

Hillingdon Gardens,
London Borough of Hillingdon

Sustainability Statement



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Table of Contents

1.0	Executive Summary.....	4
2.0	Introduction	5
3.0	Drivers of Sustainability	6
4.0	National Policy	8
5.0	Local Policy.....	11
6.0	Energy Usage and Carbon Emissions	17
6.1	Policy Review.....	17
6.2	Development Sustainability Features	18
6.3	Summary	21
7.0	Water Consumption.....	23
7.1	Policy Review	23
7.2	Development Sustainability Features	23
7.3	Summary	24
8.0	Transport.....	25
8.1	Policy Review	25
8.2	Development Sustainability Features	26
8.3	Summary	27
9.0	Construction Site Management	28
9.1	Policy Review	28
9.2	Development Sustainability Features	28
9.3	Summary	29
10.0	Sustainable Design	30
10.1	Policy Review	30
10.2	Development Sustainability Features	31
10.3	Summary	32
11.0	Flood Risk	33
11.1	Policy Review	33
11.2	Development Sustainability Features	34
11.3	Summary	36
12.0	Noise	37
12.1	Policy Review	37
12.2	Development Sustainability Features	37
12.3	Summary	39

13.0 Ecology.....	40
13.1 Policy Review	40
13.2 Development Sustainability Features	40
13.3 Summary	42

1.0 Executive Summary

This report has been prepared by Cudd Bentley Consulting to consider the energy and sustainability strategy for the proposed Hillingdon Gardens development, within the London Borough of Hillingdon. The works involves the construction of a residential-led, mixed-use development comprising buildings of between 2 and 11 storeys containing 514 units (Use Class C3); flexible commercial units (Use Class B1/A1/A3/D1); associated car (164 spaces) and cycle parking spaces; refuse and bicycle stores; hard and soft landscaping including a new central space, greenspaces, new pedestrian links; biodiversity enhancement; associated highways infrastructure; plant; and other associated ancillary development. This document will be considered as part of the planning application.

This document reviews the requirements at both national and local level, as set out in the National Planning Policy Framework (2019), The London Plan (2016), The Draft London Plan (2019), GLA Energy Assessment Guidance (2018), and the London Borough of Hillingdon Local Plan (2018).

An energy model of the development will inform the recommended sustainability features and calculate the CO₂ emissions reduction at the Hillingdon Gardens development from a base Part L 2013 compliant build. The passive design and energy efficiency measures to be incorporated within the design are features such as energy efficient lighting, occupancy and daylight sensing in relative areas, as well as the upgrading of 'U' values. The building will comply with Part L 2013 through energy efficiency and passive measures alone before the introduction of any renewable or low zero carbon technology. It is proposed that Air Source Heat Pumps (ASHP) and Solar Photovoltaics (PV) are to be incorporated into the development.

It is anticipated that further measures will be considered that may be adopted as a means of reducing carbon emissions associated with the development; such measures include the use of construction materials that will be responsibly and legally sourced, as well as ensuring that all timber used is sourced in compliance with the UK Government's Timber Procurement Policy .

In order to further reduce the energy demand of the development as well as help to conserve water resources within the local area, consideration will be given to the implementation of water efficient sanitary fittings, such measures include dual flush toilets and low flow taps.

Flood maps sourced from the Environment Agency highlight that the majority of the development is located within Flood Zone 1 and is at low risk of flooding from fluvial sources.

The development is located North East of Uxbridge and as such is within walking distance of a number of public transport nodes, as well as a range of primary local amenities such as postal services and cash points. These features should create a reduction in car based travel and transport related pollution.

The incorporation of these sustainability measures allow for the proposed Hillingdon Gardens development to be deemed sustainable whilst targeting compliance 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 Hillingdon Gardens development. Policies have been reviewed for guidelines and recommendations on each issue, at both national and local level.

The Cudd Bentley Consulting (CBC) Sustainability Team consists of a variety of qualified Engineers and Environmental Consultants with a broad range of backgrounds including Mechanical Engineering, Building Services Engineering and Environmental Science. The CBC Sustainability Team are CIBSE Low Carbon Consultants, CIBSE Low Carbon Energy Assessors, Domestic Energy Assessors, BREEAM Assessors and Accredited Professionals. This broad range of knowledge and qualification allows the CBC Sustainability Team to produce sustainability documentation for planning submissions that are tailored to the individual requirements of the development and to ensure national and local policy compliance is demonstrated with clarity.

The works involves the construction of a residential-led, mixed-use development comprising buildings of between 2 and 11 storeys containing 514 units (Use Class C3); flexible commercial units (Use Class B1/A1/A3/D1); associated car (164 spaces) and cycle parking spaces; refuse and bicycle stores; hard and soft landscaping including a new central space, greenspaces, new pedestrian links; biodiversity enhancement; associated highways infrastructure; plant; and other associated ancillary development. The proposed site plan for the site can be seen below in Figure 2.1.



Figure 2.1 Proposed Site 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.'



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 greenhouse 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.

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)**, 2019, outlines what the government deems as sustainable development in England.

Sustainable development is defined as having the following three overarching objectives which are interdependent and need to be pursued in mutually supportive ways: an economic objective, a social objective, and an environmental objective.

1. Economic objective – to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;
2. Social objective – to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering a well-designed and safe built environment, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and
3. Environmental objective – to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.

The above objectives 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, 2019.

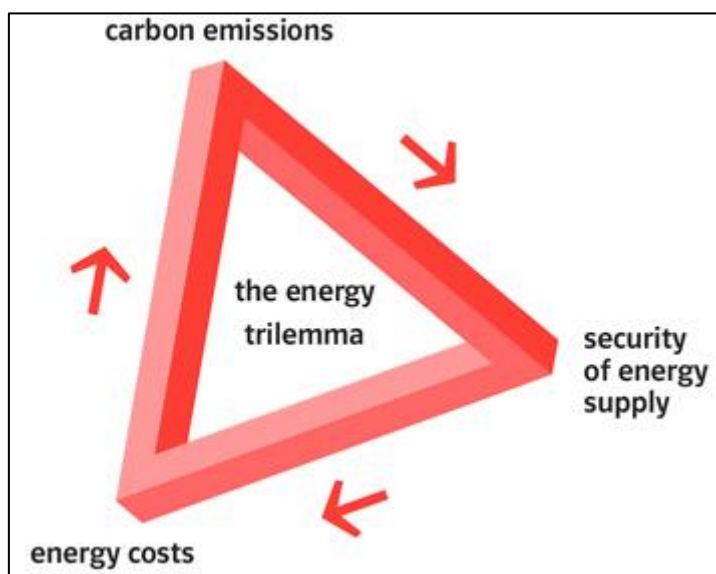


Figure 4.1 The Energy Trilemma

Guidance has been followed from the (NPPF), 2019, 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 fourteen 'Meeting the Challenge of Climate Change, Flooding & Coastal Change':

Paragraph 149

Plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating from rising temperatures. Policies should support appropriate measures to ensure the future resilience of communities and infrastructure to climate change impacts, such as providing space for physical protection measures, or making provision for the possible future relocation of vulnerable development and infrastructure.

Paragraph 150

New development should be planned for in ways that:

- a. avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure; and
- b. can help to reduce greenhouse gas emissions, such as through its location, orientation and design. Any local requirements for the sustainability of buildings should reflect the Government's policy for national technical standards.

Paragraph 151

To help increase the use and supply of renewable and low carbon energy and heat, plans should:

- a. provide a positive strategy for energy from these sources, that maximises the potential for suitable development, while ensuring that adverse impacts are addressed satisfactorily (including cumulative landscape and visual impacts);
- b. consider identifying suitable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development; and
- c. identify opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems and for collocating potential heat customers and suppliers.

Paragraph 152

Local planning authorities should support community-led initiatives for renewable and low carbon energy, including developments outside areas identified in local plans or other strategic policies that are being taken forward through neighbourhood planning.

Paragraph 153

In determining planning applications, local planning authorities should expect new development to:

- a. comply with any development plan policies on local requirements for decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not feasible or viable; and
- b. take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption.

Paragraph 154

When determining planning applications for renewable and low carbon development, local planning authorities should:

- a. not require applicants to demonstrate the overall need for renewable or low carbon energy, and recognise that even small-scale projects provide a valuable contribution to cutting greenhouse gas emissions; and
- b. approve the application if its impacts are (or can be made) acceptable. Once suitable areas for renewable and low carbon energy have been identified in plans, local planning authorities should expect subsequent applications for commercial scale projects outside these areas to demonstrate that the proposed location meets the criteria used in identifying suitable areas.

5.0 Local Policy

This section aims to highlight guidance available and the minimum requirements at local level from the Greater London Authority and Hillingdon 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.

Energy Assessment Guidance (October 2018)

The report will adhere to the guidance as part of the document stated above.

Please note that from January 2019, planning applicants are encouraged to use updated (SAP 10) carbon emission factors to assess the expected carbon performance of a new development. Applicants should continue to use the current Building Regulations methodology for estimating energy performance against Part L 2013 requirements but with the outputs manually converted for the SAP 10 emission factors.

