LANDÍVAR ARCHITECTS

Sustainability Statement

Project Address:	Land to the north of Jeremy's Cottage, Jeremy's Lane, Bolney, West Sussex, RH17 5QE
Proposal:	Erection of 2 new dwellings
Submission:	Local Authority Full Planning
Prepared by:	O Moune
Project number:	1758
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Sustainability Statement

This Sustainability statement has been prepared on behalf of the applicant, James Lewis, in support of the Full Planning Application for 2 new build houses at:

Land to the north of Jeremy's Cottage, Jeremy's lane, Bolney, RH17 5QE

This document should be read in conjunction with Landivar Architects' DAS.

The site is in a semi rural location on the western side of the A23 motorway approximately 1 km north of Bolney village and on a country lane alongside other generous plots with large detached residences in landscaped grounds.

The sustainability statement and energy strategy has been developed following the energy hierarchy 'Be Lean, Be Clean, Be Green, Be Seen'.

The MSDC District Pan 2014-31 states in policy DP39:

All development proposals must seek to improve the sustainability of development and should where appropriate and feasible according to the type and size of development and location, incorporate the following measures:

- 1.0 Minimise energy use through the design and layout of the scheme including through the use of natural lighting and ventilation;
- 2.0 Explore opportunities for efficient energy supply through the use of communal heating networks where viable and feasible;
- 3.0 Use renewable sources of energy;
- 4.0 Maximise efficient use of resources, including minimising waste and maximising recycling/re-use of materials through both construction and occupation;
- 5.0 Limit water use to 110 litres/person/day in accordance with Policy DP42: Water
- 6.0 Infrastructure and the Water Environment;
- 7.0 Demonstrate how the risks associated with future climate change have been planned for as part of the layout of the scheme and design of its buildings to ensure its longer term resilience.

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1.0 Minimise Energy Use:

The proposal seeks to incorporate a 'Be Lean' approach, incorporating key sustainable aspects to provide energy efficient homes, built to Passivhaus airtightness and insulation standards:

- Possibility for Passivhaus standards - Energy required to heat passive home is 90% lower than that of other buildings
- Zero Carbon Sustainable technologies: GSHP Source Heat Pump , Solar Panels and MVHR whole house ventilation system.
- The proposed insulation is significantly better than the default building regs compliance.
    - Ground 0.13 *(Part L compliance 0.13)*
    - External Walls 0.15 *(Part L compliance 0.18)*
    - Roofs 0.11 *(Part L compliance 0.13)*
    - Windows 0.10 *(Part L compliance 0.14)*

The 5 Passivhaus principles would be applied to the scheme :

- Air tight construction
- High quality insulation
- Low U value windows
- Minimised thermal bridging
- Mechanical ventilation with heat recovery with summer bypass
- Carefully positioned windows to minimise overheating

Passive solar gains can be useful in providing background heating during the winter months, however, during summer months solar gain should be controlled. High performance double or triple glazing to be installed, incorporating low emissivity coatings to mitigate overheating without compromising the light transmittance and access to natural daylight. Direct south facing windows have been minimised with the majority of glazing facing east and west.

An air tight building envelope plays a huge part in retaining the energy within the home, which will be built and tested to a specification of 5m3/hm2 (building regulations compliance, maximum, 10m3/hm2). The whole house ventilation system (MVHR) will allow the house to be efficiently ventilated during winter months and minimise heat loss through open windows. Building fabric air tightness will be achieved using specialised tapes around service penetrations and window & door frames. Continuous breather membrane and vapour control layers also play an important part in maintaining an airtight building.

The above principles ensure minimum energy use, stable temperatures and comfortable conditions.

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2.0 Efficient Energy Supply:

As part of the 'Be Clean' approach, the use of energy efficient equipment, community heating and heat networks have been considered.

District Energy Systems / Combined Heat & Power

At this scale of development, district heating or Combined Heat and Power (CHP) systems are not viable. CHP requires a high base energy demand load in order of operate efficiently and is usually more suited to hotel or hospital schemes with a high hot water demand, or very large residential schemes with hundreds of units.

Communal Heating

Communal heating strategies involve serving the majority of the space and water heating demand of the development from a centralised plant, making use of higher efficiencies available from larger systems. As the proposed development is small at 2 units, the installation of a community energy system would not be cost effective.

Domestic Ground Sourced Heat Pump

The proposed energy strategy is to install a closed loop group vertical ground source heat pump for heating and hot water. It works by circulating a fluid through pipes buried in the ground, which warms up from the consistent underground temperature. This collected heat is then concentrated by the heat pump and used to warm the home's central heating and hot water. Using freely available heat energy from the ground, it achieves higher efficiencies than any other heating system. They can provide both heating in the winter and cooling in the summer by reversing the process.

Solar Panels

Integrated solar panels to south facing roof slopes are proposed providing a potential of 6kW to House 1 and 5.6 kW to House 2.

There is also the potential for a Biosolar roof to the large flat roof areas that would provide extensive further area for solar panels as well as increased biodiversity. The panels could be inset so that they were not visible from ground level or the street scene.

