Woodside Lodge, Picts Lane, Cowfold, West Sussex, RH13 8AT



Energy & Sustainability Statement

12th October 2026

Report produced by -

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1.0 Introduction

1.1 Blewburton Limited has been commissioned to prepare an Energy & Sustainability Statement to support the application for planning permission for the construction of a new residential dwelling.

1.2 As licensed BREEAM, Home Quality Mark, Code for Sustainable Homes and energy assessors of several years standing, Blewburton Limited has considerable expertise in all issues of sustainability.

1.3 The proposed scheme at Woodside Lodge, Picts Lane, Cowfold, West Sussex, RH13 8AT will see the demolition of the existing dwelling and its replacement with a single, detached, 4-bedroom bungalow with private access, parking, gardens and general landscaping.

1.4 The application site lies approximately one and half miles to the east of the West Sussex village of Cowfold, in a rural location.

1.5 The site location is shown in the aerial photo in Figure 1 below, with the proposed site layout plan shown in Figure 2.



Figure 1: Aerial photo of site location and area



Figure 2: Site layout plan

2.0 Proposed Approach to Sustainability

2.1 This statement sets out the approach that the applicant is proposing to adopt to ensure that the proposal meets high standards of sustainability. The report includes a discussion of the full range of sustainability issues as shown below:

- Energy & carbon emissions;
- Water conservation;
- Flood risk & surface water management;
- Ecology & biodiversity;
- Waste & pollution;
- Materials selection and sustainable construction methods;
- Future needs.

3.0 Energy Conservation and Carbon Emissions

3.1 It is recognised that the generation of energy to heat, light and cool buildings is responsible for approximately half of the total CO_2 emissions of the UK. Part L of the Building Regulations requires a minimum standard of energy efficiency in new development and refurbishments, however, it is the intention with this development to go beyond this.

3.2 As a first step in dealing with carbon emissions arising from energy use within buildings it is important to consider designing in energy efficiency measures as part of the construction of the buildings as these will be difficult to retrofit in the future and this will also reduce the amount of energy required by a building. This is known as being 'lean' in the energy hierarchy.

3.3 Reduction of heat loss is a key element of this and it is proposed that insulation within floors, roofs and walls will exceed the minimum standards required under Part L1 (Conservation of Fuel and Power) of the Building Regulations, as will the U-values for glazing and doors.

3.4 U-values attained for similar projects suggest the following is realistic for this proposed development –

- Ground floors – 0.11 (Part L compliance is 0.18)
- External walls – 0.18 (Part L compliance is 0.26)
- Roofs – pitched 0.15 and to joists 0.10 (Part L compliance is 0.16)
- Windows/glazed doors, solid doors and roof lights – 1.40/1.40, 1.20 and 1.40 double glazed (Part L compliance is 1.60)

3.5 An airtight building will also play a major part in the reduction of heat loss via the external envelope. Accordingly, an improvement on the minimum Building Regulations requirement for building air permeability rate within the buildings will be sought, with an initial target of 4.00m^3/hm^2 (@50Pa) or lower being the intention (Part L requires a maximum target of 8.00m^3/hm^2 (@50Pa).

3.6 Attention will also be paid to the designing out of non-repeat thermal bridges and this will involve the use of a standard such as Recognised Construction Details or bespoke calculations. It is increasingly recognised that as standards of insulation improve, this issue, in conjunction with air leakage, plays a vital role in the energy efficiency of a building and getting both right at design stage and ensuring they are then implemented during construction is considered to be important for this development.

3.7 The heating and hot water requirement for the proposed dwelling will be supplied by an Air Source Heat Pump (ASHP) to underfloor heating, with full time and temperature zone controls, meaning energy is only used as and where required. This technology is a recognised low and zero carbon option and will become increasingly more carbon efficient as the UK electricity grid becomes 'greener'.

3.8 The use of passive solar design has been considered and where possible good levels of glazing have been designed into the proposals to allow for natural light penetration. Where artificial light is required, the focus will be on the provision of the energy efficient lighting systems as appropriate to locational requirements.

3.9 The option to utilise solar energy technologies has also been considered – thermal for water heating and photovoltaics (PV) for electricity generation (see images below) – with the conclusion that PV is the most logical technology to install as it will provide the larger carbon offset and the utilisation of this technology will be further reviewed if/when planning permission is granted.





Figures 3 & 4: Solar thermal and solar PV installations on roofs

3.10 When modelled on Elmhurst SAP software, the specification outlined above sees the dwelling exceed minimum Part L1 of the Building Regulations requirements by between 62.66%. This is a significant uplift and reflects well on the proactive approach to this issue proposed.

3.11 Not all energy use is controlled by the Building Regulations and with this in mind, all 'White Goods' supplied – fridge-freezer, washing machine and dishwasher – will be rated as minimum 'A' under the EU Energy Labelling Scheme and attention will be paid to the energy specification of all electrical equipment to be installed within the dwelling.

