Haringey Local Plan: Sustainable Design & Construction SPD

Haringey Council

Sustainable Design & Construction

SUPPLEMENTARY PLANNING DOCUMENT

Adopted March 2013

www.haringey.gov.uk

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1.1 Purpose of this Document

This document is a supplementary planning document (SPD) and provides guidance on how development in Haringey should be designed to ensure that it is as sustainable as possible.

The guidance replaces the previous Supplementary Planning Guidance set out below and includes details of what to include in the Sustainability Statement that should support a planning application:

- SPG 8a (adopted) – waste
- SPG 8b (draft) - materials
- SPG 8c (draft) - environmental performance
- SPG 8d (draft) - biodiversity, landscaping and trees
- SPG 8e (draft) - light pollution
- SPG 8g (draft) - ecological impact assessment
- SPG 8i (draft) - air quality

TOPICS COVERED IN THE SPD:

Energy & Carbon standards and efficiency measures
Changing Climate mitigation and adaptation
Flood Risk areas and resistant design
Water management and conservation
Pollution air, noise, light, land
Waste minimisation and management
Construction material resource efficiency & modern methods
Biodiversity areas of protection and methods of improvement
Transport sustainable modes and accessibility

1.2 What is an SPD?

A Supplementary Planning Document (SPD) does not create new policy, but provides detailed guidance on how current and emerging planning policies will be applied to new developments in the borough.

The SPD is an important material consideration in helping the Council make decisions about planning applications. The guidance forms part of Haringey's Local Plan. The current policies that the Council uses in determining planning applications are set out in the following documents. A summary is also provided in Appendix A1.

- The National Planning Policy Framework, 2012
- The London Plan, 2011
- Haringey's Local Plan: Strategic Policies, 2012 and saved policies of the Unitary Development Plan (UDP) 2006 (saved 2009)
- Development Management Development Plan Document, Draft 2013
- Site Allocations Development Plan Document, New draft in preparation 2013
- Area Action Plans (AAPs) and SPDs.

Please check the Council's website to ensure you use the most up-to-date planning policies and guidance. http://www.haringey.gov.uk

1 Introduction

1.3 Links to Other Strategies

The Guidance will seek to contribute to achieving the vision in Haringey's Sustainable Community Strategy. The SPD will also play a key role in the implementation of the Council's Greenest Borough Strategy (2008-2018) and its priorities:

1. Improving the urban environment
2. Protecting the natural environment
3. Managing environmental resources efficiently
4. Leading by example
5. Ensuring sustainable design and construction
6. Promoting sustainable travel
7. Raising awareness and involvement

The SPD will help the borough move towards its carbon reduction targets. This includes the Council's aspirational target for a reduction in CO_2 emissions in Haringey of 40% by 2020 on a 2005 baseline, as well as the targets and the development of local (decentralised) energy networks as set out in the London and Local Plans. The guidance will also assist in the implementation of the Biodiversity Action Plan 2009.

The measures identified in the SPD will help the Council to meet the various obligations for sustainability, environmental quality and carbon reductions targets set at national, regional and local levels.

"We want to tackle climate change and manage our environmental resources more effectively, increase levels of recycling, improve and promote sustainable transport and create sustainable and energy efficient homes and buildings. We want to reduce the borough's environmental footprint. We will engage children and young people in environmental issues encouraging our future citizens to be our first 'green generation'." **Sustainable Community Strategy**

How to use this document

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2.1 What development does it apply to?

General principles of sustainable design and construction apply to all developments proposals that include building and landscape work. Measures highlighted here are applicable to most major and minor developments. Householders can also benefit from the SPD and therefore are invited to give consideration to measures relevant to their house improvement proposals such as guidance on energy, retrofitting and water use.

The principles apply to all types of land uses such as housing, offices, industrial development, retail, community and leisure facilities, including:

- New buildings
- Refurbishment or retrofitting to existing buildings
- Extensions to existing buildings
- Public areas such as landscaped areas around the buildings and new or improved open spaces.

In addition to planning permission, Building Control regulation consent is required for all new developments and alterations which covers issues of fire safety, accessibility for people with disabilities, structural stability, water penetration, sound and thermal insulation, ventilation, sanitary provision, drainage, flues and boilers, stairways, renewable energy systems on roofs, energy saving measures, and glazing safety.

2.2 How to use the information in this document

Sections 1 and 2 provide background information on what this document is and how it will be used. Sections 3 to 11 explain the design principles and standards that all new development should consider. Following these principles will help you to achieve the standards expected in new development.

FACT BOX: Supporting Statements

Developers can use the following statements to show how their proposals contribute to sustainable design and construction:

- Design and Access Statement
- Sustainability Statement
- Energy Statement

The level of information required needs to be more detailed for major applications as defined below:

MAJOR:

- **Proposals for 10 or more dwellings**
- **1,000 sq m or more floorspace**
- **Development on a site of 0.5 Ha or more**

MINOR:

- **Development that falls below the major applications thresholds**

Some applications will also be subject to other external regulations for example Environmental Impact Assessment and need additional statements on specific issues.

Applicants should consult the Council's planning department to check the statements needed to support the planning application.

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Energy & Carbon

3.1 The Energy Hierarchy

The Energy Hierarchy offers a framework and a common sense approach to designing and constructing buildings to reduce carbon emissions. To be effective and cost-efficient the hierarchy should be considered at early stages of design and an energy statement, which sets out the way the hierarchy is applied to the development proposal, should accompany relevant planning applications.

Energy Assessment

Major development proposals should include a detailed energy assessment to show how a reduction in energy use and carbon dioxide (CO_2) emissions from the development will be achieved. The energy assessment can be provided as part of the Sustainability Statement or as a stand-alone assessment. The statement should show the following:

- Calculation of baseline energy demand (2010 Building Regulations) and CO_2 emissions on a 'whole energy' basis, showing the contribution of emissions both from uses covered by building regulations and those that are not (unregulated emissions e.g. appliances)
- Proposals to reduce CO_2 emissions through the energy efficient design of the site, buildings and services
- Proposals to further reduce CO_2 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 CO_2 emissions through the use of on-site renewable energy technologies.

The Mayor's Energy Hierarchy

LEAN use less energy

Before any mechanical systems are considered development should be made as energy efficient as possible by having good standards of insulation and maximising the use of sunlight, thermal mass and site microclimate to provide natural lighting, heating and cooling of buildings. Green roofs and walls and high ceilings and windows heights (for natural light and ventilation) are preferred.

CLEAN supply energy efficiently

If mechanical heating, cooling and ventilation are needed, this needs to be as efficient as possible. The priority is to use local ("decentralised") energy sources, in particular combined heat and power (CHP) systems.

GREEN use renewable energy

There may still be demand for energy (for appliances, lighting and machinery). As much as possible this remaining energy demand should be met through zero and low carbon energy sources.

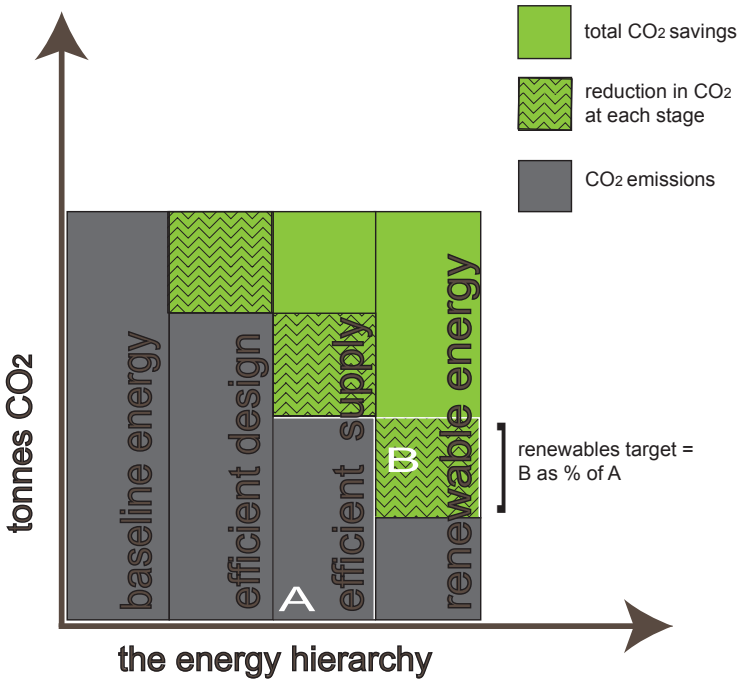

Figure 1: How to calculate energy and carbon used

3.2 Site Microclimate

When designing proposals it is important to consider the site's microclimate including the likely impacts of sun, overshadowing, wind, precipitation, building height and mass on neighbouring properties, the public realm and open space.

A microclimate assessment should be carried out where tall buildings are proposed in order to demonstrate the impact of the building and mass upon the surrounding microclimate and to identify any mitigation measures required. In Haringey a tall building is considered to be 10 storeys or above. It may also be necessary to undertake a wind tunnel test to ensure that the building does not create an uncomfortable environment for pedestrians.

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FACT BOX: Energy Standards

Code for Sustainable Homes

The Code for Sustainable Homes is the national standard for the sustainable design and construction of new home, which aims to reduce carbon emissions and promote higher standards of sustainable design above the current minimum standards set out by the building regulations. The Code uses a 1 to 6 star system to rate the overall sustainability performance of a new home with 6 stars being the most sustainable. The Code Technical guide sets out the requirements of the latest version of the code. **Haringey requires a minimum of Code 4 to be achieved.**
http://www.gov.uk

BREEAM

A BREEAM assessment is a voluntary assessment method for new non-residential buildings, which is run by the Building Research Establishment. The assessment uses recognised measures of performance, which are set against established benchmarks, to evaluate a building's specification, design, construction and use. Buildings are rated on a scale of Pass, Good, Very Good, Excellent and Outstanding. Pre-assessments for CSH (residential) and BREEAM (non-residential) are required to accompany all planning applications. **Haringey requires a minimum of 'Very Good' to be achieved.**

BRE has also introduced a new refurbishment scheme. BREEAM Domestic Refurbishment is used to measure the environmental life cycle impacts of refurbishment projects including existing dwellings undergoing refurbishment, extensions, domestic conversions and change of use projects. Major non-domestic refurbishments may use BREEAM 2008 or 2011 until BREEAM non-domestic refurbishment is released.
http://www.breeam.org

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3.3 Passive Design

Passive Design responds to local climate and site conditions to maximise building users' comfort and health whilst minimising energy use, without the use of 'active' mechanical systems.

The key elements of passive design include:

- building location and orientation on the site
- building layout
- air tightness and insulation
- solar gain and access
- thermal mass
- shading
- ventilation

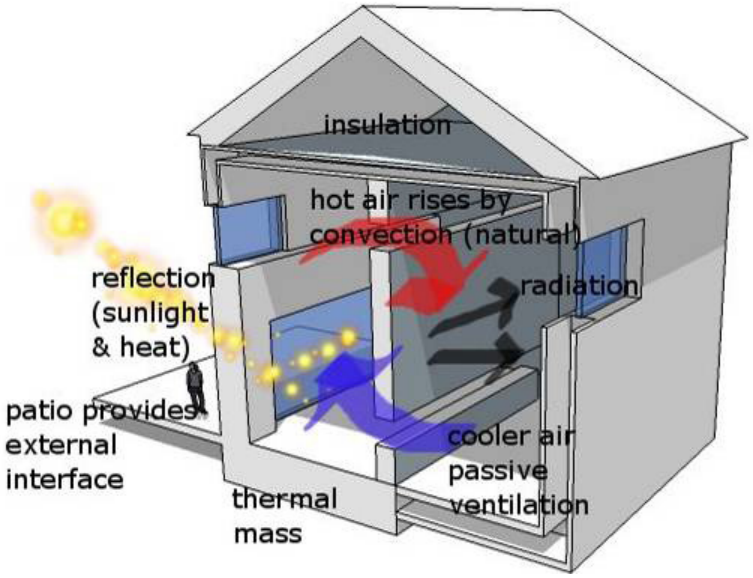

Figure 2: Principles of Passive Solar Design

Solar Gain

All development proposals should maximise the potential for passive solar gain. Site layout should use landform and landscape to:

- provide shelter to minimise heat losses in winter and adequate shade in summer
- maximise the capture and use of passive solar energy while avoiding excessive solar gain in summer
- avoid over-shadowing of the solar orientation of buildings.

The key principles of passive solar design are:

- Design the internal layout to ensure the main living room and other frequently used rooms are on the south side and rooms that benefit less from sunlight bathrooms, utility rooms) on the north side. Kitchens are better positioned on the north side to avoid excessive heat gain.
- Provide thermal mass and storage by using solid walls to buffer against heat fluctuations and provide cooler conditions in summer.
- Locate the main glazed elements on the south elevation.
- Arrange internal layout to distribute solar energy gains using through-rooms.
- Avoid single aspect flats, dual aspect should be the first option for all new developments. Where single aspect dwellings are proposed, it must be demonstrated how good levels of ventilation, daylight and privacy will be provided to each habitable room and the kitchen.

