



The Goat, Ponders End

Energy Statement for Planning

Job No: 3282

Issued: February 2020

Issue: 2



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Document Control

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19.02.20

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19.02.20

Signature



Signature



1.0 Executive Summary

- 1.1 T16 Design has been appointed to produce this Energy Statement for the proposed development at The Goat Public House , Ponders End, EN3 .
- 1.2 The report assesses the predicted energy performance and carbon dioxide emissions of the proposed development in the context of local and London-wide policy requirements and best practice methods.
- 1.3 The methodology used to demonstrate the effects of the proposed energy efficiency measures is the 3-stage Energy Hierarchy expounded by the London Plan, Policy 5.2A.
- 1.4 Emissions reductions are shown for both the residential and commercial elements of the scheme at each of these stages and the strategy underpinning them is detailed in the relevant sections of the report.
- 1.5 The overall effect of these measures is a reduction in CO₂ emissions of at least 35% on a site-wide basis.



2.0 Project Summary

- 2.1 The site is located on the corner Queensway, fronting on to the High Street, adjacent to a recently developed block of flats.
- 2.2 Currently the site has an existing pub which will be refurbished and extend these elements will not be part of the calculations.
- 2.3 The proposal involves, the construction of a 9 residential units consisting of maisonettes and apartments to the rear of the existing pub.
- 2.4 The site location and approximate boundary are shown below.



3.0 Policy Requirements and Drivers

3.1 The relevant planning policy documents for this site, relating to energy are:

- The London Plan (2016)
- Enfield Local Plan (2018)
- Sustainable Design and Construction SPG (2014)
- Housing Supplementary Planning Guidance (2016)

3.2 The London Plan is the overall strategic plan for London, setting out an integrated economic, environmental, transport and social framework for developments in London over the coming decades.

- Policy 5.2: Minimising carbon dioxide emissions;
- Policy 5.3: Sustainable Design and Construction;
- Policy 5.4: Retrofitting;
- Policy 5.4A: Electricity and gas supply;
- Policy 5.5: Decentralised energy networks;
- Policy 5.6: Decentralised energy in development proposals;
- Policy 5.7: Renewable energy;
- Policy 5.8: Innovative energy technologies,
- Policy 5.9: Overheating and cooling.

3.3 The primary driver for this report is Policy 5.2 - "Minimizing Carbon Dioxide Emissions"

3.4 This policy sets out the progressive tightening of emissions targets over the next 10 years or so, aligning with the governments stated aim of achieving zero-carbon development.

3.5 As a part of this, residential developments are required to reduce emissions by at least 35% over Building Regulations.



- 3.6 Thus, it is logical to reduce emissions so far as reasonably practical on-site, before the offsetting payment is calculated.
- 3.7 Enfield Council's Core Strategy and Sustainable Design and Construction SPG also set standards relating to these areas, and require the demonstration of high standards in resource efficiency, sustainable design.
- 3.8 A small selection of units from the scheme has been selected to be representative of the overall methodology to comply with the planning requirements.
- 3.9 In light of these policy requirements and through the developer and design team's commitment to reducing the impact of the development on the environment, this report sets out some of the measures that will be adopted to meet the policy targets



4.0 Energy Strategy and Approach

- 4.1 The London Plan document titled "Energy Assessment Guidance", updated in October 2018, provides the parameters by which Energy Statements should be formulated and the approach to be adopted.
- 4.2 The targets and hierarchies to be used for both domestic are shown in the graphs below:

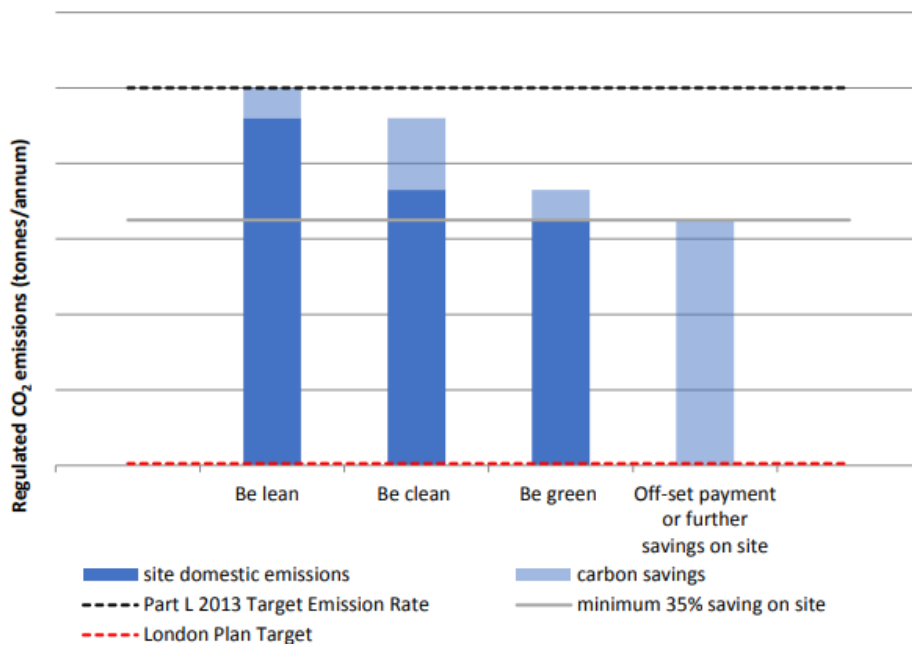


Figure 1- Domestic Targets and Hierarchy



- 4.3 The three stages of the hierarchy are referred to as Be Lean (Use Less Energy), Be Clean (Supply Energy Efficiently) and Be Green (Use Renewable Energy).
- 4.4 Essentially, this means the first step is to improve insulation and air tightness levels and to reduce thermal bridging.
- 4.5 Stage 2 is to supply energy cleanly, meaning consideration of the use of heat pumps, district heating networks, biomass and Combined Heat and Power.
- 4.6 The third stage is the addition, where required and sensible, of renewable technology such as solar panels, wind and hydroelectric.
- 4.7 The first stage of this process is to establish the baseline emissions on which the reductions will be based.
- 4.8 This is done using SAP (Standard Assessment Procedure) for the residential units.



5.0 Baseline Emissions

- 5.1 The baseline emissions on which reduction figures are based are calculated using SAP for the residential units
- 5.2 SAP calculates a notional building using the baseline Building Regulations parameters and represents the minimum allowable standard for the energy performance of the building to meet Part L1A.
- 5.3 The parameters used are defined by the methodology and represent a target upon which improvements can be measured.
- 5.4 The TER figures are given in $\text{kgCO}_2/\text{m}^2/\text{year}$ (kilograms of CO_2 , per square metre, per year).
- 5.5 Thus, to establish the actual baseline emissions per annum, it is necessary to multiply the TER by the floor area.
- 5.6 For each element, the baseline emissions are as follows:

Element	TER ($\text{kgCO}_2/\text{m}^2/\text{year}$)	Floor Area	Annual Emissions (kg) per Year
Residential - Flats	16.65	690 m^2	11488



6.0 Be Lean Strategy

- 6.1 The next stage, once the baseline has been established to is to make improvements within the "Be Lean" category. This includes improving the U Values, the addition of energy efficient ventilation systems and the reduction of thermal bridging.
- 6.2 Highly efficient gas boilers will be the heating source throughout the different stages
- 6.3 The U value improvements for each element, with the relevant Part L backstop are shown below:

Element	Value Used (Residential)	Part L1A Backstop (Residential)	Improvement (Residential)
Roofs	0.13 W/m ² K	0.20 W/m ² K	35%
Walls	0.18 W/m ² K	0.30 W/m ² K	49%
Ground Floors	0.14 W/m ² K	0.25 W/m ² K	44%
Windows/Rooflights	1.4 W/m ² K	2.0 W/m ² K	30%
Glazed Doors	1.4 W/m ² k	2.0 W/m ² k	30%
Air Permeability	5	10	50%

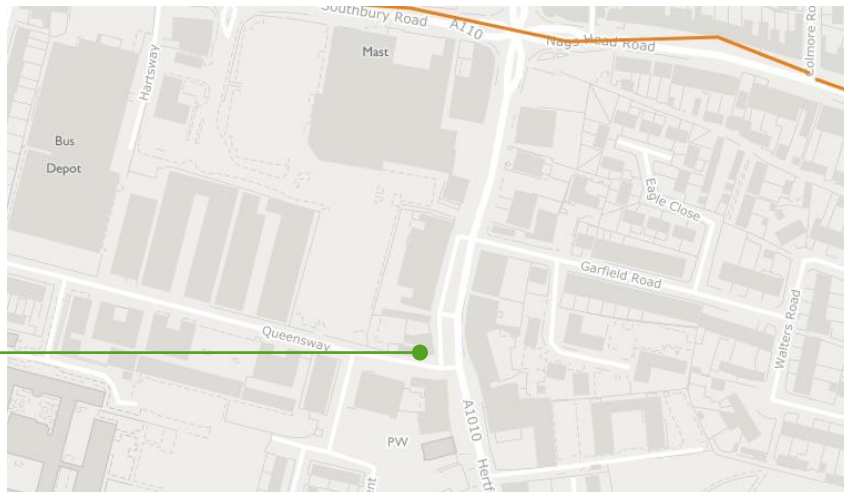
- 6.5 The reduction in emissions achieved from these improvements can be seen in Section 9.
- 6.6 Natural ventilation is assumed the most appropriate solution to deal with the London plan 5.9 overheating and cooling at this stage. Mechanical ventilation could be considered at a detailed design stage.



7.0 Be Clean Strategy

- 7.1 The Be Clean element of the hierarchy refers to supplying energy in a clean manner. This encompasses the use of energy efficient heating sources (such as heat pumps), decentralised energy and heat networks and the consideration of Combined Heat and Power.
- 7.2 The site is near a **proposed** decentralized energy or heating networks (as shown on the map below) therefore future proofing will be considered at detailed design stage.

Site Location



- 7.3 Due to the relatively small scale of the proposal, CHP is also not considered to be a viable solution.
- 7.4 Ground Source Heat pumps are also unlikely to be a viable proposition due to the ground disturbance required in their installation and the proximity of existing buildings.
- 7.5 Air Source Heat Pumps however are not a suitable solution in this instance due to the lack of space for a plant room or individual ASHPs.

8.0 Be Green Strategy

- 8.1 The Be Green element of the hierarchy requires the consideration of renewable technologies to reduce emissions still further beyond the savings made at the Be Lean and Be Clean stages.
- 8.2 The technologies that are considered here are wind power and solar panels (photovoltaic (PV) or Solar Thermal).
- 8.3 Wind power is not suitable in an urban location such as this. The site is heavily surrounded by buildings and existing structures.
- 8.4 Any wind that is received on the site would be too intermittent and turbulent to provide any meaningful reduction in emissions.
- 8.5 Solar panels (both PV and Solar Thermal) have been considered, and it has been concluded that PV panels are the most suitable option due to the large flat roof.
- 8.6 It has been calculate that 8kWp of PV would be required to comply with the 35% reduction target. Using 250W panels 32 panels would be required.
- 8.7 These would be position facing south at 30° where possible.
- 8.8 As a result, most savings are made at the "be green" stage.



9.0 Summary of Results

- 9.1 The tables below give the percentage improvement in emissions at each stage of the hierarchy and the overall savings made over Part L of the Building Regulations.
- 9.2 The scheme will be provided with increased U values (as shown above), gas boilers and PV (photovoltaic) panels.

Residential - Flats	Stage	Emissions (kgCO ₂ /m ² /year)	% Reduction
	Baseline (Part L compliance)	16.65	-
	Be Lean	16.00	3.90%
	Be Clean	16.00	3.90%
	Be Green	10.80	35.14%



10.0 Potable Water Usage

- 10.1 It is a best-practice measure to ensure that new dwellings achieve a predicted internal water usage of less than the 125L/person/day required by Building Regulations Part G. A target of 95L/person/day has been proposed for this site.
- 10.2 This is calculated using the Part G Water Usage tool. A version of this is used for the Code for Sustainable Homes and approved by BRE. This has been used at this early stage to give a guide to the potential internal water usage.
- 10.3 Please note that although the number of WCs, basins and showers varies from one unit to another, the overall usage is per person and so is not affected by the number of fittings installed, provided they are all the same.
- 10.4 The assumptions used for the calculations are:

- Basin Taps and Kitchen taps: 3l/min at 3bar
- Showers: 8l/min at 3bar
- Baths: 145l to overflow
- WCs: Dual flush - 4/2.6l
- No Waste Disposal
- No Water Softener
- Washing Machine: Default value (8.17l/kg load)
- Dishwasher: Default value (1.25l/place setting)

Total Predicted Usage 94.7l/person/day



11.0 Conclusion

- 11.1 This report has been set out to demonstrate how the proposed development at The Goat, Ponders End, EN3 will meet the policy requirement of achieving 35% reduction in emissions through the Be Lean, Be Clean, Be Green hierarchy.
- 11.2 In doing so, preliminary SAP calculations of a selected number of units have been undertaken using the information available and sensible assumptions on construction and M&E parameters.
- 11.3 The baseline figures have been calculated and improvements made to the fabric and plant proposed to both the residential and new-build commercial elements of the scheme.
- 11.4 Photovoltaics, improved thermal bridging and improved fabric U values are proposed to ensure the 35% target is met and exceeded.
- 11.5 The results in Section 9 show that a 35.14% site-wide improvement is achieved, exceeding the target and providing some room for changes should they be required through the detailed design process.





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Appendix A - SAP Calculations



Block Compliance WorkSheet: The Goat, Ponders End - Be Lean

User Details

Assessor Name: Samuel Westover
Software Name: Stroma FSAP

Stroma Number: STRO012073
Software Version: Version: 1.0.4.23

Calculation Details

Dwelling	DER	TER	DFEE	TFEE	TFA
Flat 1	20.38	20.7	52.7	58.1	61.4
Flat 2	19.04	19.04	44.4	48.3	57.6
Flat 3	18.04	18.15	41.7	46.3	64.5
Flat 4	13.65	14.35	30.5	36.6	98.8
Flat 5	14.57	15.57	35.3	43.3	95.5
Flat 6	15.07	15.74	28.8	33.6	63.9
Flat 7	18.14	19.08	43.1	49.4	60.1
Flat 8	14.44	15.18	33.5	39.4	92.7
Flat 9	14.61	15.58	35.8	43.2	95.5

Calculation Summary

Total Floor Area	690.00
Average TER	16.65
Average DER	16.00
Average DFEE	37.42
Average TFEE	43.45
Compliance	Pass
% Improvement DER TER	3.9
% Improvement DFEE TFEE	13.88

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.23
Printed on 17 January 2020 at 16:37:25

Project Information:

Assessed By: Samuel Westover (STRO012073)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 61.4m²

Site Reference : The Goat

Plot Reference: Flat 1

Address :

Client Details:

Name:

Address :

**This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.**

1a TER and DER

Fuel for main heating system: Mains gas

Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER) 20.7 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER) 20.38 kg/m² **OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE) 58.1 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE) 52.7 kWh/m² **OK**

2 Fabric U-values

Element	Average	Highest	
External wall	0.18 (max. 0.30)	0.18 (max. 0.70)	OK
Floor	0.14 (max. 0.25)	0.14 (max. 0.70)	OK
Roof	(no roof)		
Openings	1.40 (max. 2.00)	1.40 (max. 3.30)	OK

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals 5.00 (design value)
Maximum 10.0 **OK**

4 Heating efficiency

Main Heating system: Boiler systems with radiators or underfloor heating - mains gas
Data from manufacturer
Combi boiler
Efficiency 90.0 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

5 Cylinder insulation

Hot water Storage: No cylinder

N/A

Regulations Compliance Report

6 Controls

Space heating controls	TTZC by plumbing and electrical services	OK
Hot water controls:	No cylinder thermostat	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (Thames valley):	Medium	OK
Based on:		
Overshading:	Average or unknown	
Windows facing: West	14.2m ²	
Windows facing: East	1.5m ²	
Ventilation rate:	3.00	

10 Key features

None

SAP Input

Property Details: Flat 1

Address:
 Located in: England
 Region: Thames valley
 UPRN:
 Date of assessment: 14 January 2020
 Date of certificate: 17 January 2020
 Assessment type: New dwelling design stage
 Transaction type: New dwelling
 Tenure type: Unknown
 Related party disclosure: No related party
 Thermal Mass Parameter: Indicative Value Medium
 Water use <= 125 litres/person/day: True
 PCDF Version: 454

Property description:

Dwelling type: Flat
 Detachment:
 Year Completed: 2020
 Floor Location: Floor area: Storey height:
 Floor 0 61.4 m² 2.6 m
 Living area: 32 m² (fraction 0.335)
 Front of dwelling faces: South

Opening types:

Name:	Source:	Type:	Glazing:	Argon:	Frame:
W	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes	
E	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes	

Name:	Gap:	Frame Factor:	g-value:	U-value:	Area:	No. of Openings:
W	16mm or more	0.7	0.76	1.4	14.2	1
E	16mm or more	0.7	0.76	1.4	1.5	1

Name:	Type-Name:	Location:	Orient:	Width:	Height:
W		External	West	0	0
E		External	East	0	0

Overshading: Average or unknown

Opaque Elements:

Type:	Gross area:	Openings:	Net area:	U-value:	Ru value:	Curtain wall:	Kappa:
<u>External Elements</u>							
External	73.84	15.7	58.14	0.18	0	False	N/A
Ground	61.4			0.14			N/A

Internal Elements

Party Elements

Thermal bridges:

Thermal bridges: User-defined (individual PSI-values) Y-Value = 0.0625

	Length	Psi-value		
[Approved]	7.5	0.3	E2	Other lintels (including other steel lintels)
[Approved]	0.7	0.04	E3	Sill
[Approved]	14	0.05	E4	Jamb
[Approved]	28.4	0.16	E5	Ground floor (normal)

SAP Input

[Approved]	20.8	0.09	E16	Corner (normal)
[Approved]	10.4	-0.09	E17	Corner (inverted internal area greater than external area)

Ventilation:

Pressure test:	Yes (As designed)
Ventilation:	Natural ventilation (extract fans)
Number of chimneys:	0
Number of open flues:	0
Number of fans:	2
Number of passive stacks:	0
Number of sides sheltered:	2
Pressure test:	5

Main heating system:

Main heating system:	Boiler systems with radiators or underfloor heating
	Gas boilers and oil boilers
	Fuel: mains gas
	Info Source: Manufacturer Declaration
	Manufacturer's data
	Efficiency: 90.0% (SEDBUK2009)
	Condensing combi with automatic ignition
	Fuel Burning Type: Unknown
	Systems with radiators
	Central heating pump : 2013 or later
	Design flow temperature: Unknown
	Unknown
	Boiler interlock: Yes
	Delayed start

Main heating Control:

Main heating Control:	Time and temperature zone control by suitable arrangement of plumbing and electrical services
	Control code: 2110

Secondary heating system:

Secondary heating system:	None
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Water heating:

Water heating:	From main heating system
	Water code: 901
	Fuel :mains gas
	No hot water cylinder
	Solar panel: False

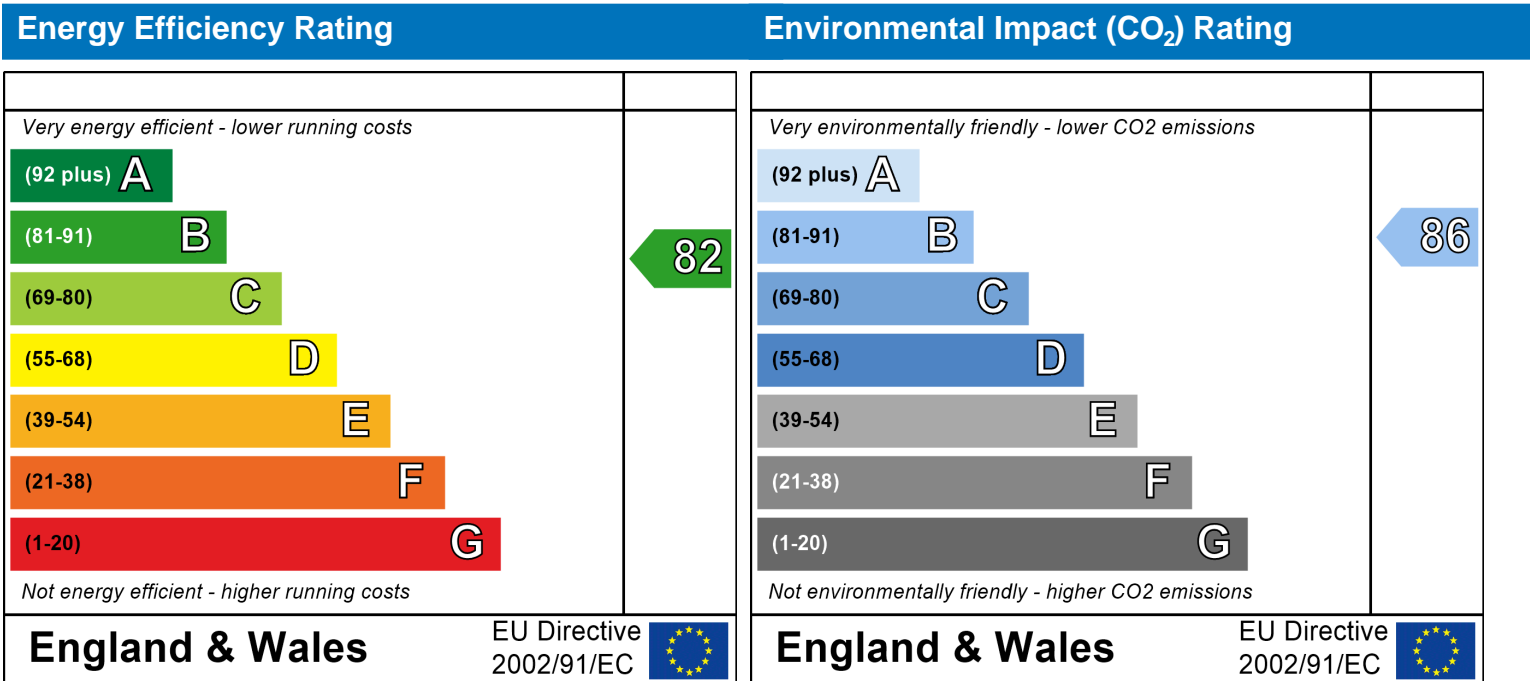
Others:

Electricity tariff:	7-Hour Tariff
In Smoke Control Area:	Yes
Conservatory:	No conservatory
Low energy lights:	100%
Terrain type:	Dense urban
EPC language:	English
Wind turbine:	No
Photovoltaics:	None
Assess Zero Carbon Home:	No

Dwelling type: Ground floor Flat
 Date of assessment: 14 January 2020
 Produced by: Samuel Westover
 Total floor area: 61.4 m²

This is a Predicted Energy Assessment for a property which is not yet complete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, an Energy Performance Certificate is required providing information about the energy performance of the completed property.

Energy performance has been assessed using the SAP 2012 methodology and is rated in terms of the energy use per square metre of floor area, energy efficiency based on fuel costs and environmental impact based on carbon dioxide (CO₂) emissions.



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.

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.

