



**Residential Development
Red Cow PH
50 Crown Street
Reading
RG1 2SE**

**Planning Application No. 172255
Condition 16 – Sustainability Measures**

August 2018

This Sustainability Statement has been prepared by JSA Energy on behalf of their clients to support a planning application for 3 newly created flats on the first floor of 50 Crown Street, Reading, RG1 2SE.

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1. Executive Summary

This Sustainability Statement is to address Condition 16 of the planning consent granted on 19 July 2018, application No. 172255. The application for the change of use from public house (Class A4) to restaurant (Class A3) on the ground floor and creation of 3no. one bedroom self-contained residential flats on the first floor of 50 Crown Street, Reading.

As part of its Local Development Framework Reading Borough Council adopted the Core Strategy in 2008 with alterations adopted in January 2015. It contains a number of Policies relating to the sustainability of new dwellings and these are supplemented by the Sites and Detailed Policies Document adopted in 2012, again with alterations in January 2015. In addition, a Revised Sustainable Design and Construction Supplementary Planning Document was adopted in July 2011 and whilst some of the policies in this have since been superseded by central government policy, most notably the withdrawal of the Code for Sustainable Homes, it still sets the framework for the sustainability assessment of new residential development.

This Sustainability Statement addresses all of the relevant policies with regard to sustainability that are relevant to the proposed development and demonstrates how overall, the development fully meets all of the existing applicable policy requirements. It is contended that the planning condition has therefore been satisfied.

2. Introduction

This report is for submission to address the planning condition and is intended to demonstrate that environmental sustainability has been considered and fully addressed in accordance with planning policy.

The planning application 172255 is for the change of use from public house (Class A4) to restaurant (Class A3) on the ground floor and creation of 3no. one bedroom self-contained residential flats on the first floor..

3. Policy Context

The National Planning Policy Framework (NPPF) sets a presumption in favour of sustainable development (paragraph 14). This includes an environmental dimension aimed at “helping to improve biodiversity, use natural resources prudently, minimise waste and pollution, and mitigate and adapt to climate change including moving to a low carbon economy”. It sets out the 12 core planning principles (paragraph 17.) that underpin the setting of local plans and decision-taking; in particular it addresses the issue of meeting the challenge of climate change and flooding (paragraphs 99-104).

Reading Borough Council adopted its Core Strategy in 2008 and updated it in 2015. It sets out the Council's adopted planning strategy and provides a framework for sustainable development criteria which development proposals must accord with. With regard to the development this application relates to, the principle policies that apply with regard to sustainability are Policy CS1 (*Sustainable Construction and Design*) as well CS2 (*Waste Minimisation*), CS5 (*Inclusive Access*), CS23 (*Sustainable Travel and Travel Plans*), CS34 (*Pollution and Water Resources*), CS35 (*Flooding*) and CS36 (*Biodiversity and Geology*). The requirements to achieve compliance with these policies is set out in the Site and Detailed Policies Document (2012 & 2015) as well as various Supplementary Planning Documents (SPDs). These contain a number of policies which relate to sustainable development and are referred to in more detail throughout this report.

It is noted that since the adoption of the Council's Core Strategy the Code for Sustainable Homes has been wound down by the government and no longer applies to new planning submissions or consents. As a result, the Sustainable Design and Construction Checklist referred to in Appendix 5 of the Revised Sustainable

Design and Construction SPD (2011) is no longer applicable, however, the categories it listed are used to guide the overall structure of this report.

In addition, reference is also made to the Sites and Detailed policies SPD (2012, updated 2015) and the Parking Standards and Design SPD (2011).

4. Energy Efficiency and Climate Change.

Applicable policies: CS1: Sustainable Construction and Design, DM1: Adaptation to Climate Change, DM2 Decentralised Energy.

Policy CS1 states that:

- *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 incorporate on-site generation of energy from renewable sources and energy efficient design measures (including the use of CHP where appropriate) to off-set at least 20% of predicted carbon dioxide emissions from the estimated energy usage of the completed and occupied development;*

Development Management Policy DM1, emphasises the importance of consideration being given to measures that will mitigate the future impact of climate change, including orientation, shading etc. all of which are addressed. Policy DM2 requires that any development of more than 20 dwellings considers the inclusion of a CHP plant, biomass fuelled heating scheme or other form of decentralised heating provision. In addition, the feasibility of linking to an existing or future decentralised energy network should also be evaluated.

