondary Heating	
Description	
SHS efficiency %	
SAP Code	
HETAS Approved System	
Smoke Control Area	
Test Method Manufacturer	
Model Name	

29.0 Water Heating Water use <= 125 litres/person/day SAP Code Immersion Heater Summer Immersion Suplementary Immersion Immersion Only Heating Hot Water 29.1 Flue Gas Heat Recovery System Database ID Brand Model Details 29.2 Waste Water Heat Recovery System	HWP From main heatir Yes 901	ıg 1		
Total rooms with shower and/or bath				
30.0 Hot Water Cylinder	Hot Water Cylinder			
Cylinder Stat	Yes			
Cylinder In Heated Space	Yes			
Independent Time Control	Yes			
	Measured Loss			
Insulation Type Insulation Thickness	Measured Loss			
	175.00			
Cylinder Volume				
Loss (kwh/day)	2.00	ninowork		
Pipes insulation	Fully insulated primary	pipework		
In Airing Cupboard				
31.0 Solar Panel				
Solar Panel Area				
Area Type				
Panel Type				
n0, a1, a2, A/G ratio				
Orientation				
Elevation				
Overshading				
Solar Storage Volume				
Pump electrically powered				
Combined Cylinder				
32.0 Thermal Store	None			
Thermal Store Pipework				
33.0 Photovoltaic Unit				
Apportioned KWh/Year				
34.0 Wind Turbines				
Terrain Type	Urban			
Wind Turbines				
Count				
Apportioned Kwh/year				
Rotor Diameter				
Hub Height				
35.0 Small-scale Hydro				
Electricity Generated				
Description				
Apportioned kWh/Year				
Recommendations None				
Further measures to achieve even highe standards	r			
Solar water heating	£4,000 - £6,000	£119	B 87	B 88
Solar photovoltaic panels, 2.5 kWp	£5,000 - £8,000	£279	B 91	A 92



Bui	lding Regu	lation Co	mpliance			Page 1 of 6
Property Reference: Right Survey Reference: ASHP Right Property:				Issued of Prop Ty	n Date: 04./ pe Ref:	Apr.2016
SAP Rating: 85 B CO2 Emissions (t/year): Environmental:86 B General Requirements Co		ER: 12.51 Pass FEE:48.84 Pass			ntage DER <t ntage DFEE<</t 	ER: 37.56 9 TFEE: 12.06 9
CfSH Results Version:		Credits: N/A ENI	E2 Credits: N/A	ENE7 Credits:	N/A CfSI	H Level: N/A
Surveyor: Richard Holmes, Tel: 0115 Address: Denton Drive, West Bridgfo Client:		NG2 7FS		S	urveyor ID:	4477-0001
Software Version: Elmhurst Energy Systen SAP version: SAP 2012, Regs Region: En						
SUMMARY FOR INPUT DATA FOR New	v Build (As Desig	gned)				
1a TER and DER						
Fuel for main heating:		Electricity				
Fuel factor:		1.55 (elec	tricity)			
Target Carbon Dioxide Emission R	ate (TER)	20.04 kg/r				
Dwelling Carbon Dioxide Emission		12.51 kg/r				OK
Ib TFEE and DFEE						
Farget Fabric Energy Efficiency (Tl	FEE)	55.53 kWł	n/m²			
Dwelling Fabric Energy Efficiency ((DFÉE)	48.84 kWł	n/m²			OK
2 Fabric U-values						
Element	Avera	ie	Highest			
External wall	-	-	•	(0 70)		ОК
Party wall	· ·	nax. 0.30) nax. 0.20)	0.20 (ma	(. 0.70)		OK
Floor	· ·	nax. 0.20)	- 0.16 (ma:	(070)		OK
Roof	· ·	nax. 0.20)	0.16 (max			OK
Openings		nax. 2.00)	1.60 (ma			OK
2a Thermal bridging						
Thermal bridging calculated from li	near thermal	transmittand	ces for each	junction		
3 Air permeability						
Air permeability at 50 pascals:		5.00 (desi	gn value)			
Maximum		10.0				OK
4 Heating efficiency						
Main heating system:			o with radia	tors or und	derfloor -	
		Electric				
			ECODAN 8	-		
			5VHA(2)-B	5		
Secondary heating system:		None				
5 Cylinder insulation		Maggurad	oulinderlog		Nh/dov	
Hot water storage			cylinder los by DBSCG		vii/udy	OK
Primary pipework insulated:		Yes	by DBSCG	2.00		OK
6 Controls		100				
Space heating controls:		Time and	temperature	2006 COr	ntrol	OK
Hot water controls:		Cylinderst				OK
			ent timer for	DHW		OK
7 Low energy lights						
Percentage of fixed lights with low-	energy	100%				
ittings:	0,					
Vinimum		75%				OK
8 Mechanical ventilation						
Not applicable						

Building	Building Regulation Compliance						
9 Summertime temperature Overheating risk (Thames Valley): Based On:	Not significant	ОК					
Overshading:	Average						
Windows facing South: Air change rate:	39.60 m ² , No overhang 8.00 ach						
Blinds/curtains:	None						
10 Key features Party wall U-value	0.00 W/m²K						



Property Reference: Right Survey Reference: ASHP Right

Issued on Date: 04.Apr.2016 Prop Type Ref:

Page 3 of 6

Property:

•	85 B CO2 Emissions (t/year): 86 B General Requirements Compliance:		DER: 1 DFEE:4	-		TER: 2			ntage D ntage D			
CfSH Results	Version:	ENE [,]	1 Credits:	N/A	ENE2	Credits:	N/A ENE7	Credits:	N/A	CfSH	Level:	N/A
Surveyor: Address: Client:	Richard Holmes, Tel: 0115 9231707 Denton Drive, West Bridgford, Nottir		n, NG2	7FS				S	urveyoi	r ID:	4477-	-0001
	sion: Elmhurst Energy Systems SAP2 SAP 2012, Regs Region: England (Pa									ed)		

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

Orientation 1.0 Property Type 2.0 Number of Storeys 3.0 Date Built 3.0 Property Age Band 4.0 Sheltered Sides 5.0 Sunlight/Shade	South House, End-Te 4 2016 2 Average or unl					
6.0 Measurements	Average of uni	IIIIII				
	Heat Loss Perimeter	Internal Floor Area	Average Ste	rov Hoight		
		Internal Floor Area	Average Sto	rey ⊓eigni		
Basement:	39.11	104.83	2.6			
1st Storey:	38.51	87.87	3.2	20		
2nd Storey:	32.77	73.57	3.0	0		
3rd Storey:	32.77	73.57	2.9	0		
7.0 Living Area	61.38					
8.0 Thermal Mass Parameter	Simple calcula	tion - Medium				
9.0 External Walls Description	Construction	nse plaster, lightweight	U-Value	Kappa	Gross Area	Nett Area
Basement	aggregate bloc structure	0.20		101.68	101.68	
Main	Cavity wall; de aggregate bloc structure	0.20		316.58	275.09	
9.1 Party walls Description	Construction		Кар	pa /	Area	
Party Wall 1	Dense plaster blocks, cavity o	both sides. lightweight aggre or cavity fill	egate			
10.0 External Roofs Description	Construction		U-Value	Карра	Gross Area	Nett Area
Flat	Plasterboard, i	nsulated flat roof	0.16		104.83	100.99
10.1 Party Ceilings Description	Construction		Кар	pa /	\rea	
Party Ceilings 1	Other			8	7.87	
g and 1	Concrete floor	slab, carpeted		-	50.00	
11.0 HeatLoss Floors Description	Construction		U-Value	Kappa	Area	
Basement	Slab on ground	d, screed over insulation	0.16		104.83	