Draft London Plan – Consolidated Changes Version (July 2019)

Policy SI2 Minimising greenhouse gas emissions

- A) Major development should be net zero-carbon. This means reducing greenhouse emissions in operation and minimising both annual and peak energy demand in accordance with the following energy hierarchy:
 - 1. be lean: use less energy and manage demand during operation.
 - 2. be clean: exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly.
 - 3. be green: maximise opportunities for renewable energy by producing, storing and using renewable energy on-site.
 - 3A. be seen: monitor, verify and report energy performance.
- B) Major development proposals should include a detailed energy strategy to demonstrate how the zero-carbon target will be met within the framework of the energy hierarchy.
- C) A minimum on-site reduction of at least 35 per cent beyond Building Regulations is required for major development. Residential development should achieve 10 per cent, and non-residential development should achieve 15 per cent through energy efficiency measures. Where it is clearly demonstrated that the zero-carbon target cannot be fully achieved on-site, any shortfall should be provided, in agreement with the borough, either:
 - 1. through a cash in lieu contribution to the borough's carbon offset fund, or
 - 2. off-site provided that an alternative proposal is identified and delivery is certain.
- D) Boroughs must establish and administer a carbon offset fund. Offset fund payments must be ring-fenced to implement projects that deliver carbon reductions. The operation of offset funds should be monitored and reported on annually.
 - a. Major development proposals should calculate and minimise carbon emissions from any other part of the development, including plant or equipment, that are not covered by Building Regulations, i.e. unregulated emissions.
 - b. Development proposals referable to the Mayor should calculate whole life-cycle carbon emissions through a nationally recognised Whole Life-Cycle Carbon Assessment and demonstrate actions taken to reduce life-cycle carbon emissions.

London Borough of Hillingdon (LBH) Local Plan Part 1: Strategic Policies (2012)

Policy BE1: Built Environment

The Council will require all new development to improve and maintain the quality of the built environment in order to create successful and sustainable neighbourhoods, where people enjoy living and working and that serve the long-term needs of all residents. All new developments should:

- Maximise the opportunities for all new homes to contribute to tackling and adapting to climate change and reducing emissions of local air quality pollutants. The Council will require all new development to achieve reductions in carbon dioxide emissions in line with the London Plan targets through energy efficient design and effective use of low and zero carbon technologies. Where the required reduction from on-site renewable energy is not feasible within major developments, contributions off-site will be sought. The Council will seek to merge a suite of sustainable design goals, such as the use of SUDS, water efficiency, lifetime homes, and energy efficiency into a requirement measured against the Code for Sustainable Homes and BREEAM. These will be set out within the Hillingdon Local Plan: Part 2- Development Management Policies Local Development Document (LDD). All developments should be designed to make the most efficient use of natural resources whilst safeguarding historic assets, their settings and local amenity and include sustainable design and construction techniques to increase the re-use and recycling of construction, demolition and excavation waste and reduce the amount disposed to landfill;

Policy EM1: Climate Change Adaptation and Mitigation

Climate change mitigation should be addressed at every stage of the development process by:

- Prioritising higher density development in urban and town centres that are well served by sustainable forms of transport.
- Promoting a modal shift away from private car use and requiring new development to include innovative initiatives to reduce car dependency.
- Ensuring development meets the highest possible design standards whilst still retaining competitiveness within the market.
- Working with developers of major schemes to identify the opportunities to help provide efficiency initiatives that can benefit the existing building stock.
- Promoting the use of decentralised energy within large scale development whilst improving local air quality levels.
- Targeting areas with high carbon emissions for additional reductions through low carbon strategies. These strategies will also have an objective to minimise other pollutants that impact on local air quality. Targeting areas of poor air quality for additional emissions reductions.
- Encouraging sustainable techniques to land remediation to reduce the need to transport waste to landfill. In particular developers should consider bioremediation as part of their proposals.
- Encouraging the installation of renewable energy for all new development in meeting the carbon reduction targets savings set out in the London Plan. Identify opportunities for new sources of electricity generation including anaerobic digestion, hydroelectricity and a greater use of waste as a resource.
- Locating and designing development to minimise the probability and impacts of flooding.
- Requiring major development proposals to consider the whole water cycle impact which includes flood risk management, foul and surface water drainage and water consumption.
- Giving preference to development of previously developed land to avoid the loss of further green areas.

- Promoting the use of living walls and roofs, alongside sustainable forms of drainage to manage surface water run-off and increase the amount of carbon sinks.
- Promoting the inclusion of passive design measures to reduce the impacts of urban heat effects.

Policy EM6: Flood Risk Management

The Council will require new development to be directed away from Flood Zones 2 and 3 in accordance with the principles of the (NPPF).

The Council will require all development across the Borough to use sustainable urban drainage systems (SUDS) unless demonstrated that it is not viable. The Council will encourage SUDS to be linked to water efficiency methods. The Council may require developer contributions to guarantee the long term maintenance and performance of SUDS to an appropriate standard.

Policy EM7: Biodiversity and Geological Conservation

Hillingdon's biodiversity and geological conservation will be preserved and enhanced with attention given to:

- The protection and enhancement of populations of protected species as well as priority species and habitats identified within the UK, London and the Hillingdon Biodiversity Action Plans.
- Appropriate contributions from developers to help enhance Sites of Importance for Nature Conservation in close proximity to development and to deliver/ assist in the delivery of actions within the Biodiversity Action Plan.
- The provision of biodiversity improvements from all development, where feasible.
- The provision of green roofs and living walls which contribute to biodiversity and help tackle climate change.
- The use of sustainable drainage systems that promote ecological connectivity and natural habitats.

Policy EM8: Land, Water, Air and Noise

Water Quality

The Council will seek to safeguard and improve all water quality, both ground and surface.

Air Quality

All development should not cause deterioration in the local air quality levels and should ensure the protection of both existing and new sensitive receptors.

The Council seeks to reduce the levels of pollutants referred to in the Government's National Air Quality Strategy and will have regard to the Mayor's Air Quality Strategy.

Noise

The Council will seek to ensure that noise sensitive development and noise generating development are only permitted if noise impacts can be adequately controlled and mitigated.

Land Contamination

The Council will expect proposals for development on contaminated land to provide mitigation strategies that reduce the impacts on surrounding land uses. Major development proposals will be expected to demonstrate a sustainable approach to remediation that includes techniques to reduce the need to landfill.

Water Resources

The Council will require that all new development demonstrates the incorporation of water efficiency measures within new development to reduce the rising demand on potable water. All new development must incorporate water recycling and collection facilities unless it can be demonstrated it is not appropriate. For residential developments, the Council will require applicants to demonstrate that water consumption will not surpass 105 litres per person per day.

Policy EM11: Sustainable Waste Management

The Council will require all new development to address waste management at all stages of a development's life from design and construction through to the end use and activity on site, ensuring that all waste is managed towards the upper end of the waste hierarchy.

Policy T1: Accessible Local Destinations

The Council will steer development to the most appropriate locations in order to reduce their impact on the transport network. All development should encourage access by sustainable modes and include good cycling and walking provision.

The Council will ensure access to local destinations which provide services and amenities.

The Council will promote active travel through improvements to Hillingdon's public rights of way.

LBH Local Plan Part 2: Development Management Policies (2019)

Policy DME2: Reducing Carbon Emissions

- A. All developments are required to make the fullest contribution to minimising carbon dioxide emissions in accordance with London Plan targets.
- B. All major development⁷ proposals must be accompanied by an energy assessment showing how these reductions will be achieved.
- C. Proposals that fail to take reasonable steps to achieve the required savings will be resisted. However, where it is clearly demonstrated that the targets for carbon emissions cannot be met onsite, the Council may approve the application and seek an offsite contribution to make up for the shortfall.

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) to reduce carbon emissions for all residential and non-domestic properties. The Climate Change Act (Nov 2008) sets the UK targets of CO₂ reduction of 34% by 2020 and CO₂ reduction of 80% by 2050.

6.1 Policy Review

National Planning Policy Framework (2018)

Section 14- Meeting the Challenge of Climate Change, Flooding and Coastal Change

To help increase the use and supply of renewable and low carbon energy and heat, plans should:

- a. provide a positive strategy for energy from these sources, that maximises the potential for suitable development, while ensuring that adverse impacts are addressed satisfactorily (including cumulative landscape and visual impacts);
- b. consider identifying suitable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development.

The London Plan (March 2016)

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.

The Mayor will work with boroughs and developers to ensure that major developments meet the following targets for carbon dioxide emissions reduction in buildings. These targets are expressed as minimum improvements over the Target Emission Rate (TER) outlined in the national Building Regulations leading to zero carbon residential buildings from 2016 and zero carbon non-domestic buildings from 2019.

