



SUSTAINABLE CONSTRUCTION, ENERGY, WATER AND CARBON REDUCTION STATEMENT

Proposed new dwelling

LAND ADJACENT TO 25 CHAPEL LANE LETTY GREEN
SG12 2PA



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INTRODUCTION

The proposal has been designed to reduce the energy demand of the new dwelling and the carbon emissions created by the development in accordance with National Planning Policy set out in section 14 of the NPPF and policies CC2, CC3 and DES4 of the adopted District Plan.

The application is submitted with a Sustainability checklist and Biodiversity Checklist and the following statement sets out the sustainable construction, energy and water consumption measures that will reduce energy demand; promote energy efficiency and lower carbon emissions:

1.00 ENERGY AND CO2 EMISSIONS

The proposal has been designed in accordance with the Energy Hierarchy as set out in the District Plan: via passive design and orientation; fabric performance and energy efficiency. This ensures that its construction includes measures to reduce carbon emissions through thermal performance, high levels of insulation, good levels of air tightness and installation of high performance windows and doors. Its simple external form also minimizes surface area and thereby heat loss.

The external walls, roof, floor, windows and doors of the dwellings will be super insulated, airtight and wind tight.

The simple external insulated brickwork and rendered blockwork walls will provide thermal mass and maintain a stable internal temperature, delaying heat gain in the building fabric on warm days and releasing it slowly as external temperatures fall. This limits the needs for space heating internally.

Materials of construction and building contractors will be locally sourced wherever possible - this will reduce the need for long delivery or work trips and thereby reduce CO₂ emissions and air pollution in transportation.

High performance double-glazed, and sustainably sourced windows and doors are proposed which will result in increase thermal energy in-use whilst being constructed from low embodied carbon materials.

The East Herts District Plan requires all new developments to demonstrate how carbon dioxide emissions will be minimized, achieving performance above and beyond current Building Regulation requirements.

The design approach to minimizing CO₂ emissions in this instance employs the following 3 considerations:

- The reduction of energy demand us good levels of insulation, natural ventilation and illumination, and shading to glazed areas.
- Increased energy efficiency through the use of efficient services and appliances, and low energy lighting.
- The use of low carbon technologies to provide heat.

Thermal Performance of the Building Envelope

Elements of the new structure will achieve or exceed the recommended/notional requirements of the Building Regulations (Approved Document L1A) in terms of thermal performance

Target 'U' values for individual elements will be as follows:

<u>Element</u>	<u>Target U Value</u>
Ground Floor	0.13W/m ² k
External Walls	0.18W/m ² k
Roofs	0.11W/m ² k
Glazing	1.2W/m ² k

All building elements will achieve a high standard of thermal insulation and inefficient cold bridging of the structure will be avoided by employing accredited construction details.

Ventilation and Illumination

The design incorporates large glazed areas to maximize levels of natural light within the building.

Large openable window areas will also provide excellent natural ventilation throughout.

The large south/east facing windows to the main living accommodation will be shaded by deep roof overhangs..

Internal Fittings

Energy consumption within the new house will be minimized through the use of A* rated electrical appliances, and low energy LED light fittings throughout.

Heating and Hot Water/Renewable Energy

The following options have been considered for the provision of renewable energy within the design:

Solar Thermal Panels

Solar thermal panels could be incorporated into the roof design. Panels could be positioned relative to the sun path to provide maximum efficiency.

The large flat roof area provides an excellent opportunity for the installation of solar thermal panels.

PV Solar Panels

Again there is potential to install numerous photovoltaic panels to contribute towards the overall energy demand.

Wind Turbines

Wind turbine technology could contribute towards the overall energy demand.

However, this has been discounted due to concerns over aesthetics, impact on neighbours, planning issues and economical viability.

Ground Source Heat Pumps

This technology has been considered due to the overall size of the site.

However, the initial study considered the extent of excavation/boreholes required and the proximity of the existing trees/root zones.

It was concluded that this was not a viable option to provide the heat loads required.

Air Source Heat Pumps

Air source heat pumps were considered as an alternative to a traditional gas fired boiler to provide space heating and hot water to the dwelling.

Space heating is to be provided by a wet underfloor heating system throughout and the operating temperatures would be compatible with the use of an air source heat pump.

Air source heat pumps operate at approximately 300% efficiency in terms of the amount of energy consumed to the amount produced, compared to traditional gas fired boilers which operate at approximately 90% efficiency.

It was therefore concluded that the use of an air source heat pump would be a viable low carbon technology for use with this project.

