



SAP Calculations

Client: Radmore & others

Project: House 4, Green Farm Paddocks
Stafford, Seighford

Contact: Ian Owen
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01785 660066

Building Regulation Compliance

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Property Reference: 000307

Issued on Date: 10.Aug.2015

Survey Reference: 001 House 4 LPG System

Prop Type Ref: House 4 Detached

Property: House 4, Green Farm Paddocks, Seighford, Stafford

SAP Rating: 77 C **CO2 Emissions (t/year):** 2.85 **DER:** 15.15 Pass **TER:** 15.31 **Percentage DER<TER:** 1.02 %
Environmental: 85 B **General Requirements Compliance:** Pass **DFEE:** 46.67 Pass **TFEE:** 54.17 **Percentage DFEE<TFEE:** 13.85 %

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

Surveyor: Ian Owen, Tel: 01785660066 **Surveyor ID:** 8172-0001
Address: 40 Weeping Cross, Stafford, ST17 0DS
Client: Radmore & others, JD & WT

Software Version: Elmhurst Energy Systems SAP2012 Calculator (Design System) version 3.01r13
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:	Bulk LPG	
Fuel factor:	1.06 (LPG)	
Target Carbon Dioxide Emission Rate (TER)	15.31 kg/m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	15.15 kg/m ²	OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	54.17 kWh/m ²	
Dwelling Fabric Energy Efficiency (DFEE)	46.67 kWh/m ²	OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.21 (max. 0.30)	0.21 (max. 0.70)	OK
Floor	0.17 (max. 0.25)	0.22 (max. 0.70)	OK
Roof	0.11 (max. 0.20)	0.12 (max. 0.35)	OK
Openings	1.12 (max. 2.00)	1.20 (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:	5.00 (design value)	
Maximum	10.0	OK

4 Heating efficiency

Main heating system:	Boiler system with radiators or underfloor - Bulk LPG Data from database Worcester Greenstar 40CDi Classic Regular ErP LPG Efficiency: 90.2% SEDBUK2009 Minimum: 88.0%	OK
Secondary heating system:	Room heaters - Wood Logs Data from manufacturer, tested to BS EN 1266, HETAS approved Stockton 6 Efficiency: 75% Minimum: 65%	OK

5 Cylinder insulation

Hot water storage	Measured cylinder loss: 2.00 kWh/day Permitted by DBSCG 2.30	OK
Primary pipework insulated:	Yes	OK

6 Controls

Space heating controls:	Time and temperature zone control	OK
Hot water controls:	Cylinderstat	OK

Boiler interlock	Independent timer for DHW Yes	OK 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 (Midlands):	Not significant	OK
Based On:		
Overshading:	Average	
Windows facing North:	7.68 m ² , No overhang	
Windows facing East:	0.95 m ² , No overhang	
Windows facing South:	7.42 m ² , No overhang	
Windows facing West:	3.50 m ² , No overhang	
Air change rate:	4.00 ach	
Blinds/curtains:	None	
10 Key features		
Roof U-value	0.11 W/m ² K	
Roof U-value	0.12 W/m ² K	
Door U-value	1.10 W/m ² K	
Window U-value	1.10 W/m ² K	
Secondary heating (wood logs)		
Secondary heating fuel:	wood logs	

