

Sustainability Statement

Ellerdale Road: Single basement scheme

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Sustainability Statement

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Contents

Ellerdale Road

Sustainability Statement

Contents	Executive Summary.....	4
	Introduction	6
	Policy Context	7
	Energy and CO ₂	9
	Materials and Waste.....	15
	Water Management	16
	Biodiversity and People	17
	Conclusion.....	20

Executive Summary

Ellerdale Road

Sustainability Statement

Executive Summary

The proposal at Ellerdale Road comprises the construction of a 2 storey dwelling in the London Borough of Camden, with one basement level and a small garden. The dwelling has a total Gross Internal Area of 154 m².

The scheme does not have to comply with the London Plan Policy based on the floor area, however the aspiration of the scheme is to achieve a 35% carbon reduction target (beyond Part L 2013) as set out in The London Plan Policy 5.2.

The scheme complies with the 2013 Building Regulations Part L and the minimum energy efficiency targets in the following documents have been followed:

- New build (Part L1A) – The actual building CO₂ emissions rate (DER) is no greater than the notional building CO₂ target emissions rate.

This Sustainability Statement has been provided as evidence to the local authority of the actions being taken to demonstrate the development's holistic approach to sustainable design and construction. It provides a summary of the contribution that the design will make to creating a more sustainable development, drawing on information provided by specialist consultants and design reports and identifying key features intrinsic to achieving low carbon homes.

Key sustainability features within the development will include:

- At least 35% improvement over Building Regulations Part L 2013 to demonstrate compliance with national policy to achieve an 80% reduction in carbon emissions by 2050, and to meet the Building Performance of Buildings Directive of nearly zero carbon homes by 2020.
 - At least a 40% reduction in typical water use rates through implementation of water efficiency and reuse measures.
 - A sustainable materials procurement policy and an efficient waste strategy on site including at least 85% of waste to be diverted from landfill.
 - The inclusion of sustainable transport options such as cycle storage and a home office to allow the occupants to work from home.
 - Protection and enhancement of ecology on site including birds and bat boxes and the appropriate actions to ensure protected species including, but not restricted to, bats and great crested newts.
 - The inclusion of a 65m² green roof to reduce and delay the discharge of rainfall into public sewers and watercourses, thereby minimising the risk and impact of localised flooding and on and off-site watercourse pollution.
 - An emphasis on local supply and labour to encourage employment opportunities and to offer a diverse, self-sustaining environment.
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Executive Summary

Ellerdale Road

Sustainability Statement

Executive Summary (continued)

In summary, the key measures incorporated to meet planning requirements and to achieve a low carbon development address the following key areas of sustainable design and construction:

- **Energy and CO₂**
 - **Materials and Waste**
 - **Water Management**
 - **Biodiversity and People**
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Introduction

Ellerdale Road

Sustainability Statement

Sustainability Introduction

The design team has significant experience in delivering schemes that are considered highly sustainable, either through application of formal green building rating systems, such as Code for Sustainable Homes, BREEAM or SKA, as well as applying benchmarks from standards such as Passivhaus Design, and adopting precedents from industry exemplar sustainable developments.

The Ellerdale Road scheme is not required to comply with Code for Sustainable Homes following the Government's Deregulation Bill issued in March 2015. To reflect the holistic nature of the scheme and to demonstrate the commitment of sustainable development to London Borough of Camden however, the scheme will target a stringent goal to exceed the London Plan benchmark to achieve 35% reduction over Part L 2013 Building Regulations.

The scheme will also demonstrate its commitment to sustainable development in the following areas:

- Economic** Provision of additional housing in an area of need, and the use of local labour to boost employment.
- Social** Community engagement during development design to ensure the building matches the needs of the local populous. Alleviating fuel poverty in the region as well as the shortfall in new, quality build households is also addressed.
- Ecological** Improvement of nesting and foraging for bats and birds through introduction of native planting within the sites and adequate protection of protected and priority species.

Description of Site

The site is located on Ellerdale Road in the London Borough of Camden. The Ellerdale Road scheme comprises the construction of a 2 storey dwelling with one basement level and small garden.

