elmhurst energy systems

SAP Calculations

Client:

Project: Customized Project 1
Customized Project 2

Contact: Andrew Allison
Ryland Design Services Ltd
andrew@rylanddesign.co.uk

energy rating made easy

Sample Report Ltd
1 Sample Street
Sampletown

Building Regulation Compliance

Property Reference: 000160
Survey Reference: 001
Property: Plot 1, Shop Lane , Goulceby, Louth, Lincolnshire, LN11 9UW

Issued on Date: 02.Mar.2015
Prop Type Ref:

SAP Rating:	84 B	**CO2 Emissions (t/year):**	3.27	**DER:** 13.51 Pass	**TER:** 20.46	**Percentage DER<TER:**	33.95 %
Environmental:	86 B	**General Requirements Compliance:**	Pass	**DFEE:** 53.71 Pass	**TFEE:** 54.53	**Percentage DFEE<TFEE:**	1.50 %

CfSH Results	**Version:**	**ENE1 Credits:**	N/A	**ENE2 Credits:**	N/A	**ENE7 Credits:**	N/A	**CfSH Level:**	N/A

Surveyor: Andrew Allison, Tel: 01673860100 Surveyor ID: 1276-0001
Address: Lincoln Road , Welton, Lincoln, Lincolnshire, LN2 3PZ
Client:

Software Version: Elmhurst Energy Systems SAP2012 Calculator (Design System) version 2.01r14
SAP version: SAP 2012, Regs Region: England (Part L1A 2013), Calculation Type: New Dwelling As Designed

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

1a TER and DER

Fuel for main heating:	Electricity	
Fuel factor:	1.55 (electricity)	
Target Carbon Dioxide Emission Rate (TER)	20.46 kg/m^2	
Dwelling Carbon Dioxide Emission Rate (DER)	13.51 kg/m^2	OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	54.53 kWh/m^2	
Dwelling Fabric Energy Efficiency (DFEE)	53.71 kWh/m^2	OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.27 (max. 0.30)	0.27 (max. 0.70)	OK
Floor	0.14 (max. 0.25)	0.14 (max. 0.70)	OK
Roof	0.10 (max. 0.20)	0.10 (max. 0.35)	OK
Openings	1.33 (max. 2.00)	1.80 (max. 3.30)	OK

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

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

4 Heating efficiency

Main heating system:	Heat pump with radiators or underfloor - Electric Vaillant geoTHERM 10 kW VWS 101/2	
Secondary heating system:	Room heaters - Wood Logs Data from manufacturer, tested to BS EN 1266, HETAS approved ? Efficiency: 70% Minimum: 65%	OK

5 Cylinder insulation

Hot water storage	Nominal cylinder loss: 2.55 kWh/day Permitted by DBSCG 2.86	OK
Primary pipework insulated:	Yes	OK

6 Controls

Space heating controls:	Time and temperature zone control	OK
Hot water controls:	Cylinderstat	OK
	Independent timer for DHW	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings:	100%	

Minimum	75%	OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (East Pennines):	Not significant	OK
Based On:		
Overshading:	Average	
Windows facing North:	10.89 m^2, No overhang	
Windows facing East:	4.14 m^2, No overhang	
Windows facing South:	26.73 m^2, No overhang	
Windows facing West:	4.02 m^2, No overhang	
Air change rate:	8.00 ach	
Blinds/curtains:	Light-coloured curtain or roller blind, closed 5% of daylight hours	

10 Key features

Roof U-value	0.10 W/m^2K
Secondary heating (wood logs)	
Secondary heating fuel:	wood logs

