

**1, Greenways Crescent, Ferring,
West Sussex, BN12 4HF**

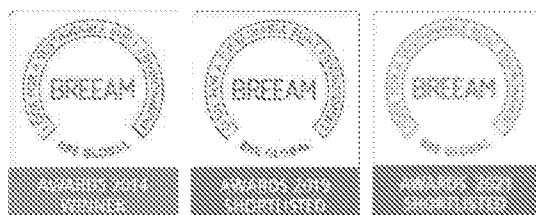
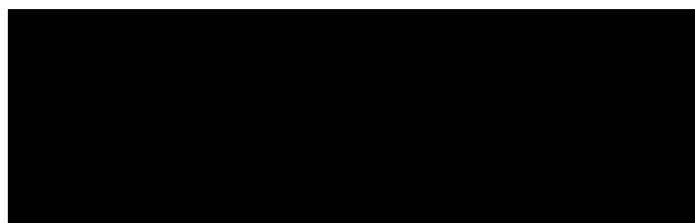


Energy & Sustainability Statement

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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 dwelling at 1, Greenways Crescent, Ferring, West Sussex.
- 1.2 As licensed BREEAM, HQM, Code for Sustainable Homes and energy assessors of several years standing, Blewburton Limited has considerable expertise in all issues of energy assessment and sustainability.
- 1.3 The proposed scheme will see the demolition of an existing dwelling and the erection of a detached three-bedroom dwelling with detached garage.
- 1.4 The existing site area and location is shown in the aerial photo in Figure 1 below, with the site location plan shown in Figure 2 and the proposed site plan shown in Figure 3.



Figure 1: Existing aerial photo of site location and area

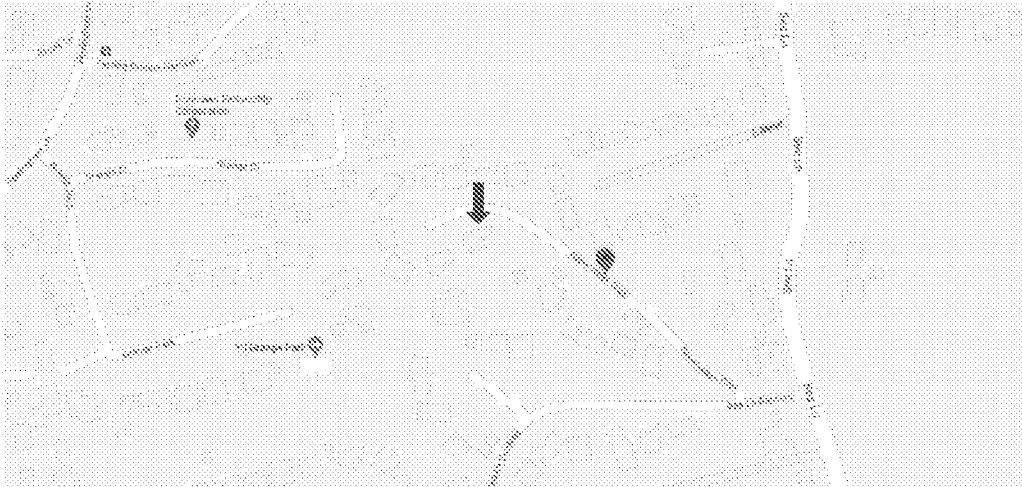


Figure 2: Proposed site location plan (shown by blue arrow)

