Persephone Gardens

Sustainability Statement

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TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY

This report considers the energy and sustainability measures to be incorporated within the proposed Persephone Gardens development in West Hampstead. This document reviews the requirements at both National and Local level, as set out in the National Planning Policy Framework (2012), The London Plan (March 2016) and the London Borough of Camden Local Plan 2017 and Camden Planning Guidance (CPG3), 2015.

The development has an anticipated CO_2 improvement of 25.31%; this is achieved through an Energy Strategy consisting of passive design and energy efficient measures, Combined Heat and Power, high efficiency chillers and a Photovoltaic array.

It is anticipated that various measures will be adopted as a means of reducing carbon emissions associated with the development such as using construction materials that will be responsibly and legally sourced, as well as having Green Guide ratings between A+ and D. In addition to this, it is anticipated any new insulation materials specified, for both the structure and building services, will be assessed under the Green Guide to Specification and also be responsibly sourced.

To reduce the energy demand of the development as well as help to conserve water resources within the local area, it is anticipated that the fit out works will provide for sanitary fittings which will be water efficient through measures such as dual flush toilets and low flow taps.

Flood Maps sourced from the Government Flood Warning Information Service highlight that the development is located within Flood Zone 1 and is at low risk of flooding from fluvial and surface water sources.

The development is located within West Hampstead and as such is in proximity to a large number of public transport nodes including West Hampstead Thameslink and underground station, as well as a range of primary local amenities such as postal services, cash points and food outlets. These features allow for the reduction of car based travel and transport related pollution.

Noise maps highlight that the development site is not subject to noise pollution from surrounding roads or railway lines. An Acoustician has been appointed to provide recommendations for attenuation measures which will be incorporated into the design to meet Part E of the Building Regulations.

The incorporation of these sustainability measures allow for the proposed Persephone Gardens development to be deemed sustainable and compliant with local and national policy.

2.0 INTRODUCTION

This report has been prepared by Cudd Bentley Consulting Ltd, to investigate the issues of energy and sustainability surrounding the Persephone Gardens development. Government policies have been reviewed for guidelines and recommendations on each issue, at both national and local level.

The proposed Persephone Gardens development is located in West Hampstead and the planning application shall include for 82 No. apartments and 15 No. care rooms, associated communal areas for residents including a pool, gym and restaurant as well as landscaping. The proposed lower level plans are shown in Figures 2.1, 2.2 and 2.3.

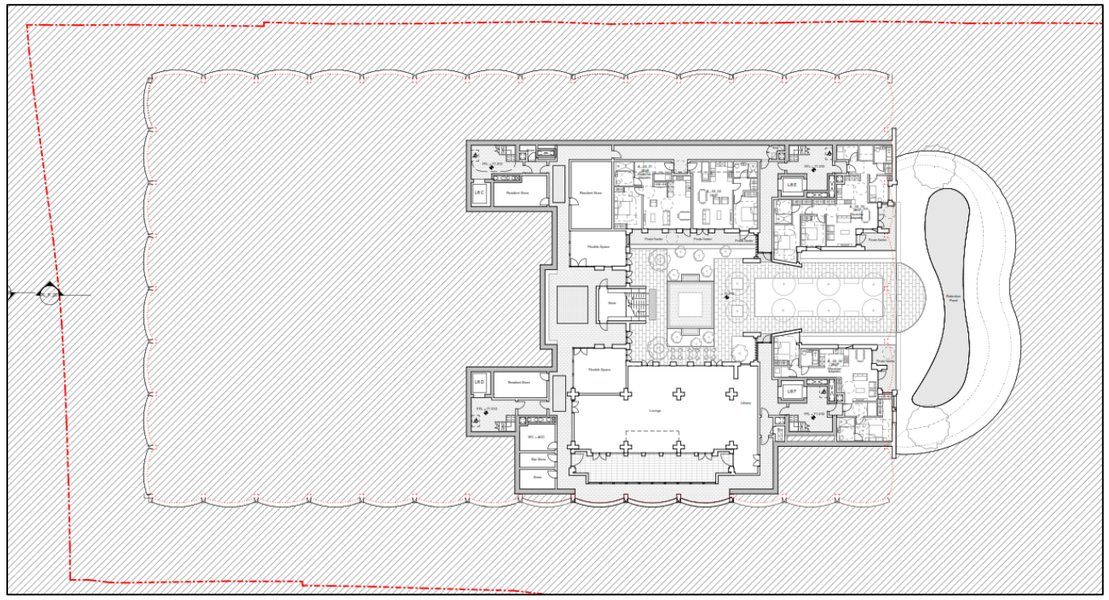

Figure 2.1 Proposed Level -02 Plan

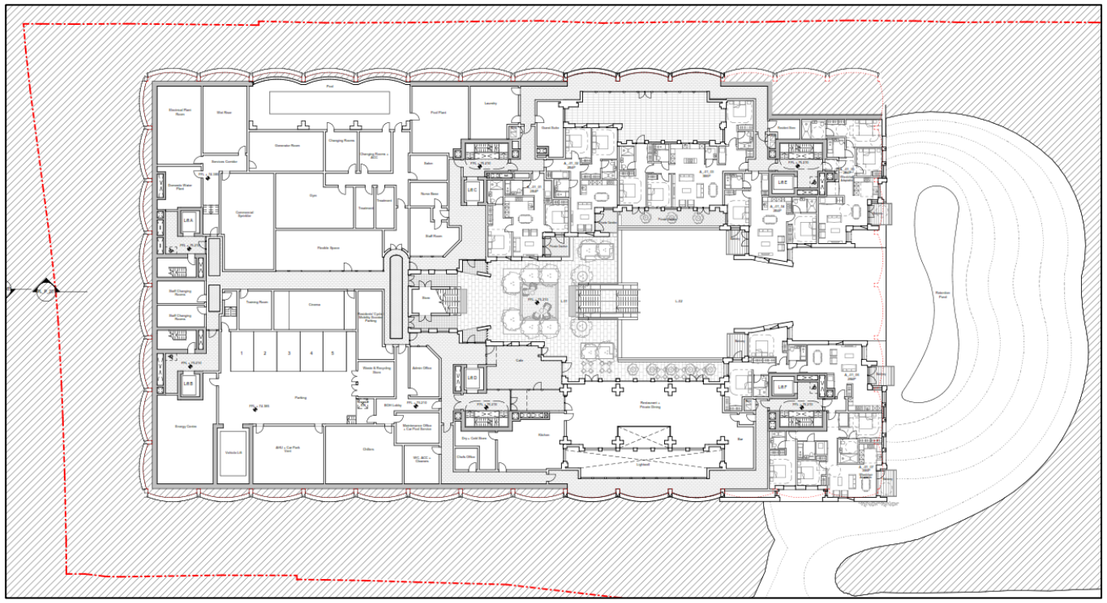

Figure 2.2 Proposed Level -01 Plan

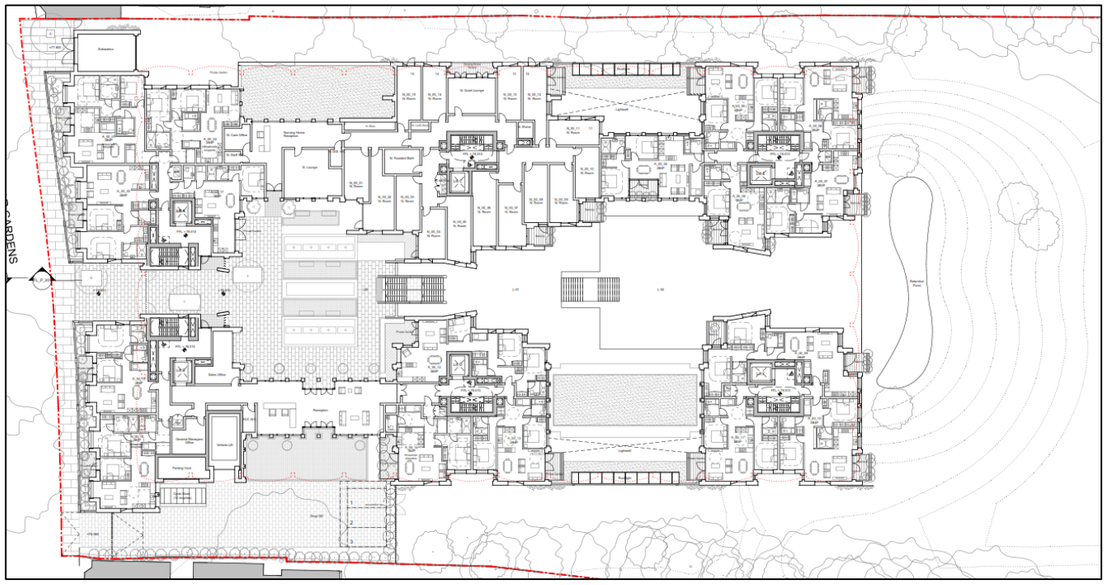

Figure 2.3 Proposed Level 00 Ground Floor Plan

3.0 DRIVERS OF SUSTAINABILITY

The term *Sustainable Development*, is defined by the Department for the Environment, Food and Rural Affairs as:

'… making sure people throughout the world can satisfy their basic needs now, while making sure that future generations can also look forward to the same quality of life. It recognises that the "three pillars" – economy, society and environment – are interconnected.'

United Nations Framework Convention on Climate Change

To achieve this objective of sustainable development in any industry, sector strict regulations have been put in place that have filtered down through EU Directives from the European Climate Change Programme, to National UK Acts such as the Climate Change Act 2008, to Local Policy in the form of Core Strategies. However, there are larger drivers behind the concept of sustainable development.

Kyoto Protocol

In 1997, the Kyoto Protocol was adopted as part of the United Nations Framework Convention on Climate Change, to which the UK is a signatory. The key feature of the protocol was the binding targets that were set for industrialised countries to reduce their Green House Gas emissions by 12.5% below 1990 levels by 2008-2012.

Cancun Agreements

Since the initial adoption of the Kyoto Protocol, extensive research has been put forward as to the causes and markers of climate change from the Intergovernmental Panel on Climate Change, which has led to new targets and objectives being made. In 2012, the international community met to discuss new directions for responding to climate change by adopting new agreements. The key objectives of the Cancun Agreements are:

- Establish clear objectives for reducing human-generated greenhouse gas emissions over time to keep the global average temperature rise below two degrees;
- Mobilise the development and transfer of clean technology to boost efforts to address climate change, getting it to the right place at the right time and for the best effect;
- Assist the particularly vulnerable people in the world to adapt to the inevitable impacts of climate change;
- Protect the world's forests, which are a major repository of carbon;
- Establish effective institutions and systems which will ensure these objectives are implemented successfully.

COP21: Paris Global Climate Agreement

In December 2015, a global climate deal was reached in a summit involving all of the world's nations. The targets of this aimed principally to curb the dangerous levels of climate change and drive an increase in low-carbon infrastructure investment. Numerous organisations and corporations also committed to helping create a greener future by making their own pledges through the course of the summit. The key elements of the agreement are:

- To keep global temperatures "well below" 2.0C above pre-industrial times and "endeavour to limit" them even more, to 1.5C
- To limit the amount of greenhouse gases emitted by human activity to the same levels that trees, soil and oceans can absorb naturally, beginning at some point between 2050 and 2100
- To review each country's contribution to cutting emissions every five years so they scale up to the challenge
- For rich countries to help poorer nations by providing "climate finance" to adapt to climate change and switch to renewable energy.