Description			Construct	ion				Kappa	Area		
2 1 and g			Precast c	oncrete pl	anks floor,	screed, ca	rpeted		236.00		
12.0 Openir	0 71	_							_		
Description	Data Source	Туре	Glazing	(Blazing Gap	Argon Filled	d Sola	ar Trans F	rame Type	Frame Fac	tor U value
Door	Manufacturer	Solid Door									1.60
Windows	Manufacturer	Window	Double gla	zed				0.76		0.70	1.40
Rooflight	Manufacturer	Roof Window	Double gla	zed				0.76		0.70	1.40
13.0 Openir Name	ngs Opening Type	Location		Orientation	Curtain Ty	20	Overhang	Wide	Width Height		Curtain
Name	Opening Type	Location	I	Onentation	Curtain Ty	þe	Ratio	Overhang		Journe Al	Closed
Door	Solid Door	[2] Main		South						1.	89
Windows	Window	[2] Main		South	None		0.00			39	.60
RL	Roof Window	[1] Flat		Horizontal	None					3.	84
14.0 Consei	rvatory		None								
15.0 Draugh			100								
16.0 Draugh	nt Lobby		No								
17.0 Therma	0 0		Calculate	Bridges							
17.1 List of Source Type	0	Bridge Type							Length	Psi	Imported
Independen	tly assessed	E1 Steel linte	I with perfo	rated stee	l base plat	e			18.90	0.050	Yes
Table K1 - A	•	E3 Sill							18.00	0.040	Yes
Table K1 - A	Approved	E4 Jamb							70.20	0.050	Yes
Table K1 - A	Approved	E5 Ground flo	oor (norma)					38.51	0.160	No
Table K1 - D	Default	E22 Baseme	nt floor						39.11	0.070	No
Table K1 - A	Approved	E6 Intermedia	ate floor wi	thin a dwe	lling				65.54	0.070	No
Table K1 - D	Default	E15 Flat roof	with parap	et	•				32.57	0.560	No
Table K1 - A	Approved	E16 Corner (I							26.00	0.090	No
Table K1 - A		E17 Corner (i	,	nternal are	a areater t	han externa	al area)		2.60	-0.090	No
Table K1 - A		E18 Party wa			J		,		23.40	0.060	Yes
Table K1 - D	••	P1 Party wall		-					5.29	0.160	No
Table K1 - D		P2 Party wall			within a dw	ellina			10.74	0.000	No
Table K1 - D		P4 Party wall				Ũ			5.37	0.240	No
18.0 Pressu	ire Testina		Yes								
Designe	0		5.00								
	/ Tested ?										
As Built											
	s Designed ?	n									
	ical Ventilation		No								
Present		-									
	ed Installation		\A/instance	f							
	s open in hot w entilation possil		Yes	fully open							
Night Ve			No								
Air chan	nge rate		8.00								
	ical Ventilation	data Type									
Type MV Refe	erence Number										
Configui											
0	Duct Insulated										
	cturer SFP										
Duct Ty											
Wet Roc	Efficiency										
Brand, N											
	Open Fireplace										
		MH			Total						
Number of C	•	(0	0						
Number of c	•	C)	0	0						
	ntermittent fans	3			4						
•	bassive vents				0						
	lueless gas fire	S			0						
21.0 Cooling		hurst Eporav Sveta	No								

22.0 Lighting	
Internal Total number of light fittings	20
Total number of light fittings	20 20
Percentage of L.E.L. fittings	100.00
External	100.00
External lights fitted	No
Light and motion sensors	
23.0 Electricity Tariff	Standard
24.0 Heating Systems	
Main Heating 1	Database
Description	
Percentage of Heat	100 %
Main Heating 2	None
Description	0/
Percentage of Heat Community Heating	%
Secondary Heating	None
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery	No
Instantaneous System 1	
Waste Water Heat Recovery	No
Instantaneous System 2	Ne
Waste Water Heat Recovery Storage System	NU
System Solar Panel	No
25.0 Main Heating 1	
Database Ref. No.	100061
Fuel Type	Electricity
Main Heating	PET
TestMethod	
SAP Code	224
Efficiency (Split Efficiences) %	
Efficiency (Split Efficiences) %	054.0
In Winter	351.3
In Summer Model Name	198.9
Manufacturer	
Controls	CHD Time and temperature zone control
PCDF Controls	0
Delayed Start Stat	
Sap Code	2207
Burner Control	
Boiler Compensator	
HETAS approved System Oil Pump Inside	
FI Case	
FI Water	
Flue Type	
Smoke Control Area	
Fan Assisted Flue	
Is MHS Pumped	Pump in heated space
Heat Emitter Underfloor Heating	Radiators
Flow Temperature	Normal (> 45°C)
Electric CPSU Temperature	
Combi boiler type	
Combi keep hot type	
Combi store type	
27.0 Community Heating	
Space Community Heating	
PCDF Index	
Distribution Loss Distribution Loss Value	
Controls	
SAP Code	
Water Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Charging Linked To Heat Use	
28.0 Secondary Heating	
Description	
SHS efficiency % SAP Code	

HETAS Approved System Smoke Control Area Test Method Manufacturer Model Name				
29.0 Water Heating Water use <= 125 litres/person/day	HWP From main heatin Yes	ng 1		
SAP Code	901			
Immersion Heater	501			
Summer Immersion				
Suplementary Immersion				
Immersion Only Heating Hot Water				
29.1 Flue Gas Heat Recovery System Database ID				
Brand Model				
Details				
29.2 Waste Water Heat Recovery				
System				
Total rooms with shower and/or bath	List Water Culinder			
30.0 Hot Water Cylinder Cylinder Stat	Hot Water Cylinder Yes			
Cylinder In Heated Space	Yes			
Independent Time Control	Yes			
Insulation Type	Measured Loss			
Insulation Thickness	175.00			
Cylinder Volume	175.00			
Loss (kwh/day) Pipes insulation	2.00 Fully insulated primary	ninework		
In Airing Cupboard	i dily insulated primary	pipework		
31.0 Solar Panel				
Solar Panel Area				
Area Type				
Panel Type				
n0, a1, a2, A/G ratio Orientation				
Elevation				
Overshading				
Solar Storage Volume				
Pump electrically powered				
Combined Cylinder				
32.0 Thermal Store	None			
Thermal Store Pipework 33.0 Photovoltaic Unit				
Apportioned KWh/Year				
34.0 Wind Turbines				
Terrain Type	Urban			
Wind Turbines				
Count Apportioned Kwh/year				
Rotor Diameter				
Hub Height				
35.0 Small-scale Hydro				
Electricity Generated				
Description Apportioned kWh/Year				
Recommendations				
None				
Further measures to achieve even higher standards	r			
Solar water heating	£4,000 - £6,000	£119	B 86	B 88
Solar photovoltaic panels, 2.5 kWp	£5,000 - £8,000	£279	B 90	B 91