The aspiration for the scheme is to significantly improve the existing site and its immediate environment by providing an efficient and inclusive development, which meets the policy recommendations of the London Borough of Camden.

Policy Context

Ellerdale Road

Sustainability Statement

National Context: The 2008 Climate Change Act

The UK Government is committed to reducing the UK's carbon emissions by 80% over 1990 levels through the Climate Change Act 2008. Achieving truly sustainable design and construction and forwarding the green agenda within the construction industry across the UK is inherent to meeting these emission targets. This development aims to do both of these.

To help monitor carbon reductions and to plot progress being made for future plans and investments in the UK's low-carbon economy, intermediary targets have been established. The UK is currently in the second of four established carbon budgets, in which a 29% in CO₂ emissions is required by the end of 2017 to ensure that the UK remains on course for meeting the 80% reduction by 2050.

Concurrent with reducing CO₂ emissions by 80% by 2050 is the European Climate Change Policy targets. It sets the objective of ensuring 20% of energy consumption is generated from renewable sources by 2020 whilst also reducing Europe's carbon footprint by 20%. Ensuring a fabric first approach with consideration to renewable energy production fits both the climate change act and the European Commission's 2020 targets for reducing greenhouse gas (GHG) emissions.

Policy Context

Ellerdale Road

Sustainability Statement

Local Context: London Borough of Camden Planning Policies

Local Development Framework: Core Strategy 2010 - London Borough of Camden Policy 13, 17 and 18

The Ellerdale Road scheme meets the requirements of the London Borough of Camden's Core Strategy Policy 29 and 30, including the following:

- Ensuring patterns of land use that minimise the need to travel by car and help support local energy networks.
- Promoting the efficient use of land and buildings.
- Minimising carbon emissions from the redevelopment, construction and occupation of buildings by implementing, in order, all of the elements of the following energy hierarchy:
 - a. Ensuring developments use less energy,
 - b. Making use of energy from efficient sources, such as the King's Cross, Gower Street, Bloomsbury and proposed Euston Road decentralised energy networks; and
 - c. Generating renewable energy on-site.
- Ensuring buildings and spaces are designed to cope with, and minimise the effects of, climate change.
- Include facilities for the storage and collection of waste and recycling.
- The provision of new or enhanced habitat, where possible, including through biodiverse green or brown roofs and green walls.

Local Development Management Plan – London Borough of Camden policy DM22 and DM23

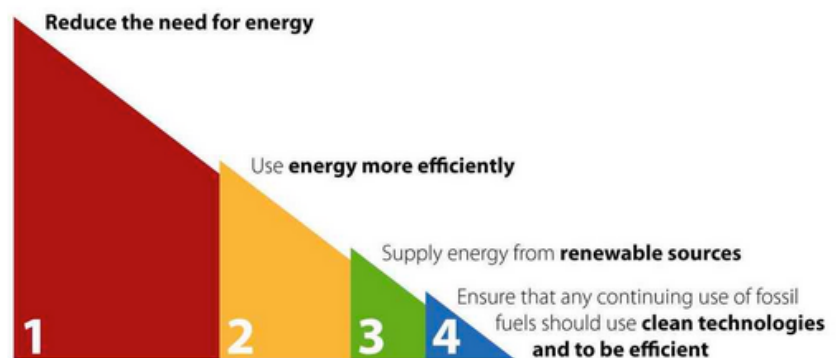
The Ellerdale Road scheme meets the requirements of the London Borough of Camden's Local Development Plan Policy DM22, including the following:

- Incorporate sustainable design and construction measures and green or brown roofs and green walls wherever suitable.
 - Climate change adaptation measures, such as:
 - a. Summer shading and planting;
 - b. Limiting run-off;
 - c. Reducing water consumption;
 - d. Reducing air pollution; and
 - e. Not locating vulnerable uses in basements in flood-prone areas.
 - Incorporating water efficient features and equipment and capturing, retaining and re-using surface water and grey water on-site.
 - Limiting the amount and rate of run-off and waste water entering the combined storm water and sewer network through the methods outlined in part a) and other sustainable urban drainage methods to reduce the risk of flooding.
 - All proposals for residential development must meet the requirements set out in the Building Regulations.
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Energy and CO₂ Ellerdale Road Sustainability Statement

