



Energy and Sustainability Statement

Erection of a detached dwelling land adjacent to 6 Drivers End Lane

G C Planning Partnership Ltd, Bedford i-Lab,
Stannard Way, Bedford MK44 3RZ

079506490955
Enquiries@gcpp.co.uk

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1 INTRODUCTION

- 1.1 This Energy and Sustainability Statement has been prepared to support a full application for the erection of a detached dwelling
- 1.2 Sustainable development is at the heart of the planning system and thus plans and decisions apply a presumption in favour sustainable development, in order to support the transition to a low-carbon future in a changing climate, taking into account flood resilience, reductions in greenhouse gas emissions, making effective use of land, minimising vulnerability and supporting renewable and low carbon energy.

2 POLICY AND GUIDANCE

- 2.1 National and local policy advocates compliance with energy standards that exceed Building Regulations by measures that include energy from decentralised, renewable or low carbon sources and carbon efficiency measures.

Policy SP1: Sustainable development in North Hertfordshire

This Plan supports the principles of sustainable development within North Hertfordshire. We will:

- a) Maintain the role of key settlements within and adjoining the District as the main focus for housing, employment and new development making use of previously developed land where possible;
- b) Ensure the long-term vitality of the District's villages by supporting growth which provides opportunities for existing and new residents and sustains key facilities;
- c) Grant planning permission for proposals that, individually or cumulatively:
 - i. deliver an appropriate mix of homes, jobs and facilities that contribute towards the targets and aspirations in this Plan;
 - ii. create high-quality developments that respect and improve their surroundings and provide opportunities for healthy lifestyle choices;
 - iii. provide the necessary infrastructure required to support an increasing population;
 - iv. protect key elements of North Hertfordshire's environment including biodiversity, important landscapes, heritage assets and green infrastructure (including the water environment); and
 - v. secure any necessary mitigation measures that reduce the impact of development, including on climate change; and
- d) Support neighbourhood plans and other local planning initiatives where they are in general conformity with the strategic policies of this Local Plan.

The National Planning Policy Framework (as amended)

- 2.2 The Framework identifies three dimensions to sustainable development. These are: economic, social and environmental. These dimensions give rise to the need for the planning system to perform a number of roles:
- An economic role – contributing to building a strong, responsive and competitive economy, by ensuring that sufficient land of the right type is available in the right places and at the right time to support growth and innovation; and by identifying and coordinating development requirements, including the provision of infrastructure;
 - A social role – supporting strong, vibrant and healthy communities by providing the supply of housing required to meet the needs of present and future generations; and by creating a high-quality built environment, with accessible local services that reflect the community's needs and support its health, social and cultural well-being; and
 - An environmental role – contributing to protecting and enhancing our natural, built and historic environment; and, as part of this, helping to improve biodiversity, use natural resources prudently, minimise waste and pollution, and mitigate and adapt to climate change including moving to a low carbon economy.
- 2.3 The three dimensions of sustainable development are given equal weight. They are not considered in isolation because they are three integral dimensions of sustainable development.
- 2.4 The planning system should support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change. It should help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and

improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure.

- 2.5 Plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating from rising temperatures. Policies should support appropriate measures to ensure the future resilience of communities and infrastructure to climate change impacts, such as providing space for physical protection measures, or making provision for the possible future relocation of vulnerable development and infrastructure.
- 2.6 In determining planning applications, local planning authorities should expect new development to:
- a) comply with any development plan policies on local requirements for decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not feasible or viable; and
 - b) take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption.

IMPLEMENTATION

- 2.7 This section assesses methods of control and mitigation in line with National and Local policy and guidance, with respect to the following –
- Pollution and air quality;
 - Construction: materials and self-build;
 - Carbon emissions and energy efficiency;
- Minimising water use;

- Flooding and surface water drainage;
- Waste

POLLUTION AND AIR QUALITY

- 2.8 The development is expected to minimise the emission of pollution into the environment and consider emissions from heating, cooling and ventilation plant.
- 2.9 The design, layout and orientation of the new dwelling has been established to maximise natural ventilation, cooling and avoid excessive solar gain. The proposed dwelling is orientated with the front façade facing a south-westerly aspect and the rear façade facing north-easterly. The front façade will benefit from morning daylight/sun for most of the day with the rear façade enabling daylight/sun during early evening onwards. Windows have been located and sized to provide effective daylight whilst avoiding excessive solar gain. Most windows would be openable which aids natural ventilation.
- 2.10 The proposed dwelling could implement a heat pump system such as electric air-to-water. Air source heat pumps (ASHPs) 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. ASHPs extract heat from the outside air and 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. Unlike gas and oil boilers, heat pumps deliver heat at lower temperatures over much longer periods. During the winter they may need to be on constantly to heat your home efficiently. The overall benefits of using an ASHP are as follows –
- Lower fuel bills, especially if you are replacing conventional electric heating.

