

Queen Victoria Street

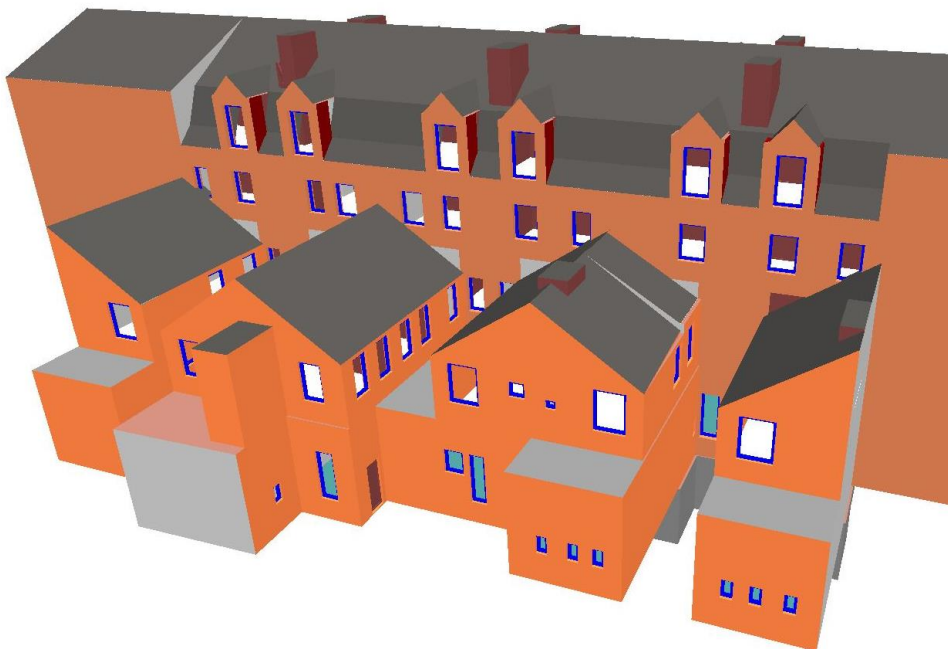
IDREAM Reading LTD, British Virgin Islands

Energy (SAP) Analysis Report

C1 APPLICATION ISSUE

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Energy (SAP) Analysis Report

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ISSUE SUMMARY AND SIGN OFF

REV	DATE	DESCRIPTION	SIGN OFF
1.0	21/03/2017	Draft Issue	GB/MH
2.0	31/03/2017	Planning Application Issue	GB/MH
3.0	13/07/2018	C1 Application issue	GB
4.0	20/07/2018	Update including architects comments	GB

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Energy (SAP) Analysis Report

1 SUMMARY

This report outlines the sustainability strategy for the proposed Queen Victoria Street development containing 19 serviced apartments (use class C1), in line with the requirements set out by the Reading's Council. It describes the measures that have been adopted to achieve the carbon reduction required from Reading's Council, as defined in the next paragraph.

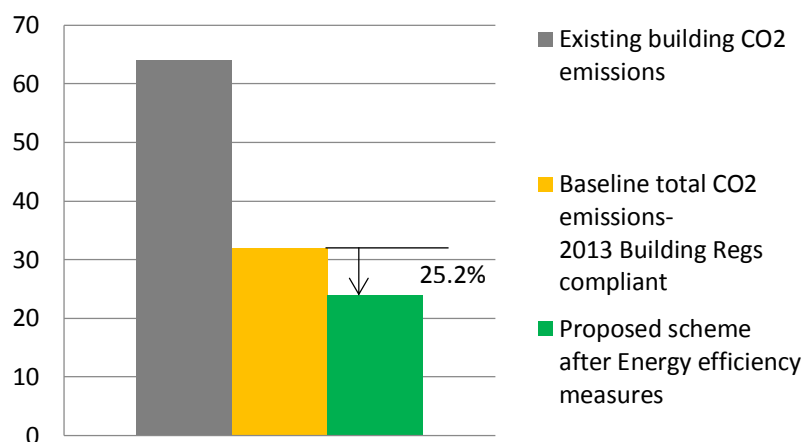
The analysis has been undertaken using SAP (Standard Assessment Procedure) in accordance with Building Regulations Part L1B 'Conservation of fuel and power in existing dwelling' to demonstrate compliant conditions and it sets out Reading Council's approach.