SAP 2012 Overheating Assessment

Calculated by Stroma FSAP 2012 program, produced and printed on 17 January 2020

Property Details: Flat 1

Dwelling type:	Flat
Located in:	England
Region:	Thames valley
Cross ventilation possible:	Yes
Number of storeys:	1
Front of dwelling faces:	South
Overshading:	Average or unknown
Overhangs:	None
Thermal mass parameter:	Indicative Value Medium
Night ventilation:	False
Blinds, curtains, shutters:	
Ventilation rate during hot weather (ach):	3 (Windows open half the time)

Overheating Details:

Summer ventilation heat loss coefficient:	158.04	(P1)
Transmission heat loss coefficient:	48.3	
Summer heat loss coefficient:	206.38	(P2)

Overhangs:

Orientation:	Ratio:	Z_overhangs:
West (W)	0	1
East (E)	0	1

Solar shading:

Orientation:	Z blinds:	Solar access:	Overhangs:	Z summer:	
West (W)	1	0.7	1	0.7	(P8)
East (E)	1	0.9	1	0.9	(P8)

Solar gains:

Orientation	Area	Flux	g _z	FF	Shading	Gains
West (W)	0.7 x	14.2	117.51	0.76	0.7	559.25
East (E)	0.9 x	1.5	117.51	0.76	0.9	75.95
					Total	635.2 (P3/P4)

Internal gains:

	June	July	August
Internal gains	364.84	350.15	357.72
Total summer gains	1039.12	985.35	916.55 (P5)
Summer gain/loss ratio	5.04	4.77	4.44 (P6)
Mean summer external temperature (Thames valley)	16	17.9	17.8
Thermal mass temperature increment	0.25	0.25	0.25
Threshold temperature	21.29	22.92	22.49 (P7)
Likelihood of high internal temperature	Slight	Medium	Medium

Assessment of likelihood of high internal temperature: Medium

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.23
Printed on 17 January 2020 at 16:37:11

Project Information:

Assessed By: Samuel Westover (STRO012073)

Building Type: Maisonette

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 57.6m²

Site Reference : The Goat

Plot Reference: Flat 2

Address :

Client Details:

Name:

Address :

**This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.**

1a TER and DER

Fuel for main heating system: Mains gas

Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER) 19.04 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER) 19.04 kg/m² **OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE) 48.3 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE) 44.4 kWh/m² **OK**

2 Fabric U-values

Element	Average	Highest	
External wall	0.18 (max. 0.30)	0.18 (max. 0.70)	OK
Floor	(no floor)		
Roof	0.14 (max. 0.20)	0.14 (max. 0.35)	OK
Openings	1.40 (max. 2.00)	1.40 (max. 3.30)	OK

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals 5.00 (design value)
Maximum 10.0 **OK**

4 Heating efficiency

Main Heating system: Boiler systems with radiators or underfloor heating - mains gas
Data from manufacturer
Combi boiler
Efficiency 90.0 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

5 Cylinder insulation

Hot water Storage: No cylinder

N/A

Regulations Compliance Report

6 Controls

Space heating controls	TTZC by plumbing and electrical services	OK
Hot water controls:	No cylinder thermostat	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (Thames valley):	Medium	OK
Based on:		
Overshading:	Average or unknown	
Windows facing: East	15.6m ²	
Ventilation rate:	2.50	

10 Key features

Thermal bridging	0.035 W/m ² K
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SAP Input

Property Details: Flat 2

Address:
 Located in: England
 Region: Thames valley
 UPRN:
 Date of assessment: 14 January 2020
 Date of certificate: 17 January 2020
 Assessment type: New dwelling design stage
 Transaction type: New dwelling
 Tenure type: Unknown
 Related party disclosure: No related party
 Thermal Mass Parameter: Indicative Value Medium
 Water use <= 125 litres/person/day: True
 PCDF Version: 454

Property description:

Dwelling type: Maisonette
 Detachment:
 Year Completed: 2020
 Floor Location: Floor area: Storey height:
 Floor 0 30.5 m² 2.6 m
 Floor 1 27.1 m² 2.9 m
 Living area: 25.6 m² (fraction 0.444)
 Front of dwelling faces: South

Opening types:

Name:	Source:	Type:	Glazing:	Argon:	Frame:	
E	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes		
Name:	Gap:	Frame Factor:	g-value:	U-value:	Area:	No. of Openings:
E	16mm or more	0.7	0.67	1.4	15.6	1
Name:	Type-Name:	Location:	Orient:	Width:	Height:	
E		External	East	0	0	

Overshading: Average or unknown

Opaque Elements:

Type:	Gross area:	Openings:	Net area:	U-value:	Ru value:	Curtain wall:	Kappa:
<u>External Elements</u>							
External	47.47	15.6	31.87	0.18	0	False	N/A
Roof	47.52	0	47.52	0.14	0		N/A
<u>Internal Elements</u>							
<u>Party Elements</u>							

Thermal bridges:

Thermal bridges: User-defined (individual PSI-values) Y-Value = 0.0348

	Length	Psi-value		
[Approved]	6.5	0.3	E2	Other lintels (including other steel lintels)
[Approved]	8.4	0.05	E4	Jamb
[Approved]	20.8	0.09	E16	Corner (normal)
[Approved]	10.4	-0.09	E17	Corner (inverted internal area greater than external area)

Ventilation:

Pressure test: Yes (As designed)

SAP Input

Ventilation:	Natural ventilation (extract fans)
Number of chimneys:	0
Number of open flues:	0
Number of fans:	2
Number of passive stacks:	0
Number of sides sheltered:	2
Pressure test:	5

Main heating system:

Main heating system:	Boiler systems with radiators or underfloor heating Gas boilers and oil boilers Fuel: mains gas Info Source: Manufacturer Declaration Manufacturer's data Efficiency: 90.0% (SEDBUK2009) Condensing combi with automatic ignition Fuel Burning Type: Unknown Systems with radiators Central heating pump : 2013 or later Design flow temperature: Unknown Unknown Boiler interlock: Yes Delayed start
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Main heating Control:

Main heating Control:	Time and temperature zone control by suitable arrangement of plumbing and electrical services Control code: 2110
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Secondary heating system:

Secondary heating system:	None
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Water heating:

Water heating:	From main heating system Water code: 901 Fuel :mains gas No hot water cylinder Solar panel: False
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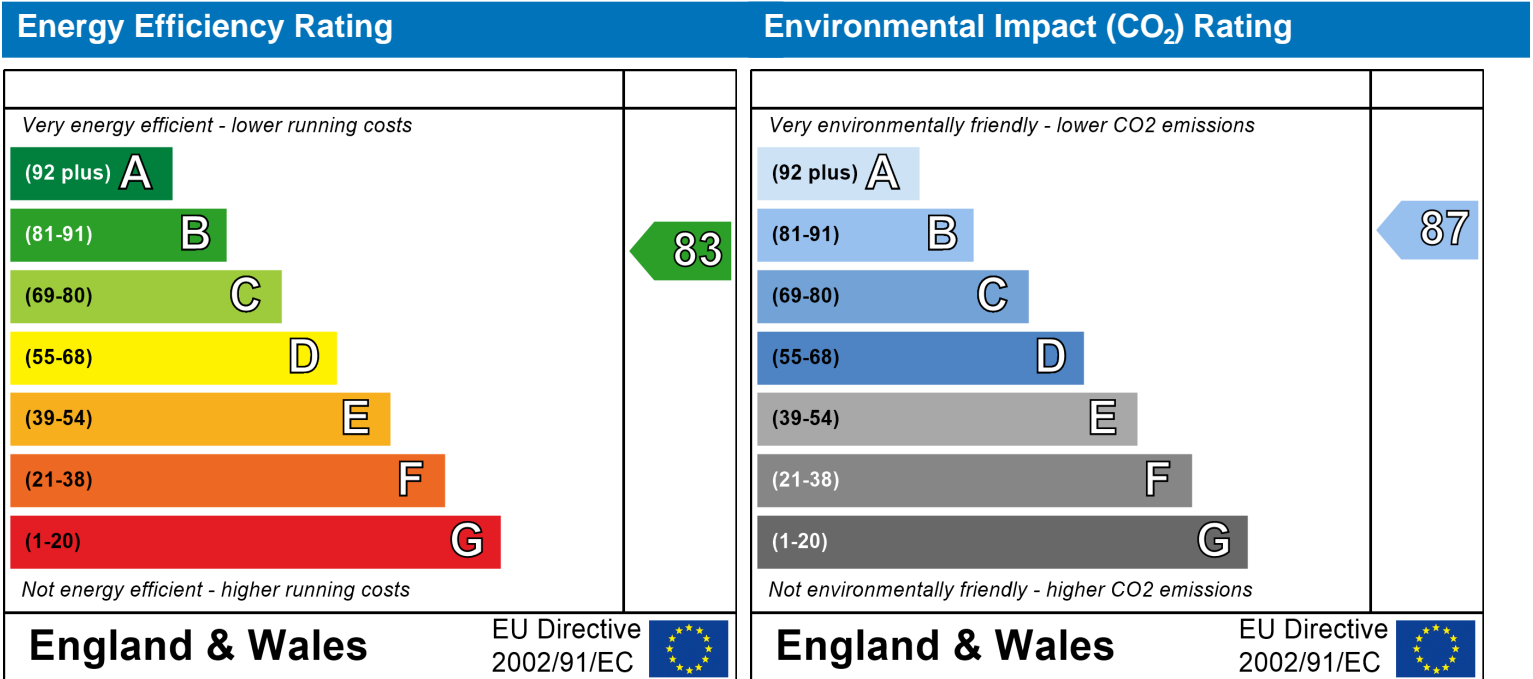
Others:

Electricity tariff:	7-Hour Tariff
In Smoke Control Area:	Yes
Conservatory:	No conservatory
Low energy lights:	100%
Terrain type:	Dense urban
EPC language:	English
Wind turbine:	No
Photovoltaics:	None
Assess Zero Carbon Home:	No

Dwelling type: Top floor Maisonette
 Date of assessment: 14 January 2020
 Produced by: Samuel Westover
 Total floor area: 57.6 m²

This is a Predicted Energy Assessment for a property which is not yet complete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, an Energy Performance Certificate is required providing information about the energy performance of the completed property.

Energy performance has been assessed using the SAP 2012 methodology and is rated in terms of the energy use per square metre of floor area, energy efficiency based on fuel costs and environmental impact based on carbon dioxide (CO₂) emissions.



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.

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.

SAP 2012 Overheating Assessment

Calculated by Stroma FSAP 2012 program, produced and printed on 17 January 2020

Property Details: Flat 2

Dwelling type:	Maisonette
Located in:	England
Region:	Thames valley
Cross ventilation possible:	No
Number of storeys:	2
Front of dwelling faces:	South
Overshading:	Average or unknown
Overhangs:	None
Thermal mass parameter:	Indicative Value Medium
Night ventilation:	False
Blinds, curtains, shutters:	
Ventilation rate during hot weather (ach):	2.5 (Windows open half the time)

Overheating Details:

Summer ventilation heat loss coefficient:	130.26	(P1)
Transmission heat loss coefficient:	36.4	
Summer heat loss coefficient:	166.64	(P2)

Overhangs:

Orientation:	Ratio:	Z_overhangs:
East (E)	0	1

Solar shading:

Orientation:	Z blinds:	Solar access:	Overhangs:	Z summer:	
East (E)	1	0.7	1	0.7	(P8)

Solar gains:

Orientation	Area	Flux	g _z	FF	Shading	Gains
East (E)	0.7 x 15.6	117.51	0.67	0.7	0.7	541.63
					Total	541.63 (P3/P4)

Internal gains:

	June	July	August
Internal gains	348.15	334.16	341.45
Total summer gains	923.1	875.79	817.96 (P5)
Summer gain/loss ratio	5.54	5.26	4.91 (P6)
Mean summer external temperature (Thames valley)	16	17.9	17.8
Thermal mass temperature increment	0.25	0.25	0.25
Threshold temperature	21.79	23.41	22.96 (P7)
Likelihood of high internal temperature	Slight	Medium	Medium

Assessment of likelihood of high internal temperature: Medium

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.23
Printed on 17 January 2020 at 16:36:56

Project Information:

Assessed By: Samuel Westover (STRO012073)

Building Type: Maisonette

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 64.5m²

Site Reference : The Goat

Plot Reference: Flat 3

Address :

Client Details:

Name:

Address :

**This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.**

1a TER and DER

Fuel for main heating system: Mains gas

Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER) 18.15 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER) 18.04 kg/m² **OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE) 46.3 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE) 41.7 kWh/m² **OK**

2 Fabric U-values

Element	Average	Highest	
External wall	0.18 (max. 0.30)	0.18 (max. 0.70)	OK
Floor	(no floor)		
Roof	0.14 (max. 0.20)	0.14 (max. 0.35)	OK
Openings	1.40 (max. 2.00)	1.40 (max. 3.30)	OK

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals 5.00 (design value)
Maximum 10.0 **OK**

4 Heating efficiency

Main Heating system: Boiler systems with radiators or underfloor heating - mains gas
Data from manufacturer
Combi boiler
Efficiency 90.0 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

5 Cylinder insulation

Hot water Storage: No cylinder

N/A

Regulations Compliance Report

6 Controls

Space heating controls	TTZC by plumbing and electrical services	OK
Hot water controls:	No cylinder thermostat	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (Thames valley):	Medium	OK
Based on:		
Overshading:	Average or unknown	
Windows facing: West	15.6m ²	
Ventilation rate:	2.50	

10 Key features

Thermal bridging	0.034 W/m ² K
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SAP Input

Property Details: Flat 3

Address:
 Located in: England
 Region: Thames valley
 UPRN:
 Date of assessment: 14 January 2020
 Date of certificate: 17 January 2020
 Assessment type: New dwelling design stage
 Transaction type: New dwelling
 Tenure type: Unknown
 Related party disclosure: No related party
 Thermal Mass Parameter: Indicative Value Medium
 Water use <= 125 litres/person/day: True
 PCDF Version: 454

Property description:

Dwelling type: Maisonette
 Detachment:
 Year Completed: 2020
 Floor Location: Floor area: Storey height:
 Floor 0 37.4 m² 2.6 m
 Floor 1 27.1 m² 2.9 m
 Living area: 25.6 m² (fraction 0.444)
 Front of dwelling faces: South

Opening types:

Name:	Source:	Type:	Glazing:	Argon:	Frame:	
W	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes		
Name:	Gap:	Frame Factor:	g-value:	U-value:	Area:	No. of Openings:
W	16mm or more	0.7	0.67	1.4	15.6	1
Name:	Type-Name:	Location:	Orient:	Width:	Height:	
W		External	West	0	0	

Overshading: Average or unknown

Opaque Elements:

Type:	Gross area:	Openings:	Net area:	U-value:	Ru value:	Curtain wall:	Kappa:
<u>External Elements</u>							
External	50.33	15.6	34.73	0.18	0	False	N/A
Roof	47.52	0	47.52	0.14	0		N/A
<u>Internal Elements</u>							
<u>Party Elements</u>							

Thermal bridges:

Thermal bridges: User-defined (individual PSI-values) Y-Value = 0.0338

	Length	Psi-value		
[Approved]	6.5	0.3	E2	Other lintels (including other steel lintels)
[Approved]	8.4	0.05	E4	Jamb
[Approved]	20.8	0.09	E16	Corner (normal)
[Approved]	10.4	-0.09	E17	Corner (inverted internal area greater than external area)

Ventilation:

Pressure test: Yes (As designed)

SAP Input

Ventilation:	Natural ventilation (extract fans)
Number of chimneys:	0
Number of open flues:	0
Number of fans:	2
Number of passive stacks:	0
Number of sides sheltered:	2
Pressure test:	5

Main heating system:

Main heating system:	Boiler systems with radiators or underfloor heating Gas boilers and oil boilers Fuel: mains gas Info Source: Manufacturer Declaration Manufacturer's data Efficiency: 90.0% (SEDBUK2009) Condensing combi with automatic ignition Fuel Burning Type: Unknown Systems with radiators Central heating pump : 2013 or later Design flow temperature: Unknown Unknown Boiler interlock: Yes Delayed start
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Main heating Control:

Main heating Control:	Time and temperature zone control by suitable arrangement of plumbing and electrical services Control code: 2110
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Secondary heating system:

Secondary heating system:	None
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Water heating:

Water heating:	From main heating system Water code: 901 Fuel :mains gas No hot water cylinder Solar panel: False
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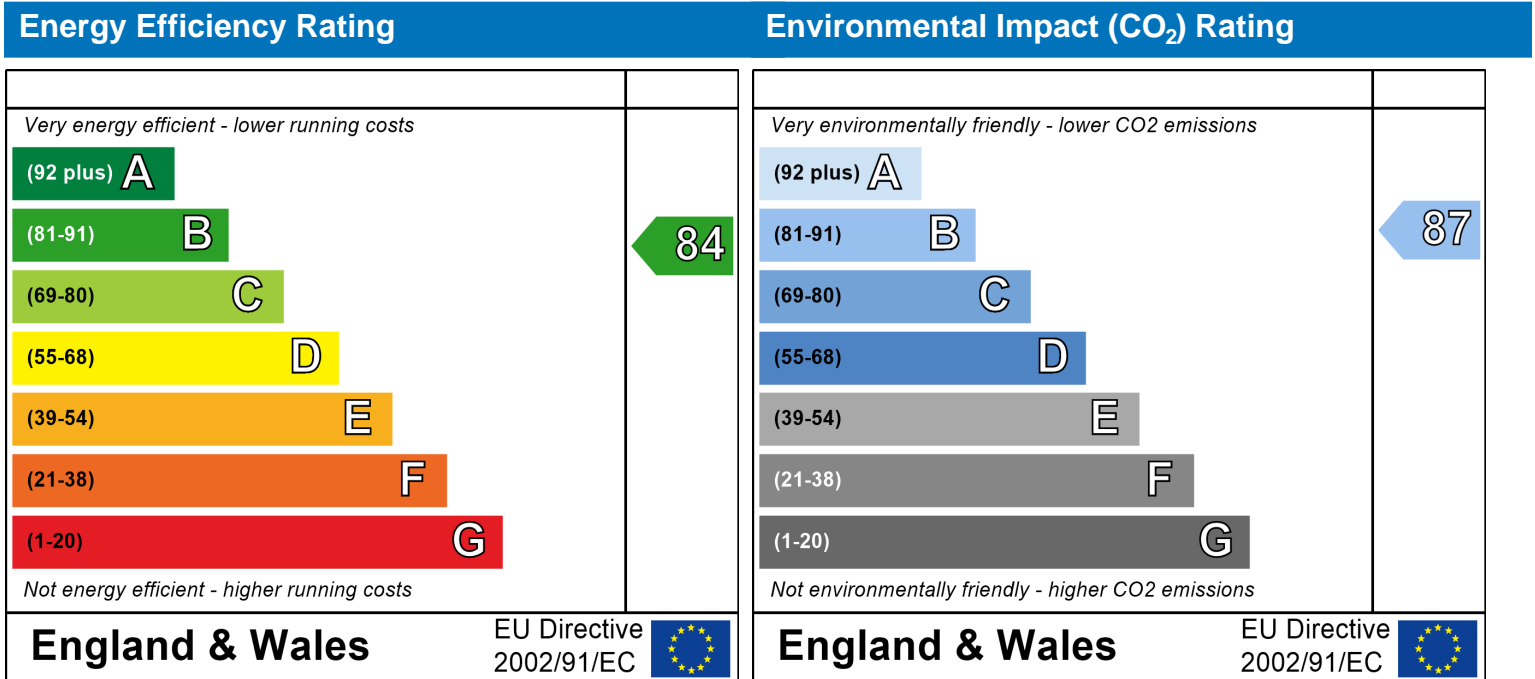
Others:

Electricity tariff:	7-Hour Tariff
In Smoke Control Area:	Yes
Conservatory:	No conservatory
Low energy lights:	100%
Terrain type:	Dense urban
EPC language:	English
Wind turbine:	No
Photovoltaics:	None
Assess Zero Carbon Home:	No

Dwelling type: Top floor Maisonette
 Date of assessment: 14 January 2020
 Produced by: Samuel Westover
 Total floor area: 64.5 m²

This is a Predicted Energy Assessment for a property which is not yet complete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, an Energy Performance Certificate is required providing information about the energy performance of the completed property.

Energy performance has been assessed using the SAP 2012 methodology and is rated in terms of the energy use per square metre of floor area, energy efficiency based on fuel costs and environmental impact based on carbon dioxide (CO₂) emissions.



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.

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.

SAP 2012 Overheating Assessment

Calculated by Stroma FSAP 2012 program, produced and printed on 17 January 2020

Property Details: Flat 3

Dwelling type:	Maisonette
Located in:	England
Region:	Thames valley
Cross ventilation possible:	No
Number of storeys:	2
Front of dwelling faces:	South
Overshading:	Average or unknown
Overhangs:	None
Thermal mass parameter:	Indicative Value Medium
Night ventilation:	False
Blinds, curtains, shutters:	
Ventilation rate during hot weather (ach):	2.5 (Windows open half the time)

Overheating Details:

Summer ventilation heat loss coefficient:	145.06	(P1)
Transmission heat loss coefficient:	36.9	
Summer heat loss coefficient:	181.95	(P2)

Overhangs:

Orientation:	Ratio:	Z_overhangs:
West (W)	0	1

Solar shading:

Orientation:	Z blinds:	Solar access:	Overhangs:	Z summer:	
West (W)	1	0.7	1	0.7	(P8)

Solar gains:

Orientation	Area	Flux	g _z	FF	Shading	Gains
West (W)	0.7 x 15.6	117.51	0.67	0.7	0.7	541.63
					Total	541.63 (P3/P4)

Internal gains:

	June	July	August
Internal gains	378.19	362.95	370.77
Total summer gains	953.14	904.58	847.28 (P5)
Summer gain/loss ratio	5.24	4.97	4.66 (P6)
Mean summer external temperature (Thames valley)	16	17.9	17.8
Thermal mass temperature increment	0.25	0.25	0.25
Threshold temperature	21.49	23.12	22.71 (P7)
Likelihood of high internal temperature	Slight	Medium	Medium

Assessment of likelihood of high internal temperature: Medium

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.23
Printed on 17 January 2020 at 16:36:40

Project Information:

Assessed By: Samuel Westover (STRO012073)

Building Type: Maisonette

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 98.8m²

Site Reference : The Goat

Plot Reference: Flat 4

Address :

Client Details:

Name:

Address :

**This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.**

1a TER and DER

Fuel for main heating system: Mains gas

Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER) 14.35 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER) 13.65 kg/m² **OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE) 36.6 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE) 30.5 kWh/m² **OK**

2 Fabric U-values

Element	Average	Highest	
External wall	0.18 (max. 0.30)	0.18 (max. 0.70)	OK
Floor	0.14 (max. 0.25)	0.14 (max. 0.70)	OK
Roof	(no roof)		
Openings	1.40 (max. 2.00)	1.40 (max. 3.30)	OK

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals 5.00 (design value)
Maximum 10.0 **OK**

4 Heating efficiency

Main Heating system: Boiler systems with radiators or underfloor heating - mains gas
Data from manufacturer
Combi boiler
Efficiency 90.0 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

5 Cylinder insulation

Hot water Storage: No cylinder

N/A

Regulations Compliance Report

6 Controls

Space heating controls	TTZC by plumbing and electrical services	OK
Hot water controls:	No cylinder thermostat	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (Thames valley):	Medium	OK
Based on:		
Overshading:	Average or unknown	
Windows facing: West	4.5m ²	
Windows facing: South	14m ²	
Ventilation rate:	2.50	

10 Key features

None

SAP Input

Property Details: Flat 4

Address:
 Located in: England
 Region: Thames valley
 UPRN:
 Date of assessment: 14 January 2020
 Date of certificate: 17 January 2020
 Assessment type: New dwelling design stage
 Transaction type: New dwelling
 Tenure type: Unknown
 Related party disclosure: No related party
 Thermal Mass Parameter: Indicative Value Medium
 Water use <= 125 litres/person/day: True
 PCDF Version: 454

Property description:

Dwelling type: Maisonette
 Detachment:
 Year Completed: 2020
 Floor Location: Floor area: Storey height:
 Floor 0 73.3 m² 2.6 m
 Floor 1 25.5 m² 2.6 m
 Living area: 32 m² (fraction 0.521)
 Front of dwelling faces: South

Opening types:

Name:	Source:	Type:	Glazing:	Argon:	Frame:
W	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes	
S	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes	

Name:	Gap:	Frame Factor:	g-value:	U-value:	Area:	No. of Openings:
W	16mm or more	0.7	0.76	1.4	4.5	1
S	16mm or more	0.7	0.76	1.4	14	1

Name:	Type-Name:	Location:	Orient:	Width:	Height:
W		External	West	0	0
S		External	South	0	0

Overshading: Average or unknown

Opaque Elements:

Type:	Gross area:	Openings:	Net area:	U-value:	Ru value:	Curtain wall:	Kappa:
<u>External Elements</u>							
External	56.14	18.5	37.64	0.18	0	False	N/A
Ground	73.3			0.14			N/A
<u>Internal Elements</u>							
<u>Party Elements</u>							

Thermal bridges:

Thermal bridges: User-defined (individual PSI-values) Y-Value = 0.0653

	Length	Psi-value		
[Approved]	7.5	0.3	E2	Other lintels (including other steel lintels)
[Approved]	0.7	0.04	E3	Sill
[Approved]	14	0.05	E4	Jamb

SAP Input

[Approved]	28.4	0.16	E5	Ground floor (normal)
[Approved]	20.8	0.09	E16	Corner (normal)
[Approved]	10.4	-0.09	E17	Corner (inverted internal area greater than external area)

Ventilation:

Pressure test:	Yes (As designed)
Ventilation:	Natural ventilation (extract fans)
Number of chimneys:	0
Number of open flues:	0
Number of fans:	2
Number of passive stacks:	0
Number of sides sheltered:	2
Pressure test:	5

Main heating system:

Main heating system:	Boiler systems with radiators or underfloor heating
	Gas boilers and oil boilers
	Fuel: mains gas
	Info Source: Manufacturer Declaration
	Manufacturer's data
	Efficiency: 90.0% (SEDBUK2009)
	Condensing combi with automatic ignition
	Fuel Burning Type: Unknown
	Systems with radiators
	Central heating pump : 2013 or later
	Design flow temperature: Unknown
	Unknown
	Boiler interlock: Yes
	Delayed start

Main heating Control:

Main heating Control:	Time and temperature zone control by suitable arrangement of plumbing and electrical services
	Control code: 2110

Secondary heating system:

Secondary heating system:	None
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Water heating:

Water heating:	From main heating system
	Water code: 901
	Fuel :mains gas
	No hot water cylinder
	Solar panel: False

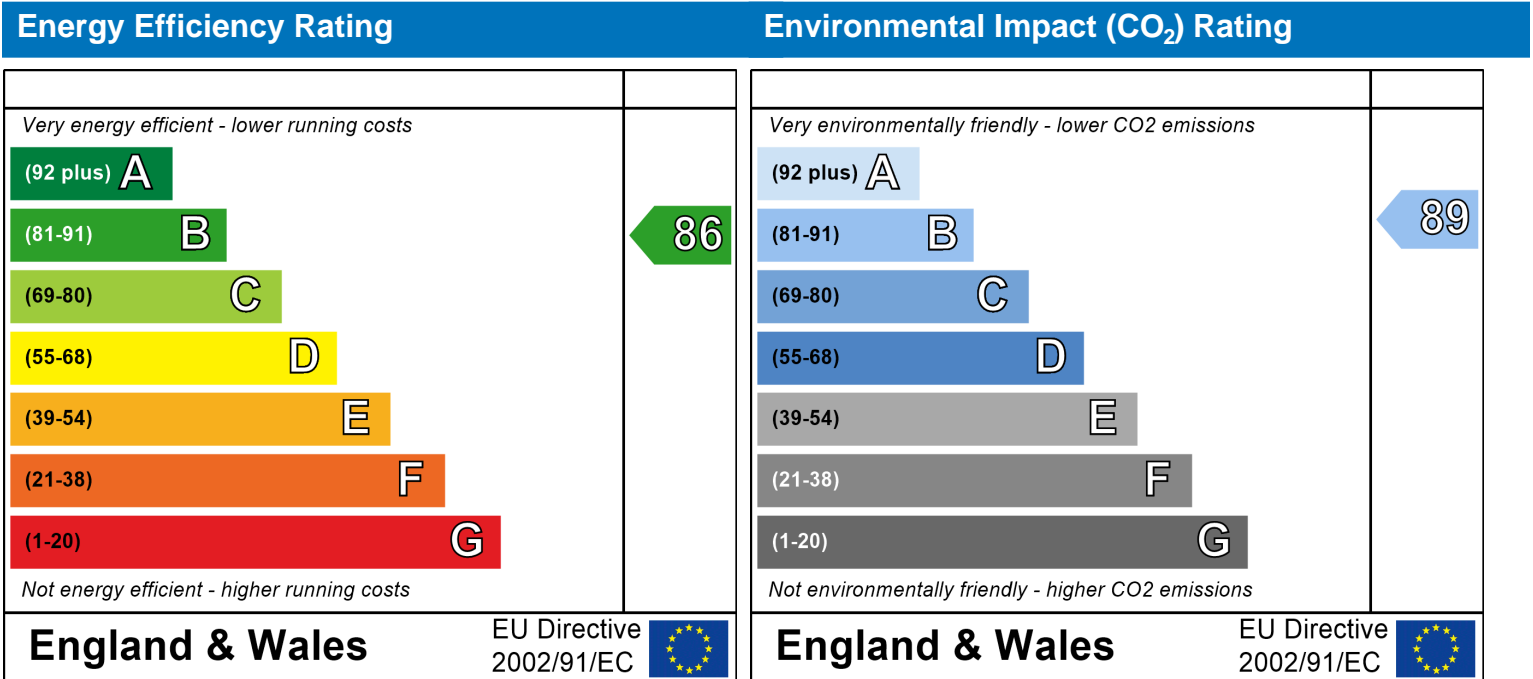
Others:

Electricity tariff:	7-Hour Tariff
In Smoke Control Area:	Yes
Conservatory:	No conservatory
Low energy lights:	100%
Terrain type:	Dense urban
EPC language:	English
Wind turbine:	No
Photovoltaics:	None
Assess Zero Carbon Home:	No

Dwelling type: Ground floor Maisonette
 Date of assessment: 14 January 2020
 Produced by: Samuel Westover
 Total floor area: 98.8 m²

This is a Predicted Energy Assessment for a property which is not yet complete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, an Energy Performance Certificate is required providing information about the energy performance of the completed property.

