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Introduction

Purpose of this supplementary planning document

1.0.1 Sustainable design and construction has an integral role in achieving the wider aim of sustainable development which seeks to meet the needs of people today whilst also preserving the environment for the benefit of future generations. At the centre of sustainable design and construction is the aspiration of creating buildings and spaces around buildings that meet the needs of users and the wider community whilst positively impacting on the environment and minimising any adverse effects.

1.0.2 Sustainable design and construction also seeks to ensure that new developments both mitigate their contribution to further climate change and are appropriately adapted to the impacts of climate change which are now inevitable.

1.0.3 The Greener Greenwich Supplementary Planning Document (SPD) provides guidance on how new development in Royal Greenwich should be designed and built so that it has a positive impact on the environment and achieves the highest standards of sustainable design and construction.

1.0.4 The SPD covers seven key topic areas:

- Energy;
- Water;
- Biodiversity;
- Materials;
- Waste;
- Flood Risk; and
- Pollution.

How to use the SPD

1.0.5 This document should be used by developers, designers, architects, planners and Royal Borough officers from the earliest stage of designing buildings. This will ensure that the environmental impacts of a development are considered from the outset and that minimising these impacts are integral to the scheme's design, construction and use.

1.0.6 The SPD primarily focuses on new development and the associated space around it, however many of the principles within it can be usefully applied to the refurbishment of existing buildings and also provide advice for homeowners seeking to improve the environmental performance of their property.

1.0.7 The SPD is a material consideration when determining planning applications and will be implemented primarily through the development control process.

1.0.8 Planning applications have to follow a formal procedure for major developments or all residential developments of 10 units or more but developers are strongly advised to follow the [planning application guide](#) for all applications and ensure that development proposals are fully supported by officers at the time of application.

1.0.9 To help applicants comply with the principles set out in this SPD, a sustainability checklist is included in Section 2.

Policy context

1.0.10 The Greener Greenwich SPD has been prepared to supplement the policies and proposals within the Mayor's London Plan and the Royal Greenwich Local Plan: Core Strategy with Detailed Policies, which together form the Development Plan for Royal Greenwich. The SPD does not set out new policy or replicate policy that is set out in other planning documents. It is not the intention of this document to cover those aspects of design and construction that are mandatory such as building regulations.

1.0.11 The SPD is consistent with the standards set out in the Mayor of London's Housing Supplementary Planning Guidance (SPG), the Mayor's Sustainable Design and Construction SPG, the Code for Sustainable Homes (CfSH) and Building Research Establishment Environmental Assessment Method (BREEAM). The CfSH and BREEAM levels required of developers are set out in the Royal Greenwich Local Plan: Core Strategy with Detailed Policies (the 'Core Strategy').

1.0.12 The national, regional and local planning policy context for each topic area are set out in Appendix B.

Environmental assessment tools

1.0.13 All development should be rated under an environmental assessment tool such as the Code for Sustainable Homes or relevant BREEAM. The process has three stages, namely:

1. a pre-assessment;
2. a design stage assessment; and
3. a post construction assessment

1.0.14 The Royal Borough expects developers to submit a pre-assessment for all planning applications. The Royal Borough will then impose conditions in the planning approval to submit a design stage assessment prior to implementation and a post construction assessment prior to the first occupation of the development.

1.0.15 It is recommended that developers aim to achieve a mid-point score of the relevant level to be achieved (in accordance with the Core Strategy) in both the pre-assessment and design stage assessment to ensure that any points lost through the construction phase of a development do not result in a lower rating being achieved than what is intended.

Contact details

1.0.16 Contact details of relevant Royal Borough of Greenwich departments are provided in Appendix C.

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Checklist

2.0.1 The sustainability checklist set out below should be used to assist applicants applying for planning permission to comply with the principles set out in this SPD.

Subject	Key considerations	Relevant section	Details expected	Applies to
Energy	Can a mid-point score for the relevant standard defined in the Local Plan be achieved?	Whole document	Code for Sustainable Homes / BREEAM Pre-Assessment	All development
	How does the development design ensure that energy will be used efficiently?	Section 3.1	Energy Strategy or Statement in accordance GLA guidance	All major development ⁽¹⁾
	Has the feasibility and viability of decentralised energy been assessed?	Section 3.2		
	Has the feasibility and viability of a range of renewable energy technology been assessed?	Section 3.3		
Are development proposals to a listed building, heritage asset or located in a conservation area?	Section 3.1	Developers should contact Royal Greenwich's Conservation Officers to discuss possible options. ⁽²⁾	Listed buildings, heritage assets and developments in a conservation areas	
Water	How does the development design ensure that water will be used efficiently?	Section 4.1	Code for Sustainable Homes / BREEAM Pre-Assessment	All development
Biodiversity	Are there any priority species or habitats on the site?	Section 5.1	Phase 1 Survey	All development

- 1 Major residential development is defined as 10 or more dwellings or an area greater than .5ha. For all other uses major development is defined as having a floorspace of 1000 sq metres or more (or the site area is 1 hectare or more).
- 2 Changes to the fabric of heritage assets or their setting should only be considered following assessment of the significance of the heritage asset. Further guidance is available at <http://www.climatechangeandyourhome.org.uk/>

Subject		Key considerations		Relevant section		Details expected		Applies to	
	What is the nature and scale of the priority species and habitats on the site?						Extended Phase I Survey	All development where a Phase I Survey has identified priority species or habitats	
	How will priority species and habitats be protected and enhanced?						Ecological Management Plan	All development where an Extended Phase I Habitat Survey has recommendations to be implemented	
Materials	Are the specifications in accordance with the GRO Code of Practice and Environment Agency Green Roof Toolkit?			Section 5.2			Living Roof/Wall specifications	All development where a living roof is proposed	
	Do the materials to be used have a low environmental impact?			Section 6.1			Code for Sustainable Homes / BREEAM Pre-Assessment	All development	
	Have local suppliers been considered?			Section 6.2			Sustainable sourcing rationale	All development	
Waste	Is the timber to be used in the development independently verifiable as sustainable and legal?						Chain of Custody certification	To secure Code for Sustainable Homes or BREEAM credits	
	What measures will be implemented to reduce site waste?			Section 7.1			Site Waste Management Plan	All major development	
	How does the development design ensure that waste arisings will be minimised?			Section 7.2			Code for Sustainable Homes / BREEAM Pre-Assessment	All development	
Pollution	Is further site investigation required?			Section 8.1			Phase 1 Desktop Investigation	Where contaminative use was known or likely or a sensitive end use is proposed	
	What remediation strategy options are available?						Phase 2 Intrusive Site Investigation	Where contaminated land has been identified	

Subject	Key considerations	Relevant section	Details expected	Applies to
Flood Risk	What are the most appropriate sustainable remediation proposals for the site?		Remediation Strategy and Remediation Method Statement	For sites where remediation of contaminated land is required
	How will the remediation works be undertaken and validated?		Validation Report	Where remediation works have been undertaken
	What remediation works were completed successfully?		Noise Assessment	All development
	What is the quality control of imported soils (if any)?		Air Quality Assessment	Where a planning application is subject to an environmental impact assessment or significant impacts on air quality are likely
	How does the development design ensure that the impact of noise will be minimised?	Section 8.2		
	How does the development design ensure that the impact on air quality will be minimised?	Section 8.3		
	What is the existing air quality?	Section 9.1		
	What is the future air quality likely to be without the development?			
	What is the future air quality likely to be with the development?			
	Has a detailed site-specific Flood Risk Assessment been undertaken?	Section 9.1	Flood Risk Assessment	All development except those located in Flood Zone 1 and are less than one hectare in size and not at risk from other sources of flooding or where there is not a known drainage issue
	How does the development include appropriate application of SuDS?	Section 9.2	SuDS site survey	All development

Energy

The amount of energy used in a development, the type of fuel used and the way that energy is supplied can all have a significant impact on CO₂ emissions, which are a key contributor to climate change.

