13 Kemplay Road, London
Energy & Sustainability Statement

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Version 1

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JAWSustainability

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1 Introduction

The development comprises of the redevelopment of 13 Kemplay Road, London. The proposed scheme includes the demolition of an existing residence followed by the construction of a new build residential dwelling with greater floor area.

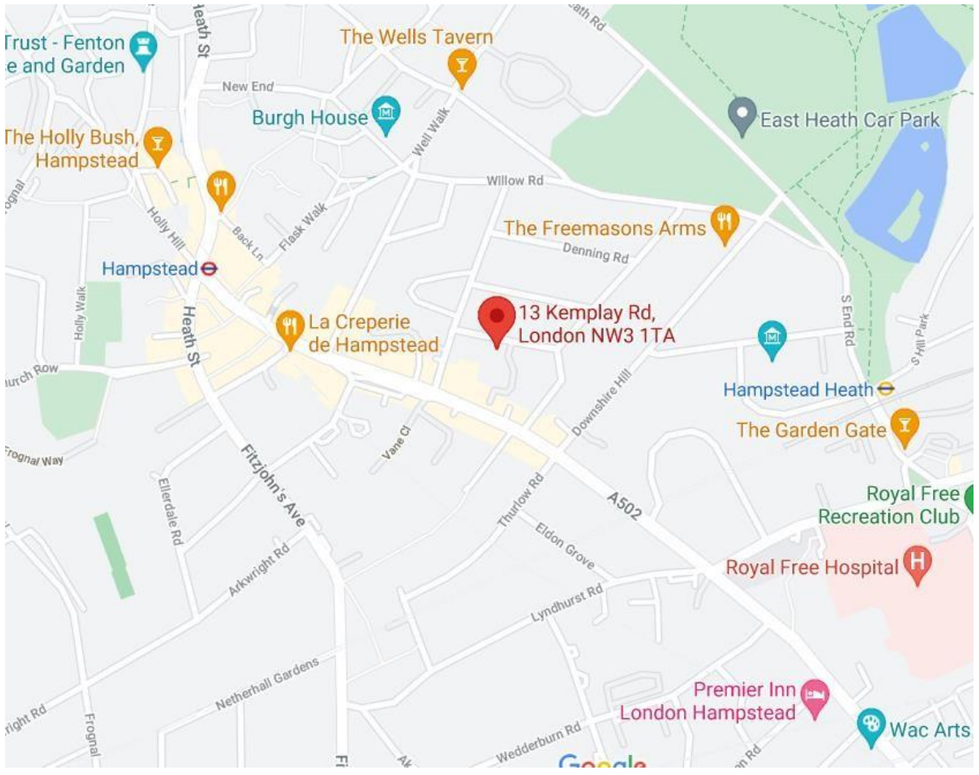

Figure 1-1 13 Kemplay Road © Google Maps

This report summarises the sustainable design and construction measures that have been incorporated into development in order to meet the sustainability requirements of the London Borough of Camden. Additionally, this Report compares the proposed dwellings emissions of both the Building Regulations Part L and to those of the existing building with the intention to show that the proposed development stands to substantially improve the energy performance and reduce carbon emissions associated with the residence at 13 Kemplay Road.

2 Policy

2.1 Camden CC1 Climate Change and Mitigation – Local Plan

Policy CC1 Climate change mitigation The Council will require all development to minimise the effects of climate change and encourage all developments to meet the highest feasible environmental standards that are financially viable during construction and occupation.
We will:

a) promote zero carbon development and require all development to reduce carbon dioxide emissions through following the steps in the energy hierarchy;
b) require all major development to demonstrate how London Plan targets for carbon dioxide emissions have been met;
c) ensure that the location of development and mix of land uses minimise the need to travel by car and help to support decentralised energy networks;
d) support and encourage sensitive energy efficiency improvements to existing buildings;
e) require all proposals that involve substantial demolition to demonstrate that it is not possible to retain and improve the existing building; and
f) expect all developments to optimise resource efficiency.
For decentralised energy networks, we will promote decentralised energy by:
g) working with local organisations and developers to implement decentralised energy networks in the parts of Camden most likely to support them;
h) protecting existing decentralised energy networks (e.g. at Gower Street, Bloomsbury, King's Cross, Gospel Oak and Somers Town) and safeguarding potential network routes; and
i) requiring all major developments to assess the feasibility of connecting to an existing decentralised energy network, or where this is not possible establishing a new network.