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Buildings should avoid overheating during summer months without reliance on energy intensive mechanical cooling systems. Natural ventilation should be used where possible.

Conservatories can help to harness passive solar energy and provide shelter to external walls, however, they should be carefully incorporated into a design to:

- ensure effective distribution of heat around the home
- avoid heat loss in winter through large glazed areas
- prevent over-heating in summer.

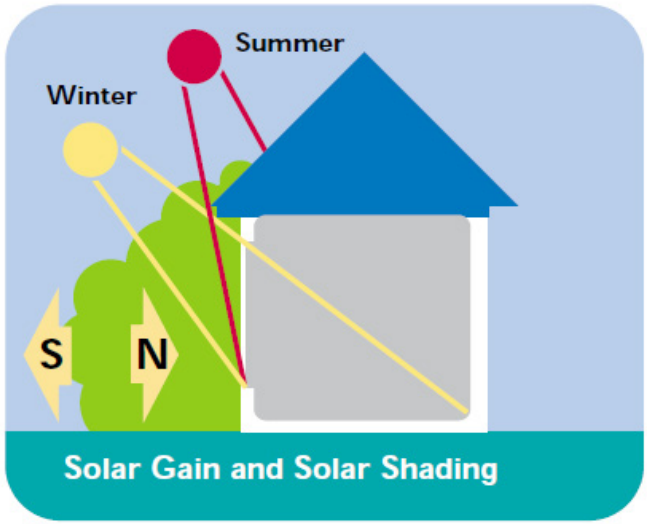

Figure 3: Solar Gain and Shading

Solar Access

Dwellings should receive adequate sunlight to provide: thermal comfort; an area to dry clothes outside; and to efficiently use a solar hot water system. Solar access is also important for landscaped areas and the usability of a private open space.

Retaining direct solar access and avoiding detrimental overshadowing of internal and external spaces should be taken into consideration where building work is proposed on adjoining or nearby sites.

Building Fabric, Materials and Fittings

The energy used in the building fabric, materials and fittings should also be considered. Buildings should be fitted with energy efficient lighting and appliances. Lighting should be designed to minimise wasted light spilling to where it is not needed or being reflected to the night sky. Further details can be found in the sections on Construction, Waste and Pollution.

FACT BOX:
Listed Buildings & Conservation Areas

There is much that can be done in the historic environment to further the aims of sustainable living. The works to buildings which are listed, or located in conservation areas need to be considered to ensure that any works complement best practice for the historic built environment. The circumstances where development and alterations would require planning permission because the house is located in a conservation area or an area covered by an Article 4 Direction (regarding areas where permitted development rights have been removed) can be clarified by Haringey's planning service. Works that alter the character of a listed building would require listed building consent. This is a separate process to obtaining planning permission.

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FACT BOX:
Passivhaus

The term 'Passivhaus' refers to a low-energy construction standard developed in Germany. The core focus is to dramatically reduce the requirement for space heating and cooling. This is primarily achieved by specifying high levels of insulation to the thermal envelope with exceptional levels of air-tightness and the use of whole house mechanical ventilation.

Further information can be found at:

http://www.passivhaus.org.uk

Figure 4: Passivhaus design, Lordship Recreation Centre, Haringey

Passivhaus Trust FOUNDER
The UK Passive House Organisation

3.4 Thermal Mass

The Thermal Mass of the building is the ability of the building's materials to absorb, store and release heat. Heat absorbed can be released slowly helping to moderate the internal temperature as a result of daily temperature fluctuations, reducing the energy needed from active heating and cooling systems. Concrete and brick are examples of high thermal mass materials.

Thermal Insulation

Thermal insulation is one of the most important of all energy saving measures. Insulation provides warmth and comfort, saves money and fuel and has a high investment value. It is possible to construct buildings that require virtually no extra heating due to little heat being lost through the walls. Insulation also keeps buildings cool in summer. The type and level of insulation should therefore be a primary consideration of the building design.

The type of insulation selected is also an important factor to minimise any environmental impact. The ecological impact associated with conventional insulation materials such as foamed glass; glass wool; mineral/rock wool; expanded and extruded polystyrene; Rigid Urethane Foams; Vermiculite; and Woodwool Slabs, relate to their manufacture through to their disposal.

Natural insulation products (e.g. sheep's wool, hemp or wood fibre) have much less impact on the environment than conventional insulation products; are made from renewable plant or animal sources; produced with low energy use; use only natural additives; are biodegradable; and have an ability to 'breathe' so can absorb airborne moisture.

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3.5 Decentralised Energy Systems

Where mechanical heating and cooling is required, development proposals should investigate using energy more efficiently through local (decentralised) energy generation. Decentralised energy generation uses a series of local systems generating heat and/or power (for space or water) at or near the point of use, connected to local distribution networks.

Examples of district networks
Vital Energi

The use of local distribution networks minimises energy that is lost in transmitting energy. The Council is working with the neighbouring boroughs and the Greater London Authority to bring forward a strategic decentralised energy network and local satellites in the Upper Lee Valley.

The Upper Lee Valley is one of London's most exciting areas of change and the opportunity for an alternative energy supply in the area is unique. The core idea of the strategic decentralised energy network here is to capture low-carbon heat from waste-to-energy facilities in the Edmonton area of the Lee Valley and supply the heat to existing businesses and residential customers as well as to new developments.

The London Heat Map (http://www.londonheatmap.org.uk) is an open-access mapping tool showing the relative heat density of different areas, locations of high heat users, large heating plant as well as existing and planned energy networks. The map should be used to assess the proximity of existing and planned district energy networks and additional suitable loads to the development site.

Launched at the end of 2009, the map is a live document and online tool. The information presented is continuously updated and new data added as this becomes available. The Haringey area of the London Heat Map contains data from the Council's estate (schools, council buildings, leisure centres and libraries) and Homes for Haringey properties. Other users are also able to submit information, which is checked before being uploaded.

Haringey has also undertaken heat mapping across the borough which shows that there is potential for networks around key growth and opportunity areas. Developers should consult the London Heat map and contact the Council for the latest information on existing and proposed decentralised energy networks.

See map of potential decentralised energy networks in Haringey, p12

Combined Heat and Power (CHP)

The most efficient form of decentralised energy systems are CHP or Combined Cooling, Heating and Power (CCHP) systems. These systems are efficient because the waste heat left over from creating electricity is used, maximising the energy delivered to end users compared to conventional systems.

The CHP systems require a relatively even and constant demand for energy. Area-wide schemes that cover mixed use buildings are therefore most likely to be viable.

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When considering CHP systems the following order of preferences should be followed:

- Connect to an existing energy network, CHP or CCHP systems, including those on nearby housing estates
- If the above is not possible, use a site-wide CHP/ CCHP system that connects different uses and/ or groups of buildings, either powered by renewables or gas-fired. Also assess the feasibility of extending the system to adjacent sites
- If the above is not possible, communal heating or cooling systems should be used, preferably powered by renewables, but at the very least gas-fired
- If none of the above alternatives are feasible, other efficient systems should be considered, such as heat pumps or heat recovery ventilation. These systems should be powered by low or zero emission fuels
- It is important that occupants understand how to use the energy features of a building efficiently.

Connection to an existing network typically includes a financial contribution to provide the connection based on the avoided cost of a site-specific system. Contributions may also be collected towards development of a future network based on the costs established within the area's Energy Master Plan.

The design of CHP/CCHP systems should also minimise impacts on air quality, as detailed in Section 7.

Future connection

Where site-specific solutions are proposed, the development should be designed to 'future-proof' to connect to an area wide district heating network when it comes forward in the future. Examples of the elements to be addressed include:

- The construction of a single energy centre / plant room producing hot water for space heating and domestic hot water, site wide heating distribution, and wet heating systems
- Appropriate design of on-site (secondary) heating systems, such as, compatible return temperatures, tees and isolation valves to facilitate the connection to a district heating heat exchanger in future
- Safeguarding for the installation of district heating heat exchangers in the energy centre/plant room and other ancillary items to connect to a future DE network
- Installing or safeguarding an identified route from the energy centre/plant room to the property boundary, roadway or similar for flow and return pipes to enable connection to a future area wide DE network. Also appropriate design of building fabric such as soft foundations, or built in penetrations in the energy centre/plant room wall which will allow a pipe from the DE network to be pushed through the wall without significant structural alterations or other works.

Additional guidance on the information to be provided at the pre-application and application stage, as well as design guidance is provided in Appendix A4.

Examples of CHP Vital Energi

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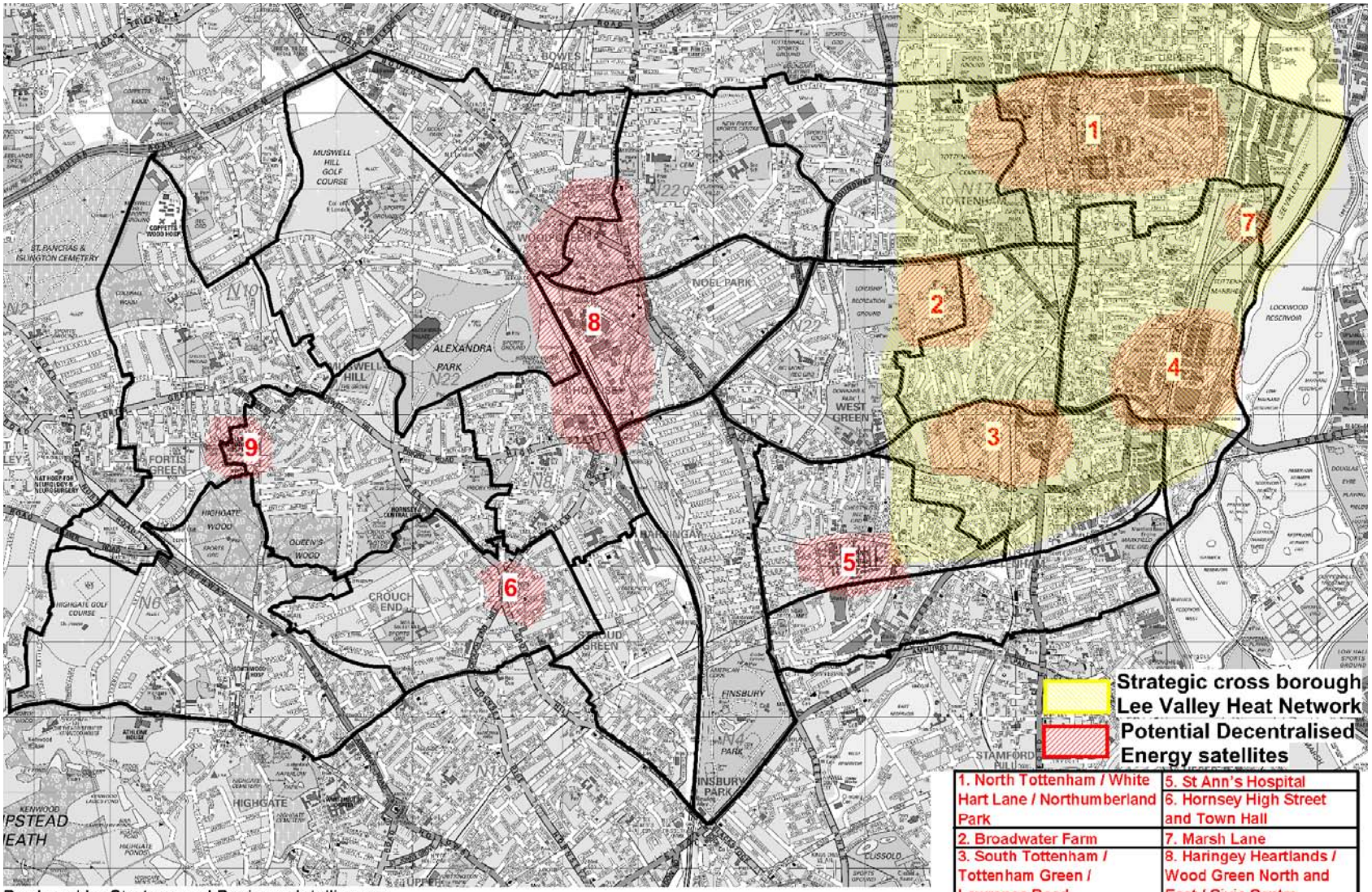

Produced by Strategy and Business Intelligence

Figure 5: Haringey's potential decentralised energy network

Fact Box: Renewable Energy

Solar Thermal

- excellent for hot water
- either flat plate or evacuated tubes generally (more effective) used.
- most effective when placed on unshaded south facing roofs and facades
- A back up source of heat such as gas or electricity will normally be required.