It is essential that there is a reduction in carbon emissions and this will be achieved by applying the energy hierarchy:

- Be lean (use less energy)
- Be clean (supply energy efficiently)
- Be green (use renewable energy)

Where necessary, developments will be required to offset any remaining regulated carbon emissions through a cash-in-lieu payment.

This chapter includes guidance on each of the stages of the energy hierarchy, demonstrating how development can be designed to be energy efficient and reduce demand for energy. It also covers decentralised energy including combined heat and power, connecting to an existing network and biomass and includes guidance on renewable energy.

Energy Assessments for all major development ⁽¹⁾ in the borough should follow the guidance from the Greater London Authority available at www.london.gov.uk

3.1 Energy Efficiency (Be Lean)

Passive Solar Design

3.1.1 The Royal Borough expects new buildings in new developments to utilise solar passive design features to reduce heat impacts and the energy needed to provide heating, cooling, ventilation and lighting.

3.1.2 Heat impacts can be reduced in new developments through following the cooling hierarchy:

- i. Minimise internal heat generation through energy efficient design;
- i. Reduce the amount of energy entering a building in Summer through shading, albedo, fenestration, insulation and green roofs and walls;
- ii. Manage the heat within a building through exposed thermal mass and high ceilings;
- iii. Passive ventilation;

¹ Major residential development is defined as 10 or more dwellings or an area greater than 5ha. For all other uses major development is defined as having a floorspace of 1000 sq metres or more (or the site area is 1 hectare or more).

- iv. Mechanical ventilation; and
- v. Active cooling systems (ensuring they are the lowest carbon options).

3.1.3 Development should be designed in a manner that reduces the energy needed to provide heating and lighting. This can be achieved through:

- i. Layout and orientation, preventing buildings from overshadowing each other;
- ii. Orientating buildings to within 30 degrees of south to achieve appropriate daylight penetration through windows with adequate provision for solar shading;
- iii. Ensuring that the main living areas of dwellings, such as bedrooms and living rooms, are on the south or east side of the building while utility rooms including kitchens and bathrooms face north; and
- iv. Making three quarters of the total window area of a building face south with adequate provision for solar shading.

Passivhaus (www.passivhaus.org.uk) is a high environmental standard from Germany that as an example expects buildings to be designed with an annual heating or cooling demand not exceeding 15 kWh per m² per year.

Insulation

3.1.4 High building insulation standards are the most effective way to improve the energy efficiency of a building. Insulation can be measured as a U-value or overall heat transfer coefficient. The U-value measures the rate of heat transfer through a building element over a given area under standardised conditions. The lowest possible U-value (expressed as W/m².K) should be sought for all developments.

3.1.5 Insulation can also be improved through:

- Increased thermal mass (i.e. use of materials that can absorb and retain heat such as concrete);
- Porches, atriums, conservatories, lobbies and sheltered courtyards to provide thermal buffers between a cold outside and warm inside; and
- Living roofs and walls.

Ventilation

3.1.6 The Royal Borough expects development to be suitably ventilated and to provide natural cooling. This can be achieved in the following ways:

- Using windows and wall vents to draw in air with roof vents that allow air to escape;
- With high ceilings to improve circulation; and

- Using mechanical ventilation with heat recovery (MVHR) systems with summer bypass valves where natural cooling is not possible.

3.1.7 Where passive ventilation of the building is not possible the applicant will need to assess and demonstrate that solar gain is minimised throughout the building and determine if a cooling system is required. The proposed scheme will need to attain at least level 5 of the Code for Sustainable Homes and be compliant with Part L of the Building Regulations.

3.1.8 Where appropriate the cooling strategy should investigate the opportunities to improve cooling efficiencies through the use of district cooling or locally available sources such as ground cooling, river/dock water cooling, etc.

3.1.9 Proposed mitigation methods must **not** impede the quality of life for the future occupants of the development. Windows must be openable to allow for passive ventilation and cooling.

Air Tightness

3.1.10 New development should have an identifiable and continuous air tight envelope around a building. Air tightness is an issue that must be carefully addressed during both design and construction as the intended result can be compromised at either stage.

3.1.11 The Royal Borough expects that air permeability of 3 m³ per hour per m² at 50 Pa can be achieved for most buildings.

Artificial Lighting

3.1.12 The Royal Borough expects all indoor and outdoor light fixtures to have dedicated energy efficient fittings for compact fluorescent (CFL), cold cathode or light emitting diode (LED) lighting. Indoor lighting should be easily controlled and zoned and communal lighting areas should be controlled automatically by sensors. Where possible outdoor lighting should be solar powered and designed to minimise light pollution.

Technology

3.1.13 The Royal Borough expects that where appliances are to be provided in new developments they are A+ rated for energy efficiency. New developments should also incorporate user-friendly energy monitoring and metering controls accessible by building users to inform and facilitate behaviour change.

Refurbishment

3.1.14 Developers and residents are encouraged to consider energy efficiency when refurbishing or redeveloping existing properties in Royal Greenwich. The Energy Saving Trust provides information on how to reduce energy demand in existing buildings (www.energysavingtrust.org.uk) and the following measures should be considered:

- Brush seals on windows and doors;
- Reflector panels behind radiators;

- Shutters for windows and/or thicker curtains that do not drape over radiators;
- Energy efficient light fixtures and fittings;
- Secondary glazing on windows;
- Loft insulation
- Floor insulation;
- Cavity wall insulation;
- Solid wall insulation (internal or external);
- Energy efficient boiler;
- Upgraded central heating and heating controls;
- Insulating hot water pipes; and
- Renewable energy technology.

Conservation Areas, Heritage Assets and Statutory Listed Buildings

3.1.15 Alterations to statutory listed buildings will require listed building consent. If you are seeking to improve the energy efficiency of a listed building you are advised to contact the Royal Borough's conservation officers to discuss possible options. The Planning Department can be contacted on planningapps@royalgreenwich.gov.uk. Listed buildings in Royal Greenwich are diverse and each proposal will need to be considered on an individual basis.

3.1.16 The Royal Borough is producing conservation area character appraisals that identify the main elements that contribute towards the special architectural or historic interest of the conservation areas. Conservation area management strategies propose detailed guidance on repairs and on protecting the character of the estate, to focus on how refurbishment, repair and upgrading of the properties can be achieved whilst minimising losses of the character of the houses. The conservation area character appraisals and management strategies can be accessed in the planning portal website on the following link: http://www.royalgreenwich.gov.uk/downloads/511/conservation_areas.

3.1.17 An Appraisal of Areas of High Archaeological Potential (AHAP) has been produced by English Heritage and has been adopted by Royal Greenwich to support the Policy DH(m) of the Royal Greenwich Local Plan: Core Strategy with Detailed Policies. The AHAP contains information about the historic environment as well as traditional archaeological information.

3.1.18 Changes to the fabric of Heritage Assets or their settings should only be considered following assessment of the significance of the Heritage Asset. Early assessment is essential. Poorly designed insulation can result in problems of condensation or damage to building fabric. Well considered adaptation can avoid this.

3.1.19 A selection of free [publications](#) related to the historic environment and energy considerations in planning is available from English Heritage. Additionally, the English Heritage Website contains further information and guidance in relation to the historic environment and climate change at: <http://www.climatechangeandyourhome.org.uk/>.

3.2 Decentralised Energy (Be Clean)

Combined (cooling) heat and power

3.2.1 Combined (Cooling) Heat and Power (C(C)HP) is a technology that can effectively power and heat houses and businesses at the city, community, neighbourhood or street scale. C(C)HP can deliver efficiencies of up to 85% over central power stations that waste significant amounts of heat through the electricity generation process. More information about C(C)HP can be found at www.chpa.co.uk.

3.2.2 For new development proposals the preferred approach to the implementation of this technology is in the following order:

- Connect to an existing C(C)HP network;
- Install a site wide C(C)HP network powered by renewable energy source;
- Install a site wide C(C)HP network powered by gas/hydrogen fuel cells accompanied by renewable energy;
- Install a communal heating and cooling system powered by renewable energy; and
- Install a communal heating and cooling system powered by gas.