To ensure that the Council can monitor the effectiveness of renewable and low carbon technologies, major developments will be required to install appropriate monitoring equipment

2.2 Camden CC2 Adapting to Climate Change – Local Plan

The Council will require development to be resilient to climate change.
All development should adopt appropriate climate change adaptation measures such as:

a) the protection of existing green spaces and promoting new appropriate green infrastructure;
b) not increasing, and wherever possible reducing, surface water run-off through increasing permeable surfaces and use of Sustainable Drainage Systems;
c) incorporating bio-diverse roofs, combination green and blue roofs and green walls where appropriate; and
d) measures to reduce the impact of urban and dwelling overheating, including the application of the cooling hierarchy.

Any development involving 5 or more residential units or 500 sqm or more of any additional floor space is required to demonstrate the above in a Sustainability Statement.

Sustainable design and construction measures

The Council will promote and measure sustainable design and construction by:

e. ensuring development schemes demonstrate how adaptation measures and sustainable development principles have been incorporated into the design and proposed implementation;
f. encourage new build residential development to use the Home Quality Mark and Passivhaus design standards;
g. encouraging conversions and extensions of 500 sqm of residential floorspace or above or five or more dwellings to achieve "excellent" in BREEAM domestic refurbishment; and
h. expecting non-domestic developments of 500 sqm of floor space or above to achieve "excellent" in BREEAM assessments and encouraging zero carbon in new development from 2019

3 Sustainability Strategy

3.1 Energy Performance

An energy strategy has been developed following the energy hierarchy 'Be Lean, Be Clean, Be Green'. Energy calculations using Building Regulations approved and accredited software have been undertaken at each stage to calculate the savings associated with the measures incorporated.

Figure 3.1 The Energy Hierarchy

The energy consumption and carbon emission figures within this report have been calculated using the approved Standard Assessment Procedure for the Energy Rating of Dwellings (SAP). This report has been reviewed by Jessica James who is an On Construction Domestic Energy Assessor (OCDEA).

Solar Gain Control and Daylight

Solar gains are a passive form of heating from the sun's radiation and are beneficial to a building during the winter months as they provide an effective source of heat and reduce internal heating requirements. However, during the summer months, they must be controlled in order to mitigate the risk of overheating. They can be controlled through glazing and shading design in order to allow low-level winter sun to enter the building and to limit access to high-level summer sun.

The glazing strategy design within the proposed building has carefully considered orientation and window size to maximise daylight while controlling excessive solar gains. The orientation and window size for the comparative refurbishment case is limited by the existing building and as such cannot be changed. However, in both designs glazing will incorporate low emissivity coatings to limit overheating without compromising light transmittance.

Overheating

The impact of solar gains has been analysed as part of the SAP calculations, taking into account the ventilation strategies and the risk of solar overheating has been concluded to be slight, when measured against the Part L1A criteria.

Building Fabric

Designing an efficient thermal envelope will greatly reduce the need for space heating and cooling as heat transmittance through the thermal elements is reduced.

Low air permeability rates will also reduce heating and cooling energy demand by reducing the volume of air that can penetrate the building. Typically older buildings will have much higher

Both instances of the development have followed the 'fabric first' approach. The building fabric has been carefully considered and specified to meet or exceed current Building Regulations minimum requirements, as detailed in Table 3-2 below.