Energy performance has been assessed using the SAP 2012 methodology and is rated in terms of the energy use per square metre of floor area, energy efficiency based on fuel costs and environmental impact based on carbon dioxide (CO₂) emissions.



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.

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.

SAP 2012 Overheating Assessment

Calculated by Stroma FSAP 2012 program, produced and printed on 17 January 2020

Property Details: Flat 4

Dwelling type:	Maisonette
Located in:	England
Region:	Thames valley
Cross ventilation possible:	No
Number of storeys:	2
Front of dwelling faces:	South
Overshading:	Average or unknown
Overhangs:	None
Thermal mass parameter:	Indicative Value Medium
Night ventilation:	False
Blinds, curtains, shutters:	
Ventilation rate during hot weather (ach):	2.5 (Windows open half the time)

Overheating Details:

Summer ventilation heat loss coefficient:	211.93	(P1)
Transmission heat loss coefficient:	50	
Summer heat loss coefficient:	261.95	(P2)

Overhangs:

Orientation:	Ratio:	Z_overhangs:
West (W)	0	1
South (S)	0	1

Solar shading:

Orientation:	Z blinds:	Solar access:	Overhangs:	Z summer:	
West (W)	1	0.7	1	0.7	(P8)
South (S)	1	0.9	1	0.9	(P8)

Solar gains:

Orientation		Area	Flux	g _z	FF	Shading	Gains
West (W)	0.7 x	4.5	117.51	0.76	0.7	0.7	177.23
South (S)	0.9 x	14	112.21	0.76	0.7	0.9	676.93
						Total	854.15 (P3/P4)

Internal gains:

	June	July	August
Internal gains	493.29	473.14	482.79
Total summer gains	1383.11	1327.29	1306.58 (P5)
Summer gain/loss ratio	5.28	5.07	4.99 (P6)
Mean summer external temperature (Thames valley)	16	17.9	17.8
Thermal mass temperature increment	0.25	0.25	0.25
Threshold temperature	21.53	23.22	23.04 (P7)
Likelihood of high internal temperature	Slight	Medium	Medium

Assessment of likelihood of high internal temperature: Medium

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.23
Printed on 17 January 2020 at 16:36:25

Project Information:

Assessed By: Samuel Westover (STRO012073)

Building Type: Maisonette

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 95.5m²

Site Reference : The Goat

Plot Reference: Flat 5

Address :

Client Details:

Name:

Address :

**This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.**

1a TER and DER

Fuel for main heating system: Mains gas

Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER) 15.57 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER) 14.57 kg/m² **OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE) 43.4 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE) 35.3 kWh/m² **OK**

2 Fabric U-values

Element	Average	Highest	
External wall	0.18 (max. 0.30)	0.18 (max. 0.70)	OK
Floor	(no floor)		
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	OK
Openings	1.40 (max. 2.00)	1.40 (max. 3.30)	OK

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals 5.00 (design value)
Maximum 10.0 **OK**

4 Heating efficiency

Main Heating system: Boiler systems with radiators or underfloor heating - mains gas
Data from manufacturer
Combi boiler
Efficiency 90.0 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

5 Cylinder insulation

Hot water Storage: No cylinder

N/A

Regulations Compliance Report

6 Controls

Space heating controls	TTZC by plumbing and electrical services	OK
Hot water controls:	No cylinder thermostat	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (Thames valley):	Slight	OK
Based on:		
Overshading:	Average or unknown	
Windows facing: West	4.5m ²	
Windows facing: South	15.4m ²	
Roof windows facing: West	3m ²	
Ventilation rate:	5.00	

10 Key features

None

SAP Input

Property Details: Flat 5

Address:
 Located in: England
 Region: Thames valley
 UPRN:
 Date of assessment: 14 January 2020
 Date of certificate: 17 January 2020
 Assessment type: New dwelling design stage
 Transaction type: New dwelling
 Tenure type: Unknown
 Related party disclosure: No related party
 Thermal Mass Parameter: Indicative Value Medium
 Water use <= 125 litres/person/day: True
 PCDF Version: 454

Property description:

Dwelling type: Maisonette
 Detachment:
 Year Completed: 2020
 Floor Location: Floor area: Storey height:
 Floor 0 37 m² 2.6 m
 Floor 1 58.5 m² 3.2 m
 Living area: 32 m² (fraction 0.521)
 Front of dwelling faces: South

Opening types:

Name:	Source:	Type:	Glazing:	Argon:	Frame:
W	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes	
S	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes	
W	Manufacturer	Roof Windows	low-E, En = 0.1, soft coat	Yes	PVC-U

Name:	Gap:	Frame Factor:	g-value:	U-value:	Area:	No. of Openings:
W	16mm or more	0.7	0.76	1.4	4.5	1
S	16mm or more	0.7	0.76	1.4	15.4	1
W	16mm or more	0.7	0.76	1.4	3	1

Name:	Type-Name:	Location:	Orient:	Width:	Height:
W		External	West	0	0
S		External	South	0	0
W		Roof	West	0	0

Overshading: Average or unknown

Opaque Elements:

Type:	Gross area:	Openings:	Net area:	U-value:	Ru value:	Curtain wall:	Kappa:
<u>External Elements</u>							
External	50.02	19.9	30.12	0.18	0	False	N/A
Roof	100.98	3	97.98	0.13	0		N/A
<u>Internal Elements</u>							
<u>Party Elements</u>							

Thermal bridges:

Thermal bridges: User-defined (individual PSI-values) Y-Value = 0.056

Length	Psi-value	
[Approved]	7.5	0.3 E2 Other lintels (including other steel lintels)

SAP Input

[Approved]	0.7	0.04	E3	Sill
[Approved]	14	0.05	E4	Jamb
[Approved]	28.4	0.16	E5	Ground floor (normal)
[Approved]	20.8	0.09	E16	Corner (normal)
[Approved]	10.4	-0.09	E17	Corner (inverted internal area greater than external area)

Ventilation:

Pressure test:	Yes (As designed)
Ventilation:	Natural ventilation (extract fans)
Number of chimneys:	0
Number of open flues:	0
Number of fans:	2
Number of passive stacks:	0
Number of sides sheltered:	2
Pressure test:	5

Main heating system:

Main heating system:	Boiler systems with radiators or underfloor heating Gas boilers and oil boilers Fuel: mains gas Info Source: Manufacturer Declaration Manufacturer's data Efficiency: 90.0% (SEDBUK2009) Condensing combi with automatic ignition Fuel Burning Type: Unknown Systems with radiators Central heating pump : 2013 or later Design flow temperature: Unknown Unknown Boiler interlock: Yes Delayed start
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Main heating Control:

Main heating Control:	Time and temperature zone control by suitable arrangement of plumbing and electrical services Control code: 2110
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Secondary heating system:

Secondary heating system:	None
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Water heating:

Water heating:	From main heating system Water code: 901 Fuel :mains gas No hot water cylinder Solar panel: False
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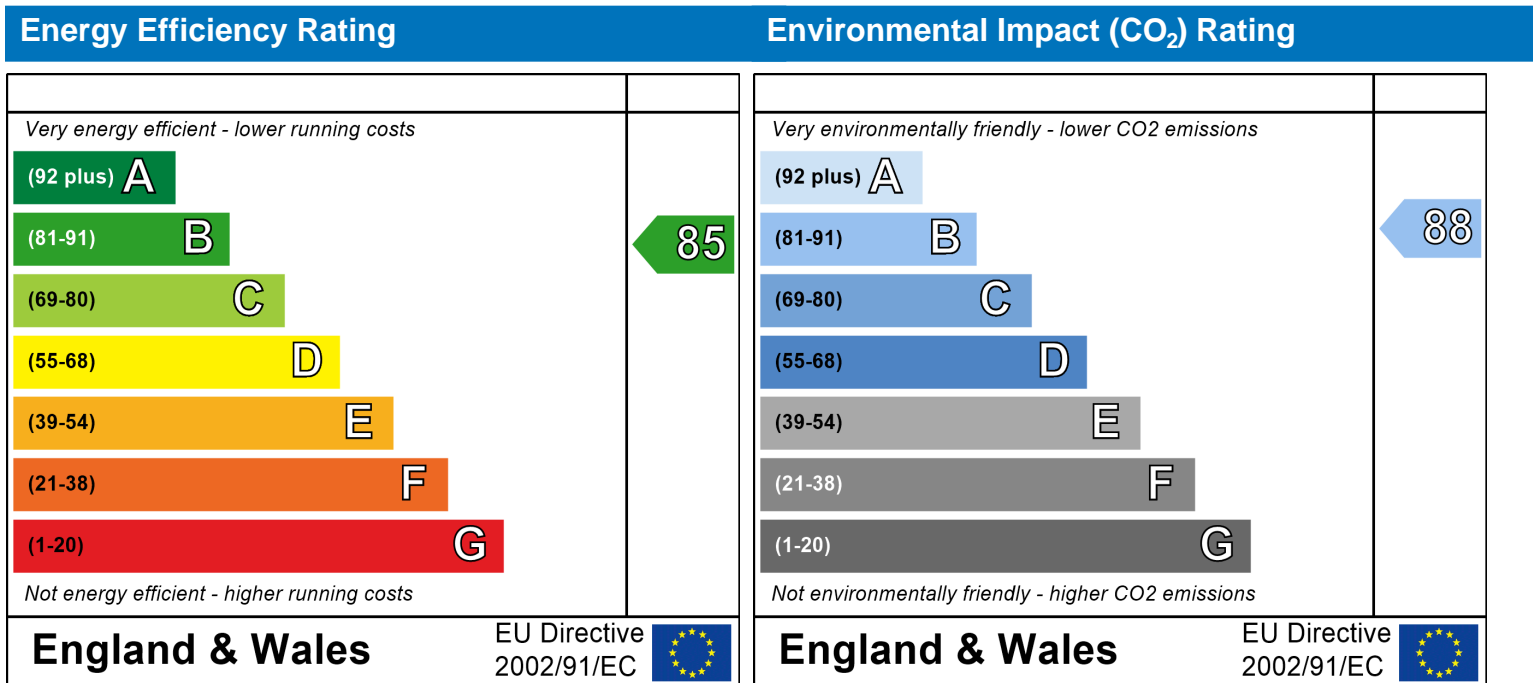
Others:

Electricity tariff:	7-Hour Tariff
In Smoke Control Area:	Yes
Conservatory:	No conservatory
Low energy lights:	100%
Terrain type:	Dense urban
EPC language:	English
Wind turbine:	No
Photovoltaics:	None
Assess Zero Carbon Home:	No

Dwelling type: Top floor Maisonette
 Date of assessment: 14 January 2020
 Produced by: Samuel Westover
 Total floor area: 95.5 m²

This is a Predicted Energy Assessment for a property which is not yet complete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, an Energy Performance Certificate is required providing information about the energy performance of the completed property.

Energy performance has been assessed using the SAP 2012 methodology and is rated in terms of the energy use per square metre of floor area, energy efficiency based on fuel costs and environmental impact based on carbon dioxide (CO₂) emissions.



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.

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.

SAP 2012 Overheating Assessment

Calculated by Stroma FSAP 2012 program, produced and printed on 17 January 2020

Property Details: Flat 5

Dwelling type:	Maisonette
Located in:	England
Region:	Thames valley
Cross ventilation possible:	No
Number of storeys:	2
Front of dwelling faces:	South
Overshading:	Average or unknown
Overhangs:	None
Thermal mass parameter:	Indicative Value Medium
Night ventilation:	False
Blinds, curtains, shutters:	
Ventilation rate during hot weather (ach):	5 (Windows fully open)

Overheating Details:

Summer ventilation heat loss coefficient:	467.61	(P1)
Transmission heat loss coefficient:	57	
Summer heat loss coefficient:	524.59	(P2)

Overhangs:

Orientation:	Ratio:	Z_overhangs:
West (W)	0	1
South (S)	0	1
West (W)	0	1

Solar shading:

Orientation:	Z blinds:	Solar access:	Overhangs:	Z summer:	
West (W)	1	0.7	1	0.7	(P8)
South (S)	1	0.9	1	0.9	(P8)
West (W)	1	1	1	1	(P8)

Solar gains:

Orientation		Area	Flux	g₋	FF	Shading	Gains
West (W)	0.7 x	4.5	117.51	0.76	0.7	0.7	177.23
South (S)	0.9 x	15.4	112.21	0.76	0.7	0.9	744.62
	1 x	3	190.54	0.76	0.7	1	273.69
Total							1195.53 (P3/P4)

Internal gains:

	June	July	August
Internal gains	484.43	464.61	474
Total summer gains	1736.69	1660.14	1599.09 (P5)
Summer gain/loss ratio	3.31	3.16	3.05 (P6)
Mean summer external temperature (Thames valley)	16	17.9	17.8
Thermal mass temperature increment	0.25	0.25	0.25
Threshold temperature	19.56	21.31	21.1 (P7)
Likelihood of high internal temperature	Not significant	Slight	Slight

Assessment of likelihood of high internal temperature: Slight

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.23
Printed on 17 January 2020 at 16:36:10

Project Information:

Assessed By: Samuel Westover (STRO012073)

Building Type: Maisonette

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 63.9m²

Site Reference : The Goat

Plot Reference: Flat 6

Address :

Client Details:

Name:

Address :

**This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.**

1a TER and DER

Fuel for main heating system: Mains gas

Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER) 15.74 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER) 15.07 kg/m² **OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE) 33.6 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE) 28.8 kWh/m² **OK**

2 Fabric U-values

Element	Average	Highest	
External wall	0.18 (max. 0.30)	0.18 (max. 0.70)	OK
Floor	0.14 (max. 0.25)	0.14 (max. 0.70)	OK
Roof	(no roof)		
Openings	1.40 (max. 2.00)	1.40 (max. 3.30)	OK

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals 5.00 (design value)
Maximum 10.0 **OK**

4 Heating efficiency

Main Heating system: Boiler systems with radiators or underfloor heating - mains gas
Data from manufacturer
Combi boiler
Efficiency 90.0 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

5 Cylinder insulation

Hot water Storage: No cylinder

N/A

Regulations Compliance Report

6 Controls

Space heating controls	TTZC by plumbing and electrical services	OK
Hot water controls:	No cylinder thermostat	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (Thames valley):	Slight	OK
Based on:		
Overshading:	Average or unknown	
Windows facing: South	14m ²	
Ventilation rate:	5.00	

10 Key features

None

SAP Input

Property Details: Flat 6

Address:
 Located in: England
 Region: Thames valley
 UPRN:
 Date of assessment: 14 January 2020
 Date of certificate: 17 January 2020
 Assessment type: New dwelling design stage
 Transaction type: New dwelling
 Tenure type: Unknown
 Related party disclosure: No related party
 Thermal Mass Parameter: Indicative Value Medium
 Water use <= 125 litres/person/day: True
 PCDF Version: 454

Property description:

Dwelling type: Maisonette
 Detachment:
 Year Completed: 2020
 Floor Location: Floor area: Storey height:
 Floor 0 45.6 m² 2.6 m
 Floor 1 18.3 m² 2.6 m
 Living area: 32 m² (fraction 0.521)
 Front of dwelling faces: South

Opening types:

Name:	Source:	Type:	Glazing:	Argon:	Frame:	
S	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes		
Name:	Gap:	Frame Factor:	g-value:	U-value:	Area:	No. of Openings:
S	16mm or more	0.7	0.76	1.4	14	1
Name:	Type-Name:	Location:	Orient:	Width:	Height:	
S		External	South	0	0	

Overshading: Average or unknown

Opaque Elements:

Type:	Gross area:	Openings:	Net area:	U-value:	Ru value:	Curtain wall:	Kappa:
<u>External Elements</u>							
External	28.94	14	14.94	0.18	0	False	N/A
Ground	45.6			0.14			N/A
<u>Internal Elements</u>							
<u>Party Elements</u>							

Thermal bridges:

Thermal bridges: User-defined (individual PSI-values) Y-Value = 0.1135

	Length	Psi-value		
[Approved]	7.5	0.3	E2	Other lintels (including other steel lintels)
[Approved]	0.7	0.04	E3	Sill
[Approved]	14	0.05	E4	Jamb
[Approved]	28.4	0.16	E5	Ground floor (normal)
[Approved]	20.8	0.09	E16	Corner (normal)
[Approved]	10.4	-0.09	E17	Corner (inverted internal area greater than external area)

SAP Input

Ventilation:

Pressure test:	Yes (As designed)
Ventilation:	Natural ventilation (extract fans)
Number of chimneys:	0
Number of open flues:	0
Number of fans:	2
Number of passive stacks:	0
Number of sides sheltered:	2
Pressure test:	5

Main heating system:

Main heating system:	Boiler systems with radiators or underfloor heating Gas boilers and oil boilers Fuel: mains gas Info Source: Manufacturer Declaration Manufacturer's data Efficiency: 90.0% (SEDBUK2009) Condensing combi with automatic ignition Fuel Burning Type: Unknown Systems with radiators Central heating pump : 2013 or later Design flow temperature: Unknown Unknown Boiler interlock: Yes Delayed start
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Main heating Control:

Main heating Control:	Time and temperature zone control by suitable arrangement of plumbing and electrical services Control code: 2110
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Secondary heating system:

Secondary heating system:	None
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Water heating:

Water heating:	From main heating system Water code: 901 Fuel :mains gas No hot water cylinder Solar panel: False
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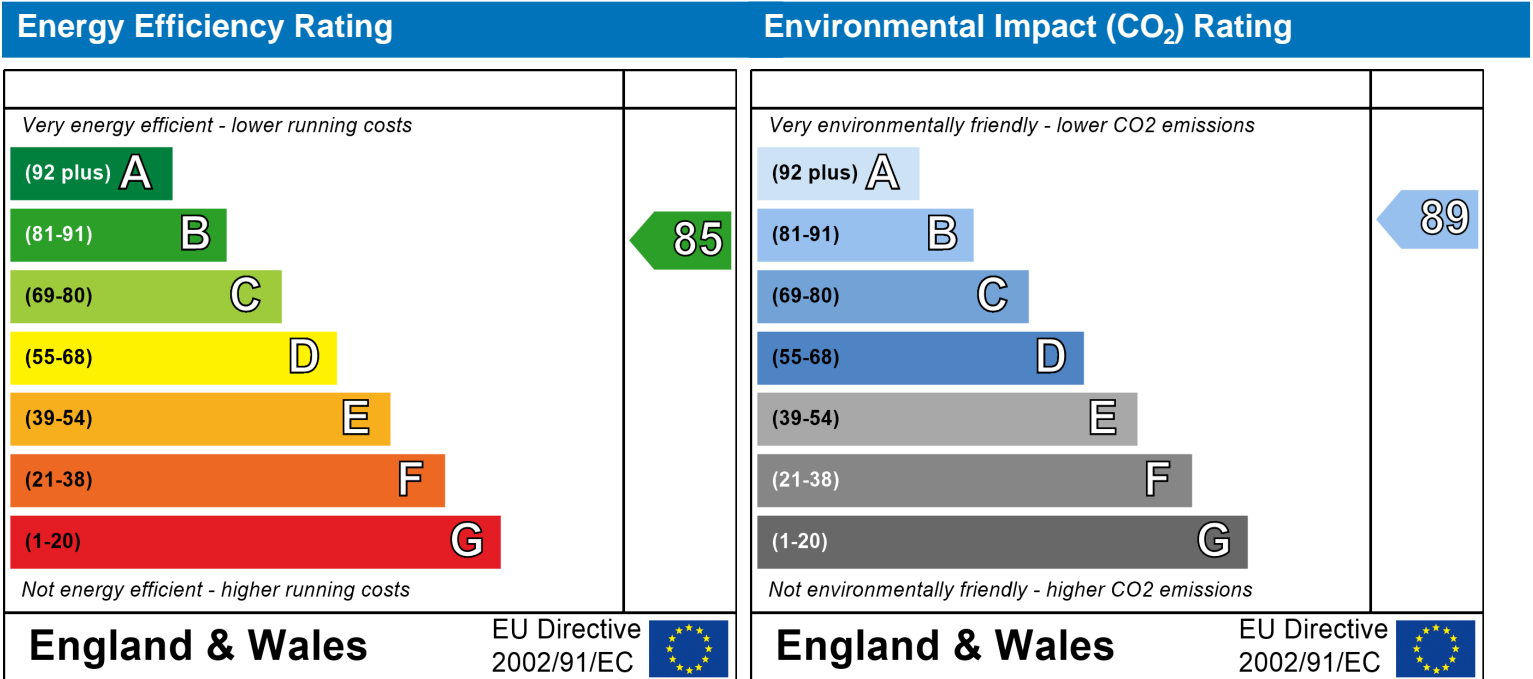
Others:

Electricity tariff:	7-Hour Tariff
In Smoke Control Area:	Yes
Conservatory:	No conservatory
Low energy lights:	100%
Terrain type:	Dense urban
EPC language:	English
Wind turbine:	No
Photovoltaics:	None
Assess Zero Carbon Home:	No

Dwelling type: Ground floor Maisonette
 Date of assessment: 14 January 2020
 Produced by: Samuel Westover
 Total floor area: 63.9 m²

This is a Predicted Energy Assessment for a property which is not yet complete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, an Energy Performance Certificate is required providing information about the energy performance of the completed property.

Energy performance has been assessed using the SAP 2012 methodology and is rated in terms of the energy use per square metre of floor area, energy efficiency based on fuel costs and environmental impact based on carbon dioxide (CO₂) emissions.



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.

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.