Solar Photovoltaic panels (PV)

- panels which convert light to electrical power.
- range in efficiency from 4-15%.
- can be incorporated into buildings roofs, facades, atria and shading devices.
- can be mounted on frames or incorporated into the building fabric.

The use of solar thermal/photovoltaics may be constrained by Conservation Area designations. Please check with the Planning Department.

Wind Turbines

- small-scale are not likely to be effective in Haringey.
- applications will need to demonstrate that they will be effective.
- accurate information on wind-speeds through the site will be needed, rather than regional estimates.

Biomass boilers

- an alternative to conventional heating systems
- sources of biomass are diverse including forestry, energy crops and a variety of waste materials.
- fuel usually comes in the form of wood chips, logs and pellets.
- must not result in any exceedances in air quality and must consider the impact of vehicle movements for fuel delivery.
- local delivery and storage of fuel required.

Heat Pumps

- ground or air source
- not counted as a 100% renewable source of energy as they are powered by electricity.
- energy used to operate the heat pumps will be deducted from energy calculations

Fuels containing a portion of fossil fuels, such as bio-diesel, will not be counted as a 100% renewable source of energy.

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Marks & Spencer PV panels

Springfield Avenue PV

Fortismere solar pv panels

3.5 Renewable Energy

All major development proposals should seek to reduce carbon dioxide emissions by at least 20 per cent through the use of on-site renewable energy generation wherever feasible. Subscribing to green tariffs that draw energy from the national grid will not be counted as this is not an efficient energy source.

The following are preferred for on-site renewable energy systems:

- Solar thermal
- Solar photovoltaic panels
- Wind turbines (in suitable locations)
- Biofuels (subject to air quality standards)
- Heat pumps

3.6 Home Energy Retrofit

The reduction of carbon emissions in the existing housing stock is an increasingly important challenge. Home energy retrofit will also improve the thermal comfort and health of occupants. Improving the energy efficiency of homes will also reduce the fuel bills and help secure against future rises in energy costs.

Home energy retrofit should be approached by adopting the energy hierarchy and design approaches outlined earlier in this section. Further guidance on how to green your home is contained in the Haringey's 'Greening Your Home Guide'

http://www.haringey.gov.uk/index/housing_and_planning/planning-mainpage/designandconservation/greening.htm

A range of common retrofit measures that could be applied include:

Low Cost

- Low Energy Light-bulbs
- Hot Water Tank Insulation
- Heating Controls i.e. Thermostatic Radiator Valves, Programmers and Thermostats
- Draft Proofing

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Medium Cost

- New Gas Condensing Boilers
- Loft Insulation
- Cavity Wall Insulation
- Building Fabric and Glazing
- External Wall Insulation
- Internal Wall Insulation
- Floor Insulation
- Double Glazing

Low Carbon & Renewable Energy Technology

- Communal Heating Systems
- Photovoltaic Panels
- Solar Thermal Evacuated Tube

Some of these measures may require building control planning permission and listed building consent. Applicants should check the requirements with the Planning and Building Control departments.

External Solid Wall Insulation

Consideration should be given to the potential for external solid wall insulation to the rear or non-public facing gables of individual houses in non-conservation areas, subject to the agreement in writing with the planning authority of the materials, finish and detailing of the installation appropriate to the circumstances of the proposed retrofit. External wall insulation proposed in all other cases will be considered upon individual merits. Proposals for any external solid wall installation should be sensitively designed and carefully detailed with reference to the surrounding built environment.

The Green Deal in Haringey

The Government's Green Deal Initiative will be introduced in 2013. The scheme removes the up front costs to the consumer of energy efficiency measures with the cost recouped through savings on energy bills. A guidance note produced by Haringey Council can be found at:
http://www.haringey4020.org.uk/green_deal

Home Extensions

Best practice standards for energy efficiency in relation to design and specifications should be considered for home extensions. Home extension designs will benefit from adopting the energy hierarchy and design approaches outlined above.

Simple cost effective energy efficiency measures to the existing house should also be considered if possible and practical. These measures could include:

- upgrading loft insulation
- cavity wall insulation
- draft proofing
- upgrading heating controls
- installation of radiator reflective panels
- low energy light bulbs
- boiler upgrade.

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Haringey Example: Retrofit In Haringey

There are a number of projects large and small in Haringey for improving energy efficiency of existing housing stock.

The Low Carbon Zone in Muswell Hill is an area-based project which ran between 2010-2012 which achieved a 17% reduction in carbon emissions in the area. The scheme operated in an area which included a conservation area and “hard to treat” housing stock. The project focused on energy efficiency upgrades, use of renewable energy in house improvements and behaviour change. Legacy of the project is the establishment of a community energy company.

Peabody Trust recently completed a retrofit scheme of terrace of four houses in Clyde Road which aimed to demonstrate how to achieve 80% reductions in the CO2 emissions of an existing modern housing built in the 1970’s. Dwellings were insulated from the outside, windows replaced with high performance versions, and individual heating systems were replaced with a communal system. The scheme included a solar thermal system and a small Photovoltaic array.

Metropolitan Housing Trust worked on a Passivhaus-inspired refurbishment of an Edwardian, solid brick, mid-terrace property in Hawthorn Road. The project included super-insulation, airtightness, mechanical ventilation with heat recovery for maximum energy efficiency. The heating and hot water solutions are designed to remove the need for a conventional wet heating system.

Changing Climate 4

4.1 Urban Heat Island

All urban areas create an ‘urban heat island’ effect where higher ambient temperatures are experienced after sunset, particularly in the highly built up areas of London. The hard surfaces of buildings and roads absorb more solar radiation than green spaces and vegetation. Combined with man-made heat emissions from buildings, machinery and traffic, this can make the centre of London up to eight degrees warmer than the green belt on summer nights.

In London the ‘urban heat island effect’ is likely to exacerbate the intensity of heat-waves, which will increase the need for buildings that maintain comfortable internal temperatures. It is predicted that many buildings will suffer from overheating by the 2020s without design or retrofit for future higher temperatures.

Proposals should demonstrate how the design of buildings will avoid overheating during summer months without reliance on energy intensive mechanical cooling systems. Passive Ventilation is the preferred method of cooling buildings. Development should: be orientated to minimise summer and maximise winter solar gain; use trees and other shading; include green roofs and walls; maximise natural ventilation; and help create green spaces. The type of building materials and even the colour of finishing will also affect heat absorption.

Development should be adaptable to allow for additional shading or cooling requirements as the climate changes. Large expanses of hard surfacing, such as car parks, should be avoided as they are likely to be refused planning permission on design grounds. Where unavoidable, such areas should be landscaped or shaded as much as possible and be light in colour.

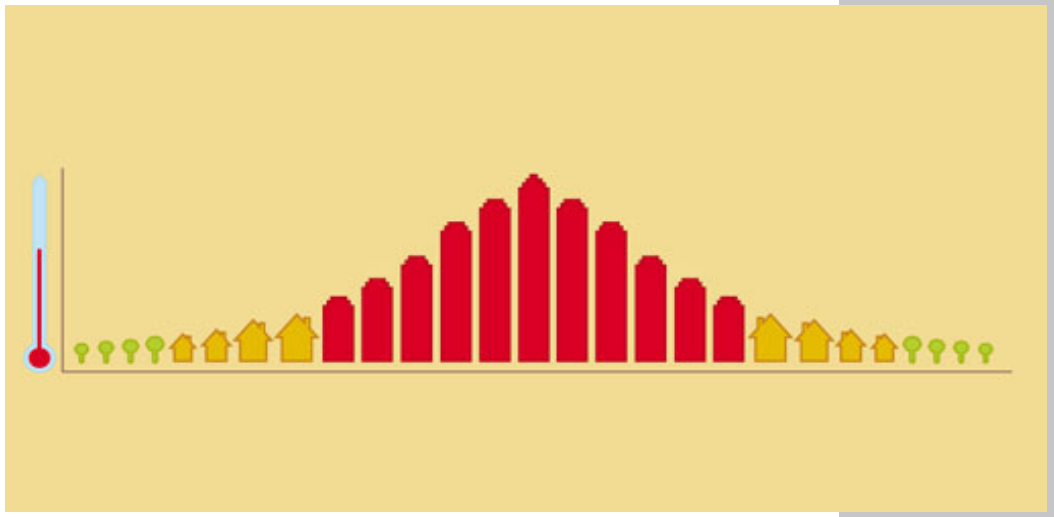


Figure 6: Urban heat island effect

4 Changing Climate

4.2 Low Energy Cooling

Low energy cooling can be achieved through the following methods:

Passive design - to minimise unwanted heat gain and manage heat, for example by using building orientation, shading, a well insulated and air tight building envelope, high levels of thermal mass and energy efficient lighting and equipment.

Passive/natural cooling – using outside air to ventilate and cool a building without the use of a powered system, for example by maximising cross ventilation passive stack ventilation, night-time cooling and/or ground coupled passive cooling.

Mixed mode cooling - with local mechanical ventilation/ cooling provided where required to supplement the above measures using (in order of preference):

1. Low energy mechanical cooling (e.g. fan-powered ventilation with/without evaporative cooling or ground coupled cooling)
2. Air conditioning (not a preferred approach as these systems are energy intensive)

Full building mechanical ventilation/cooling system using (in order of preference):

1. Low energy mechanical cooling
2. Air conditioning

4.3 Around the Buildings

The following measures around buildings can also be used to provide further cooling:

Green cooling - Plants have evaporative cooling effects. A matrix of green corridors, smaller open spaces, street trees, and green roofs and walls can dramatically reduced the Urban Heat Island Effect.

Shading – Measures such as planting, shading and advanced glazing systems should be used to reduce solar heat gain. Large, shade providing trees provide cool, shady areas during summer.

Water cooling - Innovative use can be made of water for cooling, including the use of ground or surface water.

Thermal storage - Heavier masonry construction has the capacity to store heat using its thermal storage or mass and release it slowly. It can be used, particularly where it is exposed, can be used to absorb heat during hot periods so that it can dissipate in cooler periods, usually using ventilation. Ground coupled systems can also be used to make use of thermal storage in the ground.

Cool surfaces – 'Cool' pavement materials on roadways or large parking areas can increase surface reflectivity (though it is important to avoid glare problems) or increase rainfall permeability to encourage the cooling effect of evaporation. Porous cool pavements offer the additional benefit of rainwater infiltration at times of heavy rain. Networks of 'cool roofs' made of light coloured materials can reduce solar heat gain and the need for mechanical cooling.

4.4 Living Roofs

Living roofs (green or brown) should be incorporated where feasible. Living roofs can take various forms including vegetated roofs, roof terraces and roof gardens and can have many benefits, including the following:

- act as insulation, reducing the energy needs of a development and providing noise insulation
- keep local areas cooler (reducing the ”heat-island effect”)
- absorb rainfall and reduce run-off
- improve biodiversity
- improve air quality
- improve amenity for occupiers
- improve the appearance of a development.

There are three main types:

- **Sedum mats**
  a base layer sprinkled with sedum cuttings and installed as a sedum blanket when plants are mature. Sedums are used because they are wind, frost and drought resistant but have less biodiversity benefits.
- **Substrate based**
  crushed recycled brick is used as the base with sedum added on top.
- **Green/brown roofs**
  recycled aggregate used as the base and the roof is either left to colonise naturally or can be seeded with wild flowers or local plants.

FACT BOX: Green Roofs

There are three main kinds of green roofs:

INTENSIVE-

A deep growing medium is used to allow more substantial planting such as trees and shrubs. The roof will require extra loading requirements within the building structure and a complex irrigation system. Intensive roofs are principally designed to provide amenity and recreational use usually in the form of roof gardens or terraces.

SEMI INTENSIVE -

A semi-intensive green roof system is characterised by small herbaceous plants, ground covers, grasses and small shrubs, requiring moderate maintenance and occasional irrigation. A typical growing medium depth for a semi-intensive green roof is 150-300 mm. This system is able to retain more stormwater than an extensive system and provides the potential to host a richer ecology. Though higher in maintenance, this green roof system also provides the potential for a formal garden effect.

EXTENSIVE -

Uses a shallow growing medium, requires minimal maintenance and is generally less expensive to install than an intensive roof, but will not be publicly accessible or contribute to amenity or recreation.

Green roof structure

Green roofs should incorporate a number of layers, as shown below:

- Substrate -
  provides a low weight growing medium (e.g. soil or compost mixed with polystyrene chips or crushed brick) - minimum 110 mm deep on an extensive green roof, 300 mm deep on an intensive green roof
- Filter membrane -
  prevents soil being washed into the drainage layer
- Drainage element -
  holds some rainwater, while allowing the excess to drain away, preventing water logging
- Moisture mat -
  retains water and helps prevent the roof drying out; also protects the waterproofing layer
- Root barrier and waterproofing -
  protects the roof from water or root damage.