- 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.
- Can be easier to install than a ground source heat pump (Air Heat Pump as additional option).

- 2.11 Photo-voltaic tiles could be fitted to the most suitable roof slope and could provide most of the electricity requirements for the building. Surplus energy could either be stored in batteries or provided to the grid.
- 2.12 The new dwelling would incorporate double and powder coated triple glazed windows to maximise thermal and acoustic insulation.
- 2.13 A pre-treatment SuDS system would provide treatment of water through the removal of contaminants.

CONSTRUCTION:

Materials

- 2.14 The proposed materials will be in keeping with the surrounding context in order to achieve a high-quality development. The Framework confirms that good design is a key aspect of sustainable development. Materials will be sourced from local businesses where possible. The foundations and floor slab would be constructed with concrete. The development would have roof cavity insulation.
- 2.15 The specification of materials will be based on the 'Green Guide to Specification' with principal elements being selected for the achievement of an 'A' rating.
- 2.16 Up to 30% of heat loss in a modern, well-insulated building are estimated to result from 'air leakage'. Heat escapes through gaps in the building envelope, such as around a pipe fitting or between poorly fitted slabs of wall insulation. Airtightness is a procedure that measures 'uncontrolled' ventilation rates throughout a house, including designed ventilation. The Approved Document for Part L1A states "A reasonable limit for the design air permeability is 10m³ /h/m² at 50Pa." The proposed dwelling could incorporate the following practices for improving airtightness –
- Use sealant materials to fill any gaps around windows and door frames.
 - Apply mastic seals to windows and doors.
 - Apply a bead of mastic to seal gaps between the wall reveals/window boards and external doors.
 - Apply draught proofing to gaps around window opening casements and sashes.
 - Seal gaps around service pipes and the cables that pass through external walls, ceilings and ground floors.
 - Maintain a good seal around boiler flue pipes where they pass through the external wall or ceiling.

- Improve the air tightness of suspended timber floors by laying hardboard sheeting over the top to cover any gaps between the floorboards.
- Ensure any loft hatches fit into their apertures and apply draught stripping between the hatch and frame.
- Resolve any damage to mortar joints and any holes in the external walls.
- In dry-lining applications, inject continuous ribbons of expanding polyurethane foam between the plasterboard sheets and inner leaf blockwork.

Self-build

- 2.17 Achieving an appropriate housing mix is a vital element in seeking to create sustainable, inclusive and mixed communities. The key source of evidence for determining housing mix is the Council's Strategic Housing Market Assessment. It analyses the need for different sizes and types of dwellings, recognising that households of different ages and compositions will have differing needs. The proposal is a self build but not in line with the self build Act 2015.
- 2.18 Local plan policies emphasises local and national government support for self-build projects and sustainable development. Self-build projects are a key player in delivering sustainable development, meeting local housing need and encouraging owner-occupation.

CARBON EMISSIONS AND ENERGY EFFICIENCY

- 2.19 A calculation for the development will be based on benchmarks given in the Renewables Toolkit and CIBSE Guide F. These loads assume compliance with Part L.

- 2.20 Good practice benchmarks for carbon emissions are given in the London Renewables Toolkit for Planners, Developers and Consultants (2004).
- 2.21 The design and the fabric of the new building will create an optimum balance between minimising heat loss, utilising passive heat from the sun, maximising daylight penetration and minimising infiltrations while meeting the Building Regulations carbon benchmarks and ventilation criteria.
- 2.22 The typical measures to reduce energy consumption fall into the four categories set out below, and these have been assessed for this development:
- The passive design of the Proposed Development
 - Energy efficient building services
 - Combined heat and power
 - On-site renewable energy generation
- 2.23 Regarding passive design, features within the proposed development are likely to include enhanced U values that fall below the elemental maximum average values set out in Part L of the Building Regulations.