A detailed assessment and energy calculations will be carried out by a specialist consultant at the construction stage of the project, and an appropriately sized air source heat pump installation will be designed to suit.

2.00 WATER DEMAND

Reducing water consumption is an important sustainability issue.

It is proposed to reduce the water use within the dwelling through the use of low consumption fixed appliances and taps.

The maximum water consumption rate set out under current Building Regulations is 125l/person/day.

The target for this development is to reduce the consumption rate to 110l/person/day.

The principle of grey water recycling has been considered, but is viewed as being too cost prohibitive for use on this project, in terms of capital cost and payback period.

It is however proposed to install water butts to store rainwater for irrigation of the garden areas.

3.00 DRAINAGE & FLOODING

Flood risk is an important issue, and this risk is likely to increase with the effects of climate change.

It is necessary to ensure that the redevelopment of the site will not contribute to flood risk elsewhere, and to that end a number of sustainable drainage options have been considered.

There is a lack of nearby watercourses. The use of balancing ponds is feasible, but excavations to provide such features are likely to result in the damage to tree roots. The most practical sustainable surface water solution would be the use of soakaways.

The geology of the site would need to be assessed and if it does not lend itself to the efficient use of soakaway, It would be necessary to discharge surface water from the site into the existing public sewer.

The rate of discharge into the sewer will be limited in accordance with the parameters set by Thames Water, in order to avoid increasing the pressure on the existing local drainage infrastructure.

Surface water discharge into the sewer will be limited by a proprietary flow restrictor, which will result in the need for an underground tank to store surface water following peak storms, before it can be gradually discharged into the sewer.

Calculations will be undertaken to ensure that the storage tank will be suitably sized to cope with surface water from a 1 in 100 year storm event, with a 40% factor applied to accommodate climate change.

The calculation will take into account the footprint of the proposed dwelling, together with any other drained hard surfaces.

Rainwater run off from the site will be minimized by the use of a permeable gravel driveway and parking area surface

4.00 SUSTAINABLE DESIGN FEATURES

The design of the dwelling also includes the following features, which will contribute to it's sustainability:

- The re-use of existing developed land
- Space for bicycle storage
- A home office which will encourage home working and reduce journeys
- High speed broadband will be incorporated, which again will encourage home working
- Space allocated for the separate storage of recyclable waste.
- Rooms within the dwelling will be provided with mechanical extract ventilation, suitable for use as drying spaces
- Numerous mature trees and hedgerows exist on the site, which would be retained and will contribute towards sustaining local wildlife

5.00 POLLUTION

Air Quality pollution in the construction of the development will be mitigated through the use of locally sourced materials wherever possible (to reduce transportation journeys for materials) and the provision of secure cycle storage so that cycling is a genuine transport option for future residents.

Where car use is required, electric vehicle charging points can be provided.

All these factors will ensure that future occupiers are able to minimize the use of energy and air pollution.

The applicant is keen to ensure that the development does not have any adverse impact on lighting in this rural location and there are no proposals for significant elements of external lighting.

Where access or security lighting is required, it will be low level and via timer to reduce both energy use and light pollution.

6.00 BIODIVERSITY

A biodiversity checklist accompanies the application and the local planning authority is referred to this document.

A biodiversity net gain is proposed for the developed site – please refer to the separate ecology report.

7.00 SUSTAINABLE TRANSPORT

The site is located 2.9 miles south west of Hertford town centre. Hertford North train station is some 2.6 miles away, and Hertford East 3.5 miles.

The nearby bus stop at Cole Green is a 10 minute walk away, and offers a regular bus service into the town.

The town offers extensive employment, retail and leisure facilities, together with good transport links to the surrounding areas via bus and rail.

Electric vehicle charging points can be provided to limit emissions made from any other necessary car trips. This can be secured by planning condition.

The proposal includes the provision of secure bike storage as shown on the submitted plans and this can be secured by planning condition.

National Cycle Network Route 61 runs to the rear of the application site, providing excellent cycle connections to both Welwyn Garden City and Hertford.

8.00 WASTE MANAGEMENT

Waste prevention measures will be incorporated into the construction of the dwelling such as using recycled aggregates and locally source materials with a longer lifespan.

Kerbside waste and recycling facilities are available through the Local Authority household refuse scheme, and there is provision for refuse bin storage on site. Composting facilities will also be used.

Further refuse details can also be secured by condition if considered necessary and reasonable.

CONCLUSION

Overall, the energy strategy for the site will be consistent with the NPPF and policies CC1, CC2 and CC3 of the adopted District Plan. It also meets the aims and objectives of the Council's Sustainability SPD.