THERMAL & ACOUSTIC SOLUTIONS LTD

Accredited S A P / S B E M & Code for Sustainable Homes Assessors – BREEAM - Air Pressure Testing - Smoke Tests – Acoustic Design & Testing - U Value Calculations - Acoustic Specifications – Part G Water Calculations

Predicted Energy statement

For

Land Adjacent

11-13 Meeting House Lane

Ringwood

Hampshire

BH24 1AY

Prepared by

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The proposed scheme will be required to contribute to mitigating the effects of climate change as part of the planning authorities Renewable Energy Provision for Residential and Non-residential Developments

The Local Plan sets out a strategy and policies for the use, development or protection of land and buildings in the Plan Area for the period 2016 to 2036. The Plan Area is those parts of New Forest District outside the New Forest National Park.

The Local Plan forms part of the statutory development plan for the Plan Area (together with any Neighbourhood Plans and the Hampshire Minerals and Waste Plan). The policies of the statutory development plan are the basis for deciding planning applications for development.

The proposed scheme comprises a site of 1 new Apartment to be constructed into the roof of an already existing development, located outside the New Forest National Park.

In conjunction with the above, we anticipate that the generation of energy needs for the proposed dwellings could be achieved using enhanced thermal elements. The use of biomass technology is not considered appropriate for this site.

We look at renewable technologies further in this report.

Sustainability

New Forest District (outside the National Park) Local Plan Part 2: Sites and Development Management (2014)
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Saved Policy DM4: Renewable and low carbon energy generation.

Policy DM4: Renewable and low carbon energy generation

The benefits associated with development proposals relating to renewable energy schemes will be given significant weight, if they avoid unacceptable impacts on:

- land uses, including all nature conservation designations (regarding any impacts on international designations within, or near to, the Plan area) and heritage assets, including the setting of heritage assets.
- the immediate and wider landscape, giving particular importance to impacts on the New Forest National Park and the Cranborne Chase and West Wiltshire Downs AONB.
- residential amenity both during and after construction; and

- the road networks.

Permitted development rights often allow the installation of microgeneration renewable technologies on residential properties. Micro-generation schemes which do require planning permission will be encouraged where they comply with Policy DM4 and other policies of the Local Development Framework.

Renewable Energy

Development proposals for, or incorporating, Renewable energy generation, other than wind energy, will be permitted where they:

- are small-scale and provide energy for individual households or businesses, or for small local community facilities.
- are located and designed to have minimal visual impact; and
- do not have adverse impact on the landscape character, heritage assets, natural beauty, wildlife, tranquillity, or other special qualities of the National Park.

Developments likely to have an adverse effect on a designated nature conservation site (including Natura 2000 sites, Sites of Special Scientific Interest and National Nature Reserves) will not be granted.

The NPPF supports the delivery of renewable and low carbon energy and associated infrastructure and requires local planning authorities to have a positive strategy to promote energy from renewable and low carbon sources. The NPPF places the responsibility on all communities to contribute to energy generation from renewable or low carbon sources. In response to this requirement, the Authority has taken a positive approach to appropriate renewable energy proposals in the National Park. This includes the allocation of grant funding to support local community renewable energy projects; and the support offered through the planning system to proposals that respect their location within a nationally protected landscape.

Sustainability targets associated with this site are as follows.

- Local Planning requirements
- To ensure that the buildings meet the client's aspirations.

This report considers a site of 1 new Home. Passive and efficiency measures will be put at the forefront of the design before renewables are considered.

Key energy efficiency measures in the design will include.

- High efficiency heating systems
- Energy efficient lighting
- Improved U-Values
- Lower water usage of <110 litres per person per day.
- Good air permeability standards
- Time and temperature controls on the heating systems
- Use of recycled building materials

The carbon in both the construction material and the construction method needs to be balanced. against the likely carbon usage of the site. As we move towards carbon neutral buildings the embedded carbon becomes a much more significant issue associated with the carbon footprint of a building.

Active energy efficiency measures are fundamental to assist the LZCT proposed meeting the remaining load. It is well understood that in the case of dwellings, heating and hot water are historically the most significant loads.

The intention is to reduce heat loss in the building elements by specifying and introducing enhanced. U values along with improvements in the air permeability beyond the minimum targets set down in the Building Regulations.