	Building	Regu	lation Cor	mpliance		Page 1 of 6
Property Referer Survey Referenc Property:					Issued on Date: 04 Prop Type Ref:	.Apr.2016
SAP Rating: 81 B C Environmental:95 A G	02 Emissions (t/year): eneral Requirements Compliance		ER: 4.05 Pass FEE:48.84 Pass	TER: 13.42 TFEE:55.53	Percentage DER< Percentage DFEE	
CfSH Results Version:		ENE1 C	redits: N/A ENE	2 Credits: N/A EN	IE7 Credits: N/A Cf	SH Level: N/A
	ard Holmes, Tel: 0115 923170 on Drive, West Bridgford, Not		NG2 7FS		Surveyor ID	: 4477-0001
	mhurst Energy Systems SAF 012, Regs Region: England (
SUMMARY FOR I	NPUT DATA FOR New Build	(As Desig	jned)			
1a TER and DEF	8					
Fuel for main hea	ating:		Wood Pelle			
Fuel factor:			1.00 (wood	. ,		
•	ioxide Emission Rate (T		13.42 kg/m			
	Dioxide Emission Rate	(DER)	4.05 kg/m ²			OK
1b TFEE and DF				1 2		
	ergy Efficiency (TFEE)	-\	55.53 kWh			
Dwelling Fabric E 2 Fabric U-value	Energy Efficiency (DFEE	=)	48.84 kWh	/104		OK
z radric U-value	-					
	Element	Averag	е	Highest		
	External wall	0.20 (n	nax. 0.30)	0.20 (max.	0.70)	OK
	Party wall	· ·	nax. 0.20)	-		OK
	Floor	· ·	nax. 0.25)	0.16 (max.		OK
	Roof		nax. 0.20)	0.16 (max.		OK
	Openings	1.41 (n	nax. 2.00)	1.60 (max.	3.30)	OK
2a Thermal bridg						
	calculated from linear t	hermal	transmittanc	es for each j	unction	
3 Air permeabilit						
Air permeability a	at 50 pascals:		5.00 (desig	in value)		OK
Maximum			10.0			
4 Heating efficier Main heating sys	-		Roiler evet	am with radia	ators or underfloo	r _
main nearing sys			Wood pelle			1 -
				manufacture	r	
			Efficiency:	75%		
			Minimum: 7	75%		OK
Secondary heati			None			
5 Cylinder insula						
Hot water storag	e				: 2.00 kWh/day	OK
	k inculated.			by DBSCG 2	.87	OK
Primary pipeworl 6 Controls	k insulated:		Yes			
Space heating co	ontrols.		Time and t	emperature z	zone control	OK
			Cylindersta			OK
				nt timer for D	нw	OK
			masponae			-
Hot water contro	hts					
Hot water contro 7 Low energy lig		V	100%			
Hot water contro 7 Low energy lig	hts red lights with low-energ	IУ	100%			

Building Regulation Compliance

8 Mechanical ventilation Not applicable		
9 Summertime temperature		
Overheating risk (Thames Valley):	Not significant	OK
Based On:		
Overshading:	Average	
Windows facing South:	39.60 m ² , No overhang	
Air change rate:	8.00 ach	
Blinds/curtains:	None	
10 Key features		
Party wall U-value Main heating fuel:	0.00 W/m ² K wood pellets (bulk)	



Property Reference: L Survey Reference: Bi				Issued or Prop Typ	n Date: 04.Ap be Ref:	r.2016
Property: SAP Rating: 81 B CO2 Emis Environmental:95 A General R		1.19 DER: 4.05 Pass Pass DEFF :48 84 Pass	TER: 13.42 TFEE: 55.53		ntage DER <ter ntage DFEE<tf< th=""><th></th></tf<></ter 	
CfSH Results Version:		ENE1 Credits: N/A ENE2		NE7 Credits:	N/A CfSH Le	
Surveyor: Richard Holr	nes, Tel: 0115 9231707 ə, West Bridgford, Notti	7				477-0001
Software Version: Elmhurst SAP version: SAP 2012, Re						
SUMMARY FOR INPUT	DATA FOR New Build (A	As Designed)			Р	age 3 of 6
Orientation 1.0 Property Type 2.0 Number of Storeys 3.0 Date Built 3.0 Property Age Band 4.0 Sheltered Sides 5.0 Sunlight/Shade	South House, End-Te 4 2016 2 Average or unl					
6.0 Measurements						
	Heat Loss Perimeter	Internal Floor Area	Average Sto	, ,		
Basement:	39.11	104.83	2.6			
1st Storey:	38.51	87.87	3.2			
2nd Storey:	32.77	73.57	3.0			
3rd Storey:	32.77	73.57	2.9	90		
7.0 Living Area	61.38					
8.0 Thermal Mass Parameter	Simple calcula	tion - Medium				
9.0 External Walls Description	Construction	nse plaster, lightweight	U-Value	Kappa	Gross Area	Nett Area
Basement	aggregate bloc structure	k, filled cavity, any outside	0.20		101.68	101.68
Main	-	nse plaster, lightweight k, filled cavity, any outside	0.20		316.58	275.09
9.1 Party walls Description	Construction		Кар	ipa A	\rea	
Party Wall 1	Dense plaster blocks, cavity o	both sides. lightweight aggr or cavity fill	egate	6	6.08	
10.0 External Roofs Description	Construction		U-Value	Карра	Gross Area	Nett Area
Flat	Plasterboard, i	nsulated flat roof	0.16		104.83	100.99
10.1 Party Ceilings Description	Construction		Кар	pa A	Area	
Party Ceilings 1	Other			8	7.87	
g and 1	Concrete floor	slab, carpeted			60.00	
11.0 HeatLoss Floors Description	Construction		U-Value	Kappa	Area	
Basement	Slab on ground	d, screed over insulation	0.16		104.83	