The site is currently occupied by the Red Cow Public House at the corner of Southampton Street and Crown Street. The proposed development consists of the conversion of the first floor space to create 3no. one bedroom flats. As such the dwellings are not subject to Building Regulations Approved Document L1A for new dwellings but AD L1B for existing dwellings.

4.1 Climate Change

The basic principle followed for the design of the development is to reduce the energy demand of the dwellings by means of a 'fabric first' approach. This means that heat loss elements such as walls and roofs exceed the minimum performance requirements of Building Regulations Approved Document Part L1B 2013.

Although passive solar gain can be a significant advantage by reducing energy demand, the constraints imposed by the site and location in terms of orientation and design limit the opportunities for solar gain with some units able to benefit far more than others. In contrast, excessive solar gain during the summer months can lead to potential issues with overheating. Windows are fixed by the size and location of the existing building and are currently single glazed. Whilst double glazed units can be installed in the area of new construction, the existing windows can only be secondary glazed as the building is listed.

Normally, the ability to purge ventilate by opening windows, combined with appropriate window coverings will enable residents to reduce the risk of overheating using natural ventilation only. However, because of potential noise issues due to the proximity to Crown Street and Southampton Street (see Section 12). The ventilation strategy will be based on the use of Mechanical Ventilation and Heat Recovery units in each flat. These will ensure adequate ventilation throughout the year combined with

high levels of energy efficiency to reduce heating demand. The use of a summer bypass mechanism in the MVHR units will enable high levels of ventilation in the summer without the need to open windows and therefore reduce the risk of potential summer over-heating.

4.2 Carbon dioxide emissions reduction

This Energy Assessment takes a standard hierarchical approach as follows:

1. **Baseline.**

A calculation of baseline energy demand, demonstrating the projected annual heating, cooling and electricity demand of the development. The assessment shows the carbon dioxide emissions resulting from the predicted energy use.

2. **Energy Efficiency (Lean).**

An explanation of how the total energy demand and carbon dioxide emissions will be reduced relative to the baseline energy demand through further improvements to building energy efficiency standards; recalculation of total energy demand and associated carbon dioxide emissions.

3. **Decentralised Energy - CHP/CCHP (Clean).**

Proposals for the reduction of energy demand and carbon dioxide emissions from heating, cooling and electrical power, including the feasibility of Combined Heat and Power / Combined Cooling, Heating, and Power systems, and community heating systems;

4. **Renewable Energy (Green).**

Details of any renewable energy technologies to be incorporated in the development, demonstrating how much carbon dioxide emissions from expected energy use will be reduced through on-site renewable energy generation;

The space heating, hot water, pumps, fans and lighting energy requirements were calculated using the detailed Bredem-12 method developed by the Building Research Establishment and used in the SAP 2012 calculation, and referenced in the latest version (2013) of the Building Regulations Approved Document L1B.

The starting point was to determine the performance of the “baseline” for the dwellings using the levels of insulation performance and building services equipment consistent with the dwelling achieving compliance with Approved Document L1B: 2013. The specific energy consumption figures for space heating, hot water and lighting were then extracted.

The calculations were then repeated using improved U-values or other measures proposed for the scheme by the applicant and other possible improvements to building services..

4.3 Energy demand and efficiency (Baseline)

The total baseline energy demand has been calculated taking full account of energy demands for space heating and hot water, and electricity for pumps, fans and lights. The baseline was determined by using

the orientation and make-up of building elements (walls, windows etc.) with U-values and other values consistent with achieving compliance with Approved Document Part L1B: 2013.

The specific energy consumption figures for all the new dwellings were then extracted from the SAP 2012 software, Table 1.