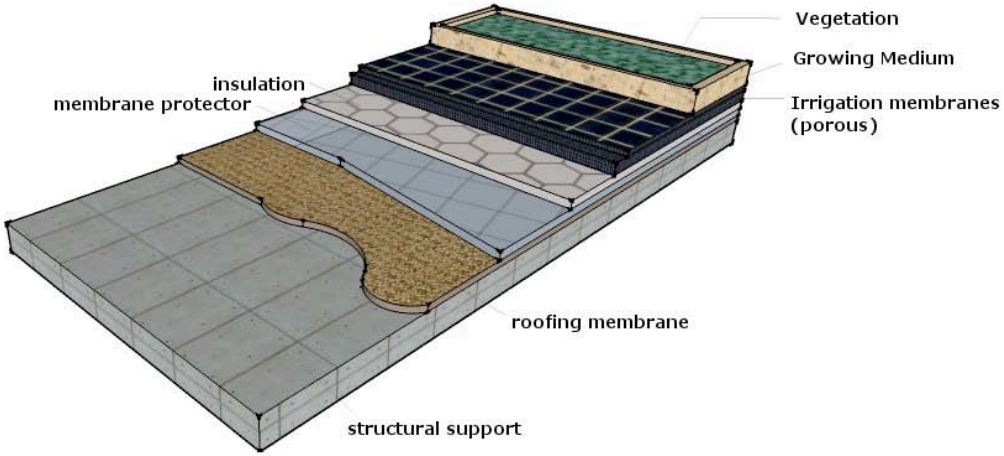


Figure 7: Typical green roofing system

4.5 Brown Roofs

When a building is built on a brownfield site, soil and rubble can be set to one side and used as the brown roof substrate. This soil and rubble should be able to provide a rooftop habitat for the flora and fauna that inhabited the site before the construction of the building.

Brown roofs can also be described as 'biodiverse roofs.' The type of vegetation and features on the roof can be tailored specifically to the area or to a particular species of plant or animal if required. This is particularly important in inner city areas and redeveloping areas where habitats are lost.

Having a habitat on a roof means that any particularly vulnerable species are protected from animal or human interference on the ground. Brown roofs can also be used to introduce areas of vegetation to otherwise barren places, the perfect example being the inner city.

It is beneficial to use a variety of different local substrates (e.g. gravel in one area, topsoil in another area, crushed concrete in another area). This effectively provides a number of different environments on the rooftop, each favouring different species. This should create habitats for a wider range of species on the rooftop, thus maximising biodiversity.

4.6 Green Walls

Green walls provide a living, self-regenerating cladding system using plants either planted into the structure of the wall itself or upon a structure attached to the wall. Green walls will not work in all locations and require extremely careful design. Specialist advice should be sought to avoid failure of the system.

Green roofs and walls may or may not be appropriate in certain settings, particularly in relation to heritage assets such as Conservation Areas.

4.7 Other Impacts of Climate Change

Ground Conditions - Ground conditions and land stability are affected by temperature and precipitation. As a result, climate change may have significant impacts on ground conditions in some areas. During longer, hotter summers shrinkable clay soils are likely to dry out, making buildings and service pipes vulnerable to cracking. Wetter winters will contribute to risks of 'heave' where ground swells. The risk of subsidence and heave is strongly dependent on local soil type with the most susceptible land found in the South East of England, including in Haringey.

Vegetation management - Careful choice and placement of trees should avoid building subsidence in shrink-swell soils. Vegetative cover can also be used to provide additional external surface protection.

Surface erosion control structures - Stronger retaining walls and fences with good drainage or use of vegetation can prevent surface erosion.

Sustainable Drainage Systems – Use of SuDS techniques, such as permeable paving or swales, which increase infiltration into the ground, can reduce subsidence caused by drying out of soils - see above.

Foundation design - Foundations should be designed to be strong enough and extend downward below the zone that may be affected by seasonal variations in moisture content. Other measures include underpinning with concrete supports that extend under existing foundations into more stable soils and infilling of foundations.

4

Changing Climate

4.8 Impact of Climate Change on Building Materials

Climate change will increase the importance of optimising thermal mass to maintain a comfortable internal environment with minimum energy use. The characteristics of materials may also alter with changes in temperature and humidity. Developers should ensure the materials specified will perform adequately in the climate throughout the lifetime of the development; and that the construction methods to be used are suitable for the weather conditions at the time of construction.

Some potential adverse effects are listed below:

- Concrete: strength affected by curing at higher temperatures
- Lime mortar, stone: affected by increased CO_2 and driving rain
- Plastics: affected by increased UV
- Bricks: strength affected by change in moisture content
- MDF/Chipboard: not to be used where flooding is expected
- Roofing felt: increased UV is likely to accelerate degradation

4.9 Growing Food

There is considerable scope for growing food inside London on existing plots or more unconventional sites. In addition to plots with good quality soil, other options such as raised beds can also be considered. Entirely soil-less options include hydroponics or even beehives.

In order to provide more land for growing food in London, new developments should include suitable plots where possible. Food growing areas could be integrated in the overall soft landscape strategy of the site or be allocated as flexible space depending on local demand. In housing developments, allotments and community gardens are most suitable. Green roofs can also provide “urban farmland”, if structurally suitable, and accommodate both growing beds and greenhouses.

Allotments

Haringey has 26 allotment sites with over 1600 plots at present. Many sites already have waiting lists and with predicted future growth, there will be extra pressure on these sites.

Living under one sun community allotment - Haringey

Food from the sky project - Haringey

In addition, Haringey created 88 new community food growing spaces in the borough in the last two years as part of the Capital Growth campaign.

The distribution of the allotments and food growing spaces range from relatively small areas of disused land, to school grounds and social housing sites to multi-plot large scale allotments. More information about food growing spaces in Haringey and the capital growth initiative can be found at http://www.capitalgrowth.org/

Fact Box:

Living Under One Sun (LUOS) Community Allotment

Situated on the eastern borders of Haringey, LUOS is one of the leading community food growing spaces in the borough. This local community hub is a recognised area of community development for residents from all walks of life. This multi-award winning site has been acknowledged across the country for its approach to local engagement and empowerment through food growing. Previously a derelict plot on the Lee Valley owned allotment site it has been transformed in a relatively short time making use of reclaimed materials (including an old theatre set converted into a green house), the hard work of volunteers and through the creative use of support from local and national businesses. In addition to a vast range of traditional food growing beds the site comprises of a large greenhouse and teaching space, herbal medicine beds, botanical teaching spaces, a mini-orchard and apiary. More information can be found at:

http://livingunder1sun.blogspot.co.uk/

5 Flood Risk

5.1 Areas of Flood Risk

Changing climate is likely to result in an increased risk of flooding in certain parts of the borough. Sources of flood risk in Haringey include:

- River (Fluvial) Flooding - from heightened levels of water in major watercourses into recognised floodplains
- Surface Water (Pluvial) Flooding - from intense rainfall overwhelming local drainage
- Groundwater Flooding - where water levels in the soil or underlying geology rise to the surface or to otherwise change hydrology
- Sewer Flooding - from drainage discharges, damage to sewers or surface water overwhelming existing sewers causing the foul water in them to flood.

River Flooding -

The areas which are currently regarded to be at greatest risk are shown in Figure 8: Haringey Fluvial Flood Risk Map overleaf, as Zones 2 (medium risk) and 3 (high risk). These boundaries are subject to periodic review by the Environment Agency.

A Strategic Flood Risk Assessment has been prepared for Haringey, which explains the level and type of fluvial flood risk in different parts of the borough.

Surface Water Flooding -

In principle, all areas of the borough are considered to be at risk, especially as climate change is expected to increase the intensity of rain storms with greater quantities of rain predicted to fall more frequently in a shorter time. The existing local surface water drainage system was not designed to cope with such flows.

(Haringey is developing plans for improvement in critical drainage areas. Details will be in the emerging Surface Water Management Plan).

Groundwater Flooding -

The level of the water table changes with the seasons due to variables in rainfall and water abstraction. The disturbance of groundwater and small surface and subterranean watercourses from development, particularly large basements, can cause or threaten groundwater flooding.

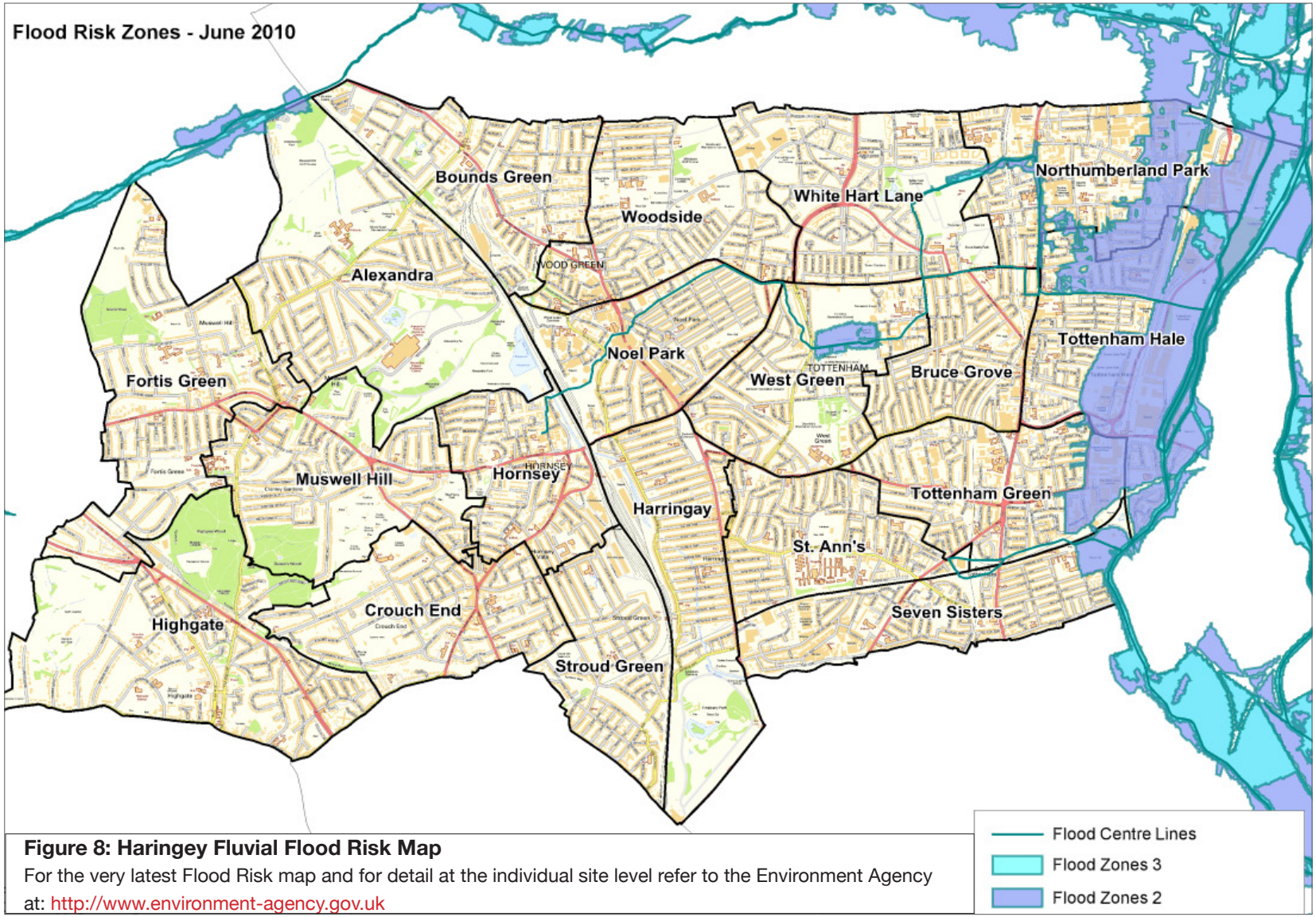


Figure 8: Haringey Fluvial Flood Risk Map

For the very latest Flood Risk map and for detail at the individual site level refer to the Environment Agency at: http://www.environment-agency.gov.uk

5 Flood Risk

Basement Development -

Basement development may affect groundwater flows. The displaced water will find a new course around the area of obstruction, which may have other consequences for nearby buildings, trees, etc. Emerging evidence shows that even where there are a number of consecutively constructed basement developments, the groundwater flows will find a new path.

Given the nature of the ground in many higher parts of the borough, basement development may have the potential to cause harm through the diversion of ground water. The Council will therefore require a Basement Impact Assessment Report to be submitted with proposals where relevant.

See Haringey Guidance Note on Basement Development
http://www.minutes.haringey.gov.uk

Sewer Flooding -

New developments are required to have their drainage installations approved by Building Control and by the statutory Service provider, which is usually Thames Water. The Haringey Surface Water Management Plan (SWMP) shows that the majority of incidents of sewer flooding are located in the south of the borough. Any proposed development located within the postcodes described in the Surface Water Management Plan should be able to demonstrate that any excess surface water, resulting from the increase in hard surface areas, is managed with the use of Sustainable Drainage Systems (SuDS) in order to reduce the amount of surface water entering the sewer system.