3.2.3 Where multiple energy centres are proposed in a phased development these should be designed to integrate into a larger district heat network in later phases of the development, where there is sufficient heat demand. C(C)HP systems should be compatible with different forms of fuel to remain adaptable and flexible to changes in local and affordable fuel supplies.

Connection to an existing network

3.2.4 Where a new development is within 1km of an existing C(C)HP network, or one that is proposed and likely to be in operation within three years, a feasibility and viability assessment of a connection to that system should be undertaken in an Energy Assessment. The infrastructure to connect to a future C(C)HP is expected to include:

- Space for a plant room to accommodate a heat exchanger and any other necessary equipment; and
- Pipes from the plant room to the property boundary where the connection to the network is most likely to be located.

3.2.5 To identify the potential for developments to connect to an existing CHP heating network, the [London Heat Map](#) provides information on existing CHP systems and opportunities for connections.

Communal heating

3.2.6 Communal heating systems are more common in single use developments. A communal or district heating system supplies heat to a number of units from a common heat source. It may comprise, for example, a system heating a block of flats or a larger scale system heating many buildings. This type of system uses significantly less energy when compared to individual gas fired boilers and with the combination of renewable energy sources, carbon emissions are greatly reduced.

3.2.7 Ideally each individual unit will have time and temperature controls with a smart meter to monitor energy consumption .

3.2.8 Where individual units have their own heating, wet central systems designed to 'Central Heating System Specification' (CHeSS) - Year 2008 (CE51/GIL59) best practice standards are preferred. Boilers should be A rated under Seasonal Efficiency of Domestic Boilers in the United Kingdom (SEDBUK) and produce low levels of NO_x and particulates.

Biomass and biofuel

3.2.9 Biomass and biofuel, including organic fuel sources such as wood and straw, etc can be used to power C(C)HP systems or smaller heating systems. The Royal Borough expects any proposal for a decentralised energy system powered with biomass or biofuel to be designed and operated in accordance with best practice standards. The impact on air quality of these systems is an important consideration when proposing a biomass powered system (see Chapter 8 and www.environmental-protection.org.uk/biomass for more details). Other considerations include:

- The carbon intensity of processing and transporting the fuel;
- The space required for plant and fuel storage; and
- Fuel delivery and transfer arrangements.

3.3 Renewable Energy (Be Green)

3.3.1 All development is encouraged to incorporate renewable energy into its design and construction to reduce CO₂ emissions. Major developments are expected to seek to reduce CO₂ emissions by at least 20 per cent through the use of on-site renewable energy generation wherever possible, in line with the expectations of the Mayor's London Plan. More information about renewable technology can be found at www.therenewableenergycentre.co.uk.

3.3.2 Permitted development rights exist for small scale renewable and low carbon energy technologies and domestic microgeneration technologies. Further guidance can be found at <http://www.microgenerationcertification.org/consumers/planning-information>.

Photo Voltaic (PV) Panels

3.3.3 PV panels can be incorporated onto roofs, walls and to some extent in gardens. Where considered they should be sited for maximum efficiency, which will generally be:

- Sitting at an angle of approximately 30° to 40° to the horizontal;
- Facing 45° either side of due south (i.e. south east through to south west); and
- In full sunlight as even a little overshadowing can significantly impair performance.

3.3.4 PV panels and living roofs can be mutually beneficial. Living roofs create a microclimate that enhances the operating efficiency of PV panels, while the panels help to create greater habitat diversity on the roof. Further information on the compatibility of PV panels and living roofs can be found in section 5.2.3.

Solar Hot Water Panels (SHWP)

3.3.5 There are two predominant types of SHWPs namely:

- Flat plate systems that are cheaper and can be fixed on or integrated into the roof; and
- Evacuated tube systems that are generally more efficient and require less roof space.

3.3.6 SHWPs can be incorporated onto roofs. Where considered they should be sited for maximum efficiency, which will generally be:

- At an angle of approximately 30° to 40° to the horizontal; and
- Facing 45° either side of due south (i.e. south east through to south west).

3.3.7 The Royal Borough recommends that particular care is taken when selecting a heating system to accompany a SHWP installation. Any system should be complementary and appropriately compatible (e.g. it includes a requisite storage tank and can accept pre-heated water).

Wind Turbines

3.3.8 Wind turbines should always be considered carefully in built up areas. They are best suited to low density developments or those with large areas of open space. The Royal Borough expects that where wind turbines are proposed an assessment of the noise, vibration and flicker impacts on adjoining properties as well as any potential impacts on birds and bats is undertaken.

Ground Source Heat Pump (GSHP)

3.3.9 A GSHP requires electricity to operate. Because of this the Royal Borough recommends that where proposed a GSHP should be powered from another renewable energy source onsite (e.g. PV panels). All GSHPs are expected to achieve a Coefficient of Performance (CoP) of more than three where the CoP is the ratio of the change in heat at the output to the input (e.g. For every 1 heat unit input, 3 heat units are output). Because GSHPs provide heat at lower temperatures than conventional gas fired boilers, buildings should be well insulated to ensure that the GSHPs are as effective as possible.

3.3.10 The Royal Borough expects that where a GSHP is proposed evidence is provided to confirm that the local geology is suitable for the necessary excavation. Where appropriate vertical GSHPs may require a drilling license from the Environment Agency and should not pose a risk to groundwater.

Air Source Heat Pump (ASHP)

3.3.11 Like a GSHP an ASHP requires electricity to operate. Because of this the Royal Borough also recommends that where proposed an ASHP should be powered from another renewable energy source onsite (e.g. PV panels). An ASHP is less efficient than a GSHP because air temperature is more variable. All ASHPs are expected to achieve a Coefficient of Performance (CoP) of more than 2.5 where the CoP is the ratio of the change in heat at

the output to the input (e.g. For every 1 heat unit input, 2.5 heat units are output). Where an ASHP is proposed an assessment of the noise, vibration and visual impacts on adjoining properties should be undertaken.

3.4 Offsetting Carbon Emissions

3.4.1 Priority should be given to achieving the carbon emissions reductions required by the Royal Greenwich Local Plan and the London Plan on-site through the energy hierarchy. However there may be circumstances where the Royal Borough agrees that it is technically unfeasible to reach target emission reductions through on-site measures.

Funding emissions reductions off site

3.4.2 In order to maximise the contribution that development can make to tackling climate change, the Royal Borough requires developments, where further on-site measures are unfeasible, to offset any shortfall in required CO₂ emissions reduction through a financial contribution. The financial contribution is based on an agreed price per tonne of carbon and funds measures that reduce CO₂ emissions from the existing building stock.

The cost of offsetting

3.4.3 For all major developments the financial contribution shall be calculated based on the nationally recognised price of carbon ⁽²⁾. This price of carbon is currently set at £60/tonne for a lifespan of 30 years i.e. £1800/tCO₂.

Calculating the carbon to be offset

3.4.4 The amount of CO₂ to be offset will be determined by the shortfall between actual carbon emissions performance of the development and the carbon performance of the development had it met the required targets based upon baseline information submitted in the development energy strategy. The spending of carbon offset payments and monitoring of CO₂ savings delivered will be managed by the Royal Borough.

3.5 Adapting to Climate Change

3.5.1 It is important that the effects of climate change are considered over the lifetime of a development. Buildings and infrastructure built today should be designed for occupation and use for their anticipated lifetime. Development proposals should take account of the expected changes in local climate conditions and consider how the development will function in the future in the context of a changing climate throughout the proposed lifetime of the development, by adaptation or flexibility to allow future adaptation.

3.5.2 Design to prevent overheating – It is important designers consider the internal comfort required by occupiers at the design stage and that this comfort level is met through implementing the cooling hierarchy set out in the London Plan. For example, designing buildings to reduce solar heat gain in summertime, and using component materials with a high capacity to store heat to help reduce variation in temperature within a building; materials

with a high capacity to store heat can assist in moderating temperature change by storing excessive day time heat that can be released at night. Additionally, tree planting has been shown to be one element of an adaptation strategy for reducing the urban heat island effect. The following link helps anyone wanting to plant trees decide what trees are suitable to plant in London and other urban areas in face of a changing climate.