BRE's COP21 Climate Pledge (December 2015)

"We commit to continue to drive best practice and carbon reduction, as we have through the use of BREEAM for the past 25 years. By reaching over 9,000 BREEAM rated buildings we predict emissions savings will be in excess of 900,000 tonnes of CO2, compared to regulatory minimum performance requirements, by 2020. Saving not only carbon, but bringing wider benefits to both the owner and occupiers."

4.0 NATIONAL POLICY

National Planning Policy

An effective planning system is required to contribute to achieving sustainable development. The ***National Planning Policy Framework*** (NPPF), 2012, outlines what the government deems as sustainable development in England.

Sustainable development is described as having three dimensions; economic, social and environmental.

1. Economic Role – Contributing to creating a strong competitive economy with affordable energy costs;
2. Social Role – Supporting communities to be strong and healthy by providing a high quality built environment, accessible local services and providing security of supply;
3. Environmental Role – contributing to protecting our environment, built, natural and historic by reducing carbon emissions and promoting a move to a low carbon economy.

The above three dimensional scenario can be described as an energy trilemma, this is demonstrated in Figure 4.1 below. Each dimension is dependent on each other and sustainable development proposals should adhere to each role. This energy statement shall ensure the proposed Development is one that contributes economically, socially and environmentally in accordance with the NPPF, 2012.

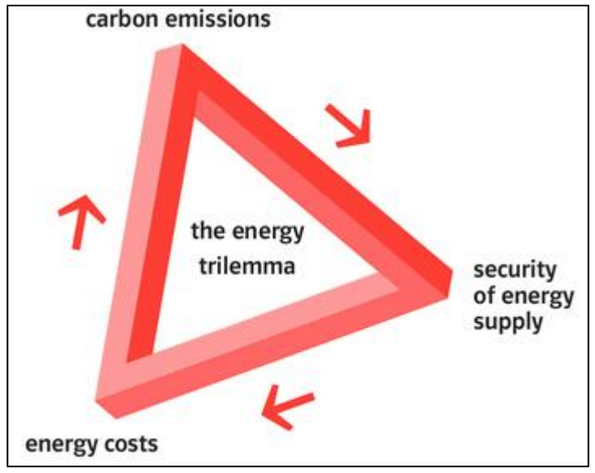

Figure 4.1 The Energy Trilemma

Guidance has been followed from the ***National Planning Policy Framework*** (NPPF), 2012, to provide an energy strategy which reduces energy use and carbon emissions, in line with best practice. This will provide a balanced scheme which focuses on optimal use of non-renewable resources (energy efficiency measures) whilst providing a renewable energy strategy best suited to the sites and their building uses. Below are some key extracts relevant to the development from Chapter ten 'Meeting the Challenge of Climate Change, flooding & Coastal Change':

Paragraph 94

Local planning authorities should adopt proactive strategies to mitigate and adapt to climate change.

Paragraph 95

Local Planning authorities should:

- Plan for new development in locations & ways which reduce greenhouse gas emissions.

Paragraph 96

Local authorities should expect new developments:

- To comply with adopted Local Plan policies on local requirements for decentralised energy supply unless this can be demonstrated that this is not feasible or viable;
- To take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption.

Paragraph 97

Local planning authorities should recognise the responsibility on all communities to contribute to energy generation from renewable or low carbon sources. They should:

- Have a positive strategy to promote energy from renewable and low carbon sources;
- Design their policies to maximise renewable and low carbon energy development;
- Consider identifying suitable areas for renewable and low carbon energy sources and supporting infrastructure.

Identifying opportunities where development can draw its energy supply from decentralised, renewable or low carbon energy supply systems and for co-locating potential heat customers and suppliers.

5.0 LOCAL POLICY

This section aims to highlight guidance available and the minimum requirements at local level from the Greater London Authority and Camden Council, which states the Council's vision, spatial strategy and policies for the future development of the area.

The London Plan 2016

The London plan states that:

"*Tackling climate change will also require a move towards more sustainable energy sources, and the London Plan seeks to support the development of decentralised energy systems, including the use of low carbon and renewable energy and the greater utilisation of energy generated from waste*" (Chapter 5, Paragraph 5.9).

The following policies outline requirements made by the Greater London Authority in relation to climate change and energy use.

Policy 5.1 Climate Change Mitigation

The Mayor seeks to achieve an overall reduction in London's carbon dioxide emissions of 60 per cent (below 1990 levels) by 2025. All Boroughs are to develop policies to promote the reduction of carbon dioxide emissions and to help achieve the mayor's strategic carbon dioxide emissions target.

Policy 5.2 Minimising Carbon Dioxide Emissions

Development proposals should make the fullest contribution to minimising carbon dioxide emissions in accordance with the following energy hierarchy:

- Be Lean: use less energy –This involves the use of passive and energy efficiency design measures to reduce the energy requirement and subsequent carbon footprint of the site. These provide a footprint which delivers compliance with Building Regulations Part L (2013) and the Baseline Energy and Carbon emission figures for the development;
- Be Clean: supply energy efficiently – The use of a central energy centre has been considered to serve the development, to provide the primary heating and cooling requirements for the development;
- Be Green: use renewable energy – The use of renewable energy has been investigated in the context of the site and the overall usage patterns of energy throughout the development.

Development proposals are required to demonstrate via an energy assessment that the development achieves a 40% reduction in carbon emissions beyond Part L 2010.

Policy 5.3 Sustainable Design and Construction

Development proposals should demonstrate that sustainable design standards are integral to the proposal. This should include:

- Minimising carbon dioxide emissions across the site, including the building and services (such as heating and cooling systems);
- Avoiding internal overheating and contributing to the urban heat island effect;
- Efficient use of natural resources (including water), including making the most of natural systems both within and around buildings;
- Minimising pollution (including noise, air and urban runoff);
- Minimising the generation of waste and maximising reuse or recycling;
- Avoiding impacts from natural hazards (including flooding);
- Ensuring developments are comfortable and secure for users, including avoiding the creation of adverse local climatic conditions;
- Securing sustainable procurement of materials, using local supplies where feasible, and;
- Promoting and protecting biodiversity and green infrastructure

Design features such as green roofs can enhance biodiversity, absorb rainfall, improve the performance of the building, reduce the urban heat island effect and improve the appearance of a development.

Policy 5.5 Decentralised Energy Networks

- The Mayor expects 25 per cent of the heat and power used in London to be generated through the use of localised decentralised energy systems by 2025.
- The Mayor prioritises the development of decentralised heating and cooling networks at the development and area wide levels, including larger scale heat transmission networks.
- Boroughs are to develop policies and proposals to identify and establish decentralised energy network opportunities.

Policy 5.6 Decentralised Energy in Development Proposals

Development proposals should evaluate the feasibility of Combined Heat and Power (CHP) systems, and where a new CHP system is appropriate also examine opportunities to extend the system beyond the site boundary to adjacent sites.

Major development proposals should select energy systems in accordance with the following hierarchy:

1. Connection to existing heating or cooling networks;
2. Site wide CHP network;
3. Communal heating and cooling.

Policy 5.7 Renewable Energy

The Mayor seeks to increase the proportion of energy generated from renewable sources. Development proposals should provide a reduction in expected carbon dioxide emissions through the use of on-site renewable energy generation, where feasible.

Policy 5.8 Innovative Energy Technologies

The Mayor supports and encourages the more widespread use of innovative energy technologies to reduce use of fossil fuels and carbon dioxide emissions. The Mayor will seek to work with Boroughs that are interested in the following technologies:

1. Electric and hydrogen fuel cell vehicles;
2. Hydrogen supply and distribution infrastructure;
3. Anaerobic digestion, gasification and pyrolysis for the treatment of waste.

Policy 5.9 Overheating and Cooling

A The Mayor seeks to reduce the impact of the urban heat island effect in London and encourages the design of places and spaces to avoid overheating and excessive heat generation, and to reduce overheating due to the impacts of climate change and the urban heat island effect on an area wide basis.

B Major Development proposals should reduce potential overheating and reliance on air conditioning systems and demonstrate this in accordance with the following cooling hierarchy:

1. Minimise internal heat generation through energy efficient design

2. Reduce the amount of heat entering a building in summer through orientation, shading, albedo, fenestration, insulation and green roofs and walls
3. Manage the heat within the building through exposed internal thermal mass and high ceilings
4. Passive ventilation
5. Mechanical ventilation
6. Active cooling systems (ensuring they are the lowest carbon options).

C Major Development proposals should demonstrate how the design, materials, construction and operation of the development would minimise overheating and also meet its cooling needs. New development in London should also be designed to avoid the need for energy intensive air conditioning systems as much as possible. Further details and guidance regarding overheating and cooling are outlined in the London Climate Change Adaptation Strategy.

D Within LDFs boroughs should develop more detailed policies and proposals to support the avoidance of overheating and to support the cooling hierarchy.

Greater London Authority Sustainable Design and Construction Supplementary Planning Guidance (2014)

2.4 Energy and Carbon Dioxide Emissions

In line with The London Plan Policy 5.2 the following carbon savings are required:

Residential:

• 2013 – 2016 40% improvement beyond 2010 Building Regulations;

• 2016 – 2031 Zero carbon.

Non-domestic:

• 2013 – 2016 40% improvement beyond 2010 Building Regulations;

• 2016 – 2019 As per the Building Regulations requirements;

• 2019 – 2031 Zero carbon.

To avoid complexity and extra costs, the Mayor has adopted a flat carbon dioxide improvement beyond Part L 2013 of 35% for both residential and non-residential developments.

Camden Planning Guidance Sustainability – CPG3 (2015)

Section 3 – Energy Efficiency: New Buildings

- All developments are to be designed to minimise carbon dioxide emissions;
- The most cost effective ways to minimise energy demand are through good design and high levels of insulation and air tightness.

Section 4 – Energy Efficiency: Existing Buildings

- As a guide, at least 10% of the project cost should be spent on environmental improvements;
- Potential measures will be bespoke to each property;
- Sensitive improvements can be made to historic buildings to reduce carbon dioxide emissions.

Section 5 – Decentralised Energy Networks and Combined Heat and Power

- Decentralised energy could provide 20% of Camden's heating demand by 2020;
- Combined heat and power plants can reduce carbon dioxide emissions by 30-40% compared to a conventional gas boiler;
- Where feasible and viable your development will be required to connect to a decentralised energy network or include CHP.

Section 6 – Renewable Energy

- There are a variety of renewable energy technologies that can be installed to supplement a development's energy needs;
- Developments are to target a 20% reduction in carbon dioxide emissions from on-site renewable energy technologies.

Section 7 – Water Efficiency

- At least 50% of water consumed in homes and workplaces does not need to be of drinkable quality re-using water;
- All developments are to be water efficient;
- Developments over 10 units or 1000sq m should include grey water recycling.

Section 8 – Sustainable Use of Materials

- Reduce waste by firstly re-using your building, where this is not possible you should implement the waste hierarchy;
- The waste hierarchy prioritises the reduction, re-use and recycling of materials;
- Source your materials responsibly and ensure they are safe to health.