The Energy Hierarchy:

The proposed scheme has followed the energy hierarchy that is illustrated below:



This methodology widely used in accordance with meeting the Sustainable Design and Construction (SPG), has been adopted for the scheme using a 'Lean', 'Clean', and Green' approach in addressing London Borough of Camden's CS13 policy. A summary of the savings in carbon emissions are shown below:

GLA's Energy Hierarchy – Regulated Carbon Emissions				
	Baseline:	Be Lean:	Be Clean:	Be Green:
CO ₂ emissions (Tonnes CO ₂ /yr)	2.51	2.46	-	1.44
CO ₂ emissions saving (Tonnes CO ₂ /yr)	-	0.04	-	1.03
Saving from each stage (%)	-	1.8	-	40.9
Total CO ₂ emissions saving (Tonnes CO ₂ /yr)	1.07			
42.7% Total carbon emissions savings over Part L of the Building Regulations 2013 achieved				

Energy and CO₂ Ellerdale Road Sustainability Statement

Be Lean (Energy Efficiency)

Low carbon principles have been applied throughout the design of the scheme. The energy strategy follows the 'energy hierarchy' by looking foremost at delivering significant CO₂ savings through passive design and better practice energy efficiency measures.

Through adopting passive energy efficiency measures, the energy demands of the properties within the Ellerdale Road development will be reduced. Passive efficiency measures are those that reduce energy demand, for example, the use of insulation to reduce building heat loss.

Passive energy efficiency measures that are to be included in the proposed development include:

- Optimal insulation levels and high performance windows and doors;
- Low building air permeability;
- Effectively insulated pipework and ductwork; and
- Optimal glazing arrangements to make best use of the sun's energy whilst minimising the risk of overheating.

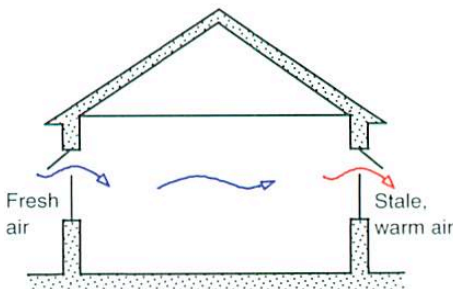
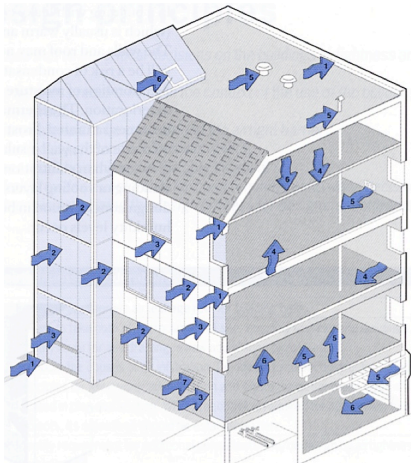
Be Clean (CHP)

GLA guidance stipulates that small, or purely residential developments of less than 350 dwellings will not be expected to include on-site CHP. CHP systems are best utilised where there is a consistent and high demand for heat. Because of the small electricity supplies and demand of this scheme, a CHP installed to meet the base heat load would typically require the export of electricity to the grid. The administrative burden of managing CHP electricity sales at a small scale without an active energy service companies (ESCOs) is prohibitive for smaller operators of residential developments.

The heat demand profile of this residential scheme is not suitable to CHP. The implemented fabric improvements from the 'Be Lean' scenario have also reduced the energy demand from space heating to hot water. For CHP systems to be economically viable they need to run for at least 5,000 hours per year. Therefore, a CHP system would most likely be oversized, and as a result less efficient and economic.