Element	U Value (W/m ² K)
• Walls	0.24
• Roofs	0.10
• Floors	0.14
• Windows	1.40
• Doors	1.40

- 2.24 The measures that could be used to achieve the 10% saving above that required by building regulations are: windows containing low-E argon filled double glazed units with a solar transmission (G value) of 0.2 to 0.3 (compared with 0.65 for clear double glazing); balancing the ratio of glazing to solid wall so that larger glazing areas, to provide the necessary daylight and views; opening windows and trickle vents to L1A and air tight construction to control infiltration to below $7\text{m}^3/\text{m}^2/\text{h}$, i.e. below the requirements of Part L 2013.
- 2.25 The development will achieve a 10% reduction in carbon emissions below the standards set out within Approved Document L1A: Conservation of fuel and power in new dwellings 2013 edition and Approved Document L2A: Conservation of fuel and power in new buildings other than dwellings 2013 edition, DCLG March 2014 (as amended).
- 2.26 The following measures may be incorporated into the development to minimise carbon emissions and ensure energy is efficiently used:
- The use of energy efficient lighting;
 - The installation of energy efficient appliances;
 - A drying space will be provided to avoid the need for a tumble dryer;
 - Air pressure test to achieve 5.00 or less;
 - The insulation of the building to exceed that required by building regulations;
 - Little construction waste – recycle where possible;
 - Cycle storage will be provided;
 - E.V charging points will be provided;
 - Time and temperature zone controls; and
 - Heating could be in the form of Air Source with separate controls for heating and hot water with an interlock timer and thermostatic radiator valves to each room if required or with underfloor heating.

2.27 There are a number of ways to reduce the carbon footprint and achieve the 10% saving over that required by building regulations. One means is to incorporate renewable energy generation within a development. Methods of generating renewable energy are:

- Solar hot water (solar collectors);
- Photovoltaics;
- Wind turbines;
- Combined heat and power (biomass);
- Geothermal energy;
- Ground source heat pumps;
- Borehole cooling;
- Solar air heating;
- Fuel cells using hydrogen from renewable source; and
- Gas from anaerobic digestion.

MINIMISING WATER USE

2.28 The new dwelling would be fitted with a smart water meter.

2.29 A water butt will be installed. Consideration will be given to a grey water system to serve the toilets.

2.30 The residential unit would have new sanitary ware featuring water saving devices, such as 6/4 Dual flush WCs and low flow taps.

- 2.31 The measures will ensure that water usage is minimised and the development will achieve the higher water efficiency standard in the Building Regulations Approved Document G: Sanitation, hot water safety and water efficiency, 2015 edition, DCLG October 2015.

FLOODING AND SURFACE WATER DRAINAGE

- 2.32 The use of permeable block paving where appropriate would-be SUDS compliant. Soakaways to the new dwelling would be part of a surface water management system.
- 2.33 A rainwater harvesting system would collect stormwater from roofs or paved surfaces (via guttering and downpipes) in an underground or over-ground tank for use on site. The subsequent water store can be used for flushing WCs, supplying washing machines, irrigating the garden and for other non-potable purposes. Harvesting rainwater reduces future occupants need for water from the mains, thus minimising pressure on the conventional supply and can cut domestic bills. It is also beneficial on the drainage system as it holds run off rather than allowing it to run directly into the drains. Heavy precipitation is expected to increase; widespread rainwater harvesting could reduce the risk of local flooding.
- 2.34 A greywater harvesting system could be incorporated, which would re-use water that has been used for showers, hand washing and washing machines. It has to be channelled into a treatment unit where it is filtered and disinfected before it is re-used. It can then be sent to a storage unit and linked up to WC's around the home. This would boost the proposed dwellings sustainability merits, reduce the mains use and thus minimise the dwellings environmental impact.
- 2.35 The proposal would meet the requirements of Part H of Building Regulations.

WASTE

- 2.36 Space will be provided on the site for the storage of bins and compost bin. The development would utilise the Council's existing residential waste collection and recycling service.
- 2.37 Construction waste would be minimised and recycled where possible. As part of the Site Waste Management Plan, site operations will include designating locations for depositing and stacking materials prior to delivery; recycling skips will be provided; trades will generally be required to dispose of their own waste; colour coded or label waste skips will be provided and these will be protected from contamination, rain and wind; particular skips will be locked at night and weekend to prevent rubbish dumping; reputable waste service providers will be used and recycling paybacks will be negotiated with local resource recovery firms.

3 CONCLUSIONS

- 3.1 The proposed dwelling will utilise sustainable construction techniques, facilitate the efficient use of resources during construction and in use and seeks to adapt to, and mitigate against, the impacts of climate change. The proposed dwelling would achieve a 10% reduction in carbon emissions below the Building Regulation requirement, as set out in Approved Document L1A: Conservation of fuel and power in new dwellings, 2013 edition and Approved Document L2A: Conservation of fuel and power in new buildings other than dwellings, 2013 edition. DCLG March

2014 (as amended) and achieve the higher water efficiency standard in the Building Regulations, as set out in approved Document G: Sanitation, hot water safety and water efficiency, 2015 edition, DCLG October 2015.

- 3.2 The proposal complies with the development plan and the Framework. A number of material considerations have been identified that provide further weight in favour of the development. In these circumstances, there exists a presumption in favour of development and planning permission should be granted.