Section 10 – Brown Roofs, Green Roofs and Green Walls

- All developments should incorporate green and brown roofs;
- The appropriate roof or wall will depend on the development, the location and other specific factors;
- Specific information needs to be submitted with applications for green/ brown roofs and walls.

Section 11 – Flooding

- Developments are required to prevent or mitigate against flooding;
- All developments are expected to manage drainage and surface water;
- There is a hierarchy you should follow when designing a sustainable drainage system.

Section 12 – Adapting to Climate Change

- All development should consider how it can be occupied in the future when the weather will be different;
- The early design stage is the most effective time to incorporate relevant design and technological measures.

Section 13 – Biodiversity

Proposals should demonstrate:

- How biodiversity considerations have been incorporated into the development;
- If any mitigation measures will be included;
- What positive measures for enhancing biodiversity are planned.

Camden Local Plan – Adopted July 2017

Policy A3 – Protection, Enhancement and Management of Biodiversity

The Council will protect and improve sites of nature conservation and biodiversity. We will:

- Designate and protect nature conservation sites and safeguard protected and priority habitats and species;

- Resist development which would directly or indirectly result in the loss, reduction in area or harm to a designated nature conservation site or adversely affect the status or population of priority habitats and species;
- Protect other green areas with nature conservation value, including gardens, where possible;
- Assess developments against their ability to enhance biodiversity through incorporating measures to support wildlife, proportionate to the scale of development proposed;
- On larger sites, we will seek satisfactory levels of natural greenspace, including the creation and restoration of BAP habitat;
- Ensure that benefits for biodiversity and ecology are realised in the layout, design and materials used in the built structure and landscaping elements of a proposed development;
- Secure biodiversity improvements to habitat corridors, particularly where a development scheme is adjacent to an existing habitat;
- Improve opportunities to experience nature, in particular where such opportunities are lacking;
- Require the demolition and construction phase of development, including the movement of works vehicles, to be planned to avoid disturbance to species and ecologically sensitive areas;
- Secure management plans to ensure that nature conservation objectives are met; and
- Work with The Royal Parks, the London Wildlife Trust, friends of park groups and local nature conservation groups to protect and improve open spaces and nature conservation in Camden.

Policy A4 – Noise and Vibration

The Council will seek to ensure that noise and vibration is controlled and managed. We will not grant planning permission for:

- Development likely to generate unacceptable noise and vibration impacts; or
- Development sensitive to noise in locations with existing high levels of noise unless appropriate attenuation measures are provided.

Development that exceeds Camden's Noise and Vibration Thresholds (Appendix 2) will not normally be permitted.

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:

- Require all development proposals of five or more dwellings and/or 500m sq of any floorspace to show in an energy statement how the energy hierarchy has been applied;
- Ensure that the location of development and mix of land uses minimises the need to travel by car and help support local energy networks;
- Support and encourage sensitive energy efficiency improvements to existing buildings; and
- Ensure that developments maximise resource efficiency.

We will promote local energy generation by:

- Working with our partners and developers to implement local energy networks in the parts of Camden most likely to support them;
- Protecting existing local energy networks where possible (e.g. at Gower Street and Bloomsbury) and safeguarding potential network routes (e.g. Euston Road); and
- Requiring all major developments to assess the feasibility of establishing a decentralised energy network or connecting to an existing network.

Policy CC2 – Adapting to Climate Change

The Council will require development to be resilient to climate change. We will ensure that schemes include appropriate climate change adaptation measures, such as:

- Protecting existing green spaces and promoting new appropriate green infrastructure;
- Not increasing and wherever possible reducing surface water run-off;
- Incorporate green roofs, combination green and blue roofs and green walls where appropriate; and
- Measures to reduce the impact of urban and dwelling overheating.

Sustainable design and construction; we will promote and measure sustainable design and construction by:

- Ensuring development schemes demonstrate how adaptation measures and sustainable development principles have been incorporated into the design and proposed implementation;
- Expecting new build housing to meet Code for Sustainable Homes Level 4 and Code Level 6 (zero carbon) by 2016 or future replacement standards;
- Expecting developments (conversions/extensions) of 500sqm of residential floorspace or above or five or more dwellings to achieve "excellent" in BREEAM domestic refurbishment; and
- Expecting non-domestic developments of 500sqm of floorspace or above to achieve "excellent" in BREEAM assessments from 2016 and encouraging zero carbon in new development from 2019.

Policy CC3 – Water and Flooding

The Council will require developments to mitigate against flooding, be adaptable and reduce their water consumption. We will ensure that development:

- Considers the impact of development on Local Flood Risk Zones (including drainage);
- Does not locate vulnerable development (such as basements dwellings) in flood-prone areas;
- Achieves a greenfield run-off rate or, where this is not possible, achieve runoff rates that do not exceed those predevelopment;
- Incorporates water efficiency measures; and
- Avoids harm to the water environment and water quality.

Development should not increase flood risk and should reduce the risk of flooding where possible. Where an assessment of flood risk is required, developments should consider surface water flooding in detail and groundwater flooding where applicable.

Policy CC4 – Air Quality

The Council will take into account the impact of air quality when assessing development proposals, through the consideration of both the exposure of occupants to air pollution and the effect of a development on air quality. Consideration must be taken to the actions identified in the Council's Air Quality Action Plan.

Air Quality Assessments (AQAs) are required where development is likely to expose residents to high levels of air pollution. Where the AQA shows that a development would cause harm to air quality, the Council will not grant planning permission unless mitigation measures are adopted to reduce the impact to acceptable levels. Similarly, developments in locations of poor air quality will not be acceptable unless designed to mitigate the impact to within acceptable limits.

Development which involves significant demolition, construction or earthworks will also be required to assess the risk of impacts in an AQA and include appropriate mitigation measures to be secured in a Construction Management Plan.

The Council will only grant planning permission for development in Camden's Clear Zone region that significantly increases travel demand where it considers that appropriate measures to minimise the transport impact of development are incorporated.

Policy CC5 – Waste

The Council will seek to make Camden a low waste borough. We will:

- Aim to reduce the amount of waste produced in the borough and increase recycling and the re-use of materials to meet the London Plan targets of 50% of household waste recycled/composted by 2020 and aspiring to achieve 60% by 2031;
- Deal with North London's waste by working with our partner boroughs in North London to produce a Waste Plan, which will ensure that sufficient land is allocated to manage the amount of waste apportioned to the area in the London Plan;
- Safeguard Camden's existing waste site at Regis Road unless a suitable compensatory waste site is provided that replaces the maximum throughput achievable at the existing site; and
- Make sure that developments include facilities for the storage and collection of waste and recycling.

6.0 ENERGY USAGE AND CARBON EMISSIONS

Government policies require significant energy reductions from buildings. Building a Greener Future sets a planned trajectory (delivered via Part L of the building regulations 2013) with an aspiration for all non-domestic new buildings to be zero carbon by 2020. The Climate Change Act (Nov 2008) sets the UK targets of; CO_2 reduction of 26% by 2020 and CO_2 reduction of 80% by 2050.

6.1 POLICY REVIEW

National Planning Policy Framework (2012)

Section 10 – Meeting the Challenge of Climate Change, Flooding and Coastal Change

New developments should comply with local requirements regarding decentralised energy, unless this is not feasible. Developments should comply with local strategy to promote generation of energy from renewable and/ or low carbon sources.

Greater London Authority Sustainable Design and Construction Supplementary Planning Guidance (2014)

2.4 Energy and Carbon Dioxide Emissions

In line with The London Plan Policy 5.2 the following carbon savings are required:

Non-domestic:

• 2013 – 2016 40% improvement beyond 2010 Building Regulations;

• 2016 – 2019 As per the Building Regulations requirements;

• 2019 – 2031 Zero carbon.

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Section 6 – Renewable Energy

- There are a variety of renewable energy technologies that can be installed to supplement a development's energy needs;
- Developments are to target a 20% reduction in carbon dioxide emissions from on-site renewable energy technologies.

6.2 DEVELOPMENT SUSTAINABILITY FEATURES

The energy requirements of the development have been modelled in compliance with Part L1A and L2A the Building Regulations 2013 and are based on the site layout plans provided by Robin Partington and Partners. Full details of the energy strategy can be found within the Cudd Bentley Consulting Energy Statement.

This report includes annualised baseline calculations which predict the likely energy consumption and associated CO_2 emissions for this development. The total baseline energy and carbon emissions for the development, taking into account regulated energy demands are:

- **922,061 kWh/annum**
- **303.17 Tonnes CO_2/annum**

Unregulated energy use is not covered by existing regulations and includes energy consumed by the occupants through activities and appliances; in this case it would typically be cooking and small power usage (appliances, computers, equipment etc.). The following unregulated energy use for the development was calculated:

- **649,196 kWh/annum**
- **198.52 Tonnes CO_2/annum**

The following energy hierarchy has been adhered to in order to determine the most appropriate strategy for the Development in accordance with The London Plan 2016 and Camden CPG3 2015:

1. **Be Lean**, Reduce energy and carbon emissions through the use of passive design and energy efficiency measures;
2. **Be Clean**, Reduce energy and carbon emissions by investigating the possibility of installing a site wide Combined Heat and Power (CHP) system or connecting to an existing decentralised CHP network;
3. **Be Green**, Reduce energy and carbon emissions by installing Low or Zero Carbon Technologies such as Air Source Heat Pumps (ASHP), Solar panels, Photovoltaics (PV), Wind Turbines etc.

Proposed Energy Strategy for Proposed Development:

In summary the energy strategy comprises of:

1. Passive Design and Energy Efficient Measures;
2. Combined Heat and Power (CHP);
3. High efficiency chillers;
4. Photovoltaic Panels (PVs).

This review has resulted in the formulation of an Energy Strategy to be adopted for the development involving the use of passive design and energy efficiency measures, CHP and the installation of PV; which achieves compliance with Part L2A and L1A 2013, the London Borough of Camden's Local Planning Guidance, CPG3 requirements, and targets compliance with The London Plan 2016 requirements. The following Table 6.1 and 6.2 highlights the carbon savings that are currently anticipated for the development from a base Part L1A and L2A 2013 compliant build.

	Carbon Dioxide Emissions (Tonnes CO_2 per annum)	
	Regulated	**Unregulated**
Baseline : Part L 2013 of the Building Regulations Compliant Development	303.17	198.52
After Energy Demand Reduction	294.14	It is anticipated that a circa 3% saving can be achieved through the use of energy efficient equipment, for example A or A+ appliances. This would reduce the unregulated carbon emissions to: 192.56
After CHP	228.16	
After PV	226.44	

Table 6.1 Carbon Dioxide Emissions

	Regulated Carbon Dioxide Savings	
	Tonnes CO_2 per annum	**%**
Savings from energy demand reduction	9.03	2.98
Savings from CHP	65.98	21.76
Savings from PV	1.72	0.57
Total Cumulative Savings	**76.73**	**25.31**
Total Target Savings	**106.11**	**35.00%**
Annual Shortfall	**29.38**	**9.69%**

Table 6.2 Regulated Carbon Savings

The proposed Development shall include both residential and commercial elements, the following Table 6.3 and Table 6.4 demonstrates the carbon savings achieved independently by the residential and commercial elements respectively.