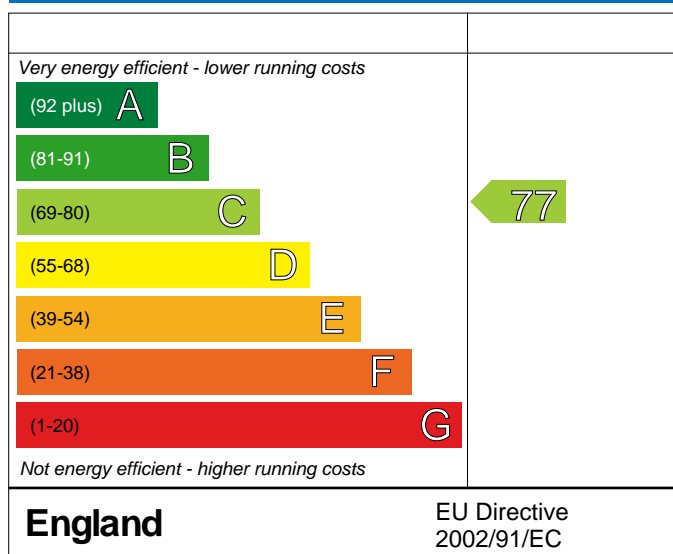
House 4, Green Farm Paddocks,
Seighford,
Stafford

Dwelling type: House, Detached
Date of assessment: 10.Aug.2015
Produced by: Active Energy Assessors Ltd
Total floor area: 206.64 m²

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.

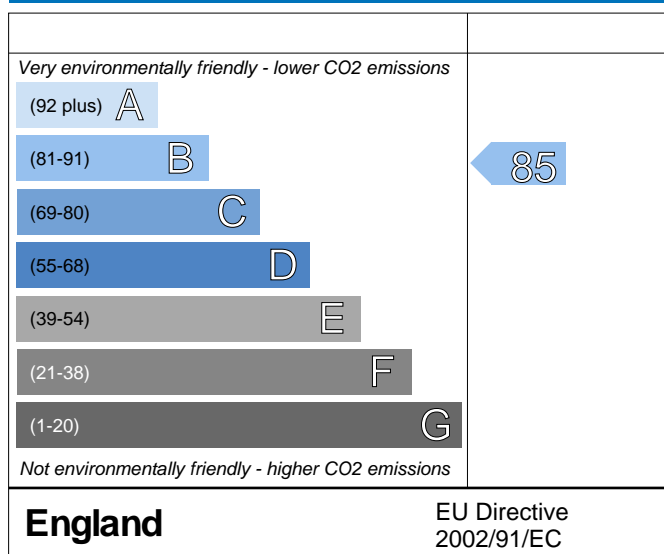
The energy performance has been assessed using the Government approved SAP2012 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO₂) emissions.

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.

Summary Information

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Orientation	South
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:	39.39	89.00	2.60
1st Storey:	49.45	117.64	2.30

7.0 Living Area 25.00

8.0 Thermal Mass Parameter Simple calculation - Low

9.0 External Walls	Description	Construction	U-Value	Kappa	Gross Area	Nett Area
External Wall 1	External Wall 1	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.21		201.36	171.49
Garage sheltered wall	Garage sheltered wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.21		14.79	14.79

10.0 External Roofs	Description	Construction	U-Value	Kappa	Gross Area	Nett Area
External Roof 1	External Roof 1	Plasterboard, insulated at ceiling level	0.11		89.00	89.00
External Roof 2	External Roof 2	Plasterboard, insulated slope	0.12		32.20	30.15

11.0 HeatLoss Floors	Description	Construction	U-Value	Kappa	Area
Heat Loss Floor 1	Heat Loss Floor 1	Slab on ground, screed over insulation	0.15		60.36
Heat Loss Floor 2	Heat Loss Floor 2	Other	0.25		28.64

12.0 Opening Types	Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	Solar Trans	Frame Type	Frame Factor	U value
Windows	Windows	Manufacturer	Window	Double Low-E Soft 0.1			0.63		0.70	1.10
French windows	French windows	Manufacturer	Half Glazed Door	Double Low-E Soft 0.1			0.63		0.70	1.10
Half glazed door	Half glazed door	Manufacturer	Half Glazed Door	Double Low-E Soft 0.1			0.63		0.70	1.20
Roof lights	Roof lights	Manufacturer	Roof Window	Double Low-E Soft 0.05			0.63		0.70	1.20