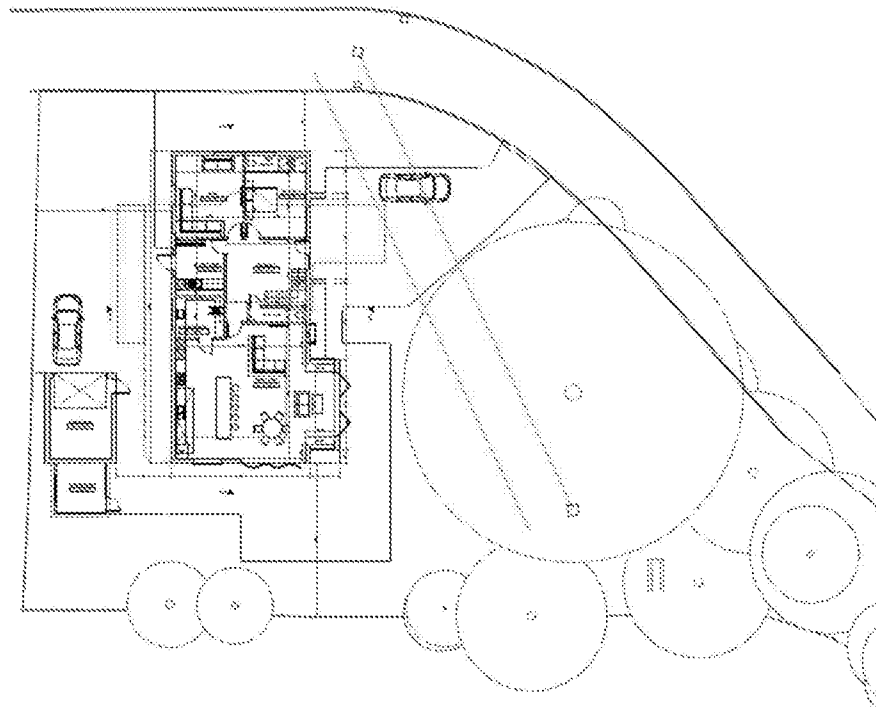


Figure 3: Proposed site layout

2.0 Proposed Approach to Energy & Sustainability

- 2.1 This proposal is within Arun District Council's (ADC) planning jurisdiction. The ADC Local Plan Policy ECC SP2: Energy and Climate Change Mitigation states the following:

All new residential and commercial development (including conversions, extensions and changes of use) will be expected to be energy efficient and to demonstrate how they will:

- a. Achieve energy efficiency measures that reflect the current standards applicable at the time of submission;*
- b. Use design and layout to promote energy efficiency;*
- c. Incorporate decentralised, renewable and low carbon energy supply systems, for example small scale renewable energy systems such as solar panels.*

All major development must produce 10% of the total predicted energy requirements from renewable or low carbon energy generation on site, unless it can be demonstrated that this is unviable. Energy efficiency measure will be taken into consideration when the total predicted energy requirements are calculated.

- 2.3 Therefore, whilst there is no requirement for this proposed single dwelling to exceed Part L of the Building Regulations compliance, it is expected that a strong approach to energy efficiency will be undertaken and that some form of renewable energy technology will be incorporated into the specification.

- 2.4 ADC Local Plan Policy ECC SP1: Adapting to Climate Change also requires new development to consider the following issues:

- a. Location (in relation to flood risk and vulnerability to coastal erosion);
- b. Water efficiency
- c. Shade, cooling, ventilation, solar gain;
- d. Connectivity to the green infrastructure network;
- e. Layout and massing;
- f. Resilience of buildings and building materials to extreme weather events; and
- g. Capacity of drainage systems and incorporation of Sustainable Urban Drainage Systems (SUDS).

- 2.5 Accordingly, this statement sets out the approach that the applicant is proposing to adopt to ensure that the proposal meets the high standards of energy use and sustainability set out in local planning policy as detailed above.

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, however, it is the intention with this development to go significantly 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 building as these will be difficult to retrofit in the future and this will also reduce the amount of energy required by a building.
- 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 L1A (Conservation of Fuel and Power) of the Building Regulations, as will the U-values for glazing and doors.
- 3.4 The initial specification has the following U-values and these will be confirmed once detailed design commences post planning permission being granted –
- Ground floors – 0.11 (Part L compliance is 0.25)
 - External walls – 0.21 (Part L compliance is 0.3)
 - Roofs – 0.16 (Part L compliance is 0.2)
 - Windows/glazed doors – 1.5 (Part L compliance is 2.0)
- 3.5 An air tight building will also play a major part in the reduction of heat loss via the external envelope and coupled with adequate ventilation to ensure internal air quality, is an important element in energy efficient building design. Accordingly, an improvement on the minimum Building Regulations requirement for building air permeability rate within the building will be sought, with an initial target of 4.50m³/hm² (@50Pa) or lower being the intention (Part L requires a maximum target of 10m³/hm² (@50Pa)).
- 3.6 Attention will also be paid to the designing out of thermal bridges and this will involve the use of a standard such as Accredited Construction Details and/or Enhanced Construction Details, where applicable. It is increasingly recognised that as standards of insulation improve, this issue, in conjunction with air leakage, plays an increasingly important 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 proposed heating and hot water system for the dwelling has yet to be confirmed, with preference currently for a mains gas boiler, although an alternative may be to install an Air Source Heat Pump (ASHP) and with this in mind, an underfloor heating system is proposed for the ground floor area. The system will feature full time and temperature zone controls for both heating and hot water delivery, meaning energy

is only used as and where required. Additional smart control systems such as a delayed start thermostat will also be incorporated into the heating specification.