<http://www.righttrees4cc.org.uk/>

3.5.3 Design for sustainability – Sustainable landscape planning, design and management are essential for adapting our environments to a changing climate and to mitigate future change. In many instances, landscape responses incorporate a range of mitigation and adaptation principles, with many of these being interlinked and mutually-reinforcing. For example, provision of urban green space will mitigate through carbon storage as well as reducing surface run-off, an important aspect of adaptation.

3.5.4 Design more resilient foundations – developers should consider any long term potential for extreme weather events to affect a building’s foundations and to ensure they are robust.

3.5.5 Drought resistant planting: developers should select drought resistant planting so that it needs less watering and so that when water restrictions are in place, plants are more likely to survive and meet their intended purpose. The careful selection of drought resistant planting will also maximise the support for native fauna.

3.5.6 Designing for flooding: surface water flooding is likely to increase due to the anticipated increased intensity in rainfall events. It is essential to consider how sustainable drainage systems (SuDS) measures will be incorporated at the initial design stage. Further information on flood risk and design is found within the flood chapter. For small developments, including those that do not require planning permissions, simple measures can include draining impervious surfaces to a landscaped area of the garden or to a soak away or installing a water butt to collect water from an existing or new impervious roof.

3.5.7 Green Infrastructure: green infrastructure approaches to planning and design have been identified as measures that can facilitate effective adaptation to climate change. Green spaces and corridors help to cool our urban environments, improve air quality and ameliorate surface run-off. A green infrastructure planning approach will reduce flood risk, protect building integrity and improve human health and comfort in the face of more intense rainfall and higher temperatures. Well-connected green infrastructure also provides wildlife corridors for species migration in the face of climate change as well as wider benefits for recreation, community development, biodiversity, food provision and place shaping.

3.5.8 Encouraging non carbon based transport modes: facilities for bicycles and electric vehicles should be provided in developments to support different transport modes such as the provision of bicycle racks or charging points for electric vehicles. Showers and changing facilities should be provided in non-residential buildings to encourage cycling.

Water

4.1 Water Supply and Use

4.1.1 London is categorised as an area of serious water stress. Water resources will be affected by climate change. Water abstraction will be reduced by 179 million litres a day in the Thames Water region alone. Thames Water estimate that in London by 2035 there will be a shortfall of available water supplies of 359 million litres a day, with increase in population and greater demand for development there will be enormous stress placed on available water supplies. It is also evident that London is susceptible to droughts and deluges as demonstrated in 2012. By integrating water use within the design and fabric of the development, the development can be resilient to both the impacts of drought and flood, and create nicer places to live, as discussed in 4.1.13 Water Sensitive Urban Design.

4.1.2 As an essential resource it is important that all developments +reduce both the use of water within the boundary of the development and apply the water hierarchy (as set out below) in the earliest stages of the design process. Development should also appropriately manage water leaving the boundary of the development and consideration should also be given to how the development can positively influence water management around the development.

- i. Reduce the demand for water;
- ii. Use alternative sources of water;
- iii. Re-use the water used in buildings.

Demand Management

4.1.3 Applicants should demonstrate how the water demand for the development has been minimised through water efficient design.

4.1.4 Water saving fixtures and fittings should be considered in all development and reference should be made to the Water label website <http://www.europeanwaterlabel.eu/> for the latest appropriate water efficient fixtures and fittings.

4.1.5 All residential developments must have a predicted water consumption that meets the requirements of Part G of the Building Regulations currently set at less than 125 litres/person/day. In Royal Greenwich, new residential developments are expected to have a predicted water consumption that meets the specifications required to achieve Code For Sustainable Homes Level 4 of less than 105 litres/head/day using the Government's national calculation methodology for assessing water efficiency in new dwellings outlined in the *Water Efficiency Calculator for New Dwellings*.

4.1.6 All residential developments, including flats should have an individually metered water supply. Water meters should be visible to occupants as this has been shown to reduce the consumption of water.

4.1.7 Landscaped and garden areas have the potential to place large demands on water resources. They should be designed to minimise the use of potable water and rely primarily on local rainfall rather than regular watering, including the introduction of:

- Native plants or species that are able to resist local climatic conditions

- Use water retaining Mulches
- Use of rainwater harvesting or water butts to irrigate landscaped and garden areas
- Use adjustable automatic drip irrigation systems, and
- Where water features are used they should be closed re-cycling systems.
- Additionally, the use of green infrastructure and Sustainable Drainage Systems (SuDS), such as rain gardens and bioswales can be as an effective way to manage water and create healthier urban environments

Alternative Water Sources

4.1.8 Not all water needs to be of drinkable quality and all developments should seek to reduce the consumption of water from the mains system. Rainwater should be harvested for outdoor use (gardening and car washing) and non-potable indoor uses like toilet flushing.

4.1.9 A water butt connected to a downpipe is a simple and low cost way of collecting rainwater from the roof of a building that can then be used for outside water needs. All residential developments should be fitted with water butts.

4.1.10 Larger rainwater harvesting systems can collect rainwater from the roof or driveway of a property which is then filtered and stored (usually in an underground tank). The inclusion of such a system should be considered in all developments.

Water Re-use

4.1.11 To further reduce the consumption of potable water, greywater (from hand washing, baths, showers and clothes washers) should be recycled using an appropriate reclamation system and used for appropriate non-potable activities like garden watering (non edible plants only) as well as toilet flushing. Greywater systems require a dual plumbing system to be installed with one pipe for fresh drinking water and one for recycled water.

4.1.12 The consumption of energy associated with the treatment of water in greywater systems and the potential for contamination of the mains drinking water must be carefully considered during the design process.

4.1.13 Development proposals should consider Water Sensitive Design (WSUD) at the planning and design process stages to ensure that greater priority is given to water-management considerations during the planning of development proposals whilst optimising opportunities for delivering benefits to communities and the natural environment http://www.susdrain.org/files/resources/ciria_guidance/wsud_ideas_book.pdf

Water Quality

4.1.14 Development should incorporate sustainable drainage techniques suitable to the site (see flood risk chapter).

4.1.15 Planning applications for industrial uses need to provide information on expected waste discharges and how risks of pollution are being avoided. Where discharges into waterways are proposed a permit from the Environment Agency may be required.

4.1.16 Developers are advised to consult the Flood and Water Management Act 2010 which requires mandatory sewer and lateral drain adoption.

Biodiversity

5.0.1 While changes to natural systems are inevitable as a result of development these should be managed to create positive benefits while minimising adverse impacts. Objectives should include connecting fragmented habitats and promoting access to and appreciation of nature.

5.0.2 To achieve these outcomes it is first necessary to employ a suitably qualified ecologist to assess the biodiversity values present on a site through the preparation of an Ecological Statement. Once this is completed and the baseline biodiversity has been established there are a wide range of measures that a suitably qualified ecologist can recommend to:

1. Avoid adverse impacts on biodiversity;
2. Enhance biodiversity values; and
3. Mitigate any unavoidable impacts where enhancement is not possible.

5.1 Protecting Biodiversity

Assessment

5.1.1 A Preliminary Ecological Appraisal should be carried out for all development sites to gather data on existing ecological conditions.

5.1.2 A Preliminary Ecological Appraisal, together with any ecological evaluation undertaken, does not replace the more formal Ecological Impact Assessment (EiA) (IEEM 2006 and IEEM 2010). A Preliminary Ecological Appraisal may be prepared before undertaking a full EiA or may be stand alone documents where no EiA is required.

5.1.3 Development sites should be surveyed by a suitably qualified ecologist to identify areas of potential ecological value. This should be undertaken in accordance with the Institute of Ecology and Environmental Management (IEEM) best practice standards (www.ieem.net). Particular regard should be had to the species and habitats listed in both the London Biodiversity Action Plan (delivered by the London Biodiversity Partnership) and Greenwich Biodiversity Action Plan for protection. The UK Biodiversity Action Plan provides the overall framework for these plans.

5.1.4 Where animal species are to be surveyed the ecologist should also be able to demonstrate that they meet the minimum knowledge, skills and practical experience requirements as set out in the IEEM Technical Guidance Series Competencies for Species Survey.