The following table summarizes the results of the SAP calculation and highlights a 25% CO₂ reduction compared with the Notional Part L 2013 compliant baseline.

EMISSIONS SUMMARY

	CO ₂ EMISSIONS (KgCO ₂ /yr)	CO ₂ EMISSION SAVINGS (%)
2013 PART L1B COMPLIANT BASELINE SCHEME / NOTIONAL BUILDING	31,960	
PROPOSED SCHEME AFTER ENERGY EFFICIENCY MEASURES	23,910	
TOTAL SAVINGS AGAINST BASELINE	8,050	25.2

CO₂ savings relative to 2013 Baseline



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2 INTRODUCTION

This report shows the Energy analysis of the new development for Queen Victoria Street in Reading. The proposal consists of the internal change of use from office to apart-hotel (use class C1). No. 19 units will be designed from the 1st to 3rd floor of the historical building at 17-27 Queen Victoria Street.

The development of the existing building presents an opportunity to add value and reduce the carbon emissions through improvement energy efficient design. The energy study has been conducted in accordance with Reading Core Strategy without affecting the character of the listed building and keeping to a minimum the impact on the whole building.

The energy demands of the refurbished building were calculated using SAP adopted by the UK government as part of the national methodology for demonstrating compliance with building regulations and for providing energy ratings for dwellings.



FIGURE 1: GOOGLE EARTH VIEW

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3 PROJECT DESCRIPTION

The project consists of the conversion of the interior plans of the buildings from commercial to serviced apartment units. It is proposed to retain the existing historical building while amending the internal plan of the upper floors. The new development includes 19 units that will be located from the first to the third floor. This energy study does not include the ground floor and neither the common stairwells.

The SAP assessment has been carried for all the dwellings of the development. The following pictures shown all the unit types identified for each floor. The units highlighted with the same colour have been modelled as 'identical units' because they have been identified having the same internal floor area, window area and orientation.

Please note that the plans might still change following any comments from the Council.