3.0 Renewable Energy Source:

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Each house incorporates the 'Be Green' approach by utilising large south facing roof areas for integrated solar panels , generating electricity for use in the home that would then be stored in batteries. The large tiled roofs oriented to either the south or south west have space for up to 16 solar panels per dwelling generating approximately 6kwh of electricity. The large flat roofs could also be utilised to accommodate a further 16 solar panels. Space has been allocated for batteries and an inverter in the garage or plant room of each dwelling.

The proposed GSHP unit runs on electricity, generated on site via solar panels. Due to the efficiency of the GSHP system together with each house's battery storage capacity it is anticipated that each house will feed electricity back into the grid.

Each house will be provided with a EV charging points for Cars and e-Bikes.

4.0 Sustainable Materials Strategy:

Care has been taken to research sustainable materials and to understand their benefits in reducing the overall carbon footprint both during construction and within the buildings lifetime.

Local Suppliers and Trades:

- Local suppliers have been considered in the specification and are to be prioritised where possible. The development will be built with local builders and tradesmen familiar with the local suppliers as well as local traditional detailing for any brick work or flint work . The aim is to reduce long distance haulage where possible and eliminate unnecessary journeys.
- Ibstock have local brick factories at Laybrook near Pulborough and Chailey. This is an opportunity to specify locally manufactured bricks that are in keeping with the historic character of the area.

Timber Framed Construction:

- The superstructure of each house will be formed as a timber frame (FSC certified), with timber floor and ceiling structures. The benefits of using timber, rather than steel or concrete are numerous. Timber has the lowest C02 'cost' of all commercial building methods and is lighter in weight than materials like stone and concrete, meaning that transportation requirements are lower and resulting in less emissions from road, rail, air and sea as well as reducing foundation requirements due to lower loads. Timber is non toxic and easy to recycle at the end of the building lifecycle, whether this be used as energy for bio mass, re-used in construction or allowed to decompose.

Low Embodied Energy:

- Using a structural timber frame enables the engineer to eliminate the requirement for any steel framing. Steel is a material with high embodied energy, therefore it is highly beneficial to be able to eliminate it from the superstructure.

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- Avoid the use of high embodied carbon materials such as concrete and steel where possible.
- Low carbon high recycled content of insulation materials: Wood fibre, breathable systems with recycled denim acoustic insulation between floors.
- Lime plaster is a sustainable building material, Lime mortar is made from limestone, which absorbs CO2 from the atmosphere as it hardens and sets. The lime mortar production process is completely carbon neutral due to all CO2 emissions that are expelled are then completely reabsorbed. Therefore, using lime mortar as a building material helps to reduce greenhouse gas emissions into our atmosphere.

Long life materials over uPVC:

- Aluminium rainwater goods are to be specified and installed rather than uPVC. These are more durable and can be easily recycled at the end of their life cycle.

Sustainable Vapour Control Layers:

- The airtight, watertight paper based vapour control layer will be used instead of the more commonly used polythene membranes. The IZOPERM Plus ECO consists of up to 60% renewable FSC paper for healthier buildings.

High Specification Glazing system:

- Triple glazed timber windows and doors are to be specified on this project, utilising the zero carbon qualities of 100% FSC certified timber from a UK company such as Bereco that manufactures triple glazed windows that achieve a U value as low as 0.8 W/m2k.

General:

- All materials for the project have been selected for their compatibility and contribution to achieve an overall low-carbon construction for the project.

5.0 Efficient Water Use:

Water fittings with each house will be specified with the following (or similar) flow rates to meet a water consumption of 105 l/p day:

Wash Basin taps	4 l/min
Showers	7.5 l/m
Bath	140 l to overflow
Dishwasher	1.2 l/place setting
Washing Machine	9 l/kg load
WC	6/3 l dual flush
Kitchen tap	6 l/min

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500 Litre water butts will be fitted to each house within the garden, promoting the use of rainwater within the garden.

The water meter will have a pulsed output to allow for the connection to any Building Management System. Leak detection with be installed within each plot to highlight any major leak on the mains water supply.

6.0 Sustainable Urban Drainage:

The site is located in Flood Zone 1, the lowest of the 3 flood risk zones, with no areas prone to flooding in the immediate vicinity.

The roof area of each house has been calculated and appropriately sized attenuation tanks and boreholes will be situated in each garden. (Refer to 1739_3.040_As proposed drainage strategy).

A pond has been proposed to act as a buffer during exceptionally wet months. With carefully arranged gradients from the permeable driveway area, any excess surface water will flow towards the pond area.

7.0 Climate change mitigation:

Each house will be built to exceed the building regulation energy performance targets, with onsite electricity generation. Care has been taken to specify 'low flow rate' appliances and taps.on.

The floor plans of each house have been well thought through and are adaptable, with options to expand into the roof space, convert a downstairs room to an accessible bedroom. Adaptable dwellings are an important part of climate change mitigation, creating sustainable future proof housing.

As part of the 'Be Seen' strategy, a smart energy metering system will be installed at each property along with solar generation monitoring to allow each resident other to develop a greater awareness of of the energy demand of the house.

A well thought through native planting and landscaping scheme has been proposed for each house and the common access areas. It is shown through the BNG metric that the site will benefit from an improved Ecology and Biodiversity Net Gain of at least 10%.