	Regulated Carbon Dioxide Savings	
	Tonnes CO_2 per annum	**%**
Savings from energy demand reduction	3.15	2.77
Savings from CHP	31.80	27.99
Total Cumulative Savings	**34.95**	**30.76**

Table 6.3 Regulated Carbon Savings Residential (Part L1A)

	Regulated Carbon Dioxide Savings	
	Tonnes CO_2 per annum	**%**
Savings from energy demand reduction	5.88	3.10
Savings from CHP	34.18	18.03
Savings from PV	1.72	0.91
Total Cumulative Savings	**41.78**	**22.04**

Table 6.4 Regulated Carbon Savings Commercial (Part L2A)

6.3 SUMMARY

The recommended scheme takes into consideration the site layout and requirements for the building type to produce a design that incorporates the most appropriate technologies available to the site. This provides a scheme that is commercially viable whilst targeting compliance with all policies applicable to this development.

The Greater London Authority Sustainable Design and Construction SPG requires all developments to achieve a 35% carbon improvement. The Housing Supplementary Planning Guidance, March 2016, Standard 35, requires residential development proposals to achieve zero carbon from the 1st of October 2016. The Mayor's Housing Standards' Viability Assessment assumed a carbon off-set price of £60 per tonne of carbon dioxide for a period of 30 years. The Development has an anticipated CO_2 improvement of 25.31% beyond Part L 2013. This provides a shortfall of 9.69% with The London Plan, March 2016; therefore a contribution shall be required. The Development achieves a 22.33% carbon saving from the use of combined heat and power and photovoltaics.

The use of further/emerging technologies may be included for use within this development if their feasibility increases in the future, in line with best practice.

7.0 WATER CONSUMPTION

The ever increasing impacts of climate change are continuously inflating demand for water, as well as increasing a need for awareness towards water usage. The South of the UK is already under a large amount of pressure regarding water resources. To contribute towards mitigating this issue, the proposed development will consider various means of being economical with water consumption.

7.1 POLICY REVIEW

Camden Planning Guidance Sustainability – CPG3 (2015)

Section 7 – Water Efficiency

- At least 50% of water consumed in homes and workplaces does not need to be of drinkable quality re-using water;
- All developments are to be water efficient;
- Developments over 10 units or 1000sq m should include grey water recycling.

7.2 DEVELOPMENT SUSTAINABILITY FEATURES

In order to ensure the reduction and management of water consumption within the proposed development, it is anticipated that various measures shall be undertaken and specific features installed during the fit out works to minimise the building's potable water consumption.

It is anticipated that improvements in the consumption of potable water will be achieved through the specification of water efficient components within sanitary areas during the fit out works. Such features include the specification of low flow taps as well as dual flush toilets with reduced flush volumes.

To allow the building users to monitor their water usage, it is also anticipated that water meters shall be specified on the mains supply and to systems which consume more than 10% of the over building water usage; for example the pool. Water meters should have a pulsed output to allow connection to a Building Management System should one be installed at a later date.

It is anticipated that flow control devices will be installed within communal sanitary areas of the building, in order to prevent water leaks by stopping the flow of water when an area is not in use.

7.3 BREEAM NEW CONSTRUCTION 2014

Water consumption

The following fittings where present, will be specified with low flush volumes and flow rates in order to provide a 25% reduction in potable water consumption:

- WCs;
- Urinals;
- Taps;
- Showers;
- Dishwashers.

Water Monitoring

It is anticipated water meters with a pulsed output will be supplied on the mains water supply to the commercial element of the development. Meters should be pulsed to allow future occupants to monitor water consumption.

Water Leak Detection

It is anticipated a water leak detection system shall be installed on the buildings mains water supply.

Water Efficient Equipment

It is anticipated that water efficient irrigation methods shall be installed. Alternatively, any landscaping will be naturally irrigated through rain water, resulting in a reduction of potable water consumption.

7.4 SUMMARY

To ensure the sustainability of the development it is anticipated that water efficient fixtures will be incorporated into the design, such as low flow taps and showers as well as dual flush toilets with reduced effective flush volumes.

To be further sustainable, it is anticipated that a water leak detection system and pulsed water meters will be installed on the mains water supply, to effectively monitor water consumption.

The inclusion of the above sustainability features allow for the proposed development to be deemed sustainable with regard to water consumption.

8.0 TRANSPORT

Transport produces a large proportion of the country's greenhouse gas emissions, something which government at both national and local level are striving to combat, especially through planning frameworks for new developments. Solutions to transport issues are to be incorporated into the design of the development.

8.1 POLICY REVIEW

National Planning Policy Framework (2012)
Section 4 – Promoting Sustainable Transport
Encouragement should be given to solutions which aim to reduce greenhouse gas emissions, especially through opportunities for sustainable transport, with large developments delivering a travel plan for building users.

8.2 DEVELOPMENT SUSTAINABILITY FEATURES

The proposed development is located west of Hampstead and south of Hampstead Cemetery and is surrounded by residential properties; this can be seen below in Figure 8.1.

This urban location allows for an excellent provision of public transport with a plethora of bus stops, underground and train stations which provide a variety of routes to different areas within London and the surrounding suburbs. The public transport links available can be seen in Figure 8.2 below.

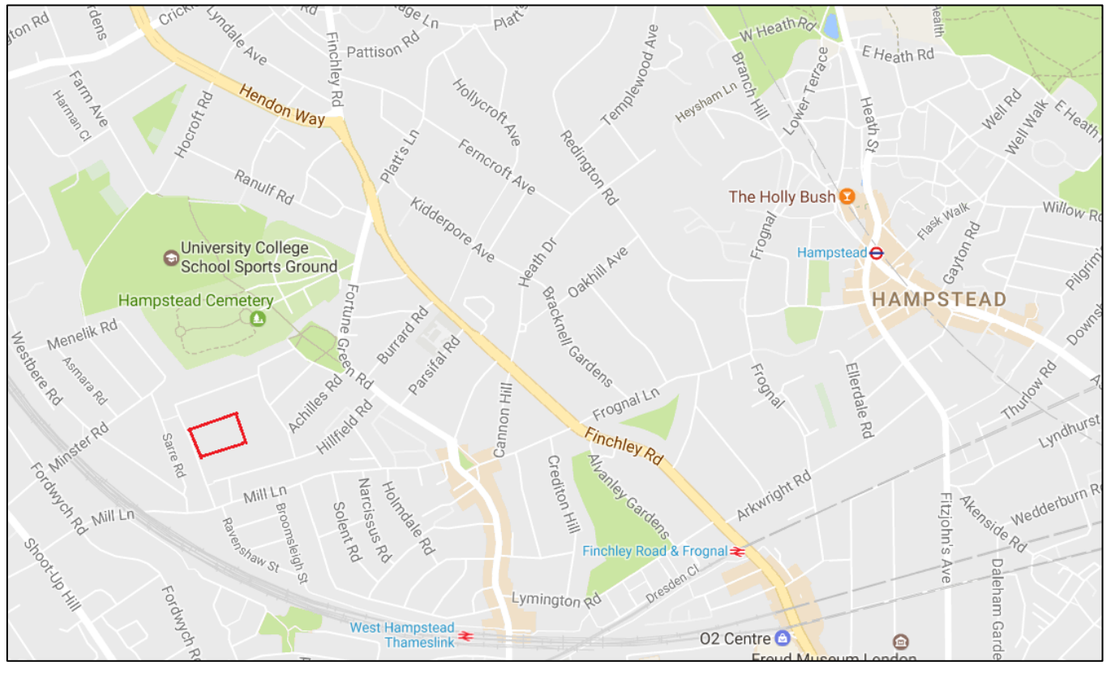

Figure 8.1 Location of the Development

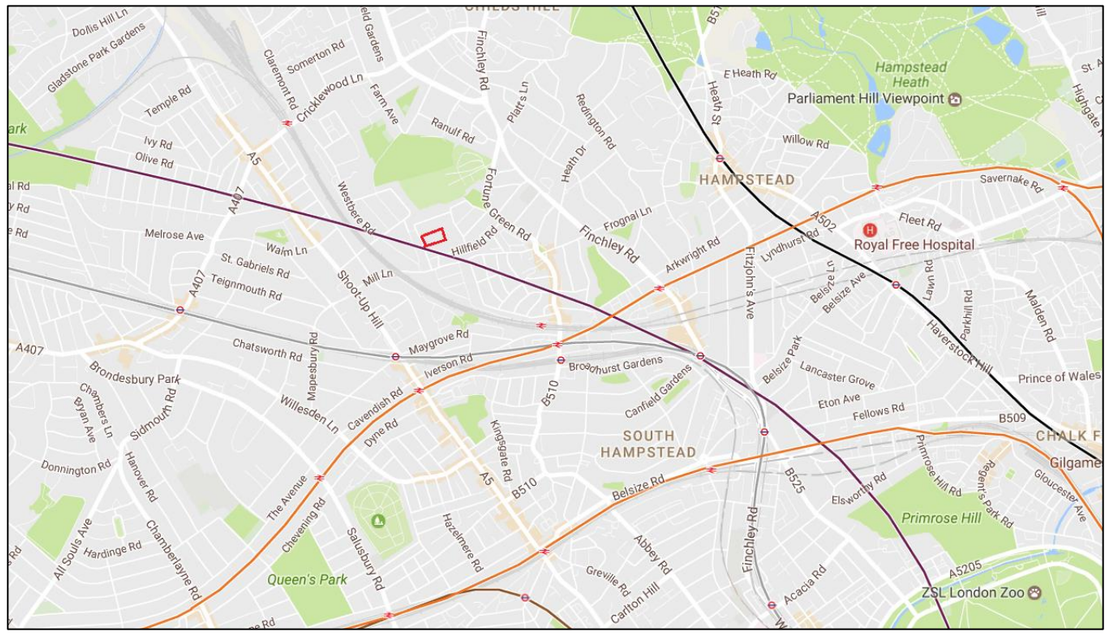

Figure 8.2 Public Transport Links

The location of the development is also in close proximity to a significant number of primary amenities including a number of postal services, cash points and food outlets located in walking distance; the closest being located on Mill Lane which is approximately a 2 minute walk from the development site. As the development is in a locality with a wide variety of amenities available, this should reduce the need for extended travel in private vehicles and in turn also reduce transport related carbon emissions.

It is anticipated that sheltered and secure cycle storage will also be provided for building users. The provision of cycle storage should encourage staff and visitors to use a means of commuting which does not rely on the private vehicle. A total of 4 car pool car parking spaces and 6 visitor spaces are proposed at the basement level, there are no private car spaces for residents. The proposed development location is surrounded by a number of cycle routes within the London area, which lead on to routes across the entire city, as seen within Figure 8.3.