- 3.8 The option to utilise solar energy technologies has been considered with the adoption of solar photovoltaics (PV) for electricity generation taken to be a viable option for the site, as there is a small area of unshaded space on the area of southerly facing roof over bedroom 1, or significantly more on the west facing roof to host the required PV array. Modelling has been undertaken with a view to installing a PV array to allow for a significant contribution to the buildings electricity needs and accordingly, a 4.0kWp array is proposed for the west facing roof (12-16 panels, dependent of product chosen).



Figures 4: Solar PV installation on roof within an AONB in Oxfordshire

- 3.9 The use of passive solar design has been considered and where possible good levels of glazing have been designed in to 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. No cooling is required as the dwelling is not expected to suffer from overheating and ventilation will be from trickle vents and standard extracts in wet rooms.
- 3.10 When modelled on Elmhurst SAP software, the specification outlined above for a mains gas heated dwelling and associated PV array sees the dwelling have a Target Emission Rate (TER) of 12.65 kgCO₂/yr/m² and a projected Dwelling Emission Rate (DER) of 8.11 kgCO₂/yr/m², which is a 35.90% improvement over Part L1A of the Building Regulations.
- 3.11 All 'White Goods' installed – 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 (or similar product) 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.

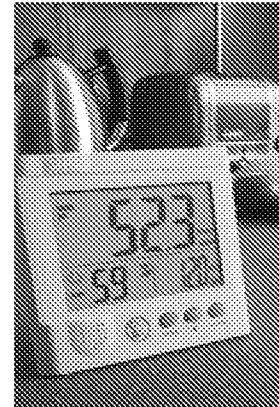
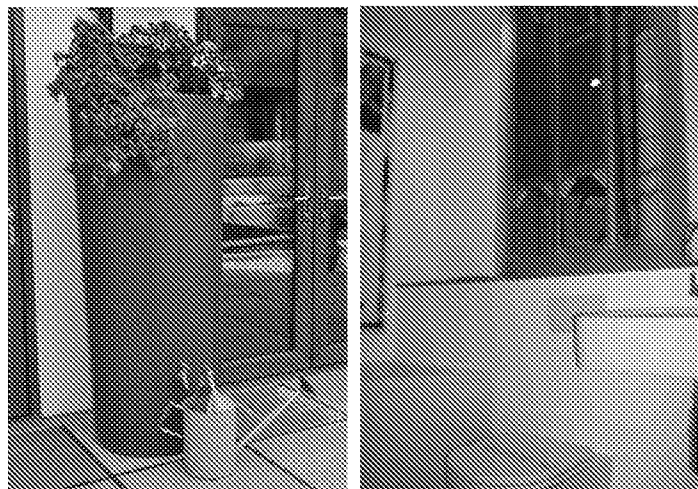


Figure 5: Image of OWL monitor

- 3.13 The use of energy conscious design principles and a fabric first approach means that the building should remain energy efficient for its entire lifetime and the overall requirement for energy input is reduced for heating and hot water. The approach outlined above meets the various requirements in the ADC Local Plan.

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 108.9l/p/d with the following proposed specification (which is below the 125.00l/p/d required by Part G of the Building Regulations):
- Dual 4.0/3.0 litre flush WCs;
 - Shower average flow rates of 10.0L/min;
 - Basin average tap flow rates of 3.0L/min;
 - Kitchen tap average flow rates of 5.0L/min;
 - Bath average overflow capacities of 165 litres;
 - Water efficient washing machine (10.0L 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.
- 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 individual, easily accessible water meter installed as part of the specification.

5.0 Flood Risk, Surface & Waste 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://flood-warning-information.service.gov.uk/long-term-flood-risk/map?easting=523555&northing=114594&address=100061800883>.
- 5.2 A surface water-runoff strategy will be developed in compliance with Building Regulations, thereby minimising the 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, such as permeable paving, to contain surface water runoff arising from the work outlined above and where hard landscaping is installed, attention will be given to the opportunity for a porous surfacing, such as that shown below in Figure 8, to aid infiltration.

