



17-3388

Sustainability and Energy Statement

The Woodley
Arms,
Waldeck
Street,
Reading

June 2019



Quality Standards Control

The signatories below verify that this document has been prepared in accordance with our quality control requirements. These procedures do not affect the content and views expressed by the originator.

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1. Executive Summary

This Energy and Sustainability Statement demonstrates the predicted energy performance and carbon dioxide emissions of the proposed development at **The Woodley Arms, Waldeck Street, Reading** based on the information provided by the design team. The development consists of **two blocks (A&B) of 38 co-living residential units at above location.**

1.1. Policy Requirements

Reading Council requires new developments to incorporate sustainable design and construction measures. The table below summarises the local policy requirements for the proposed development.

Policies	Requirements	Compliance Check
Policy CS1 and SPD 3.	All developments of more than 10 dwellings or 1000m ² floorspace must incorporate on-site generation of energy from renewable technology. Energy efficient design measures (including the use of CHP where appropriate) must offset at least 20% of predicted CO ₂ from the estimated energy usage of the completed and occupied development.	The development achieved an overall 51.75% carbon saving via proposed energy efficiency measures and renewables technology The summarised strategies are in the table below, and details are in Section 5-9.
	Large developments (more than 10 dwellings) – Minimum 50% CfSH Level 4 and remainder with CfSH Level 3.	As CfSH was withdrawn by the government as of April 2015, a pre-assessment has not been provided as part of this report. However, the overall proposed carbon savings are beyond Code for Sustainable Homes (CfSH) Level 4 (19%) requirements. Also, high standards of sustainable design and construction measures including water consumption of 105 litres/person/day, equivalent to the Level 4, have been incorporated. Details are in Section 4.
	Considering the use of Combined heat and Power (CHP) systems where appropriate.	The CHP system is not feasible on the site due to the small size of the development.

Table 1 Policy Requirements

1.2. Methodology and Strategies

The methodology used to determine the CO₂ emissions is in accordance with the three-step Energy Hierarchy. The below table shows the Energy Hierarchy and suggested strategies for the proposed development.

Stages	Strategies
Stage 1 Energy efficient design	- U-values and air permeability better than Building Regulations Part L 2013. - The use of Accredited Construction Details at all thermal bridging junctions. - Natural ventilation with extract fans in wet rooms 100% Low energy lights - Low water consumption
Stage 2 Combined Heat and Power	Not feasible on the site – Details are in Section 8.
Stage 3 On-site renewable technologies	High efficient communal Air Source Heat Pumps (ASHPs) for heating and hot water.

Table 2 Energy Hierarchy and suggested strategies

1.3. Assessment Results

After the application of all strategies at each stage of the Energy Hierarchy, the regulated carbon dioxide emissions from the proposed development have been calculated as shown in the table below. The table also demonstrates the total carbon savings from the energy efficient measures and renewable technologies.

Energy Hierarchy		Regulated Carbon Emissions (Tonnes CO ₂ /yr)
BASELINE	TER set by Building Regulations Part L 2013	35.90
STAGE 1 - 3	After energy efficient measures and renewable technologies	17.32
TOTAL CARBON SAVINGS		51.75 %
TARGET SAVINGS		20 %

Table 3 Carbon Emissions after each stage of the proposed strategy

The Energy Hierarchy

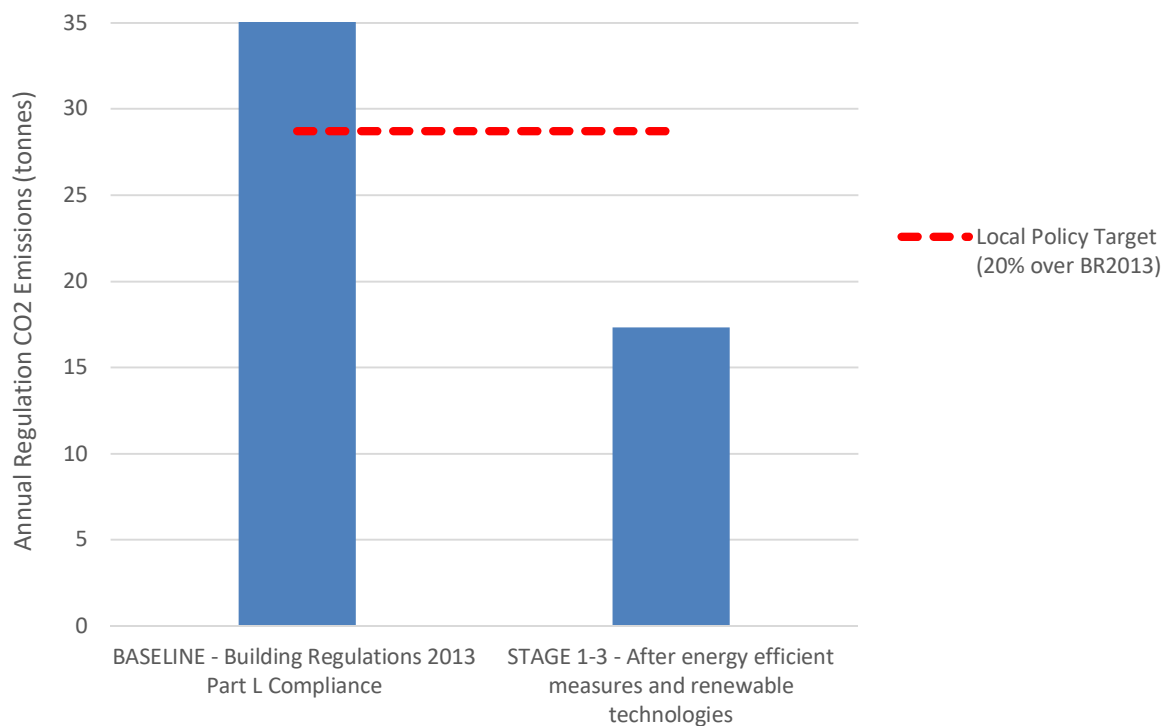


Figure 1 The energy hierarchy

2. Introduction

This Energy Statement will be included as part of the planning application that addresses the environmental impact of the development. This report focuses on the energy strategy for the proposed scheme and how energy consumption and carbon emissions will be minimised and to meet the targeted carbon emissions in accordance with the London Plan and Local planning policy.

This development is to be located in the **Reading Borough** and it is in close proximity to Reading Station (approx. 1 mile to North) and Royal Berkshire Hospital (approx. 1 mile to North-East). The proposal consists of **38 co-living residential units at The Woodley Arms, Waldeck Street, Reading.**