5.1.5 The method that should be employed in producing the ecological assessment report should include the following:

1. Undertake desk based research of biological records in the area using Greenspace Information for Greater London (GiGL) as the primary resource with the results mapped on a site plan;
2. Complete a Phase I Habitat Survey (in accordance with Joint Nature Conservation Committee guidelines available at <http://jncc.defra.gov.uk/page-2468>) as a minimum.

This survey is the baseline study, identification and mapping of important wildlife habitats on a site and in the surrounding area;

3. Prepare a map of the site showing protected and notable species in the area that may be affected by development with numbers (may be approximate) and their distribution and use of the area, site, structure or feature (e.g. feeding, shelter, breeding etc);
4. Complete an Extended Phase I Habitat Survey to include ecological records data, and further details of any protected species and/or habitats confirmed to be on a development site;
5. Assess the zone of influence of the project over its lifetime and identify ecological resources and features likely to be affected, both directly and indirectly;
6. Clearly identify and describe potential development impacts to protected species and/or their habitats that are likely to occur (both direct and indirect as well as during and after construction);
7. Where harm from development is likely the assessment should demonstrate:
 - i. Alternative development options considered;
 - i. How adverse impacts will be avoided;
 - ii. How unavoidable impacts will be mitigated or reduced; and
 - iii. How impacts that cannot be mitigated or reduced will be compensated for.
8. Identify how species numbers are likely to change (if at all) as a result of the development;
9. Consider and contribute to wider ecological improvements such as green and river corridors and green infrastructure.

5.1.6 Attention should be focused on connections between the survey area and nearby habitats, especially aquatic habitats and wetlands both upstream and downstream via fluvial networks or other hydrological networks. Potential effects within the water table should also be considered e.g groundwater dependent raised bogs and other groundwater dependent wetlands.

5.1.7 It is important to note that seasonal constraints can apply to ecological surveys for specific species and habitats. Developers should allow for appropriate lead in times to ensure that surveys are undertaken at the appropriate time of year so as to ascertain maximum species numbers.

5.1.8 The results of an ecological site survey will be transferred to GiGL (www.gigl.org.uk) and to facilitate this the data should be provided as a summary table in an appendix of the Ecological Statement. The following details are required:

- Grid Reference;
- Date;
- Species;
- Observer (the person who made the record);
- Location name; and
- Abundance (if recorded).

5.1.9 The information provided by developers in an ecological survey will be made available to the public via subscription as a result of its transfer to GiGL by the Council. The purpose of this data exchange is to increase the knowledge, protection and enhancement of biodiversity in the Borough.

Avoidance

5.1.10 Where a development is within 250 metres of a Site of Importance for Nature Conservation (SINC), only native plant species and where possible of local provenance should be used for landscaping. Invasive species of plants, such as Japanese Knotweed and Giant Hogweed, should be eradicated where appropriate and not inadvertently spread through landscaping proposals or future management. Developers are advised to follow guidance provided by Defra for [dealing with invasive plants and how to remove them](#). Plants that require intensive ongoing maintenance to limit their invasiveness are not recommended.

5.1.11 The use of peat should be avoided in landscaping due to its extraction impact on vulnerable habitats. The use of chemicals, such as herbicides and pesticides, should be avoided on rough grassland and wildflowers. Management regimes should also reduce reliance on chemical treatments.

5.1.12 Killing, injuring or disturbing a protected species constitutes a criminal offence under the Wildlife and Countryside Act 1981. The Greenwich Biodiversity Action Plan details both protected habitats and species that are likely to be found in Royal Greenwich.

5.1.13 Where practical, development should be phased to avoid impacting species breeding patterns, especially bird nesting times.

5.1.14 Wildlife differ from humans in their sensitivity to light (e.g. they can be affected by very low levels of light) and may be adversely affected in a number of ways (see the Royal Commission on Environmental Pollution's 2009 report, [Artificial Light in the Environment](#)). The positioning, duration, type of light source and level of lighting are all factors that can affect the impact of light on wildlife.

5.1.15 Lighting can adversely impact a number of species, notably bats and invertebrates, and external lighting should be designed so as to:

1. Be directed where it is needed and not allowed to 'spill' onto natural features, including watercourses, or areas of known wildlife activity (hoods or shields can prevent this);
2. Ensure that lighting columns are as low as possible; and
3. Restrict lighting times to only when it is needed (e.g. through the use of sensors).

5.1.16 All development will be expected to minimise light pollution. Planning applications for development with the potential to result in significant light pollution should be accompanied by an assessment of the likely impact to show that the lighting scheme is the minimum necessary for functional or security purposes and that it minimises potential pollution from glare and spillage. Particular attention will be paid to schemes in or close to open countryside, close to areas or features important for nature conservation or close to residential properties.

5.1.17 Where development proposals are within the vicinity of the waterside, proposals should protect and enhance the biodiversity of the waterside. A marine licence may be needed for activities involving a deposit or removal of a substance or object below the mean high water springs mark or in any tidal river to the extent of the tidal influence. Any works may also require consideration under The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended) Early consultation with the Marine Management Organisation is advised. More information is available at www.marinemangement.org.uk

5.1.18 The design of new developments should not cause a net loss of publicly accessible open space and should improve access and the accessibility of open spaces. Appropriate new open green publicly accessible spaces should be created particularly where these can address identified areas of deficiency of public open spaces. The Royal Borough Of Greenwich Local Plan: core strategy with detailed policies outlines open spaces located in Royal Greenwich and provides further information on how such spaces should be improved and integrated with new development.

Enhancement

5.1.19 Developments should be sensitively designed so that there is no net loss in the quality and quantity of habitat across a development site and to enhance biodiversity and increase connectivity between patches of urban habitat.

5.1.20 A net gain for biodiversity will usually result from not only protecting existing biodiversity values but also implementing appropriate site specific improvements which will include some or all of the following:

1. Increasing the area of existing habitat(s) and improving their maintenance management;
2. Creating new habitat(s) that benefits wildlife;
3. Link into the existing network of natural open spaces through maintaining or contributing to 'stepping stones' and 'corridors';
4. Implementing specific measures that will benefit particular species. Examples for bats can be found at www.bats.org.uk/pages/bats_and_buildings.html;
5. Creating linkages between habitats on and next to the site so that wildlife can move between habitat(s);
6. Ensuring that landscaping, including ornamental planting, benefits wildlife;
7. Integrating nesting and roosting opportunities for bats and birds into built structures.

5.1.21 Retention and protection of existing features should be a priority during development design and site works. Existing vegetation that developers should consider retaining includes mature trees to provide nesting and roosting opportunities and hedges and dense bushes to provide cover for foraging. Implementing the recommendations of a suitably qualified ecologist should be a high priority in the development process to secure site specific biodiversity protection and improvement. There should be at least a neutral change in ecological value when measured in species per hectare.

5.1.22 Even where little biodiversity interest has been identified on a site, developers should aim to create features that will provide habitat for wildlife. The design of landscaping presents an obvious opportunity for enhancing biodiversity. However even where there are space constraints, there are many different ways habitat improvements can be achieved in cost effective ways, including through green roofs and installing bat bricks and bird boxes.

5.1.23 The Royal Borough expects that developments will include at least some of the following biodiversity features:

1. Native and/or nectar producing and/or deciduous plant and tree species preferably of local provenance;
2. Diversity grassland areas such as lawns with low growing native herbs, unmown grass verges, wildflower mixes on amenity and recreational open spaces and/or meadow areas;
3. Dense areas of shrubbery;
4. Habitat areas identified in the Greenwich Biodiversity Action Plan;
5. Living roofs and walls;
6. Street trees; and
7. Artificial nesting and roosting sites.

5.1.24 Non- native plants, grasses, shrubs and trees used in landscaping should be valuable for wildlife. This could be achieved by selecting species that provide one or more of the following:

- Nectar for invertebrates;
- Fruits and / or seeds for birds;
- Nesting cover for birds.