Predicted Energy Assessment

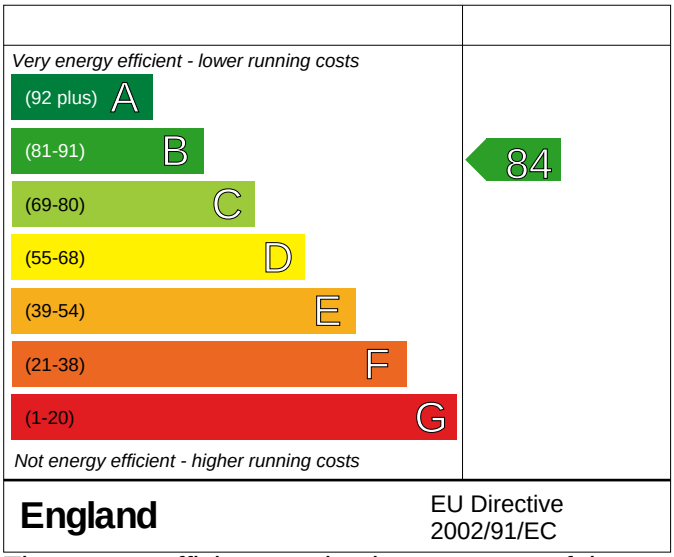
Plot 1, Shop Lane ,
Goulceby,
Louth,
Lincolnshire,
LN11 9UW

Dwelling type:	House, Detached
Date of assessment:	02.Mar.2015
Produced by:	Ryland Design Services Ltd
Total floor area:	258.9 m^2

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

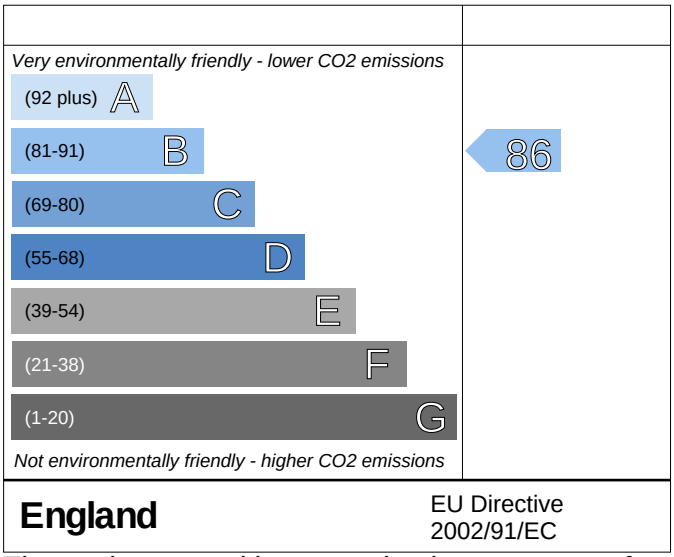
The energy performance has been assessed using the Government approved SAP2012 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO2) emissions.

Energy Efficiency Rating



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

Environmental Impact (CO2) Rating



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

SURVEY NOTES

Property Reference: 000160
Survey Reference: 001

Issued on Date: 02.Mar.2015
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Revision A Heat pump updated

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Summary Information

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SUMMARY FOR INPUT DATA FOR New Build (As Designed)

Orientation	North West
1.0 Property Type	House, Detached
2.0 Number of Storeys	2
3.0 Date Built	2015
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
Ground Floor:	67.20	175.50	2.36
1st Storey:	37.30	83.40	2.71

7.0 Living Area	29.70
8.0 Thermal Mass Parameter	Simple calculation - Medium

9.0 External Walls

Description	Construction	U-Value	Kappa	Gross Area	Nett Area
External Wall 1	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.27		240.68	191.08
External Wall 2	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.28		19.00	19.00

10.0 External Roofs

Description	Construction	U-Value	Kappa	Gross Area	Nett Area
External Roof 1	Plasterboard, insulated at ceiling level	0.10		175.50	175.50

11.0 HeatLoss Floors

Description	Construction	U-Value	Kappa	Area
Heat Loss Floor 1	Suspended concrete floor, carpeted	0.14		175.50

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	Solar Trans	Frame Type	Frame Factor	U value
Opening Type 1	Manufacturer	Solid Door							1.80
Opening Type 2	Manufacturer	Window	Double Low-E Soft 0.1			0.63		0.70	1.30
Opening Type 3	Manufacturer	Half Glazed Door	Double Low-E Soft 0.1			0.63		0.70	1.50

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width	Height	Count	Area	Curtain Closed
Opening 1	Solid Door	[1] External Wall 1	South							1.91	
Opening 2	Half Glazed Door	[1] External Wall 1	West							1.91	
Opening 3	Window	[1] External Wall 1	North	Light-coloured curtain or roller blind	0.00					10.89	5
Opening 4	Window	[1] External Wall 1	East	Light-coloured curtain or roller blind	0.00					4.14	5

