

**Town Barn, Dragons Green Road,
Shipley, West Sussex, RH13 8GQ**



Energy & Sustainability Statement

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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 Town Barn, Dragons Green Road, Shipley, West Sussex, RH13 8GQ, will see the construction of a single, detached, 4-bedroom bungalow with private access, parking, gardens and general landscaping.
- 1.4 The site consists of an isolated barn within a rural setting, with the surrounding land used for cattle grazing. It is located to the north of the village of Dragons Green and east of the village of Brooks Green. The site is roughly rectangular in shape, covering an area of approximately 0.08ha and is accessed from Dragons Green Road to the east.
- 1.5 The site location is shown in the aerial photo in Figure 1 below, with the proposed site location shown in Figure 2 and the proposed site layout plan shown in Figure 3.

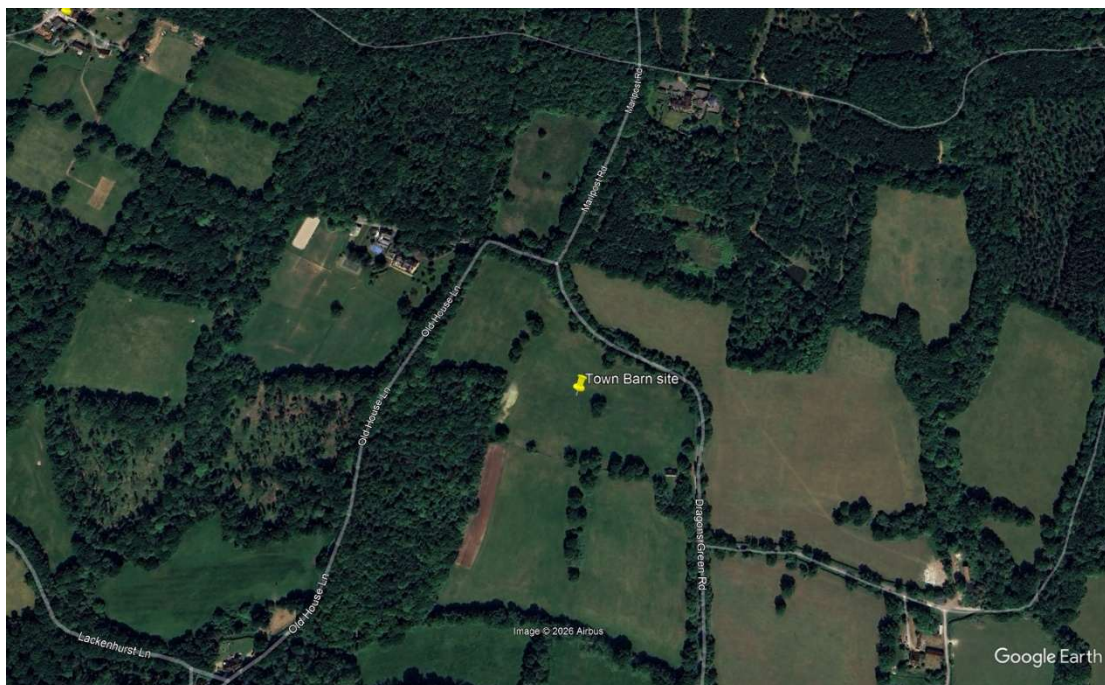


Figure 1: Aerial photo of site location and area



Figure 2: Site location plan

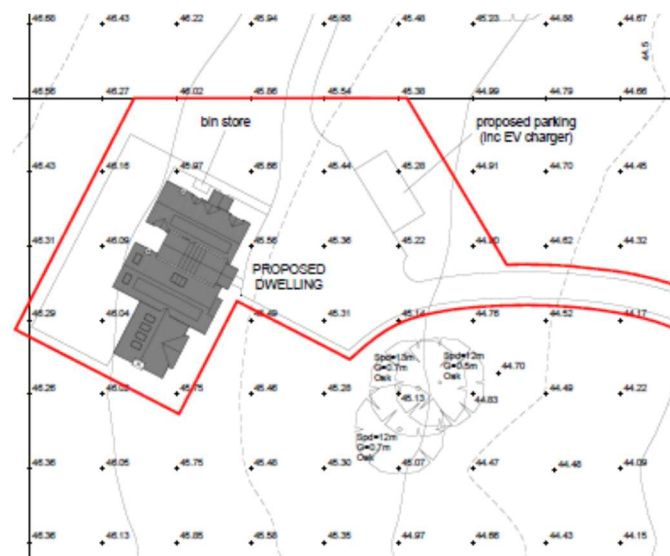


Figure 3: Proposed site layout

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 CO₂ 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 3.50m³/hm² (@50Pa) or lower being the intention (Part L requires a maximum target of 8.00m³/hm² (@50Pa). Mechanical Heat Recovery Ventilation (MVHR) will be installed to ensure adequate air quality and ventilation.
- 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 on the ground floor and radiators on the first floor, 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 proposal 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 is proposed with panels on the south-west facing roof areas (modelled with an array of 7.6kWp installed).