5.1.25 The installation of artificial nesting and roosting sites as well as habitat walls are strongly recommended by the Royal Borough. The Royal Borough prefers these measures to be incorporated into building structures rather than retro-fitted after construction. The Royal Borough expects developers to:

- Ensure that all designs are appropriate for target species;
- Select the most suitable locations for installations; and
- Provide supporting habitat for target species;

5.1.26 The Bat Conservation Trust has produced a bat box information pack that provides guidance on the type and number of boxes that development proposals should consider and how and where to install them.

5.1.27 An Ecological Management Plan should be developed for sites where there are local features of significant ecological value. The plan should outline how lifetime management issues such as pest control, maintenance and monitoring will be undertaken. Ecological Management Plans should be appropriately handed over to and implemented by any maintenance company or staff responsible for the site. A summary version can also be provided to residents of the development.

5.1.28 General principles to enhance biodiversity through Sustainable Urban Drainage Systems (SuDS) should be followed including creating swales, ponds, wetlands and reedbeds while ensuring all landscaping is multi-functional. Guidance on SuDS can be found on the Construction Industry Research and Information Association website www.ciria.org/suds.

5.1.29 On development sites where there is the potential for habitat creation the decision on what habitat to create should be guided by those listed in the Greenwich BAP and the Habitat Suitability Maps developed by GiGL and the London Biodiversity Partnership (LBP).

5.1.30 Development boundaries should be wildlife friendly. Hedges between gardens are preferred and where hedges are not appropriate wildlife friendly fencing with a 150 mm gap between the fence and the ground should be used with no spikes on the top or bottom. This is not appropriate however on development sites containing known predators to priority species identified in the Greenwich BAP.

5.1.31 Opportunities to link habitats and wildlife corridors both within the development site and to habitats and wildlife corridors adjacent to or near the site should be always be pursued in development design.

5.1.32 Existing green urban infrastructure should be retained wherever practical. Green infrastructure can be defined as the network of spaces and natural elements that are present in and interconnect our landscapes. Further information on Green Infrastructure, including case studies, can be found in [Natural England's webpages](#).

5.1.33 Developers should provide urban greening measures on-site, either on the buildings or within the curtilage of the site. Developers should design green infrastructure into their scheme at the initial design stage to ensure that the full consideration can be given to the type of vegetation that would be appropriate in the proposed location, including allowing sufficient space to enable the vegetation to reach maturity and whether there are any watering and daylight requirements.

5.1.34 For major housing led development projects developers are encouraged to build wildlife gardens as part of any show homes to promote wildlife gardening to prospective home owners and residents.

Mitigation

5.1.35 It is recommended that any Construction Management Plan includes a section on the protection of biodiversity. Construction should be planned to take the following into consideration to reduce the impact on biodiversity values:

- Timed to take place out of breeding seasons;
- Protective fencing around ecologically sensitive areas;
- Careful placement of construction huts and storage areas;
- Reducing vehicular movements in sensitive areas;
- Cover trenches overnight and the use of ramps to avoid trapping of terrestrial fauna;
- Keeping light, noise and human presence to a minimum in ecologically sensitive areas; and

- Protecting water courses and groundwater from pollution.

5.1.36 Where required, a Construction Management Plan may be required to be submitted at planning application stage and secured by condition.

5.1.37 Developers are expected to monitor sensitive receptors throughout construction to avoid damaging biodiversity values. For large and complex developments it is further expected that an ecologist will support and advise on the construction process.

5.1.38 Only in exceptional cases where the benefits of the proposal clearly outweigh the biodiversity impacts and when maintenance, restoration and enhancement options have been justifiably discounted the translocation of species will be considered. Translocation of species should be:

- As local as possible;
- Suitable to all species involved;
- Clear of competing species;
- Connected to other areas; and
- Subject to both medium and long term monitoring.

5.1.39 Land adjacent to watercourses is particularly valuable for wildlife and it is essential that such land is protected. Natural networks of linked corridors allow movement of species between suitable habitats. The [European Centre for River Restoration \(ECRR\)](#) provides guidance on enhancing and promoting river restoration and sustainable river management.

5.1.40 The Council will consult the Environment Agency on development proposals that directly affect the Borough's rivers and watercourses.

5.1.41 Royal Greenwich's natural river features and corridors should be protected, enhanced and restored by appropriate landscaping and design. SuDS designs can help to minimise pollution in urban runoff and improve water quality. For example, vegetation slows runoff and helps filter out pollutants and infiltration trenches also remove pollutants. The [Estuary Edges Guidance document](#), developed by the Thames Estuary Partnership, is a 'how to' guide on ecological design for soft natural riverbank edges to encourage wildlife on the Thames that developers are encouraged to refer to where relevant in their development proposals.

5.1.42 Water run-off from the urban environment washes chemicals, sediment and litter from pavements and roads, construction sites, industry and gardens into waterways. Increases in hard surfaces will increase the amount of run-off and climate change will increase the amount of extreme weather and flash flooding events.

5.1.43 Residential developments discharging domestic sewage should connect to the public foul sewer or combined sewer network.

5.1.44 To prevent groundwater and surface water located within or near construction and development sites from being contaminated, developers should ensure the following measures, as appropriate, are incorporated into the development from the outset to control pollution at source:

- oil separators;
- clear marking/signage of drainage stems;
- correcting wrong connections to the drainage systems;
- bunding of chemical, fuel and oil delivery storage areas; designating and bunding of areas for cleaning activities; and
- bunding of construction sites.

5.1.45 This type of pollution is one of the factors contributing to water bodies failing to achieve 'good status' under the Water Framework Directive.

5.1.46 Additionally, measures to prevent the spread of invasive species are particularly important for works near watercourses, during both development and subsequent maintenance. For more information on managing invasive species see paragraph 5.1.11.

Trees

5.1.47 Trees are of considerable value to the built and natural environment and make a significant contribution to the quality of life in Royal Greenwich. They can soften the visual impact of buildings, form valuable habitats for wildlife and also play an increasingly important role in improving air quality and reducing the harmful effects of climate change. Given their importance to the community and the environment, the Council seeks to ensure their retention wherever this is possible on development sites.

5.1.48 The potential effect of development on all trees is a material consideration irrespective of whether they are protected by a tree protection order, are within a conservation area status, or not.

5.1.49 It is essential that the design of development considers existing trees as well as the space trees require for growth. Where there is overriding justification to remove an existing tree there should be adequate replacement planting to compensate for the loss of the canopy cover.

5.1.50 Trees should be planted in an appropriate locations where they have enough space to grow and will not cause unwanted overshadowing. Root systems, stems and canopies, with allowance for future movement and growth, need to be taken into account in all projects, including those that do not require planning permission.

5.1.51 Developers should use British Standard 5837:2012 Trees in relation to design, demolition and construction - Recommendations, as guidance in respect of development sites on deciding which trees are appropriate for retention, on the effect of trees on design considerations, and on the means of protecting trees during development. This applies to applications for most developments where construction work is involved.

5.2 Living Roofs and Walls

5.2.1 Living roofs and living walls provide a range of benefits including:

- Supporting biodiversity by providing habitat to invertebrates (a food source for bats and birds);

- Reducing rainwater runoff and trapping pollutants;
- Improving insulation (heat and sound) and increasing energy efficiency;
- Providing local shade, cooling and amenity; and
- Improvements to appearance of the building.

5.2.2 The design for a living roof or living wall should follow the Green Roof Organisation Code of Practice (www.greenroofcode.co.uk) and take the following into account:

- Any species disruption or habitat loss arising from or likely to arise from the proposed development and/or the need for additional habitat creation in the local area;
- Whether there is an identified deficiency in local open space such as parks or community gardens;
- Whether the roof is overlooked by other nearby buildings to improve local amenity;
- Whether the site has any existing flooding or drainage issues that could cause maintenance problems;
- The amount of heat to be generated by the development and whether a living roof could help to ameliorate the effects of this;
- The location of any mechanical plant that would be incompatible with a living roof;
- The inclusion of any blank wall spaces that could accommodate climbing plants;
- Access to roofs and walls for maintenance; and
- The standards of the Green Roof Code of Practice available at <http://livingroofs.org/>

5.2.3 A diverse range of living roofs should be established within a development in old and new spaces for both recreation and biodiversity purposes. This can and should be in conjunction with renewable energy technology such as PV panels. The Environment Agency Green Roof Toolkit can be used to assist in the design of living roofs. The toolkit is available from www.gov.uk/government/organisations/environment-agency

5.2.4 There are broadly two kinds of living roof - green (vegetated), which can be intensive (e.g. a garden) or extensive (e.g. mosses, herbs, grasses), or brown (rubble-based with sparse vegetation).