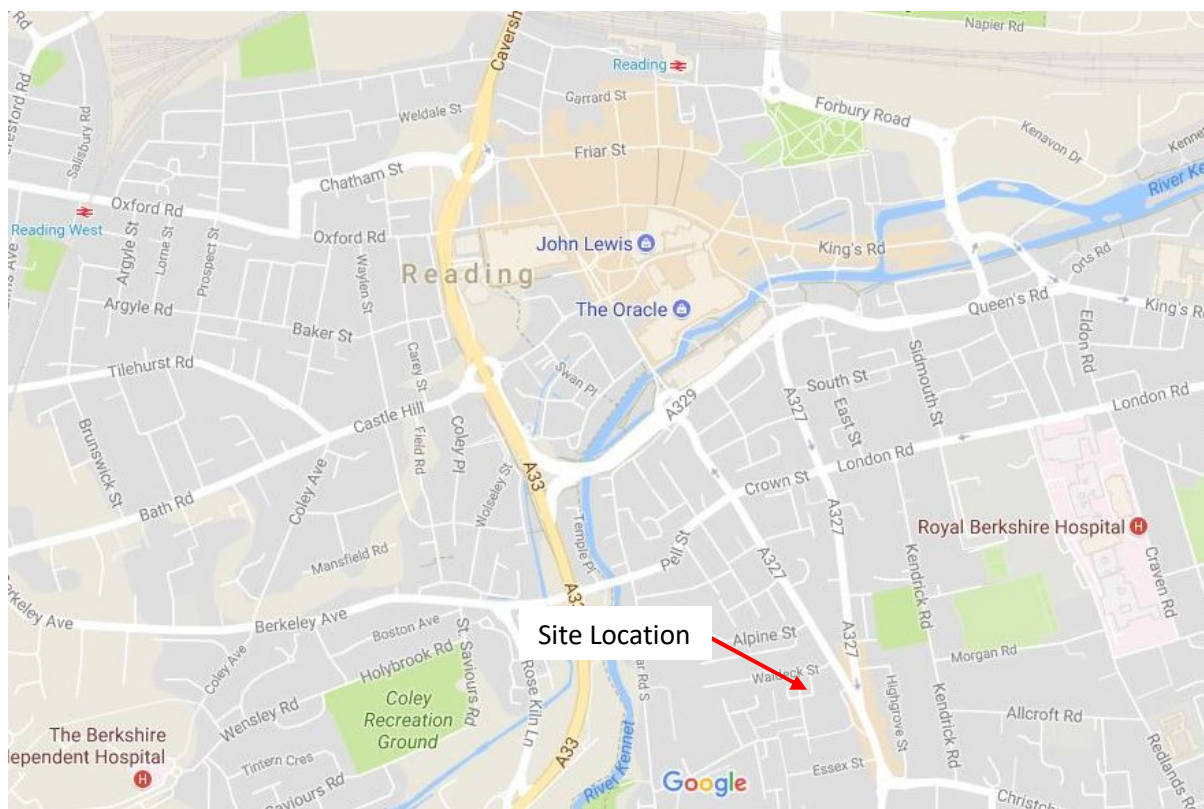


Figure 2 Site Location

The following table presents the type, area and number of units to be assessed within this report.

Students	Studios	Floor	No. Bedrooms
Block 1	Unit 1	Ground	Studio
	Unit 2	Ground	Studio
	Unit 3	Ground	Studio
	Unit 4	Ground	Studio
	Unit 5	Ground	Studio
	Unit 6	Ground	Studio
	Unit 7	1st	Studio
	Unit 8	1st	Studio
	Unit 9	1st	Studio
	Unit 10	1st	Studio
	Unit 11	1st	Studio
	Unit 12	1st	Studio
	Unit 13	1st	Studio
	Unit 14	2nd	Studio
	Unit 15	2nd	Studio
	Unit 16	2nd	Studio
	Unit 17	2nd	Studio
	Unit 18	2nd	Studio
Block 2	Unit 1	Ground	Studio
	Unit 2	Ground	Studio
	Unit 3	Ground	Studio
	Unit 4	Ground	Studio
	Unit 5	Ground	Studio
	Unit 6	Ground	Studio
	Unit 7	1st	Studio
	Unit 8	1st	Studio
	Unit 9	1st	Studio
	Unit 10	1st	Studio
	Unit 11	1st	Studio
	Unit 12	1st	Studio
	Unit 13	1st	Studio
	Unit 14	1st	Studio
	Unit 15	1st	Studio
	Unit 16	2nd	Studio
	Unit 17	2nd	Studio
	Unit 18	2nd	Studio
	Unit 19	2nd	Studio
	Unit 20	2nd	Studio

Table 4 Proposed units to be assessed for the development

3. Planning Policy

3.1. National Planning Policy Framework (February 2019)

The National Planning Policy Framework is a key part of our reforms to make the planning system less complex and more accessible, to protect the environment and to promote sustainable growth.

3.2. Reading Borough



Core Strategy (adopted January 2008 (with alteration adopted 27th January 2015)

Policy CS1: Sustainable Construction and Design

Proposals for new development, including the construction of new buildings and the redevelopment and refurbishment of existing building stock, will be acceptable where the design of buildings and site layouts use energy, water, minerals, materials and other natural resources appropriately, efficiently and with care and take account of the effects of climate change.

To meet these requirements:

- All new housing is required to meet the most up to date Eco-Homes 'Very Good' as a minimum standard, and all new commercial developments are required to meet the most up to date BREEAM 'Very Good' as a minimum standard;
- On larger developments of more than 10 dwellings or 1,000 m² of floorspace, ensure that 50% of the provision meets the most up to date Eco-Homes and BREEAM 'Excellent' standards;
- All new developments maximise the use of energy efficiency and energy conservation measures in their design, layout and orientation to reduce overall energy demand;
- All developments of more than 10 dwellings or 1000m² floorspace must incorporate on-site generation of energy from renewable technology. Energy efficient design measures (including the use of CHP where appropriate) must **off-set at least 20% of predicted carbon dioxide emissions** from the estimated energy usage of the completed and occupied development;

- All developments reduce mains water use and demonstrate that water conservation measures are incorporated so that predicted per capita consumption does not exceed the appropriate levels set out in the Code for Sustainable Homes.
- Developments incorporate sustainable urban drainage facilities and techniques as part of the layout of a development as appropriate and as advised by the Environment Agency, including minimising the size of impermeable areas so that peak run-off and annual water run-off is reduced where possible and in any case is no greater than the original conditions of the site. Particular care will be needed in areas of flood risk where different solutions may be required.

Policy CS2: Waste Minimisation

Development should demonstrate measures to minimise the generation of waste in the construction, use and life of buildings and promote more sustainable approaches to waste management, including the reuse and recycling of construction waste and the promotion of layouts and designs that provide adequate space to facilitate waste storage, reuse, recycling and composting.

Revised Sustainable Design and Construction SPD (adopted 11th January 2011)

Table 3.1: Summary of submission requirements at each stage of application process

Pre-application stage

- A Pre-assessment estimator incorporating a 3% buffer of for minor development, provision of other appropriate information to provide confidence to the LPA that policy CS1 requirements can be achieved;
- Draft Sustainability statement for all major development;
- Draft Energy Statement for all major development.

Submission with a formal planning application

- A Pre-assessment estimator incorporating a 3% buffer of for minor development, provision of other appropriate information to provide confidence to the LPA that policy CS1 requirements can be achieved;
- Sustainability Statement for all major development;
- Energy Statement for all major development.

Post-approval stage

- Condition to ensure sustainability requirements as set out in policy CS1 are met. Typically, this would be through a condition requiring an interim Code/ BREEAM Certificate as appropriate to be submitted prior to commencement of development and a Final Code/ BREEAM Certificate, again as appropriate, to be submitted prior to occupation of the development.

Table 3.2: Required level of relevant sustainability standard

	Size of development	Required Level of which standard
New build residential development (including flats)	Minor	CfSH Level 3
	Larger developments of more than 10 dwellings	Minimum 50% CfSH Level 4 and remainder with CfSH Level 3
Creation of new residential units through conversion and/or major refurbishment of residential buildings	Minor	BREEAM (EcoHomes) level 'Very Good'.
	Large developments of more than 1,000sqm non-residential floorspace	Minimum 50% BREEAM (EcoHomes) level 'Excellent' and remainder BREEAM level 'Very Good'.
Non-residential development	Minor	BREEAM level 'Very Good'
	Larger developments of more than 1,000sqm non-residential floorspace	Minimum 50% BREEAM level 'Excellent' and remainder BREEAM level 'Very Good'
Non-residential refurbishment	Minor	BREEAM level 'Very Good'
	Larger developments of more than 1,000sqm non-residential floorspace.	Minimum 50% BREEAM level 'Excellent' and remainder BREEAM level 'Very Good'

4. Sustainability Statement

4.1. Materials

The development will utilise **low embodied materials** - at least three of the key elements of the building envelope are to achieve a rating of A+ to D in the BRE's The Green Guide of specification. At least 50% of timber and timber products will be sourced from accredited Forest Stewardship Council (**FSC**) or Programme for the Endorsement of forestry certification (**PEFC**) where feasible. All material used will be durable to cater for their level of use and exposure, and will not release toxins into the internal and external environment where feasible.

4.2. Nature conservation and biodiversity

There will be **no loss in the quality and quantity of biodiversity** by this development as the site was previously developed, **planting trees and making communal garden**. And, the development will make a contribution to biodiversity on the site in the course of design development.

4.3. Waste

The construction waste will be considered **to minimise, recycle and reuse** on site where possible, this will reduce the overall construction cost and at the same time minimise the amount of waste diverting to landfill. **Site Waste Management Plan (SWMP)** will be formalised before the construction works start and updated as the works continue on the site.

The proposed development will adopt the best waste management procedures to reduce the amount of waste going to landfill. This will be established by creating provisions for recycling and also waste segregation from general to recyclable waste. This development has **separated bin storages**, and the storages include refuse, recycling, composting bins with enough sizes in accordance with borough requirements.