Opening 5	Window	[1] External Wall 1	South	Light-coloured curtain or roller blind	0.00	26.73	5
Opening 6	Window	[1] External Wall 1	West	Light-coloured curtain or roller blind	0.00	4.02	5

14.0 Conservatory None
15.0 Draught Proofing 100
16.0 Draught Lobby No

17.0 Thermal Bridging Calculate Bridges
17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Table K1 - Approved	E2 Other lintels (including other steel lintels)	33.31	0.300	Yes
Table K1 - Approved	E3 Sill	31.49	0.040	Yes
Table K1 - Approved	E4 Jamb	71.50	0.050	Yes
Table K1 - Approved	E5 Ground floor (normal)	67.20	0.160	Yes
Table K1 - Approved	E6 Intermediate floor within a dwelling	37.30	0.070	Yes
Table K1 - Approved	E10 Eaves (insulation at ceiling level)	41.50	0.060	No
Table K1 - Approved	E12 Gable (insulation at ceiling level)	23.00	0.240	No
Table K1 - Approved	E16 Corner (normal)	20.28	0.090	Yes

18.0 Pressure Testing Yes
Designed q50 4.00
Property Tested ?
As Built q50
Same As Designed ?

19.0 Mechanical Ventilation
Mechanical Ventilation System Present No
Approved Installation
Windows open in hot weather Windows fully open
Cross ventilation possible Yes
Night Ventilation Yes
Air change rate 8.00
Mechanical Ventilation data Type
Type
MV Reference Number
Configuration
MVHR Duct Insulated
Manufacturer SFP
Duct Type
MVHR Efficiency
Wet Rooms
Brand, Model

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	1	0	0	1
Number of open flues	0	0	0	0
Number of intermittent fans				6
Number of passive vents				0
Number of flueless gas fires				0

21.0 Cooling System No

22.0 Lighting
Internal
Total number of light fittings 40
Total number of L.E.L. fittings 40
Percentage of L.E.L. fittings 100.00
External
External lights fitted Yes
Light and motion sensors Yes
23.0 Electricity Tariff Standard

24.0 Heating Systems
Main Heating 1 Database
Description Heat Pump
Percentage of Heat 100 %
Main Heating 2 None
Description
Percentage of Heat %
Community Heating None
Secondary Heating Manufacturer
Water Heating Main Heating 1
Flue Gas Heat Recovery System No

Waste Water Heat Recovery Instantaneous System 1	No
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage System	No
Solar Panel	No
25.0 Main Heating 1	
Database Ref. No.	100071
Fuel Type	Electricity
Main Heating	PER
TestMethod	
SAP Code	221
Efficiency (Split Efficiences) %	
Efficiency (Split Efficiences) %	
In Winter	401.7
In Summer	202.1
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	Underfloor
Underfloor Heating	Yes - Pipes in thin screed
Flow Temperature	Yes - Pipes in thin screed
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	RWM
Description	Wood Logs RWM Closed room heater
SHS efficiency %	70.00
SAP Code	633
HETAS Approved System	Yes
Smoke Control Area	Unknown
Test Method	BS EN 1266
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	No
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 water heating	£4,000 - £6,000	£113	B 86	B 87
Solar photovoltaic panels, 2.5 kWp	£5,000 - £8,000	£277	B 90	B 91

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Thermal Bridging

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	Junction detail	Source Type	Psi (W/mK)	Length (m)	Result	Reference
External wall	E2 Other lintels (including other steel lintels)	Table K1 - Approved	0.300	33.31	9.99	
External wall	E3 Sill	Table K1 - Approved	0.040	31.49	1.26	
External wall	E4 Jamb	Table K1 - Approved	0.050	71.50	3.58	
External wall	E5 Ground floor (normal)	Table K1 - Approved	0.160	67.20	10.75	
External wall	E6 Intermediate floor within a dwelling	Table K1 - Approved	0.070	37.30	2.61	
External wall	E10 Eaves (insulation at ceiling level)	Table K1 - Approved	0.060	41.50	2.49	
External wall	E12 Gable (insulation at ceiling level)	Table K1 - Approved	0.240	23.00	5.52	
External wall	E16 Corner (normal)	Table K1 - Approved	0.090	20.28	1.83	

Total W/mK: 38.03
Y-Value W/m2K: 0.062