Energy and CO₂ Ellerdale Road Sustainability Statement

Be Clean (Heating and Cooling)



To ensure high quality and sustainable design, the development will feature the following measures:

Internal heat generation minimisation

- Energy efficient equipment: this will help reduce internal heat gain, improving the effectiveness of natural ventilation and reducing cooling loads.
- LED lighting: low energy lighting will be specified to reduce lighting power consumption.

Solar gain reduction

- Heat transfer: Insulation levels have been maximised and the resulting u-values are lower than required by Building Regulations. The build-ups therefore prevent the penetration of heat as much as practically possible.
- Air permeability: A reduced air permeability rate of 3 m³/(hr.m²) @ 50 pa has been targeted to minimise uncontrolled air infiltration.

Internal building heat management

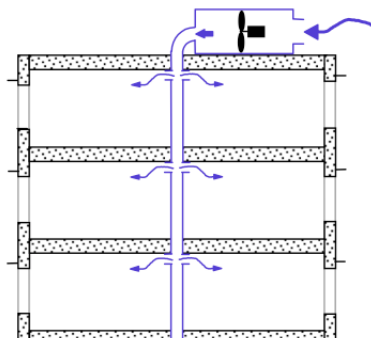
- Room heights: High ceilings are traditionally used in hot climates to allow thermal stratification. The proposed building will have floor to ceiling heights of approximately 2.8m. As the roof will be well insulated to achieve a u value of 0.11 W/m²K (flat roof), there will be minimal penetration of heat through the roof.
- A seedum roof covering 65m² will be included. This will act as an insulation barrier and the ecological processes will reduce the amount of solar energy absorbed by the roof membrane, so will reduce temperatures below the surface and cool the building areas directly below. Significant thermal insulation has also been specified to prevent any heat absorbed being transferred into the building.

Passive Ventilation

- Openable windows have been specified to facilitate natural ventilation. The placements of the openings enhance the cross ventilation effect, which will be achieved by opening windows on two facades and ensuring there is a clear path for airflow.

Energy and CO₂ Ellerdale Road Sustainability Statement

Be Clean (Heating and Cooling)



Mechanical ventilation

- A mixed mode system will be implemented. This will be complementary to the passive cooling measures taken. During summer months, mechanical ventilation using fans will circulate and remove hot air from the building. The building will also adopt a zoned design to allow natural ventilation where possible and mechanical ventilation where there are increased cooling loads.
- Fan powered ventilation: single point extracts will be used in WCs and kitchen. A whole building system will be specified which will use air handling units with separate supply and extract fans. Heat recovery units will also be specified to reduce energy demand, optimal performance will be achieved by the reduced air permeability rate of 3 m³/(hr.m²) @ 50 pa.
- The mechanical systems will have the following efficiencies which are in compliance with the Domestic Building Services Compliance Guide:
 - o Specific fan power of 0.52 W/l/s for whole ventilation systems with heat recovery
 - o Heat recovery efficiency of 90%

Active cooling systems

- Air conditioning has been specified for scheme to provide the required level of comfort. Following the methodology of the cooling hierarchy has significantly reduced the demand for cooling. To ensure the cooling system is the most carbon efficient possible the following parameters have been selected:
- The location of the outdoor units that 'dump' the heat has been carefully conspired carefully so not to cause problems for people and the environment, and not to add to the urban heat island effect. They will be located on the roof space and will allow adequate air movement around the condensing units, this will ensure maximum operating efficiency and will limit the impacts of dumped heat on people and the environment.
- The AC systems will have the following efficiencies which are in compliance with the Domestic Building Services Compliance Guide:
 - o Energy Label Class of A; and

Be Green (LZC Technologies)

A photovoltaic panel system of 2.6 kWp has been specified (approximately 8 high efficient photovoltaic panels) for the development and detailed summary of the lifecycle cost, revenue and payback for the photovoltaic panels is presented in this section.

There is 65m² of available roof that could be used to install photovoltaic modules. PV panels will be oriented southwest, placed horizontal, covering 16m² of the roof.

Energy and CO₂ Ellerdale Road Sustainability Statement

Total Carbon Emissions:

To ensure the site can be confirmed as being a 'low carbon' development, both the regulated and unregulated emissions of the development must be quantified and demonstrated. The total emissions for the scheme are shown below.