FIGURE 2: FIRST FLOOR

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INTRODUCTION

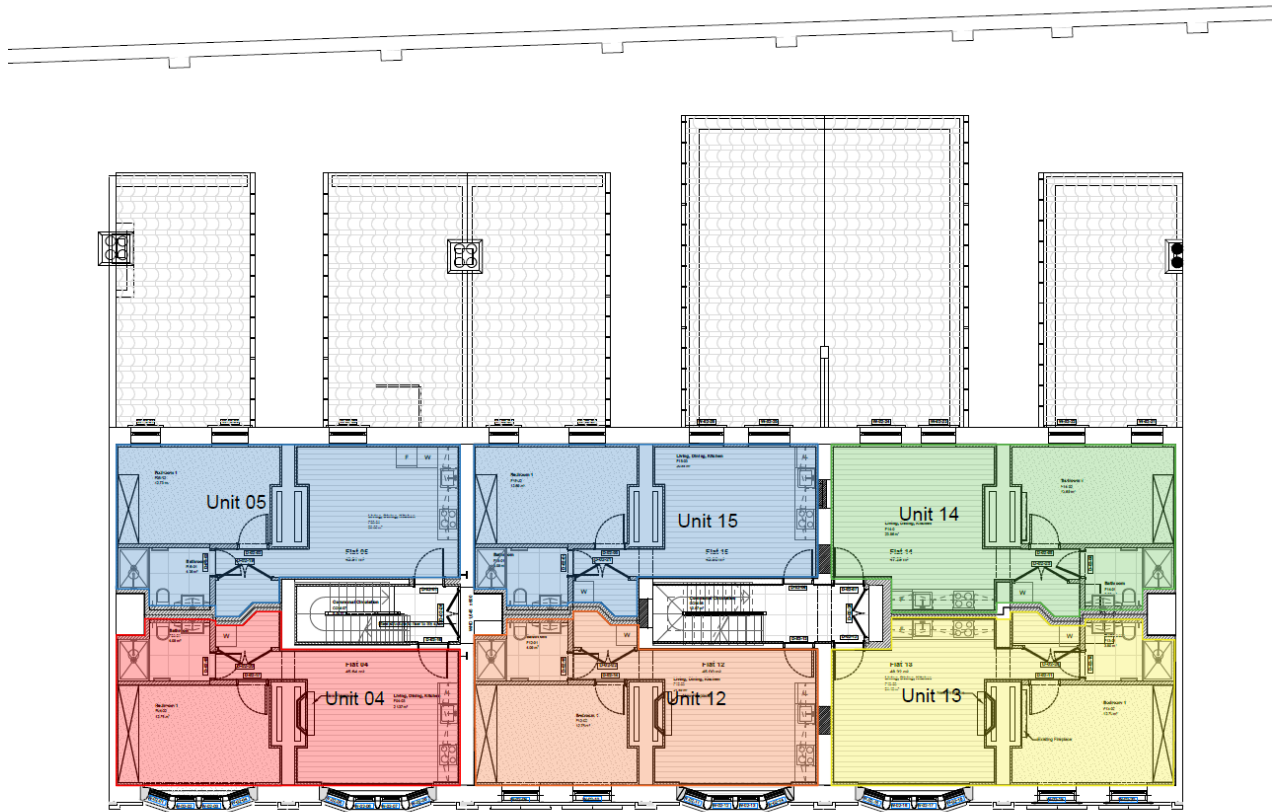


FIGURE 3: SECOND FLOOR

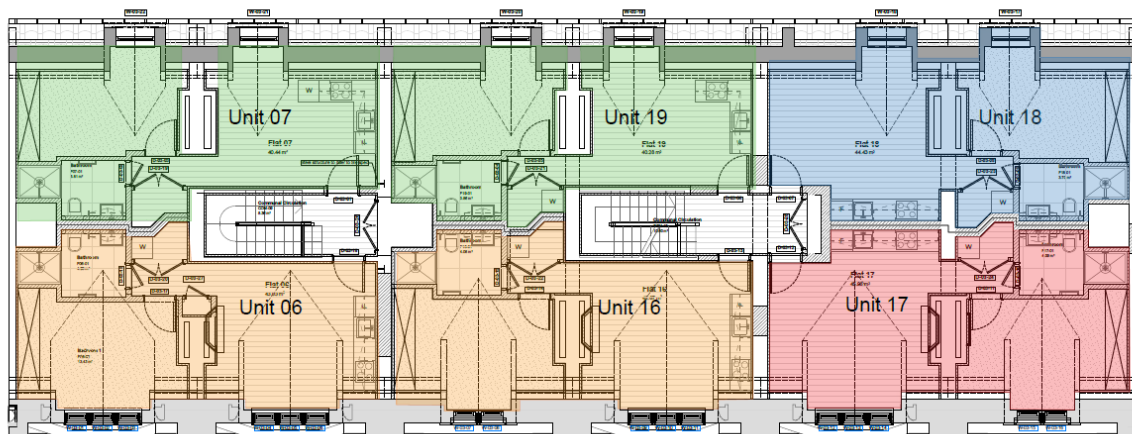


FIGURE 4: THIRD FLOOR

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4 POLICY CONTEXT

SUSTAINABILITY POLICY

The Council is no longer using EcoHomes and it is in the process of updating its sustainability policies to reflect this. The requirements on the Core Strategy have been superseded by changes in National Regulations but the process has not been finalized yet. For that reason the Energy analysis of this building refers to Reading Borough Council's officers advice.