Fabric Component	Existing – Upgraded	Proposed Design
External Walls	0.55 W/m²K	0.15 W/m²K
Roof – Pitched	0.16 W/m²K	0.16 W/m²K
Roof – Basement	N/A	0.15 W/m²K
Roof - Flat	N/A	0.20 W/m2K
Basement Floor	N/A	0.11 W/m²K
Ground floor	0.25	N/A
Windows (Including the skylights)	2.00 W/m²K	1.4 W/m²K
Air Tightness	Default (15m3/m2/hr)	4m3/m2/hr
Party walls	Default	Fully filled cavity with edge sealing
Thermal Bridging	Default	Default

Table 3-2 Proposed passive design measures

With regards to the party walls, to reach the required new build standards, within the proposed design these must be fully filled. Partially filled cavities will not comply.

The upgraded existing comparative case has been upgraded in line with the Building Regulation Part L1B. Further upgrades beyond this point were seen to be infeasible as they would result in a net loss of already limited internal floor space. Without solving the fundamental problem with the existing building. That being the permeability of the external envelope.

Building Services

Individual systems have been identified as being the most appropriate for the site. These have been specified to maximise efficiency, therefore, reducing energy used to deliver services.

Table 3-2 shows the proposed services strategy and energy efficiency measures for the development.

Services Component	Existing – Upgraded	Proposed Design
Space Heating, cooling & hot water	New condensing gas boiler 91% efficient, rads 200l cylinder	ASHP 317% efficient, UF/H 300l cylinder
Heating Controls	Time and temperature zone control	Time and temperature zone control
Ventilation	Natural	MVHR 89% efficient SFP 0.5 W/l/s Rigid Duct/ Insulated Approved Installation
Lighting & Controls	100% low energy lighting	100% low energy lighting

Table 3-2 Proposed energy-efficient design measures

The use of appropriate building services has been carefully considered. The comparative upgraded existing case utilises a new condensing boiler with modern efficiency values with radiators as heat emitters. The use of an ASHP with low-temperature underfloor heating was deemed inappropriate as the high air permeability rate of the existing building. This would result in high energy use and low internal thermal comfort. The 200l domestic hot water cylinder is used as the smaller internal area and the lower occupancy rate of the existing house results in lower water demands.

Renewable Energy

In order to further reduce carbon emissions for the residential units, solar PV as the most appropriate technology for the site. The following system is proposed for both the proposed and the comparative upgraded existing case:

- Peak Power – 1 kWp (approx. 4 Panels)
- Orientation – South East
- Angle of elevation – 30 degrees

Energy and Carbon Savings

Energy Use

The breakdown of carbon and energy use has been identified for the site. Table 3-4 shows the breakdown of carbon and energy use once the strategies proposed in this report are incorporated.

Design	Gas (kWh/yr)			Gas CO2 (kg/yr)	Electricity (kWh/yr)							Electricity CO2 (kg/yr)	Total Energy	Total CO2
	Space Heating	Hot Water	Total		Space Heating	HW	Cooling	Pumps & Fans	Lighting	PV	Total			
Part L	11,023	2,777	13,800	2,898	0	0	0	75	682	0	757	176	14,557	3,074
Existing - Upgraded	6,459	7,076	13,535	2,842	0	0	0	75	308	-858	-550	-128	12,985	2,714
Proposed	0	0	0	0	3,115	846	0	653	682	-858	4,438	1,034	4,438	1,034

Table 3-4 Estimated regulated energy demand and carbon emissions per energy source

Carbon Savings

Table 3-5 Shows the improvements in CO_2 emissions for the proposed design when compared both to the notional building regulation baseline. Table 3-6 shows the improvements in CO_2 emissions for the proposed design when compared to the existing building following building fabric and systems upgrades to bring it in line with The Building Regulations Part L1B upgrade values.