Carbon Dioxide Emissions – Regulated and Unregulated (Tonnes CO ₂ /yr)			
	Regulated Emissions	Unregulated Emissions	Total Emissions
Baseline: Part L 2013	2.51	1.42	3.93
Be Lean: After demand reduction	2.46	1.42	3.88
Be Clean: After CHP	-	-	-
Be Green: After Renewable energy	1.44	1.42	2.86

Energy Strategy Summary

An assessment has been completed to assess the potential to reduce energy and related CO₂ emissions from the Ellerdale Road project. The target reduction has been set at 35% relative to Part L 2013 to ensure the scheme is considered low carbon.

Energy efficiency is the first approach to reaching the target reduction. Through carrying out option appraisals on the facade design and building services a specification has been arrived at that will achieve a reduction in overall CO₂ emissions.

The development will reduce carbon emissions by 1.8% from the fabric energy efficiency measures described in the "Be Lean" section, and will reduce total carbon emissions by 42.7% over Building Regulations with the further inclusion of low and zero carbon technologies.

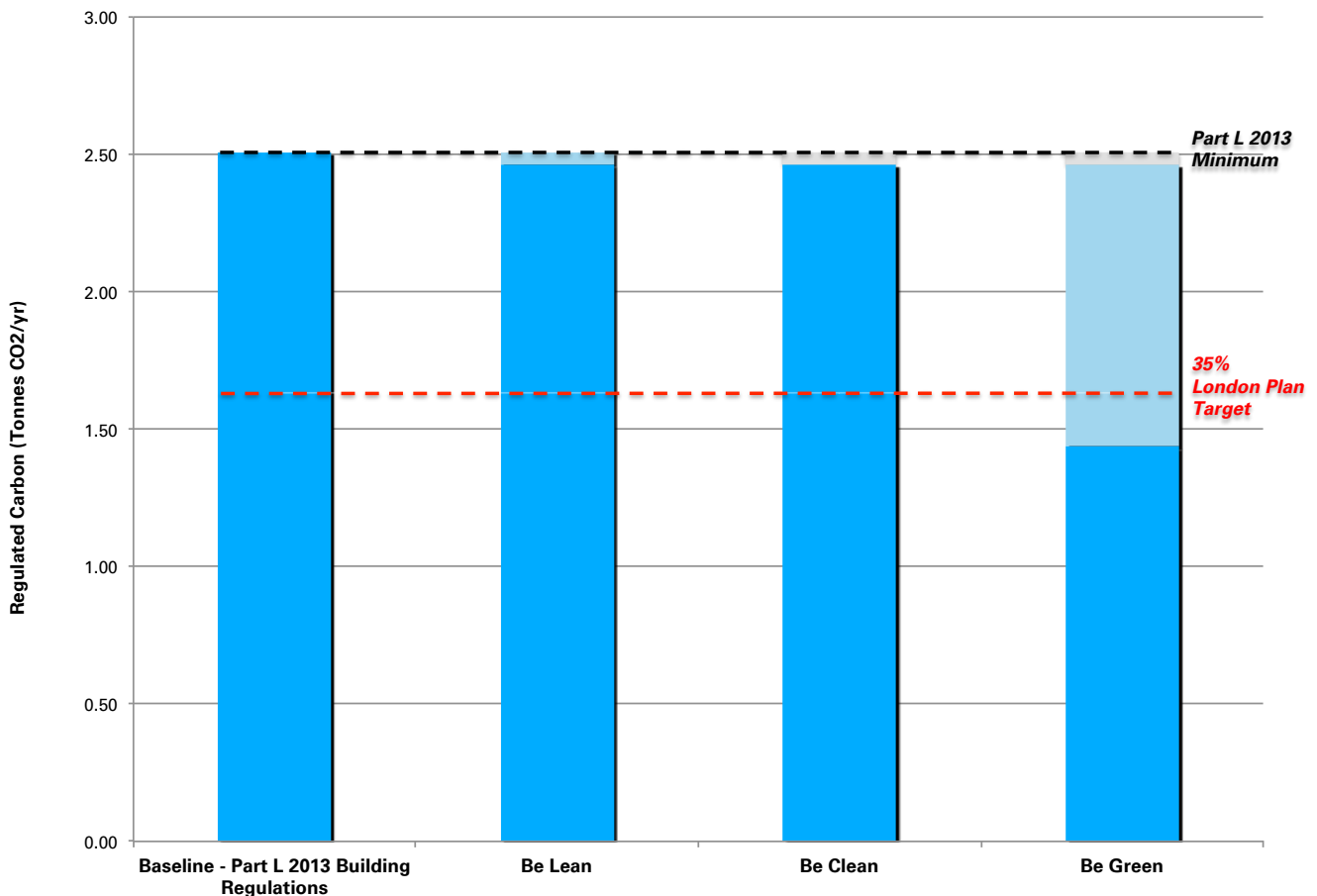
Due to the locality of the scheme it has not been deemed viable to specify CHP technology. Numerous measures have been taken to optimise the development's energy performance whilst also ensuring the wellbeing and quality of life of occupants.