Residential Buildings:

Year	Improvement on 2010 Building Regulations
2010 – 2013	25 per cent (Code for Sustainable Homes level 4)t
2013 – 2016	40 per cent
2016 – 2031	Zero Carbon

Major development proposals should include a detailed energy assessment to demonstrate how the targets for carbon dioxide emissions reduction outlined above are to be met within the framework of the energy hierarchy.

As a minimum, energy assessments should include the following details:

- calculation of the energy demand and carbon dioxide emissions covered by Building Regulations and, separately, the energy demand and carbon dioxide emissions from any other part of the development, including plant or equipment, that are not covered by the Building Regulations (see paragraph 5.22) at each stage of the energy hierarchy
- proposals to reduce carbon dioxide emissions through the energy efficient design of the site, buildings and services c proposals to further reduce carbon dioxide emissions through the use of decentralised energy where feasible, such as district heating and cooling and combined heat and power (CHP)
- proposals to further reduce carbon dioxide emissions through the use of on-site renewable energy technologies.

The carbon dioxide reduction targets should be met on-site. Where it is clearly demonstrated that the specific targets cannot be fully achieved on-site, any shortfall may be provided off-site or through a cash in lieu contribution to the relevant borough to be ring fenced to secure delivery of carbon dioxide savings elsewhere.

The GLAs Energy Planning guidance requires carbon reduction for schemes received on or after the 1st October 2016 to be zero carbon for residential development and 35% below Part L 2013 for commercial development.

The carbon dioxide reduction targets should be met on-site. Where it is clearly demonstrated that the specific targets cannot be fully achieved on-site, any shortfall may be provided off-site or through a cash in lieu contribution to the relevant borough to be ring fenced to secure delivery of carbon dioxide savings elsewhere.

LBH Local Plan Part 2 Development Management Policies (2019)

Policy DME2: Reducing Carbon Emissions

- A. All developments are required to make the fullest contribution to minimising carbon dioxide emissions in accordance with London Plan targets.
- B. All major development proposals must be accompanied by an energy assessment showing how these reductions will be achieved.
- C. Proposals that fail to take reasonable steps to achieve the required savings will be resisted. However, where it is clearly demonstrated that the targets for carbon emissions cannot be met onsite, the Council may approve the application and seek an offsite contribution to make up for the shortfall.

6.2 Development Sustainability Features

To assess the energy consumption of the development, computer calculations have been completed using the developments architectural plans. The commercial element has been modelled using approved SBEM software (Bentley, Hevacomp, Version V8i, SS1 SP5) and the residential elements has been assessed using approved SAP software (JPA Designer, Version 9.92). The calculations highlight annualised energy consumption for the development, from which the “carbon footprint” can be assessed.

The assessment of the energy demand for the site has been based on the notional development according to the development's uses, through the construction of a building model in compliance with the requirements of Part L2A and L1A 2013 of the Building Regulations.

Baseline

The total baseline energy and carbon emissions for the development (built to Part L 2013), takes into account the developments regulated energy demands. The primary energy demands of the development will be:

- Heating;
- Cooling;
- Lighting;
- Hot Water;
- General Power;
- Ventilation.

Be Lean

Passive design measures includes upgraded construction details above the minimum requirements as detailed in Part L1A (2013). For the residential element, the building fabric data is as detailed below:

- External Walls - U = 0.16 W/m².K;
- Exposed Floors - U = 0.11 W/m².K;
- Exposed Roofs - U = 0.11 W/m².K;
- Glazing - U = 1.2 W/m².K; G' value of 0.36;
- Air Permeability - 3 m³/hr/m²@ 50 Pa;

Please note that Accredited Construction Details in accordance with Table K1 of Appendix K of Part L are to be achieved.

The following 'U' values shall be targeted within the commercial element of the development, in accordance with Part L2A (2013), these 'U' values go beyond the minimum requirements of Part L2A 2013.

- External Walls - U = 0.20 W/m².K;
- Exposed Floors - U = 0.20 W/m².K;
- Exposed Roofs - U = 0.16 W/m².K;
- Glazing - U = 1.4 W/m².K; G' value of 0.36;
- Air Permeability - 5 m³/hr/m²@ 50 Pa.

In conjunction with the GLAs Energy Assessment Guidance, the domestic element of the development will target a 10% carbon emission improvement beyond Part L from passive and energy efficiency measures. Similarly, the non-domestic development will target at least a 15 % carbon emission improvement beyond Part L from energy efficiency.

The total energy and carbon emissions for the development (built to Part L 2013) will be calculated after incorporation of the following energy efficiency and passive measures:

- Improved double glazing with low G values and shading co-efficient to limit the effects of solar gain;
- Mechanical Whole House Ventilation with Heat Recovery (in areas where required);
- The provision of energy efficient lighting;
- The provision of time and temperature zone control on HVAC systems;
- Improved specific fan powers;

Be Clean

In line with Policy SI3 Energy infrastructure of the Draft London Plan, decentralised energy is to be generated at the development through the use of Air Source Heat Pumps (ASHP). It is proposed that ASHP are implemented in a central block-by-block heat pump system for each building, which will provide heating and hot water for the residential units. The plant allocation space required by a building by building system is to be spread across each building. A route for pipework to connect all buildings will be indicated, and future connections to a district heating network shall be provided from one of the buildings to the site boundary (including indicative area for a heat interface unit within the plant room).

Existing District Heating Networks have been investigated through the London Heat Map from the GLA which confirms there is no district heating network to which a connection is technically feasible. This can be seen in Figure 6.1 as the red lines display active district heat networks and the black dot displays the development. Furthermore, as the development is less than 800 dwellings, GLA Energy Assessment Guidance suggests that a connection with an ESCO wide heat network is unlikely to be a feasible option.

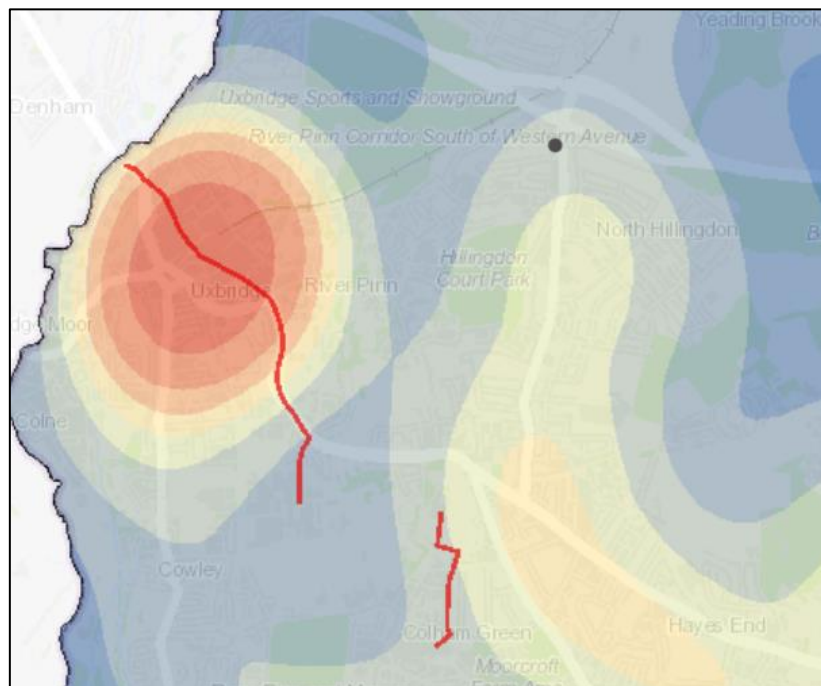


Figure 6.1: London Heat Map

The technical viability of installing a single site wide CHP system has been explored to deliver the heating and hot water demand of the residential units. However, it is considered unviable for the following reasons:

- For the provision of a CHP system to be commercially viable, a base load (in this case heating and domestic hot water) must extend for a minimum operational period of 4,000 – 5,000 hours per annum, the anticipated individual CHP operation hours is expected to be lower than this required minimum operation period.

- Within Appendix 3 of the GLA Energy Assessment Guidance (2018) it states that it is not generally considered economical feasible to install CHP in small to medium residential/mixed use developments.

Be Green

A range of low or zero carbon technologies have been considered for incorporation within the proposed development; it has been proposed that a 155.65 kWp Solar PV array is utilised at roof level and Air Source Heat Pumps (ASHP) are implemented to provide the heating and cooling of the commercial element of the development, and the heating and hot water demand of the residential unit.

6.3 Summary

Consideration has been given to the following options that are available for the development in relation to Low Zero Carbon technologies and renewable energy. The technologies considered are as follows:

- Decentralised Gas fired CHP;
- Bio-fuel boilers;
- Wind Turbine;
- Ground Source Heat Pump;
- Solar Water Heating;
- Air Source Heat Pump;
- Solar PV

This review has resulted in the formulation of the following energy strategy displayed in Table 6.1 and 6.2.