Table 1. Baseline energy demand and associated CO₂ emissions, L1B 2013 compliance

Energy use	Energy (kWh/yr)	CO ₂ emission (kg/yr)
Primary space heating	10,612	5,508
Secondary space heating	0.0	0.0
Water heating	2,565	1,331
Pumps, fans etc.	606	315
Lighting	542	281
Total	14,325	7,435

4.4 Energy efficiency measures (Lean)

The improvements to the dwelling fabric and services that have been included are better U-values for the floor, roof insulated at the flat ceiling level and new wall to flat 1. In addition the efficiency of the MVHR ventilation system was significantly improved. Overall these changes resulted in a 5.1% reduction in energy demand and associated carbon dioxide emissions, Table 2.

Table 2. Lean case energy demand and associated CO₂ emissions

Energy use	Energy (kWh/yr)		CO ₂ emission (kg/yr)		
	Baseline	Lean	Baseline	Lean	Reduction
Primary space heating		10,197		5,292	
Water heating		2,565		1,331	
Pumps, fans etc.		294		152	
Lighting		542		281	
Total	14,325	13,598	7,435	7,057	5.1

4.5 Decentralised Energy (Clean)

Although the feasibility of Combined Heat and Power / Combined Cooling, Heating, and Power (CHP/CCHP) systems was considered, the nature of the development precludes the use of such technology. Such systems are better suited to those developments that have a constant heat demand such as residential care homes, leisure centres, hotels or mixed use developments. It is less suited to

exclusively residential developments or smaller developments (<100 dwellings) which is the subject of this planning application.

Consideration has also been given to the feasibility of connecting to an existing or planned district heating network, however no local or district heat network currently exists in the locality of the development.

4.6 Renewable Energy (Green)

Renewable energy sources are those defined by EU Directive 2009/28/EC and include, wind, solar, aerothermal, geothermal, hydrothermal and ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases. All possible domestic renewable energy technologies were evaluated in relation to the site. All technologies were excluded because of the nature of the site in terms of the type of development, location and the fact that the building is listed, as described in Table 3.

Table 3. Feasibility of Renewable Energy

Technology	Criteria	Assessment	Overall suitability
Biofuels	Year-round heat demand Established supply chain Sufficient space for delivery of fuel Sufficient space for storage of fuel Sufficient space for boiler and auxiliary equipment Can the flue be designed to meet planning authority requirements	Development is residential with seasonal and daily variations in heat demand. Limited space on site for location of plant room and storage of fuel. Fuel delivery issues re. traffic movements to and from site. Biomass has relatively high NOx emissions which is a significant consideration in the local area.	Not suitable
Ground Source Heat Pump	Sufficient space for horizontal coil or separation of multiple boreholes Ground suitable for vertical drilling and avoidance of obstacles Sufficient space for GSHP and auxiliary equipment	Closed loop indirect borehole system possible but insufficient space for horizontal coil. Unknown soil and geological conditions, particularly sub-surface infra-structure.	Not suitable
Air Source Heat Pump	Sufficient space for ASHP and auxiliary equipment Sufficient distance between installation and neighbours to avoid noise disturbance	Does not reduce carbon dioxide emissions adequately compared with gas. Potential noise and vibration issues. Limited space for water cylinder.	Not suitable
Hydroelectricity	Nearby watercourse with sufficient head Permission available for access to watercourse Climate change modelling confirms longevity of watercourse (25 yrs)	No suitable water course nearby.	Not suitable
Solar PV	Suitable roof orientation, lack of shading Sufficient roof space	Suitable roof pitch and orientation. Space on main roof of both buildings No shading. Building is listed	Partially suitable

Technology	Criteria	Assessment	Overall suitability
Solar thermal	Suitable roof orientation, lack of shading. Sufficient roof space. Year-round hot water demand. Compatibility with proposed heating system. Sufficient space for communal or individual hot water storage	Suitable roof pitch and orientation. Space on main roof of both buildings No shading. Building is listed Insufficient space for water cylinders in flats.	Not suitable
Wind turbines	Sufficient wind speed. Area free from obstructions / causes of turbulence. Sufficient open space for installation. Sufficient distance between installation and neighbours to avoid noise disturbance	High density urban location with insufficient wind speed. Potential noise and vibration issues.	Not suitable

The most suitable renewable energy option is the installation of a Photovoltaic (PV) system for the generation of electricity. Although feasible it is unlikely planning consent would be granted because of the prominent position of the site and the fact that the building has Grade 2 listing. Therefore no further consideration has been given to renewable technology.