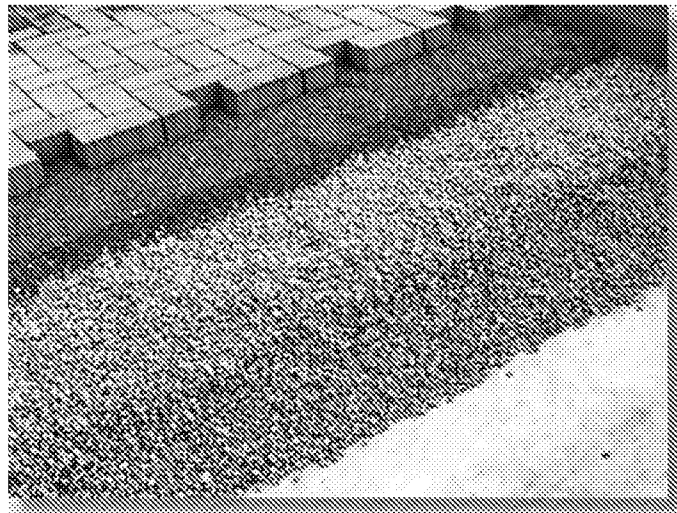


Figure 8: Typical permeable paving solution

6.0 Ecology & Biodiversity

- 6.1 The site is currently dominated by the buildings to be demolished and the footprint of the new building will be similar to these buildings. Therefore, there is little impact projected for the on the site ecology. An image of the front of the site from ground level looking west is shown below in Figure 9, with an image of the rear shown in Figure 10.



Figure 9: Image of existing front of the site

- 6.2 Externally, the site currently is to garden, all be it quite vegetated to the rear and to the east is a small area of woodland. Accordingly, the site would retain existing routes for wildlife across and through the site, with any fencing having small holes included for access of animals such as hedgehogs. Existing hedgerow boundaries will remain to provide wildlife corridors and no trees will need to be felled to facilitate the development.



Figure 10: Image of existing rear of the site

- 6.3 New biodiversity measures will be incorporated across the site with options such as bird and bat boxes to be considered. It is also intended to increase the level of soft landscaping to benefit wildlife with new grass and native wildflower planting to help create additional wildlife opportunities.

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 comprehensive 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 demolition of buildings, as will occur at this site, creates a waste stream of hard core that can be used in foundations and other ground works and where possible this will be reused on this site or other building projects in the area.
- 7.4 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.
- 7.5 Provision for composting of food waste arising from the kitchen will also be supplied in the form of a compost cone to the garden along with information on how to successfully compost, to further reduce waste streams arising from the new development.
- 7.6 Pollution can occur in various guises and attempts will be made to design out or mitigate against a number of issues identified below.
- 7.7 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.
- 7.8 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 The final material specification has not yet been confirmed for this project and will be subject to planning considerations, however, the client is committed to ensuring that all materials score as highly as possible in the Building Research Establishment's Green Guide to specification – see Figure 11 below. In particular, the construction of the walls, roof and windows are expected to achieve an A or A+ rating.

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 in to the supply chain as possible.

8.3 The use of factory made Structurally Insulated Panels (SIPs) will also be investigated as these can have a strong positive impact in the reduction of waste, as well as allowing for reduced embodied and transport energy impacts.

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

8.5 All materials selected will be reviewed for their resilience and ability to withstand climate change and any associated extreme weather events.

8.5 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.

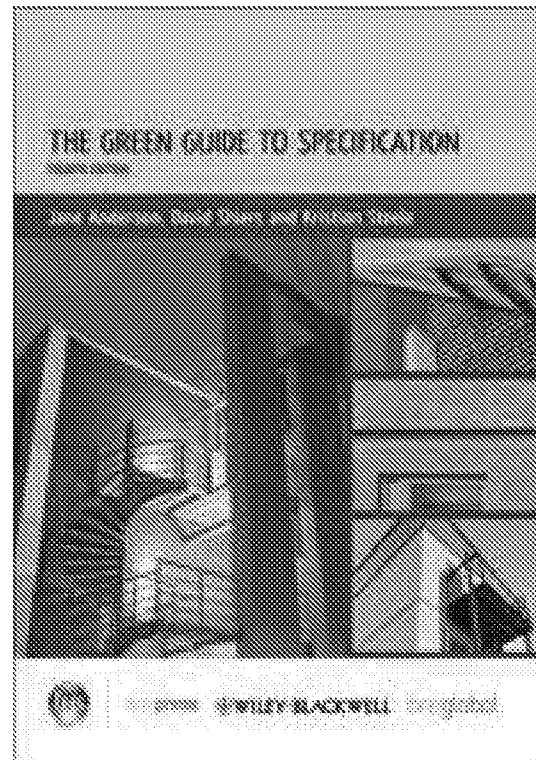


Figure 11: BRE Green Guide to Specification

9.0 Summary

- 9.1 In summary, this development demonstrates a strong commitment to sustainability, above and beyond that required for a minor development within the ADC planning jurisdiction.
- 9.2 Areas of strong approach involve the plans for energy and water efficiency, which significantly exceed Building Regulations compliance levels. Waste and materials are also to be approached in a manner beyond standard for most developments.
- 9.3 In short, given the nature of the scheme, along with the intentions outlined within this report, the proposed development is deemed to meet high levels of sustainability.