Figures 4 & 5: 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 86.99%. 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 CO₂ 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 6: 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 7 & 8: 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/surface-water> and <https://check-long-term-flood-risk.service.gov.uk/rivers-and-sea>.
- 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 9.

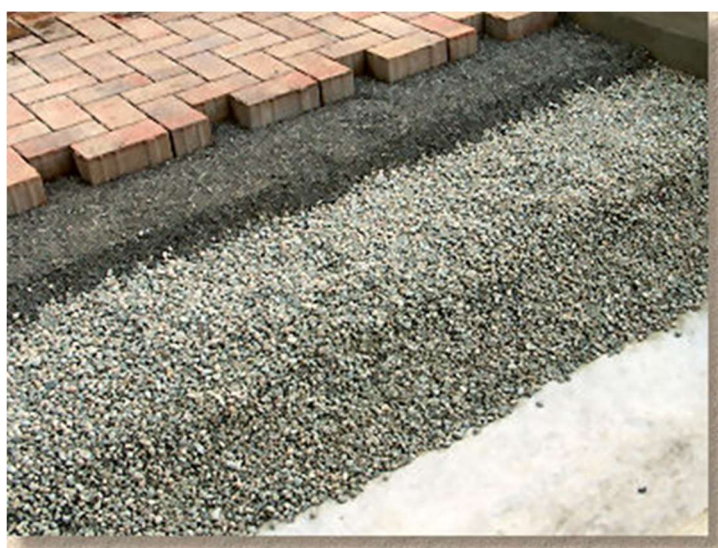


Figure 9: Typical permeable paving solution

6.0 Ecology & Biodiversity

- 6.1 A Preliminary Ecological Appraisal (PEA) has been undertaken for the site by Ecology & Habitat Management Ltd and this work informs the approach required with regards ecology and biodiversity for this site.
- 6.2 The PEA states that the site forms an isolated rural plot, with the surrounding land predominantly used for cattle grazing. The wider landscape is characteristically rural, comprising a patchwork of agricultural fields interspersed with pockets of woodland, as well as scattered hamlets and villages. There is a reasonable degree of ecological connectivity in the area, provided by hedgerows, woodland edges, and grassland habitats, although this connectivity is locally interrupted by roads. An image of the site from ground level is shown below in Figure 10.



Figure 10: View of the field where the house will be situated

- 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 The following mitigation measures will be incorporated to avoid, mitigate and compensate the identified impacts to ecologically important habitats:
- Clearance of all vegetation and other light debris by hand and allow any reptiles uncovered to move from the working area under their own motion.
 - Undertake works under a watching brief with an ecologist on call to provide advice should reptiles be uncovered.

- A sensitive lighting strategy will be implemented into the construction and operational phases of the development to avoid impacts to bats arising from increases in artificial illumination.

6.5 The proposed development is considered to fall below the threshold for mandatory Biodiversity Net Gain requirements under the Environment Act 2021, as it constitutes a small-scale development with a limited red line boundary. Notwithstanding this, the development provides opportunities to deliver proportionate biodiversity enhancements through sensitive landscaping and habitat retention, in line with national and local planning policy and a soft landscaping package will be implemented on construction to reflect this.

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) 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 dwelling.
- 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 policies 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 11 below – and the initial thoughts to specify buff facing brickwork and plain clay roof tiles certainly match this aspiration.
- 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.
- 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.

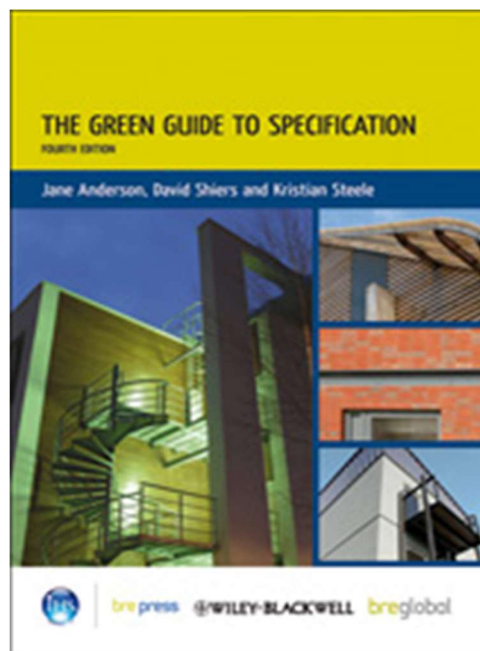


Figure 11: BRE Green Guide to Specification

- 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 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) and the approach to materials and future proofing.

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