Residential Element	
Heating	Individual Building ASHP system
Hot water (DHW)	Individual Building ASHP system
Cooling	N/A
Ventilation	Mechanical ventilation with heat recovery (MVHR) where required.
Lighting	Energy efficient LED lighting where applicable

Table 6.1: Proposed Energy Strategy for Residential Element

Commercial Element	
Heating	Stand Alone ASHP system
Hot water (DHW)	Class Use A1 = Electric Point of Use Class A3 = stand Alone ASHP
Cooling	Stand Alone ASHP system
Ventilation	Mechanical ventilation with Heat Recovery (MVHR)
Lighting	Energy efficient LED lighting where applicable

Table 6.2: Proposed Energy Strategy for Commercial Element

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 achieving compliance with all policies applicable to this development. The use of further/emerging technologies may be included for use within this development if their feasibility increases in the future, also in accordance with best practice.

The carbon emissions and savings that are currently anticipated for the development from a base Part L 2013 compliant build will be calculated and stated within the report upon receipt of the finalised architectural plans. Compliance with Part L 2013 and local planning requirements as stated by the Borough of Hillingdon council and The London plan will be discussed.

The London Plan requires all major commercial developments to achieve a 35% carbon reduction beyond Part L 2013, and all residential developments to now be carbon neutral. Any cash in lieu required for compliance will be calculated assuming a carbon off-set price of £60 per tonne of carbon dioxide for a period of 30 years.

Please note that the energy consumption and carbon emission calculations are presented within the Energy Strategy for Hillingdon Gardens.

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 UK is already under a large amount of pressure regarding water resources. To contribute towards mitigating this issue, the Site will consider various means of being economical with water consumption.

7.1 Policy Review

The London Plan March 2016

Policy 5.3 Sustainable Design and Construction

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

- Efficient use of natural resources (including water), including making the most of natural systems both within and around buildings.

Hillingdon Local Plan Part 1 (2013)

Policy EM8: Land, Water, Air and Noise

Water Quality

The Council will seek to safeguard and improve all water quality, both ground and surface.

Water Resources

The Council will require that all new development demonstrates the incorporation of water efficiency measures within new development to reduce the rising demand on potable water. All new development must incorporate water recycling and collection facilities unless it can be demonstrated it is not appropriate. For residential developments, the Council will require applicants to demonstrate that water consumption will not surpass 105 litres per person per day.

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 efficiency features will be considered for inclusion 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. Water meters for the commercial element will have a pulsed output to allow connection to a Building Management System should one be installed at a later date.

It is anticipated that consideration will be given to the specification of flow control devices within the sanitary areas of the buildings' commercial elements during fit out, in order to prevent water leaks by stopping the flow of water when an area is not in use.

7.3 Summary

To ensure the sustainability of the development it is anticipated that water efficient fixtures will be considered, this may include the specification of low flow taps and dual flush toilets with reduced effective flush volumes and flow rates.

To be further sustainable, it is anticipated that 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 Site to be deemed sustainable with regards 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 Site.

8.1 Policy Review

National Planning Policy Framework (2018)

Section 9 - 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.

The London Plan March 2016

Policy 6.9 Cycling

The Mayor will work with all relevant partners to bring about a significant increase in cycling in London, so that it accounts for at least 5 per cent of modal share by 2026. He will:

- identify, promote and implement a network of cycle routes across London which will include Cycle Superhighways and Quietways
- continue to operate and improve the cycle hire scheme and fund the transformation of up to four outer London borough town centres into cycle friendly 'mini-Hollands'. Planning decisions

Developments should:

- provide secure, integrated, convenient and accessible cycle parking facilities in line with the minimum standards set out in Table 6.3 and the guidance set out in the London Cycle Design Standards (or subsequent revisions)
- provide on-site changing facilities and showers for cyclists
- contribute positively to an integrated cycling network for London by providing infrastructure that is safe, comfortable, attractive, coherent, direct and adaptable and in line with the guidance set out in the London Cycle Design Standards (or subsequent revisions)
- provide links to existing and planned cycle infrastructure projects including Cycle Superhighways, Quietways, the Central London Grid and the 'mini-Hollands'
- facilitate the Mayor's cycle hire scheme through provision of land and/or planning obligations where relevant, to ensure the provision of sufficient capacity

Policy 6.10 Walking

Development proposals should ensure high quality pedestrian environments and emphasise the quality of the pedestrian and street space by referring to Transport for London's Pedestrian Design Guidance.

London Borough of Hillingdon (LBH) Local Plan Part 1: Strategic Policies (2012)

Policy T1: Accessible Local Destinations

The Council will steer development to the most appropriate locations in order to reduce their impact on the transport network. All development should encourage access by sustainable modes and include good cycling and walking provision.

The Council will ensure access to local destinations which provide services and amenities.

The Council will promote active travel through improvements to Hillingdon's public rights of way.

8.2 Development Sustainability Features

The Site is located north east of Uxbridge and is bordered by the A40 to the north, as seen in Figure 8.1. This location provides a good provision of public transport with the closest London underground station (Hillingdon station) located 200m to the west, providing building occupants' access to the Metropolitan and Piccadilly underground lines. The Site is also within 100m of two Transport for London (TfL) bus stops providing services west towards Uxbridge and south towards Hillingdon Hospital.

The Site has a few dedicated cycling routes nearby, and with bus services and a tube station in such close proximity, building users should be discouraged from using private vehicles as their main form of transportation; the cycling routes can be seen in Figure 8.2.

Primary amenities including a cash machine, post box and food outlets are available to building users and are located at approximately a 3 minute walking distance away on Long Lane. The proximity of such amenities should encourage building users to avoid using private vehicles for short journeys and in turn reduce transport related emissions.

A Transport Assessment and Travel Plan is to be undertaken by WSP for the Site which will detail more detailed information on the public transport options available, as well as recommending sustainable transport measures.