4.7 Summary

The foregoing projected results show that this development proposal meets the applicable planning policies that relate to the energy efficiency and the reduction of carbon dioxide emissions, as a result of fabric improvements but excludes the use of renewable technology. The baseline annual energy demand and associated carbon dioxide emissions for the proposed development are 14,325 kWh and 7.43 tonnes respectively. As a consequence of the improvement to the standard of the building fabric and services only a reduction in CO₂ emissions, of 5.1%, equivalent to 0.38 tonnes, Table 4.

Table 4. Carbon dioxide reduction at each stage of the energy hierarchy

	Regulated carbon dioxide savings	
	t CO ₂ / yr	%
Savings from energy demand reduction	0.378	5.1
Savings from heat network / CHP	0.0	0.0
Savings from renewable energy	0.0	0.0
Cumulative on site savings	0.378	5.1

5. Water Resource Management

Applicable policies: CS1: Sustainable Construction and Design.

The dwellings will comply with Building Regulations Approved Document G (2015) and so meet the requirement to restrict indoor water usage to less than 120 Litres/person/day. This will be achieved by the use of low capacity and flow rate fittings as detailed below:

Fitting	Flow rate / capacity
Basin taps	Max. 4 L/min
Kitchen taps	Max. 6 L/min
WCs	Dual flush 6L / 3L
Baths	Max 210 L capacity
Showers	Max. 11 L/min
Washing machine	Max. 8.17 L/kg dry load (default value)
Dishwasher	Max. 1.25 L/place setting (default value)
No water softener or waste disposal unit	

The development will not incorporate rainwater harvesting or greywater collection and reuse for internal water usage, as the required levels of water usage can be achieved by the installation of low water use fittings as described above.

6. Materials

Applicable policies: CS1: Sustainable Construction and Design.

Where possible, materials will be sourced locally therefore minimising the distance materials will need to travel by road. However, in the context of sustainability and minimising the environmental impact of materials over the lifetime of the building, priority will be given to sourcing materials that have the highest rating in the BRE Green Guide to Specification www.bre.co.uk/greenguide. Priority will be given to the reuse of materials, then preference given to the use of recycled materials before the use of virgin material is accepted.

At least 75% of all timber used on site will be certified as coming from sustainable sources (FSC, PEFC or similar) and all timber will be legally sourced.

Choice of external finishes is subject to planning condition 3. Roof tiles will be wholly reclaimed from existing roof.

7. Sustainable Drainage

Applicable policies: CS34: Pollution and Water Resources, DM1 Adaptation to Climate Change.

As the impermeable area of the overall development site will not increase there will be no change in the surface-water run-off peak rate or volume. Surface water will continue to be dealt with in the same manner as prior to development.

8. Flood Risk Management

Applicable policies: CS35: Flooding, DM1 Adaptation to Climate Change.

According to the Environment Agency flood risk map (<https://flood-map-for-planning.service.gov.uk/>) the development is sited in Flood Risk Zone 1- *low annual probability of flooding*. There are no indications of risk to the development from other sources of flooding e.g. pluvial or surface water run-off. As the development plot is less than 1 hectare and not in an area of known historic flooding, a full Flood Risk Assessment is not required.



The development will not increase the potential for flooding elsewhere as there is no change to the surface-water run-off, Section 7.

9. Waste, Recycling and Composting Facilities.

Applicable policies: CS2: Waste Minimisation. Planning Condition: 8.

There is no longer a legal requirement for construction projects to implement a Site Waste Management Plan but it is in the interest of developers to minimise waste to landfill in order to reduce disposal costs. In addition, the number of material types that can be sent to landfill continues to reduce e.g. gypsum products, requiring an increasing focus on waste minimisation, reuse and recycling. A significant portion of the materials in the existing fabric will continue to be reused in situ. During construction, waste will be sorted and removed by authorised waste handlers with the emphasis on diverting waste from landfill and maximising the amount of waste that goes for re-use or recycling.