Energy and CO₂ Ellerdale Road Sustainability Statement

Energy and CO₂ graph:

A graphical illustration of how the scheme performs in relation to Building Regulations and the Energy Hierarchy is shown below.

The Energy Hierarchy



Materials and Waste Ellerdale Road Sustainability Statement

Materials and Waste Introduction

Sustainable material sourcing and waste management will be considered throughout the life of the building to ensure the scheme's environmental footprint is minimised as far as possible.

Materials Selection and Sourcing

The development consists of entirely new build elements. New construction materials will be selected, where feasible, with a low environmental impact. In addition, basic building and finishing elements will be sustainably procured and sourced, prioritising of local suppliers and manufacturers to encourage growth in economic activity within the London Borough of Camden.

The Green Guide for Specification is a reference tool, providing guidance on the relative environmental impacts for a range of different building elemental specifications, based on Life Cycle Assessment and the Environmental Profile Methodology. The design team has committed to using the Green Guide to Specification to help specify materials with a low environmental impact, where feasible.

In addition, the project team has committed to responsibly source materials used on site. This will include, where feasible, non-timber elements to be ISO 14001 or BES 6001 certified and 100% timber to be sourced from FSC or PEFC certified sources.

Waste Management – Construction Waste

The Ellerdale Road design team has committed to promote resource efficiency through effective and appropriate management of construction site waste.

A site waste management plan will be developed for the site which adopts target best practice benchmarks for resource efficiency, details procedures and commitments to minimise non-hazardous and hazardous waste at the design stage and monitors/measures waste production on site.

The site waste management plan will also include procedures and commitments to sort and divert waste from landfill through the following:

- Re-use on site;
- Salvage/reclaim for re-use;
- Return to supplier via a 'take-back' scheme;
- Recovery and recycling using an approved waste management contractor; and
- Compost.

In addition, the design team has committed to diverting at least 85% by weight or volume of construction waste from landfill.

Waste Management – Operational Waste

Dedicated internal and external waste storage and recycling facilities for end users are proposed to encourage recycling. The storage space will provide inclusive access and usability. Camden operates a weekly front-of-property recycling collection service.

Water Management Ellerdale Road Sustainability Statement

Water Management Introduction

The Ellerdale Road design proposals recognise the need to create a scheme that is efficient and adaptable to future climatic scenarios.

Water Conservation

The design team is committed to achieve a significant reduction in water use for the development in Ellerdale Road over typical performance.

Water efficient sanitary fittings will be installed in the house to achieve no more than 105 litres per person per day, in line with the London Borough of Camden Policy DM22. Indicatively this may include low flow shower-heads and taps, with toilets being dual flush and baths not exceeding specific overflow limits.