5.2 Flood Risk Assessments

Flood Risk Assessments are required for development proposals for all sites in Flood Risk Zones 2 and 3, and for sites for 1 hectare and over in Flood Zone 1. The Flood Risk Assessment is to relate to fluvial flood risk and surface water run-off, and address how this will be managed and the run-off rate reduced.

Site specific Flood Risk Assessments (FRA) carried out by the developer should identify the functional floodplain on a site. All applicants for schemes requiring a FRA should contact Haringey Planning Service first to discuss the scheme. The Environment Agency has on-line information, which enables applicants to check if development requires a Flood Risk Assessment at: http://www.environment-agency.gov.uk/research/planning/82584.aspx

Applicants should demonstrate through a site specific Flood Risk Assessment (FRA), whether the proposed development will:

- Increase the risk of current or future flooding
- Add to flood risk elsewhere
- Include mitigating measures to address the affects identified
- Provide evidence within the application so that the Sequential Test can be applied in order to assess whether the development will be safe
- Ensure that the development is safe and where possible reduce flood risk
- Where applicable, provide evidence within the application in order to assess the Exception Test.

Sequential Test aims to steer all developments towards areas of lowest risk. Where new development is considered necessary in flood-risk areas it must be made safe, without increasing flood risk elsewhere and, where possible, reducing flood risk overall in accordance with the requirements of the 'exception test' set out in the national planning guidance.

The Environment Agency is likely to comment on cases where it considers the FRA does not or cannot adequately address the flood risk issues. The Council will assess applications on their merits but will give considerable weight to the Agency's views. For development within Zone 3 of the floodplain, buildings on stilts and those with storage void beneath will generally be opposed. The Council requires, where appropriate, proposals for flood protection and attenuation to take into account their ecological impact and, where possible, to make use of natural materials that contribute to wildlife habitat and amenity.

Fact Box:
Flood Resilient and Flood Resistant Design

Flood resistant design, or 'dry proofing', is used to help prevent flood water entering a building. For example using flood barriers across doorways and airbricks, or raising floor levels.

Flood resilient design, or 'wet proofing', accepts that flood water will enter the building and allows for this situation through careful internal design for example raising electrical sockets and fitting tiled floors. The finishes and services are such that the building can quickly be returned to use after the flood.

5.3 Sustainable Drainage Systems (SuDS)

Surface water run-off should be controlled as near to its source as possible through a sustainable drainage approach to surface water management (SuDS). Sustainable Drainage Systems manage surface water drainage in ways that mimic the natural environment. SuDS help reduce and slow down the amount of surface water leaving a site.

SuDS involve a range of techniques including soakaways, infiltration trenches, permeable pavements, grassed swales, ponds and wetlands. Opening up culverts and recreating river corridors, with natural meandering rivers with soft, vegetated banks, can also reduce fluvial flooding. SUDS offer significant advantages over conventional piped drainage systems in reducing flood risk by attenuating the rate and quantity of surface water run-off from a site, promoting groundwater recharge, and improving water quality and amenity.

The SuDS technique suitable for a site will depend on its location, size, density of development, type of soil, depth of groundwater and presence of contamination. SuDS are normally most cost effective and their design most appropriate when the system is designed to work with the natural drainage pattern of the site. For instance, it is preferable to locate swales and ponds in natural depressions and existing ditches.

5 Flood Risk

In all cases, it must be established that these options are feasible, can be adopted and properly maintained and would not lead to any other environmental problems. For example, using soakaways or other infiltration methods on contaminated land carries groundwater pollution risks and may not work in areas with a high water table. Where the intention is to dispose to soakaway, these can be shown to work through an appropriate assessment carried out under BRE Digest 365. National Standards for SuDS are currently under development and will be applied once these are adopted. Until that time the guidance contained in this document should be followed.

Other measures that help reduce surface water run- off include the following:

Green space - green open space, verges and green roofs can be designed to filter and store rainwater, reducing pressure on drainage systems during heavy rainfall. Trees also reduce surface water runoff – research has suggested a 5% increase in tree cover can reduce runoff by as much as 2%. Green space as a flood risk reduction strategy can complement other reasons for green space such as design, landscape, amenity, wildlife and heritage.

Rainwater harvesting - rainwater can be collected from roofs for reuse in flushing toilets or watering plants and landscaped areas. Rainwater collected in permeable paving can also be reused in these ways.

Green roofs - planted 'green' roofs can attenuate up to 60% of runoff, depending on their type and depth, as well as providing a range of wider benefits. (**See sections 4.4-4.5)**

Permeable paving - rainwater filters through permeable paving where it may soak directly into the ground or be stored in an underground chamber.

Wherever possible, water from source control mechanisms should be fed into wider site control systems. Where this is not possible because of space constraints, runoff from the site (for example from the green roof or permeable paving) should be fed at a controlled rate into the conventional drainage course.

A combination of techniques such as those listed above might be most effective. This combination should provide a water quality and biodiversity benefit as well as reducing the amount and rate of run-off leaving a site. The Drainage Hierarchy order of preference should be followed.

Drainage Design Considerations

No flooding of property or off-site flows should occur as a result of a one in 100 year storm event (including an appropriate allowance for climate change). In principle, a well designed surface water drainage system should ensure that there is little or no residual risk of property flooding occurring during events well in excess of the return-period for which the sewer system itself is designed.

The design of drainage needs to be able to cope with the heaviest of storms expected over the buildings lifetime. Drainage techniques relying on water soaking into the soil underneath a site (known as infiltration systems) will NOT be effective in parts of the borough with clay soils as they become waterlogged easily. The use of soakaways or other infiltration methods on contaminated land carries groundwater pollution risks and may not work in areas with a high water table.

Discharges into the River Lee navigation require the agreement of Canal & Rivers Trust because they own and operate the navigation. Construction works (e.g. an outfall structure) to enable discharges of surface water into the River Lee Navigation will require Flood Defence Consent from the Environment Agency to ensure that works do not increase flood risk and are designed appropriately. Discharges of substances, other then clean water, to watercourses or into the ground via infiltration will require a permit from the Environment Agency.

Fact Box: Drainage Hierarchy

The London Plan sets out the following Drainage Hierarchy, which should be followed:

1. Store rainwater for later use
2. Use infiltration techniques, such as porous surfaces in non-clay areas
3. Attenuate rainwater in ponds or open water features for gradual release
4. Attenuate rainwater by storing in tanks or sealed water features for gradual release
5. Discharge rainwater direct to a watercourse
6. Discharge rainwater to a surface water sewer/drain
7. Discharge rainwater to the combined sewer.

5.4 Making Buildings Safe

Development in flood risk areas (after application of the Sequential and Exception tests) will need to be made safe from flooding through the following measures:

Site layout - locating the most vulnerable uses in lower risk parts of the site and ensuring buildings do not block key flood routes

Design of building - such as raising floor levels of buildings or locating vulnerable uses on upper levels. It is preferable that less vulnerable uses (such as shops, offices and leisure facilities) are located at ground floor level. In general, basements should be avoided or used for storage, servicing or parking purposes only. At the very least, sleeping areas should not be located below the predicted 1 in 100 year flood level (with an allowance for climate change). Safe access and egress, safe refuge and evacuation should also be accommodated. Buildings also need to be designed and built to remain structurally sound and be easily repairable in the event of a flood through the appropriate application of flood resilience and resistance measures.

Flood Defences / Walls - need to be maintained to prevent their deterioration. It is the responsibility of the Riparian Owner to keep flood defences in a good condition and upgrade them where necessary.

6 Water

6.1 Reduce the need for water

In the first instance, developments should minimise the need for water. The simplest way of doing this is through installing efficient water fittings and plumbing.

Such measures include:

- dual flush toilets
- low flow shower heads
- tap and shower head aerators
- water efficient dishwashers
- low water consuming washing machines
- leak detection systems
- drought resistant landscape
- good (i.e. efficient) plumbing design, which minimises pipe lengths saving both wasted water and wasted energy heating hot water.

The use of durable plumbing is also important to prevent leakages. Individual dwellings and tenancies should be provided with water meters, which can be supplied by water companies free of charge. Meters should be visible to occupants, as this has been shown to result in reductions in water use.

6.2 Supply Water Efficiently

In new and existing homes, it is generally more economic to reduce water use by fitting more water efficient appliances and educating users in 'waterwise' behaviour before considering the use of either rainwater (except a garden water butt) or greywater. After maximising efficiency, however, maximising use of greywater for relevant appliances and uses is strongly encouraged.

At least 50% of water consumed in homes and workplaces does not need to be of drinkable quality (e.g. water used for toilets, laundry, parks and gardens). Rainwater should be collected or grey water reused to supply these uses where appropriate.

Rainwater – water collected from the external surfaces of buildings or hard-standing areas by diverting the flow to a storage tank. Where gardens or landscape schemes need a lot of watering, simple, low cost rainwater diversion systems can save considerable quantities of water. Similarly, water butts and rain water collection tanks are able to capture rain for reuse.

Greywater – water originating from the mains water supply that has been used for bathing (showers or baths) and in hand basins is usually clean enough for flushing the WC, following the relevant treatment. Grey water systems are often only feasible on large schemes as they require a dual plumbing system to be installed.

Boreholes - it may also be possible to draw water locally from boreholes, or connect to existing local water supply systems that source water from boreholes. Generally, sites over chalk soils will be suitable for boreholes. **Applicants should contact Thames Water**

For new large scale developments, using an alternative source of water for some applications that do not require drinking quality water may be a feasible option, providing it is taken into account at the planning or construction stage. It is important that occupants understand how to use the water supply systems in a building.

Water

6

6.3 Water Consumption

New housing schemes should be designed to ensure that no more than 105 litres of water is consumed per person per day. This is equivalent to Code for Sustainable Homes level 4 standard.

6.4 Protecting Water Sources

Polluted water can cause damage to wildlife and river habitats and affect human health. Surface water run-off from the urban environment washes chemicals, sediment and litter into waterways. Pollution can also be caused by:

- contaminated soil and landfill sites
- the misconnection of household sewage to rain water drainage.
- chemical spills from industrial or construction sites.

Much of the London Borough of Haringey is underlain by London Clay. Beneath the London Clay is the Chalk Aquifer which is the major aquifer of the London Basin, drained by the River Thames. As the chalk aquifer is overlain by impermeable clay, there is a low risk of it being contaminated by surface water or groundwater. The only exception is the potential for piling or building foundations or boreholes (including Ground Source Heating) to penetrate the London Clay thus increasing the risk to groundwater.

The groundwater vulnerability maps by the Environment Agency show source protection zones protecting two drinking water extraction sites in Haringey. This is in order to maintain the quality of this water source in line with Environment Agency: Ground Water Protection Policy and Practice, (GP3). Development proposals are not likely to be acceptable where there is an unacceptable risk of pollution of groundwater within Source Protection Zones 1 and 2, as defined by the Environment Agency.
http://www.environment-agency.gov.uk

Watercourses should be protected from pollution sources, and development should aim to improve the status and condition of watercourses by de-culverting, naturalising, and cleaning.

7 Pollution

7.1 Air Quality

Haringey is designated an Air Quality Management Area for the pollutants of nitrogen dioxide and respirable particulates. Any major development will require an Air Quality Assessment (AQA) to be submitted with the planning application. Developments should have regard to these pollutants at the initial design stage.

Any mitigation measures should be incorporated into the design prior to submission. Figure 9 shows the main areas of air pollution concern. A comparison of emissions of the site both before and after development may also be required to inform the decision making process.

Haringey air quality monitoring station

Further guidance on AQAs an be found on the Haringey website;
http://www.haringey.gov.uk/index/business/licensing_regulations/environment_and_waste/pollution/airquality.htm

Biomass -

Whilst biomass boilers are an effective method of providing the renewable energy requirement for development, the emissions from biomass boilers can have an impact on air quality.

New development proposals, which require planning permission and include biomass boilers, must undertake an emissions assessment to be submitted with the planning application. The emissions assessment must demonstrate NOX and PM10 emissions achievable under normal operating conditions are capable of meeting set emission standards as appropriate and determined by the Mayor. An annual certificate will be required as evidence of meeting these emission limits.

Consideration should also be given to the following:

- that the biomass meets national legislative requirements under the Clean Air Act. The whole of the borough of Haringey is designated a Smoke Control Area under the Clean Air Act 1993.
- that the biomass may require regulation by either the Environment Agency (EA) or the Local Authority (LA). Regulation is dependant on the size of the biomass; > 3MW inc. aggregated will require regulation by the EA, between 0.4 and 3MW is regulated by the LA. Developers must be aware that there are annual fees and charges applicable and that the permit will contain conditions that must be adhered to at all times. Biomass <0.4MW do not require regulatory controls.
- a chimney height calculation will be required with the planning application.