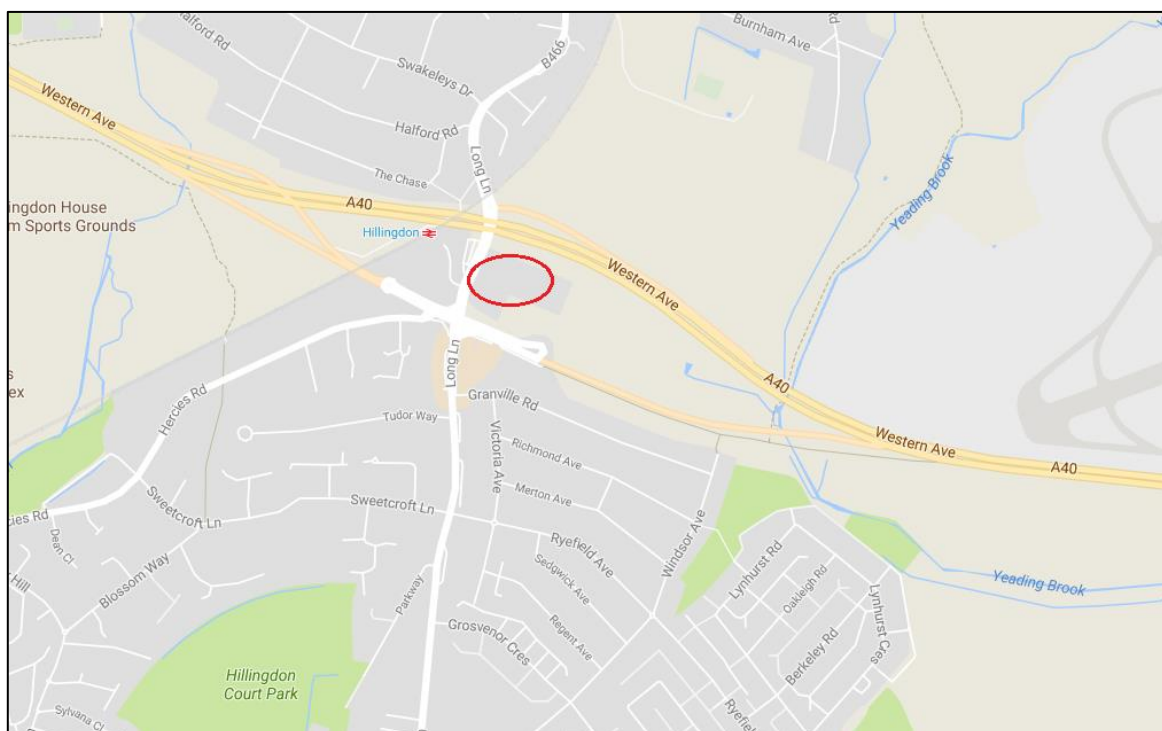


Figure 8.1 Location of Hillingdon Gardens Development

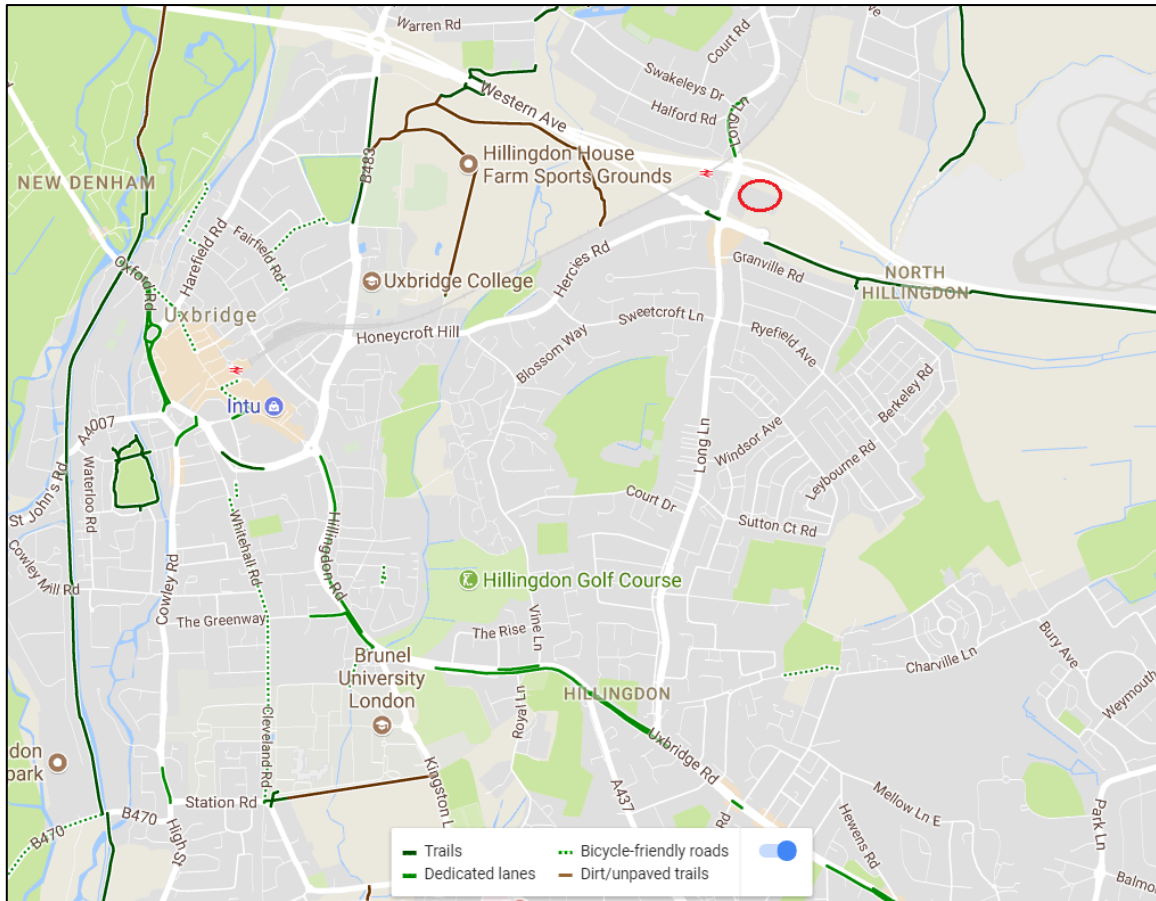


Figure 8.2 Hillingdon Cycling Routes

8.3 Summary

The above provisions aim to make the Site easier to access for all building users, as well as offering a sustainable means of commuting.

The development is located north of Long Lane which provides a number of local amenities within walking distance including a cash point, post box and food outlets therefore minimising the need for short car based travel which in turn reduces travel based emissions.

The location of the Site is within proximity of multiple existing transport links for future building users, including frequent bus services and a tube station. These features allow the Site to be deemed sustainable with regard to transport. A Transport Assessment and Travel Plan is to be conducted by WSP.

9.0 Construction Site Management

A large proportion of all waste produced is due to construction and demolition operations. 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 (2019)

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.

The London Plan March 2016

Policy 5.3 Sustainable Design and Construction

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

- Minimising the generation of waste and maximising reuse or recycling.

London Borough of Hillingdon (LBH) Local Plan Part 1: Strategic Policies (2012)

Policy EM11: Sustainable Waste Management

The Council will require all new development to address waste management at all stages of a development's life from design and construction through to the end use and activity on site, ensuring that all waste is managed towards the upper end of the waste hierarchy.

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's energy and water consumption and ensures that all timber used on site is responsibly and legally sourced in compliance with the UK Government's Timber Procurement Policy. Further to this the Site Waste Management Plan will also monitor the resource efficiency of the development construction works as well as the percentage of non-hazardous materials, demolition and construction, which have been diverted from landfill. Monitoring of such actions can encourage contractors to become more resource efficient to meet given targets.

In addition to this, it is expected that the main contractor will comply with best standards as set out in the Considerate Constructors Scheme which will be assessed under the following sections in order to achieve a score which is considered as exceeding compliance with the criteria of the scheme:

- Appearance;
- Community;
- Environment;
- Safety;
- Workforce.

To ensure the sustainable construction of the development, the project will consider the concept of 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 or waste or up cycling;
- Recycling of all applicable materials;
- Recovery of energy from waste (anaerobic digestion plants);
- Waste is sent to landfill.

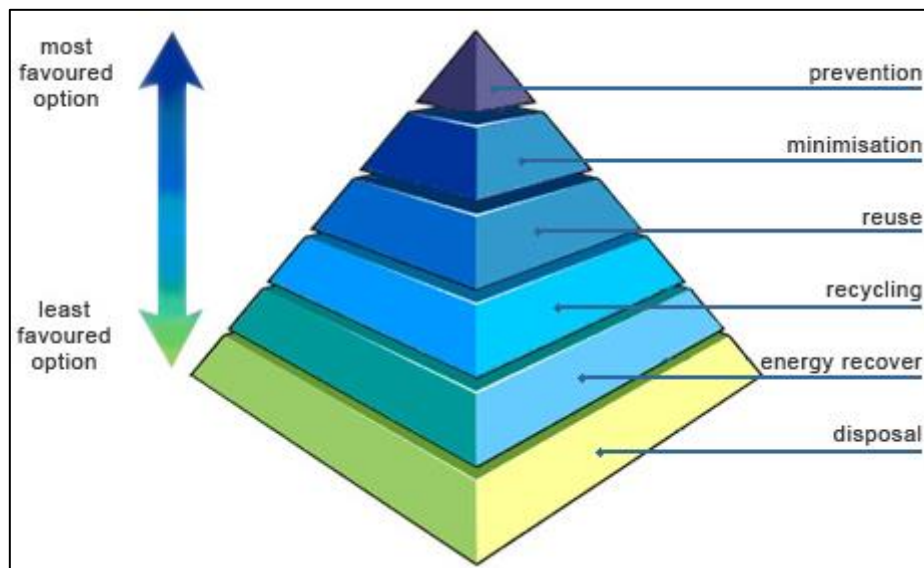


Figure 9.1 Waste Hierarchy Diagram

9.3 Summary

It is anticipated that this development will produce a Site Waste Management Plan, highlighting key waste materials and the correct waste streams for recycling these materials. In addition to this, during construction it is anticipated there will be a target resource efficiency for non-hazardous demolition and construction waste, as well as exceeding compliance of the considerate constructor scheme.

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 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 (2019)

Section 12- Achieving Well-Designed Places

The creation of high quality buildings and places is fundamental to what the planning and development process should achieve. Good design is a key aspect of sustainable development, creates better places in which to live and work and helps make development acceptable to communities. Being clear about design expectations, and how these will be tested, is essential for achieving this. So too is effective engagement between applicants, communities, local planning authorities and other interests throughout the process.

The London Plan March 2016

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, promoting and protecting biodiversity and green infrastructure.

Hillingdon Council Local Plan Part 1: Strategic Policies (2012)

Policy BE1: Built Environment

The Council will require all new development to improve and maintain the quality of the built environment in order to create successful and sustainable neighbourhoods, where people enjoy living and working and that serve the long-term needs of all residents. All new developments should:

- Maximise the opportunities for all new homes to contribute to tackling and adapting to climate change and reducing emissions of local air quality pollutants. The Council will require all new development to achieve reductions in carbon dioxide emission in line with the London Plan targets through energy efficient design and effective use of low and zero carbon technologies. Where the required reduction from on-site renewable energy is not feasible within major developments, contributions off-site will be sought. The Council will seek to merge a suite of sustainable design...

...goals, such as the use of SUDS, water efficiency, lifetime homes, and energy efficiency into a requirement measured against the Code for Sustainable Homes and BREEAM. These will be set out within the Hillingdon Local Plan: Part 2- Development Management Policies Local Development Document (LDD). All developments should be designed to make the most efficient use of natural resources whilst safeguarding historic assets, their settings and local amenity and include sustainable design and construction techniques to increase the re-use and recycling of construction, demolition and excavation waste and reduce the amount disposed to landfill.

10.2 Development Sustainability Features

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

To provide as much natural light as possible, glazing has been provided to these elevations. To ensure the building modelling confirms that no occupied space is at risk from excessive solar gains, a high performance glazing with a shading coefficient of 0.41 is to be specified. To improve the thermal comfort of building users, a strategy to provide occupants with a level of control over the heating system within the building is to be implemented.