- Extensive green roofs can be installed on a variety of roof slopes. For slopes greater than 9.5 degrees or 17% additional support structures will be needed to prevent slippage. For slopes greater than 30 degrees or 58% specialised media and retention structures will be necessary. The roof slope will impact water distribution on the roof and this should be taken into account during roof design and species selection.
- Intensive green roofs usually require substantial structural support and should have vegetation covering at least 70% of the area with at least 50% of the vegetation to be of known biodiversity value to native species. Intensive green roofs will vary in their design based on proposed use but in general should have a biodiverse substrate of between 120mm and 250mm.

- Brown roofs should be designed to mimic local brownfield sites with crushed brick or reclaimed concrete from the site provided it is not too heavy and can hold water for irrigation. Brown roofs can be planted or left to colonise naturally with areas of dead wood and/or perches for birds.

5.2.5 Extensive green living roofs should have:

- A substrate which is commercial brick-based aggregate or equivalent with a varied substrate depth of 80 -150mm;
- A saturated storage capacity of at least 29 litres per m²;
- At least 16 wildflower plugs per m²;
- A predominance of native herbs and wildflower species with a diverse range of ecological values in accordance with the Environment Agency Green Roof Toolkit (or it's successor). Priority should be given to species that are known to be present within 250 metres of the site; and
- Areas of bare shingle, sand, logs and logpiles.

5.2.6 Intensive green living roofs should be comprised of, but not necessarily limited to, the following:

- Soil and vegetation to cover a minimum of 70% of the green roof area for water attenuation purposes;
- A minimum of 25% of the vegetated area should be native species. Of the remaining vegetated area, a minimum of 50% should be of known wildlife value (rather than purely ornamental);
- An ecological management plan including the landscape features and a cross section of the roof; and
- An assessment of the effectiveness of the living roof as a source control mechanism and interceptor for a Sustainable Urban Drainage System (SUDS).

5.2.7 Brown roofs should comprise of the following:

- Comprise a base mixture of crushed brick or concrete aggregate from the original site graded from 25mm to dust;
- Contain a collection of larger aggregate items from 40 to 75mm and large boulders;
- Be contoured from heights of at least 5cm to 15cm;
- Have a gravel base and drainage points;
- Have a protective rubber membrane;
- Be allowed to colonise naturally (or allow for interspersed seed mix if appropriate);
- Consist of material from the site itself and allowed to sit on site during construction; and
- Mould dune sand and compacted crush brick and concrete in gentle slope formation.

5.2.8 For all living roofs developers are expected to submit the following specifications:

- A statement of design objectives;

- Proposed construction details comprising a scale plan and cross section (preferably at 1:20);
- A planting schedule outlining varieties, sizes, densities as well as the planting technique to be employed; and
- A management plan.

Living Walls

5.2.9 There are broadly two types of living wall - climbers, which may require support, and vertical systems.

- Appropriate species for living wall climbers that require support such as trellis or wires include honeysuckle, jasmine and wild clematis. Climber species such as Ivy, Russian Vine and Virginia Creeper do not require support and can grow directly on a wall surface.
- Vertical systems comprise modular panels on the side of a building to support plant growth with a feeding and watering system. The planting arrangement can be customised but the maintenance requirements are quite high.

5.2.10 The plants selected for living walls should provide one or more the following biodiversity benefits:

- Roosting and nesting opportunities for birds (e.g. Thick climbers);
- Nectar sources for insects (e.g. Late flowering varieties);
- Fruit for birds and insects; and
- Hibernation opportunities for insects.

Microclimate

5.2.11 Developers are expected to avoid the creation of adverse local climatic conditions for both nature and people. Some new developments, especially tall buildings, can have a marked effect on local climatic conditions, particularly on small urban wildlife sites.

5.2.12 The avoidance of such effects can be achieved by employing the following:

- Avoid the creation of wind tunnel effects;
- Avoid the creation of deep shadows, particularly over water bodies; and
- Improve local climatic conditions through the retention of natural vegetation and well designed landscaping.

Local Food Growing

5.2.13 Existing or established food growing spaces should be protected and space for individual or communal food growing should be provided, where possible and appropriate.

5.2.14 Local food growing can encompass a range of activities including back garden food growing, roof top gardening, education and health gardens, allotment cultivation and community gardening projects.

5.2.15 Landscape designs within developments that provide flexible open spaces which may be adapted for food growing to be undertaken in the future should take the following considerations into account at the design stage:

- safeguarding south facing spaces;
- the availability of water, incorporating rain water harvesting ;
- the loading capacity of green roofs and balconies;
- planting walls with espaliers or climbing plants;
- integrating edible plants with ornamental plants;
- proving planters that can be easily converted for food growing; and
- management.

5.2.16 Additionally, prior to designing a scheme's landscape or green infrastructure plan developers should investigate the demand and opportunities for providing food growing space on their site. Developers should contact [Capital Growth](#) to determine whether there is demand for food growing space in the vicinity of the application site. Where opportunities arise, especially where there is an organisation willing to manage and maintain the space, food growing space should be designed into the development proposal. For phased schemes this can be temporary growing space until that area of the site is developed or permanent space provided on the final developed site.

Materials

6.1 Environmental Impact

6.1.1 Developers should seek to use sustainable materials when constructing new developments. The following should be taken into account when selecting materials:

- Fitness for purpose;
- Ability to be de-constructed at the end of building's expected lifetime;
- The embodied energy from material processing and transportation; and
- Thermal mass potential (i.e. the ability to absorb and retain heat).

6.1.2 Developers are encouraged to maximise the use of recycled and reused materials during construction. Giving consideration to demolition at the design stage can lead to improved planning for the recovery of materials. The Waste & Resources Action Programme (WRAP) has devised a recycled content toolkit that should be used at the design stage to assess how use of recycled and reused materials can be maximised.

6.1.3 Developers should also consider the environmental impact of paints, insulation and materials for kitchens and landscaping. It is recommended that any materials containing or emitting toxic substances, such as volatile organic compounds (VOCs) or formaldehyde, are avoided as far as possible. Where possible non renewable materials and those from vulnerable habitats (e.g. limestone) should also be avoided in construction.

6.1.4 Off site construction should be considered for all development as it has significant advantages for developers (in terms of efficiency) and the environment (in terms of reduced waste). The following types for prefabrication should be considered:

- Light steel frames;
- Volumetric construction (e.g. pre-constructed pods assembled into a building onsite);
- Precast floors and walls; and
- Timber frames.

6.1.5 Haulage accounts for almost 20% of the embodied environmental impact from materials. Recycled steel and aggregates generally have less embodied energy than comparable virgin materials but the environmental impact of processing can still be high. Developers are encouraged to always seek local suppliers and sources in the first instance.

6.1.6 The financial and energy costs of purchasing new building materials and undergoing new construction wastes more resources than the adaptive reuse of existing buildings. Developers are encouraged to consider the reuse of buildings, where feasible, and where the original use is no longer required or appropriate.

Statutory Listed Buildings and Conservation Areas

6.1.7 Listed Building Consent is required for alterations which affect the architectural or historic interest and character of a listed building. Therefore, materials used in the alteration of statutory listed buildings will require listed building consent. Pre-application advice should be sought for most proposals prior to considering alterations.