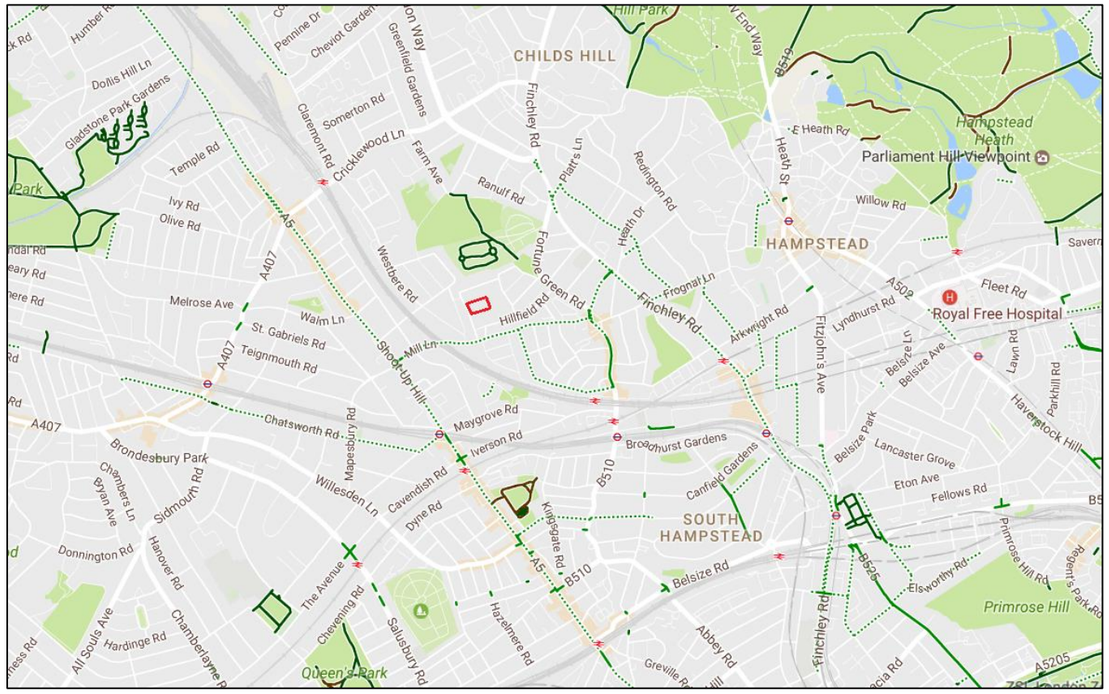

Figure 8.3 London Cycle Network

8.3 BREEAM NEW CONSTRUCTION 2014

Public Transport Accessibility

The proposed development is set in central London and as such the development is in close proximity to a variety of public transport nodes including London Underground, London Overground, Nation Rail and bus services.

Proximity to Amenities

The development is located in close proximity to a number of primary amenities required by BREEAM, including postal services, food outlets and cashpoints; this which will further reduce the need for personal vehicle use.

Cycling Facilities

Cycle storage spaces and cyclist facilities will be provided which are sheltered and secure within a storage facility, to encourage building users to adopt a sustainable means of transport.

Travel Plan

A Travel Plans has been undertaken (Morgan Tucker Consulting Engineers) which is based upon a site specific Transport Statement. The Travel Plan puts forwards the following measures in order to promote sustainable transportation to and from the development:

- Information provision to both staff and residents regarding public transport available, public transport timetables and on-site parking restrictions among other measures;
- Promotion of a Bicycle User Group to use the cyclist facilities included within the scheme design;
- Provision of a sustainable Travel Pack to all residents and staff;
- Provision of a notice board with travel information;
- Provision of 4 car pool car parking spaces and 6 visitor spaces.

8.4 SUMMARY

The above provisions aim to make the proposed development easier to access for all building users, as well as offering a sustainable means of commuting rather than using a private vehicle.

The development is located in West Hampstead, and therefore is in close proximity to a significant number of local primary amenities including a cash point, post box and food outlets, eliminating the need for extended car based travel.

It is anticipated that cycle storage facilities will be provided to encourage staff and visitors to cycle to the development rather than using a private vehicle. The inclusion of the above sustainability features allow for the proposed development to be deemed sustainable with regard to transport.

9.0 CONSTRUCTION SITE MANAGEMENT

In the South of the UK, a large proportion of all waste is due to construction and demolition. The requirement for new materials needs to be minimised, by re-using existing buildings and materials where possible and providing a Site Waste Management Plan for all construction sites. This responsibility lies with the contractor and needs to be clarified at an early design stage. It is becoming a greater requirement now to construct buildings that are flexible and can be re-used.

9.1 POLICY REVIEW

National Planning Policy Framework (2012)

Local plans should set out strategic priorities for the area; this should include strategic policies to deliver the provision of infrastructure for waste management, water supply and wastewater.

Camden Planning Guidance Sustainability – CPG3 (2015)

Section 8 – Sustainable Use of Materials

- Reduce waste by firstly re-using your building, where this is not possible you should implement the waste hierarchy;
- The waste hierarchy prioritises the reduction, re-use and recycling of materials;
- Source your materials responsibly and ensure they are safe to health.

Camden Local Plan (2017)

Policy CC5 – Waste

The Council will seek to make Camden a low waste borough. We will:

- Aim to reduce the amount of waste produced in the borough and increase recycling and the re-use of materials to meet the London Plan targets of 50% of household waste recycled/composted by 2020 and aspiring to achieve 60% by 2031;
- Deal with North London's waste by working with our partner boroughs in North London to produce a Waste Plan, which will ensure that sufficient land is allocated to manage the amount of waste apportioned to the area in the London Plan;
- Safeguard Camden's existing waste site at Regis Road unless a suitable compensatory waste site is provided that replaces the maximum throughput achievable at the existing site; and
- Make sure that developments include facilities for the storage and collection of waste and recycling.

9.2 DEVELOPMENT SUSTAINABILITY FEATURES

In order to comply with national and local policy, it is anticipated that certain measures will be put into place for this development, such as a Site Waste Management Plan which monitors the site energy and water consumption and ensures that that site timber is legally and responsibly sourced in accordance with the UK Government's Timber Procurement Policy. Further to this the Site Waste Management Plan should also monitor the resource efficiency of the development construction works as well as the percentage of non-hazardous materials, excavation and construction, which have been diverted from landfill.

It is expected that the main contractor will also set targets and monitor site consumption data for water consumption, energy consumption as well as fuel from deliveries and collection of waste and materials to and from site. Monitoring of such actions can encourage contractors to become more resource efficient to meet given targets.

Additionally, it is expected the main contractor will comply with best standards as set out in the Considerate Constructors Scheme, achieving a score which is considered as exceeding compliance with the criteria of the scheme, which covers the following elements;

- Care about appearance;
- Respect the community;
- Protect the environment;
- Secure everyone's safety;
- Value their workforce.

To ensure the sustainable construction of the development, the project will consider the concept of the waste hierarchy as seen in Figure 9.1 below. The waste hierarchy recognises the need for waste to be considered for a variety of waste streams before being sent to land fill as a last resort. The hierarchy is as follows:

- Waste minimisation;
- Reusing of waste or up cycling;
- Recycling of all applicable materials;
- Recovery of energy from waste (anaerobic digestion plants);
- Waste is sent to landfill.

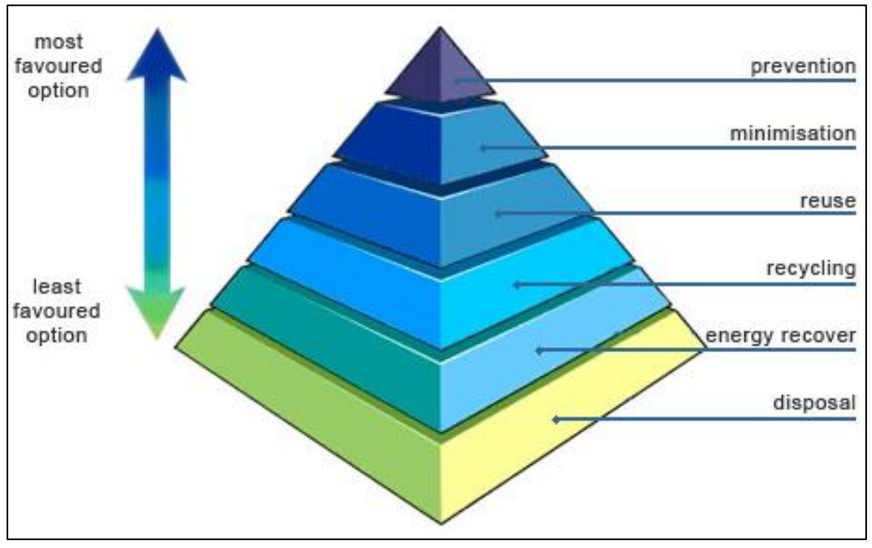

Figure 9.1 Waste Hierarchy Diagram

9.3 BREEAM NEW CONSTRUCTION 2014

Responsible Construction Practices

It is anticipated that the principle contractor will operate an environmental management system such as IS0 14001. Further to this it is also anticipated that the principal contractor will undertake the following actions:

- Adhere to a Considerate Constructors Scheme and achieve a score which significantly exceeds compliance;
- Monitor and record all energy consumption data from construction works;
- Monitor and record all water consumption data from construction works;
- Monitor and record transport movements and impacts from construction works;
- Ensure all timber used on site has been legally and responsibly sourced.

Construction Waste Management

It is expected that a Resource Management Plan or a Site Waste Management Plan (SWMP) will be developed which will consider the waste streams of non-hazardous waste generated from site activities and the ability to divert such waste from landfill.

9.4 SUMMARY

It is anticipated that this development will produce a Site Waste Management Plan, highlighting key construction waste materials and the correct waste streams for recycling these materials.

The development should adhere to a Considerate Constructors Scheme, achieving a targeted score which exceeds ‘compliance’ with the criteria of the scheme. As a result of these measures, the development may be deemed sustainable as regards to construction site management.

10.0 SUSTAINABLE DESIGN

Good urban design is essential in providing a varied and sustainable environment, which can facilitate opportunities for positive contributions within communities. As part of sustainable design for developments, it is essential that suitable design principles are followed to maximise opportunities for energy reduction through design as well as ensuring buildings follow or enhance the character of an area. Developments should also give further consideration to the level of security and comfort that is provided for future building users, including thermal and visual comfort, inclusivity and safe access.

10.1 POLICY REVIEW

National Planning Policy Framework (2012)

Section 7 – Requiring Good Design

Good design is a key aspect of sustainable development and local authorities should aim to ensure that developments establish a strong sense of place while responding to local character and supporting local transport links.

Camden Planning Guidance Sustainability – CPG3 (2015)

Section 12 – Adapting to Climate Change

- All development should consider how it can be occupied in the future when the weather will be different;
- The early design stage is the most effective time to incorporate relevant design and technological measures.

10.2 DEVELOPMENT SUSTAINABILITY FEATURES

The proposed development shall include a variety of features which are regarded as having a good sustainable design. It is anticipated that any external lighting specified will be designed to reduce unnecessary light pollution during night time hours. This can be achieved through the use of time switches or daylight sensors which switch off lighting between 2300hrs and 0700hrs as well as cut off luminaires which reduce light spill.

To ensure that overheating will not occur during summer months and the building is suitably insulated as well as allowing for adaptation due to the effects of climate change, it is anticipated that the commercial element of the development will use building fabrics with enhanced 'U' values which go beyond the minimum requirements of Part L2A (2013); this can be seen within Table 10.1 below. The residential U Values used are also beyond the requirements of Part L1A (2013), the thresholds for which are set lower than Part L2A (2013), see Table 10.2. It is anticipated that such measures will lower the building's energy requirements making its operation feasible and practical for years to come.