11.1 Party Floors

Description			Construct	ion				Kappa	Area		
2 1 and g			Precast c	oncrete pl	anks floor,	screed, ca	rpeted		236.00		
12.0 Openir	0 71	_							_		
Description	Data Source	Туре	Glazing	(Blazing Gap	Argon Filled	d Sola	ar Trans F	rame Type	Frame Fac	tor U value
Door	Manufacturer	Solid Door									1.60
Windows	Manufacturer	Window	Double gla	zed				0.76		0.70	1.40
Rooflight	Manufacturer	Roof Window	Double gla	zed				0.76		0.70	1.40
13.0 Openir Name	ngs Opening Type	Location		Orientation	Curtain Ty	20	Overhang	Wide	Width Height		Curtain
Name	Opening Type	Location	I	Onentation	Curtain Ty	þe	Ratio	Overhang		Journe Al	Closed
Door	Solid Door	[2] Main		South						1.	89
Windows	Window	[2] Main		South	None		0.00			39	.60
RL	Roof Window	[1] Flat		Horizontal	None					3.	84
14.0 Consei	rvatory		None								
15.0 Draugh			100								
16.0 Draugh	nt Lobby		No								
17.0 Therma	0 0		Calculate	Bridges							
17.1 List of Source Type	0	Bridge Type							Length	Psi	Imported
Independen	tly assessed	E1 Steel linte	I with perfo	rated stee	l base plat	e			18.90	0.050	Yes
Table K1 - A	•	E3 Sill							18.00	0.040	Yes
Table K1 - A	Approved	E4 Jamb							70.20	0.050	Yes
Table K1 - A	Approved	E5 Ground flo	oor (norma)					38.51	0.160	No
Table K1 - D	Default	E22 Baseme	nt floor						39.11	0.070	No
Table K1 - A	Approved	E6 Intermedia	ate floor wi	thin a dwe	lling				65.54	0.070	No
Table K1 - D	Default	E15 Flat roof	with parap	et	•				32.57	0.560	No
Table K1 - A	Approved	E16 Corner (I							26.00	0.090	No
Table K1 - A		E17 Corner (i	,	nternal are	a areater t	han externa	al area)		2.60	-0.090	No
Table K1 - A		E18 Party wa			J		,		23.40	0.060	Yes
Table K1 - D	••	P1 Party wall		-					5.29	0.160	No
Table K1 - D		P2 Party wall			within a dw	ellina			10.74	0.000	No
Table K1 - D		P4 Party wall				Ũ			5.37	0.240	No
18.0 Pressu	ire Testina		Yes								
Designe	0		5.00								
	/ Tested ?										
As Built											
	s Designed ?	n									
	ical Ventilation		No								
Present		-									
	ed Installation		\A/instance	f							
	s open in hot w entilation possil		Yes	fully open							
Night Ve			No								
Air chan	nge rate		8.00								
	ical Ventilation	data Type									
Type MV Refe	erence Number										
Configui											
0	Duct Insulated										
	cturer SFP										
Duct Ty											
Wet Roc	Efficiency										
Brand, N											
	Open Fireplace										
		MH			Total						
Number of C	•	(0	0						
Number of c	•	C)	0	0						
	ntermittent fans	3			4						
•	bassive vents				0						
	lueless gas fire	S			0						
21.0 Cooling		hurst Eporav Sveta	No								

22.0 Lighting Internal	
Total number of light fittings	20
Total number of L.E.L. fittings	20
Percentage of L.E.L. fittings	100.00
External External lights fitted	No
Light and motion sensors	
23.0 Electricity Tariff	Standard
24.0 Heating Systems	
Main Heating 1 Description	Manufacturer
Percentage of Heat	100 %
Main Heating 2 Description	None
Percentage of Heat	%
Community Heating	
Secondary Heating	None
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery	No
Instantaneous System 1 Waste Water Heat Recovery	No
Instantaneous System 2	
Waste Water Heat Recovery Storage	No
System	NL
Solar Panel	No
25.0 Main Heating 1 Database Ref. No.	
Fuel Type	
Main Heating	BUC
TestMethod	
SAP Code	153
Efficiency (Manufacturer) %	75.0
Efficiency (Manufacturer) %	
In Winter	
In Summer Model Name	
Manufacturer	
Controls	CBI Time and temperature zone control
PCDF Controls	0
Delayed Start Stat	Yes
Sap Code	2110
Burner Control Boiler Compensator	
HETAS approved System	Yes
Oil Pump Inside	
FI Case	
FI Water	
Flue Type	
Smoke Control Area	No
Fan Assisted Flue Is MHS Pumped	Pump in heated space
Heat Emitter	
Underfloor Heating	
Flow Temperature	
Electric CPSU Temperature	
Combi boiler type	
Combi keep hot type Combi store type	
27.0 Community Heating	
Space Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Controls SAP Code	
SAP Code Water Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Charging Linked To Heat Use	
28.0 Secondary Heating	
Description	
SHS efficiency % SAP Code	

HETAS Approved System Smoke Control Area Test Method Manufacturer Model Name				
29.0 Water Heating	HWP From main heatir	ig 1		
Water use <= 125 litres/person/day	Yes			
SAP Code	901			
Immersion Heater Summer Immersion				
Suplementary Immersion				
Immersion Only Heating Hot Water				
29.1 Flue Gas Heat Recovery System				
Database ID				
Brand Model				
Details 29.2 Waste Water Heat Recovery				
System				
Total rooms with shower and/or bath				
30.0 Hot Water Cylinder	Hot Water Cylinder			
Cylinder Stat	Yes			
Cylinder In Heated Space Independent Time Control	Yes Yes			
Insulation Type	Measured Loss			
Insulation Thickness				
Cylinder Volume	175.00			
Loss (kwh/day)	2.00			
Pipes insulation In Airing Cupboard	Fully insulated primary	pipework		
31.0 Solar Panel				
Solar Panel Area				
Area Type				
Panel Type				
n0, a1, a2, A/G ratio				
Orientation Elevation				
Overshading				
Solar Storage Volume				
Pump electrically powered				
Combined Cylinder				
32.0 Thermal Store	None			
Thermal Store Pipework 33.0 Photovoltaic Unit				
Apportioned KWh/Year				
34.0 Wind Turbines				
Terrain Type	Urban			
Wind Turbines Count				
Apportioned Kwh/year				
Rotor Diameter				
Hub Height				
35.0 Small-scale Hydro				
Electricity Generated				
Description Apportioned kWh/Year				
Recommendations				
None				
Further measures to achieve even higher standards				
Solar water heating	£4,000 - £6,000	£76	B 82	A 96
Solar photovoltaic panels, 2.5 kWp	£5,000 - £8,000	£279	B 85	A 99