SAP 2012 Overheating Assessment

Calculated by Stroma FSAP 2012 program, produced and printed on 17 January 2020

Property Details: Flat 6

Dwelling type:	Maisonette
Located in:	England
Region:	Thames valley
Cross ventilation possible:	No
Number of storeys:	2
Front of dwelling faces:	South
Overshading:	Average or unknown
Overhangs:	None
Thermal mass parameter:	Indicative Value Medium
Night ventilation:	False
Blinds, curtains, shutters:	
Ventilation rate during hot weather (ach):	5 (Windows fully open)

Overheating Details:

Summer ventilation heat loss coefficient:	274.13	(P1)
Transmission heat loss coefficient:	36.1	
Summer heat loss coefficient:	310.22	(P2)

Overhangs:

Orientation:	Ratio:	Z_overhangs:
South (S)	0	1

Solar shading:

Orientation:	Z blinds:	Solar access:	Overhangs:	Z summer:	
South (S)	1	0.9	1	0.9	(P8)

Solar gains:

Orientation	Area	Flux	g _z	FF	Shading	Gains
South (S)	0.9 x 14	112.21	0.76	0.7	0.9	676.93
					Total	676.93 (P3/P4)

Internal gains:

	June	July	August
Internal gains	375.52	360.38	368.12
Total summer gains	1077.21	1037.3	1036 (P5)
Summer gain/loss ratio	3.47	3.34	3.34 (P6)
Mean summer external temperature (Thames valley)	16	17.9	17.8
Thermal mass temperature increment	0.25	0.25	0.25
Threshold temperature	19.72	21.49	21.39 (P7)
Likelihood of high internal temperature	Not significant	Slight	Slight

Assessment of likelihood of high internal temperature: Slight

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.23
Printed on 17 January 2020 at 16:35:56

Project Information:

Assessed By: Samuel Westover (STRO012073)

Building Type: Maisonette

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 60.1m²

Site Reference : The Goat

Plot Reference: Flat 7

Address :

Client Details:

Name:

Address :

**This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.**

1a TER and DER

Fuel for main heating system: Mains gas

Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER) 19.08 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER) 18.14 kg/m² **OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE) 49.4 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE) 43.1 kWh/m² **OK**

2 Fabric U-values

Element	Average	Highest	
External wall	0.18 (max. 0.30)	0.18 (max. 0.70)	OK
Floor	(no floor)		
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	OK
Openings	1.40 (max. 2.00)	1.40 (max. 3.30)	OK

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals 5.00 (design value)
Maximum 10.0 **OK**

4 Heating efficiency

Main Heating system: Boiler systems with radiators or underfloor heating - mains gas
Data from manufacturer
Combi boiler
Efficiency 90.0 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

5 Cylinder insulation

Hot water Storage: No cylinder

N/A

Regulations Compliance Report

6 Controls

Space heating controls	TTZC by plumbing and electrical services	OK
Hot water controls:	No cylinder thermostat	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (Thames valley):	Medium	OK
Based on:		
Overshading:	Average or unknown	
Windows facing: South	14.4m ²	
Windows facing: North	3m ²	
Ventilation rate:	4.00	

10 Key features

None

SAP Input

Property Details: Flat 7

Address:
 Located in: England
 Region: Thames valley
 UPRN:
 Date of assessment: 14 January 2020
 Date of certificate: 17 January 2020
 Assessment type: New dwelling design stage
 Transaction type: New dwelling
 Tenure type: Unknown
 Related party disclosure: No related party
 Thermal Mass Parameter: Indicative Value Medium
 Water use <= 125 litres/person/day: True
 PCDF Version: 454

Property description:

Dwelling type: Maisonette
 Detachment:
 Year Completed: 2020
 Floor Location: Floor area: Storey height:
 Floor 0 16 m² 2.6 m
 Floor 1 44.1 m² 3.2 m
 Living area: 32 m² (fraction 0.335)
 Front of dwelling faces: South

Opening types:

Name:	Source:	Type:	Glazing:	Argon:	Frame:
S	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes	
N	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes	

Name:	Gap:	Frame Factor:	g-value:	U-value:	Area:	No. of Openings:
S	16mm or more	0.7	0.76	1.4	14.4	1
N	16mm or more	0.7	0.76	1.4	3	1

Name:	Type-Name:	Location:	Orient:	Width:	Height:
S		External	South	0	0
N		External	North	0	0

Overshading: Average or unknown

Opaque Elements:

Type:	Gross area:	Openings:	Net area:	U-value:	Ru value:	Curtain wall:	Kappa:
<u>External Elements</u>							
External	45.32	17.4	27.92	0.18	0	False	N/A
Roof	77.52	0	77.52	0.13	0		N/A
<u>Internal Elements</u>							
<u>Party Elements</u>							

Thermal bridges:

Thermal bridges: User-defined (individual PSI-values) Y-Value = 0.0689

	Length	Psi-value		
[Approved]	7.5	0.3	E2	Other lintels (including other steel lintels)
[Approved]	0.7	0.04	E3	Sill
[Approved]	14	0.05	E4	Jamb

SAP Input

[Approved]	28.4	0.16	E5	Ground floor (normal)
[Approved]	20.8	0.09	E16	Corner (normal)
[Approved]	10.4	-0.09	E17	Corner (inverted internal area greater than external area)

Ventilation:

Pressure test:	Yes (As designed)
Ventilation:	Natural ventilation (extract fans)
Number of chimneys:	0
Number of open flues:	0
Number of fans:	2
Number of passive stacks:	0
Number of sides sheltered:	2
Pressure test:	5

Main heating system:

Main heating system:	Boiler systems with radiators or underfloor heating
	Gas boilers and oil boilers
	Fuel: mains gas
	Info Source: Manufacturer Declaration
	Manufacturer's data
	Efficiency: 90.0% (SEDBUK2009)
	Condensing combi with automatic ignition
	Fuel Burning Type: Unknown
	Systems with radiators
	Central heating pump : 2013 or later
	Design flow temperature: Unknown
	Unknown
	Boiler interlock: Yes
	Delayed start

Main heating Control:

Main heating Control:	Time and temperature zone control by suitable arrangement of plumbing and electrical services
	Control code: 2110

Secondary heating system:

Secondary heating system:	None
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Water heating:

Water heating:	From main heating system
	Water code: 901
	Fuel :mains gas
	No hot water cylinder
	Solar panel: False

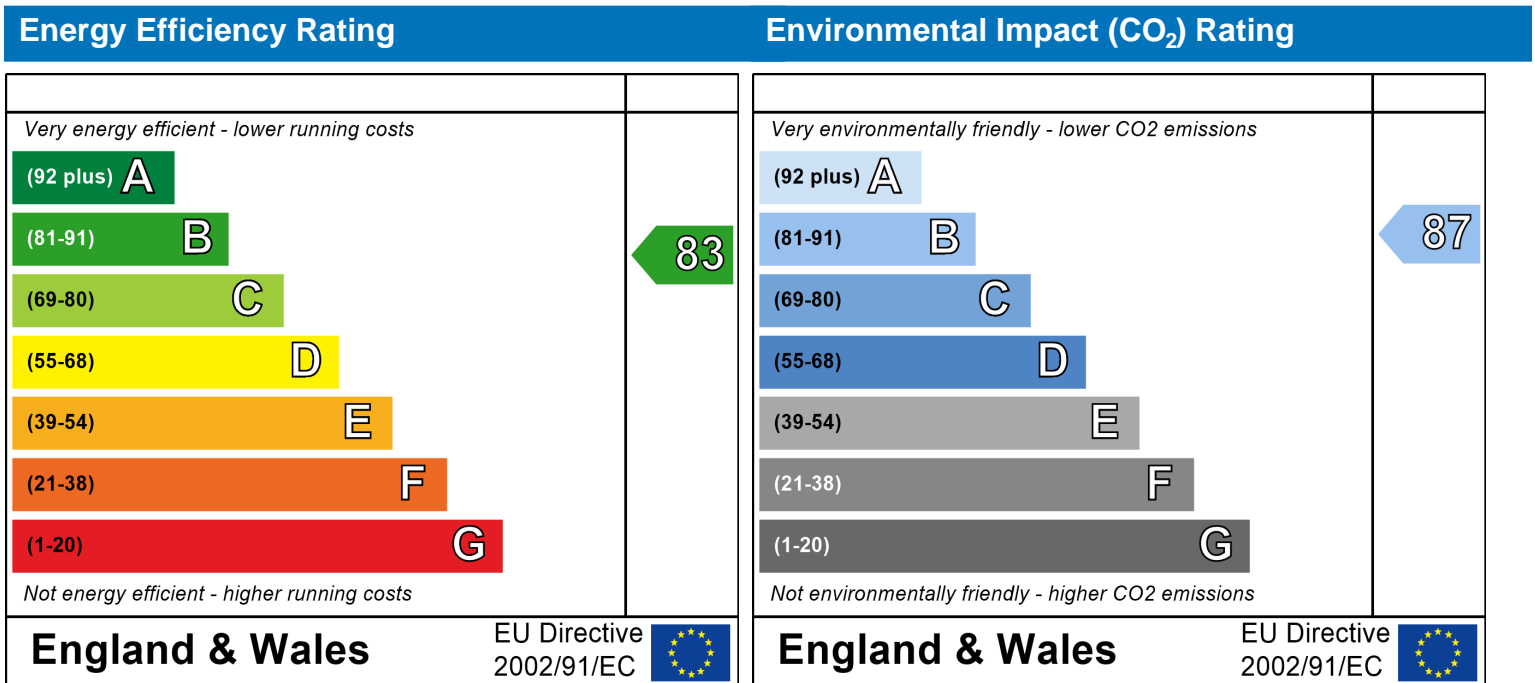
Others:

Electricity tariff:	7-Hour Tariff
In Smoke Control Area:	Yes
Conservatory:	No conservatory
Low energy lights:	100%
Terrain type:	Dense urban
EPC language:	English
Wind turbine:	No
Photovoltaics:	None
Assess Zero Carbon Home:	No

Dwelling type: Top floor Maisonette
 Date of assessment: 14 January 2020
 Produced by: Samuel Westover
 Total floor area: 60.1 m²

This is a Predicted Energy Assessment for a property which is not yet complete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, an Energy Performance Certificate is required providing information about the energy performance of the completed property.

Energy performance has been assessed using the SAP 2012 methodology and is rated in terms of the energy use per square metre of floor area, energy efficiency based on fuel costs and environmental impact based on carbon dioxide (CO₂) emissions.



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.

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.

SAP 2012 Overheating Assessment

Calculated by Stroma FSAP 2012 program, produced and printed on 17 January 2020

Property Details: Flat 7

Dwelling type:	Maisonette
Located in:	England
Region:	Thames valley
Cross ventilation possible:	Yes
Number of storeys:	2
Front of dwelling faces:	South
Overshading:	Average or unknown
Overhangs:	None
Thermal mass parameter:	Indicative Value Medium
Night ventilation:	False
Blinds, curtains, shutters:	
Ventilation rate during hot weather (ach):	4 (Windows open half the time)

Overheating Details:

Summer ventilation heat loss coefficient:	241.19	(P1)
Transmission heat loss coefficient:	46.6	
Summer heat loss coefficient:	287.82	(P2)

Overhangs:

Orientation:	Ratio:	Z_overhangs:
South (S)	0	1
North (N)	0	1

Solar shading:

Orientation:	Z blinds:	Solar access:	Overhangs:	Z summer:	
South (S)	1	0.9	1	0.9	(P8)
North (N)	1	0.9	1	0.9	(P8)

Solar gains:

Orientation	Area	Flux	g _g	FF	Shading	Gains
South (S)	0.9 x 14.4	112.21	0.76	0.7	0.9	696.27
North (N)	0.9 x 3	81.19	0.76	0.7	0.9	104.95
					Total	801.22 (P3/P4)

Internal gains:

	June	July	August
Internal gains	359.15	344.7	352.17
Total summer gains	1194.43	1145.92	1124.46 (P5)
Summer gain/loss ratio	4.15	3.98	3.91 (P6)
Mean summer external temperature (Thames valley)	16	17.9	17.8
Thermal mass temperature increment	0.25	0.25	0.25
Threshold temperature	20.4	22.13	21.96 (P7)
Likelihood of high internal temperature	Not significant	Medium	Slight

Assessment of likelihood of high internal temperature: Medium

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.23
Printed on 17 January 2020 at 16:35:40

Project Information:

Assessed By: Samuel Westover (STRO012073)

Building Type: Maisonette

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 92.7m²

Site Reference : The Goat

Plot Reference: Flat 8

Address :

Client Details:

Name:

Address :

**This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.**

1a TER and DER

Fuel for main heating system: Mains gas

Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER) 15.18 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER) 14.44 kg/m² **OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE) 39.4 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE) 33.5 kWh/m² **OK**

2 Fabric U-values

Element	Average	Highest	
External wall	0.18 (max. 0.30)	0.18 (max. 0.70)	OK
Floor	0.14 (max. 0.25)	0.14 (max. 0.70)	OK
Roof	(no roof)		
Openings	1.40 (max. 2.00)	1.40 (max. 3.30)	OK

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals 5.00 (design value)
Maximum 10.0 **OK**

4 Heating efficiency

Main Heating system: Boiler systems with radiators or underfloor heating - mains gas
Data from manufacturer
Combi boiler
Efficiency 90.0 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

5 Cylinder insulation

Hot water Storage: No cylinder

N/A

Regulations Compliance Report

6 Controls

Space heating controls	TTZC by plumbing and electrical services	OK
Hot water controls:	No cylinder thermostat	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (Thames valley):	Medium	OK
Based on:		
Overshading:	Average or unknown	
Windows facing: East	4.5m ²	
Windows facing: South	14m ²	
Ventilation rate:	2.50	

10 Key features

None

SAP Input

Property Details: Flat 8

Address:
 Located in: England
 Region: Thames valley
 UPRN:
 Date of assessment: 14 January 2020
 Date of certificate: 17 January 2020
 Assessment type: New dwelling design stage
 Transaction type: New dwelling
 Tenure type: Unknown
 Related party disclosure: No related party
 Thermal Mass Parameter: Indicative Value Medium
 Water use <= 125 litres/person/day: True
 PCDF Version: 454

Property description:

Dwelling type: Maisonette
 Detachment:
 Year Completed: 2020
 Floor Location: Floor area: Storey height:
 Floor 0 69.7 m² 2.6 m
 Floor 1 23 m² 2.6 m
 Living area: 32 m² (fraction 0.335)
 Front of dwelling faces: South

Opening types:

Name:	Source:	Type:	Glazing:	Argon:	Frame:
E	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes	
S	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes	

Name:	Gap:	Frame Factor:	g-value:	U-value:	Area:	No. of Openings:
E	16mm or more	0.7	0.76	1.4	4.5	1
S	16mm or more	0.7	0.76	1.4	14	1

Name:	Type-Name:	Location:	Orient:	Width:	Height:
E		External	East	0	0
S		External	South	0	0

Overshading: Average or unknown

Opaque Elements:

Type:	Gross area:	Openings:	Net area:	U-value:	Ru value:	Curtain wall:	Kappa:
<u>External Elements</u>							
External	72.94	18.5	54.44	0.18	0	False	N/A
Ground	69.7			0.14			N/A
<u>Internal Elements</u>							
<u>Party Elements</u>							

Thermal bridges:

Thermal bridges: User-defined (individual PSI-values) Y-Value = 0.0593

	Length	Psi-value		
[Approved]	7.5	0.3	E2	Other lintels (including other steel lintels)
[Approved]	0.7	0.04	E3	Sill
[Approved]	14	0.05	E4	Jamb

SAP Input

[Approved]	28.4	0.16	E5	Ground floor (normal)
[Approved]	20.8	0.09	E16	Corner (normal)
[Approved]	10.4	-0.09	E17	Corner (inverted internal area greater than external area)

Ventilation:

Pressure test:	Yes (As designed)
Ventilation:	Natural ventilation (extract fans)
Number of chimneys:	0
Number of open flues:	0
Number of fans:	2
Number of passive stacks:	0
Number of sides sheltered:	2
Pressure test:	5

Main heating system:

Main heating system:	Boiler systems with radiators or underfloor heating Gas boilers and oil boilers Fuel: mains gas Info Source: Manufacturer Declaration Manufacturer's data Efficiency: 90.0% (SEDBUK2009) Condensing combi with automatic ignition Fuel Burning Type: Unknown Systems with radiators Central heating pump : 2013 or later Design flow temperature: Unknown Unknown Boiler interlock: Yes Delayed start
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Main heating Control:

Main heating Control:	Time and temperature zone control by suitable arrangement of plumbing and electrical services Control code: 2110
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Secondary heating system:

Secondary heating system:	None
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Water heating:

Water heating:	From main heating system Water code: 901 Fuel :mains gas No hot water cylinder Solar panel: False
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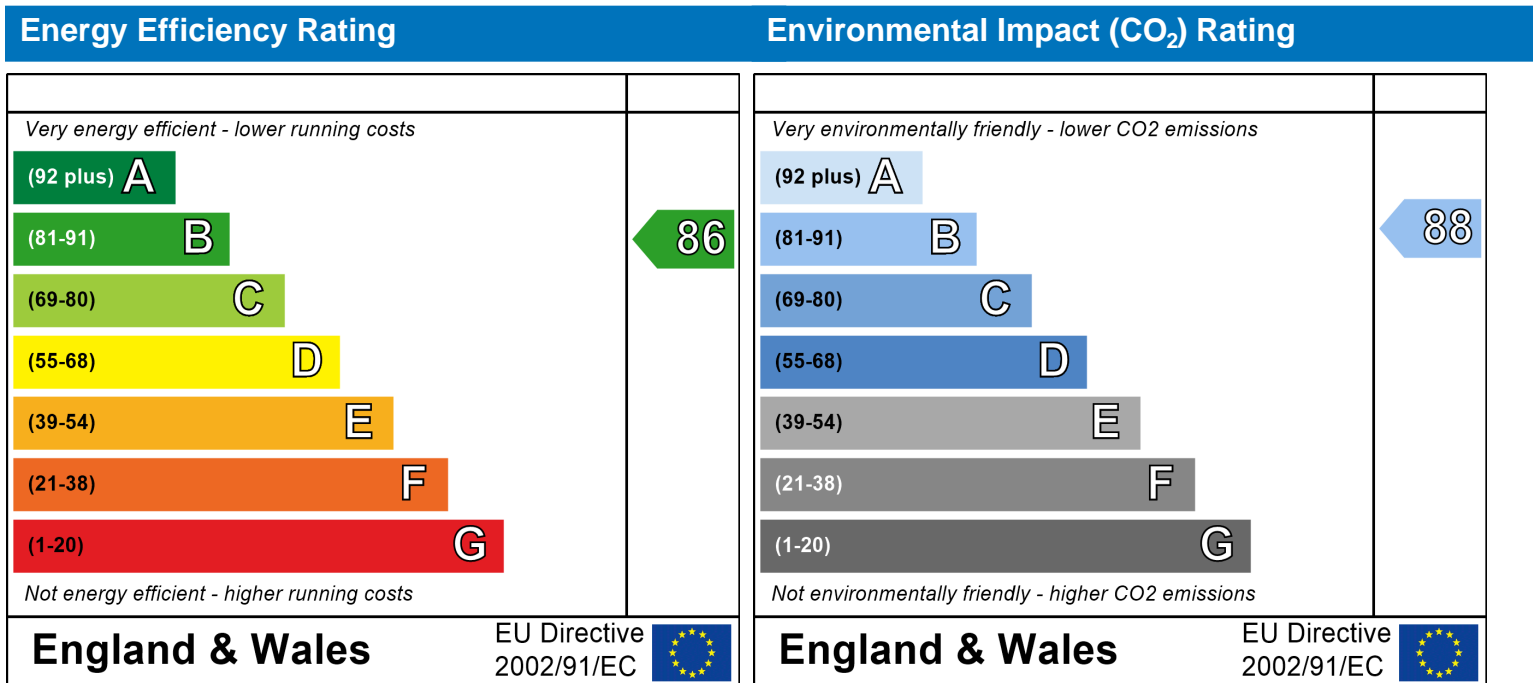
Others:

Electricity tariff:	7-Hour Tariff
In Smoke Control Area:	Yes
Conservatory:	No conservatory
Low energy lights:	100%
Terrain type:	Dense urban
EPC language:	English
Wind turbine:	No
Photovoltaics:	None
Assess Zero Carbon Home:	No

Dwelling type: Ground floor Maisonette
 Date of assessment: 14 January 2020
 Produced by: Samuel Westover
 Total floor area: 92.7 m²

This is a Predicted Energy Assessment for a property which is not yet complete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, an Energy Performance Certificate is required providing information about the energy performance of the completed property.

Energy performance has been assessed using the SAP 2012 methodology and is rated in terms of the energy use per square metre of floor area, energy efficiency based on fuel costs and environmental impact based on carbon dioxide (CO₂) emissions.



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.

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.

SAP 2012 Overheating Assessment

Calculated by Stroma FSAP 2012 program, produced and printed on 17 January 2020

Property Details: Flat 8

Dwelling type:	Maisonette
Located in:	England
Region:	Thames valley
Cross ventilation possible:	No
Number of storeys:	2
Front of dwelling faces:	South
Overshading:	Average or unknown
Overhangs:	None
Thermal mass parameter:	Indicative Value Medium
Night ventilation:	False
Blinds, curtains, shutters:	
Ventilation rate during hot weather (ach):	2.5 (Windows open half the time)

Overheating Details:

Summer ventilation heat loss coefficient:	198.84	(P1)
Transmission heat loss coefficient:	52.5	
Summer heat loss coefficient:	251.38	(P2)

Overhangs:

Orientation:	Ratio:	Z_overhangs:
East (E)	0	1
South (S)	0	1

Solar shading:

Orientation:	Z blinds:	Solar access:	Overhangs:	Z summer:	
East (E)	1	0.7	1	0.7	(P8)
South (S)	1	0.9	1	0.9	(P8)

Solar gains:

Orientation	Area	Flux	g _z	FF	Shading	Gains
East (E)	0.7 x	4.5	117.51	0.76	0.7	177.23
South (S)	0.9 x	14	112.21	0.76	0.9	676.93
					Total	854.15 (P3/P4)

Internal gains:

	June	July	August
Internal gains	477.13	457.66	467.03
Total summer gains	1366.95	1311.82	1290.83 (P5)
Summer gain/loss ratio	5.44	5.22	5.13 (P6)
Mean summer external temperature (Thames valley)	16	17.9	17.8
Thermal mass temperature increment	0.25	0.25	0.25
Threshold temperature	21.69	23.37	23.18 (P7)
Likelihood of high internal temperature	Slight	Medium	Medium

Assessment of likelihood of high internal temperature: Medium

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.23
Printed on 17 January 2020 at 16:35:26

Project Information:

Assessed By: Samuel Westover (STRO012073)

Building Type: Maisonette

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 95.5m²

Site Reference : The Goat

Plot Reference: Flat 9

Address :

Client Details:

Name:

Address :

**This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.**

1a TER and DER

Fuel for main heating system: Mains gas

Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER) 15.58 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER) 14.61 kg/m² **OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE) 43.2 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE) 35.8 kWh/m² **OK**

2 Fabric U-values

Element	Average	Highest	
External wall	0.18 (max. 0.30)	0.18 (max. 0.70)	OK
Floor	(no floor)		
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	OK
Openings	1.40 (max. 2.00)	1.40 (max. 3.30)	OK

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals 5.00 (design value)
Maximum 10.0 **OK**

4 Heating efficiency

Main Heating system: Boiler systems with radiators or underfloor heating - mains gas
Data from manufacturer
Combi boiler
Efficiency 90.0 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

5 Cylinder insulation

Hot water Storage: No cylinder

N/A

Regulations Compliance Report

6 Controls

Space heating controls	TTZC by plumbing and electrical services	OK
Hot water controls:	No cylinder thermostat	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (Thames valley):	Slight	OK
Based on:		
Overshading:	Average or unknown	
Windows facing: East	4.5m ²	
Windows facing: South	15.4m ²	
Roof windows facing: East	2.25m ²	
Ventilation rate:	5.00	

10 Key features

None

SAP Input

Property Details: Flat 9

Address:
 Located in: England
 Region: Thames valley
 UPRN:
 Date of assessment: 14 January 2020
 Date of certificate: 17 January 2020
 Assessment type: New dwelling design stage
 Transaction type: New dwelling
 Tenure type: Unknown
 Related party disclosure: No related party
 Thermal Mass Parameter: Indicative Value Medium
 Water use <= 125 litres/person/day: True
 PCDF Version: 454

Property description:

Dwelling type: Maisonette
 Detachment:
 Year Completed: 2020
 Floor Location: Floor area: Storey height:
 Floor 0 37 m² 2.6 m
 Floor 1 58.5 m² 3.2 m
 Living area: 32 m² (fraction 0.335)
 Front of dwelling faces: South

Opening types:

Name:	Source:	Type:	Glazing:	Argon:	Frame:
E	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes	
S	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes	
E	Manufacturer	Roof Windows	low-E, En = 0.1, soft coat	Yes	PVC-U

Name:	Gap:	Frame Factor:	g-value:	U-value:	Area:	No. of Openings:
E	16mm or more	0.7	0.76	1.4	4.5	1
S	16mm or more	0.7	0.76	1.4	15.4	1
E	16mm or more	0.7	0.76	1.4	2.25	1

Name:	Type-Name:	Location:	Orient:	Width:	Height:
E		External	East	0	0
S		External	South	0	0
E		Roof	East	0	0

Overshading: Average or unknown

Opaque Elements:

Type:	Gross area:	Openings:	Net area:	U-value:	Ru value:	Curtain wall:	Kappa:
<u>External Elements</u>							
External	50.02	19.9	30.12	0.18	0	False	N/A
Roof	100.98	2.25	98.73	0.13	0		N/A
<u>Internal Elements</u>							
<u>Party Elements</u>							

Thermal bridges:

Thermal bridges: User-defined (individual PSI-values) Y-Value = 0.056

Length	Psi-value	
[Approved]	7.5	0.3
	E2	Other lintels (including other steel lintels)

SAP Input

[Approved]	0.7	0.04	E3	Sill
[Approved]	14	0.05	E4	Jamb
[Approved]	28.4	0.16	E5	Ground floor (normal)
[Approved]	20.8	0.09	E16	Corner (normal)
[Approved]	10.4	-0.09	E17	Corner (inverted internal area greater than external area)

Ventilation:

Pressure test:	Yes (As designed)
Ventilation:	Natural ventilation (extract fans)
Number of chimneys:	0
Number of open flues:	0
Number of fans:	2
Number of passive stacks:	0
Number of sides sheltered:	2
Pressure test:	5

Main heating system:

Main heating system:	Boiler systems with radiators or underfloor heating Gas boilers and oil boilers Fuel: mains gas Info Source: Manufacturer Declaration Manufacturer's data Efficiency: 90.0% (SEDBUK2009) Condensing combi with automatic ignition Fuel Burning Type: Unknown Systems with radiators Central heating pump : 2013 or later Design flow temperature: Unknown Unknown Boiler interlock: Yes Delayed start
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Main heating Control:

Main heating Control:	Time and temperature zone control by suitable arrangement of plumbing and electrical services Control code: 2110
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Secondary heating system:

Secondary heating system:	None
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Water heating:

Water heating:	From main heating system Water code: 901 Fuel :mains gas No hot water cylinder Solar panel: False
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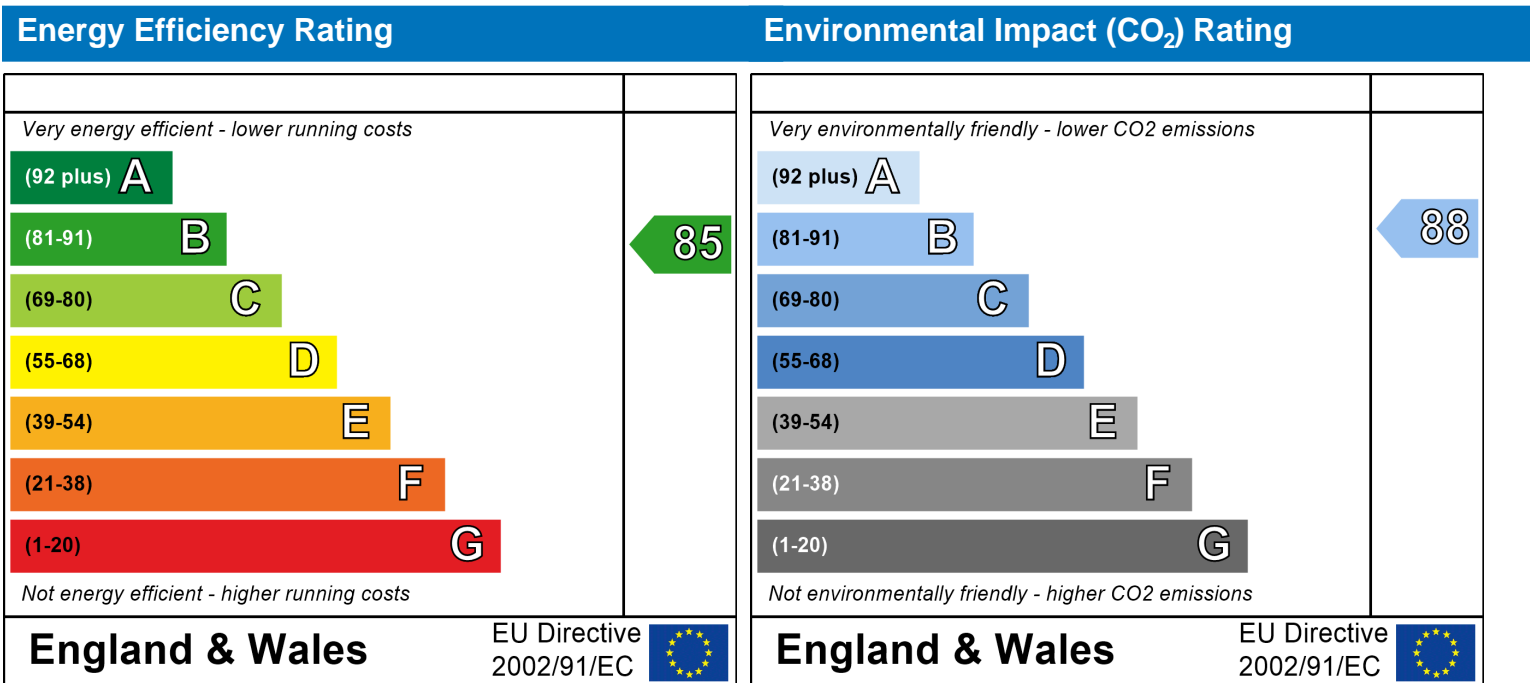
Others:

Electricity tariff:	7-Hour Tariff
In Smoke Control Area:	Yes
Conservatory:	No conservatory
Low energy lights:	100%
Terrain type:	Dense urban
EPC language:	English
Wind turbine:	No
Photovoltaics:	None
Assess Zero Carbon Home:	No

Dwelling type: Top floor Maisonette
 Date of assessment: 14 January 2020
 Produced by: Samuel Westover
 Total floor area: 95.5 m²

This is a Predicted Energy Assessment for a property which is not yet complete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, an Energy Performance Certificate is required providing information about the energy performance of the completed property.