3.12 Finally, an OWL "Standalone" Electricity Monitor will be installed to allow the householders to monitor and understand their electricity consumption – see image, right. The monitor shows consumption or cost per hour (or kwh if preferred) and has a CO_2 equivalent reading too. Because the monitor is wireless and portable, the householder can easily walk around the house and observe, by switching on and off, how much energy particular devices are using. They can also see the overall consumption by day / week / month and compare periods to see if savings have been made.



Figure 5: Image of OWL monitor

4.0 Water Resource Management

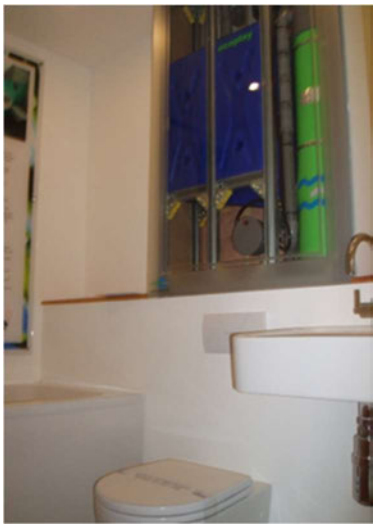
4.1 The UK has a poor record in being profligate with its abundant water resource and the South-East of England is recognised as suffering from water stress, therefore, on this site only water efficient products will be specified.

4.2 The actual specifications of the water using products are yet to be established, however, the following specification is considered realistic for this type of development and an assessment of the efficiency of the building's domestic water-consuming components has been undertaken using the Building Research Establishment's water calculator.

4.3 The water consumption (L/person/day) for the proposed dwelling shows a figure of 100.6l/p/d with the following proposed specification (which is below the 125.00l/p/d required by Part G of the Building Regulations):

- Dual 6.0/3.0 litre flush WCs;
- Shower average flow rates of 8.0L/min;
- Basin average tap flow rates of 3.0L/min;
- Kitchen tap average flow rates of 6.0L/min;
- Bath average overflow capacity of 165 litres;
- Water efficient washing machine (5.50L per kg dry load) and dishwasher (0.9L per place setting).

4.4 Should a more generous specification for internal water using products be decided upon, then thought will be given to the installation of grey-water harvesting systems, such as the EcoPlay unit, pictured below, however, rainwater harvesting will not be utilised for internal water use as the carbon footprint arising from the pumps involved with such a system is heavy and it is more efficient to specify the low flush WCs detailed above in 4.3.

Figures 6 & 7: External rainwater harvesting butt & EcoPlay unit above WC

4.5 Externally, a rainwater harvesting butt will be provided along with an external tap for use in the garden and for car washing to the property.

4.6 The provision of water meters is also recognised as an important tool in reducing water usage and in a domestic context they can encourage people to monitor and reduce their water consumption by an average of 10% to 15%. Therefore, the dwelling will have an easily accessible water meter installed as part of its specification.

5.0 Flood Risk & Surface Water Management

5.1 The Environment Agency's Flood Mapping for the area shows the site is not located within an area considered to be at risk from flooding – see https://check-long-term-flood-risk.service.gov.uk/rivers-and-sea and https://check-long-term-flood-risk.service.gov.uk/surface-water.

5.2 A surface water-runoff strategy will be developed in compliance with Building Regulations, thereby minimising any risk and impact of localised flooding on and off-site, watercourse pollution and other environmental damage. The solution implemented will ensure there is less or equal runoff from the developed site when compared to the existing site and will also lead to an improvement in the quality of the rainwater discharged from the site.

5.3 SUDS options will be employed as far as is possible and for roof drainage, traditional concrete ring soakaways (if applicable) will be designed to cater for a 1 in 100-year rainfall event with an additional 30% for climate change, without any resultant surface flooding. An alternative design using geo-cellular soakaways may also be suitable and will be further investigated if/when planning permission is granted.

5.4 All hard paved areas are to be constructed from permeable surface to allow runoff to freely drain to ground via infiltration, such as that shown below in Figure 8.



Figure 8: Typical permeable paving solution

6.0 Ecology & Biodiversity

6.1 A Preliminary Ecological Appraisal (PEA) has been undertaken for the site by Arun Ecology Ltd and this work informs the approach required with regards ecology and biodiversity for this site.

6.2 The PEA states that the site within the development boundary is comprised mainly of the existing building, sparsely vegetated urban land, modified grassland, some scattered trees and patches of scrubland. Images of the site from ground level are shown below in Figures 9, 10 & 11.



Figure 9: View of the building to be demolished

6.3 The PEA states that the development will not result in any adverse impacts on any designated sites of international, national or local importance and will not adversely impact any habitats of principal importance (HPI) or irreplaceable habitats including ancient woodland.

6.4 Based upon the desk study results, the habitats recorded within the development boundary and the development proposals, [redacted] and other mammal burrows, bats (commuting and foraging), nesting birds, great crested newts, hedgehogs and reptiles are a material consideration for the development and additional studies and mitigation measures are required and will be implemented.

