

161 West End Lane, NW6 2LG

Ground Floor Rear extension to create a 1x1bx2p apartment(re-submission)

Energy and sustainability report

1.0 Introduction and Policy

The proposal for the creation of a new dwelling is an opportunity for using sustainable construction and considering the following measures:

- Heat pump for the provision of underfloor heating and hot water
- High thermal mass
- Air tightness and natural ventilation
- Solar heat gain and heat loss reduction

Camden Planning guidance states that development should be sustainable in design and construction:

- Development should seek to be durable and adaptable to reduce resource use over time to include effective layout of infrastructure servicing development.
- The layout and design of buildings and planting can reduce energy and water use and mitigate against flooding, pollution and overheating.
- Development should be durable and robust in construction to enable where appropriate, flexibility and adaptability over time to accommodate a range of uses.
- Environmentally friendly materials, and well-designed building patterns and/or building forms that facilitate sustainable resource use and enable climate change mitigation are encouraged.

2.0 Proposal

To supplement the Council's requirements for sustainable construction the design team have considered the three issues that contribute to the proposed developments overall sustainability. These are environmental, economic and social

2.1 Solar/Daylighting

The proposed development will make good use of glazing to all but one elevations to help reduce internal lighting loads.

Where possible the following daylight factors will be met

- Kitchen areas are anticipated to achieve a minimum average daylight factor of at least 2%.
- Living room, dining room and work areas are anticipated to achieve a minimum average daylight factor of at least 1.5%.

2.2 Ventilation

Natural ventilation is proposed for the new dwelling with mechanical extracts provided for the kitchen and bathroom. These will have efficiencies in line with current Part F of the building regulations.

2.3 Overheating

None of the areas in the proposal show any risk of overheating. To reduce the risk of solar gains and reduce the need for mechanical ventilation or cooling, the London Plan Cooling Hierarchy has been used. The steps and measures included within the design are outlined below

- Minimise internal heat generation through energy efficient design - The building has been designed in such a way to reduce the internal generation within rooms. Based on the usage of the rooms within the building it is unlikely that there will be significant amounts of internal heat generated.
- Reduce the amount of heat entering a building in summer through orientation, shading, fenestration, and thermal mass in roofs and walls - The orientation of the building is such that there no windows that face South, this will greatly reduce the solar gains.
- Manage the heat within the building through exposed internal thermal mass and high ceilings- The building design will include materials with a high thermal mass to help manage the heat within the building.
- Passive ventilation - The building will make use of a natural ventilation strategy to ensure all areas are ventilated to an adequate level and reduce heat levels within the building.

2.4 Lighting

The building electrical system will be designed such that all internal lighting will be low energy fittings. To be classified as a low energy light fitting under the Domestic Building Services Guide the fitting must have an efficacy of 45 lumens per circuit watt or higher.

2.5 Insulation and fabric performance

High performance insulation will be specified throughout and will have a GWP of <5 and zero ODP. The effects of cold bridging and air infiltration will be addressed prior to construction. Low U values have been specified in order to reduce the carbon emissions for the development.

2.6 Materials

All timber sourced has Forest Stewardship Council (FSC) or Programme for the Endorsement of Forest Certification PEFC) certification. This is to ensure that the timber is legally and sustainably sourced. All bricks will be second hand London Stocks. In addition all reclaim materials will be sourced from local re-claimed centres within 5 miles.

2.7 Heating and cooling

It has been assumed for the purposes of this report that the proposed heating strategy will be air source heat pump for both hot water and main heating system.

3.0 Renewable Technologies

As part of the decision-making process required to determine the feasibility of suitable low carbon and renewable technologies, we considered the following:

1. Solar PV

This technology could achieve 35% reduction in CO2 emissions, but it may be too obtrusive for a conservation area, however, once the detailed building Control submission will be made, these may need to be used in conjunction with other measures such as heat pumps.

2. Solar Thermal

The proposed development would have low to medium hot water demand which if sized correctly tends itself to solar thermal, however it is unlikely that 35% reduction could be achieved through this technology alone.

3. Air source heat pumps

Air source technology could be used in this development and it would be recommended that it is housed in the proximity of the rear extensions to the barn where it presents less of a visual issue. This system would provide both heating and hot water, thus presenting an economical way for such development

Approximate assessment for CO2 emissions after each energy hierarchy stage for the development and comparison with Building regulations

| | Total Regulated carbon dioxide emissions across for the development (Tonnes CO ₂ per annum) |
|-------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Baseline: Part L 2013 of the Building Regulations Compliant Development | 3.10 |
| After Energy Demand reduction | 2.71 |
| After heat network/CHP | 2.71 |
| After renewable energy | 2.01 |

| | Total Regulated carbon dioxide emissions savings | |
|------------------------------------------|--------------------------------------------------|-------|
| | (Tonnes CO ₂ per annum) | (%) |
| Savings from the energy demand reduction | 0.39 | 12.58 |
| Savings from heat network/CHP | 0.00 | 0.00 |
| Savings from renewable energy | 0.70 | 25.83 |
| Cumulative on site savings | 1.09 | 35.16 |
| Annual savings from off-set payment | 2.01 | |
| (Tonnes CO ₂) | | |
| Cumulative savings for off-set payment | 60.3 | |

The above approximate calculations are based on a similar development completed in 2022 with the following u values for the fabric and renewable technologies:

- air source heat pumps
- external walls U value 0.15 W/m²k
- roofs U value 0.15 W/m²k
- windows and doors U value 1.2 W/m²k
- air permeability figure of [4.5m³/h/m²@50Pa](#)

4.0 Be Seen

4.1 Prior to occupation

Prior to first occupation, all carbon reduction energy efficiency measures shall be implemented and a Verification Report shall be submitted to the Local Planning Authority and approved in writing. The Verification Report shall demonstrate (with photographic evidence) that the energy efficiency measures have been implemented. These measures shall be retained and maintained as such thereafter in accordance with the Energy Statement and Verification Report.

4.2 Post completion testing and monitoring

The policy requires the monitoring of the 'as-built' performance of the building. Monitoring will be achieved for this dwelling with the installation and continuous monitoring of smart meters.