4.4. Management

The construction will be managed in an environmentally and socially considerate manner, mitigating environmental impacts. As measures, the best practice under a nationally or locally recognised certification scheme such as the **Considerate Constructors Scheme** would be pursued.

4.5. Water Efficiency

The development will be based upon the specification of water efficient fittings including low volume dual flush WCs, and low flow taps/ showers/ bath (see summary table below). These measures will result in the internal water consumption rate of **105 litres/person/day** or less, excluding an allowance 5 litres per person per day for external water consumption. The design stage water use calculations is below.

Installation Type	Unit of Measure	Capacity/ flow rate (1)	Use factor (2)	Fixed use (litres/head/d ay) (3)	Total Consumption Litres/head/day (1)x(2)+(3) =(4)
WC (dual flush)	Full Flush Volume (litres)	6	1.46	0	8.76
	Part flush Volume (litres)	4	2.96	0	11.85
Taps (excluding kitchen/ utility room taps)	Flow rate (litres/minute)	6.5	1.58	1.58	11.85
Bath (where shower also present)	Capacity to overflow (litres)	120	0.11	0	13.20
Shower (where bath also present)	Flow rate (litres/minute)	7.5	4.37	0	32.78
Kitchen / utility room sink taps	Flow rate (litres/minute)	6.5	0.44	10.36	13.22
Washing machine	Litres/kg dry load	9	2.1	0	18.90
Dishwasher	Litres/place setting	1.2	3.6	0	4.32
Waste disposal unit	Litres/use	If present = 1 If absent = 0	3.08	0.00	0
Water Softener	Litres/person/day	-	1.00	0.00	-
(5)	Total calculated use (litres/person/day) = Sum column 4				114.9
(6)	Contribution from greywater (litres/person/day)				0
(7)	Contribution from rainwater (litres/person/day)				0
(8)	Normalisation Factor				0.91
Total water consumption (litres/person/day)					104.5
	External water use				5

Table 5 Design stage water use calculations

4.6. Bicycle Storage

To promote exercise and help reduce congestion and carbon emissions, **cycle storages are provided on-site**. As each residential unit has their own shower facilities, additional showers are not necessary.

4.7. Flood Risk

The flood map for planning (<https://flood-map-for-planning.service.gov.uk/>) shows that the site surrounding area is **within zone 1 of the flood risk** (see below image). Therefore, the detailed flood risk assessment has not been carried out for the site. In order to protect the site for future climate change impacts the **Sustainable drainage strategy (SuDS)** will be developed to incorporate attenuation for surface water runoff as well as habitat, water quality and amenity benefits. Therefore, there will be a net decrease in both the volume and rate of run-off leaving the site. As part of this, **permeable paving materials** will be used on the ground floor to avoid, reduce and delay the discharge of rainfall to public sewers and watercourses. And also, rainwater collection and recycling systems would be considered at detailed design stage where feasible.



Figure 3 The Environmental Agency Map

4.8. Pollution

- **Air**

The proposed scheme has been designed to minimise the generation of air pollution and mitigate against increased exposure to poor air quality. This will include **low NOx heating systems and non-toxic building materials** where feasible. Contractor will follow the guidance set out in the emerging Minimising dust and emissions from construction and demolition SPG when constructing their development.

- **Noise**

The mitigation measures will be incorporated to the proposed building at construction stage to reduce sources of noise – insulate and soundproofing doors, walls, windows, floors and ceilings, and seal air gaps around windows etc.

- **Light**

Lighting scheme will be designed to minimise light pollution where feasible. Guidance Notes for the Reduction of Obtrusive Light (2005) will be utilised to reduce obtrusive light.

4.9. Health and Wellbeing

The health and wellbeing of the building occupant has been considered in this development. The proposed scheme is designed to **maximise the opportunity for daylighting potential** in habitable areas. The proposed development will ensure to introduce the **occupant controlled and zoned space heating systems** in accordance with space requirements and window orientation. This will provide occupant thermal comfort but at the same time it will reduce the overall energy cost and the carbon footprint.

5. Energy Statement - Assessment Methodology

5.1. Energy Hierarchy

The energy hierarchy is a classification of different methods to improve energy performance in a parallel sequence. This includes primarily a focus on reducing energy use by avoiding unnecessary use, to then improving the efficiency of energy systems to minimise loss, this is followed by exploiting renewable energy sources and then low carbon energy solutions for energy needs and finally, any remaining demand can be catered for by conventional fuel sources.

The Energy Strategy adopts a set of principles to guide design development and decisions regarding energy, balanced with the need to optimise environmental and economic benefits. The following hierarchy should be used to assess applications:

- **1st Stage** – By using less energy and taking into account the further energy efficiency measure in comparison to the baseline building.
- **2nd Stage** – By supplying energy efficiently. The clean building looks at further carbon dioxide emission savings over the lean building by taking into consideration the use of decentralise energy via CHP.
- **3rd Stage** – By integrating renewable energy into the scheme which can further reduce the carbon dioxide emission rate.

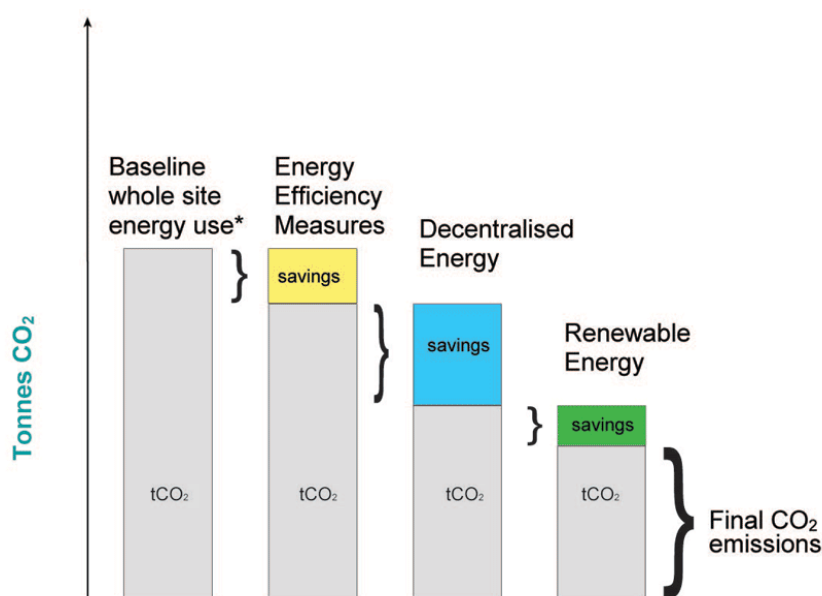


Figure 4 The Energy Hierarchy

5.2. Software and Input data

The Government approved software, i.e. **FSAP 2012**, have been utilised to carry out **Standard Assessment Procedure (SAP)** calculations. Syntegra received the architectural drawings and relevant documents, and they were used to undertake the energy assessments. The document references are listed in table below.

No.	Document Name	Received Date
1	woodley arms co living-lt2000.dwg	06-06-2019

Table 6 The document list

6. Energy Statement - Baseline

The baseline (known as Target Emission Rate), as calculated in line with the Building Regulation 2013, is the maximum amount of carbon dioxide a dwelling or non-residential unit is allowed to emit. The Target Emission Rate (TER) includes carbon dioxide emissions which are covered by Part L of the Building Regulations, known as regulated emissions (space and water heating, ventilation, lighting, pumps, fans & controls). The baseline energy uses and resulting CO₂ emissions rates of the development have been assessed using the Government approved software.

The baseline regulated CO₂ emissions for the development are presented in the table below.

Building Type	Regulated CO ₂ Emissions (Tonnes CO ₂ /yr)
Studio Apartment	35.90

Table 7 Regulated Carbon Emissions at Baseline

7. Energy Statement – 1st Stage

This section outlines the energy efficient measures taken in order to minimise the building's energy demand and therefore reduce energy use and CO₂ emissions further than the Baseline requirements (Building Regulations 2013 Part L compliance).

7.1. Passive Design Measures

- Enhanced Building Elements**

At the first stage of the energy hierarchy, energy efficient building elements have been incorporated into the build. The heat loss of different building element is dependent upon their U-value and air tightness. Therefore, better U-values and air permeability than the minimum values set in the Part L 2013 have been suggested in this development. And, Accredited Construction Detail for Part L was also applied at all thermal bridging junctions to reduce the heat loss from the thermal bridging. Therefore, the ACDs will be used during design development. Please see the proposed fabric specifications below.