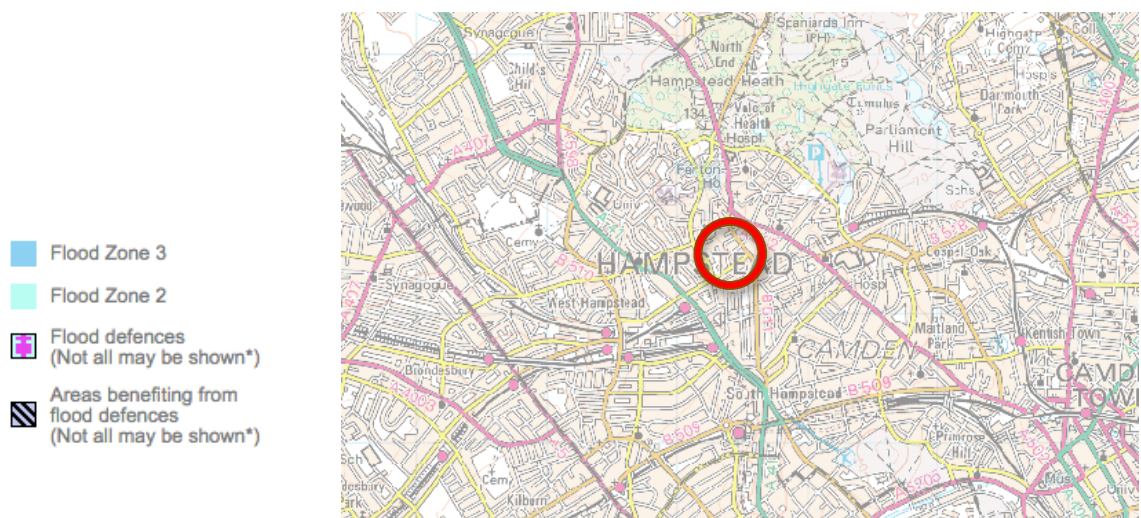
Flood Risk and Sustainable Drainage

Ellerdale Road is located within Flood Zone 1; defined as an area with little or no risk to flooding where the annual probability of flooding with defences where they exist: River, tidal & coastal is <0.1% i.e. less than 1 in 1000 years.

The development will not result in any increase in surface water runoff and therefore there is no increase in the risk of flooding. The proposed development will not have an effect upon rainfall runoff conditions downstream of the site.

Attenuation measures will be specified to manage the risk of surface water runoff. Mitigation measures will include the specification of a green roof to ensure surface water run-off following construction will not be detrimental to the environment, public well-being and the economy.

Flood map to demonstrate that Ellerdale Road project (red circle) is located within Flood Zone 1:



Biodiversity and People Ellerdale Road Sustainability Statement

Biodiversity and People Introduction

The proposed development will ensure ecological protection and enhancement and will respect the needs of neighbours and future occupants by creating a secure, inclusive and adaptable development.

The proposed development will promote the protection of any existing ecological features from damage during site demolition and the completion of the construction works. In addition the development will respect the needs of neighbours and future occupants by creating a secure, inclusive and adaptable development.

Land Use and Ecology

Ecology protection and enhancement

The design team are committed to help protect and enhance biodiversity on site by following the Ecology Report Produced by Eight Associates (ref: 1434 Ellerdale Road Code Ecology 1509-01tl), including the following:

- Planting of 28m² of planting including at least 20 species;
- Creation of vertical habitat and planting native species of climbing plants;
- Bat protection in line with best practice;
- All trees and shrubs cleared out of bird breeding season (March-August);
- Trees located outside of scope of works fully protected during construction; and
- Bird nesting boxes to be provided on site.

Arboricultural Report

The design team are committed to help protect trees on site by following the Arboricultural Report Produced by Arbor Cultural (ref: C.2015.088 1 Ellerdale Road BS5837 Report & AIA 28th August 2015), including the following:

- There will be minimal impact to the 9 trees on or nearby the site;
- Ground protection measures will be required to protect the roots of the retained trees;
- Some facilitation pruning may be required to enable to construction of the proposed building.