Under the RBC advices, the energy study reflects the following requirements:

'At least 50% of the development shall demonstrate that is achieved a 19% reduction in carbon emissions over and above the minimum requirements of Part L of the Building Regulations 2013 OR 9.5% for the whole development'.

This requirement may be achieved through energy efficient design measures, a form of decentralised energy provision or the use of renewable energies, or a combination of these measures. There are no specific requirements to incorporate renewables if the necessary improvement is achieved in other ways.

APPLICATION OF PART L TO HISTORIC BUILDINGS

The building is a listed building subjected to a 'Material change of use'.

Paragraph 3.8 in Approved Documents L1B lists three classes of buildings where special considerations apply when making reasonable provision for the conservation of fuel or power:

Historic and traditional buildings where special considerations may apply

3.8 There are three further classes of buildings where special considerations in making reasonable provision for the conservation of fuel or power may apply:

- a. buildings which are of architectural and historical interest and which are referred to as a material consideration in a local authority's development plan or local development framework;
- b. buildings which are of architectural and historical interest within national parks, areas of outstanding natural beauty, registered historic parks and gardens, registered battlefields, the curtilages of scheduled ancient monuments, and world heritage sites;
- c. buildings of traditional construction with permeable fabric that both absorbs and readily allows the evaporation of moisture.

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When a building is to be subjected to a 'change of use', that triggers the need to comply with Part L. Please find an extract from the Historic England Guide which all the historic buildings should refer to:

'EXEMPTIONS' AND 'SPECIAL CONSIDERATIONS'

Buildings which are 'exempt' from the energy efficiency requirements are clearly defined in the Regulations, as is the extent to which their conditional exemption actually applies.

For these buildings the exemption applies only to the extent that compliance with the energy efficiency requirements would unacceptably alter their character or appearance.

It should be noted from the above statement that this exemption is **not unconditional**. The regulations therefore require that these buildings should be upgraded in accordance with the energy efficiency requirements set out in Approved Documents L1B and L2B up to, but not necessarily beyond, the point at which the relevant alterations would become unacceptable.

The definition of this point requires an understanding of what qualities of character and appearance are significant in each case, as well as an effective assessment of the degree to which alterations to these qualities will be unacceptable.

For all the above and below designations, where consent is required, the local authority is required to assess proposals for any impacts on the significance of the heritage asset using the criteria set out in *Planning Policy Statement 5, Planning for the Historic Environment*.

The aim of the proposed new development is to improve energy efficiency as far as is reasonably practicable. The work will not prejudice the character of the building and it will support the conservation of the building historical asset protecting the natural environment.

The character and integrity of listed buildings will be preserved, seeking to enhance the settings of Listed Buildings wherever appropriate.

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5 ENERGY STRATEGY

The project has been assessed as a Refurbishment Change of use and the Carbon Emission Reduction has been set against the minimum values for fabric improvements identified under the requirements of Building Regulations Part L1B: Conservation of fuel and power in existing dwellings.

The SAP analysis has been carried out including condensing gas-fired boilers using a cascade flue system have been allowed to provide heating and hot water per each unit. The following paragraph summarises the strategy which has been used for this energy assessment.

BUILDING FABRIC

The first stage of reducing the overall carbon and energy consumption of the building is to reduce the demand in the first instance. By minimising the heat losses through the fabric during the winter period the overall energy required to heat the building will be reduced.

The thermal elements performance used for the SAP analysis is highlighted in the table below.

ELEMENT	DESCRIPTION	MINIMUM U VALUE FOR RETAINED ELEMENTS (W/m ² K)	PROPOSED U VALUE (W/m ² K)
EXTERNAL WALL	400mm Brick wall + insulated plasterboard	0.30	0.23
EXTERNAL WALL	200mm Brick wall + insulated plasterboard	0.30	0.24
FLOOR (TO HEATED SPACE)	Floating floor on existing timber floor	n/a	n/a
ROOF	Pitched roof - insulated ceiling	0.18	0.27 ¹
WINDOWS/ROOF-LIGHTS	Double glazing	1.6	1.6
	Secondary glazing	-	2.4

Air permeability has been assumed as 15 m³/m²/hr@50Pa ².