The total size of the waste and recycling containers will meet the requirements of BS 5906:2005 (100 Litres per property plus 70 Litres per each additional bedspace) as well as the requirements of Reading Borough Council detailed in Appendix 1 of the Guidelines, 2016 irrespective of whether collection takes place weekly or fortnightly.

		Volume required: L / dwelling	
No. bedrooms	No. dwellings	BS 5906:2005	Council requirement
1	3	100	10 flats per 1100L on a weekly collection. 5 flats per 1100L bin on a fortnightly collection
Total volume required		300 L	330L for weekly collection, 660L fortnightly collection

The development design includes provision for the storage of domestic waste and recycling containers in the south east corner of the site as shown on drawing WD-205D and is sufficient for 3no. 240L bins, a total of 720 Litres. The storage area is designed to comply with the requirements of the Reading Borough Council Guidelines 2016 in terms of access, layout and spacing as well as separation from commercial waste.

Internally the dwellings will each be provided with a waste bin with two compartments for general refuse and recycling. A kitchen waste disposal unit will not be installed as these increase internal water usage.

10. Cycle Parking.

Applicable policies: CS24: Car / Cycle Parking. Planning Condition: 7.

The number of spaces provided is in accordance with Reading Borough Council Revised Parking Standards and design SPD, 2011. This specifies that each 1/2 bed flat should be provided with 0.5 cycle parking spaces. The proposed development contains 3no. one bed flats requiring a total of 1.5 cycle parking spaces. A total of 4 cycle parking spaces will be provided in the south east corner of the site as shown on drawing WD-205D. The cycle parking will also meet the standards set out in the SPD in terms of security and access.

11. Sustainable Transport

Applicable policies: CS24: Car/ Cycle Parking, DM12: Access, Traffic and Highway-Related Matters. Planning Condition: 7.

Provision will be made for the secure storage of 4 cycles as shown on drawing WD-205D. The location of the storage allows direct access to the highway, not through the dwellings. The development site has access to local buses within 250m of the development site and is within walking distance of Reading mainline railway station.

12. Pollution.

Applicable policies: CS34: Pollution and Water Resources, DM19: Air Quality. Planning Conditions: 12 & 15.

External lighting will make use of energy efficient fittings and have appropriate controls (PIR, timers and daylight sensors) to minimise light pollution. Air pollution from vehicles driven by occupants of the dwellings will be reduced by the provision of on-site cycle storage and the proximity to public transport as previously stated.

As the development lies within the central Reading Air Quality Management Area local NO_x emissions will be zero as a result of using mains electricity for space heating and hot water. This will ensure that the development site does not further contribute to NO_x levels in the area, the primary source of which is road traffic.

To reduce resident exposure to external airborne pollutants all the flats will be ventilated using Mechanical Ventilation with Heat Recovery (MVHR). This will remove the need for trickle vents in windows and ensure that all air provided to the flats is pre-filtered.

The proximity to highways means that noise is a potential issue. A key mitigation feature is that the ventilation is provided by MVHR with a summer bypass feature. This removes the need for trickle vents in windows and means that adequate ventilation can be provided to the flats throughout the year without opening the windows, although windows can still be opened if desired. Based on the outcome of the noise assessment, acoustic baffles can be fitted to external inlets and outlets of the MVHR to ensure that noise infiltration is minimised. These measures will ensure that noise levels comply with BS 8233:2014 and Reading Borough Council's policy requirements. A full noise assessment has been provided by Cole Jarman dated 19/6/2017, report 17/0063/R1.

13. Biodiversity

Applicable policies: CS36: Biodiversity and Geology, CS38: Trees, Hedges and Woodlands, DM18: Tree Planting

The site is currently entirely covered in buildings and hardstanding and consequently has low ecological value. There are no protected habitats or species on the development site.

14. References

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Reading Borough Council. Waste Management Guidelines for Property Developers, Architects, Planners and Contractors, Nov 2016.

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