Building	Regu	lation Cor	npliance		Page 1 of 6
Property Reference: Mid Survey Reference: Bio Mid ^{Property:}				Issued on Date: 04 Prop Type Ref:	.Apr.2016
SAP Rating: 82 B CO2 Emissions (t/year): Environmental:96 A General Requirements Compliance		ER: 3.93 Pass FEE:44.83 Pass	TER: 12.83 TFEE:51.30	Percentage DER Percentage DFE	
CfSH Results Version:	ENE1 C	redits: N/A ENE	2 Credits: N/A El	NE7 Credits: N/A Ci	SH Level: N/A
Surveyor: Richard Holmes, Tel: 0115 923170 Address: Denton Drive, West Bridgford, Nott Client:		NG2 7FS		Surveyor ID	: 4477-0001
Software Version: Elmhurst Energy Systems SAP2 SAP version: SAP 2012, Regs Region: England (F					
SUMMARY FOR INPUT DATA FOR New Build (As Desig	gned)			
1a TER and DER					
Fuel for main heating:		Wood Pelle	ets (bulk)		
Fuel factor:		1.00 (wood	· · ·		
Target Carbon Dioxide Emission Rate (T	ER)	12.83 kg/m			
Dwelling Carbon Dioxide Emission Rate		3.93 kg/m ²			OK
1b TFEE and DFEE					
Target Fabric Energy Efficiency (TFEE)		51.30 kWh	/m²		
Dwelling Fabric Energy Efficiency (DFEE)	44.83 kWh	/m²		OK
2 Fabric U-values					
Element	Averag	e	Highest		
	•	nax. 0.30)	0.20 (max.	0.70)	OK
	· ·	nax. 0.30)	0.20 (max.	0.70)	OK
•	· ·	nax. 0.25)	0.16 (max.	0 70)	OK
	· ·	nax. 0.20)	0.16 (max.		OK
Openings		nax. 2.00)	1.60 (max.	,	OK
2a Thermal bridging			f h :		
Thermal bridging calculated from linear the second se	nermai	transmittanc	es for each j	unction	
		E 00 (dooid			
Air permeability at 50 pascals: Maximum		5.00 (desig 10.0	n value)		OK
4 Heating efficiency		10.0			
Main heating system:		Boiler evet	m with radia	ators or underfloo	nr -
main nouting cycloni.		Wood pelle			<i></i>
			manufacture	r	
		Efficiency:	75%		
		Minimum: 7	75%		OK
Secondary heating system:		None			
5 Cylinder insulation					
Hot water storage				: 2.00 kWh/day	
			by DBSCG 2	.87	OK
Primary pipework insulated:		Yes			OK
6 Controls		Times are all f			OK
Space heating controls:			emperature :	zone control	OK
Hot water controls:		Cylindersta			OK
7 Low operav lights		maepenae	nt timer for D		UN
7 Low energy lights		100%			
Percentage of fixed lights with low-energy	у	10076			
fittings: Minimum		75%			OK
Minimum		75%			UN

Building Regulation Compliance

8 Mechanical ventilation Not applicable		
9 Summertime temperature		
Overheating risk (Thames Valley):	Not significant	OK
Based On:		
Overshading:	Average	
Windows facing South:	36.96 m ² , No overhang	
Air change rate:	8.00 ach	
Blinds/curtains:	None	
10 Key features		
Party wall U-value Main heating fuel:	0.00 W/m ² K wood pellets (bulk)	



Property Reference: I Survey Reference: B Property:				Issued or Prop Typ	n Date: 04.Ap be Ref:	r.2016
SAP Rating: 82 B CO2 Emis Environmental:96 A General F		1.04 DER: 3.93 Pass Pass DFEE: 44.83 Pass	TER: 12.83 TFEE:51.30		ntage DER <ter ntage DFEE<tf< th=""><th></th></tf<></ter 	
CfSH Results Version:		ENE1 Credits: N/A ENE2	Credits: N/A E	NE7 Credits:	N/A CfSH Lo	evel: N/A
	mes, Tel: 0115 9231707 e, West Bridgford, Nottir			S	urveyor ID: 4	477-0001
Software Version: Elmhurst SAP version: SAP 2012, Re						
SUMMARY FOR INPUT	DATA FOR New Build (A	As Designed)			Р	age 3 of 6
Orientation	South					
1.0 Property Type 2.0 Number of Storeys	House, Mid-Te 4	rrace				
3.0 Date Built	2016					
3.0 Property Age Band	2010					
4.0 Sheltered Sides	2					
5.0 Sunlight/Shade	Average or un	nown				
6.0 Measurements						
	Heat Loss Perimeter	Internal Floor Area	Average Sto	orey Height		
Basement:	27.00	91.80	2.6	60		
1st Storey:	27.00	68.72	3.2	20		
2nd Storey:	27.00	72.49	3.0	00		
3rd Storey:	27.00	72.49	2.9			
		72.10	2.0			
7.0 Living Area	64.78					
8.0 Thermal Mass Parameter	Simple calculat	tion - Medium				
9.0 External Walls	Construction		U-Value	Kanna	Cross Area	Nett Area
Description		nse plaster, lightweight	0-value	Kappa	Gross Area	inell Alea
Basement	•	k, filled cavity, any outside	0.20		70.20	70.20
Bacomoni	structure	in, mod ouvry, any outdud	0.20		10.20	10.20
		nse plaster, lightweight				
Main	•	k, filled cavity, any outside	0.20		245.70	206.85
	structure	,, , ,,				
9.1 Party walls						
Description	Construction		Kap	opa A	Area	
		hath airles. linktursinkt som				
Party Wall 1	•	both sides. lightweight aggr	egate	13	31.30	
	blocks, cavity o	or cavity fill				
10.0 External Roofs						
Description	Construction		U-Value	Kappa	Gross Area	Nett Area
				·		
Flat	Plasterboard, i	nsulated flat roof	0.16		91.80	87.96
10.1 Party Ceilings						
Description	Construction		Kap	opa A	Area	
			. tup	· ~ ~ /		
Party Ceilings 1	Other			8	7.87	
g and 1	Concrete floor	slab, carpeted			60.00	
		, ,				
11.0 HeatLoss Floors	Construction			Konno	A ====	
Description	Construction		U-Value	Kappa	Area	
Basement	Slab on dround	d, screed over insulation	0.16		91.80	
11 1 Dorty Electro		,	2			

11.1 Party Floors

Description			Constru	uction				Kappa	a	Area			
2 1 and g			Precas	t concrete pl	anks floor,	screed, car	peted		:	236.00)		
12.0 Opening Description	Types Data Source	Туре	Glazing	C	Blazing Gap	Argon Filled	l Sola	ar Trans	Frame Ty	/pe	Frame I	Factor	· U value
Door	Manufacturer	Solid Door											1.60
Windows	Manufacturer	Window	Double	glazed				0.76			0.7	0	1.40
Rooflight	Manufacturer	Roof Window	Double	glazed				0.76			0.7	0	1.40
13.0 Opening Name	s Opening Type	Locatior	n	Orientatior	Curtain Ty	/pe	Overhang		Width	Height	Count	Area	Curtai
					-		Ratio	Overhan	g	-			Closed
Door	Solid Door	[2] Main		South								1.89	
Windows	Window	[2] Main		South	None		0.00					36.9	6
RL	Roof Window	[1] Flat		Horizontal	None							3.84	
14.0 Conserva 15.0 Draught			None 100										
16.0 Draught			No										
17.0 Thermal			Calcula	ate Bridges									
17.1 List of Br	idges	Bridge Ture							ı	onath	Dei		mnorted
Source Type		Bridge Type							L	ength	Psi	I	mported
Independently	assessed	E1 Steel linte	l with pe	rforated stee	el base plat	e			1	7.70	0.05	50 `	res
Table K1 - Ap	proved	E3 Sill							1	6.80	0.04	0	res
Table K1 - Ap	proved	E4 Jamb							6	5.80	0.05	50 `	res
Table K1 - Ap	proved	E5 Ground flo	oor (norn	nal)					2	7.00	0.16	50 `	res
Table K1 - Ap	proved	E6 Intermedia	ate floor	within a dwe	lling				5	4.00	0.07	1 O'	No
Table K1 - De	fault	E15 Flat roof	with par	apet					2	7.00	0.56	1 03	No
Table K1 - Ap	proved	E18 Party wa	II betwee	en dwellings					4	6.80	0.06	50 `	res
Table K1 - De	fault	P1 Party wall	- Groun	d floor					1	0.58	0.16	1 03	No
Table K1 - De	fault	P2 Party wall	- Interm	ediate floor	within a dw	elling			2	1.48	0.00	00	No
18.0 Pressure Designed Property T As Built q Same As 19.0 Mechani	q50 Tested ? 50 Designed ?	1	Yes 5.00										
Mechanica Present	al Ventilation		No										
	Installation	oothor	Window	ws fully open									
	tilation possib		Yes										
Night Ven	tilation .		No										
	e rate al Ventilation	data Type	8.00										
Type MV Refere	ence Number												
Configura													
MVHR Du Manufactu	ct Insulated												
Duct Type													
MVHR Eff	iciency												
Wet Room Brand, Mo													
20.0 Fans, Op		s, Flues											
		M	IS SH		Total								
Number of Ch	-	(0	0								
Number of op		()	0	0								
Number of int					4								
Number of pa		_			0								
Number of flu	eless gas fire	S			0								
21.0 Cooling	System		No										
22.0 Lighting													
Internal Total r	number of ligh	nt fittinas	20										
Total r	number of L.E	L. fittings	20										
-	ntage of L.E.L	fittings	100.00										