6.5 The following ecological enhancements relevant to the development have been recommended and will be implemented:

- One bat box to be installed on suitable tree on site;
- One integrated bird box to be installed on the proposed dwelling;
- One solitary bee box to be installed within a sunny grassland location within the development boundary; and
- One small refugia/hibernacula log pile to be created along the northern wider ownership boundary for the benefit of amphibians, reptiles and invertebrates.



Figure 10: View of the sparsely vegetated urban land habitat in the NE of the site



Figure 11: Scattered trees on the site

7.0 Waste & Pollution

7.1 Waste arising from the construction process has been an area of focus for some years now, with the industry making good strides in re-use and reduction of materials, which not only helps the environment, it also engenders significant cost savings to developers.

7.2 With this in mind, the appointed contractor for the scheme will be encouraged to develop a site waste management plan (SWMP) along with a demolition audit of the current property to ascertain the ability to re-use materials in situ, prior to the start of construction, reflecting the recognition that reduction of waste begins in the design and ordering stage of a project and carries on through to the sign-off of the building. This SWMP will set targets and procedures for the sorting, reusing and recycling of construction waste into defined waste groups, either on site or through a licensed contractor.

7.3 The generation of waste does not stop at the end of the construction process and adequate provision will be supplied to the proposed dwelling, both internally and externally, to allow for the sorting of general waste from recyclable materials.

7.4 Provision for composting of food waste arising from the kitchen will also be supplied in the form of a compost cone to the exterior of the property, along with information on how to successfully compost, to further reduce waste streams arising from the new dwellings.

7.5 Pollution can occur in various guises and attempts will be made to design out or mitigate against a number of issues identified below.

7.6 At the construction stage there can potentially be noise nuisance for neighbouring properties and all contractors will be made aware of and expected to comply with policies to prevent this issue. They will also be expected to have and operate polices to facilitate against air and water pollution from their activities and to have procedures in place should an accident occur.

7.7 Light pollution will be countered by the use of external lighting which only involves energy efficient fittings, daylight detectors and angling/capping to prevent unnecessary glare.

8.0 Materials Selection and Sustainable Construction Methods

8.1 This precise material specification for this project is yet to be confirmed, however, for new materials there is a commitment to ensure they score as highly as possible in the Building Research Establishment's Green Guide to specification – see Figure 12 below.

8.2 In addition, wherever possible, all building and finishing materials will be sought from local suppliers and manufacturers registered to an environmental management scheme such as FSC, BES6001, ISO14001 or EMAS. This will ensure that the materials have been sourced from suppliers certified as ethical and responsible as far into the supply chain as possible. The proposed timber, bricks and tiles for the dwellings can be confirmed as meeting these criteria.

8.3 All insulation materials selected for the building will have a Global Warming Potential of below 5 and where possible be made from natural products.

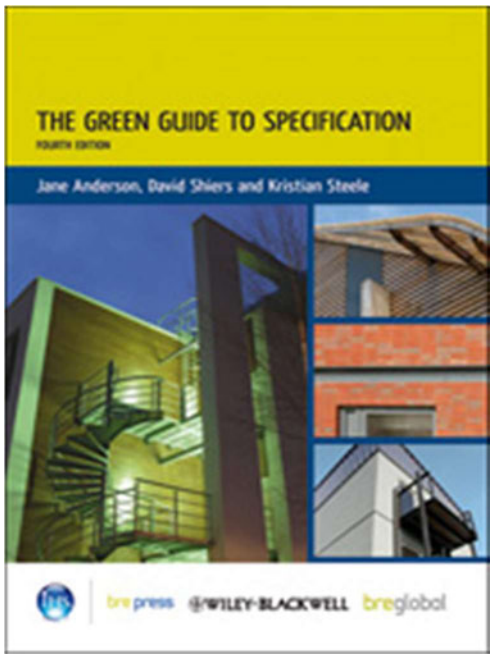


Figure 12: BRE Green Guide to Specification

8.4 Finally, attention will also be paid to materials specified for the internal environment, with a focus on materials/finishes containing low/no volatile organic compounds (VOCs) in an effort to improve the internal environment for occupants as internal air pollution is increasingly recognised as having negative impacts on health.

9.0 Future Needs

9.1 All buildings will have a lifetime of several decades, if not centuries, so more than ever it is important that they are flexible in use and adaptable to future occupier needs.

9.2 It is felt that the proposed dwelling design for this project maximises the useable space within the home, through functional layout, and provides scope to adapt and modify the dwelling to meet future requirements.

9.3 The scheme has also been developed to meet the majority of the Lifetime Homes standards, which ensures a flexible blueprint for accessible and adaptable housing in any setting.

9.4 The dwelling will be fully fitted with the latest broadband access technology and fittings will be installed to facilitate home working.

9.5 An electric vehicle charging point for the property will be installed, should future occupants have an electric vehicle requirement.

10.0 Summary

10.1 In summary, this development incorporates many sustainable features that are consistent with achieving a high level of overall sustainability and once/if planning permission is granted, the developer will consider further options for enhancement, as appropriate.

10.2 Areas of strong approach involve the plans for energy and water efficiency (both of which go significantly beyond standard Building Regulations requirements), ecological enhancement and mitigation and the approach to materials and future proofing.

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