	Part L1A		
	CO_2 Emissions (tonnes /annum)	CO_2 Savings (tonnes /annum)	% Saving
Building Regulations 2013 baseline	3.07		
Proposed Design	1.03	2.04	66.36%

Table 3-5 Total Savings over Building Regulations Part L 2013 baseline and the existing, upgraded design

	Existing – Upgraded		
	CO_2 Emissions (tonnes /annum)	CO_2 Savings (tonnes /annum)	% Saving
Existing – Upgraded	2.93		
Proposed Design	0.95	1.98	67.70%

Table 3-6 Total Savings over the existing, upgraded design

Calculations show that the proposed design not only improves significantly on the building regulations Part L1A but also represents a significant reduction in carbon emissions per year when compared to the existing building following an upgrade to the fabric and building services in line with the requirements of The Building Regulations Part L1B.

Whilst the saving in carbon on a per-year basis is large, when this is extrapolated over the expected lifetime of the proposed building (estimated at 80 years) the total savings are estimated at 158.4 tonnes of CO_2. This is a particularly crucial insight when you consider that the overall habitable floor space in the proposed design is increased to 264m2 from the habitable floor space of the existing building which is 68m2. Meaning that both an increase in overall energy efficiency is seen along with an increase in planned occupancy rate thus increasing the value of the site on two axes.

3.2 Water efficiency

Water fittings will be specified with the following or similar flow rates to meet the target water consumption of 110 l/p/day:

- Washbasin taps – 6.5 l/min
- Showers – 7.5 l/min
- Bath – 120l to overflow
- Dishwasher - 1.2 l/place setting
- Washing machine - 9 l/kg load
- WC – 6/4 litre dual flush
- Kitchen taps – 6.5 l/min

Water meters will be installed to encourage residents to limit their consumption.

3.3 Materials

Insulating materials will be specified to maximise thermal performance whilst still paying attention to the environmental impact of the materials used. The use of low embodied energy products will be further investigated.

Responsible sourcing will also be pursued. All timber used on-site during the construction phase and within the building will be from legal sources. Where possible, FSC or equivalent timber will be used. Sourcing of other materials will include products where the manufacturer employs an environmental management system such as ISO 14001 or BES 6001. Where possible, materials will be sourced locally.

Non-toxic materials will be used wherever possible, including the specification of products with a low VOC content in line with European testing standards.

All the building elements will achieve high ratings on the BRE Green Guide to Specification. Materials will be specified to have a low embodied energy, taking into account the whole life cycle analysis.

3.4 Waste Management and Construction

Construction site waste will be managed in such a way as to reduce the amount of waste produced as much as possible, and the waste hierarchy will be followed. In addition, at least 85% of waste that does arise will be recycled using an external waste contractor.

Household waste will be recycled through the local authority collection scheme. Internal recycling bins in a kitchen cupboard will be provided to facilitate this.

3.5 Nature Conservation and Biodiversity

The site is occupied by existing buildings and is considered to be of negligible ecological value. Measures will be taken during construction to minimise the impact on ecology by timing works appropriately and following best practice guidance.

3.6 Climate Change Adaptation

Tackling Increased Temperature and Drought

The impact of solar gain has been incorporated into the SAP analysis for compliance with Part L and the risk of solar overheating has been concluded to be low for the development. Windows will incorporate low emissivity coatings to reduce solar gain.

Flooding

Surface water drainage strategies will ensure that the peak and volume of surface water run-off rates will not be increased due to the development, as the site is already fully occupied by buildings. The site is in flood zone 1 so the building is not at risk of flooding.