Energy performance has been assessed using the SAP 2012 methodology and is rated in terms of the energy use per square metre of floor area, energy efficiency based on fuel costs and environmental impact based on carbon dioxide (CO₂) emissions.



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.

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.

SAP 2012 Overheating Assessment

Calculated by Stroma FSAP 2012 program, produced and printed on 17 January 2020

Property Details: Flat 9

Dwelling type:	Maisonette
Located in:	England
Region:	Thames valley
Cross ventilation possible:	No
Number of storeys:	2
Front of dwelling faces:	South
Overshading:	Average or unknown
Overhangs:	None
Thermal mass parameter:	Indicative Value Medium
Night ventilation:	False
Blinds, curtains, shutters:	
Ventilation rate during hot weather (ach):	5 (Windows fully open)

Overheating Details:

Summer ventilation heat loss coefficient:	467.61	(P1)
Transmission heat loss coefficient:	56.1	
Summer heat loss coefficient:	523.69	(P2)

Overhangs:

Orientation:	Ratio:	Z_overhangs:
East (E)	0	1
South (S)	0	1
East (E)	0	1

Solar shading:

Orientation:	Z blinds:	Solar access:	Overhangs:	Z summer:	
East (E)	1	0.7	1	0.7	(P8)
South (S)	1	0.9	1	0.9	(P8)
East (E)	1	1	1	1	(P8)

Solar gains:

Orientation		Area	Flux	g_s	FF	Shading	Gains
East (E)	0.7 x	4.5	117.51	0.76	0.7	0.7	177.23
South (S)	0.9 x	15.4	112.21	0.76	0.7	0.9	744.62
	1 x	2.25	190.54	0.76	0.7	1	205.27
Total							1127.11 (P3/P4)

Internal gains:

	June	July	August
Internal gains	484.43	464.61	474
Total summer gains	1663.62	1591.72	1540.47 (P5)
Summer gain/loss ratio	3.18	3.04	2.94 (P6)
Mean summer external temperature (Thames valley)	16	17.9	17.8
Thermal mass temperature increment	0.25	0.25	0.25
Threshold temperature	19.43	21.19	20.99 (P7)
Likelihood of high internal temperature	Not significant	Slight	Slight

Assessment of likelihood of high internal temperature: Slight

Block Compliance WorkSheet: The Goat, Ponders End - Be Green

User Details

Assessor Name: Samuel Westover
Software Name: Stroma FSAP

Stroma Number: STRO012073
Software Version: Version: 1.0.4.23

Calculation Details

Dwelling	DER	TER	DFEE	TFEE	TFA
Flat 1	13.88	20.7	52.7	58.1	61.4
Flat 2	12.12	19.04	44.4	48.3	57.6
Flat 3	11.86	18.15	41.7	46.3	64.5
Flat 4	9.62	14.35	30.5	36.6	98.8
Flat 5	10.39	15.57	35.3	43.3	95.5
Flat 6	8.83	15.74	28.8	33.6	63.9
Flat 7	11.5	19.08	43.1	49.4	60.1
Flat 8	10.13	15.18	33.5	39.4	92.7
Flat 9	10.44	15.58	35.8	43.2	95.5

Calculation Summary

Total Floor Area	690.00
Average TER	16.65
Average DER	10.80
Average DFEE	37.42
Average TFEE	43.45
Compliance	Pass
% Improvement DER TER	35.14
% Improvement DFEE TFEE	13.88

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.23
Printed on 17 January 2020 at 16:30:54

Project Information:

Assessed By: Samuel Westover (STRO012073)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 61.4m²

Site Reference : The Goat

Plot Reference: Flat 1

Address :

Client Details:

Name:

Address :

**This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.**

1a TER and DER

Fuel for main heating system: Mains gas

Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER) 20.7 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER) 13.88 kg/m² **OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE) 58.1 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE) 52.7 kWh/m² **OK**

2 Fabric U-values

Element	Average	Highest	
External wall	0.18 (max. 0.30)	0.18 (max. 0.70)	OK
Floor	0.14 (max. 0.25)	0.14 (max. 0.70)	OK
Roof	(no roof)		
Openings	1.40 (max. 2.00)	1.40 (max. 3.30)	OK

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals 5.00 (design value)
Maximum 10.0 **OK**

4 Heating efficiency

Main Heating system: Boiler systems with radiators or underfloor heating - mains gas
Data from manufacturer
Combi boiler
Efficiency 90.0 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

5 Cylinder insulation

Hot water Storage: No cylinder

N/A

Regulations Compliance Report

6 Controls

Space heating controls	TTZC by plumbing and electrical services	OK
Hot water controls:	No cylinder thermostat	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (Thames valley):	Medium	OK
Based on:		
Overshading:	Average or unknown	
Windows facing: West	14.2m ²	
Windows facing: East	1.5m ²	
Ventilation rate:	3.00	

10 Key features

Photovoltaic array

SAP Input

Property Details: Flat 1

Address:
 Located in: England
 Region: Thames valley
 UPRN:
 Date of assessment: 14 January 2020
 Date of certificate: 17 January 2020
 Assessment type: New dwelling design stage
 Transaction type: New dwelling
 Tenure type: Unknown
 Related party disclosure: No related party
 Thermal Mass Parameter: Indicative Value Medium
 Water use <= 125 litres/person/day: True
 PCDF Version: 454

Property description:

Dwelling type: Flat
 Detachment:
 Year Completed: 2020
 Floor Location: Floor area: Storey height:
 Floor 0 61.4 m² 2.6 m
 Living area: 32 m² (fraction 0.335)
 Front of dwelling faces: South

Opening types:

Name:	Source:	Type:	Glazing:	Argon:	Frame:
W	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes	
E	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes	

Name:	Gap:	Frame Factor:	g-value:	U-value:	Area:	No. of Openings:
W	16mm or more	0.7	0.76	1.4	14.2	1
E	16mm or more	0.7	0.76	1.4	1.5	1

Name:	Type-Name:	Location:	Orient:	Width:	Height:
W		External	West	0	0
E		External	East	0	0

Overshading: Average or unknown

Opaque Elements:

Type:	Gross area:	Openings:	Net area:	U-value:	Ru value:	Curtain wall:	Kappa:
<u>External Elements</u>							
External	73.84	15.7	58.14	0.18	0	False	N/A
Ground	61.4			0.14			N/A
<u>Internal Elements</u>							
<u>Party Elements</u>							

Thermal bridges:

Thermal bridges: User-defined (individual PSI-values) Y-Value = 0.0625

	Length	Psi-value		
[Approved]	7.5	0.3	E2	Other lintels (including other steel lintels)
[Approved]	0.7	0.04	E3	Sill
[Approved]	14	0.05	E4	Jamb
[Approved]	28.4	0.16	E5	Ground floor (normal)

SAP Input

[Approved]	20.8	0.09	E16	Corner (normal)
[Approved]	10.4	-0.09	E17	Corner (inverted internal area greater than external area)

Ventilation:

Pressure test:	Yes (As designed)
Ventilation:	Natural ventilation (extract fans)
Number of chimneys:	0
Number of open flues:	0
Number of fans:	2
Number of passive stacks:	0
Number of sides sheltered:	2
Pressure test:	5

Main heating system:

Main heating system:	Boiler systems with radiators or underfloor heating
	Gas boilers and oil boilers
	Fuel: mains gas
	Info Source: Manufacturer Declaration
	Manufacturer's data
	Efficiency: 90.0% (SEDBUK2009)
	Condensing combi with automatic ignition
	Fuel Burning Type: Unknown
	Systems with radiators
	Central heating pump : 2013 or later
	Design flow temperature: Unknown
	Unknown
	Boiler interlock: Yes
	Delayed start

Main heating Control:

Main heating Control:	Time and temperature zone control by suitable arrangement of plumbing and electrical services
	Control code: 2110

Secondary heating system:

Secondary heating system:	None
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Water heating:

Water heating:	From main heating system
	Water code: 901
	Fuel :mains gas
	No hot water cylinder
	Solar panel: False

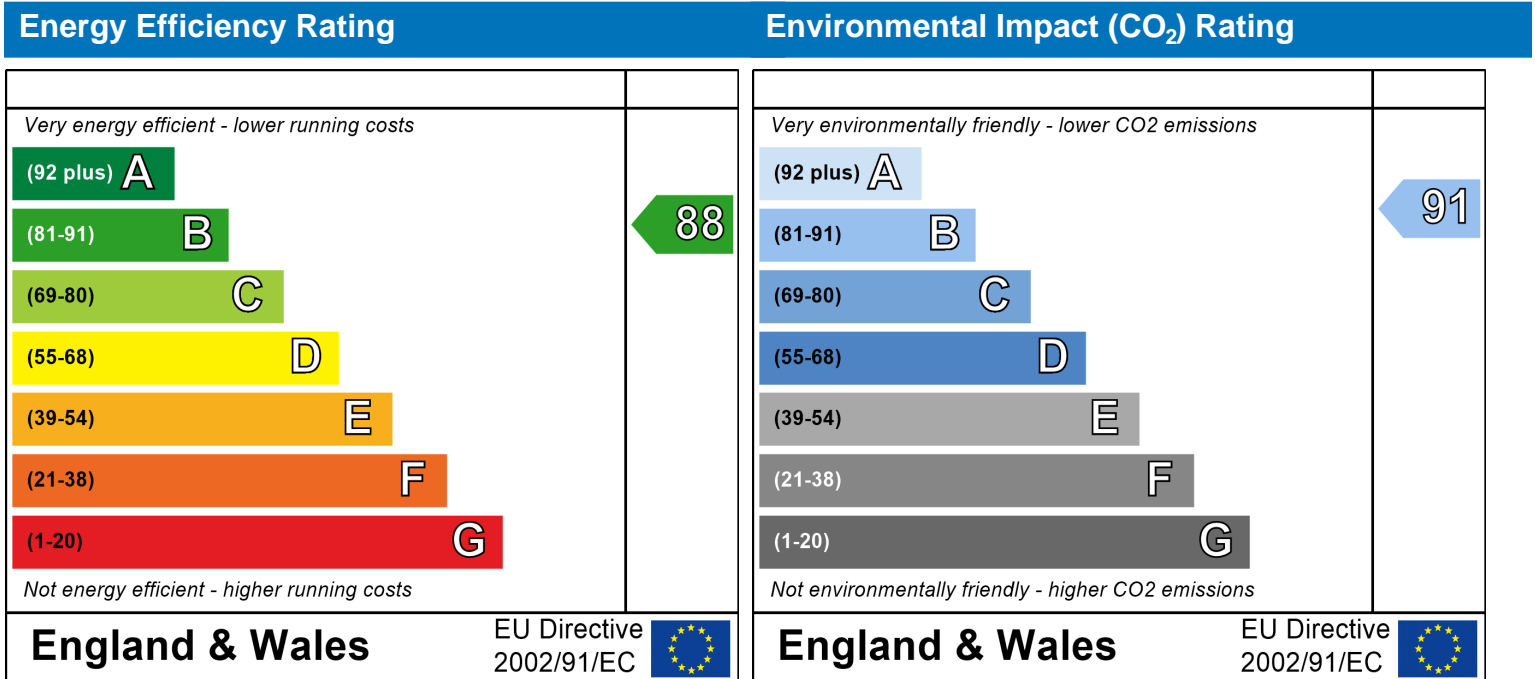
Others:

Electricity tariff:	7-Hour Tariff
In Smoke Control Area:	Yes
Conservatory:	No conservatory
Low energy lights:	100%
Terrain type:	Dense urban
EPC language:	English
Wind turbine:	No
Photovoltaics:	<u>Photovoltaic 1</u>
	Installed Peak power: 0.89
	Tilt of collector: 30°
	Overshading: None or very little
	Collector Orientation: South
Assess Zero Carbon Home:	No

Dwelling type: Ground floor Flat
 Date of assessment: 14 January 2020
 Produced by: Samuel Westover
 Total floor area: 61.4 m²

This is a Predicted Energy Assessment for a property which is not yet complete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, an Energy Performance Certificate is required providing information about the energy performance of the completed property.

Energy performance has been assessed using the SAP 2012 methodology and is rated in terms of the energy use per square metre of floor area, energy efficiency based on fuel costs and environmental impact based on carbon dioxide (CO₂) emissions.



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.

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.

SAP 2012 Overheating Assessment

Calculated by Stroma FSAP 2012 program, produced and printed on 17 January 2020

Property Details: Flat 1

Dwelling type:	Flat
Located in:	England
Region:	Thames valley
Cross ventilation possible:	Yes
Number of storeys:	1
Front of dwelling faces:	South
Overshading:	Average or unknown
Overhangs:	None
Thermal mass parameter:	Indicative Value Medium
Night ventilation:	False
Blinds, curtains, shutters:	
Ventilation rate during hot weather (ach):	3 (Windows open half the time)

Overheating Details:

Summer ventilation heat loss coefficient:	158.04	(P1)
Transmission heat loss coefficient:	48.3	
Summer heat loss coefficient:	206.38	(P2)

Overhangs:

Orientation:	Ratio:	Z_overhangs:
West (W)	0	1
East (E)	0	1

Solar shading:

Orientation:	Z blinds:	Solar access:	Overhangs:	Z summer:	
West (W)	1	0.7	1	0.7	(P8)
East (E)	1	0.9	1	0.9	(P8)

Solar gains:

Orientation	Area	Flux	g _z	FF	Shading	Gains
West (W)	0.7 x	14.2	117.51	0.76	0.7	559.25
East (E)	0.9 x	1.5	117.51	0.76	0.9	75.95
Total						635.2 (P3/P4)

Internal gains:

	June	July	August
Internal gains	364.84	350.15	357.72
Total summer gains	1039.12	985.35	916.55 (P5)
Summer gain/loss ratio	5.04	4.77	4.44 (P6)
Mean summer external temperature (Thames valley)	16	17.9	17.8
Thermal mass temperature increment	0.25	0.25	0.25
Threshold temperature	21.29	22.92	22.49 (P7)
Likelihood of high internal temperature	Slight	Medium	Medium

Assessment of likelihood of high internal temperature: Medium

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.23
Printed on 17 January 2020 at 16:30:39

Project Information:

Assessed By: Samuel Westover (STRO012073)

Building Type: Maisonette

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 57.6m²

Site Reference : The Goat

Plot Reference: Flat 2

Address :

Client Details:

Name:

Address :

**This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.**

1a TER and DER

Fuel for main heating system: Mains gas

Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER) 19.04 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER) 12.12 kg/m² **OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE) 48.3 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE) 44.4 kWh/m² **OK**

2 Fabric U-values

Element	Average	Highest	
External wall	0.18 (max. 0.30)	0.18 (max. 0.70)	OK
Floor	(no floor)		
Roof	0.14 (max. 0.20)	0.14 (max. 0.35)	OK
Openings	1.40 (max. 2.00)	1.40 (max. 3.30)	OK

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals 5.00 (design value)
Maximum 10.0 **OK**

4 Heating efficiency

Main Heating system: Boiler systems with radiators or underfloor heating - mains gas
Data from manufacturer
Combi boiler
Efficiency 90.0 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

5 Cylinder insulation

Hot water Storage: No cylinder

N/A

Regulations Compliance Report

6 Controls

Space heating controls	TTZC by plumbing and electrical services	OK
Hot water controls:	No cylinder thermostat	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (Thames valley):	Medium	OK
Based on:		
Overshading:	Average or unknown	
Windows facing: East	15.6m ²	
Ventilation rate:	2.50	

10 Key features

Thermal bridging	0.035 W/m ² K
Photovoltaic array	

SAP Input

Property Details: Flat 2

Address:
 Located in: England
 Region: Thames valley
 UPRN:
 Date of assessment: 14 January 2020
 Date of certificate: 17 January 2020
 Assessment type: New dwelling design stage
 Transaction type: New dwelling
 Tenure type: Unknown
 Related party disclosure: No related party
 Thermal Mass Parameter: Indicative Value Medium
 Water use <= 125 litres/person/day: True
 PCDF Version: 454

Property description:

Dwelling type: Maisonette
 Detachment:
 Year Completed: 2020
 Floor Location: Floor area: Storey height:
 Floor 0 30.5 m² 2.6 m
 Floor 1 27.1 m² 2.9 m
 Living area: 25.6 m² (fraction 0.444)
 Front of dwelling faces: South

Opening types:

Name:	Source:	Type:	Glazing:	Argon:	Frame:	
E	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes		
Name:	Gap:	Frame Factor:	g-value:	U-value:	Area:	No. of Openings:
E	16mm or more	0.7	0.67	1.4	15.6	1
Name:	Type-Name:	Location:	Orient:	Width:	Height:	
E		External	East	0	0	

Overshading: Average or unknown

Opaque Elements:

Type:	Gross area:	Openings:	Net area:	U-value:	Ru value:	Curtain wall:	Kappa:
<u>External Elements</u>							
External	47.47	15.6	31.87	0.18	0	False	N/A
Roof	47.52	0	47.52	0.14	0		N/A
<u>Internal Elements</u>							
<u>Party Elements</u>							

Thermal bridges:

Thermal bridges: User-defined (individual PSI-values) Y-Value = 0.0348

	Length	Psi-value		
[Approved]	6.5	0.3	E2	Other lintels (including other steel lintels)
[Approved]	8.4	0.05	E4	Jamb
[Approved]	20.8	0.09	E16	Corner (normal)
[Approved]	10.4	-0.09	E17	Corner (inverted internal area greater than external area)

Ventilation:

Pressure test: Yes (As designed)

SAP Input

Ventilation: Natural ventilation (extract fans)
Number of chimneys: 0
Number of open flues: 0
Number of fans: 2
Number of passive stacks: 0
Number of sides sheltered: 2
Pressure test: 5

Main heating system:

Main heating system: Boiler systems with radiators or underfloor heating
Gas boilers and oil boilers
Fuel: mains gas
Info Source: Manufacturer Declaration
Manufacturer's data
Efficiency: 90.0% (SEDBUK2009)
Condensing combi with automatic ignition
Fuel Burning Type: Unknown
Systems with radiators
Central heating pump : 2013 or later
Design flow temperature: Unknown
Unknown
Boiler interlock: Yes
Delayed start

Main heating Control:

Main heating Control: Time and temperature zone control by suitable arrangement of plumbing and electrical services
Control code: 2110

Secondary heating system:

Secondary heating system: None

Water heating:

Water heating: From main heating system
Water code: 901
Fuel :mains gas
No hot water cylinder
Solar panel: False

Others:

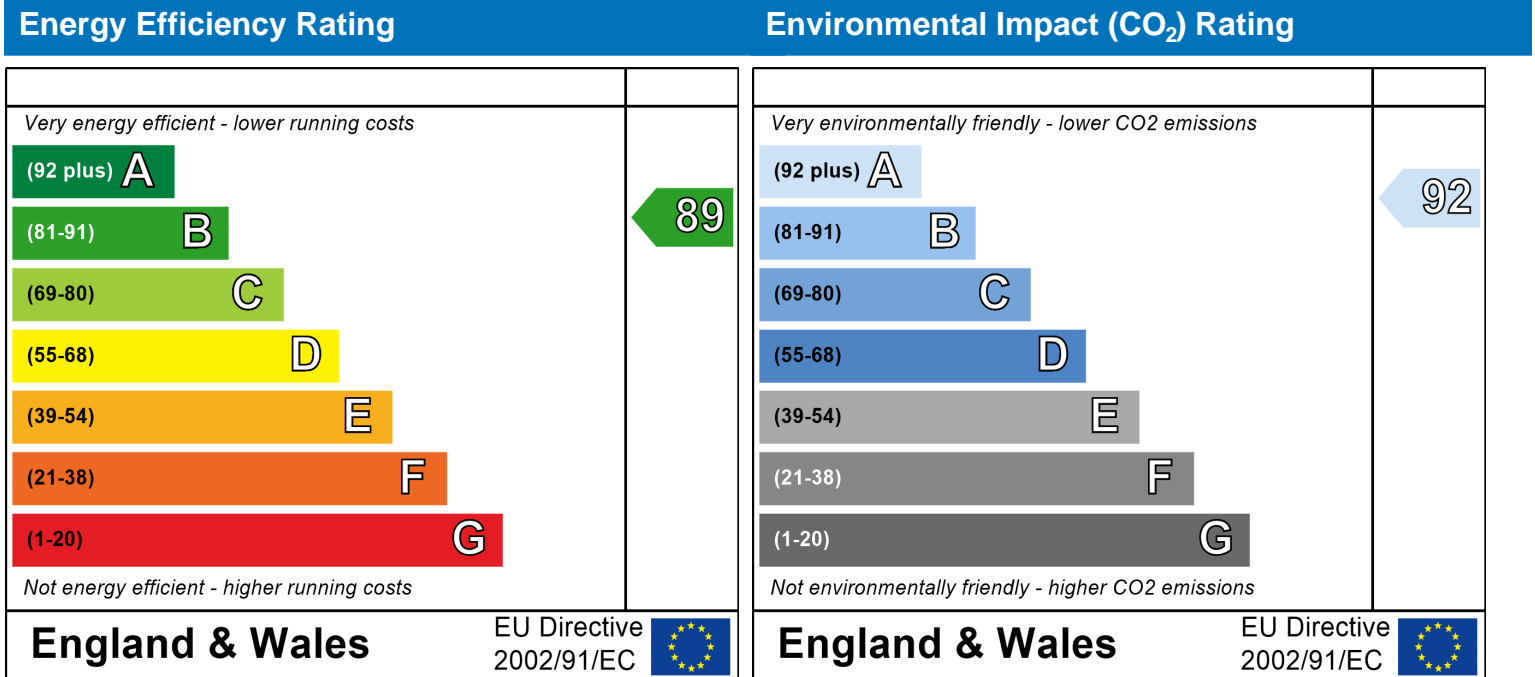
Electricity tariff: 7-Hour Tariff
In Smoke Control Area: Yes
Conservatory: No conservatory
Low energy lights: 100%
Terrain type: Dense urban
EPC language: English
Wind turbine: No
Photovoltaics: Photovoltaic 1
Installed Peak power: 0.89
Tilt of collector: 30°
Overshading: None or very little
Collector Orientation: South

Assess Zero Carbon Home: No

Dwelling type: Top floor Maisonette
 Date of assessment: 14 January 2020
 Produced by: Samuel Westover
 Total floor area: 57.6 m²

This is a Predicted Energy Assessment for a property which is not yet complete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, an Energy Performance Certificate is required providing information about the energy performance of the completed property.