FACT BOX:
Requirements for Air Quality Assessment

An AQA will be required:

- If the development is likely to cause significant impact to local air quality (i.e. once completed it will increase pollutant concentrations)
- If the development is located in an area of poor air quality (i.e. it will expose future occupiers to unacceptable pollutant concentrations/new exposure)
- If the demolition/construction phase will have a significant impact on the local environment (e.g. through fugitive dust and exhaust emissions).
- If the development prevents implementation of measures in the Air Quality Action Plan

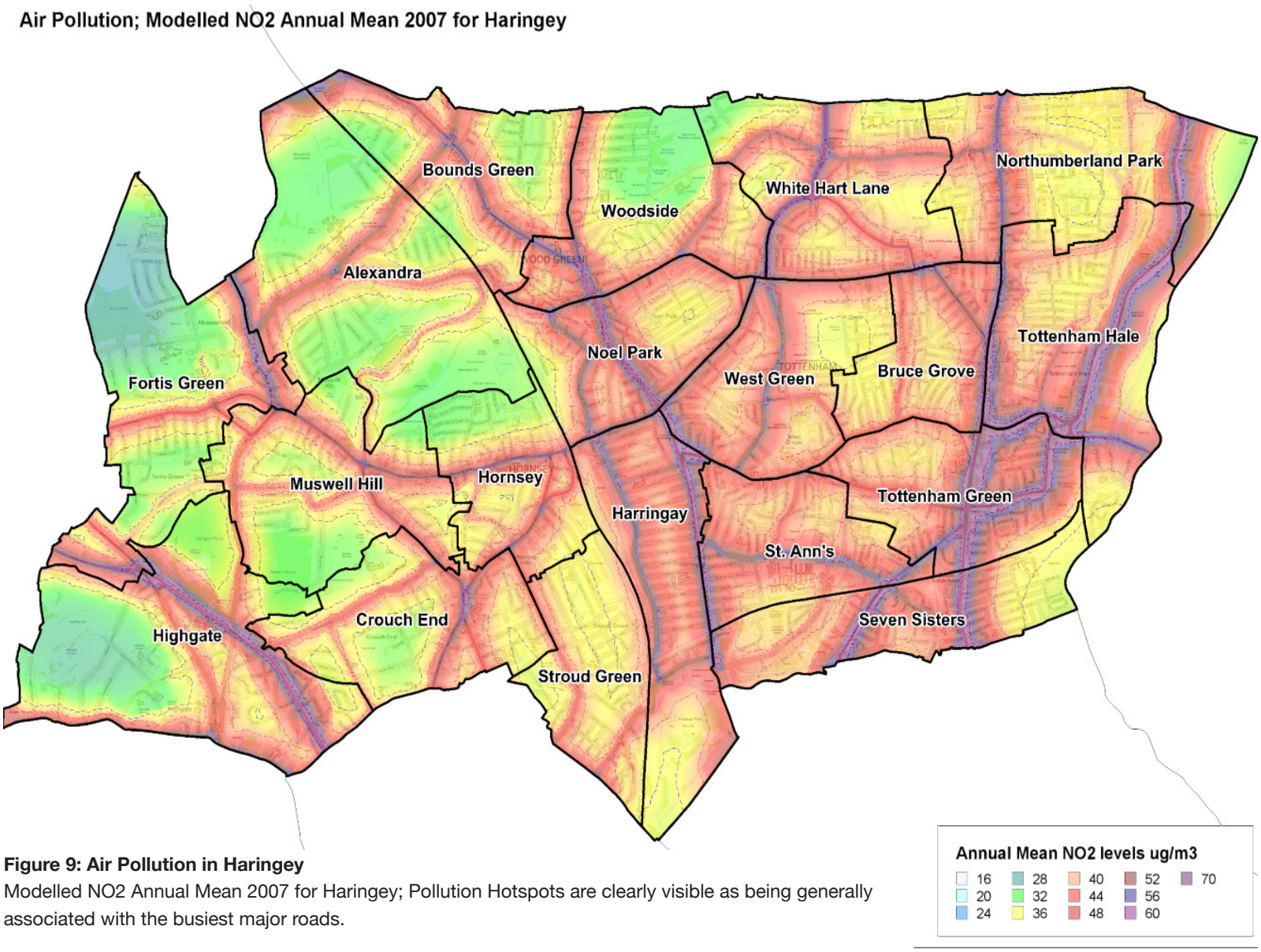


Figure 9: Air Pollution in Haringey
Modelled NO2 Annual Mean 2007 for Haringey; Pollution Hotspots are clearly visible as being generally associated with the busiest major roads.

7 Pollution

7.2 Noise

In Haringey, noise can be a planning issue arising from a variety of different sources, in particular major roads and railways. A noise assessment will need to be submitted with a planning application if the proposed development is either a noise-sensitive development or an activity with the potential to generate noise. Developments adjacent to railways will also require a vibration assessment.

Mechanical systems - Mechanical systems should only be used as a complement to natural ventilation to ensure a constant standard of indoor air quality. Systems should not create a noise nuisance and should be efficient, where possible including technology to recover heat energy for other uses. Where mechanical systems are used, careful consideration will need to be given to ensure air intakes are positioned appropriately. Mechanical ventilation should be designed to ensure no noise nuisance is caused to occupiers of other properties and that noise disturbance does not affect the property in which ventilation is situated.

Any mitigation measures should be incorporated into the design prior to the submission of an application. A planning application which requires a noise assessment but does not include one will result in either a refusal of planning permission or a delay in the decision making process.

FACT BOX:
Noise Standards

The following noise standards should be used:

- British Standard 4142:1997 - "Method for rating industrial noise affecting mixed residential and industrial areas"
- Approved document E of the Building Regulations - "Acoustic Design of Schools"
- "Sound Control for Homes", (Building Research Association and Construction Industry Research Association) 1993
- British Standard 8233:1999 "Sound insulation and noise reduction for buildings – Code of practice"
- British Standard 6472:1992 "Guide to evaluation of human exposure to vibration in buildings (1Hz to 80 Hz)"

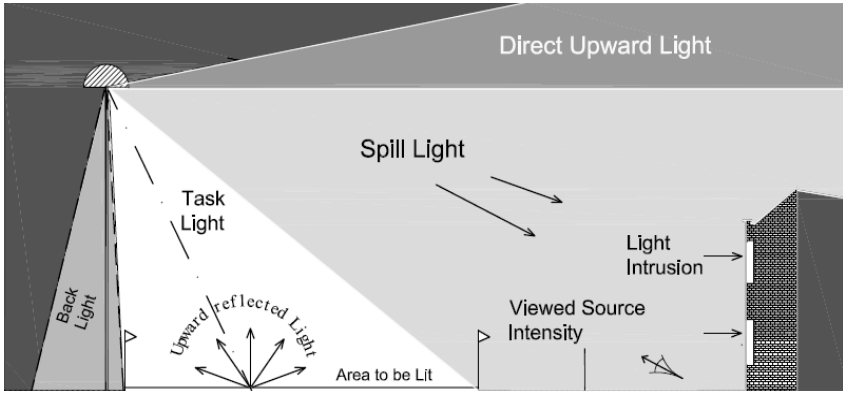
7.3 Light Pollution

Poorly designed or directed lighting of streets and public spaces, external areas of buildings, and flood lighting of outdoor sports facilities can cause light pollution. Lighting left on unnecessarily can also lead to light pollution with dense urban areas experiencing higher levels of artificial lighting.

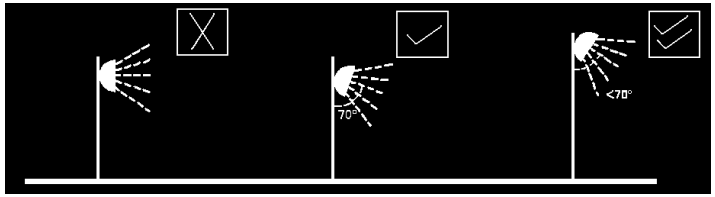
Apart from energy wastage, which can contribute to climate change and high running costs, light pollution can also impact on people's quality of life, causing stress and disrupting sleep. It can also be damaging to wildlife. Poorly aimed lights can result in unnecessary light spillage. Lighting should be designed so that it is directed to where it is needed and does not spill into neighbouring residential properties, watercourses or affect wildlife. Light spill on natural habitats and watercourses can affect the diurnal rhythms of wildlife.

Light pollution is caused by obtrusive light penetrating into facing rooms or impeding the views of the night sky, causing glare or light spillage. Light pollution is a material planning consideration and a light assessment will be needed where lighting is proposed.

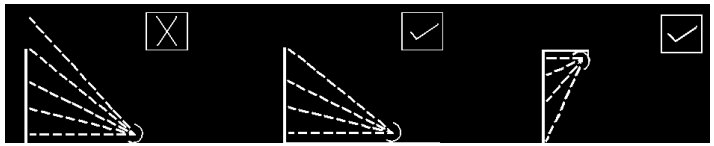
As a general guide, applicants are encouraged to submit details of lighting schemes, including light scatter diagrams, as part of the planning application to demonstrate that the proposed scheme is appropriate for its purpose in its particular setting. The assessment should demonstrate that the potential for light pollution from glare and spillage to neighbouring properties, roads and countryside has been minimised.



Types of obtrusive light



Luminare aiming angles



Façade Illumination

Images from the Institute of Lighting Professionals Guidance Notes for the Reduction of Obtrusive Light (GN01:2011), which should be referenced for further information
https://www.theilp.org.uk/documents/obtrusive-light/

Figure 10: Ways to minimise light pollution

7 Pollution

7.4 Contaminated Land

The development phase is the most cost effective time in which to address problems associated with past soil contamination. Sufficient information on the level and risks posed by contamination and whether it can be remediated to a safe level need to be known before a development can proceed.

Many areas of the borough have been in industrial use at some point. Harmful chemicals used in industrial activities can become absorbed by land in, on or under a site. Contamination can be harmful to people's health, wildlife, groundwater and waterways.

Where contamination is present, the site will need to be remediated to a level that is appropriate for the use being proposed. The most sensitive uses are housing, schools, nurseries, hospitals; children's play areas and allotments.

Haringey Council will deal with proposed development sites that may be contaminated by use of a Planning Condition. This condition will provide information of the steps that must to be taken prior to any development being carried out. It must be ensured that the site is 'fit for purpose' and does not present risk of significant harm to people, the environment, including controlled water, or structures (local receptors).

7.5 Considerate Construction

Construction sites should be carefully managed and maintained to prevent sediment and chemicals washing into waterways or drains which empty into waterways, and also to control dust and noise emissions and vibrations causing nuisance to surrounding properties. The type of machinery used, hours that construction occurs and the times that deliveries are made should be carefully managed so as to reduce impact.

Planning conditions will be used to control impacts from the construction of new development. This may include restrictions on hours of operation and construction.

FACT BOX: Graffiti

When designing a scheme it is important to identify surfaces at risk from graffiti and ensure that they are protected with a coating from which the graffiti can be easily and, if necessary, repeatedly removed. Even painted surfaces which need protection, such as a mural, can be treated with a permanent anti-graffiti coating.

Non-coated surfaces may require chemicals to remove the graffiti with the risk that inappropriate chemicals can cause the dyes to seep deeper into porous materials such as brickwork.

Further information can be obtained from the Anti-Graffiti Association.

Waste

8

8.1 Waste Management

The Council has strategies in place which seek to deliver more sustainable waste management, namely encouraging waste reduction, maximising reuse and recycling, and treating remaining waste as a resource, in line with the waste hierarchy (see section 8.2).

A key part of the delivery of such strategies is the provision of collection services to households. The Council currently provides comprehensive services for the collection of dry recyclables (i.e. paper,cardboard, plastic, glass, cans etc.) organic waste (food and garden waste) and reusable items such as furniture. Businesses can choose their provider for waste and recycling collections. The Council provides a service for businesses to collect commercial residual waste (refuse) and dry recycling.

In planning for any development, consideration should be given to how storage and collection of household and commercial waste and recyclable material can best be incorporated. Household waste collections for low-rise properties are fortnightly for residual waste and weekly for recycling. For blocks and high rise properties collections are generally weekly or for very large development twice per week. Commercial waste collection is dependent on waste type and storage capacity so can range from daily for food waste to weekly for dry waste.

All waste storage areas, internal and external, must be easily accessible to both collectors and occupants. Enough space should be provided on-site to securely and safely store all waste and recycling containers.

Space should also be provided inside buildings where occupants can separate out waste into separate containers for recyclables, organic waste and non-recyclables. For mixed development the storage areas for household waste and commercial waste must be distinct and separate to avoid misuse of household waste facilities by businesses.