		Part L1A 2013 min. required values	Proposed building values
U-value (W/m ² K)	Wall	0.30	0.15
	Window	2.0	1.4
	Floor	0.25	0.13
	Roof	0.20	0.13
	Door	1.0 (notional)	1.0
Air Permeability (m ³ /h.m ² at 50 Pa)		10	5
Thermal Bridging		-	Accredited Construction Details for Part L are applied to all thermal bridging junctions

Table 8 Proposed Building Elements

- Orientation & Natural Daylighting**

Passive solar gain reduces the amount of energy required for space heating during the winter months. The buildings are positioned having parking spaces and a communal garden, which can maximise the passive solar gains into the building throughout the day. Moreover, the internal layout, windows, and roof lights have been designed to improve daylighting in all habitable spaces, as a way of improving the health and wellbeing of occupants.

- **Solar Shading**

Each dwelling will incorporate internal blinds or curtains to reduce the solar heat coming into the dwelling, and thus can avoid installing cooling systems for summer.

- **Natural Ventilation**

A **natural ventilation strategy** will be adopted **with extract fans in wet rooms**; toilets, bathrooms, kitchens and utility rooms. Based on this, higher energy consumption and CO₂ emissions due to mechanical ventilation is avoided.

7.2. Active Design Measures

- **Heating and Hot Water System**

Communal Air Source Heat Pumps (ASPHs) have been proposed for heating and hot water to utilise renewable energy on the site. Hence, details of the proposed ASHPs will be demonstrated at Section 9 (Stage 3) of this report.

- **High Efficiency Lighting**

The proposed light fittings will be low energy efficient fittings. These can be **T5 fluorescent fittings or LED fittings**. The suggested specifications should be reviewed by electric engineers at detailed design stage.

8. Energy Statement – 2nd Stage

The Energy Hierarchy identifies the **combined heat and power (CHP)** as a method of producing heat and electricity with much lower emissions than separate heat and power. Also, it encourages the creation of district heating systems supplied by CHP. The implementation of a CHP strategy should be decided according to good practice design. Key factors for the efficient implementation of the CHP system are:

- Development with high heating load for the majority of the year.
- CHP operation based on maximum heat load for minimum 10 hours per day.
- CHP operation at maximum capacity of 90% of its operating period.

To ensure that CHP is financially viable it is essential that the unit is selected to meet the base heat load and that this load is maintained over a large proportion of the day (a figure of 14 – 17 hours per day is often quoted subject to the load profiles and gas and electricity prices) to ensure that the additional costs (maintenance) associated with running a CHP unit can be recovered. This need to run the CHP plant, as far as possible continuously makes the building load profile of prime importance when reviewing the viability of such solutions and in particular the summer time heat load profile. To enable the CHP plant to run continuously when it is operating, a thermal store is often used so that excess CHP capacity can be used to generate hot water for use at a later time.

Since this development has only 38 studios that do not require high heating loads, installing the CHP system would not be beneficial given the cost. According to the GLA Guidance on preparing energy assessment (March 2016), the development consisting around 500 residential units or more would obtain the benefits of the CHP system. **Hence the CHP system has not been considered for this development.**

9. Energy Statement – 3rd Stage

In this section, the viable **renewable energy technologies** that could reduce the development's CO₂ emissions are examined. In determining the appropriate renewable technology for the site, the following factors were considered;

- Renewable energy resource or fuel availability of the LZC technology on the site.
- Space limitations due to building design and urban location of the site.
- Capital, operating and maintenance cost.
- Planning Permission
- Implementation with regards the overall M&E design strategy for building type
- Available Grants

The table below summarises the various low zero carbon technologies considered for the projects, and we have identified that Photovoltaic (PV) and Air Source Heat Pumps (ASHP) would be the most appropriate option in this development, and **communal ASHPs have been suggested to reduce the carbon emissions on the site.**

Technology	Local Planning Requirements	Carbon Payback	Grants/ Funding	Feasibility
Air Source Heat Pumps (ASHP)	Noise Issues from External units	High	Renewable Heat Incentive (RHI)	HIGH
Photovoltaic (PV)	Spatial and Shadowing	High	-	HIGH
Solar Thermal	Spatial and Shadowing	Low	Renewable Heat Incentive (RHI)	MEDIUM
Ground Source Heat Pumps (GSHP)	Spatial issues for Bore Holes and noise	Medium	Renewable Heat Incentive (RHI)	MEDIUM
Biomass	Spatial requirement for fuel storage and biomass odour	High	Renewable Heat Incentive (RHI)	LOW
Wind Power	Extensive planning requirements for noise and local biodiversity	Low	-	LOW
Hydro Power	Extensive planning requirements for noise and water quality	None	-	ZERO

Table 9 Feasibility Study of LZC Technologies

9.1. Proposed Technology

• Air Source Heat Pumps (ASHP)

Communal ASHPs can meet the space heating demands on site efficiently in comparison with gas boilers. Although this low carbon technology consumes electricity to operate, due to the higher efficiency the heat output is much greater. Therefore, it has been suggested for the space heating and hot water. The system specifications used for energy assessment are as follows. Please note that all suggested specifications below are provisional at this early design stage, and should be reviewed by mechanical engineers and contractors during design development.

Systems	General Specification	Controls/ Other inputs
Heating	Communal ASHPs with radiators (heating efficiency of 350%)	- Charging system linked to use of community heating, programmer and TRVs - Pipes pre-insulated - Distribution with low temperature and variable flow
Hot water	From main heating system	Charged link to use

Table 10 Heating and Hot water systems

Tariffs that apply for domestic Renewable Heat Incentive (RHI) are as shown in the table below, based on the following link. <https://www.ofgem.gov.uk/environmental-programmes/domestic-rhi/contacts-guidance-and-resources/tariffs-and-payments-domestic-rhi/current-future-tariffs>. If any new tariff changes are to be made due to digression, the next announcement by BEIS would be by 1 August 2019.

Type	Technology	RHI	Eligibility
Domestic	Air Source Heat Pumps	10.71 in pence per kWh	-

Table 11 Current RHI for the ASHP

9.2. Other Technologies

• Photovoltaic (PV)

PV would be a suitable renewable technology to seek further carbon reduction on the site. However, **it has not been considered as the suggested renewable technology (ASHPs) significantly reduced the carbon emissions of the building (a 51.75% reduction achieved in total)**. For later consideration, the reasons below clarify the suitability of PV on the site.

- i. The installation of PV is much simpler when compared to other renewable technologies
- ii. There is sufficient roof space available to install enough PV modules to have a significant impact on carbon emissions of the development
- iii. PV panels sited on the roof within an urban area are less visually intrusive when compared to wind turbines

- **Ground Source Heat Pumps (GSHP)**

Ground source heat pump would be a feasible option to meet the space heating requirements, however, it requires to bore ground holes to extract the ground heat to be utilised for space heating requirements. The costs involved in installing GSHP would outweigh the advantages in this minor development. Therefore, utilization of the GSHP has not been a feasible option for this development.

- **Solar Thermal**

The use of solar thermal for this development would be limited to domestic hot water only. The use of solar thermal for space heating would not be practical as it is not required when solar thermal is at its most effective during the summer months. Therefore, this system would require additional plumbing and space for hot water storage, incurring additional financial cost. Moreover, the amount of carbon offset from the system is generally lower than other technologies. Therefore, this technology is deemed to be unsuitable for this development.

- **Hydro power**

There is no river or lake within the development site boundaries. Therefore, small scale hydro-electric will not be studied any further because of the location and the spatial limitations of the development.

- **Wind Power**

Wind turbines need extensive planning requirements and they are only feasible at consistent wind speed. Moreover, since the development is located in an urban area, the site does not have sufficient wind speed to operate wind turbine at the height of 10 meters as shown below (<http://www.renew-reuse-recycle.com/noabl.pl?n=503>). Hence this option has been discounted.

Estimated average windspeeds around RG1 2..