Energy performance has been assessed using the SAP 2012 methodology and is rated in terms of the energy use per square metre of floor area, energy efficiency based on fuel costs and environmental impact based on carbon dioxide (CO₂) emissions.



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.

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.

SAP 2012 Overheating Assessment

Calculated by Stroma FSAP 2012 program, produced and printed on 17 January 2020

Property Details: Flat 2

Dwelling type:	Maisonette
Located in:	England
Region:	Thames valley
Cross ventilation possible:	No
Number of storeys:	2
Front of dwelling faces:	South
Overshading:	Average or unknown
Overhangs:	None
Thermal mass parameter:	Indicative Value Medium
Night ventilation:	False
Blinds, curtains, shutters:	
Ventilation rate during hot weather (ach):	2.5 (Windows open half the time)

Overheating Details:

Summer ventilation heat loss coefficient:	130.26	(P1)
Transmission heat loss coefficient:	36.4	
Summer heat loss coefficient:	166.64	(P2)

Overhangs:

Orientation:	Ratio:	Z_overhangs:
East (E)	0	1

Solar shading:

Orientation:	Z blinds:	Solar access:	Overhangs:	Z summer:	
East (E)	1	0.7	1	0.7	(P8)

Solar gains:

Orientation	Area	Flux	g _z	FF	Shading	Gains
East (E)	0.7 x 15.6	117.51	0.67	0.7	0.7	541.63
					Total	541.63 (P3/P4)

Internal gains:

	June	July	August
Internal gains	348.15	334.16	341.45
Total summer gains	923.1	875.79	817.96 (P5)
Summer gain/loss ratio	5.54	5.26	4.91 (P6)
Mean summer external temperature (Thames valley)	16	17.9	17.8
Thermal mass temperature increment	0.25	0.25	0.25
Threshold temperature	21.79	23.41	22.96 (P7)
Likelihood of high internal temperature	Slight	Medium	Medium

Assessment of likelihood of high internal temperature: Medium

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.23
Printed on 17 January 2020 at 16:30:13

Project Information:

Assessed By: Samuel Westover (STRO012073)

Building Type: Maisonette

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 64.5m²

Site Reference : The Goat

Plot Reference: Flat 3

Address :

Client Details:

Name:

Address :

**This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.**

1a TER and DER

Fuel for main heating system: Mains gas

Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER) 18.15 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER) 11.86 kg/m² **OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE) 46.3 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE) 41.7 kWh/m² **OK**

2 Fabric U-values

Element	Average	Highest	
External wall	0.18 (max. 0.30)	0.18 (max. 0.70)	OK
Floor	(no floor)		
Roof	0.14 (max. 0.20)	0.14 (max. 0.35)	OK
Openings	1.40 (max. 2.00)	1.40 (max. 3.30)	OK

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals 5.00 (design value)
Maximum 10.0 **OK**

4 Heating efficiency

Main Heating system: Boiler systems with radiators or underfloor heating - mains gas
Data from manufacturer
Combi boiler
Efficiency 90.0 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

5 Cylinder insulation

Hot water Storage: No cylinder

N/A

Regulations Compliance Report

6 Controls

Space heating controls	TTZC by plumbing and electrical services	OK
Hot water controls:	No cylinder thermostat	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (Thames valley):	Medium	OK
Based on:		
Overshading:	Average or unknown	
Windows facing: West	15.6m ²	
Ventilation rate:	2.50	

10 Key features

Thermal bridging	0.034 W/m ² K
Photovoltaic array	

SAP Input

Property Details: Flat 3

Address:
 Located in: England
 Region: Thames valley
 UPRN:
 Date of assessment: 14 January 2020
 Date of certificate: 17 January 2020
 Assessment type: New dwelling design stage
 Transaction type: New dwelling
 Tenure type: Unknown
 Related party disclosure: No related party
 Thermal Mass Parameter: Indicative Value Medium
 Water use <= 125 litres/person/day: True
 PCDF Version: 454

Property description:

Dwelling type: Maisonette
 Detachment:
 Year Completed: 2020
 Floor Location: Floor area: Storey height:
 Floor 0 37.4 m² 2.6 m
 Floor 1 27.1 m² 2.9 m
 Living area: 25.6 m² (fraction 0.444)
 Front of dwelling faces: South

Opening types:

Name:	Source:	Type:	Glazing:	Argon:	Frame:	
W	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes		
Name:	Gap:	Frame Factor:	g-value:	U-value:	Area:	No. of Openings:
W	16mm or more	0.7	0.67	1.4	15.6	1
Name:	Type-Name:	Location:	Orient:	Width:	Height:	
W		External	West	0	0	

Overshading: Average or unknown

Opaque Elements:

Type:	Gross area:	Openings:	Net area:	U-value:	Ru value:	Curtain wall:	Kappa:
<u>External Elements</u>							
External	50.33	15.6	34.73	0.18	0	False	N/A
Roof	47.52	0	47.52	0.14	0		N/A
<u>Internal Elements</u>							
<u>Party Elements</u>							

Thermal bridges:

Thermal bridges: User-defined (individual PSI-values) Y-Value = 0.0338

	Length	Psi-value		
[Approved]	6.5	0.3	E2	Other lintels (including other steel lintels)
[Approved]	8.4	0.05	E4	Jamb
[Approved]	20.8	0.09	E16	Corner (normal)
[Approved]	10.4	-0.09	E17	Corner (inverted internal area greater than external area)

Ventilation:

Pressure test: Yes (As designed)

SAP Input

Ventilation: Natural ventilation (extract fans)
Number of chimneys: 0
Number of open flues: 0
Number of fans: 2
Number of passive stacks: 0
Number of sides sheltered: 2
Pressure test: 5

Main heating system:

Main heating system: Boiler systems with radiators or underfloor heating
Gas boilers and oil boilers
Fuel: mains gas
Info Source: Manufacturer Declaration
Manufacturer's data
Efficiency: 90.0% (SEDBUK2009)
Condensing combi with automatic ignition
Fuel Burning Type: Unknown
Systems with radiators
Central heating pump : 2013 or later
Design flow temperature: Unknown
Unknown
Boiler interlock: Yes
Delayed start

Main heating Control:

Main heating Control: Time and temperature zone control by suitable arrangement of plumbing and electrical services
Control code: 2110

Secondary heating system:

Secondary heating system: None

Water heating:

Water heating: From main heating system
Water code: 901
Fuel :mains gas
No hot water cylinder
Solar panel: False

Others:

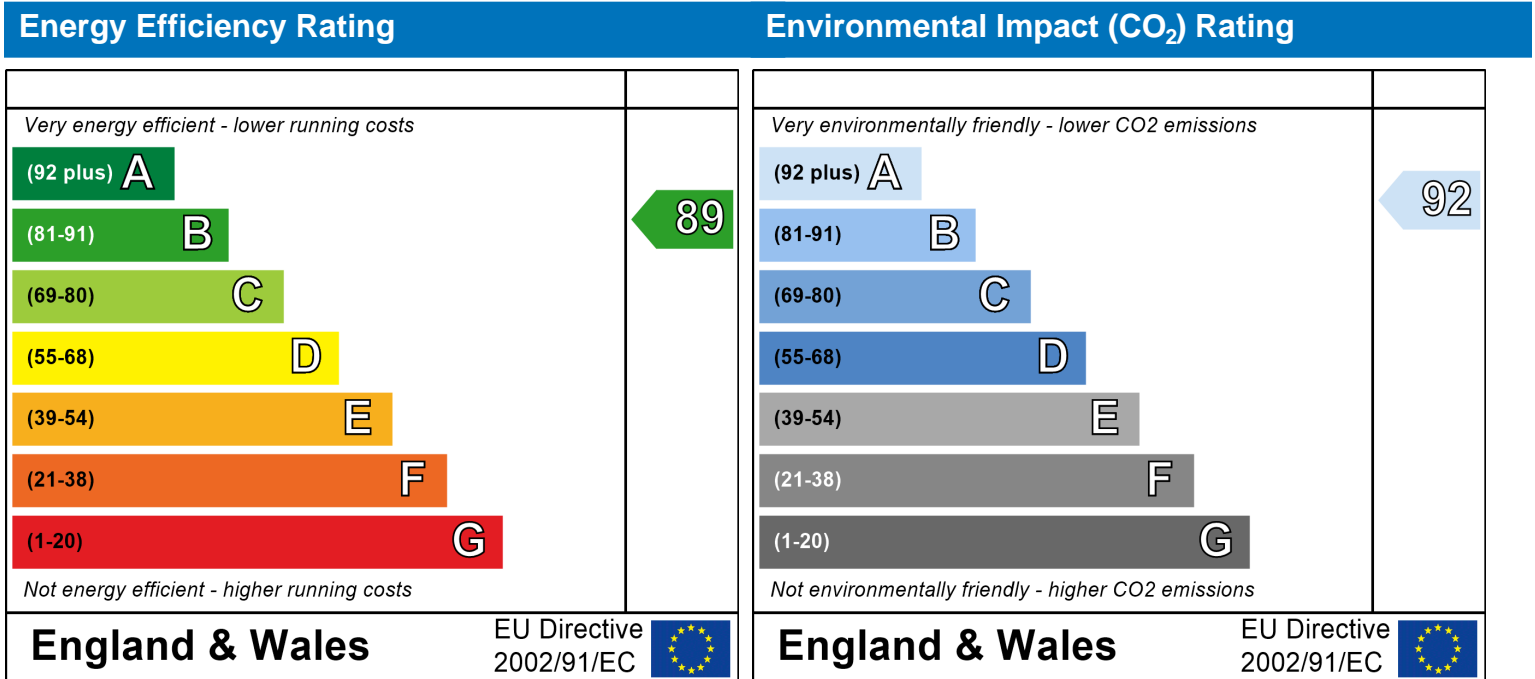
Electricity tariff: 7-Hour Tariff
In Smoke Control Area: Yes
Conservatory: No conservatory
Low energy lights: 100%
Terrain type: Dense urban
EPC language: English
Wind turbine: No
Photovoltaics: Photovoltaic 1
Installed Peak power: 0.89
Tilt of collector: 30°
Overshading: None or very little
Collector Orientation: South

Assess Zero Carbon Home: No

Dwelling type: Top floor Maisonette
 Date of assessment: 14 January 2020
 Produced by: Samuel Westover
 Total floor area: 64.5 m²

This is a Predicted Energy Assessment for a property which is not yet complete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, an Energy Performance Certificate is required providing information about the energy performance of the completed property.

Energy performance has been assessed using the SAP 2012 methodology and is rated in terms of the energy use per square metre of floor area, energy efficiency based on fuel costs and environmental impact based on carbon dioxide (CO₂) emissions.



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.

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.

SAP 2012 Overheating Assessment

Calculated by Stroma FSAP 2012 program, produced and printed on 17 January 2020

Property Details: Flat 3

Dwelling type:	Maisonette
Located in:	England
Region:	Thames valley
Cross ventilation possible:	No
Number of storeys:	2
Front of dwelling faces:	South
Overshading:	Average or unknown
Overhangs:	None
Thermal mass parameter:	Indicative Value Medium
Night ventilation:	False
Blinds, curtains, shutters:	
Ventilation rate during hot weather (ach):	2.5 (Windows open half the time)

Overheating Details:

Summer ventilation heat loss coefficient:	145.06	(P1)
Transmission heat loss coefficient:	36.9	
Summer heat loss coefficient:	181.95	(P2)

Overhangs:

Orientation:	Ratio:	Z_overhangs:
West (W)	0	1

Solar shading:

Orientation:	Z blinds:	Solar access:	Overhangs:	Z summer:	
West (W)	1	0.7	1	0.7	(P8)

Solar gains:

Orientation	Area	Flux	g _z	FF	Shading	Gains
West (W)	0.7 x	15.6	117.51	0.67	0.7	541.63
					Total	541.63 (P3/P4)

Internal gains:

	June	July	August
Internal gains	378.19	362.95	370.77
Total summer gains	953.14	904.58	847.28 (P5)
Summer gain/loss ratio	5.24	4.97	4.66 (P6)
Mean summer external temperature (Thames valley)	16	17.9	17.8
Thermal mass temperature increment	0.25	0.25	0.25
Threshold temperature	21.49	23.12	22.71 (P7)
Likelihood of high internal temperature	Slight	Medium	Medium

Assessment of likelihood of high internal temperature: Medium

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.23
Printed on 17 January 2020 at 16:29:57

Project Information:

Assessed By: Samuel Westover (STRO012073)

Building Type: Maisonette

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 98.8m²

Site Reference : The Goat

Plot Reference: Flat 4

Address :

Client Details:

Name:

Address :

**This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.**

1a TER and DER

Fuel for main heating system: Mains gas

Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER) 14.35 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER) 9.62 kg/m² **OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE) 36.6 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE) 30.5 kWh/m² **OK**

2 Fabric U-values

Element	Average	Highest	
External wall	0.18 (max. 0.30)	0.18 (max. 0.70)	OK
Floor	0.14 (max. 0.25)	0.14 (max. 0.70)	OK
Roof	(no roof)		
Openings	1.40 (max. 2.00)	1.40 (max. 3.30)	OK

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals 5.00 (design value)
Maximum 10.0 **OK**

4 Heating efficiency

Main Heating system: Boiler systems with radiators or underfloor heating - mains gas
Data from manufacturer
Combi boiler
Efficiency 90.0 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

5 Cylinder insulation

Hot water Storage: No cylinder

N/A

Regulations Compliance Report

6 Controls

Space heating controls	TTZC by plumbing and electrical services	OK
Hot water controls:	No cylinder thermostat	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (Thames valley):	Medium	OK
Based on:		
Overshading:	Average or unknown	
Windows facing: West	4.5m ²	
Windows facing: South	14m ²	
Ventilation rate:	2.50	

10 Key features

Photovoltaic array

SAP Input

Property Details: Flat 4

Address:
 Located in: England
 Region: Thames valley
 UPRN:
 Date of assessment: 14 January 2020
 Date of certificate: 17 January 2020
 Assessment type: New dwelling design stage
 Transaction type: New dwelling
 Tenure type: Unknown
 Related party disclosure: No related party
 Thermal Mass Parameter: Indicative Value Medium
 Water use <= 125 litres/person/day: True
 PCDF Version: 454

Property description:

Dwelling type: Maisonette
 Detachment:
 Year Completed: 2020
 Floor Location: Floor area: Storey height:
 Floor 0 73.3 m² 2.6 m
 Floor 1 25.5 m² 2.6 m
 Living area: 32 m² (fraction 0.521)
 Front of dwelling faces: South

Opening types:

Name:	Source:	Type:	Glazing:	Argon:	Frame:
W	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes	
S	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes	

Name:	Gap:	Frame Factor:	g-value:	U-value:	Area:	No. of Openings:
W	16mm or more	0.7	0.76	1.4	4.5	1
S	16mm or more	0.7	0.76	1.4	14	1

Name:	Type-Name:	Location:	Orient:	Width:	Height:
W		External	West	0	0
S		External	South	0	0

Overshading: Average or unknown

Opaque Elements:

Type:	Gross area:	Openings:	Net area:	U-value:	Ru value:	Curtain wall:	Kappa:
<u>External Elements</u>							
External	56.14	18.5	37.64	0.18	0	False	N/A
Ground	73.3			0.14			N/A
<u>Internal Elements</u>							
<u>Party Elements</u>							

Thermal bridges:

Thermal bridges: User-defined (individual PSI-values) Y-Value = 0.0653

	Length	Psi-value		
[Approved]	7.5	0.3	E2	Other lintels (including other steel lintels)
[Approved]	0.7	0.04	E3	Sill
[Approved]	14	0.05	E4	Jamb

SAP Input

[Approved]	28.4	0.16	E5	Ground floor (normal)
[Approved]	20.8	0.09	E16	Corner (normal)
[Approved]	10.4	-0.09	E17	Corner (inverted internal area greater than external area)

Ventilation:

Pressure test:	Yes (As designed)
Ventilation:	Natural ventilation (extract fans)
Number of chimneys:	0
Number of open flues:	0
Number of fans:	2
Number of passive stacks:	0
Number of sides sheltered:	2
Pressure test:	5

Main heating system:

Main heating system:	Boiler systems with radiators or underfloor heating
	Gas boilers and oil boilers
	Fuel: mains gas
	Info Source: Manufacturer Declaration
	Manufacturer's data
	Efficiency: 90.0% (SEDBUK2009)
	Condensing combi with automatic ignition
	Fuel Burning Type: Unknown
	Systems with radiators
	Central heating pump : 2013 or later
	Design flow temperature: Unknown
	Unknown
	Boiler interlock: Yes
	Delayed start

Main heating Control:

Main heating Control:	Time and temperature zone control by suitable arrangement of plumbing and electrical services
	Control code: 2110

Secondary heating system:

Secondary heating system:	None
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Water heating:

Water heating:	From main heating system
	Water code: 901
	Fuel :mains gas
	No hot water cylinder
	Solar panel: False

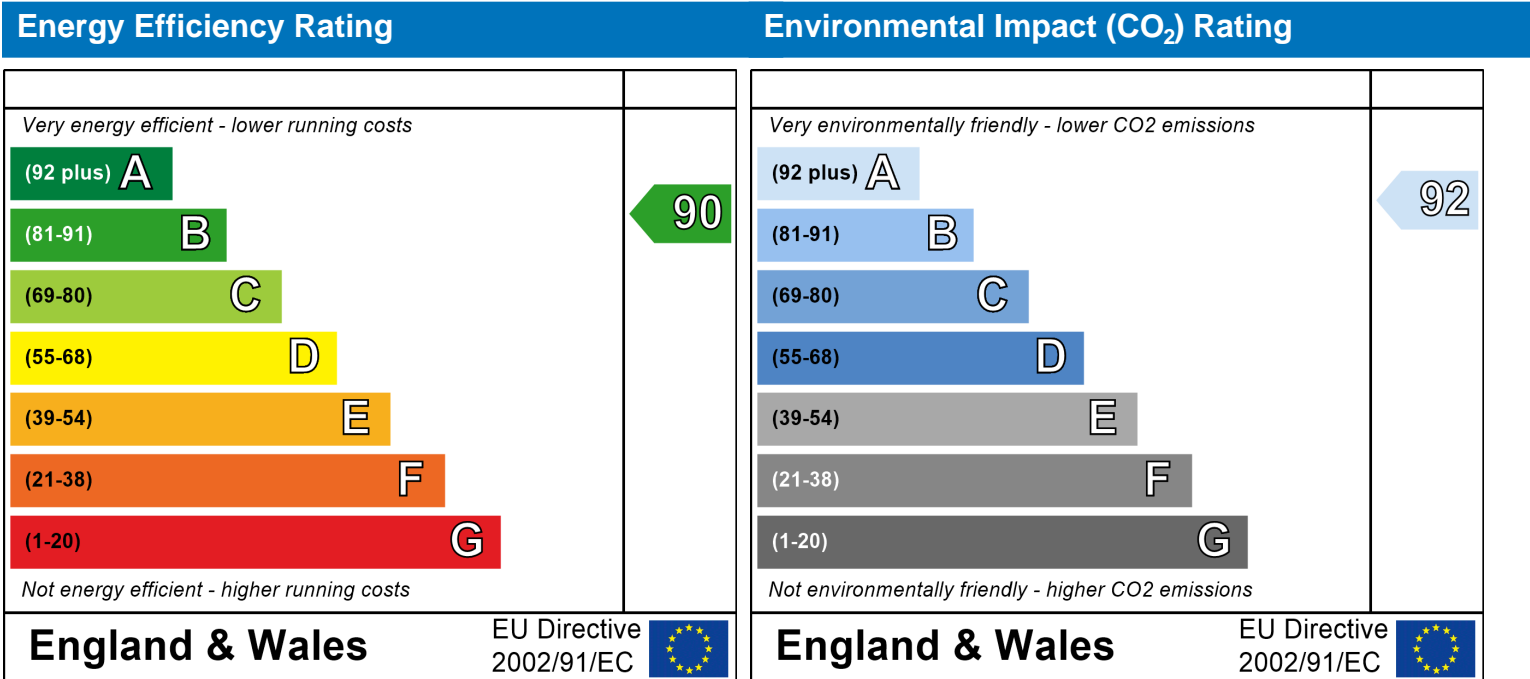
Others:

Electricity tariff:	7-Hour Tariff
In Smoke Control Area:	Yes
Conservatory:	No conservatory
Low energy lights:	100%
Terrain type:	Dense urban
EPC language:	English
Wind turbine:	No
Photovoltaics:	<u>Photovoltaic 1</u>
	Installed Peak power: 0.89
	Tilt of collector: 30°
	Overshading: None or very little
	Collector Orientation: South
Assess Zero Carbon Home:	No

Dwelling type: Ground floor Maisonette
 Date of assessment: 14 January 2020
 Produced by: Samuel Westover
 Total floor area: 98.8 m²

This is a Predicted Energy Assessment for a property which is not yet complete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, an Energy Performance Certificate is required providing information about the energy performance of the completed property.

Energy performance has been assessed using the SAP 2012 methodology and is rated in terms of the energy use per square metre of floor area, energy efficiency based on fuel costs and environmental impact based on carbon dioxide (CO₂) emissions.



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.

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.

SAP 2012 Overheating Assessment

Calculated by Stroma FSAP 2012 program, produced and printed on 17 January 2020

Property Details: Flat 4

Dwelling type:	Maisonette
Located in:	England
Region:	Thames valley
Cross ventilation possible:	No
Number of storeys:	2
Front of dwelling faces:	South
Overshading:	Average or unknown
Overhangs:	None
Thermal mass parameter:	Indicative Value Medium
Night ventilation:	False
Blinds, curtains, shutters:	
Ventilation rate during hot weather (ach):	2.5 (Windows open half the time)

Overheating Details:

Summer ventilation heat loss coefficient:	211.93	(P1)
Transmission heat loss coefficient:	50	
Summer heat loss coefficient:	261.95	(P2)

Overhangs:

Orientation:	Ratio:	Z_overhangs:
West (W)	0	1
South (S)	0	1

Solar shading:

Orientation:	Z blinds:	Solar access:	Overhangs:	Z summer:	
West (W)	1	0.7	1	0.7	(P8)
South (S)	1	0.9	1	0.9	(P8)

Solar gains:

Orientation		Area	Flux	g_z	FF	Shading	Gains
West (W)	0.7 x	4.5	117.51	0.76	0.7	0.7	177.23
South (S)	0.9 x	14	112.21	0.76	0.7	0.9	676.93
						Total	854.15 (P3/P4)

Internal gains:

	June	July	August
Internal gains	493.29	473.14	482.79
Total summer gains	1383.11	1327.29	1306.58 (P5)
Summer gain/loss ratio	5.28	5.07	4.99 (P6)
Mean summer external temperature (Thames valley)	16	17.9	17.8
Thermal mass temperature increment	0.25	0.25	0.25
Threshold temperature	21.53	23.22	23.04 (P7)
Likelihood of high internal temperature	Slight	Medium	Medium

Assessment of likelihood of high internal temperature: Medium

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.23
Printed on 17 January 2020 at 16:29:41

Project Information:

Assessed By: Samuel Westover (STRO012073)

Building Type: Maisonette

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 95.5m²

Site Reference : The Goat

Plot Reference: Flat 5

Address :

Client Details:

Name:

Address :

**This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.**

1a TER and DER

Fuel for main heating system: Mains gas

Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER) 15.57 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER) 10.39 kg/m² **OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE) 43.4 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE) 35.3 kWh/m² **OK**

2 Fabric U-values

Element	Average	Highest	
External wall	0.18 (max. 0.30)	0.18 (max. 0.70)	OK
Floor	(no floor)		
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	OK
Openings	1.40 (max. 2.00)	1.40 (max. 3.30)	OK

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals 5.00 (design value)
Maximum 10.0 **OK**

4 Heating efficiency

Main Heating system: Boiler systems with radiators or underfloor heating - mains gas
Data from manufacturer
Combi boiler
Efficiency 90.0 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

5 Cylinder insulation

Hot water Storage: No cylinder

N/A

Regulations Compliance Report

6 Controls

Space heating controls	TTZC by plumbing and electrical services	OK
Hot water controls:	No cylinder thermostat	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (Thames valley):	Slight	OK
Based on:		
Overshading:	Average or unknown	
Windows facing: West	4.5m ²	
Windows facing: South	15.4m ²	
Roof windows facing: West	3m ²	
Ventilation rate:	5.00	

10 Key features

Photovoltaic array

SAP Input

Property Details: Flat 5

Address:
 Located in: England
 Region: Thames valley
 UPRN:
 Date of assessment: 14 January 2020
 Date of certificate: 17 January 2020
 Assessment type: New dwelling design stage
 Transaction type: New dwelling
 Tenure type: Unknown
 Related party disclosure: No related party
 Thermal Mass Parameter: Indicative Value Medium
 Water use <= 125 litres/person/day: True
 PCDF Version: 454

Property description:

Dwelling type: Maisonette
 Detachment:
 Year Completed: 2020
 Floor Location: Floor area: Storey height:
 Floor 0 37 m² 2.6 m
 Floor 1 58.5 m² 3.2 m
 Living area: 32 m² (fraction 0.521)
 Front of dwelling faces: South

Opening types:

Name:	Source:	Type:	Glazing:	Argon:	Frame:
W	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes	
S	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes	
W	Manufacturer	Roof Windows	low-E, En = 0.1, soft coat	Yes	PVC-U