To further ensure that overheating will not occur during summer months and the buildings are suitably insulated as well as allowing for adaptation due to the effects of climate change, it is anticipated that the development will use building fabrics with 'U' values better than the threshold requirements of Part L (2013) as seen in Tables 10.1 and 10.2 below; further to this the energy efficiency measures discussed within Section 6.0 will be incorporated into the design of the development. It is anticipated that such measures will lower the building's energy requirements making its operation feasible and practical for years to come.

Element	Part L2A Requirement	U Value Specified	% Improvement
Wall	0.35	0.20	43%
Roof	0.25	0.16	36%
Floor	0.25	0.20	20%
Glazing	2.20	1.40	37%

Table 10.1 U Value Improvements – Commercial

Element	Part L1A Requirement	U Value Specified	% Improvement
Wall	0.30	0.16	46%
Roof	0.20	0.11	45%
Floor	0.25	0.11	56%
Glazing	2.00	1.20	40%

Table 10.2 U Value Improvements – Residential

To provide a fully sustainable development the use of materials assessed under the Building Research Establishment's Green Guide to Specification will be considered for the following main building elements:

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

In order to provide visual comfort to future building users it is anticipated that any fluorescent lamps will be fitted with high frequency ballasts, in order to minimise flickering of lights and provide a healthy working environment.

10.3 Summary

In order to comply with national and local policies, the Site 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, as well as potentially providing building users with suitable controls of the heating system during the fit out works.

External lighting except safety and security lighting should be designed to be switched off automatically through the use of timers and day light sensors as well as the specification of cut off luminaires to reduce any potential light spill.

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

11.0 Flood Risk

The Flood and Water Management Act 2010, puts emphasis on rather than managing floods through defences, to instead make space for water storage. The extent of potential flooding for the Site from fluvial sources can be seen below in Figure 11.1, sourced from The Environment Agency.

11.1 Policy Review

National Planning Policy Framework (2019)

Section 14- Meeting the Challenge of Climate Change, Flooding and Coastal Change

Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere.

The London Plan March 2016

Policy 5.3 Sustainable Design and Construction

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

- Avoiding impacts from natural hazards (including flooding).

Policy 5.12 Flood Risk Management

The Mayor will work with all relevant agencies including the Environment Agency to address current and future flood issues and minimise risks in a sustainable and cost effective way.

Development proposals must comply with the flood risk assessment and management requirements set out in the NPPF and the associated technical Guidance on flood risk¹ over the lifetime of the development and have regard to measures proposed in Thames Estuary and Catchment Flood Management Plans.

Developments which are required to pass the Exceptions Test set out in the NPPF and the Technical Guidance will need to address flood resilient design and emergency planning by demonstrating that: a the development will remain safe and operational under flood conditions b a strategy of either safe evacuation and/or safely remaining in the building is followed under flood conditions c key services including electricity, water etc will continue to be provided under flood conditions d buildings are designed for quick recovery following a flood.

Development adjacent to flood defences will be required to protect the integrity of existing flood defences and wherever possible should aim to be set back from the banks of watercourses and those defences to allow their management, maintenance and upgrading to be undertaken in a sustainable and cost effective way.

In line with the NPPF and the Technical Guidance, boroughs should, when preparing LDFs, utilise Strategic Flood Risk Assessments to identify areas where particular flood risk issues exist and develop actions and policy approaches aimed at reducing these risks.

Hillingdon Local Plan Part 1 (2013)

Policy EM6: Flood Risk Management

The Council will require new development to be directed away from Flood Zones 2 and 3 in accordance with the principles of the National Planning Policy Framework (NPPF).

The Council will require all development across the borough to use sustainable urban drainage systems (SUDS) unless demonstrated that it is not viable. The Council will encourage SUDS to be linked to water efficiency methods. The Council may require developer contributions to guarantee the long term maintenance and performance of SUDS is to an appropriate standard.

11.2 Development Sustainability Features

A flood map sourced from the Government Flood Warning Information Service seen below in Figure 11.1, demonstrates that the Site is not at risk from fluvial flooding and is located within Flood Zone 1. Additional flood maps in Figures 11.2 and 11.3 further confirm that there is also at low risk of flooding from reservoirs and surface water run-off.

A Floor Risk Assessment (FRA) and Surface Water Drainage Strategy is to be conducted by ICIS Design which will consider measures to manage surface water run-off from the proposed development.

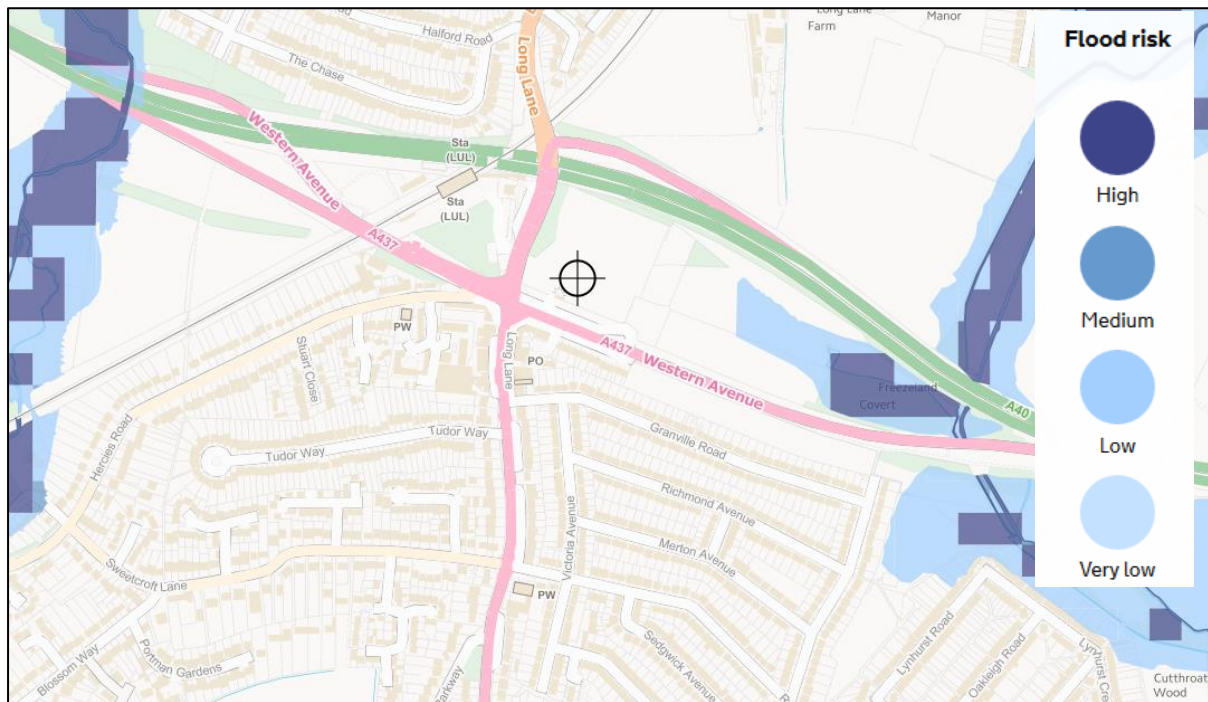


Figure 11.1 Fluvial Flooding (Sourced from the Government Flood Warning Information Service)

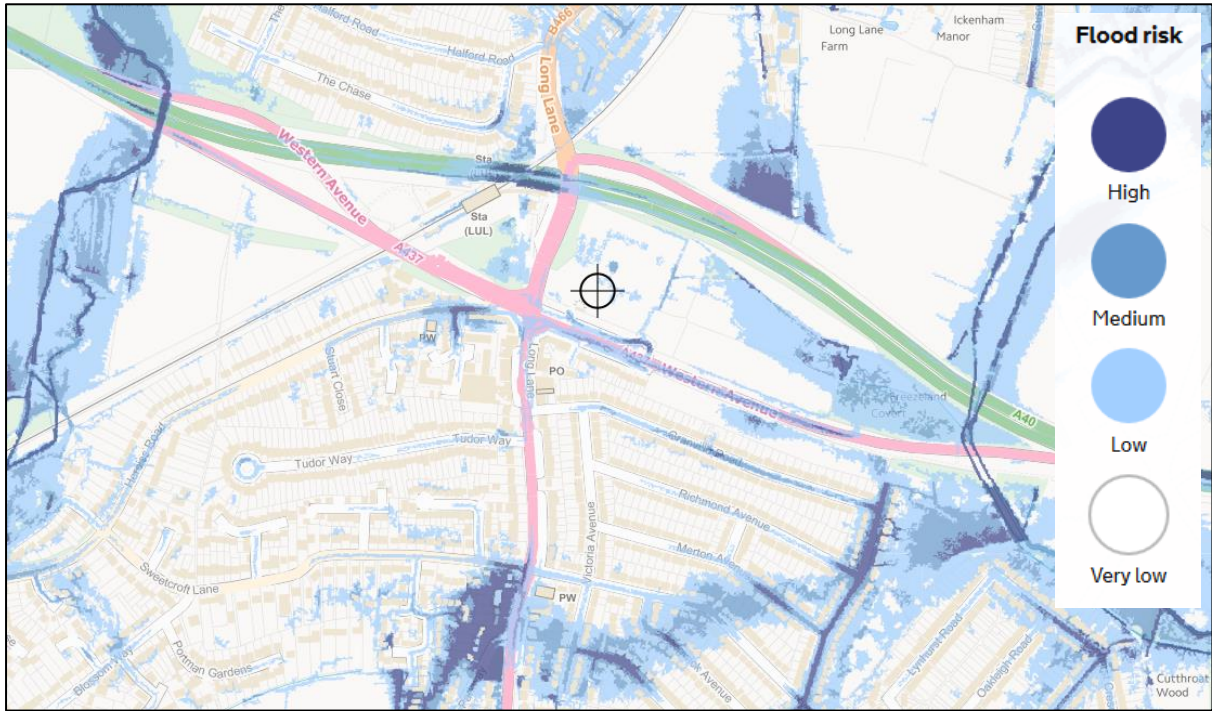


Figure 11.2 Surface Water Run-Off Flooding (Sourced from Government Flood Warning Information Service)