Building Element	Part L2A Threshold	Commercial U Value Specified	% Improvement
Walls	0.35	0.22	37.15%
Roof	0.25	0.16	36.00%
Floor	0.25	0.20	20.00%
Glazing	2.20	1.40	37.00%

Table 10.1 Improvement in U Values beyond Part L2A (2013)

Building Element	Part L1A Threshold	Residential U Value Specified	% Improvement
Walls	0.30	0.18	40.00%
Roof	0.20	0.13	35.00%
Floor	0.25	0.13	48.00%
Glazing	2.00	1.40	30.00%

Table 10.1 Residential U Values beyond Part L1A (2013)

In order to further reduce any potential overheating or contributions to the urban heat island effect, lighter colour surfaces have been incorporated into the scheme where possible. An element of this can be seen within the façade cladding shown in Figure 10.1 below. It is anticipated that lighter coloured materials will also be incorporated into aspects of the hard landscaping with the aim of light being reflected rather than absorbed and produce excess heat.

Figure 10.1 Persephone Gardens South Elevation

To provide a fully sustainable development it is also anticipated that the materials used for the following main elements of the development shall be rated under the Green Guide to Specification achieving ratings between A+ and C:

- External walls;
- Ground floor;
- Upper floors;
- Roof;
- Windows.

10.3 BREEAM NEW CONSTRUCTION 2014

Visual Comfort

To provide a comfortable environment for building users it is anticipated that all internal and external lighting will be designed in accordance with the guidelines set out by CIBSE.

Safety and Security

The design team shall consult with the local Crime Prevention Design Advisor (CPDA). Measures recommended by the CPDA shall be reflected within the development design, as well as 'secured by design' features.

Responsible Sourcing

All materials specified for the main building elements, including insulation materials (structural and building services) should be responsibly sourced with certification under and ISO 14001/ BES 6001 or equivalent scheme.

Design for Durability

To prevent damage to vulnerable areas of the building where there may be high pedestrian footfall, it is anticipated that durability measures will be incorporated into the design of the development. Examples could include:

- Hard wearing floors;
- Corner protectors;
- Kick plates on doors.

Energy Monitoring

It anticipated that sub-meters where appropriate will be supplied to monitor energy consumption within the development such as, heating, cooling, fans and lighting.

Reduction of Night Time Pollution

To prevent potential night time pollution it is anticipated that external lighting will be minimal and connected to timers or dimmers. This is further recommended within the Ecological Action Plan (James Blake Associates), that external lighting should be specified with hoods in order to prevent light spillage on boundary vegetation which during surveys was noted to be used by bats.

10.4 SUMMARY

In order to comply with national and local policies, the development shall strive to provide both to building users and the local community a building of sustainable design.

Measures should be taken to ensure the thermal comfort of future building users, through efforts such as ensuring no occupied areas will result in excessive solar gains and in turn over heating.

External lighting except safety and security lighting should be designed to be switched off automatically through the use of timers of day light sensors as well as the specification of cut off luminaires to reduce any potential light spill on to neighbouring properties as well as disturbing routes used by bats.

The above design features allow for the proposed development to be of sustainable design.

11.0 FLOOD RISK

To prevent an increase in surface water run off through development of a site, it is imperative that consideration is given to the reduction of over land flow during storm events as well as the impact of development in potential flood risk areas.

11.1 POLICY REVIEW

National Planning Policy Framework (2012)

Section 10 – Meeting the Challenge of Climate Change, Flooding and Coastal Change

In order to adapt to climate change, inappropriate development in areas at risk of flooding should be avoided.

Camden Planning Guidance Sustainability – CPG3 (2015)

Section 11 – Flooding

- Developments are required to prevent or mitigate against flooding;
- All developments are expected to manage drainage and surface water;
- There is a hierarchy you should follow when designing a sustainable drainage system.

Camden Local Plan (2017)

Policy CC3 – Water and Flooding

The Council will require developments to mitigate against flooding, be adaptable and reduce their water consumption. We will ensure that development:

- Considers the impact of development on Local Flood Risk Zones (including drainage);
- Does not locate vulnerable development (such as basements dwellings) in flood-prone areas;
- Achieves a greenfield run-off rate or, where this is not possible, achieve runoff rates that do not exceed those predevelopment;
- Incorporates water efficiency measures; and
- Avoids harm to the water environment and water quality.

Development should not increase flood risk and should reduce the risk of flooding where possible. Where an assessment of flood risk is required, developments should consider surface water flooding in detail and groundwater flooding where applicable.

11.2 DEVELOPMENT SUSTAINABILITY FEATURES

The flood map sourced from the Government Flood Warning Information Service seen below in Figure 11.1, demonstrates that the proposed site is located within Flood Zone 1 and as such is not at risk of flooding from fluvial sources. The second flood map seen below in Figure 11.2, highlights there is also no risk of flooding from surface water on the proposed site.

A Flood Risk Assessment (RSK) has been carried out which will further confirm the risk of flooding on site from all sources including:

- Fluvial;
- Tidal;
- Sewers;
- Reservoirs, canals and other artificial sources.

The list of low risk flooding sources exempts ground water and surface water sources which present in some areas of the site a medium risk of flooding. In order to mitigate against the ground water flooding it is anticipated that affected areas will be tanked as well as possibly including a land drainage solution to prevent issues.

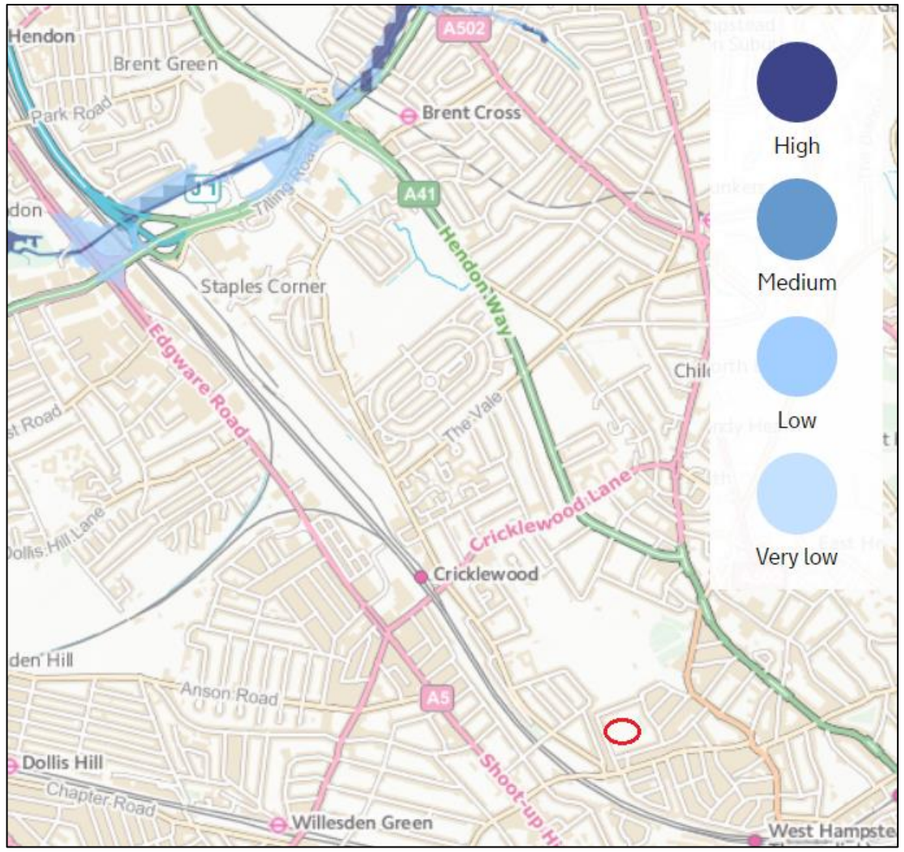

Figure 11.1 Flooding (Sourced from the Government Flood Warning Information Service)

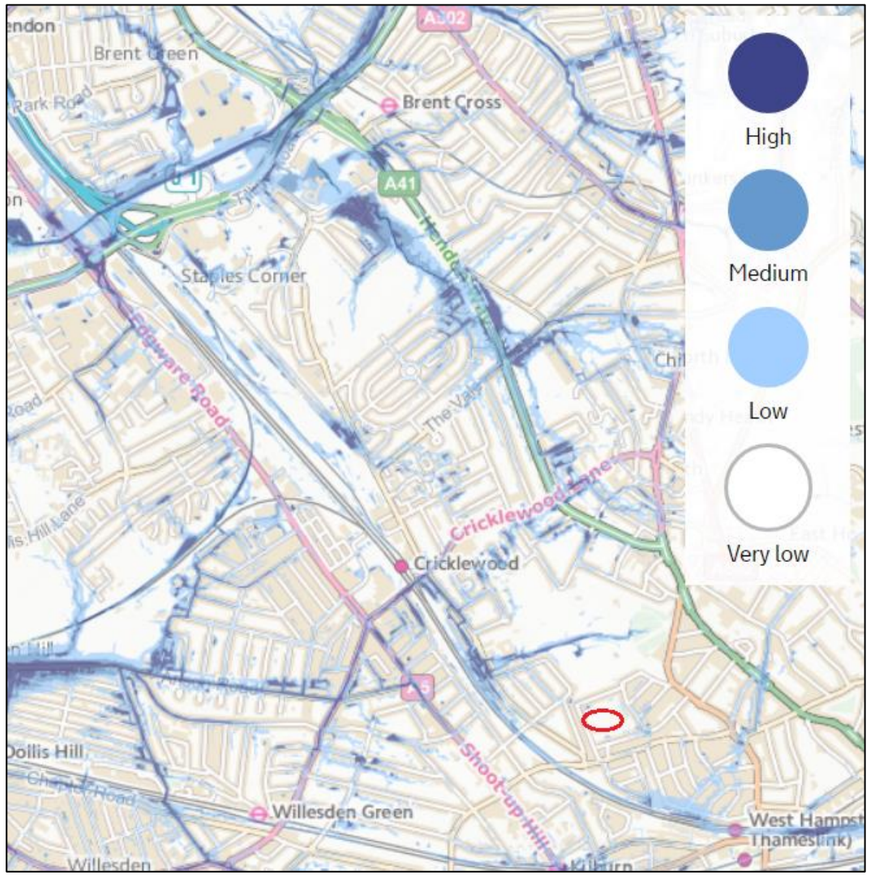

Figure 11.2 Flooding from surface water (Sourced from the Government Flood Warning Information Service)

The existing site for the proposed development consists predominantly of grassed land with semi mature and mature trees at the site boundary. As the proposed development will result in an increase in impermeable areas on site, through the building and associated hard landscaping, it is expected that measures will be implemented to ensure that the development does not increase the risk of surface water flooding in the area.

Such measures to mitigate the impacts of development could include the use of Sustainable Urban Drainages Systems (SUDS). SUDs include a variety of techniques which range from source control or site control, as detailed below.

Source control techniques:

- Soakaways;
- Porous paving;
- Rainwater harvesting;
- Green Roofs.

Site control techniques:

- Swales;
- Ponds;
- Infiltration basins;
- Detention basins;
- Larger soakaways;
- Pervious paving.

The Flood risk Assessment recommends the inclusion of green roofs and permeable paving where paving is to be provided.

11.3 BREEAM NEW CONSTRUCTION 2014

Surface Water Run Off

Flood mapping data from the Environment Agency confirms that the development site is not at risk from flooding from fluvial sources and surface water sources. Details of flood risk are to be confirmed within a Flood Risk Assessment.