If waste collection vehicles are required to leave the public highway to make collections then it must be possible to enter sites and leave in forward gear. Safe turning facilities such as hammerheads must be provided within the confines of the site. Where waste collections are required to be made on the public highway, consideration must be given to how this can be done safely, this is particularly important on main roads with high volumes of fast-moving traffic. For advice about on site turning facilities and making arrangements for safe waste collection on main roads please consult with the Neighbourhood Action Team in the Council's Single Frontline Service.

(For current waste storage standards please see Appendix A3)

Home Composting -

Space for on-site composting, such as home composting units, should also be provided. Where it is not possible to treat compost on-site due to site constraints, waste storage areas should be adapted to store organic waste separately from other refuse (as schemes for collection of organic waste from blocks/estates are being introduced to complement existing schemes for low rise properties). Where blocks and estates or groups of cooperating homes wish to set up shared or managed home composting this is encouraged. The Council also encourages linking such schemes with local food production.

8 Waste

8.2 Waste Hierarchy

The Waste Hierarchy sets out an order of priority for reducing the amount of waste that has to be disposed of and ensuring sustainable use of resources:

Prevention

- Avoid the creation of waste in the first place
- Reuse waste that is created as much as possible
- Allow left-over waste to be recycled elsewhere as much as possible, minimising the waste that ends up in landfill
- Consider methods for “other recovery” as defined in the London Plan page (add references).

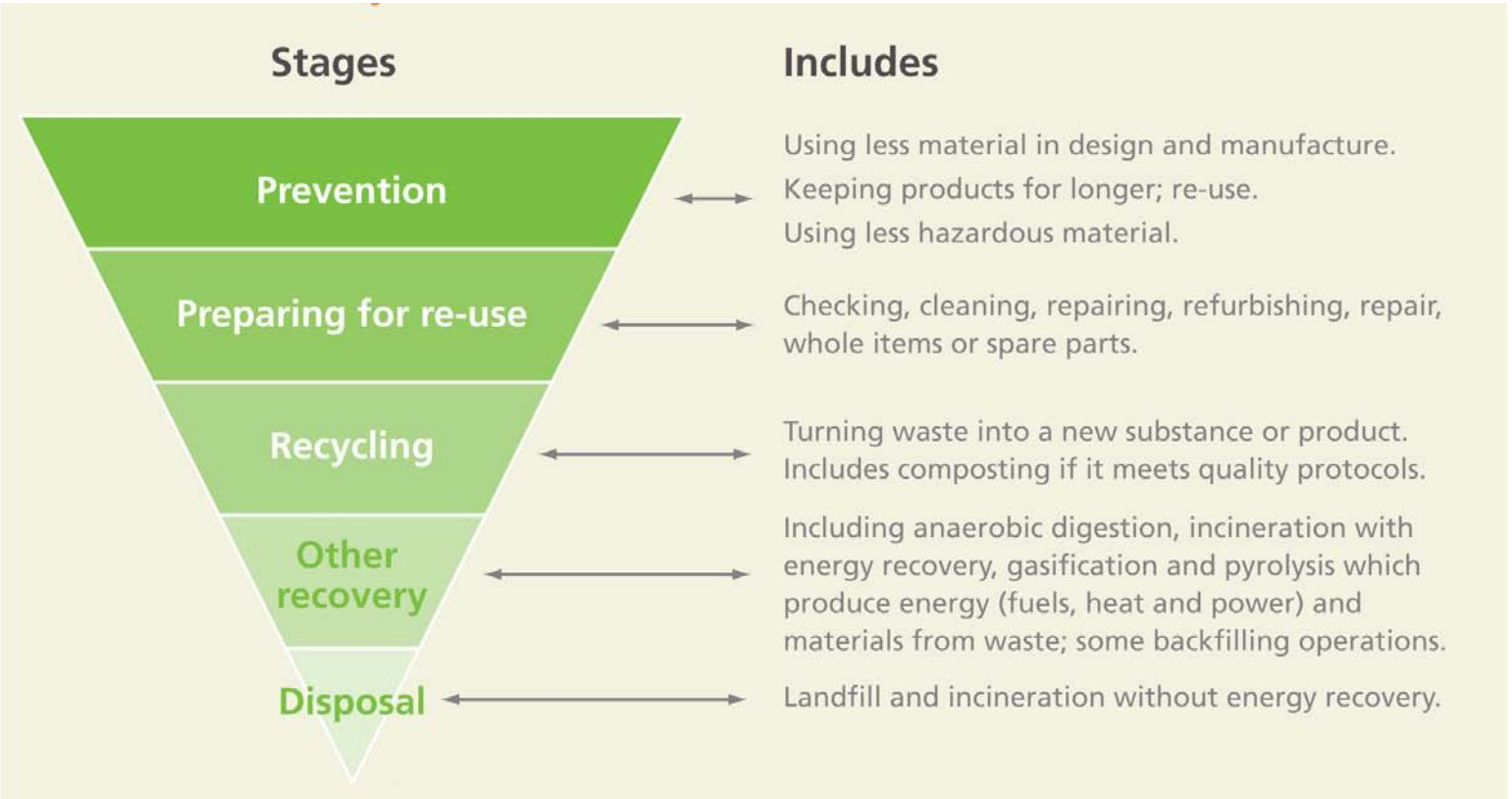


Figure 11: Waste Hierarchy

Reuse

- Recycled and Reused Sources
  Materials in all new developments should be from recycled or reused sources where possible. Reclaimed materials can be recovered from the waste stream and put back into use with minimal or no reprocessing. Examples include bricks, which may require removal of any adhering mortar and inspection for cracks or timber doors, which may only require simple repairs.
- Reuse of Existing Buildings
  Existing buildings are an important resource and should be conserved rather than demolished where feasible. It should be noted that separate building conservation policies require permissions and justifications for demolitions to listed buildings or buildings in conservation areas.
- Reuse of Building Elements
  Where development involves the demolition of existing structures, a Demolition Waste Audit should be undertaken using established methodologies, for example the Demolition Protocol, the BRE SMARTWaste strategy and a Site Waste Management Plan. This should be considered from early in the design process.
- Recycled materials
  Recycled materials are those that have been reprocessed in order to produce a new material or product, either back into their primary material such as aluminium, or as a secondary material. An example of the latter is rubber floor tiling made from motor vehicle tyres.

  Reclaimed and recycled materials can be used in any part of the building process, as well as for external site works such as roads and landscape features. In the case of demolition, the opportunities for reuse of existing building structures for aggregate or lower quality uses such as access roads and footpaths should be maximised.

  If materials from demolished buildings on the site cannot be reused, then they should, as far as possible, be disposed of to a second hand building materials supplier for use elsewhere. Concrete crushing, and the impact of demolition work on neighbours, should be discussed with the Local Authority.
- Transportation of waste
  The impact of removal of site and building waste should also be reduced in the method used for transport; waste should be removed by water or rail wherever possible, or failing that by the use of vehicles or fuels that will limit environmental impacts.

FACT BOX: Waste Audits

ICE Demolition Protocol - The Institute of Civil Engineers (ICE) and Chartered Institute of Waste Management (CIWM) Protocol provides methods to assess and recover demolition material as well as specify recovered (recycled & reclaimed) material in the new build. The detailed documents can be found on the following websites:
http://www.ice.org.uk **http://www.envirocentre.co.uk**

SMARTWaste - a web-based tool developed by BRE to help the construction industry prepare, implement and review site waste management plans (SWMPs) in full compliance with SWMP Regulations.
http://www.smartwaste.co.uk

8 Waste

8.3 Site Waste Management Plans (SWMP)

All major applications will be required to provide a Site Waste Management Plan with any planning application. The form of the plan is at the discretion of the applicant. The content of the plan must include full details of the arrangements for the storage and collection of waste for disposal (residual waste) along with waste to be recycled (recyclate).

The plan must make reference to the following:

- The number, type and size of receptacles to be dedicated to storage of residual waste.
- The number, type and size of receptacles to be dedicated to storage of recyclate.
- The position where both types of receptacles are to be stored between collections.
- The size, design and materials used in construction of any housing built for the storage of both types of receptacle.
- Access arrangements for persons using receptacles showing that consideration has been given to safety, equalities, convenience, user friendliness and maximum walking distances under building regulations.
- Access arrangements for persons collecting residual waste and recyclate giving consideration to Health and Safety at Work Act, recommended maximum pulling distances for receptacles, vehicle access/height/turning requirements and the construction and width of pathways, doors and access ways.
- For mixed use developments, how commercial/ industrial residual waste and recyclate will be stored separately from household residual waste and recyclate so as to avoid abuse of facilities by either user.

Reference should be made to the Site Waste Management Plan Regulations 2008
http://www.legislation.gov.uk/uksi/2008/314/contents/made

8.4 Treatment of contamination on site

Suitable measures to treat contamination to enable development to take place are to be encouraged. More detail is contained in Section 7.4 Contaminated Land. Invasive species such as Japanese Knotweed and Giant Hogwart may also need to be treated and safely disposed of on site, as there is a danger that transporting them off site could spread contamination.

Regulations and guidance for the safe and effective removal, destruction and disposal of matter from invasive species is available from the Environment Agency, such as the “Knotweed Code of Practice: Managing Japanese knotweed on development sites” (2009).

Construction

9

9.1 Building Construction

The type and source of materials in buildings has a major impact on sustainability. The production and use of building materials consumes large quantities of energy and resources and generates waste. The choice of materials used in a building therefore has important implications for the environment; wherever possible they should be selected to minimise negative environment impacts and the consumption of non-renewable resources.

A key concept when thinking about what materials to use is 'life cycle stewardship'. By considering the whole-life cost of materials, waste and carbon emissions resulting from the sourcing and construction of building materials can be greatly reduced. This means that the consequences and impacts of using materials must be considered from the point at which they are mined/harvested, through processing and manufacture, to transportation, installation, use, reuse/recycling and disposal.

Building materials should be long lasting, taking into account what they are being used for and the conditions they will be exposed to (such as frequent traffic, pollution, weather and extremes of temperature) to minimise the materials used in maintenance. Glare is interference with visual perception which can be caused by the reflection of sunlight off a building's facade or a structure's surface due to materials chosen. Care needs to be taken in the choice of materials so that unpleasant glare is minimised.

9.2 Modern Methods of Construction (MMC)

Modern Methods of Construction include a range of processes and technologies which involve prefabrication, off-site assembly and various forms of supply chain specifications.

Off-site construction is a modern method of construction, based on off-site manufacturing of building elements, widely used for housing and in the education sector offering economical, environmental and social advantages.

Off-site construction involves the manufacture and fit-out of building modules within a factory controlled environment, whilst ground works and foundations are prepared on site. The modular units are then delivered to site and craned into position to form the building. This approach automatically compresses the programme and enables the project to be delivered in less than half the time of a traditionally constructed facility. Off-site construction generates less waste compared to site-based building methods. This is as a result of the factory environment which gives greater control of materials and affords greater opportunity to reduce, re-use or recycle waste.

Other methods of construction which should be considered include:

Designing for deconstruction - Enables buildings to be efficiently dismantled at end of life. Salvaged materials can be re-used, recycled or re-manufactured - recovering some of their inherent value.

Designing for flexibility - Enables significant changes to be made to the building during the course of its life. This can help to delay or avoid the building's obsolescence.

9 Construction

9.3 Use of low impact building materials

Building materials should be selected as far as possible on the basis of a sustainable supply, and the least possible energy consumption involved in their manufacture. Such low impact materials include things like earth, straw, cork and hemp. Timber is also a relatively low impact product, but care should be taken that sources of supply are managed in a sustainable way. The growth of trees has the further advantage of locking up atmospheric carbon. Consideration can be given to use of cement or lightweight concrete using waste or by-product materials. High energy input materials include plastic, steel, aluminium, and uPVC.

Minimisation of transport costs for building materials

Materials should be selected, which minimise overall transport costs. This should include all aspects of transport, from the collection of raw material, to delivery to the building site. The transportation of materials to site contributes significantly to carbon emissions. The Council expects that 50% of materials will be locally sourced in order to minimise carbon emissions from transportation.

9.4 Embodied Energy

The Building Research Establishment (BRE) has produced a Green Guide to Specification, which assesses the embodied energy of different materials. Building materials and components are assessed in terms of their environmental impact across their entire life cycle - from 'cradle to grave', within comparable specifications.

The Council expects that at least 3 out of the 5 following elements be specified using materials with an embodied energy rating between A+ and D, where A+ represents the best environmental performance / least environmental impact, and E the worst environmental performance / most environmental impact.

- Roof
- External walls
- Internal walls (including separating walls)
- Upper and ground floors (including separating floors)
- Windows

Green and Brown Roofs

Green and brown roofs contain opportunities for reusing site waste. Rough broken site waste from demolished masonry and concrete structures can be used on a sufficiently strong roof as a "brown roof" suitable for wildlife. (For further information see section 4.4-4.5)

9.6 Responsible Sourcing Certificates

The responsible sourcing of materials provides a holistic approach to managing a product from the point at which a material is mined or harvested in its raw state through manufacture and processing to use, re-use and recycling, until its final disposal as waste.