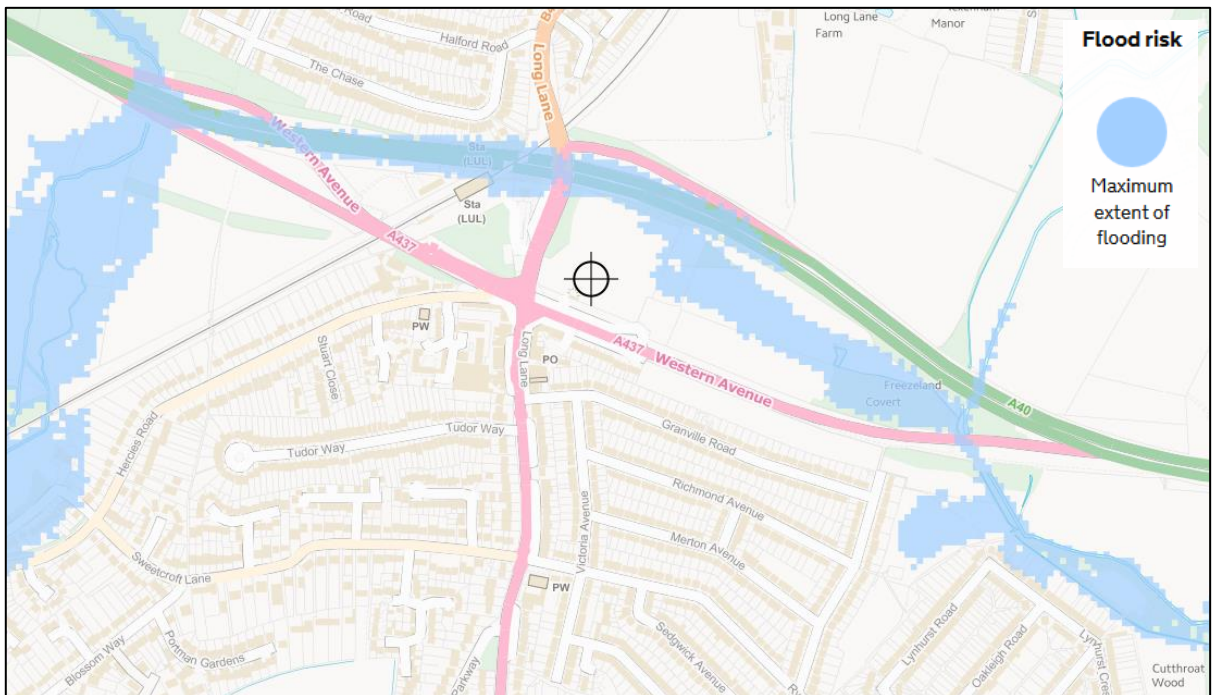


Figure 11.3 Reservoir Flooding (Sourced from Government Flood Warning Information Service)

11.3 Summary

Flood maps confirm that the Site will be located within Flood Zone 1 and is not at risk of flooding, from fluvial and reservoir sources.

A Floor Risk Assessment (FRA) and Surface Water Drainage Strategy is to be conducted by ICIS Design which will assess in more detail the sites risk to flooding and explore measures to manage surface water run-off from the proposed development if required.

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

The London Plan March 2016

Policy 5.3 Sustainable Design and Construction

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

- Minimising pollution (including noise, air and urban runoff).

LBH Local Plan Part 1 (2012)

Policy EM8: Land, Water, Air and Noise

Noise

The Council will seek to ensure that noise sensitive development and noise generating development are only permitted if noise impacts can be adequately controlled and mitigated.

12.2 Development Sustainability Features

The development will be subject to noise pollution from road sources as seen within Figure 12.1 below; this is due to the proximity of the Site to the A40. As seen within the map, noise levels across the site range from 65dBA to 75dBA in the northern areas of the site.

Figure 12.2 depicts the nearby noise pollution from rail sources, however, the substantial distance between the site and the nearest rail line means no additional noise is expected.

An Acoustic Assessment is to be undertaken by Spectrum which will offer a more detailed assessment and recommend any mitigation measures against the greater levels of external sources of noise pollution.

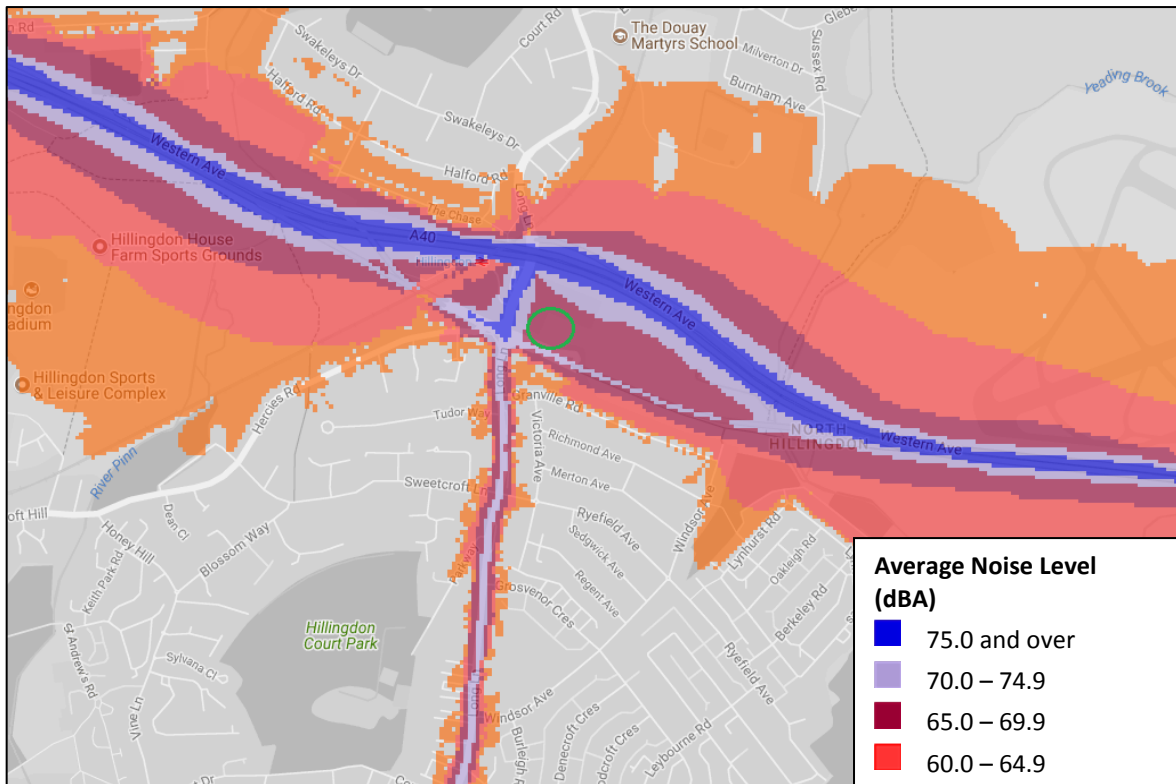


Figure 12.1 Road Noise Data Map (Sourced from Extriem)