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

External External lights fitted No Light and motion sensors 23.0 Electricity Tariff Standard 24.0 Heating Systems Manufacturer Description Manufacturer Description Percentage of Heat 100 % Main Heating 2 None Description Percentage of Heat % Community Heating Secondary Heating None Secondary Heating Main Heating 1 None Water Heat Recovery System No No Instantaneous System 1 No No	
Light and motion sensors 23.0 Electricity Tariff Standard 24.0 Heating Systems Main Heating 1 Main Heating 1 Manufacturer Description Percentage of Heat Main Heating 2 None Description Percentage of Heat Percentage of Heat 100 % Main Heating 2 None Description Percentage of Heat Vanue Vanue Description Percentage of Heat Vanue Vanue Description Vanue Vanue Vanue Description Vanue Vanue Vanue Vanue <td></td>	
23.0 Electricity Tariff Standard 24.0 Heating Systems Main Heating 1 Main Heating 1 Manufacturer Description 100 % Main Heating 2 None Description Percentage of Heat Percentage of Heat % Community Heating Secondary Heating Secondary Heating Main Heating 1 Flue Gas Heat Recovery System No Waste Water Heat Recovery No Instantaneous System 1 No	
24.0 Heating Systems Main Heating 1 Manufacturer Description Percentage of Heat 100 % Main Heating 2 None Description Percentage of Heat Percentage of Heat % Community Heating Secondary Heating Water Heating Main Heating 1 Flue Gas Heat Recovery System No Waste Water Heat Recovery No Instantaneous System 1 No	
Main Heating 1 Manufacturer Description 100 % Main Heating 2 None Description Percentage of Heat Percentage of Heat % Community Heating Secondary Heating Water Heating Main Heating 1 Flue Gas Heat Recovery System No Waste Water Heat Recovery No Instantaneous System 1 No	
Description Percentage of Heat 100 % Main Heating 2 None Description Percentage of Heat Percentage of Heat % Community Heating Secondary Heating Secondary Heating Main Heating 1 Flue Gas Heat Recovery System No Waste Water Heat Recovery No Instantaneous System 1 No	
Percentage of Heat 100 % Main Heating 2 None Description Percentage of Heat Percentage of Heat % Community Heating None Secondary Heating None Water Heating Main Heating 1 Flue Gas Heat Recovery System No Waste Water Heat Recovery No Instantaneous System 1 Value	
Main Heating 2 None Description Percentage of Heat Percentage of Heat % Community Heating None Secondary Heating None Water Heating Main Heating 1 Flue Gas Heat Recovery System No Waste Water Heat Recovery No Instantaneous System 1 No	
Description Percentage of Heat % Community Heating % Secondary Heating None Water Heating Main Heating 1 Flue Gas Heat Recovery System No Waste Water Heat Recovery No Instantaneous System 1 Keater Heat Recovery	
Percentage of Heat % Community Heating None Secondary Heating None Water Heating Main Heating 1 Flue Gas Heat Recovery System No Waste Water Heat Recovery No Instantaneous System 1 No	
Community Heating None Secondary Heating None Water Heating Main Heating 1 Flue Gas Heat Recovery System No Waste Water Heat Recovery No Instantaneous System 1 No	
Secondary Heating None Water Heating Main Heating 1 Flue Gas Heat Recovery System No Waste Water Heat Recovery No Instantaneous System 1 No	
Water Heating Main Heating 1 Flue Gas Heat Recovery System No Waste Water Heat Recovery No Instantaneous System 1 No	
Flue Gas Heat Recovery System No Waste Water Heat Recovery No Instantaneous System 1 No	
Instantaneous System 1	
Instantaneous System 1	
Waste Water Heat Recovery No	
Instantaneous System 2	
Waste Water Heat Recovery Storage No	
System Solar Panel No	
25.0 Main Heating 1	
Database Ref. No.	
Fuel Type	
Main Heating BUC	
TestMethod	
SAP Code 153	
Efficiency (Manufacturer) % 75.0	
Efficiency (Manufacturer) %	
In Winter	
In Summer	
Model Name	
Manufacturer . Controls CBI Time and temperature zone control	
Controls CBI Time and temperature zone control PCDF Controls 0	
Delayed Start Stat Yes	
Sap Code 2110	
Burner Control	
Boiler Compensator	
HETAS approved System Yes	
Oil Pump Inside	
FI Case	
FI Water	
Flue Type	
Smoke Control Area Yes Fan Assisted Flue	
Is MHS Pumped Pump in heated space	
Heat Emitter	
Underfloor Heating	
Flow Temperature	
Electric CPSU Temperature	
Combi boiler type	
Combi keep hot type	
Combi store type	
27.0 Community Heating	
Space Community Heating	
PCDF Index Distribution Loss	
Distribution Loss	
Controls	
SAP Code	
Water Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Charging Linked To Heat Use	
28.0 Secondary Heating	
Description	
Description SHS efficiency %	
Description SHS efficiency % SAP Code	
Description SHS efficiency % SAP Code HETAS Approved System	
Description SHS efficiency % SAP Code	
Description SHS efficiency % SAP Code HETAS Approved System Smoke Control Area	