Name:	Gap:	Frame Factor:	g-value:	U-value:	Area:	No. of Openings:
W	16mm or more	0.7	0.76	1.4	4.5	1
S	16mm or more	0.7	0.76	1.4	15.4	1
W	16mm or more	0.7	0.76	1.4	3	1

Name:	Type-Name:	Location:	Orient:	Width:	Height:
W		External	West	0	0
S		External	South	0	0
W		Roof	West	0	0

Overshading: Average or unknown

Opaque Elements:

Type:	Gross area:	Openings:	Net area:	U-value:	Ru value:	Curtain wall:	Kappa:
<u>External Elements</u>							
External	50.02	19.9	30.12	0.18	0	False	N/A
Roof	100.98	3	97.98	0.13	0		N/A
<u>Internal Elements</u>							
<u>Party Elements</u>							

Thermal bridges:

Thermal bridges: User-defined (individual PSI-values) Y-Value = 0.056

Length	Psi-value	
[Approved]	7.5	0.3 E2 Other lintels (including other steel lintels)

SAP Input

[Approved]	0.7	0.04	E3	Sill
[Approved]	14	0.05	E4	Jamb
[Approved]	28.4	0.16	E5	Ground floor (normal)
[Approved]	20.8	0.09	E16	Corner (normal)
[Approved]	10.4	-0.09	E17	Corner (inverted internal area greater than external area)

Ventilation:

Pressure test:	Yes (As designed)
Ventilation:	Natural ventilation (extract fans)
Number of chimneys:	0
Number of open flues:	0
Number of fans:	2
Number of passive stacks:	0
Number of sides sheltered:	2
Pressure test:	5

Main heating system:

Main heating system:	Boiler systems with radiators or underfloor heating
	Gas boilers and oil boilers
	Fuel: mains gas
	Info Source: Manufacturer Declaration
	Manufacturer's data
	Efficiency: 90.0% (SEDBUK2009)
	Condensing combi with automatic ignition
	Fuel Burning Type: Unknown
	Systems with radiators
	Central heating pump : 2013 or later
	Design flow temperature: Unknown
	Unknown
	Boiler interlock: Yes
	Delayed start

Main heating Control:

Main heating Control:	Time and temperature zone control by suitable arrangement of plumbing and electrical services
	Control code: 2110

Secondary heating system:

Secondary heating system:	None
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Water heating:

Water heating:	From main heating system
	Water code: 901
	Fuel :mains gas
	No hot water cylinder
	Solar panel: False

Others:

Electricity tariff:	7-Hour Tariff
In Smoke Control Area:	Yes
Conservatory:	No conservatory
Low energy lights:	100%
Terrain type:	Dense urban
EPC language:	English
Wind turbine:	No
Photovoltaics:	<u>Photovoltaic 1</u>
	Installed Peak power: 0.89
	Tilt of collector: 30°
	Overshading: None or very little
	Collector Orientation: South

SAP Input

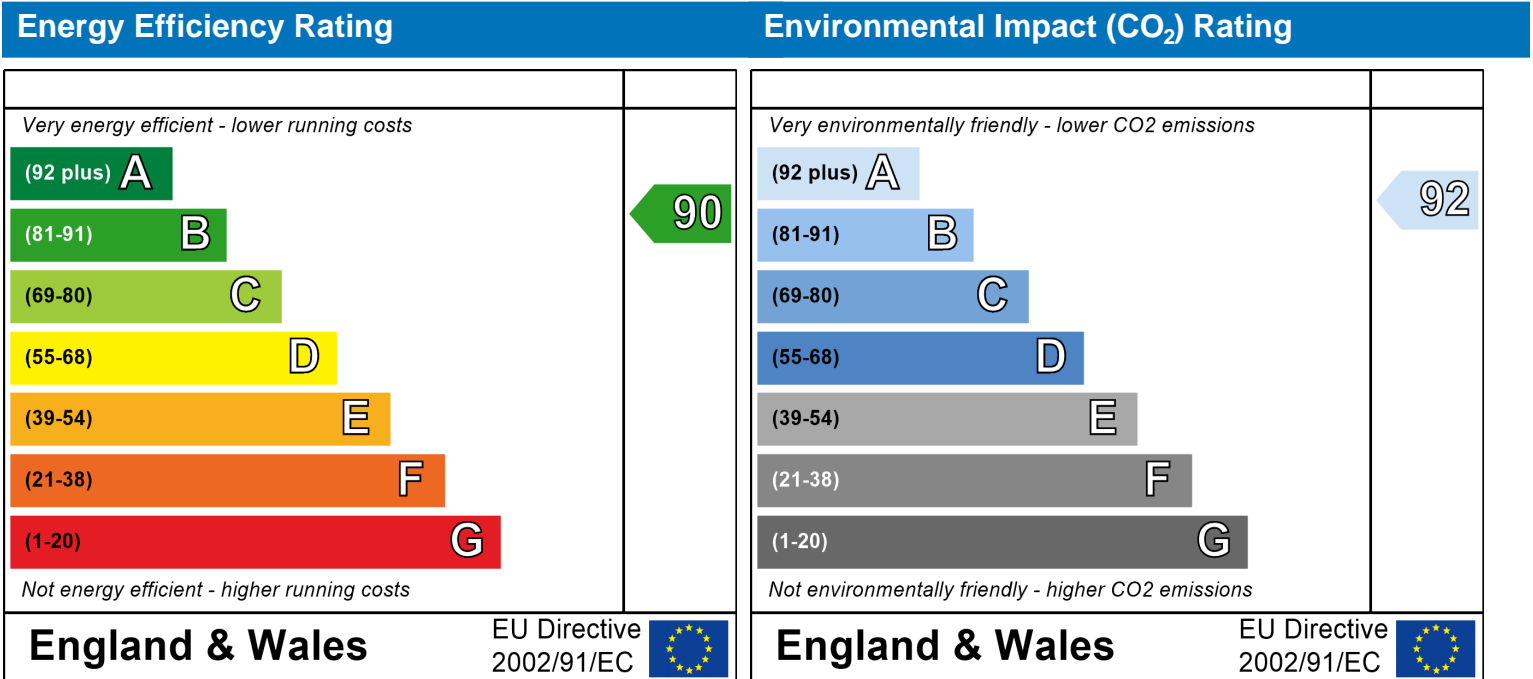
Assess Zero Carbon Home:

No

Dwelling type: Top floor Maisonette
 Date of assessment: 14 January 2020
 Produced by: Samuel Westover
 Total floor area: 95.5 m²

This is a Predicted Energy Assessment for a property which is not yet complete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, an Energy Performance Certificate is required providing information about the energy performance of the completed property.

Energy performance has been assessed using the SAP 2012 methodology and is rated in terms of the energy use per square metre of floor area, energy efficiency based on fuel costs and environmental impact based on carbon dioxide (CO₂) emissions.



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.

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.

SAP 2012 Overheating Assessment

Calculated by Stroma FSAP 2012 program, produced and printed on 17 January 2020

Property Details: Flat 5

Dwelling type:	Maisonette
Located in:	England
Region:	Thames valley
Cross ventilation possible:	No
Number of storeys:	2
Front of dwelling faces:	South
Overshading:	Average or unknown
Overhangs:	None
Thermal mass parameter:	Indicative Value Medium
Night ventilation:	False
Blinds, curtains, shutters:	
Ventilation rate during hot weather (ach):	5 (Windows fully open)

Overheating Details:

Summer ventilation heat loss coefficient:	467.61	(P1)
Transmission heat loss coefficient:	57	
Summer heat loss coefficient:	524.59	(P2)

Overhangs:

Orientation:	Ratio:	Z_overhangs:
West (W)	0	1
South (S)	0	1
West (W)	0	1

Solar shading:

Orientation:	Z blinds:	Solar access:	Overhangs:	Z summer:	
West (W)	1	0.7	1	0.7	(P8)
South (S)	1	0.9	1	0.9	(P8)
West (W)	1	1	1	1	(P8)

Solar gains:

Orientation		Area	Flux	g₋	FF	Shading	Gains
West (W)	0.7 x	4.5	117.51	0.76	0.7	0.7	177.23
South (S)	0.9 x	15.4	112.21	0.76	0.7	0.9	744.62
	1 x	3	190.54	0.76	0.7	1	273.69
Total							1195.53 (P3/P4)

Internal gains:

	June	July	August
Internal gains	484.43	464.61	474
Total summer gains	1736.69	1660.14	1599.09 (P5)
Summer gain/loss ratio	3.31	3.16	3.05 (P6)
Mean summer external temperature (Thames valley)	16	17.9	17.8
Thermal mass temperature increment	0.25	0.25	0.25
Threshold temperature	19.56	21.31	21.1 (P7)
Likelihood of high internal temperature	Not significant	Slight	Slight

Assessment of likelihood of high internal temperature: Slight

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.23
Printed on 17 January 2020 at 16:29:27

Project Information:

Assessed By: Samuel Westover (STRO012073)

Building Type: Maisonette

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 63.9m²

Site Reference : The Goat

Plot Reference: Flat 6

Address :

Client Details:

Name:

Address :

**This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.**

1a TER and DER

Fuel for main heating system: Mains gas

Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER) 15.74 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER) 8.83 kg/m² **OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE) 33.6 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE) 28.8 kWh/m² **OK**

2 Fabric U-values

Element	Average	Highest	
External wall	0.18 (max. 0.30)	0.18 (max. 0.70)	OK
Floor	0.14 (max. 0.25)	0.14 (max. 0.70)	OK
Roof	(no roof)		
Openings	1.40 (max. 2.00)	1.40 (max. 3.30)	OK

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals 5.00 (design value)
Maximum 10.0 **OK**

4 Heating efficiency

Main Heating system: Boiler systems with radiators or underfloor heating - mains gas
Data from manufacturer
Combi boiler
Efficiency 90.0 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

5 Cylinder insulation

Hot water Storage: No cylinder

N/A

Regulations Compliance Report

6 Controls

Space heating controls	TTZC by plumbing and electrical services	OK
Hot water controls:	No cylinder thermostat	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (Thames valley):	Slight	OK
Based on:		
Overshading:	Average or unknown	
Windows facing: South	14m ²	
Ventilation rate:	5.00	

10 Key features

Photovoltaic array

SAP Input

Property Details: Flat 6

Address:
 Located in: England
 Region: Thames valley
 UPRN:
 Date of assessment: 14 January 2020
 Date of certificate: 17 January 2020
 Assessment type: New dwelling design stage
 Transaction type: New dwelling
 Tenure type: Unknown
 Related party disclosure: No related party
 Thermal Mass Parameter: Indicative Value Medium
 Water use <= 125 litres/person/day: True
 PCDF Version: 454

Property description:

Dwelling type: Maisonette
 Detachment:
 Year Completed: 2020
 Floor Location: Floor area: Storey height:
 Floor 0 45.6 m² 2.6 m
 Floor 1 18.3 m² 2.6 m
 Living area: 32 m² (fraction 0.521)
 Front of dwelling faces: South

Opening types:

Name:	Source:	Type:	Glazing:	Argon:	Frame:	
S	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes		
Name:	Gap:	Frame Factor:	g-value:	U-value:	Area:	No. of Openings:
S	16mm or more	0.7	0.76	1.4	14	1
Name:	Type-Name:	Location:	Orient:	Width:	Height:	
S		External	South	0	0	

Overshading: Average or unknown

Opaque Elements:

Type:	Gross area:	Openings:	Net area:	U-value:	Ru value:	Curtain wall:	Kappa:
<u>External Elements</u>							
External	28.94	14	14.94	0.18	0	False	N/A
Ground	45.6			0.14			N/A
<u>Internal Elements</u>							
<u>Party Elements</u>							

Thermal bridges:

Thermal bridges: User-defined (individual PSI-values) Y-Value = 0.1135

	Length	Psi-value		
[Approved]	7.5	0.3	E2	Other lintels (including other steel lintels)
[Approved]	0.7	0.04	E3	Sill
[Approved]	14	0.05	E4	Jamb
[Approved]	28.4	0.16	E5	Ground floor (normal)
[Approved]	20.8	0.09	E16	Corner (normal)
[Approved]	10.4	-0.09	E17	Corner (inverted internal area greater than external area)

SAP Input

Ventilation:

Pressure test:	Yes (As designed)
Ventilation:	Natural ventilation (extract fans)
Number of chimneys:	0
Number of open flues:	0
Number of fans:	2
Number of passive stacks:	0
Number of sides sheltered:	2
Pressure test:	5

Main heating system:

Main heating system:	Boiler systems with radiators or underfloor heating Gas boilers and oil boilers Fuel: mains gas Info Source: Manufacturer Declaration Manufacturer's data Efficiency: 90.0% (SEDBUK2009) Condensing combi with automatic ignition Fuel Burning Type: Unknown Systems with radiators Central heating pump : 2013 or later Design flow temperature: Unknown Unknown Boiler interlock: Yes Delayed start
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Main heating Control:

Main heating Control:	Time and temperature zone control by suitable arrangement of plumbing and electrical services Control code: 2110
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Secondary heating system:

Secondary heating system:	None
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Water heating:

Water heating:	From main heating system Water code: 901 Fuel :mains gas No hot water cylinder Solar panel: False
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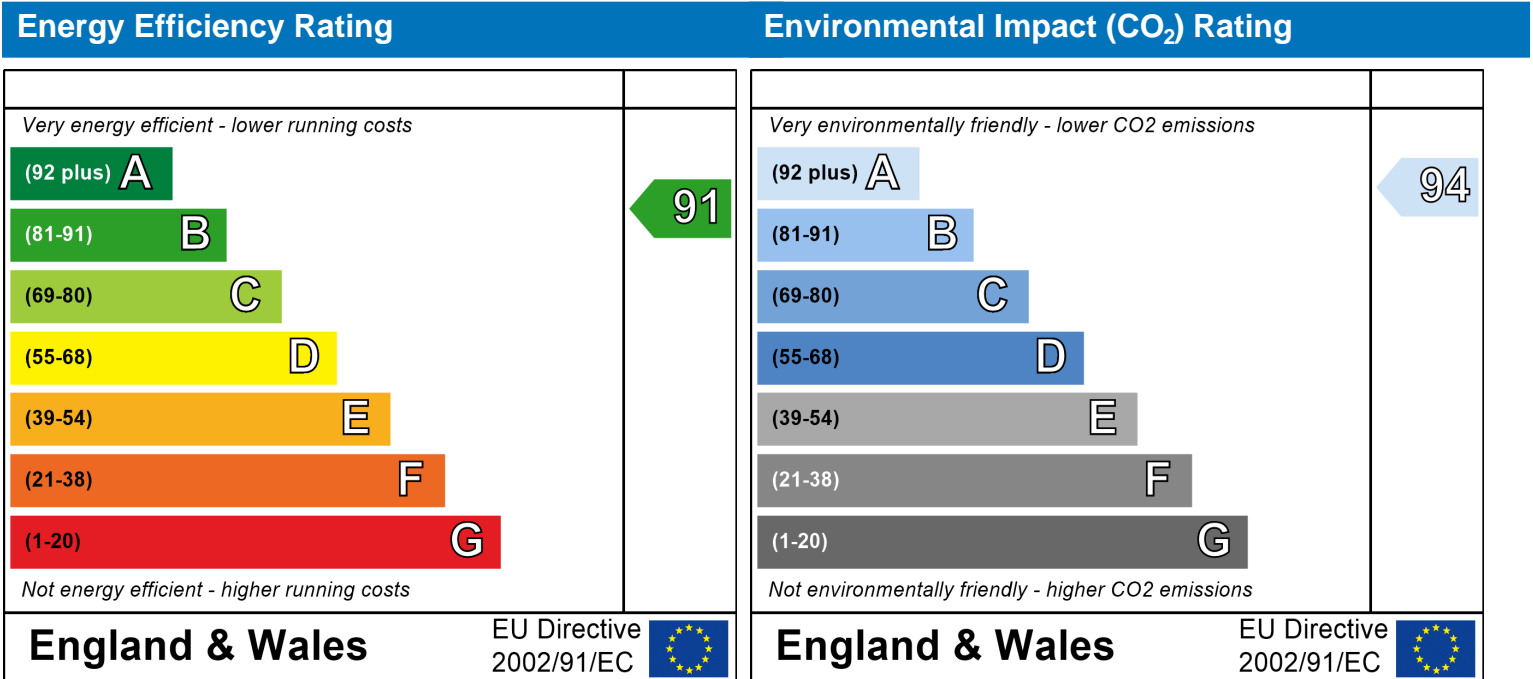
Others:

Electricity tariff:	7-Hour Tariff
In Smoke Control Area:	Yes
Conservatory:	No conservatory
Low energy lights:	100%
Terrain type:	Dense urban
EPC language:	English
Wind turbine:	No
Photovoltaics:	<u>Photovoltaic 1</u> Installed Peak power: 0.89 Tilt of collector: 30° Overshading: None or very little Collector Orientation: South
Assess Zero Carbon Home:	No

Dwelling type: Ground floor Maisonette
 Date of assessment: 14 January 2020
 Produced by: Samuel Westover
 Total floor area: 63.9 m²

This is a Predicted Energy Assessment for a property which is not yet complete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, an Energy Performance Certificate is required providing information about the energy performance of the completed property.

Energy performance has been assessed using the SAP 2012 methodology and is rated in terms of the energy use per square metre of floor area, energy efficiency based on fuel costs and environmental impact based on carbon dioxide (CO₂) emissions.



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.

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.

SAP 2012 Overheating Assessment

Calculated by Stroma FSAP 2012 program, produced and printed on 17 January 2020

Property Details: Flat 6

Dwelling type:	Maisonette
Located in:	England
Region:	Thames valley
Cross ventilation possible:	No
Number of storeys:	2
Front of dwelling faces:	South
Overshading:	Average or unknown
Overhangs:	None
Thermal mass parameter:	Indicative Value Medium
Night ventilation:	False
Blinds, curtains, shutters:	
Ventilation rate during hot weather (ach):	5 (Windows fully open)

Overheating Details:

Summer ventilation heat loss coefficient:	274.13	(P1)
Transmission heat loss coefficient:	36.1	
Summer heat loss coefficient:	310.22	(P2)

Overhangs:

Orientation:	Ratio:	Z_overhangs:
South (S)	0	1

Solar shading:

Orientation:	Z blinds:	Solar access:	Overhangs:	Z summer:	
South (S)	1	0.9	1	0.9	(P8)

Solar gains:

Orientation	Area	Flux	g _z	FF	Shading	Gains
South (S)	0.9 x 14	112.21	0.76	0.7	0.9	676.93
					Total	676.93 (P3/P4)

Internal gains:

	June	July	August
Internal gains	375.52	360.38	368.12
Total summer gains	1077.21	1037.3	1036 (P5)
Summer gain/loss ratio	3.47	3.34	3.34 (P6)
Mean summer external temperature (Thames valley)	16	17.9	17.8
Thermal mass temperature increment	0.25	0.25	0.25
Threshold temperature	19.72	21.49	21.39 (P7)
Likelihood of high internal temperature	Not significant	Slight	Slight

Assessment of likelihood of high internal temperature: Slight

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.23
Printed on 17 January 2020 at 16:29:13

Project Information:

Assessed By: Samuel Westover (STRO012073)

Building Type: Maisonette

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 60.1m²

Site Reference : The Goat

Plot Reference: Flat 7

Address :

Client Details:

Name:

Address :

**This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.**

1a TER and DER

Fuel for main heating system: Mains gas

Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER) 19.08 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER) 11.50 kg/m² **OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE) 49.4 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE) 43.1 kWh/m² **OK**

2 Fabric U-values

Element	Average	Highest	
External wall	0.18 (max. 0.30)	0.18 (max. 0.70)	OK
Floor	(no floor)		
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	OK
Openings	1.40 (max. 2.00)	1.40 (max. 3.30)	OK

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals 5.00 (design value)
Maximum 10.0 **OK**

4 Heating efficiency

Main Heating system: Boiler systems with radiators or underfloor heating - mains gas
Data from manufacturer
Combi boiler
Efficiency 90.0 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

5 Cylinder insulation

Hot water Storage: No cylinder

N/A

Regulations Compliance Report

6 Controls

Space heating controls	TTZC by plumbing and electrical services	OK
Hot water controls:	No cylinder thermostat	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (Thames valley):	Medium	OK
Based on:		
Overshading:	Average or unknown	
Windows facing: South	14.4m ²	
Windows facing: North	3m ²	
Ventilation rate:	4.00	

10 Key features

Photovoltaic array

SAP Input

Property Details: Flat 7

Address:
 Located in: England
 Region: Thames valley
 UPRN:
 Date of assessment: 14 January 2020
 Date of certificate: 17 January 2020
 Assessment type: New dwelling design stage
 Transaction type: New dwelling
 Tenure type: Unknown
 Related party disclosure: No related party
 Thermal Mass Parameter: Indicative Value Medium
 Water use <= 125 litres/person/day: True
 PCDF Version: 454

Property description:

Dwelling type: Maisonette
 Detachment:
 Year Completed: 2020
 Floor Location: Floor area: Storey height:
 Floor 0 16 m² 2.6 m
 Floor 1 44.1 m² 3.2 m
 Living area: 32 m² (fraction 0.335)
 Front of dwelling faces: South

Opening types:

Name:	Source:	Type:	Glazing:	Argon:	Frame:
S	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes	
N	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes	

Name:	Gap:	Frame Factor:	g-value:	U-value:	Area:	No. of Openings:
S	16mm or more	0.7	0.76	1.4	14.4	1
N	16mm or more	0.7	0.76	1.4	3	1

Name:	Type-Name:	Location:	Orient:	Width:	Height:
S		External	South	0	0
N		External	North	0	0

Overshading: Average or unknown

Opaque Elements:

Type:	Gross area:	Openings:	Net area:	U-value:	Ru value:	Curtain wall:	Kappa:
<u>External Elements</u>							
External	45.32	17.4	27.92	0.18	0	False	N/A
Roof	77.52	0	77.52	0.13	0		N/A
<u>Internal Elements</u>							
<u>Party Elements</u>							

Thermal bridges:

Thermal bridges: User-defined (individual PSI-values) Y-Value = 0.0689

	Length	Psi-value		
[Approved]	7.5	0.3	E2	Other lintels (including other steel lintels)
[Approved]	0.7	0.04	E3	Sill
[Approved]	14	0.05	E4	Jamb

SAP Input

[Approved]	28.4	0.16	E5	Ground floor (normal)
[Approved]	20.8	0.09	E16	Corner (normal)
[Approved]	10.4	-0.09	E17	Corner (inverted internal area greater than external area)

Ventilation:

Pressure test:	Yes (As designed)
Ventilation:	Natural ventilation (extract fans)
Number of chimneys:	0
Number of open flues:	0
Number of fans:	2
Number of passive stacks:	0
Number of sides sheltered:	2
Pressure test:	5

Main heating system:

Main heating system:	Boiler systems with radiators or underfloor heating
	Gas boilers and oil boilers
	Fuel: mains gas
	Info Source: Manufacturer Declaration
	Manufacturer's data
	Efficiency: 90.0% (SEDBUK2009)
	Condensing combi with automatic ignition
	Fuel Burning Type: Unknown
	Systems with radiators
	Central heating pump : 2013 or later
	Design flow temperature: Unknown
	Unknown
	Boiler interlock: Yes
	Delayed start

Main heating Control:

Main heating Control:	Time and temperature zone control by suitable arrangement of plumbing and electrical services
	Control code: 2110

Secondary heating system:

Secondary heating system:	None
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Water heating:

Water heating:	From main heating system
	Water code: 901
	Fuel :mains gas
	No hot water cylinder
	Solar panel: False

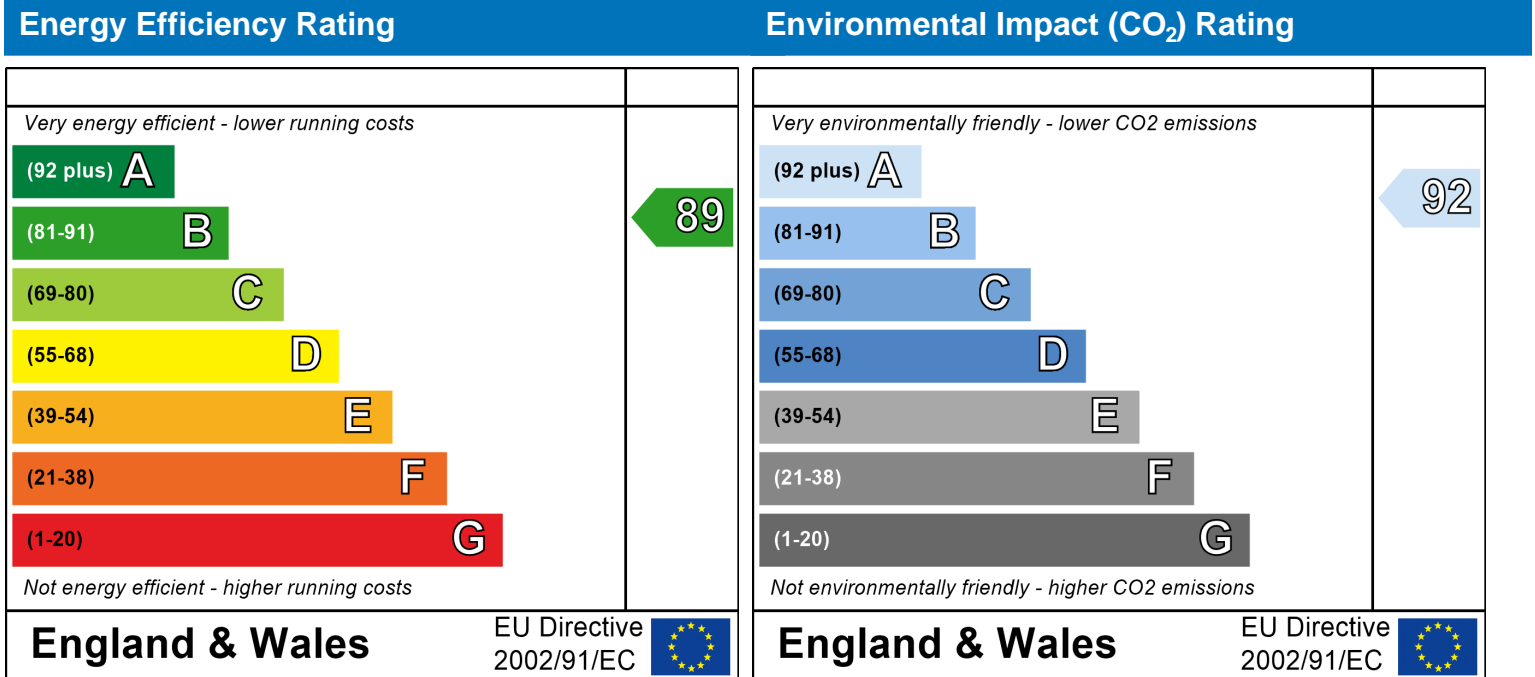
Others:

Electricity tariff:	7-Hour Tariff
In Smoke Control Area:	Yes
Conservatory:	No conservatory
Low energy lights:	100%
Terrain type:	Dense urban
EPC language:	English
Wind turbine:	No
Photovoltaics:	<u>Photovoltaic 1</u>
	Installed Peak power: 0.89
	Tilt of collector: 30°
	Overshading: None or very little
	Collector Orientation: South
Assess Zero Carbon Home:	No

Dwelling type: Top floor Maisonette
 Date of assessment: 14 January 2020
 Produced by: Samuel Westover
 Total floor area: 60.1 m²

This is a Predicted Energy Assessment for a property which is not yet complete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, an Energy Performance Certificate is required providing information about the energy performance of the completed property.