Wind speed at 10m above ground level (m/s)			Wind speed at 25m above ground level (m/s)			Wind speed at 45m above ground level (m/s)		
4.5	4.6	4.6	5.3	5.3	5.4	5.8	5.8	5.9
4.6	4.6	4.6	5.4	5.4	5.4	5.9	5.9	5.9
4.8	4.8	4.8	5.5	5.6	5.6	6	6	6.1

Squares surrounding the central square correspond to wind speeds for surrounding grid squares. Power generated is related to windspeed by a cubic ratio. That means if you halve the windspeed, the power goes down by a factor of 8 (which is $2 \times 2 \times 2$). A quarter of the windspeed gives you a 64th of the power ($4 \times 4 \times 4$). As a rough guide, if your turbine is rated at producing 1KW at 12m/s then it will produce 125W at 6m/s and 15W at 3m/s.

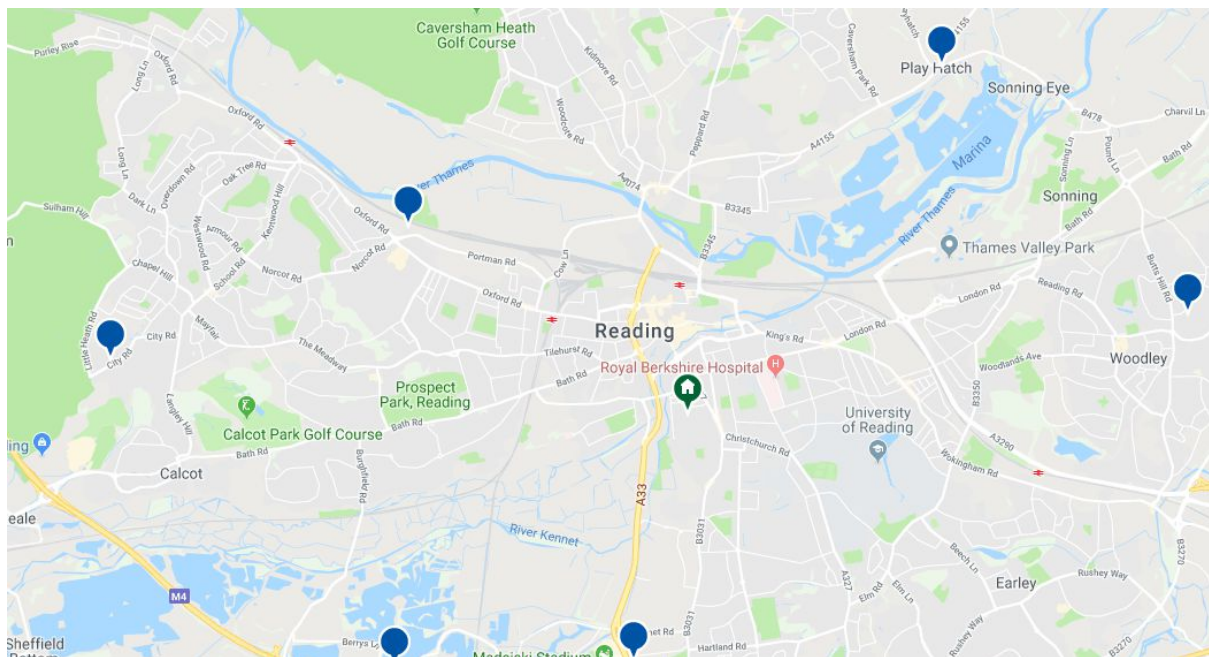
Please Note that the NOABL windspeed dataset used here is a model of windspeeds across the country, assuming completely flat terrain. It isn't a database of measured windspeeds. Other factors such as hills, houses, trees and other obstructions in your vicinity need to be considered as well as they can have a significant effect. If you're thinking about installing a wind turbine, you should perform your own windspeed measurements using an anemometer to determine what the actual figures are.

- **Biomass**

A biomass system designed for this development would be fueled by wood pellets which have a high-energy content. However, a biomass system would not be an appropriate technology for the site for the following reasons:

- The burning of wood pellets releases substantially more NOx emissions when compared to similar gas boilers. As the development is situated within an urban area, the installation of a biomass boiler would further impact on the air quality in this area.
- the lack of spaces for pellet boiler and storage on the site.
- Pellets would need to be transported from local pellet suppliers, which causes carbon emissions to the air.

However, if the biomass system is considered at detailed design stage, local suppliers can be found near the site as shown in the map below (<http://biomass-suppliers-list.service.gov.uk>).



Company name	Postcode	Contact	Fuel Supplied
Wolseley UK Ltd	RG2 0RJ	www.plumbcenter.co.uk QQ.ReadingEast@wolseley.co.uk	Pellets
Wolseley UK Ltd	RG30 6BX	www.plumbcenter.co.uk CF.Reading@wolseley.co.uk	Pellets
J Mould (Reading) Limited	RG30 3XA	www.jmouldreading.co.uk will.fleming@jmouldreading.co.uk	Chip
Travis Perkins Trading Co. Ltd	RG4 9RD	www.travisperkins.co.uk richard.butler@travisperkins.co.uk	Pellets
Travis Perkins Trading Co. Ltd	RG5 4QP	www.travisperkins.co.uk david.goodwin@travisperkins.co.uk	Pellets
Travis Perkins Trading Co. Ltd	RG31 5SD	www.travisperkins.co.uk shaun.brereton@travisperkins.co.uk	Pellets
Oxford Renewables Limited	RG8 7RE	www.oxfordrenewables.co.uk jane.yamamoto@oxfordrenewables.co.uk	Pellets
Oxford Renewables Limited	RG8 7RE	www.oxfordrenewables.co.uk pellets@oxfordrenewables.co.uk	Pellets
Travis Perkins Trading Co. Ltd	RG40 4PT	www.travisperkins.co.uk steve.stokes@travisperkins.co.uk	Pellets
Wolseley UK Ltd	RG12 1RW	www.plumbcenter.co.uk DBK.Bracknell@wolseley.co.uk	Pellets

10. Conclusion

This report demonstrates how the proposed development will incorporate sustainable design and construction measures, and assesses the carbon dioxide emissions of the proposed development, based on the information provided by the design team.

In line with the three-step energy hierarchy, the development can achieve the CO₂ emissions reduction of approximately **51.75%** over Building Regulations Part L 2013, once all measures in the table below are taken into account.

Stages	Strategies
Stage 1 Energy efficient design	- U-values and air permeability better than Building Regulations Part L 2013. - The use of Accredited Construction Details at all thermal bridging junctions. - Natural ventilation with extract fans in wet rooms 100% Low energy lights - Low water consumption
Stage 2 Combined Heat and Power	Not feasible on the site – Details are in Section 8.
Stage 3 On-site renewable technologies	High efficient communal Air Source Heat Pumps (ASHPs) for heating and hot water.

Table 12 Energy Hierarchy and suggested strategies

The carbon savings from energy efficient measures and renewable technology can be calculated as shown below. As can be seen the proposed development meets the local planning requirements.

Energy Hierarchy		Regulated Carbon Emissions (Tonnes CO ₂ /yr)
BASELINE	TER set by Building Regulations Part L 2013	35.90
STAGE 1 - 3	After energy efficient measures and renewable technologies	17.32
TOTAL CARBON SAVINGS		51.75 %
TARGET SAVINGS		20 %

Table 13 Carbon savings from the residential units

11. Appendix – SAP Reports

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 13:03:04

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 17.3m²

Site Reference : The Woodley Arms

Plot Reference: Block 1 - Studio 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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

58.26 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

27.30 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

82.5 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

67.8 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.14 (max. 0.30)

0.15 (max. 0.70)

OK

Floor

0.13 (max. 0.25)

0.13 (max. 0.70)

OK

Roof

(no roof)

Openings

1.22 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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	0.96m ²
Windows facing: West	1.24m ²
Ventilation rate:	3.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
External Walls U-value	0.13 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 13:02:54

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 19.11m²

Site Reference : The Woodley Arms

Plot Reference: Block 1 - Studio 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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

52.09 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

25.72 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

73.0 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

69.8 kWh/m²

OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	OK
Party wall	0.00 (max. 0.20)	-	OK
Floor	0.13 (max. 0.25)	0.13 (max. 0.70)	OK
Roof	(no roof)		
Openings	1.30 (max. 2.00)	1.40 (max. 3.30)	OK