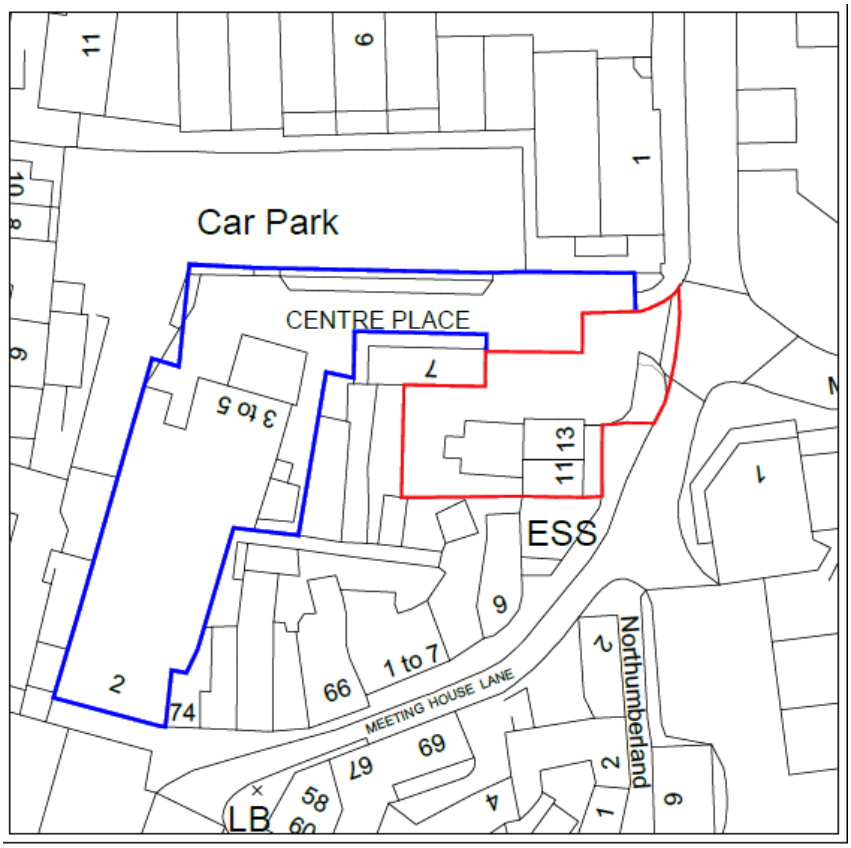
The dwelling will have an electricity supply and Photovoltaic Panels may be incorporated.

Lighting is intended to be minimised using 100% energy efficient fittings.

If the building is to be truly sustainable then this must be reflected in how it will be operated. As far as practically possible the systems in the building will be passive and simple requiring little user interface, thereby minimising the risk of systems not working effectively. This includes the enhanced. fabric selections and optimised system efficiencies.

Small power is currently considered as an unregulated load and outside of a building's regulation. carbon assessment and is realistically outside of the design team's control. For a building to be truly carbon effective, these loads must be considered in how the building is to be used. To this end, the design will consider the ways in which the energy used by equipment can be monitored and fed back. to the users to encourage them to be efficient in the way in which they interact and work within the building and potentially save themselves money.

Fig 1. Site location plan



A look at LZCT Options

ASHP

Air source heat pumps (ASHP) absorb heat from the outside air. This heat can then be used to heat radiators, underfloor heating systems, or warm air convectors and hot water in your home.
An air source heat pump extracts heat from the outside air in the same way that a fridge extracts heat from its inside. It can get heat from the air even when the temperature is as low as -15° C. Heat pumps have some impact on the environment as they need electricity to run, but the heat they extract from the ground, air, or water is constantly being renewed naturally.

The benefits of ASHPs
- lower fuel bills,
- potential income through the UK government's Renewable Heat Incentive (RHI)
- lower home carbon emissions, depending on which fuel you are replacing.
- no fuel deliveries needed.
- can heat your home as well as your water.
- minimal maintenance required.

Based on benchmark data it is estimated that circa 86% or regulated energy is associated with heating and hot water which the ASHP can be used to provide

Planning constraints: Generally, have a low impact on planning.
Land use: Require space for an external and internal unit.
Noise: Units can produce a little noise.

An ASHP delivering all the heating and DHW could deliver around 50 – 60% of the on-site renewable energy.

Strategy Decision – Air source heat pumps will be a good choice of renewable energy providing heating and hot water, the largest demand of a home. However, noise and visual impact may be an issue. The size of the property and its roof location may also be a complication.

Photovoltaics

Photo-voltaic systems convert energy from the sun into electricity through semi-conductor cells.
Systems consist of cells connected and mounted into modules. Modules are connected to an inverter to turn their direct current (DC) output into alternating current (AC) electricity for use in buildings.
PV systems require only daylight, not sunlight, to generate electricity (although more electricity is produced with more sunlight), so energy can still be produced in overcast or cloudy conditions.