Energy performance has been assessed using the SAP 2012 methodology and is rated in terms of the energy use per square metre of floor area, energy efficiency based on fuel costs and environmental impact based on carbon dioxide (CO₂) emissions.



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.

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.

SAP 2012 Overheating Assessment

Calculated by Stroma FSAP 2012 program, produced and printed on 17 January 2020

Property Details: Flat 7

Dwelling type:	Maisonette
Located in:	England
Region:	Thames valley
Cross ventilation possible:	Yes
Number of storeys:	2
Front of dwelling faces:	South
Overshading:	Average or unknown
Overhangs:	None
Thermal mass parameter:	Indicative Value Medium
Night ventilation:	False
Blinds, curtains, shutters:	
Ventilation rate during hot weather (ach):	4 (Windows open half the time)

Overheating Details:

Summer ventilation heat loss coefficient:	241.19	(P1)
Transmission heat loss coefficient:	46.6	
Summer heat loss coefficient:	287.82	(P2)

Overhangs:

Orientation:	Ratio:	Z_overhangs:
South (S)	0	1
North (N)	0	1

Solar shading:

Orientation:	Z blinds:	Solar access:	Overhangs:	Z summer:	
South (S)	1	0.9	1	0.9	(P8)
North (N)	1	0.9	1	0.9	(P8)

Solar gains:

Orientation	Area	Flux	g _g	FF	Shading	Gains
South (S)	0.9 x 14.4	112.21	0.76	0.7	0.9	696.27
North (N)	0.9 x 3	81.19	0.76	0.7	0.9	104.95
					Total	801.22 (P3/P4)

Internal gains:

	June	July	August
Internal gains	359.15	344.7	352.17
Total summer gains	1194.43	1145.92	1124.46 (P5)
Summer gain/loss ratio	4.15	3.98	3.91 (P6)
Mean summer external temperature (Thames valley)	16	17.9	17.8
Thermal mass temperature increment	0.25	0.25	0.25
Threshold temperature	20.4	22.13	21.96 (P7)
Likelihood of high internal temperature	Not significant	Medium	Slight

Assessment of likelihood of high internal temperature: Medium

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.23
Printed on 17 January 2020 at 16:28:58

Project Information:

Assessed By: Samuel Westover (STRO012073)

Building Type: Maisonette

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 92.7m²

Site Reference : The Goat

Plot Reference: Flat 8

Address :

Client Details:

Name:

Address :

**This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.**

1a TER and DER

Fuel for main heating system: Mains gas

Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER) 15.18 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER) 10.13 kg/m² **OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE) 39.4 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE) 33.5 kWh/m² **OK**

2 Fabric U-values

Element	Average	Highest	
External wall	0.18 (max. 0.30)	0.18 (max. 0.70)	OK
Floor	0.14 (max. 0.25)	0.14 (max. 0.70)	OK
Roof	(no roof)		
Openings	1.40 (max. 2.00)	1.40 (max. 3.30)	OK

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals 5.00 (design value)
Maximum 10.0 **OK**

4 Heating efficiency

Main Heating system: Boiler systems with radiators or underfloor heating - mains gas
Data from manufacturer
Combi boiler
Efficiency 90.0 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

5 Cylinder insulation

Hot water Storage: No cylinder

N/A

Regulations Compliance Report

6 Controls

Space heating controls	TTZC by plumbing and electrical services	OK
Hot water controls:	No cylinder thermostat	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (Thames valley):	Medium	OK
Based on:		
Overshading:	Average or unknown	
Windows facing: East	4.5m ²	
Windows facing: South	14m ²	
Ventilation rate:	2.50	

10 Key features

Photovoltaic array

SAP Input

Property Details: Flat 8

Address:
 Located in: England
 Region: Thames valley
 UPRN:
 Date of assessment: 14 January 2020
 Date of certificate: 17 January 2020
 Assessment type: New dwelling design stage
 Transaction type: New dwelling
 Tenure type: Unknown
 Related party disclosure: No related party
 Thermal Mass Parameter: Indicative Value Medium
 Water use <= 125 litres/person/day: True
 PCDF Version: 454

Property description:

Dwelling type: Maisonette
 Detachment:
 Year Completed: 2020
 Floor Location: Floor area: Storey height:
 Floor 0 69.7 m² 2.6 m
 Floor 1 23 m² 2.6 m
 Living area: 32 m² (fraction 0.335)
 Front of dwelling faces: South

Opening types:

Name:	Source:	Type:	Glazing:	Argon:	Frame:
E	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes	
S	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes	

Name:	Gap:	Frame Factor:	g-value:	U-value:	Area:	No. of Openings:
E	16mm or more	0.7	0.76	1.4	4.5	1
S	16mm or more	0.7	0.76	1.4	14	1

Name:	Type-Name:	Location:	Orient:	Width:	Height:
E		External	East	0	0
S		External	South	0	0

Overshading: Average or unknown

Opaque Elements:

Type:	Gross area:	Openings:	Net area:	U-value:	Ru value:	Curtain wall:	Kappa:
<u>External Elements</u>							
External	72.94	18.5	54.44	0.18	0	False	N/A
Ground	69.7			0.14			N/A
<u>Internal Elements</u>							
<u>Party Elements</u>							

Thermal bridges:

Thermal bridges: User-defined (individual PSI-values) Y-Value = 0.0593

	Length	Psi-value		
[Approved]	7.5	0.3	E2	Other lintels (including other steel lintels)
[Approved]	0.7	0.04	E3	Sill
[Approved]	14	0.05	E4	Jamb

SAP Input

[Approved]	28.4	0.16	E5	Ground floor (normal)
[Approved]	20.8	0.09	E16	Corner (normal)
[Approved]	10.4	-0.09	E17	Corner (inverted internal area greater than external area)

Ventilation:

Pressure test:	Yes (As designed)
Ventilation:	Natural ventilation (extract fans)
Number of chimneys:	0
Number of open flues:	0
Number of fans:	2
Number of passive stacks:	0
Number of sides sheltered:	2
Pressure test:	5

Main heating system:

Main heating system:	Boiler systems with radiators or underfloor heating
	Gas boilers and oil boilers
	Fuel: mains gas
	Info Source: Manufacturer Declaration
	Manufacturer's data
	Efficiency: 90.0% (SEDBUK2009)
	Condensing combi with automatic ignition
	Fuel Burning Type: Unknown
	Systems with radiators
	Central heating pump : 2013 or later
	Design flow temperature: Unknown
	Unknown
	Boiler interlock: Yes
	Delayed start

Main heating Control:

Main heating Control:	Time and temperature zone control by suitable arrangement of plumbing and electrical services
	Control code: 2110

Secondary heating system:

Secondary heating system:	None
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Water heating:

Water heating:	From main heating system
	Water code: 901
	Fuel :mains gas
	No hot water cylinder
	Solar panel: False

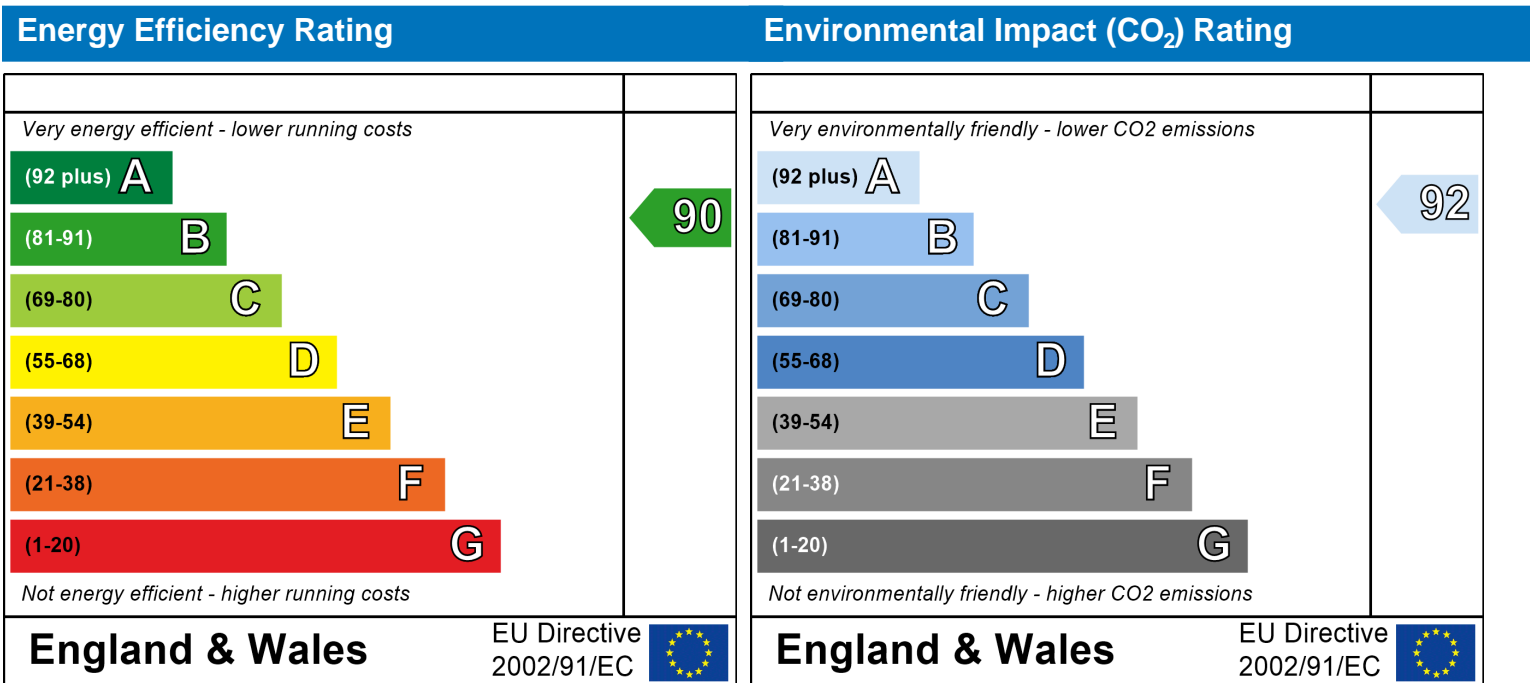
Others:

Electricity tariff:	7-Hour Tariff
In Smoke Control Area:	Yes
Conservatory:	No conservatory
Low energy lights:	100%
Terrain type:	Dense urban
EPC language:	English
Wind turbine:	No
Photovoltaics:	<u>Photovoltaic 1</u>
	Installed Peak power: 0.89
	Tilt of collector: 30°
	Overshading: None or very little
	Collector Orientation: South
Assess Zero Carbon Home:	No

Dwelling type: Ground floor Maisonette
 Date of assessment: 14 January 2020
 Produced by: Samuel Westover
 Total floor area: 92.7 m²

This is a Predicted Energy Assessment for a property which is not yet complete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, an Energy Performance Certificate is required providing information about the energy performance of the completed property.

Energy performance has been assessed using the SAP 2012 methodology and is rated in terms of the energy use per square metre of floor area, energy efficiency based on fuel costs and environmental impact based on carbon dioxide (CO₂) emissions.



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.

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.

SAP 2012 Overheating Assessment

Calculated by Stroma FSAP 2012 program, produced and printed on 17 January 2020

Property Details: Flat 8

Dwelling type:	Maisonette
Located in:	England
Region:	Thames valley
Cross ventilation possible:	No
Number of storeys:	2
Front of dwelling faces:	South
Overshading:	Average or unknown
Overhangs:	None
Thermal mass parameter:	Indicative Value Medium
Night ventilation:	False
Blinds, curtains, shutters:	
Ventilation rate during hot weather (ach):	2.5 (Windows open half the time)

Overheating Details:

Summer ventilation heat loss coefficient:	198.84	(P1)
Transmission heat loss coefficient:	52.5	
Summer heat loss coefficient:	251.38	(P2)

Overhangs:

Orientation:	Ratio:	Z_overhangs:
East (E)	0	1
South (S)	0	1

Solar shading:

Orientation:	Z blinds:	Solar access:	Overhangs:	Z summer:	
East (E)	1	0.7	1	0.7	(P8)
South (S)	1	0.9	1	0.9	(P8)

Solar gains:

Orientation	Area	Flux	g _z	FF	Shading	Gains
East (E)	0.7 x	4.5	117.51	0.76	0.7	177.23
South (S)	0.9 x	14	112.21	0.76	0.9	676.93
					Total	854.15 (P3/P4)

Internal gains:

	June	July	August
Internal gains	477.13	457.66	467.03
Total summer gains	1366.95	1311.82	1290.83 (P5)
Summer gain/loss ratio	5.44	5.22	5.13 (P6)
Mean summer external temperature (Thames valley)	16	17.9	17.8
Thermal mass temperature increment	0.25	0.25	0.25
Threshold temperature	21.69	23.37	23.18 (P7)
Likelihood of high internal temperature	Slight	Medium	Medium

Assessment of likelihood of high internal temperature: Medium

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.23
Printed on 17 January 2020 at 16:28:44

Project Information:

Assessed By: Samuel Westover (STRO012073)

Building Type: Maisonette

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 95.5m²

Site Reference : The Goat

Plot Reference: Flat 9

Address :

Client Details:

Name:

Address :

**This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.**

1a TER and DER

Fuel for main heating system: Mains gas

Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER) 15.58 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER) 10.44 kg/m² **OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE) 43.2 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE) 35.8 kWh/m² **OK**

2 Fabric U-values

Element	Average	Highest	
External wall	0.18 (max. 0.30)	0.18 (max. 0.70)	OK
Floor	(no floor)		
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	OK
Openings	1.40 (max. 2.00)	1.40 (max. 3.30)	OK

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals 5.00 (design value)
Maximum 10.0 **OK**

4 Heating efficiency

Main Heating system: Boiler systems with radiators or underfloor heating - mains gas
Data from manufacturer
Combi boiler
Efficiency 90.0 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

5 Cylinder insulation

Hot water Storage: No cylinder

N/A

Regulations Compliance Report

6 Controls

Space heating controls	TTZC by plumbing and electrical services	OK
Hot water controls:	No cylinder thermostat	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (Thames valley):	Slight	OK
Based on:		
Overshading:	Average or unknown	
Windows facing: East	4.5m ²	
Windows facing: South	15.4m ²	
Roof windows facing: East	2.25m ²	
Ventilation rate:	5.00	

10 Key features

Photovoltaic array

SAP Input

Property Details: Flat 9

Address:
 Located in: England
 Region: Thames valley
 UPRN:
 Date of assessment: 14 January 2020
 Date of certificate: 17 January 2020
 Assessment type: New dwelling design stage
 Transaction type: New dwelling
 Tenure type: Unknown
 Related party disclosure: No related party
 Thermal Mass Parameter: Indicative Value Medium
 Water use <= 125 litres/person/day: True
 PCDF Version: 454

Property description:

Dwelling type: Maisonette
 Detachment:
 Year Completed: 2020
 Floor Location: Floor area: Storey height:
 Floor 0 37 m² 2.6 m
 Floor 1 58.5 m² 3.2 m
 Living area: 32 m² (fraction 0.335)
 Front of dwelling faces: South

Opening types:

Name:	Source:	Type:	Glazing:	Argon:	Frame:
E	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes	
S	Manufacturer	Windows	low-E, En = 0.1, soft coat	Yes	
E	Manufacturer	Roof Windows	low-E, En = 0.1, soft coat	Yes	PVC-U

Name:	Gap:	Frame Factor:	g-value:	U-value:	Area:	No. of Openings:
E	16mm or more	0.7	0.76	1.4	4.5	1
S	16mm or more	0.7	0.76	1.4	15.4	1
E	16mm or more	0.7	0.76	1.4	2.25	1

Name:	Type-Name:	Location:	Orient:	Width:	Height:
E		External	East	0	0
S		External	South	0	0
E		Roof	East	0	0

Overshading: Average or unknown

Opaque Elements:

Type:	Gross area:	Openings:	Net area:	U-value:	Ru value:	Curtain wall:	Kappa:
<u>External Elements</u>							
External	50.02	19.9	30.12	0.18	0	False	N/A
Roof	100.98	2.25	98.73	0.13	0		N/A

Internal Elements

Party Elements

Thermal bridges:

Thermal bridges: User-defined (individual PSI-values) Y-Value = 0.056

Length	Psi-value	
[Approved]	7.5	0.3 E2 Other lintels (including other steel lintels)

SAP Input

[Approved]	0.7	0.04	E3	Sill
[Approved]	14	0.05	E4	Jamb
[Approved]	28.4	0.16	E5	Ground floor (normal)
[Approved]	20.8	0.09	E16	Corner (normal)
[Approved]	10.4	-0.09	E17	Corner (inverted internal area greater than external area)

Ventilation:

Pressure test:	Yes (As designed)
Ventilation:	Natural ventilation (extract fans)
Number of chimneys:	0
Number of open flues:	0
Number of fans:	2
Number of passive stacks:	0
Number of sides sheltered:	2
Pressure test:	5

Main heating system:

Main heating system:	Boiler systems with radiators or underfloor heating Gas boilers and oil boilers Fuel: mains gas Info Source: Manufacturer Declaration Manufacturer's data Efficiency: 90.0% (SEDBUK2009) Condensing combi with automatic ignition Fuel Burning Type: Unknown Systems with radiators Central heating pump : 2013 or later Design flow temperature: Unknown Unknown Boiler interlock: Yes Delayed start
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Main heating Control:

Main heating Control:	Time and temperature zone control by suitable arrangement of plumbing and electrical services Control code: 2110
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Secondary heating system:

Secondary heating system:	None
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Water heating:

Water heating:	From main heating system Water code: 901 Fuel :mains gas No hot water cylinder Solar panel: False
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Others:

Electricity tariff:	7-Hour Tariff
In Smoke Control Area:	Yes
Conservatory:	No conservatory
Low energy lights:	100%
Terrain type:	Dense urban
EPC language:	English
Wind turbine:	No
Photovoltaics:	<u>Photovoltaic 1</u> Installed Peak power: 0.89 Tilt of collector: 30° Overshading: None or very little Collector Orientation: South

SAP Input

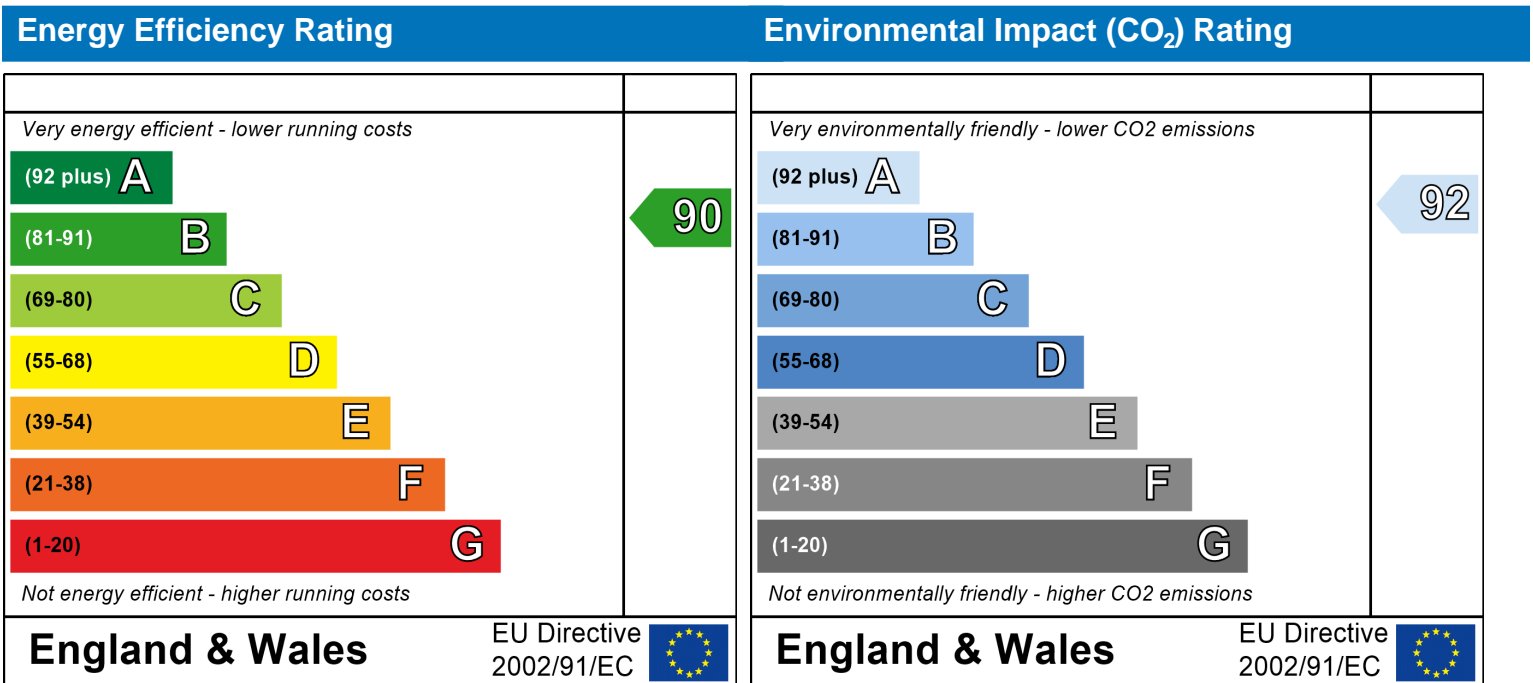
Assess Zero Carbon Home:

No

Dwelling type: Top floor Maisonette
 Date of assessment: 14 January 2020
 Produced by: Samuel Westover
 Total floor area: 95.5 m²

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Energy performance has been assessed using the SAP 2012 methodology and is rated in terms of the energy use per square metre of floor area, energy efficiency based on fuel costs and environmental impact based on carbon dioxide (CO₂) emissions.



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.

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.

SAP 2012 Overheating Assessment

Calculated by Stroma FSAP 2012 program, produced and printed on 17 January 2020

Property Details: Flat 9

Dwelling type:	Maisonette
Located in:	England
Region:	Thames valley
Cross ventilation possible:	No
Number of storeys:	2
Front of dwelling faces:	South
Overshading:	Average or unknown
Overhangs:	None
Thermal mass parameter:	Indicative Value Medium
Night ventilation:	False
Blinds, curtains, shutters:	
Ventilation rate during hot weather (ach):	5 (Windows fully open)

Overheating Details:

Summer ventilation heat loss coefficient:	467.61	(P1)
Transmission heat loss coefficient:	56.1	
Summer heat loss coefficient:	523.69	(P2)

Overhangs:

Orientation:	Ratio:	Z_overhangs:
East (E)	0	1
South (S)	0	1
East (E)	0	1

Solar shading:

Orientation:	Z blinds:	Solar access:	Overhangs:	Z summer:	
East (E)	1	0.7	1	0.7	(P8)
South (S)	1	0.9	1	0.9	(P8)
East (E)	1	1	1	1	(P8)

Solar gains:

Orientation		Area	Flux	g_	FF	Shading	Gains
East (E)	0.7 x	4.5	117.51	0.76	0.7	0.7	177.23
South (S)	0.9 x	15.4	112.21	0.76	0.7	0.9	744.62
	1 x	2.25	190.54	0.76	0.7	1	205.27
Total							1127.11 (P3/P4)

Internal gains:

	June	July	August
Internal gains	484.43	464.61	474
Total summer gains	1663.62	1591.72	1540.47 (P5)
Summer gain/loss ratio	3.18	3.04	2.94 (P6)
Mean summer external temperature (Thames valley)	16	17.9	17.8
Thermal mass temperature increment	0.25	0.25	0.25
Threshold temperature	19.43	21.19	20.99 (P7)
Likelihood of high internal temperature	Not significant	Slight	Slight

Assessment of likelihood of high internal temperature: Slight