Regulations Compliance Report

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: North	1.37m ²
Windows facing: West	1.24m ²
Windows facing: North West	1.37m ²
Windows facing: North East	1.37m ²
Ventilation rate:	6.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 13:02:44

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 16.43m²

Site Reference : The Woodley Arms

Plot Reference: Block 1 - Studio 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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

52.09 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

25.77 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

56.1 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

52.6 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.15 (max. 0.30)

0.15 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

0.13 (max. 0.25)

0.13 (max. 0.70)

OK

Roof

(no roof)

Openings

1.20 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

OK

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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: North	1.81m ²
Ventilation rate:	4.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 13:02:34

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 16.31m²

Site Reference : The Woodley Arms

Plot Reference: Block 1 - Studio 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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

53.63 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

26.46 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

61.1 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

58.1 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.15 (max. 0.30)

0.15 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

0.13 (max. 0.25)

0.13 (max. 0.70)

OK

Roof

(no roof)

Openings

1.23 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

OK

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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: North	2.48m ²
Ventilation rate:	4.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 13:02:25

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 16.46m²

Site Reference : The Woodley Arms

Plot Reference: Block 1 - Studio 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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

52.02 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

25.74 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

56.0 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

52.6 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.15 (max. 0.30)

0.15 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

0.13 (max. 0.25)

0.13 (max. 0.70)

OK

Roof

(no roof)

Openings

1.20 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

OK

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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: North	1.81m ²
Ventilation rate:	4.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 13:02:16

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 17.66m²

Site Reference : The Woodley Arms

Plot Reference: Block 1 - Studio 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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

55.08 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

27.25 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

75.0 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

73.0 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.15 (max. 0.30)

0.15 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

0.13 (max. 0.25)

0.13 (max. 0.70)

OK

Roof

(no roof)

Openings

1.30 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

OK

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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: North	1.37m ²
Windows facing: North East	1.37m ²
Windows facing: North West	1.37m ²
Windows facing: East	1.24m ²
Ventilation rate:	6.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 13:02:06

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 16.54m²

Site Reference : The Woodley Arms

Plot Reference: Block 1 - Studio 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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

55.58 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

26.36 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

67.5 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

55.0 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.14 (max. 0.30)

0.15 (max. 0.70)

OK

Floor

(no floor)

Roof

(no roof)

Openings

1.16 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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	1.24m ²
Ventilation rate:	3.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
External Walls U-value	0.13 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 13:01:56

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 17.3m²

Site Reference : The Woodley Arms

Plot Reference: Block 1 - Studio 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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

53.45 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

25.09 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

66.6 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

54.1 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.14 (max. 0.30)

0.15 (max. 0.70)

OK

Floor

(no floor)

Roof

(no roof)

Openings

1.22 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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):	High	Fail
Based on:		
Overshading:	Average or unknown	
Windows facing: South	0.96m ²	
Windows facing: West	1.24m ²	
Ventilation rate:	3.00	
Blinds/curtains:	None	

10 Key features

Doors U-value	1 W/m ² K
External Walls U-value	0.13 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 13:01:47

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 19.11m²

Site Reference : The Woodley Arms

Plot Reference: Block 1 - Studio 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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

47.76 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

23.59 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

58.7 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

56.9 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.15 (max. 0.30)

0.15 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

(no floor)

Roof

0.13 (max. 0.20)

0.13 (max. 0.35)

OK

Openings

1.30 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

OK

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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
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Based on:

Overshading:	Average or unknown
Windows facing: North	1.37m ²
Windows facing: West	1.24m ²
Windows facing: North West	1.37m ²
Windows facing: North East	1.37m ²
Ventilation rate:	6.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 13:01:38

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 16.44m²

Site Reference : The Woodley Arms

Plot Reference: Block 1 - Studio 10

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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

47.78 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

23.21 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

40.8 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

36.6 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.15 (max. 0.30)

0.15 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

(no floor)

Roof

(no roof)

Openings

1.20 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

OK

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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
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Based on:

Overshading:	Average or unknown
Windows facing: North	1.81m ²
Ventilation rate:	4.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 13:01:29

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 16.31m²

Site Reference : The Woodley Arms

Plot Reference: Block 1 - Studio 11

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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

49.23 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

23.89 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

45.7 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

42.1 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.15 (max. 0.30)

0.15 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

(no floor)

Roof

(no roof)

Openings

1.23 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

OK

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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
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Based on:

Overshading:	Average or unknown
Windows facing: North	2.48m ²
Ventilation rate:	4.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 13:01:19

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 16.46m²

Site Reference : The Woodley Arms

Plot Reference: Block 1 - Studio 12

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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

47.73 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

23.18 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

40.8 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

36.6 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.15 (max. 0.30)

0.15 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

(no floor)

Roof

(no roof)

Openings

1.20 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

OK

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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
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Based on:

Overshading:	Average or unknown
Windows facing: North	1.81m ²
Ventilation rate:	4.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 13:01:10

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 17.66m²

Site Reference : The Woodley Arms

Plot Reference: Block 1 - Studio 13

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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

50.67 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

25.09 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

60.3 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

59.8 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.15 (max. 0.30)

0.15 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

(no floor)

Roof

0.13 (max. 0.20)

0.13 (max. 0.35)

OK

Openings

1.30 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

OK

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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
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Based on:

Overshading:	Average or unknown
Windows facing: North	1.37m ²
Windows facing: North East	1.37m ²
Windows facing: North West	1.37m ²
Windows facing: East	1.24m ²
Ventilation rate:	6.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 13:01:01

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 21.73m²

Site Reference : The Woodley Arms

Plot Reference: Block 1 - Studio 14

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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER) 44.47 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER) 21.39 kg/m² **OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE) 57.4 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE) 47.5 kWh/m² **OK**

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	OK
Party wall	0.00 (max. 0.20)	-	OK
Floor	(no floor)		
Roof	(no roof)		
Openings	1.20 (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: Community heating schemes - Heat pump

Secondary heating system: None

5 Cylinder insulation

Hot water Storage:	Measured cylinder loss: 1.10 kWh/day	
	Permitted by DBSCG: 1.23 kWh/day	OK
	Primary pipework insulated: (Yes assumed)	

6 Controls

Space heating controls	Charging system linked to use of community heating, programmer and TRVs	OK
Hot water controls:	Cylinderstat	OK

Regulations Compliance Report

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):	High	Fail
Based on:		
Overshading:	Average or unknown	
Windows facing: West	1.24m ²	
Windows facing: West	0.59m ²	
Ventilation rate:	2.00	
Blinds/curtains:	None	

10 Key features

Doors U-value	1 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 13:00:52

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 23.17m²

Site Reference : The Woodley Arms

Plot Reference: Block 1 - Studio 15

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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER) 43.03 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER) 20.24 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE) 58.7 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE) 47.8 kWh/m²

OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	OK
Party wall	0.00 (max. 0.20)	-	OK
Floor	(no floor)		
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	OK
Openings	1.25 (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: Community heating schemes - Heat pump

Secondary heating system: None

5 Cylinder insulation

Hot water Storage:	Measured cylinder loss: 1.10 kWh/day	
	Permitted by DBSCG: 1.23 kWh/day	OK
	Primary pipework insulated: (Yes assumed)	

6 Controls

Space heating controls	Charging system linked to use of community heating, programmer and TRVs	OK
Hot water controls:	Cylinderstat	OK

Regulations Compliance Report

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):	High	Fail
Based on:		
Overshading:	Average or unknown	
Windows facing: South	1.1m ²	
Windows facing: West	1.51m ²	
Roof windows facing: West	0.62m ²	
Ventilation rate:	3.00	
Blinds/curtains:	None	

10 Key features

Doors U-value	1 W/m ² K
External Walls U-value	0.13 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 13:00:42

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 26.42m²

Site Reference : The Woodley Arms

Plot Reference: Block 1 - Studio 16

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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

37.68 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

18.35 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

49.5 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

41.8 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.15 (max. 0.30)

0.15 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

(no floor)

Roof

0.13 (max. 0.20)

0.13 (max. 0.35)

OK

Openings

1.23 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

OK

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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
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Based on:

Overshading:	Average or unknown
Windows facing: North	0.72m ²
Windows facing: West	1.1m ²
Roof windows facing: West	0.62m ²
Ventilation rate:	3.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 13:00:32