29.0 Water Heating Water use <= 125 litres/person/day SAP Code Immersion Heater Summer Immersion Suplementary Immersion Immersion Only Heating Hot Water 29.1 Flue Gas Heat Recovery System Database ID Brand Model Details 29.2 Waste Water Heat Recovery System	HWP From main heatin Yes 901	g 1		
Total rooms with shower and/or bath				
30.0 Hot Water Cylinder	Hot Water Cylinder			
Cylinder Stat	Yes			
Cylinder In Heated Space	Yes			
Independent Time Control	Yes			
Insulation Type	Measured Loss			
Insulation Thickness				
Cylinder Volume	175.00			
Loss (kwh/day)	2.00			
Pipes insulation	Fully insulated primary	oipework		
In Airing Cupboard				
31.0 Solar Panel				
Solar Panel Area				
Area Type				
Panel Type				
n0, a1, a2, A/G ratio				
Orientation				
Elevation				
Overshading				
Solar Storage Volume				
Pump electrically powered				
Combined Cylinder				
32.0 Thermal Store	None			
Thermal Store Pipework				
33.0 Photovoltaic Unit				
Apportioned KWh/Year				
34.0 Wind Turbines				
Terrain Type Wind Turbines	Urban			
Count				
Apportioned Kwh/year				
Rotor Diameter				
Hub Height				
35.0 Small-scale Hydro				
Electricity Generated				
Description				
Apportioned kWh/Year				
Recommendations				
None				
Further measures to achieve even highe standards	r			
Solar water heating	£4,000 - £6,000	£76	B 84	A 96
Solar photovoltaic panels, 2.5 kWp	£5,000 - £8,000	£279	B 87	A 99



	Buildi	n <mark>g Reg</mark> u	lation Cor	npliance		Page 1 of 6
	e ference: Right erence: Bio Right				sued on Date: 04./ Prop Type Ref:	Apr.2016
	B1 B CO2 Emissions (t/year): B5 A General Requirements Complia		ER: 4.05 Pass FEE:48.84 Pass	TER: 13.42 TFEE:55.53	Percentage DER<1 Percentage DFEE<	
CfSH Results \	/ersion:	ENE1 C	redits: N/A ENE	2 Credits: N/A ENE7	Credits: N/A CfS	H Level: N/A
Surveyor: Address: Client:	Richard Holmes, Tel: 0115 923 Denton Drive, West Bridgford, I		NG2 7FS		Surveyor ID:	4477-0001
	ion: Elmhurst Energy Systems S SAP 2012, Regs Region: Englar					
SUMMARY	FOR INPUT DATA FOR New Bu	iild (As Desig	gned)			
1a TER and	DER					
Fuel for ma			Wood Pelle	ets (bulk)		
Fuel factor:			1.00 (wood			
Target Carb	oon Dioxide Emission Rate	(TER)	13.42 kg/m			
Dwelling Ca	arbon Dioxide Emission Ra		4.05 kg/m ²			OK
1b TFEE ar						
	ric Energy Efficiency (TFE		55.53 kWh			
	bric Energy Efficiency (DF	EE)	48.84 kWh	/m ²		OK
2 Fabric U-	values					
	Element	Averag	e	Highest		
	External wall	•		•	70)	ОК
	Party wall	· ·	nax. 0.30) nax. 0.20)	0.20 (max. 0.	70)	OK
	Floor	· ·	nax. 0.20)	- 0.16 (max. 0.	70)	OK
	Roof	· ·	nax. 0.20)	0.16 (max. 0.		OK
	Openings		nax. 2.00)	1.60 (max. 3.	,	OK
2a Thermal					_	
	dging calculated from linea	ar thermal	transmittanc	es for each jun	ction	
3 Air perme						
	bility at 50 pascals:		5.00 (desig	in value)		
Maximum	<i>7</i> 7 1		10.0			OK
4 Heating e				م الم معرفة الم	no on constant -	
Main heatin	ig system:				rs or underfloor	-
			Wood pelle			
			Data from	manufacturer		
			 Efficiency:	75%		
			Minimum: 7			OK
Secondary	heating system:		None	0.0		0
5 Cylinder i						
Hot water s			Measured	cylinder loss: 2	.00 kWh/day	
				by DBSCG 2.87		OK
Primarv pip	ework insulated:		Yes	.,0 2.00		OK
6 Controls						
Space heat	ing controls:		Time and t	emperature zoi	ne control	OK
Hot water c			Cylindersta			OK
				nt timer for DH	W	OK
7 Low energ	gy lights					
		arav	100%			
Percentage	of fixed lights with low-ene	ergy	10070			
Percentage ittings:	or fixed lights with low-end	sigy	10070			OK

Building Regulation Compliance

8 Mechanical ventilation Not applicable							
9 Summertime temperature							
Overheating risk (Thames Valley):	Not significant	OK					
Based On:							
Overshading:	Average						
Windows facing South:	39.60 m ² , No overhang						
Air change rate:	8.00 ach						
Blinds/curtains:	None						
10 Key features							
Party wall U-value Main heating fuel:	0.00 W/m ² K wood pellets (bulk)						



Property Reference: Right Survey Reference: Bio Right

Issued on Date: 04.Apr.2016 Prop Type Ref:

Property:	5				
	81 B CO2 Emissions (t/year): I:95 A General Requirements Compliar	1.19 DER: 4.05 Pass nce: Pass DFEE: 48.84 Pass	TER: 13.42 TFEE:55.53	Percentage DE Percentage DF	ER <ter: %<="" 69.83="" th=""></ter:>
CfSH Results	Version:	ENE1 Credits: N/A ENE	2 Credits: N/A ENE	Credits: N/A	CfSH Level: N/A
Surveyor: Address: Client:	Richard Holmes, Tel: 0115 9231 Denton Drive, West Bridgford, N	-		Surveyor	ID: 4477-0001
	rsion: Elmhurst Energy Systems SA : SAP 2012, Regs Region: England				ed)
SUMMARY	FOR INPUT DATA FOR New Buil	ld (As Designed)			Page 3 of 6
Orientation	South	d Torraco			

Orientation 1.0 Property Type 2.0 Number of Storeys 3.0 Date Built 3.0 Property Age Band 4.0 Sheltered Sides 5.0 Sunlight/Shade 6.0 Measurements	South House, End-To 4 2016 2 Average or un					
	Heat Loss Perimeter	Internal Floor Area	Average Sto	orey Height		
Basement:	39.11	104.83	2.6	:0		
1st Storey:	38.51	87.87	3.2			
2nd Storey:	32.77	73.57	3.0			
3rd Storey:	32.77	73.57	2.9			
7.0 Living Area	61.38					
8.0 Thermal Mass Parameter	Simple calcula	tion - Medium				
9.0 External Walls Description	Construction	ense plaster, lightweight	U-Value	Kappa	Gross Area	Nett Area
Basement	aggregate bloo structure	0.20		101.68	101.68	
Main	Cavity wall; de aggregate bloo structure	0.20		316.58	275.09	
9.1 Party walls Description	Construction		Кар	pa A	Area	
Party Wall 1	Dense plaster both sides. lightweight aggre blocks, cavity or cavity fill		egate 66.08			
10.0 External Roofs Description	Construction		U-Value	Карра	Gross Area	Nett Area
Flat	Plasterboard, insulated flat roof		0.16		104.83	100.99
10.1 Party Ceilings Description	Construction		Kappa Area			
Party Ceilings 1 g and 1	Other Concrete floor	slab, carpeted		-	7.87 60.00	
11.0 HeatLoss Floors Description	Construction		U-Value	Kappa	Area	
Basement	Slab on groun	d, screed over insulation	0.16		104.83	