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width	Height	Count	Area	Curtain Closed
Front	Window	[1] External Wall 1	South	None	0.00					7.42	
Front Door	Half Glazed Door	[1] External Wall 1	South							3.74	
Rear windows	Window	[1] External Wall 1	North	None	0.00					7.68	
French Windows	Half Glazed Door	[1] External Wall 1	North							4.62	
Side windows	Window	[1] External Wall 1	East	None	0.00					0.95	
Side windows	Window	[1] External Wall 1	West	None	0.00					3.50	
Side door	Half Glazed Door	[1] External Wall 1	West							1.96	
Roof light W	Roof Window	[2] External Roof 2	West	None						1.38	
Roof light S	Roof Window	[2] External Roof 2	South	None						0.67	
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)	23.23	0.300	Yes
Table K1 - Approved	E3 Sill	18.32	0.040	Yes
Table K1 - Approved	E4 Jamb	44.18	0.050	Yes
Table K1 - Approved	E5 Ground floor (normal)	39.39	0.160	Yes
Table K1 - Approved	E6 Intermediate floor within a dwelling	49.45	0.070	Yes
Table K1 - Approved	E10 Eaves (insulation at ceiling level)	24.00	0.060	No
Table K1 - Approved	E11 Eaves (insulation at rafter level)	6.50	0.040	No
Table K1 - Approved	E12 Gable (insulation at ceiling level)	15.00	0.240	No
Table K1 - Approved	E13 Gable (insulation at rafter level)	8.70	0.040	No
Table K1 - Approved	E16 Corner (normal)	19.60	0.090	Yes
Table K1 - Default	R1 Head of roof window	1.92	0.080	Yes
Table K1 - Default	R2 Sill of roof window	1.92	0.060	Yes
Table K1 - Default	R3 Jamb of roof window	6.40	0.080	Yes

18.0 Pressure Testing Yes
 Designed q50 5.00
 Property Tested ?
 As Built q50
 Same As Designed ?

19.0 Mechanical Ventilation

Mechanical Ventilation System No
 Present
 Approved Installation
 Windows open in hot weather Windows half open
 Cross ventilation possible Yes
 Night Ventilation No
 Air change rate 4.00
 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	0	0	0	0
Number of open flues	0	0	0	0
Number of intermittent fans				4
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 25

Total number of L.E.L. fittings	25
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	LPG
Percentage of Heat	100 %
Main Heating 2	None
Description	
Percentage of Heat	%
Community Heating	
Secondary Heating	Manufacturer
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	
Solar Panel	No
25.0 Main Heating 1	
Database Ref. No.	17565
Fuel Type	Bulk LPG
Main Heating	BLB
TestMethod	
SAP Code	102
Efficiency (Split Efficiencies) %	
Efficiency (Split Efficiencies) %	
In Winter	91.2
In Summer	80.5
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	
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 and 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 %	75.00
SAP Code	633
HETAS Approved System	Yes
Smoke Control Area	Unknown
Test Method	BS EN 1266

Manufacturer	Stovax			
Model Name	Stockton 6			
29.0 Water Heating	HWP From main heating 1			
Water use <= 125 litres/person/day	Yes			
SAP Code	901			
Immersion Heater				
Summer Immersion				
Supplementary 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	Measured Loss			
Insulation Thickness				
Cylinder Volume	210.00			
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	£109	C 79	B 86
Solar photovoltaic panels, 2.5 kWp	£5,000 - £8,000	£286	B 84	B 91