Timber

Timber is the material most associated with certification of responsible sourcing. The incorporation of timber from sustainable sources is considered best practice. Haringey would anticipate that at least 50% of timber be from Forest Steward Council approved products and that the remainder be sourced from temperate, rather than tropical sources.

When buying timber products, look for the Forestry Stewardship Council (FSC) or Programme for Certification of Forest Management (PEFC) logos or equivalent environmental scheme, together with chain of custody certification, which verify the timber is from a sustainable source.

Softwoods (including Pine and Western Red Cedar) are generally more likely to be from sustainable sources as they are so much faster growing; low priced tropical hardwoods are almost certainly the result of unsustainable clear felling of virgin tropical rainforest. Sourcing timber grown in the UK reduces transport environmental damage but sources of durable softwoods are generally overseas.

FACT BOX:
Materials Specification and Waste Management

Embodied Energy is the sum of all the energy required to produce goods or services, considered as if that energy was incorporated or 'embodied' in the product itself. The BRE Green Guide to Specification can be referenced for further information at **http://www.bre.co.uk/greenguide**

WRAP (Waste and Resources Action Programme) is a not for profit company backed by the Government to help individuals, businesses and local authorities reduce waste, recycle more, make better use of resources and help tackle climate change. WRAP has produced numerous publications and tools to help minimise waste in the construction process, which can accessed on **http://www.wrap.org.uk**

London Remade is a not for profit business that works in partnership to develop and improve waste management, recycling and green procurement in London. Their recycling programmes include a sustainable product directory. Further information can be found on:
http://www.londonremade.com

10 Biodiversity

10.1 Biodiversity Hierarchy

Biodiversity should be considered early in the design process. An understanding of the site and its context will therefore be important in order to identify measures to preserve and enhance biodiversity. The Council will expect the following hierarchy and measures to be incorporated in the design and construction of new developments.

The following issues should be considered before submitting an application:

1. **What is the nature conservation value of the site?**
2. **How will the development impact upon the nature conservation value of the site?**
3. **Will there be a negative impact on nature conservation value?**
4. **What impact will the construction have on nature conservation?**

Avoiding Harm -

- Developers must comply with protected species legislation. A precautionary approach will be taken. Where development could result in harm to protected or priority species, a Scoping Study will be required. This study will identify if protected or priority species are using the site. In many cases this will involve a quick assessment by a trained ecologist
- Site surveys should be undertaken at the appropriate time of year for the species concerned
- The Council will refuse applications that do not provide enough information on protected or priority species
- There should be no harm to the ecological value of any site of importance for nature conservation (SINC) or local nature reserve (LNR).
- Planning obligations will be used to control the impact of development on protected and priority species and their habitat. Monitoring of impacts will be required and the submission of evidence to show that compensation has been implemented successfully
- The expert view from the Council's arboriculturalist will be sought on all developments where the loss of trees is anticipated. The loss of trees should not be seen as an automatic right and there will be instances where the preservation of trees could be a reason for refusing a planning application.

Biodiversity

10

Enhancing Biodiversity -

All development should contribute, where possible, to improving biodiversity in the borough and should increase the number and coverage of plant species on a site. Measures include:

- Artificial habitats, such as swift boxes, bat bricks and stag beetle loggeries, should be integrated into the design of buildings, unless this is demonstrated to not be feasible. This is particularly important where there is limited space for natural habitat
- Green/brown walls or roofs are to be included in the scheme, unless this is not feasible
- Design and Access Statements should explain how the development has been designed to maximise its contribution to nature conservation in the light of site constraints. This should include information on plant species that will be used and how opportunities to link with nearby open spaces have been addressed
- Where specialist habitat areas are proposed, information on how the new habitat will be managed and maintained throughout the lifetime of the development should be provided
- Net gain of biodiversity and access to nature on the development site and a reduction in areas of deficiency in access to nature
- Where developments include or front watercourses, measures to enhance the waterfront / riverbank habitat should be included.

Sites Known to Contain Protected Species -

- Where protected species are known to use a site, or a Scoping Study recommends, a full ecological assessment should be submitted with a planning application. This assessment should explain how negative impacts have been minimised. Where negative impacts are unavoidable, justification should be provided on how these are outweighed by the environmental, social and economic benefits of the scheme.
- Details on what alternative development options have been considered to avoid or reduce negative impacts should be provided, along with an explanation of why the option chosen is the best one.
- Details of proposed compensation will need to be provided, including when the compensation will be provided and how it overcomes the negative impacts. If adequate mitigation and compensation is not in place planning permission will be refused.
- A licence may be required from Natural England where development is to occur on sites where there are protected species.

10 Biodiversity

10.2 Designated Sites

The borough contains several designated sites which should be considered before submitting a planning application, to ensure that the development will not have an adverse impact. The designations include:

- Sites of Importance for Nature Conservation (SINCS)
- Local Nature Reserves
- Ecological Corridors

Further information on the designations can be found in the Local Plan.

10.3 Improving River Corridors

The Council seeks to promote river corridors as an important environmental resource and to proactively manage tributaries of the River Lee to improve access, river ecology and water quality. Measures include:

- conserving existing areas of value within river corridors and, wherever possible, seeking to restore and enhance the natural elements of the river environment, for example by deculverting and/or naturalisation
- supporting initiatives which will result in improvements to water quality
- promoting public access in and to river corridors (including users of public transport and cyclists)
- identifying appropriate locations for water related recreation along river corridors
- setting back developments from the waters edge and looking for opportunities to enhance the environment and biodiversity of the rivers in the borough, by naturalisation
- setting back of flood defences and in channel enhancements such as reed beds and timber fenders
- contributing towards the improvement in the quality and provision of open space along all rivers
- contributing towards the conservation and enhancement of the ecology of all rivers and the floodplain and their environment.

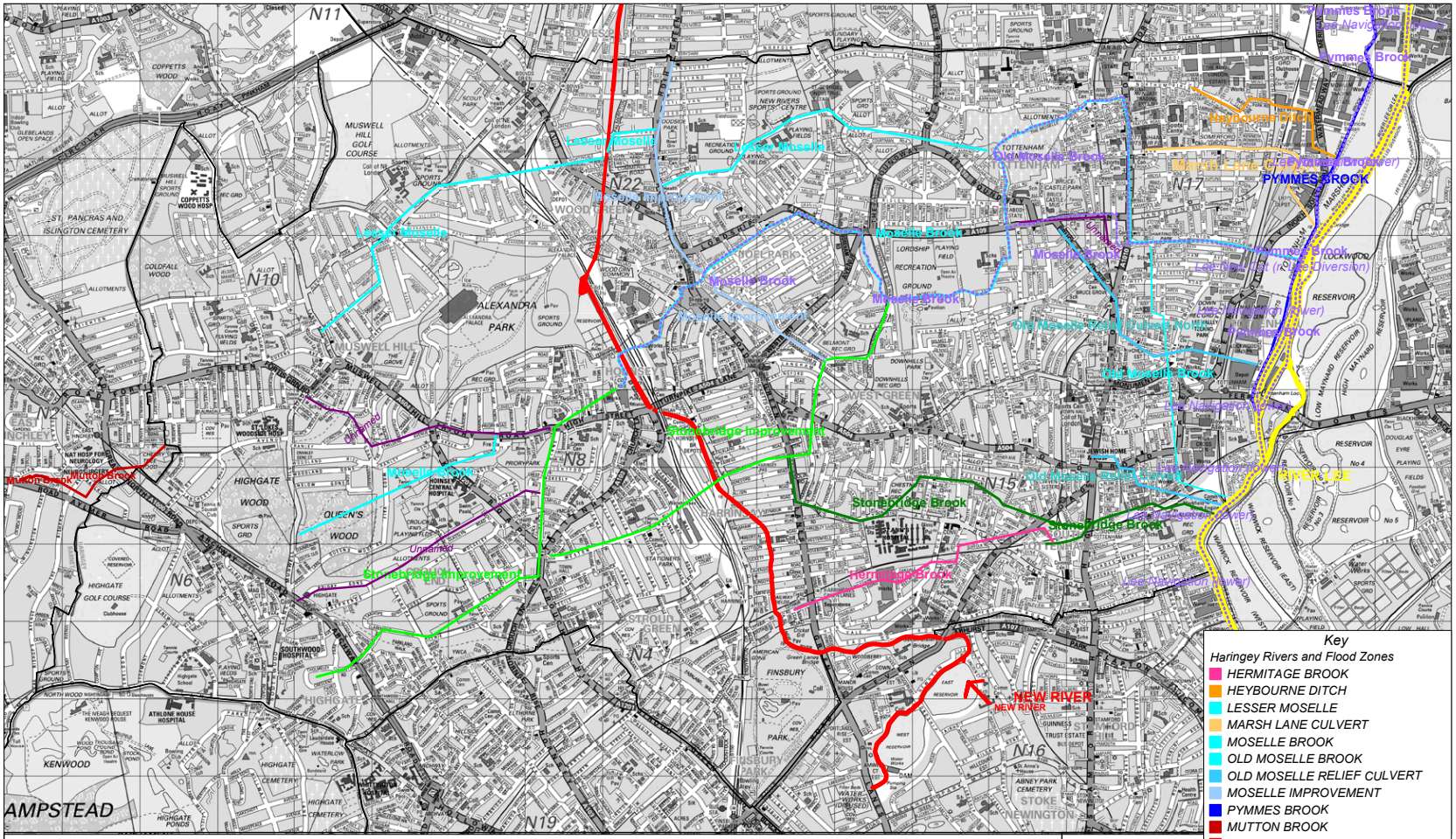


Figure 12: Haringey Rivers

Environment Agency Owns section of Rivers are marked - Violet colour dashed lines

Haringey Council

Date: 07/11/2012

Scale: 1:16260

11 Transport

11.1 Sustainable Transport

Development should ensure Haringey's transport network can accommodate increases in travel demand by tackling congestion, increasing sustainable transport capacity, encouraging modal shift and reducing the need to travel. The following issues should be considered in proposals:

- walking - safe routes/well lit
- cycling/cycle parking/storage
- public transport/transport hubs
- parking requirements
- car clubs
- car reduced development
- alternatively fuelled vehicles
- travel plans
- traffic calming/20mph zones/home zones
- accessibility
- pollution -use of SUDS in road design, lighting, air pollution

Car clubs

The Council considers increasing resident and business access to car club vehicles is an important policy for encouraging sustainable car usage. Using a car club vehicle is a step towards easing local parking problems reducing pollution and carbon dioxide emissions.

There are currently 90 car club vehicles located across Haringey. Details of car club operators and membership details can be viewed at:
http://www.haringey.gov.uk/index/environment_and_transport/travel/carclubs.htm

Electric vehicle charging points

There are 17 publicly accessible charging points in Haringey, located in car parks or on street. All these charging points are part of the Source London network. Information on Source London membership and access to the charging points can be found at:
http://www.sourcelondon.net

Cycling routes

Haringey is one of the leading boroughs in London for implementing local cycling routes, including the London Cycle Network (LCN), Greenways routes and for delivering cycle facilities and cycle training. Haringey is fortunate to have a number of parks and access to open spaces, including the parkland walk, and Lea Valley Regional Park which provides numerous opportunities for pleasant off road cycling routes.

Transport

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Greenways shared cycle and pedestrian routes
The Greenways routes provide increased accessibility, safety and connectivity for pedestrians and cyclists through a network of traffic-free green corridors and numerous specially constructed sections to create a quality cycling and pedestrian link across the borough.

Cycle storage in front gardens

In front gardens, all storage units require planning permission. The preferred location, to place/build the storage unit is where visual impact is minimal. Appropriate screening should be used - perhaps using plants. Materials should be used, which are in keeping with the locality – reflecting the original materials of the property. If the storage unit is painted, choosing colours already used on the property or dark or subdued colours such as dark green/black help minimise the visual impact. Access doors must not overhang the highway (pavement or road). The height should be the same or less than the boundary treatment (wall/fence) where feasible.

For cycle storage and electric parking standards please see London Plan 2011 and Mayor's SPG on Housing 2012.

Transport accessibility

Overall much of the borough is well served by public transport, although some parts have a low level of access to public transport. Haringey is strategically located in the London-Stansted-Cambridge-Peterborough growth area. The borough is relatively well connected for business and commuting opportunities with good radial transport networks for road, bus, rail and three underground lines into central London, plus road and rail access to Stansted Airport and the Stratford City development,

For orbital journeys, the London Overground rail network serves the southern boundary of the borough. The nature of the road network and low rail bridges provides some constraint on enhancing orbital travel. Of the 43 bus routes currently serving Haringey all but 10 are high frequency routes.

Haringey Council

Sustainable Design and Construction

Supplementary Planning Document

Adopted March 2013

www.haringey.gov.uk