Green Roof

A 65m² green roof will be installed on the single storey portion of the development and on the garage roof, to provide the following ecological and sustainable benefits:

- Provision of habitat to promote species diversity;
 - Reduction in urban heat island effect;
 - Improvement in air quality;
 - Minimisation of heat loss during winter months;
 - Protection from solar gain during summer months; and
 - Provision of a sustainable urban drainage technique.
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Biodiversity and People

Ellerdale Road

Sustainability Statement

Construction Environmental Management

Environmental impacts of the construction works will be mitigated as far as possible. This will include the incorporation of the following:

- Contractor following environmental management system processes (under ISO14001), including the development of a construction environmental management plan (CEMP) specific to the sites.
- Training and site induction of all site operatives.
- Monitoring of energy, water and transport to and from site during construction.
- Management of waste on site and minimisation of air pollution.
- Following best practice pollution guidance from the Environment Agency,
- Ensuring all site timber is responsibly sourced in line with the UK Government's Timber Procurement Policy.

Considerate Constructors



The scheme will be registered under the Considerate Constructors Scheme (CCS) and is targeting at least 35 out of 50 points, including 7 points within each section of the scheme. The CCS scheme aims to recognise and encourage construction sites that are managed in an environmentally and socially considerate, responsible and accountable manner.

Occupant Wellbeing

The development has been designed to ensure the wellbeing of occupants in terms of levels of fresh air, thermal comfort and reduction of overheating, access to natural light, good lighting levels internally and externally, acoustic performance and access to safe drinking water.

The building services strategy has been carefully considered in order to balance the need for energy-smart, low carbon technologies with the need for adequate and controllable ventilation, heating and cooling.

The design team will specify all low VOC finishing products, including adhesives, sealants and paints. All composite wood product will have no added urea formaldehyde.

Overall, the development will promote health, wellbeing and community engagement within the local community.

Biodiversity and People

Ellerdale Road

Sustainability Statement

Sustainable Transport

Ellerdale Road is in proximity to a significant number of sustainable transport options. It is located within 325 metres of Hampstead Underground Station, and within 45 metres of the nearest bus stop (Fitzjohn's Avenue (Stop C) providing a frequent service in both peak and off-peak hours.

Accessibility and Security

Design proposals have taken into consideration external and internal accessibility. This includes cyclist and pedestrian access to the sites. Creating a secure but fully accessible development is a key part of the development. To ensure this is achieved, the design team will adopt where feasible, the key principles of "Secured by Design" within all elements of the scheme.

Lifetime Homes are ordinary homes incorporating 16 Lifetime Home Standard Design Criteria. The Lifetime Homes criteria have been targeted in the form doorway and hallway and wheelchair accessibility. The incorporation of the Lifetime Homes principles will ensure the dwelling is adaptable and user friendly for people with reduced mobility.

Home office facilities will be provided within the dwelling in order for the occupant to work from home and reduce the need for road transport. Two suitable cycle storage will be provided for the residential element, which will be safe and secure.

Conclusion

Ellerdale Road

Sustainability Statement

Conclusion:

This Sustainability Statement has responded to the London Borough of Camden's Local Plan requirements.

In summary the scheme will adopt the following sustainable features:

- A photovoltaic panel system of 2.6 kWp covering 16m² of the roof;
 - Reduced energy consumption by targeting improved U-values, airtightness, and low energy lighting;
 - Be located in a low flood risk zone;
 - Be of high build quality, surpassing the minimum Building Regulations for water using fittings and source materials ethically and sustainability;
 - Aim to source local labour throughout the construction phase;
 - Ensure all materials are responsibly sourced and of low environmental impact;
 - Implement a site waste management plan;
 - Create a scheme that is efficient and adaptable to future climatic scenarios by installing water efficient sanitary fittings;
 - Provide attenuation measures, valuable habitat for flora and fauna, and insulation through the inclusion of a green roof.
 - Ensure that there is no net loss of biodiversity as a result of the scheme;
 - Follow best practice policies in terms of air, water and ground pollution and appoint a contractor who will register for the Considerate Constructors Scheme; and
 - Incorporate Lifetime Homes principles to provide accessibility.
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