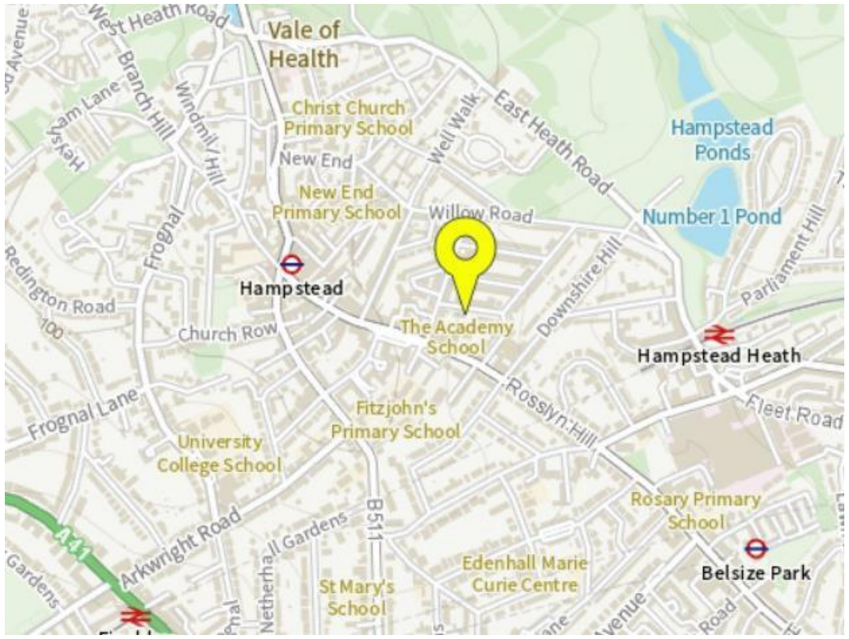

Figure 3-1 13 Kemplay Road Flood Risk Map

3.7 Pollution Management

Air Quality

The construction site will be managed in such a way that the environmental impact is minimised. This includes following best practice policies for dust pollution by using dust sheets, covering skips and damping down where appropriate.

Plant and machinery

All plant and equipment installed in the development will be appropriately sized and selected for efficiency in order to reduce greenhouse gas emissions.

The proposed design utilises ASHP for the provision of space heating and domestic hot water, as a result, there are no associated NO_x emissions.

All equipment will be frequently maintained to ensure it continues to run efficiently and cleanly.

Insulating materials and heating systems will be specified to keep pollutants to a minimum. Insulation will have a low Global Warming Potential (GWP).

Noise

The dwellings will comply with Building Regulations Part E, providing a good level of sound insulation. All windows are to be specified as high-efficiency double glazing to minimise the transmission of noise between the property and the surrounding area.

Light Pollution

100% of the proposed lighting will be provided by low energy light fittings specified to have a luminous efficacy greater than 40 lm/W. All external lighting will be adequately controlled to ensure that spaces are only lit out of daylight hours and when the area is occupied. As the proposed building use is residential; there will be no illuminated signage or uplighting incorporated. The proposed dwelling is in a highly urbanised location, and therefore will not significantly contribute to increasing the effects of light pollution.

4 Conclusion

The development comprises of the redevelopment of 13 Kemplay Road, London. The proposed scheme is for a new build residential dwelling. The requirement is to follow the energy hierarchy and incorporate sustainable design and construction measures.

The development follows the energy hierarchy, incorporating passive design measures and energy-efficient equipment. The development employs an efficient building fabric, including high-performance insulation and highly efficient glazing. Space heating and domestic hot water are provided by an ASHP with a space heating efficiency of 317%. Ventilation is provided by a mechanical ventilation system with heat recovery to maximise carbon savings for the development.

These improvements result in a 66.36% reduction in emissions when compared to the building regulations baseline and a 67.70% reduction in emissions per annum when compared to the existing house following upgrades in line with the building regulations part L1B upgrade values.

Given both the dramatic increase in energy efficiency and habitable floor space provided by the proposed design, we would suggest that the development at 13 Kemplay Road stands to improve the environmental profile of the site whilst also bringing additional value into the London Borough of Camden through the provision of additional housing.

Measures are also incorporated to minimise pollution and reduce water use. The development complies with the sustainability policy of the London Borough of Camden Development Policies.

The figures within this report are based on preliminary analysis only and further detailed studies will be required at the detailed design stage before specifying any of the proposed systems.