11.1 Party Floors

Description			Constructi	on				Kappa	Area		
2 1 and g			Precast co	oncrete pl	anks floor,	screed, ca	peted		236.00)	
12.0 Openir	0 71	_									
Description	Data Source	Туре	Glazing	(Glazing Gap	Argon Filled	I Sola	ar Trans F	Frame Type	Frame Fac	tor U value
Door	Manufacturer	Solid Door									1.60
Windows	Manufacturer	Window	Double glaz	ed				0.76		0.70	1.40
Rooflight	Manufacturer	Roof Window	Double glaz	ed				0.76		0.70	1.40
13.0 Openir		Lesstier			Ourtain Tu		Overhang	Wide		O suit As	Curtain
Name	Opening Type	Location	,	Jrientation	Curtain Ty	pe	Ratio	Overhang	Width Height	Count Ar	Closed
Door	Solid Door	[2] Main	:	South						1.	89
Windows	Window	[2] Main		South	None		0.00			39	.60
RL	Roof Window	[1] Flat		Horizontal	None						84
		[1]									
14.0 Conser 15.0 Draugh			None 100								
16.0 Draugh			No								
17.0 Therma	,		Calculate	Bridges							
17.1 List of	00			0							
Source Type	e	Bridge Type							Length	Psi	Imported
Independen	itly assessed	E1 Steel linte	l with perfor	atad stad	hase nlat	2			18.90	0.050	Yes
Table K1 - A		E3 Sill							18.00	0.040	Yes
Table K1 - A	••	E4 Jamb							70.20	0.050	Yes
Table K1 - A		E5 Ground flo	or (normal)						38.51	0.160	No
Table K1 - E	••	E22 Basemer	```						39.11	0.070	No
Table K1 - A		E6 Intermedia		nin a dwe	lling				65.54	0.070	No
Table K1 - E	••	E15 Flat roof			anng				32.57	0.560	No
Table K1 - A		E16 Corner (i		<i>.</i>					26.00	0.090	No
Table K1 - A		E17 Corner (i	,	tornal are	o graatar t	oon oxtorn			20.00	-0.090	No
Table K1 - A		E17 Conter (i E18 Party wa			ea greater ti	Ian externa	ai alea)		2.60	-0.090	Yes
Table K1 - Z	••	P1 Party wall		-					5.29	0.000	No
Table K1 - E		P2 Party wall			within a dw	alling			10.74	0.000	No
Table K1 - E		P4 Party wall				-			5.37	0.240	No
						.,			0.01	0.210	
18.0 Pressu Designe	0		Yes 5.00								
	/ Tested ?		0.00								
As Built	•										
	s Designed ?										
	nical Ventilation		No								
Present	ical Ventilation	System	No								
	ed Installation										
	s open in hot w		Windows f	ully open	1						
	entilation possitentilation	ble	Yes No								
Air chan			8.00								
	ical Ventilation	data Type	0.00								
Туре											
	erence Number										
Configu MV/HR [Duct Insulated										
	cturer SFP										
Duct Ty											
	Efficiency										
Wet Roo Brand, N											
	viodei Open Fireplace	s. Flues									
		MH	IS SHS	Other	Total						
Number of (Chimneys	C)	0	0						
Number of c	open flues	C)	0	0						
Number of i	ntermittent fans	5			4						
Number of p	passive vents				0						
Number of f	lueless gas fire	s			0						
21.0 Cooling	g System		No								
	•	hurst Enorgy Syste	-	internal Offici		- har - Durain	Davis Lutter				

22.0 Lighting Internal	
Total number of light fittings	20
Total number of L.E.L. fittings	20
Percentage of L.E.L. fittings	100.00
External External lights fitted	No
Light and motion sensors	
23.0 Electricity Tariff	Standard
24.0 Heating Systems	
Main Heating 1 Description	Manufacturer
Percentage of Heat	100 %
Main Heating 2	None
Description Percentage of Heat	%
Community Heating	
Secondary Heating	None
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery	No
Instantaneous System 1 Waste Water Heat Recovery	No
Instantaneous System 2	NO
Waste Water Heat Recovery Storage	No
System	
Solar Panel	No
25.0 Main Heating 1	
Database Ref. No.	
Fuel Type Main Heating	BUC
TestMethod	
SAP Code	153
Efficiency (Manufacturer) %	75.0
Efficiency (Manufacturer) %	
In Winter	
In Summer	
Model Name Manufacturer	•
Controls	CBI Time and temperature zone control
PCDF Controls	0
Delayed Start Stat	Yes
Sap Code	2110
Burner Control	
Boiler Compensator	No
HETAS approved System Oil Pump Inside	No
FI Case	
FI Water	
Flue Type	
Smoke Control Area	Unknown
Fan Assisted Flue	Pump in bostod space
Is MHS Pumped Heat Emitter	Pump in heated space
Underfloor Heating	
Flow Temperature	
Electric CPSU Temperature	
Combi boiler type	
Combi keep hot type Combi store type	
27.0 Community Heating	
Space Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Controls SAB Code	
SAP Code Water Community Heating	
PCDF Index	
Distribution Loss	
Distribution Loss Value	
Charging Linked To Heat Use	
28.0 Secondary Heating	
Description	
SHS efficiency % SAP Code	

HETAS Approved System Smoke Control Area Test Method Manufacturer Model Name				
29.0 Water Heating	HWP From main heatir	ng 1		
Water use <= 125 litres/person/day	Yes			
SAP Code	901			
Immersion Heater Summer Immersion				
Suplementary Immersion				
Immersion Only Heating Hot Water				
29.1 Flue Gas Heat Recovery System				
Database ID				
Brand Model				
Details 29.2 Waste Water Heat Recovery				
System				
Total rooms with shower and/or bath				
30.0 Hot Water Cylinder	Hot Water Cylinder			
Cylinder In Heated Space	Yes Yes			
Cylinder In Heated Space Independent Time Control	Yes			
Insulation Type	Measured Loss			
Insulation Thickness				
Cylinder Volume	175.00			
Loss (kwh/day) Pipes insulation	2.00 Fully insulated primary	ninowork		
In Airing Cupboard	i uliy ilisulated primary	рремок		
31.0 Solar Panel				
Solar Panel Area				
Area Type				
Panel Type n0, a1, a2, A/G ratio				
Orientation				
Elevation				
Overshading				
Solar Storage Volume				
Pump electrically powered Combined Cylinder				
32.0 Thermal Store	None			
Thermal Store Pipework	None			
33.0 Photovoltaic Unit				
Apportioned KWh/Year				
34.0 Wind Turbines	Lirbon			
Terrain Type Wind Turbines	Urban			
Count				
Apportioned Kwh/year				
Rotor Diameter				
Hub Height 35.0 Small-scale Hydro				
Electricity Generated				
Description				
Apportioned kWh/Year				
Recommendations				
None				
Further measures to achieve even higher	r			
standards				
Solar water heating	£4,000 - £6,000	£76	B 82	A 96
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Solar photovoltaic panels, 2.5 kWp	£5,000 - £8,000	£279	B 85	A 99