

Sustainability Statement.

To: Reading Borough Council
Date: September 2021
Re: 58 Prospect Street, RG4 8JN.

Introduction

The document has been prepared to accompany a planning application 58 Prospect Street RG4 8JN for the, 'The construction of a two-storey detached single family dwelling'.

Various energy saving measures have been incorporated into the design of the scheme, including a thermally efficient building fabric, whilst lighting and services will be specified which meet and exceed the requirements of the Domestic Building Services Compliance Guide. An air-source heat pump system has been recommended to provide both heating and hot water to the units, whilst a solar PV array will be installed at roof level.

The purpose of this report is to indicate the reduction in carbon emissions achievable and to elaborate on various sustainable design and construction measures that will be implemented, according to the National Planning Policy Framework (NPPF), and Reading Development Plan.

Description of site and surroundings

The application site is situated in Caversham, which is located within the Reading Borough Council administrative area. The site is located at the rear of 58 Prospect Street RG4 8JN which is at the intersection of Oxford Street and Prospect Street. The site is approximately a 20-minute walk from Reading Station and there are a number of bus stops in close proximity.

The site is currently in use as a car park, while the main property of 58 Prospect Street is in use as a House in Multiple Occupation (HMO).

The surrounding area is typified by residential dwellings. Whilst residential use predominates, there are also a variety of community and retail facilities in the wider area. In terms of the street scene, the immediate area is characterised by residential buildings which generally consist of two storey terraced properties.



The site currently comprises of a plot of land that is used for vehicle parking and it does not have any built form. The site did previously contain a single storey garage, but this has been demolished. The site is accessed off Oxford Street.

The application site is bound by two buildings. The boundary wall at the end of the rear garden of No. 58 Prospect Road is located to the east of the site. The side boundary wall of No. 5 Oxford Street projects along the western boundary of the site. The north of the site is bound by the rear garden of No.60 Prospect Road.

Policy Context

Reading Local Plan Policy CC2 - 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 major non-residential developments or conversions to residential are required to meet the most up-to-date BREEAM 'Excellent' standards, where possible;
- All minor non-residential developments or conversions to residential are required to meet the most up-to-date BREEAM 'Very Good' standard as a minimum;
- All non-residential development or conversions to residential should incorporate water conservation measures so that predicted per capita consumption does not exceed the appropriate levels set out in the applicable BREEAM standard. Both residential and non-residential development should include recycling greywater and rainwater harvesting where systems are energy and cost effective.

Energy overview.

The development will meet the requirements of Building Regulations Approved Document L1A 'Conservation of fuel and power in new dwellings'. This includes the Dwelling Emissions Rate (DER) meeting the Target Emissions Rate (TER), and the Dwelling Fabric Energy Efficiency (DFEE) meeting the Target Fabric Energy Efficiency (TFEE).

The three steps of the Energy Hierarchy will be followed in order to achieve this:

- Be Lean
- Be Clean
- Be Green

Improved passive energy performance ('Be Lean') will be achieved throughout the development by specifying high-performing building fabric (U-values which improve upon the Part L

requirements), and Accredited Construction Details and/or BRE Construction Details (relating to linear thermal bridges).

Efficient building services ('Be Clean') will be installed which meet and exceed the Domestic Building Services Compliance Guide requirements, and Low Energy Lighting will be implemented throughout.

The proposed Renewable Energy Strategy ('Be Green') recommends an air-source heat pump (ASHP) system, which captures renewable energy from the external air and raises the temperature for use indoors. Additionally, a solar PV array has been proposed, which results in a reduction in CO2 emissions of between 25-50% compared to Building Regulations Part L1A 2013.

Energy Reduction – Be Lean

Reduction of energy demand has been achieved initially through passive measures, by specifying high performing building fabric to reduce heat losses. In addition, building services have been specified which are beyond the Domestic Building Services Compliance Guide requirements, whilst low energy lighting systems have been specified throughout.

Energy efficient systems – Be Clean

There are no existing district heating (DH) networks in the vicinity of the development, and the cost of implementing such a system has been deemed prohibitive.

Renewal Energy – Be Green

- 1.1.1 The primary goal according to the Energy Hierarchy is to achieve a reduction in emissions prior to the implementation of renewable energy. Further reduction in emissions can be achieved through the implementation of a suitable renewable energy system
- 1.1.2 A range of renewable energy technologies have been considered, with Air-Source Heat Pumps and Solar PV being the standout options due to the good financial case and suitability of the site (flat unshaded roof).
- 1.1.3 The following renewable technology overview shows the analysis that has been performed regarding the various options:

Technology	Suitability	Recommendation
Solar Thermal	The building has a flat roof, with space for a solar thermal array. Financial returns and CO2 reductions are expected to be less beneficial than that of an equivalent area solar PV array. A central solar thermal hot water cylinder	No



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	would be required with dual coil and suitable storage volume	
Solar PV	The proposed development features a pitched roof area, with adequate space for a 10kW solar PV array. The PV system would generate savings through reduced reliance on grid-supplied electricity. A total of 8 x 250W PV panels have been proposed, which will be mounted on A-frames at a pitch of 15-30° with 500-750mm spacing between rows. Each PV panel measures 1650 x 1000mm.	Yes
Ground Source Heat Pump (GSHP)	There is limited outdoor space available for a potential horizontal GSHP installation due to the limited extent of undeveloped (including hardstanding and/or landscaped) land post-construction. GSHP pipework should not be installed beneath buildings, as the warming effect of the sun would be limited.	No
Air Source Heat Pump (ASHP)	An ASHP offers an element of renewable energy, as the system extracts heat from the external air and raises the temperature for use indoors. The efficiency decreases in severe cold weather, thus care should be taken in sizing the system correctly. A number of heat pump options have been considered, with the CO2 reduction ranging from 25%-50%. A rooftop mounted heat pump system might be feasible is located suitably on the roof.	Possible
Combine Heat and Power	CHP systems are not truly classed as renewable energy technologies, however they are classed as 'LZC' (Low or Zero Carbon). In the case of this proposal, a district heating network is not present, thus large-scale CHP has been discounted. Micro-scale CHP systems would be costly and therefore may be unfeasible for a development of this scale.	No
Wind Turbine	Small wind turbines need planning permission and can be acceptable where they do not impact greatly on the amenity of neighbouring property and accord with the other policies of the Council's development plan. Factors to be considered in deciding whether the amenity of neighbours are affected include noise, and visual impact.	No

Water usage.



The consumption of water will be kept to a minimum within the proposed new dwellings through the implementation of water efficient fittings and appliances. These will include the following:

- Low-flow taps and showers
- Dual Flush toilets
- Low Volume (to overflow) bathtubs

Through the implementation of water efficient fittings and appliances, wastewater will also be reduced within the proposed new dwellings

Recycling

Where possible, the development will make use of recycled building materials, such as high-grade aggregate from demolition, and responsibly sourced timber products. In addition to the structural materials and hardcore, further sustainable materials will be included in the design of the building. These may include, for example:

- Mineral wool insulation – made from natural volcanic rock, recyclable
- Floorboards, structural roof timber – responsibly sourced timber products

In order to encourage household recycling, the proposal includes a Refuse Bin area with sufficient space for recycling bins and organic waste bins. Recycled waste will be collected in accordance with local waste collection policies.

Conclusion.

The building will achieve Building Regulations Part L without any renewable technologies implemented. This is due to passive measures such as the high thermal-efficiency of the building fabric, along with 100% low energy lighting specified throughout.. The recommended ASHP will achieve a further reduction.