11.4 SUMMARY

The flood maps confirms that the proposed Persephone Gardens development is in a location which is not at risk from either fluvial or surface water flooding. It is confirms that a detailed analysis will be provided within a Flood Risk Assessment, confirming the risk of flooding from all sources as well as any mitigation measures required for the site. Should the Flood Risk Assessment recommendations be included within the scheme design, the Persephone Gardens development may be deemed sustainable with regard to flooding.

12.0 NOISE

Noise is a subjective concept that can affect people differently, however there are set standards as to acceptable levels of noise, for different areas and times of day.

12.1 POLICY REVIEW

Camden Local Plan (2017)
Policy A4 – Noise and Vibration
The Council will seek to ensure that noise and vibration is controlled and managed. We will not grant planning permission for:

- Development likely to generate unacceptable noise and vibration impacts; or
- Development sensitive to noise in locations with existing high levels of noise unless appropriate attenuation measures are provided.

Development that exceeds Camden's Noise and Vibration Thresholds (Appendix 2) will not normally be permitted.

12.2 DEVELOPMENT SUSTAINABILITY FEATURES

The proposed development will be not be subject to noise pollution from road sources as seen within Figure 12.1 below. The nearest road noise sources are the A5 and the A41 located to the west and east of the site respectively, though despite their relative proximity do not impact upon the proposed development site.

Furthermore, the site is not within an area which is impacted by rail noise pollution, as seen within Figure 12.2 below. The Thames Link railway line runs around the west and south of the site but is not in close enough proximity to have an impact upon future building users.

It is anticipated that an Acoustic Report will be undertaken firstly to provide recommendations as to how the scheme design can ensure compliance with Part E of the building regulations as well as providing a dB improvement in both airborne and impact sound insulation performance.

In addition to the above, it is expected that the Acoustic Report will also include a noise assessment to determine the existing background noise levels. Consideration will be given to the mechanical design of the scheme to ensure that any external plant provided does not exceed the existing background noise levels, though it is currently anticipated that the majority of plant equipment will be located at basement level and as such not become a source of localised noise pollution.

Figure 12.1 Road Noise Data Map (Postal Code Analysis, Sourced from Extrium)

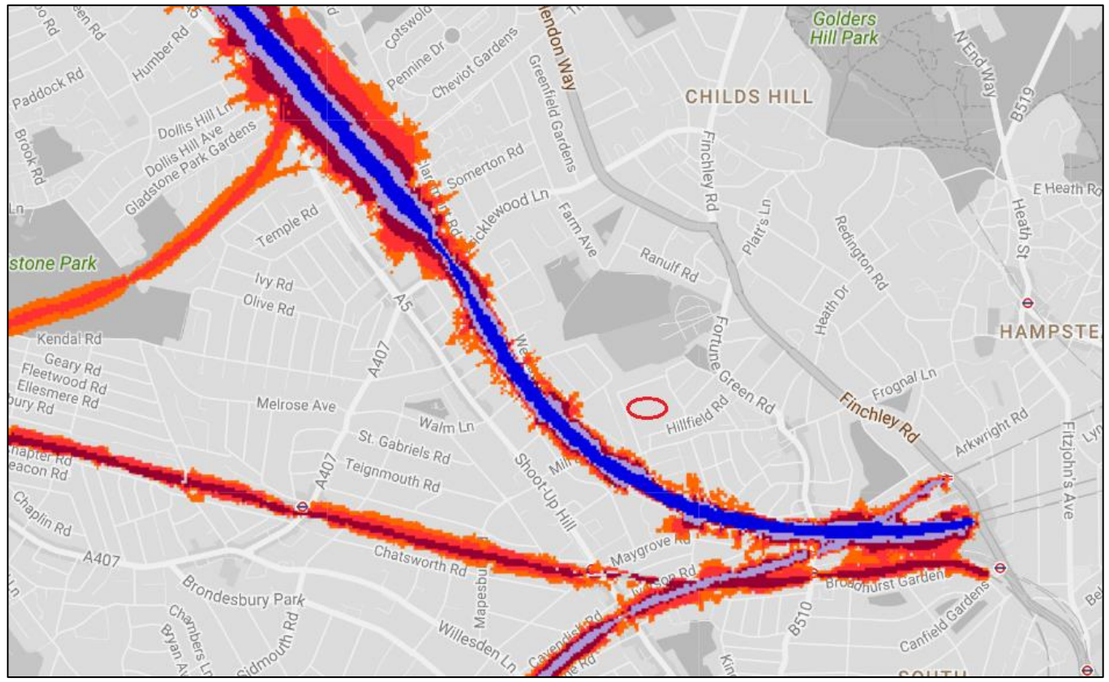

Figure 12.2 Rail Noise Data Map (Postal Code Analysis, Sourced from Extrium)

12.3 BREEAM NEW CONSTRUCTION 2014

Acoustic Mitigation

It is anticipated that an Acoustic Report will be undertaken to ensure the scheme is compliant with Part E of the Building Regulations as well as being able to achieve a 5dB improvement on airborne and impact sound insulation.

12.4 SUMMARY

The development would be not be subject to sources of noise pollution from the surrounding roads or railway routes. It is anticipated that any plant equipment installed will not have an impact on the local area though mitigation measures may be required to prevent disturbance to surrounding residential properties. As a result the proposed development may be deemed sustainable with regard to noise.

13.0 ECOLOGY

Ecology is essential within many communities, with the mix of flora and fauna facilitating benefits such as flood alleviation and pollution amelioration. In addition to this, areas with a wealth of green spaces and an abundance of biodiversity are seen to provide a positive contribution to a community.

13.1 POLICY REVIEW

Camden Planning Guidance Sustainability – CPG3 (2015)

Section 10 – Brown Roofs, Green Roofs and Green Walls

- All developments should incorporate green and brown roofs;
- The appropriate roof or wall will depend on the development, the location and other specific factors;
- Specific information needs to be submitted with applications for green/ brown roofs and walls.

Section 13 – Biodiversity

Proposals should demonstrate:

- How biodiversity considerations have been incorporated into the development;
- If any mitigation measures will be included;
- What positive measures for enhancing biodiversity are planned.

Camden Local Plan (2017)

Policy A3 – Protection, Enhancement and Management of Biodiversity

The Council will protect and improve sites of nature conservation and biodiversity. We will:

- Designate and protect nature conservation sites and safeguard protected and priority habitats and species;
- Resist development which would directly or indirectly result in the loss, reduction in area or harm to a designated nature conservation site or adversely affect the status or population of priority habitats and species;
- Protect other green areas with nature conservation value, including gardens, where possible;
- Assess developments against their ability to enhance biodiversity through incorporating measures to support wildlife, proportionate to the scale of development proposed;
- On larger sites, we will seek satisfactory levels of natural greenspace, including the creation and restoration of BAP habitat;
- Ensure that benefits for biodiversity and ecology are realised in the layout, design and materials used in the built structure and landscaping elements of a proposed development;
- Secure biodiversity improvements to habitat corridors, particularly where a development scheme is adjacent to an existing habitat;
- Improve opportunities to experience nature, in particular where such opportunities are lacking;
- Require the demolition and construction phase of development, including the movement of works vehicles, to be planned to avoid disturbance to species and ecologically sensitive areas;
- Secure management plans to ensure that nature conservation objectives are met; and
- Work with The Royal Parks, the London Wildlife Trust, friends of park groups and local nature conservation groups to protect and improve open spaces and nature conservation in Camden.

13.2 DEVELOPMENT SUSTAINABILITY FEATURES

Ecology conservation map (sourced from MAGIC) highlights that there are no Sites of Special Scientific Interest (SSSI) or Special Conservation Areas within a mile radius of the development site; the closest is Hampstead Heath Woods though this SSSI is considered not to be in close enough proximity of the development to be impacted by either construction works or the operation of the building, this can be seen below in Figure 13.1. There are however, a number of green areas surrounding the development as detailed within Table 13.1 below. An Ecological assessment of the site has been undertaken JBA, May 2017, Rev D, which additionally confirms that there are a number of Sites Important to Nature Conservation (SINC) surrounding the site and including the development site itself. The site is made up of neutral grassland with trees and shrub at boundary areas, being classified as a Site of Borough Grade II Importance for Nature Conservation.

Site Name	Distance (miles)	Site description	Statutory Conservation Area?
Hampstead Cemetery	0.09	Priority Habitat Inventory – Deciduous Woodland	No
Westbere Copse	0.19	Local Nature Reserve	Yes
Golders Hill Park	0.90	Priority Habitat Inventory – Deciduous Woodland Wood Pasture and Parkland Biodiversity Action Plan Priority Habitat	No

Table 13.1 Persephone Gardens Local Habitats

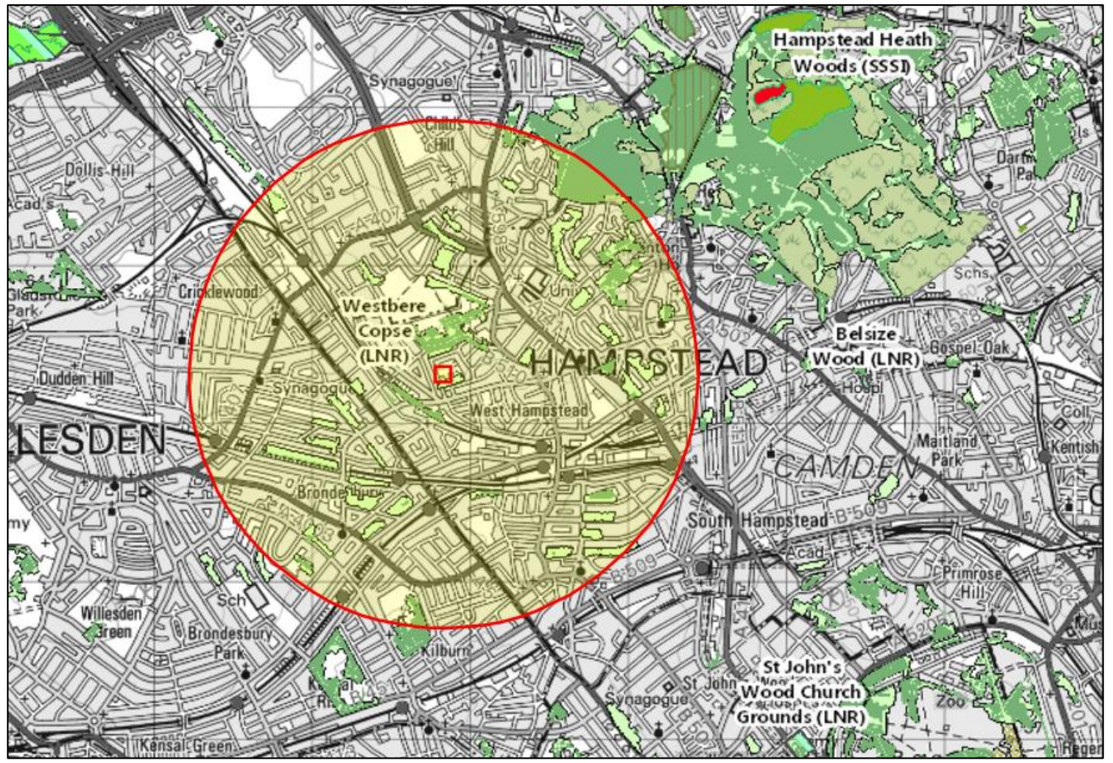

Figure 13.1 Ecology Conservation Map (Post Code Analysis, Sourced from MAGIC)

In compliance with Camden Council policy requirements, consideration has been given to the feasibility of green roofs as part of the proposed scheme, as such outside spaces will be provided at higher levels, as seen within Figure 13.2 below, though a large amount of soft landscaping will also be provided as a visual amenity for building

users at the eastern side of the site, as seen in Figure 13.3 below. This in compliance with the recommendations of the Ecology Report which encourages the use of native planting to attract wildlife, as well as the following:

- Precautionary clearance of the site;
- Provision of bat and bird boxes;
- Provision of stag beetle loggery.