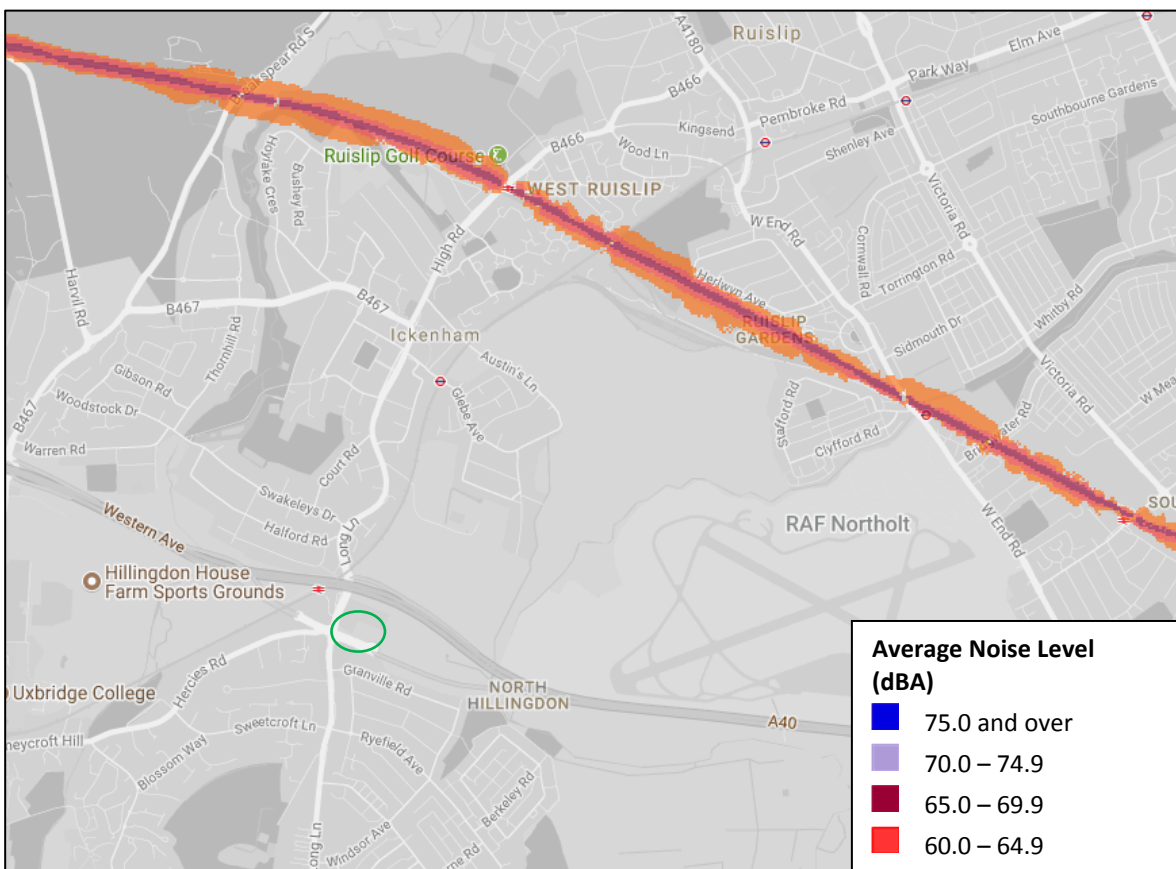


Figure 12.2 Rail Noise Data Map (Sourced from Extriem)

12.3 Summary

Due to the proximity of the A40 to the proposed development site, current noise levels are likely to be high, the facilities introduced are unlikely to increase noise pollution of the area. It is anticipated that design measures will be implemented where necessary to attenuate noise, recommended by the Acoustic Assessment conducted by Spectrum, in order to determine the development sustainable in terms of 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

National Planning Policy Framework (2019)

Section 15- Conserving and Enhancing the Natural Environment

The planning system should protect and enhance valued landscapes, minimise impacts on biodiversity.

The London Plan March 2016

Policy 5.3 Sustainable Design and Construction

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

- Promoting and protecting biodiversity and green infrastructure.

LBH Local Plan Part 1 (2012)

Policy EM7: Biodiversity and Geological Conservation

Hillingdon's biodiversity and geological conservation will be preserved and enhanced with attention given to:

- The protection and enhancement of populations of protected species as well as priority species and habitats identified within the UK, London and the Hillingdon Biodiversity Action Plans.
- Appropriate contributions from developers to help enhance Sites of Importance for Nature Conservation in close proximity to development and to deliver/ assist in the delivery of actions within the Biodiversity Action Plan.
- The provision of biodiversity improvements from all development, where feasible.
- The provision of green roofs and living walls which contribute to biodiversity and help tackle climate change.
- The use of sustainable drainage systems that promote ecological connectivity and natural habitats.

13.2 Development Sustainability Features

Ecology conservation map (sourced from MAGIC) highlights that there are a number of Sites of Special Scientific Interest (SSSI) or Special Conservation Areas within a mile radius of the development site; the closest are woodland running adjacent to Grove close (an SSSI) and the forest area as part of Long Lane Farm (a SSSI), these and more can be seen below in Figure 13.1. The previously listed sites are detailed within Table 13.1 below.

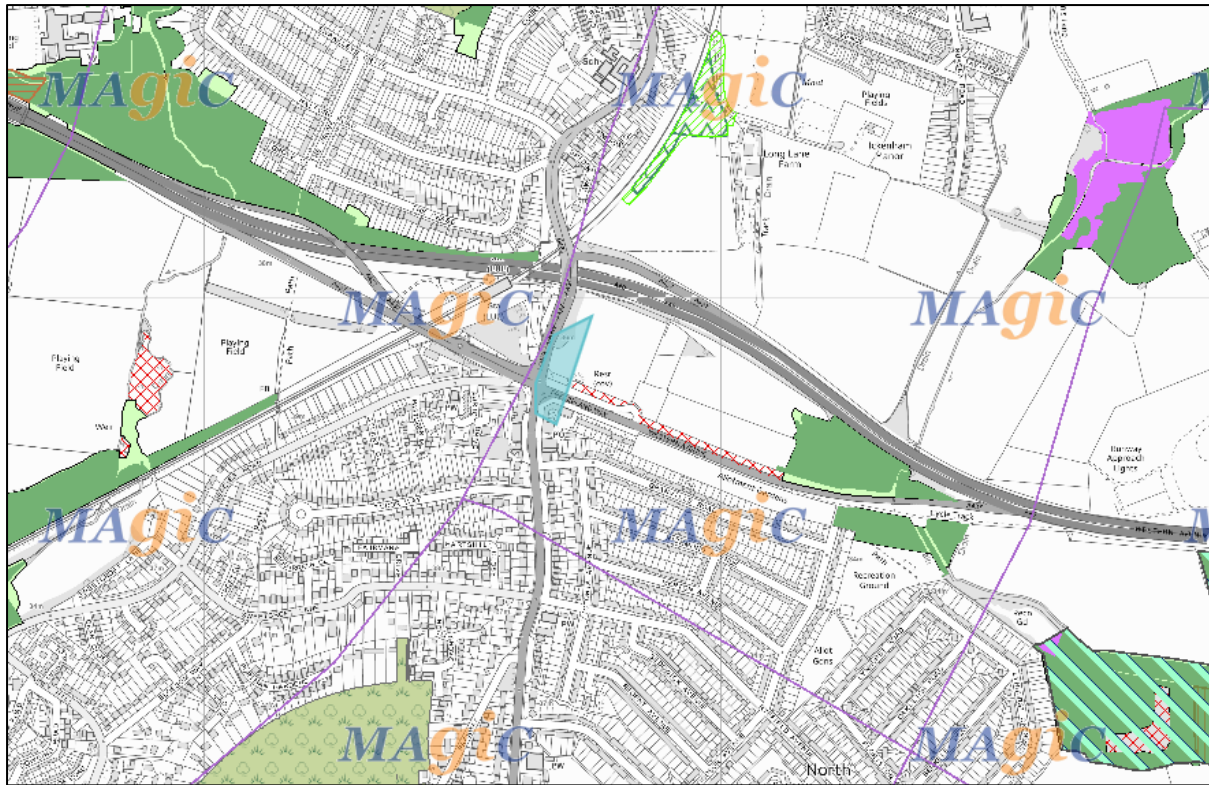


Figure 13.1 Ecology Conservation Map (Post Code Analysis, Sourced from MAGIC)

Site Name	Distance (miles)	Site description	Statutory Conservation Area?
Land north-west of Site	0.13	Priority Habitat Inventory – Deciduous Woodland	Yes
Long Lane Farm	0.20	English Woodland Grant Scheme	Yes

Table 13.1 Hillington Gardens Local Habitats

In order to mitigate any potential impacts on these habitats from the construction process, it is anticipated that dust pollution prevention measures will be put in place throughout construction and as such will not have an impact.

In order to form a more detailed understanding of the sites ecological status, as well as enhancing and projecting the overall ecology value of the site landscaping, an Ecology Phase 1 Habitat Report shall be conducted for the development by Bradley Murphy Design.

13.3 Summary

Initial analysis of the site confirms that there are some ecological conservation areas within close proximity to the development site. It is anticipated that none of the habitat will be affected by the development through either the construction or operational phases of the Site, with pollution prevention measures being implemented by the contractor. It is anticipated that an Ecology Phase 1 Habitat Report shall be conducted for the development by Bradley Murphy Design which will provide further detail surrounding the sites ecological status, as well as enhancing and projecting the overall ecology value of the site landscaping