Photovoltaics are generally blue/grey in colour and can be used successfully in all parts of the UK.

There should be very little maintenance required as the technology has no moving parts. If there is a large bird population in the area, they should be discouraged from perching on or near the PV cells as quantities of bird excrement on the panels will affect their performance. Bird excrement is unlikely to be washed away by rain.

PV panel systems are vulnerable to vandalism. This may be a consideration for this project.
The output of the panel should be monitored so that if the output is much lower than expected, the panels and set up can be inspected and if necessary, cleaned.

Planning constraints: PV panels on a roof generally have a low impact on planning.

Land use: PV panels are typically positioned on a building's roof and so do not use any additional land over the building's footprint.

Noise: PV panels do not produce any noise when in operation.

It is expected that all the energy would be used in the buildings or on site.

Strategy decision: PV is a preferred solution; However, this would depend on Planning acceptance of the visual impact.

The technologies below have not been considered in detail for the following reasons.

Technology	Reason not to explore
Biomass heating and hot water	Not appropriate
CHP	Not appropriate as a central system would not be considered appropriate for the project. In addition, an individual micro CHP for each unit was considered higher maintenance/risk than conventional systems.
Wind turbines	Low wind speed on site limits the viability of a turbine. There is no space for a free-standing turbine and small roof mounted turbines will not contribute significantly and there is considerable variation in performance.
Ground sourced cooling / borehole cooling/water source heat pumps	Buildings will have no significant need for mechanical cooling. No outside space.

Solar thermal	Solar thermal systems - Limited roof space for the amount that would be needed to achieve a reasonable supply of hot water.
Community heating using waste heat/renewable heat sources	No known source at site
Biogas from anaerobic digestion, geothermal energy, micro hydro power, tidal/wave power	No known source at site
Fuel Cells using Hydrogen	Emerging technology
ASHP	Noise and visual impact of outdoor units

District Heating

Though District heating has many benefits there are no known sources available for this in the area of the build at this current time.

There are about 17,000 heat networks in the UL, of which approximately 5,500 are district heat networks and 11,500 are communal heat networks.

Design and construction proposals

Approved document L1 – Conservation of fuel and Power in New dwellings sets the standards for carbon emissions from new dwellings and was last revised in 2021, to which this residential development will comply, thereby exceeding the requirements of the 2012 Edition of the Approved Document by 31%.

The property will need to comply with the criteria set out in the document, as follows:

1) The predicted Dwelling Emission Rate of CO2 emissions from dwellings (DER) is not greater than the Target Emission Rate (TER), as referred to above exceeding the requirements of the former 2012 Edition of the Approved Document by 31%.

2) The performance of the building fabric and fixed building services should be no worse than the design limits set out in Table 2 of the Approved Document.

3) The dwelling will have appropriate passive control measures to limit the effect of solar gains on indoor temperatures in summer.

4) That the performance of dwelling as built comply with the DER values achieved, including site testing of a representative sample of dwellings demonstrating that the 'air permeability' rate achieved is as per that specified, or better.

5) The necessary provisions for energy efficient operation of dwellings are put in place, including operation and maintenance instructions aimed at achieving economy in the use of fuel and power in a way that householders can understand.

The site will opt for a construction and design in order to implement higher U-Values to surpass Building regulation Requirements. The chart below shows the design limits and predicted for the site.

Element	Building Regulations Part 1A	Proposed
Walls	0.26	0.18 – 0.2
Floor	0.18	0.12 NA
Roof	0.16	0.11 – 0.15
Glazing	1.6	1.4
Air Permeability m3/ (h.m2) at 50Pa	8 m3/ (h.m2)	5 m3/ (h.m2)

Predicted SAP Calculations will be run using proposed layout plans and the results will show an improvement over Building Regulations with the use of high efficiency heating and renewable technologies.

Conclusion

It is in our professional opinion that renewable technology would greatly improve the performance of this dwelling; however, the visual impact may be of concern due to the location and New Forest limitations on any visual impact on design. Regardless of the implementation of solar Photovoltaics, this property will be designed with high levels of insulation and air tightness and surpass current Building Regulation requirements Part L1 2021 for fabric requirements.

Primary energy will require electric heating and renewable sources to aid compliance. This will be a design stage investigation.

The DER of the calculation will need to achieve less than the TER. And under new Regulations Part L 2021 we will be 31% better than previous Regulations Part L 2012.