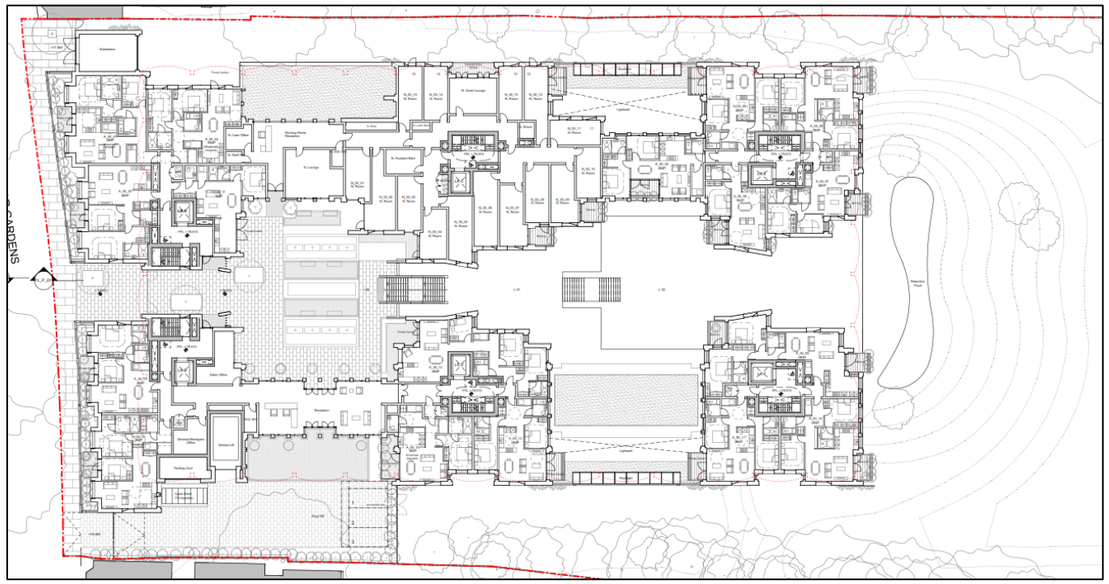

Figure 13.2 Proposed Outside Spaces at Higher Levels

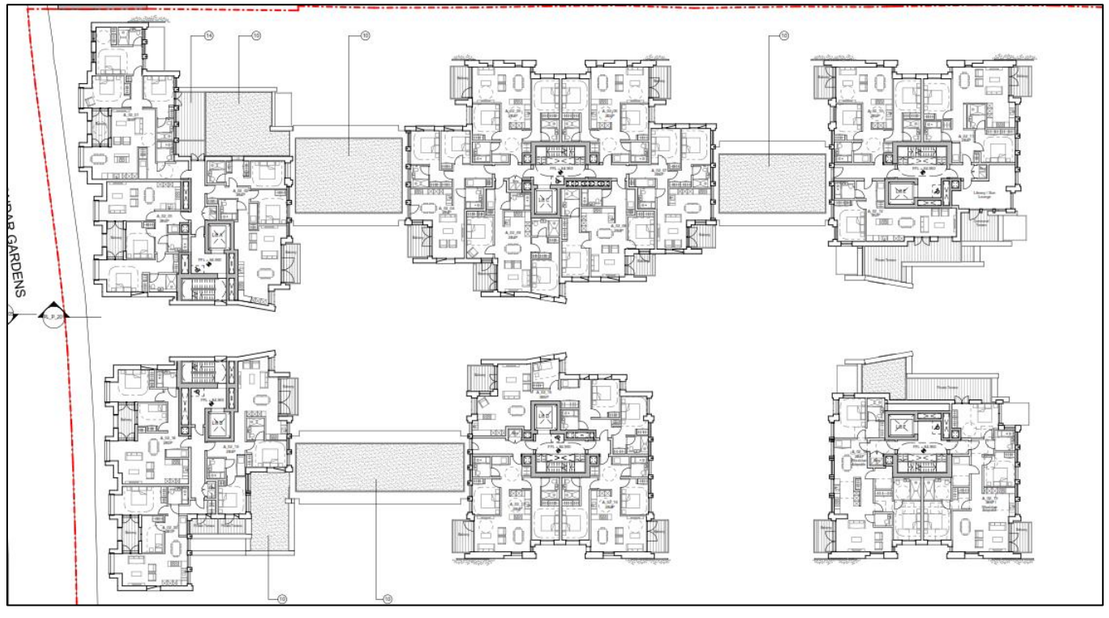

Figure 13.3 Proposed External Landscaping at Ground Level

13.3 BREEAM NEW CONSTRUCTION 2014

Ecological Value

An Ecological Assessment and Ecological Action Plan (James Blake Associates) have been undertaken for the site which confirm there are a range of habitats on site including the following:

- Semi-improved grassland;
- Trees and shrubs;
- Scrub.

The Action Plan confirms that the areas of the site with the most species diversity and ecological value will not be developed. The footprint of the old reservoir where the majority of construction works shall take place comprises mainly of vegetation of less importance to the local wildlife.

Enhancing Site Ecology

The Ecology Assessment undertaken puts forward the following recommendations to protect the existing wildlife and enhance the ecological value of the development:

- Implementation of precautionary measures during site clearance taking into account bird nesting season;
- Provision of bat and bird boxes on the trees retained on site;
- Incorporation of a loggery for stag beetles and other insects;
- Incorporation of native species within new landscaping provided;
- Incorporation of green and brown roofs.

13.4 SUMMARY

Analysis of the site ecology confirms that there are no ecological sites within close enough proximity to be affected by the development. The Development itself is designated as a Grade II SINC for its mostly neutral grassland, moderate diversity and common wild flower plants and a population of the locally uncommon spiked sedge.

An Ecology Assessment has been undertaken by JBA, May 2017, Rev D, which confirms the ecological value of the site and provides mitigation and enhancement measures for the Development.

14.0 AIR QUALITY

In order to provide building users with a healthy environment it is essential that consideration is given to the air quality within the building with regard to both the potential intake of pollutants from nearby sources of pollution such as transport or industry, or emissions given off from internal finishing products. Additionally, it is essential that the scheme design does not become a source of pollution within the local area.

14.1 POLICY REVIEW

Camden Local Plan (2017)
Policy CC4 – Air Quality
The Council will take into account the impact of air quality when assessing development proposals, through the consideration of both the exposure of occupants to air pollution and the effect of a development on air quality. Consideration must be taken to the actions identified in the Council's Air Quality Action Plan.

Air Quality Assessments (AQAs) are required where development is likely to expose residents to high levels of air pollution. Where the AQA shows that a development would cause harm to air quality, the Council will not grant planning permission unless mitigation measures are adopted to reduce the impact to acceptable levels. Similarly, developments in locations of poor air quality will not be acceptable unless designed to mitigate the impact to within acceptable limits.

Development which involves significant demolition, construction or earthworks will also be required to assess the risk of impacts in an AQA and include appropriate mitigation measures to be secured in a Construction Management Plan.

The Council will only grant planning permission for development in Camden's Clear Zone region that significantly increases travel demand where it considers that appropriate measures to minimise the transport impact of development are incorporated.

14.2 DEVELOPMENT SUSTAINABILITY FEATURES

The air quality map seen in Figure 14.1 (sourced from the Environment Agency) confirms that there are no breaches in air pollution within close proximity to the Persephone Gardens development location. The Environment Agency analysis reviews emission levels from the following pollutants:

- Carbon dioxide;
- Dioxins;
- Nitrogen oxides;
- Particulates (PM10);
- Sulphur oxides.

The map within Figure 14.1 shows that there are areas north west and east of the Persephone Gardens location which are in breach of air pollution levels, though have been classified as either Good or Very Good breaches. Under the Environment Agency classification scheme it is confirmed that this type of breach would have no environmental impact.

The air pollution levels directly surrounding the development location are lower than other areas within Camden Borough as the building types are predominantly residential with more frequent green spaces.

The majority of plant equipment will be located at basement level within the designated plant space, as such there will be minimal emissions of air pollutants into the local area from the development. The scheme will also provide only a small number of car parking spaces which in turn will reduce any transport related pollutant emissions.

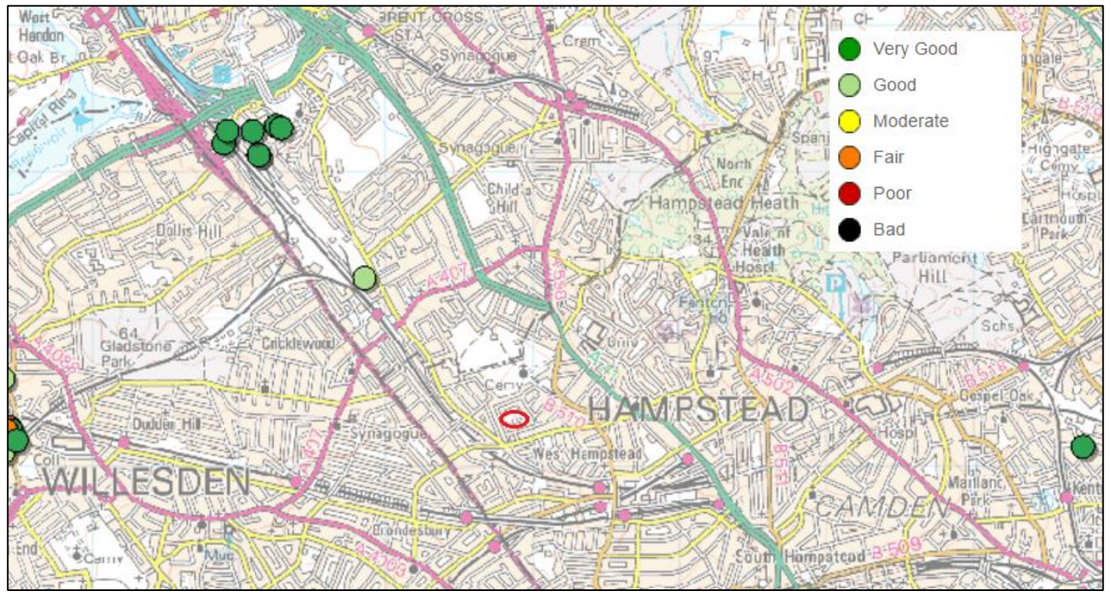

Figure 14.1 Air Quality Map (Sourced from Environment Agency)

14.4 SUMMARY

Assessment of the site air quality confirms that the area is not in breach of pollutants measured by the environment agency. Additionally, the site is not likely to produce a large quantity of air pollutants into the local environment and as such can be deemed sustainable with regard to air quality.