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	23.23	6.97	
External wall	E3 Sill	Table K1 - Approved	0.040	18.32	0.73	
External wall	E4 Jamb	Table K1 - Approved	0.050	44.18	2.21	
External wall	E5 Ground floor (normal)	Table K1 - Approved	0.160	39.39	6.30	
External wall	E6 Intermediate floor within a dwelling	Table K1 - Approved	0.070	49.45	3.46	
External wall	E10 Eaves (insulation at ceiling level)	Table K1 - Approved	0.060	24.00	1.44	
External wall	E11 Eaves (insulation at rafter level)	Table K1 - Approved	0.040	6.50	0.26	
External wall	E12 Gable (insulation at ceiling level)	Table K1 - Approved	0.240	15.00	3.60	
External wall	E13 Gable (insulation at rafter level)	Table K1 - Approved	0.040	8.70	0.35	
External wall	E16 Corner (normal)	Table K1 - Approved	0.090	19.60	1.76	
External roof	R1 Head of roof window	Table K1 - Default	0.080	1.92	0.15	
External roof	R2 Sill of roof window	Table K1 - Default	0.060	1.92	0.12	
External roof	R3 Jamb of roof window	Table K1 - Default	0.080	6.40	0.51	

Total W/mK: 27.87
 Y-Value W/m2K: 0.065

U-value calculator report

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Building Elements:

Roof 000004 - 400mm Quilt

Roof Type: Pitched Roof, insulated flat ceiling

Layer	Description	Thickness	Conductivity	Resistance	Fraction
Ext surface				0.040	
Layer 1	Mineral wool quilt				
	Main construction	300 mm	0.042	7.143	100.00 %
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 2	Mineral wool quilt				
	Main construction	100 mm	0.042	2.381	90.14 %
	Bridging - Timber	100 mm	0.130		9.86 %
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 3	Plasterboard, standard				
	Main construction	12 mm	0.210	0.057	100.00 %
Int surface				0.100	
Total resistance:		Upper limit = 9.534 m ² K/W	Lower limit = 9.313 m ² K/W	Average = 9.424 m ² K/W	
U-value (unrounded) = 0.11 W/m ² K					

Unheated space: None

Total thickness: 412 mm U-value: 0.11 W/m² K

Floor 000003 - 125 mm Celotex slab

Floor Type: Slab On Ground Floor
Area = 40.20 m², Perimeter = 39.39 m, Wall thickness = 275.00 mm, Soil: Unknown
Horizontal edge insulation: none
Vertical edge insulation: none

Layer	Description	Thickness	Conductivity	Resistance	Fraction
Ext surface				0.040	
Layer 1	Screed				
	Main construction	75 mm	1.150	0.065	100.00 %
Layer 2	Celotex FF4000				
	Main construction	125 mm	0.022	5.682	100.00 %
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 3	Concrete, medium density				
	Main construction	150 mm	1.350	0.111	100.00 %
Int surface				0.170	
Total resistance:		Upper limit = 5.858 m ² K/W	Lower limit = 5.858 m ² K/W	Average = 5.858 m ² K/W	
U-value (unrounded) = 0.15 W/m ² K					

Unheated space: None

Total thickness: 350 mm U-value: 0.15 W/m² K

U-value calculator report

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Building Elements:

Floor 000005 - floor- suspended timber floor

Floor Type: Suspended Floor
Area = 28.64 m², Perimeter = 49.45 m, Wall thickness = 300.00 mm, Soil: Clay
Depth of underfloor space below ground:0.200 m Floor wind shielding: Average (suburban)
Floor height above ground:h = 0.200 m
U-value of walls above ground:Uw = 1.500 m
Ventilation openings per perimeter length:e = 0.0015 %
Mean wind speed:v = 5.000 m/s
Resistance on solum:Rg = 0.000 m²K/W

Layer	Description	Thickness	Conductivity	Resistance	Fraction
Ext surface				0.170	
Layer 1	Insulation/joists				
	Main construction	150 mm	0.040	3.750	89.00 %
	Bridging - Timber	150 mm	0.130		11.00 %
Layer 2	Chipboard				
	Main construction	19 mm	0.130	0.146	100.00 %
Int surface				0.170	
Total resistance:		Upper limit = 3.608 m ² K/W Lower limit = 3.492 m ² K/W Average = 3.550 m ² K/W		U-value (unrounded) = 0.25 W/m ² K	

Unheated space: None

Total thickness: 169 mm U-value: 0.25 W/m² K