¹ The U-value for the roof is worse than the minimum threshold value because the insulation has been included in the internal ceiling. That has been allowed because the total CO₂ reduction across the whole building is still higher than the required carbon reduction for the development.

² Under SAP convention Guide, if a pressure test will not be carried out a default value of 15m³/h/m²@50Pa is assumed.

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The following build-ups have been allowed for the external brickwalls:

- External 400mm brickwall + 62.5mm insulated plasterboard Kooltherm K118

Layers							485 mm
Layer	Description	Thickness	Conductivity	Resistance	Bridging	Density	Sp
Ext surface	Horizontal heat flow direction			0.0400			
Layer 1	Brick, outer leaf	400 mm	0.7700	0.5195			
Layer 2	airspace/timber battens	22 mm	0.1222	0.1800	10.37 % Timber		
Layer 3	Kooltherm K118 - Insulated plasterboa	62.5 mm	0.0175	3.5714		161.3 kg/m ³	
Int surface	Horizontal heat flow direction			0.1300			

- External 200mm brickwall + 62.5mm insulated plasterboard Kooltherm K118

Layers							285 mm
Layer	Description	Thickness	Conductivity	Resistance	Bridging	Density	Specif
Ext surface	Horizontal heat flow direction			0.0400			
Layer 1	Brick, outer leaf	200 mm	0.7700	0.2597			
Layer 2	airspace/timber battens	22 mm	0.1222	0.1800	10.37 % Timber		
Layer 3	Kooltherm K118 - Insulated plasterboa	62.5 mm	0.0175	3.5714		161.3 kg/m ³	
Int surface	Horizontal heat flow direction			0.1300			

HEATING AND CONTROLS

The current heating space is provided by electric heaters in all rooms.

Within the design proposal Heating and Hot Water are provided by gas condensing combi-boiler per each unit. The models that have been selected for the project at this stage are:

- Mydens 2P Combi Boiler (in 1 bedroom units)
- Mydens 24 B System Boiler (for 2 bedrooms units) with Gemtex GTX150 water tank

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VENTILATION

A natural ventilation strategy has been proposed, together with a Mechanical Ventilation Heat Recovery system to provide fresh air. At this stage Itho Ventilation-Advance MVHR has been selected for each unit.



Advance.

LIGHTING

Lighting fittings have been assumed to be replaced and high efficiency lighting has been used as the design standard. A number of 20 luminaires have been assumed in each unit so far.



Please refer to 'Mechanical & Electrical Technical specification' document and drawings for more details.

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6 RESULTS

SAP software has been used to assess the proposal for Queen Victoria new development under Building Regulation Part L1B 2013.

The energy model of the proposed building has been create and compared with the Notional dwelling (a building modelled with the same dimensions and orientation of the actual building which meets the regulation minimum requirements for thermal elements, controlled fittings and controlled services).

All of the information provided within above chapter shows a compliant case for this building under Building Regulation Part L1B 2013. The new development achieves an Average 25% CO₂ reduction above the Notional building which meets the Council's Planning requirements.

	ENERGY DEMAND (kWh/yr)	ENERGY CONSUMPTION SAVINGS (%)	CO ₂ EMISSIONS (Kg/yr)	CO ₂ EMISSION SAVINGS (%)
2013 PART L1B COMPLIANT BASELINE SCHEME/NOTIONAL BUILDING	127,801		31,960.0	
PROPOSED SCHEME AFTER ENERGY EFFICIENCY MEASURES	108,363		23,910.00	
PROPOSED SCHEME AFTER RENEWABLE SAVINGS			N/A	
TOTAL SAVINGS (AGAINST BASELINE)	19,438	15.2	8,050	25.2