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 20.11m²

Site Reference : The Woodley Arms

Plot Reference: Block 1 - Studio 17

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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

45.37 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

22.09 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

54.4 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

47.3 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.14 (max. 0.30)

0.14 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

(no floor)

Roof

0.13 (max. 0.20)

0.13 (max. 0.35)

OK

Openings

1.22 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

OK

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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
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Based on:

Overshading:	Average or unknown
Windows facing: North	2.2m ²
Ventilation rate:	4.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 13:00:23

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 29.92m²

Site Reference : The Woodley Arms

Plot Reference: Block 1 - Studio 18

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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

36.56 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

17.95 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

53.1 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

45.5 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.14 (max. 0.30)

0.15 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

(no floor)

Roof

0.13 (max. 0.20)

0.13 (max. 0.35)

OK

Openings

1.24 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

OK

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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
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Based on:

Overshading:	Average or unknown
Windows facing: North	1.1m ²
Windows facing: North	0.76m ²
Windows facing: East	1.1m ²
Ventilation rate:	3.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 13:00:12

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 16.88m²

Site Reference : The Woodley Arms

Plot Reference: Block 2 - Studio 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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

54.16 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

26.43 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

66.9 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

62.4 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.15 (max. 0.30)

0.15 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

0.13 (max. 0.25)

0.13 (max. 0.70)

OK

Roof

(no roof)

Openings

1.25 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

OK

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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
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Based on:

Overshading:	Average or unknown
Windows facing: West	1.24m ²
Windows facing: North	2.01m ²
Ventilation rate:	6.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 13:00:03

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 16.73m²

Site Reference : The Woodley Arms

Plot Reference: Block 2 - Studio 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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

52.44 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

25.86 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

59.7 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

55.4 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.15 (max. 0.30)

0.15 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

0.13 (max. 0.25)

0.13 (max. 0.70)

OK

Roof

(no roof)

Openings

1.21 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

OK

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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
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Based on:

Overshading:	Average or unknown
Windows facing: North	2.01m ²
Ventilation rate:	4.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 12:59:54

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 16.54m²

Site Reference : The Woodley Arms

Plot Reference: Block 2 - Studio 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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

55.77 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

26.85 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

69.7 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

60.5 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.14 (max. 0.30)

0.15 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

0.13 (max. 0.25)

0.13 (max. 0.70)

OK

Roof

(no roof)

Openings

1.21 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

OK

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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
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Based on:

Overshading:	Average or unknown
Windows facing: North	2.01m ²
Ventilation rate:	4.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
External Walls U-value	0.13 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 12:59:44

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 16.57m²

Site Reference : The Woodley Arms

Plot Reference: Block 2 - Studio 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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

55.42 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

26.60 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

68.6 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

59.4 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.15 (max. 0.30)

0.15 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

0.13 (max. 0.25)

0.13 (max. 0.70)

OK

Roof

(no roof)

Openings

1.21 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

OK

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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
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Based on:

Overshading:	Average or unknown
Windows facing: East	2.01m ²
Ventilation rate:	4.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 12:59:35

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 16.57m²

Site Reference : The Woodley Arms

Plot Reference: Block 2 - Studio 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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

52.48 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

25.00 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

58.7 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

49.4 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.14 (max. 0.30)

0.15 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

0.13 (max. 0.25)

0.13 (max. 0.70)

OK

Roof

(no roof)

Openings

1.21 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

OK

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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
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Based on:

Overshading:	Average or unknown
Windows facing: East	2.01m ²
Ventilation rate:	4.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 12:59:25

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 16.24m²

Site Reference : The Woodley Arms

Plot Reference: Block 2 - Studio 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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

53.31 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

25.63 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

59.2 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

51.6 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.14 (max. 0.30)

0.15 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

0.13 (max. 0.25)

0.13 (max. 0.70)

OK

Roof

(no roof)

Openings

1.21 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

OK

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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
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Based on:

Overshading:	Average or unknown
Windows facing: East	2.01m ²
Ventilation rate:	4.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 12:59:16

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 17.74m²

Site Reference : The Woodley Arms

Plot Reference: Block 2 - Studio 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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

53.5 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

25.79 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

69.4 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

60.2 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.15 (max. 0.30)

0.15 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

0.13 (max. 0.25)

0.13 (max. 0.70)

OK

Roof

(no roof)

Openings

1.21 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

OK

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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
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Based on:

Overshading:	Average or unknown
Windows facing: East	2.01m ²
Ventilation rate:	4.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
External Walls U-value	0.13 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 12:59:06

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 16.84m²

Site Reference : The Woodley Arms

Plot Reference: Block 2 - Studio 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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

54.84 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

25.81 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

68.1 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

55.3 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.14 (max. 0.30)

0.15 (max. 0.70)

OK

Floor

(no floor)

Roof

(no roof)

Openings

1.20 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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
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Based on:

Overshading:	Average or unknown
Windows facing: West	1.81m ²
Ventilation rate:	4.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
External Walls U-value	0.13 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 12:58:56

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 16.88m²

Site Reference : The Woodley Arms

Plot Reference: Block 2 - Studio 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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

50.94 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

24.69 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

56.0 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

51.4 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.15 (max. 0.30)

0.15 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

(no floor)

Roof

(no roof)

Openings

1.25 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

OK

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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
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Based on:

Overshading:	Average or unknown
Windows facing: West	1.24m ²
Windows facing: North	1.81m ²
Ventilation rate:	6.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 12:58:46

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 16.73m²

Site Reference : The Woodley Arms

Plot Reference: Block 2 - Studio 10

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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER) 47.97 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER) 23.31 kg/m² **OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE) 43.7 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE) 38.9 kWh/m² **OK**

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	OK
Party wall	0.00 (max. 0.20)	-	OK
Floor	(no floor)		
Roof	(no roof)		
Openings	1.20 (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: Community heating schemes - Heat pump

Secondary heating system: None

5 Cylinder insulation

Hot water Storage:	Measured cylinder loss: 1.10 kWh/day	
	Permitted by DBSCG: 1.23 kWh/day	OK
	Primary pipework insulated: (Yes assumed)	

6 Controls

Space heating controls	Charging system linked to use of community heating, programmer and TRVs	OK
Hot water controls:	Cylinderstat	OK

Regulations Compliance Report

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
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Based on:

Overshading:	Average or unknown
Windows facing: North	1.81m ²
Ventilation rate:	4.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 12:58:36

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 16.54m²

Site Reference : The Woodley Arms

Plot Reference: Block 2 - Studio 11

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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

51.1 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

24.48 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

53.4 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

45.2 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.14 (max. 0.30)

0.15 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

(no floor)

Roof

(no roof)

Openings

1.20 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

OK

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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
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Based on:

Overshading:	Average or unknown
Windows facing: North	1.81m ²
Ventilation rate:	4.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
External Walls U-value	0.13 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 12:58:26

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 16.57m²

Site Reference : The Woodley Arms

Plot Reference: Block 2 - Studio 12

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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

51.41 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

24.63 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

55.4 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

50.3 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.15 (max. 0.30)

0.15 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

(no floor)

Roof

(no roof)

Openings

1.27 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

OK

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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
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Based on:

Overshading:	Average or unknown
Windows facing: East	1.81m ²
Windows facing: North	1.92m ²
Ventilation rate:	6.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 12:58:16

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 16.57m²

Site Reference : The Woodley Arms

Plot Reference: Block 2 - Studio 13

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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

48.01 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

23.18 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

42.5 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

37.4 kWh/m²

OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	OK
Party wall	0.00 (max. 0.20)	-	OK
Floor	(no floor)		
Roof	(no roof)		
Openings	1.20 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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
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Based on:

Overshading:	Average or unknown
Windows facing: East	1.81m ²
Ventilation rate:	4.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 12:58:07

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 16.24m²

Site Reference : The Woodley Arms

Plot Reference: Block 2 - Studio 14

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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

81.85 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

38.67 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

151.7 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

131.7 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.14 (max. 0.30)

0.15 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

(no floor)

Roof

0.13 (max. 0.20)

0.13 (max. 0.35)

OK

Openings

1.20 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

OK

Primary pipework insulated: (Yes assumed)

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

OK

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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
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Based on:

Overshading:	Average or unknown
Windows facing: East	1.81m ²
Ventilation rate:	4.00
Blinds/curtains:	None

10 Key features

Thermal bridging	0.018 W/m ² K
Doors U-value	1 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 12:57:57

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 17.74m²

Site Reference : The Woodley Arms

Plot Reference: Block 2 - Studio 15

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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

48.89 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

23.43 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

53.5 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

45.0 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.15 (max. 0.30)

0.15 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

(no floor)

Roof

(no roof)

Openings

1.20 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

OK

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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
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Based on:

Overshading:	Average or unknown
Windows facing: East	1.81m ²
Ventilation rate:	4.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
External Walls U-value	0.13 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 12:57:47

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 21.98m²

Site Reference : The Woodley Arms

Plot Reference: Block 2 - Studio 16

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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

71.22 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

33.44 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

144.6 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

123.2 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.15 (max. 0.30)

0.15 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

(no floor)

Roof

0.13 (max. 0.20)

0.13 (max. 0.35)

OK

Openings

1.21 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

OK

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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	1.04m ²	
Windows facing: South	1.04m ²	
Ventilation rate:	4.00	
Blinds/curtains:	None	

10 Key features

Thermal bridging	0.021 W/m ² K
Doors U-value	1 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 12:57:37

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 30.02m²

Site Reference : The Woodley Arms

Plot Reference: Block 2 - Studio 17

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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

35.36 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

17.51 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

48.3 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

41.0 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.14 (max. 0.30)

0.15 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

(no floor)

Roof

0.13 (max. 0.20)

0.13 (max. 0.35)

OK

Openings

1.20 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

OK

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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
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Based on:

Overshading:	Average or unknown
Windows facing: North	0.76m ²
Windows facing: West	1.1m ²
Ventilation rate:	3.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 12:57:27

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 20.73m²

Site Reference : The Woodley Arms

Plot Reference: Block 2 - Studio 18

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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER) 47.52 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER) 22.03 kg/m² **OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE) 62.6 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE) 45.8 kWh/m² **OK**

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	OK
Party wall	0.00 (max. 0.20)	-	OK
Floor	(no floor)		
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	OK
Openings	1.14 (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: Community heating schemes - Heat pump

Secondary heating system: None

5 Cylinder insulation

Hot water Storage:	Measured cylinder loss: 1.10 kWh/day	
	Permitted by DBSCG: 1.23 kWh/day	OK
	Primary pipework insulated: (Yes assumed)	

6 Controls

Space heating controls	Charging system linked to use of community heating, programmer and TRVs	OK
Hot water controls:	Cylinderstat	OK

Regulations Compliance Report

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):	High	Fail
Based on:		
Overshading:	Average or unknown	
Windows facing: North	1.05m ²	
Ventilation rate:	2.00	
Blinds/curtains:	None	

10 Key features

Doors U-value	1 W/m ² K
External Walls U-value	0.13 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 12:57:18

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 24.73m²

Site Reference : The Woodley Arms

Plot Reference: Block 2 - Studio 19

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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

41.61 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

20.00 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

57.8 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

47.4 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.14 (max. 0.30)

0.15 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

(no floor)

Roof

0.13 (max. 0.20)

0.13 (max. 0.35)

OK

Openings

1.21 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

OK

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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
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Based on:

Overshading:	Average or unknown
Windows facing: North	1.05m ²
Windows facing: East	1.1m ²
Ventilation rate:	3.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.18
Printed on 18 July 2019 at 12:57:09

Project Information:

Assessed By: Su Lee (STRO031315)

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 28.23m²

Site Reference : The Woodley Arms

Plot Reference: Block 2 - Studio 20

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: Electricity (c)

Fuel factor: 1.55 (electricity (c))

Target Carbon Dioxide Emission Rate (TER)

39.38 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

18.95 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

58.4 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

47.7 kWh/m²

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.14 (max. 0.30)

0.15 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

(no floor)

Roof

0.13 (max. 0.20)

0.13 (max. 0.35)

OK

Openings

1.22 (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:

Community heating schemes - Heat pump

Secondary heating system:

None

5 Cylinder insulation

Hot water Storage:

Measured cylinder loss: 1.10 kWh/day

Permitted by DBSCG: 1.23 kWh/day

Primary pipework insulated: (Yes assumed)

OK

6 Controls

Space heating controls

Charging system linked to use of community heating, programmer and TRVs

OK

Hot water controls:

Cylinderstat

OK

Regulations Compliance Report

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
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Based on:

Overshading:	Average or unknown
Windows facing: South	1.1m ²
Windows facing: East	1.1m ²
Ventilation rate:	3.00
Blinds/curtains:	None

10 Key features

Doors U-value	1 W/m ² K
External Walls U-value	0.13 W/m ² K
Party Walls U-value	0 W/m ² K
Community heating, heat from electric heat pump	

Block Compliance WorkSheet: The Woodley Arms

User Details

Assessor Name: Su Lee
Software Name: Stroma FSAP
Stroma Number: STRO031315
Software Version: Version: 1.0.4.18

Calculation Details

Dwelling	DER	TER	DFEE	TFEE	TFA
Block 1 - Studio 1	27.3	58.26	67.8	82.5	17.3
Block 1 - Studio 2	25.72	52.09	69.8	73	19.11
Block 1 - Studio 3	25.77	52.09	52.6	56.1	16.43
Block 1 - Studio 4	26.46	53.63	58.1	61.1	16.31
Block 1 - Studio 5	25.74	52.02	52.6	56	16.46
Block 1 - Studio 6	27.25	55.08	73	74.9	17.66
Block 1 - Studio 7	26.36	55.58	55	67.5	16.54
Block 1 - Studio 8	25.09	53.45	54.1	66.6	17.3
Block 1 - Studio 9	23.59	47.76	56.9	58.7	19.11
Block 1 - Studio 10	23.21	47.78	36.6	40.8	16.44
Block 1 - Studio 11	23.89	49.23	42.1	45.7	16.31
Block 1 - Studio 12	23.18	47.73	36.6	40.8	16.46
Block 1 - Studio 13	25.09	50.67	59.8	60.3	17.66
Block 1 - Studio 14	21.39	44.47	47.5	57.4	21.73
Block 1 - Studio 15	20.24	43.03	47.8	58.7	23.17
Block 1 - Studio 16	18.35	37.68	41.8	49.5	26.42
Block 1 - Studio 17	22.09	45.37	47.3	54.4	20.11
Block 1 - Studio 18	17.95	36.56	45.5	53.1	29.92
Block 2 - Studio 1	26.43	54.16	62.4	66.9	16.88
Block 2 - Studio 2	25.86	52.44	55.4	59.7	16.73
Block 2 - Studio 3	26.85	55.77	60.5	69.7	16.54
Block 2 - Studio 4	26.6	55.42	59.4	68.6	16.57
Block 2 - Studio 5	25	52.48	49.4	58.7	16.57
Block 2 - Studio 6	25.63	53.31	51.6	59.2	16.24
Block 2 - Studio 7	25.79	53.5	60.2	69.4	17.74
Block 2 - Studio 8	25.81	54.84	55.3	68.1	16.84

Block Compliance WorkSheet: The Woodley ArmsCont...

Dwelling	DER	TER	DFEE	TFEE	TFA
Block 2 - Studio 9	24.69	50.94	51.4	56	16.88
Block 2 - Studio 10	23.31	47.97	38.9	43.7	16.73
Block 2 - Studio 11	24.48	51.1	45.2	53.4	16.54
Block 2 - Studio 12	24.63	51.41	50.3	55.4	16.57
Block 2 - Studio 13	23.18	48.01	37.4	42.5	16.57
Block 2 - Studio 14	38.67	81.85	131.7	151.7	16.24
Block 2 - Studio 15	23.43	48.89	45	53.5	17.74
Block 2 - Studio 16	33.44	71.22	123.2	144.6	21.98
Block 2 - Studio 17	17.51	35.36	41	48.3	30.02
Block 2 - Studio 18	22.03	47.52	45.8	62.6	20.73
Block 2 - Studio 19	20	41.61	47.4	57.8	24.73
Block 2 - Studio 20	18.95	39.38	47.7	58.4	28.23

Calculation Summary

Total Floor Area	721.51
Average TER	49.75
Average DER	24.01
Average DFEE	54.88
Average TFEE	63.00
Compliance	Pass
% Improvement DER TER	51.74
% Improvement DFEE TFEE	12.89