6.1.8 Across Royal Greenwich there are 20 Conservation Areas which are designated for their special architectural and historic character and appearance. As such materials should preserve or enhance this character. Each area has a written conservation area appraisal which gives greater detail about the area's special interest and will include some analysis of the locally distinctive materials that are characteristic of each area. The Royal Borough's conservation area appraisals can be found at http://www.royalgreenwich.gov.uk/downloads/511/conservation_areas. Some of the Royal Borough's Conservation Areas are subject to Article 4 Directions where planning permission is required for minor alterations as certain permitted development rights are removed. Specific materials may be required in order to satisfy aesthetic requirements, the type of material and in particular the use of those with a low environmental impact should be discussed with Royal Greenwich's Planning Officers.

6.1.9 Further information on planning and heritage assets can be found in paragraph 3.1.15.

6.2 Sourcing

6.2.1 Developers are expected to describe in their planning application how and why materials have been selected. This should include the opportunities for sustainable sourcing, the options considered and reasons for the sourcing choices made. It should also be clear what materials can and are to be re-used in the development or elsewhere.

6.2.2 Under the Code for Sustainable Homes the Royal Borough expects developers to achieve an area weighted average of between A+ and B for the major building elements (roof, external walls, floor finishes, internal partitions and windows) in accordance with the Green Guide to Specification (available at www.bre.co.uk/greenguide).

6.2.3 The Royal Borough expects developers to specify materials from suppliers who participate in responsible sourcing schemes such as the BRE BES 6001:2008 Responsible Sourcing Standard. All timber should be sourced from schemes supported by the Central Point of Expertise for Timber Procurement such as the Forest Stewardship Council (FSC) accreditation. Timber used in developments should be independently verifiable as sustainable and legal. The most effective way of doing this is by using timber with a Chain of Custody (CoC) certification allowing the timber to be traced to its forest of origin.

Waste

7.1 Construction, Demolition and Excavation Waste

7.1.1 The principal objective of good practice minimisation and management of construction, demolition and excavation (CD&E) waste is to use materials more efficiently and to reduce the amount of waste requiring final disposal. The Waste Strategy for England (2007) identifies the construction sector as the largest single source of waste arising in England, producing 90 million tonnes of inert waste each year. According to the Draft London Plan, 10.4 million tonnes of CD&E waste was produced in 2008 in London alone.

Reprocessing Inert Construction, Demolition and Excavation (CD&E) Waste

7.1.2 Constructors should actively seek out opportunities for the reprocessing of inert CD&E waste, minimising the amount sent to landfill wherever possible and in doing so having environmental and financial benefits. The reprocessed aggregates can be used in a variety of developments such as in the sub-base for new roads.

7.1.3 Aggregates produced from inert waste should comply with the Waste Quality Protocol⁽¹⁾ prescribed by the Environment Agency. The Quality Protocol sets out end of waste criteria for the production and use of a product from a specific waste type.

7.1.4 Facilities should be employed for the storage of waste construction material which allow material suitable for recycling to be separated from waste materials to be disposed in a landfill site. Waste required to be sent to a landfill must be subject to the Duty of Care provisions.

Site Waste Management Plans

7.1.5 All construction projects are strongly recommended to have a site waste management plan (SWMP).

7.1.6 A SWMP should be in place prior to commencement of work. It is used to record how waste is reduced, reused, recycled and disposed of on a construction site by:

- Recording decisions taken to prevent waste through concept and design;
- Forecasting waste produced on site;
- Planning how to reduce, reuse and then recover the forecasted waste;
- Implementing and monitoring the planned activity; and
- Review the SWMP and record lessons learnt.

7.1.7 A SWMP is a non-mandatory requirement of Code for Sustainable Homes and demonstration of good practice can see a proposed scheme awarded further points. To demonstrate good practice the SWMP should include procedures and commitments for waste minimisation and diversion from landfill, and setting target benchmarks for resource efficiency in accordance with guidance from bodies such as the Department for Environment Food and Rural Affairs (DEFRA), and the Waste & Resources Action Programme (WRAP).

¹ Prepared by the Waste and Resources Action Programme (www.wrap.org.uk), the Highways Agency and the aggregates industry in conjunction with Environment Agency

7.1.8 The implementation of a good practice SWMP would see benefits such as less waste on-site, less waste to landfill, financial savings in waste handling charges and savings on waste management costs compared to landfill disposal.

7.1.9 Achieving effective delivery throughout a construction project requires adoption of the SWMP by clients, designers and contractors from the project outset. This should be clearly demonstrated to the Council within development planning applications.

7.2 Operational Waste

7.2.1 The following guidelines should be incorporated in all new developments in Royal Greenwich.

Transport of Waste

7.2.2 Where waste needs to be transported from a site, a range of transport modes should be considered in light of the availability of connections. Greenwich has 13km of river frontage and transporting waste by water or rail can have benefits over road transport in reduced air pollution and CO₂ emissions and off-setting road congestion.

Provision for Household Waste and Recycling Collection

Houses

Waste and recycling containers and quantities

7.2.3 Within the confines of the property it is necessary to provide sufficient storage for:-

- 1 x 240 litre wheeled bin for food and garden waste (compostable material);
- 1 x 240 litre blue-topped wheeled bin for mixed dry recyclables; and
- 1 x 240 litre wheelie bin for refuse.

7.2.4 Storage areas should be designed to accommodate the wheeled bins “side by side” and not “end to end”. This will allow residents to access all containers without having to wheel them out of the storage area.

Size of containers

7.2.5 The 240 litre wheeled bins have the following dimensions: Width 650 mm, Depth 800 mm and Height (with lid open) 1750 mm.

7.2.6 Where developments include terrace-linked properties, consideration must be given to building in storage facilities for three wheeled bins.

Flatted Accommodation

Waste & recycling containers and quantities

7.2.7 Communal storage chambers will need to be provided in the development to house containers based on the following:-

7.2.8 The first eight properties require three containers;

- 1 x 1,100 litre container for household waste;
- 1 x 1,100 litre container for mixed dry recyclables; and
- 1 x 500 litre container for organic waste.

7.2.9 Similarly, each additional eight properties will also require space for each type of waste container.

Size of containers

7.2.10 The 1,100 litre container for non-recyclable household waste has the following dimensions: Width 985mm, Height 1470mm and Length 1260mm

7.2.11 The 1,100 litre container for mixed dry recycling has the following dimensions: Width 985mm, Height 1470mm and Length 1260mm.

7.2.12 The 500 litre container for organic waste has the following dimensions: Width 985mm, Height 735mm and Length 1260mm.

Communal Storage Chambers

7.2.13 The chambers that house the containers need to be accessible and convenient to all households so that waste disposal and recycling does not become an effort for residents. Ideally they should be close to each residential block which should be accessed en route to or from the development's car park(s).

7.2.14 The doors need to be of a durable and hard wearing material as they will inevitably be knocked. Ideally they will need to open outwards rather than in to the chamber to allow maximum access and manoeuvring. The housing chamber should have a water supply, drainage and lighting.

7.2.15 It is also necessary to provide storage facilities for household bulky items such as old furniture and white goods. The size of this facility is dependant on the size of the development but it must be accessible for collection. This is important to avoid fly tipping on the public highway and will avoid clogging up the household waste and recycling chambers

Accessibility

7.2.16 Royal Greenwich requires that the walking distance from the container storage area to the refuse collection vehicle is no more than 15 metres.

7.2.17 The clearance height for a refuse collection vehicle is 3.7 metres (the length of the vehicle is 10.10 metres and the width is 2.90 metres).

7.2.18 Operatives require a safe collection area such as a lay by if access to the chambers is to be via a dual carriage or main, fast flowing road.

7.2.19 A dropped kerb or crossover will be required to move the containers from the chamber to the refuse collection vehicle as it is not good practice to wheel the full containers down kerbs and then back up again after emptying.

7.2.20 If access to the chambers is within a car park area or via internal estate roads, the size of the refuse collection vehicles (26 tonne gross vehicle weight) and their manoeuvrability and turning characteristics need to be taken into account. The wall to wall turning circle is 16.1 metres.

7.2.21 Access to the storage chambers must be at ground level and they should be sited in locations which do not require refuse operatives to wheel containers up/down steps or inclines.

Charges

Developers

7.2.22 It is the developers' responsibility to meet the costs of providing residents on new developments with the appropriate containers for household, mixed dry recycling and organic waste. Royal Greenwich requires from the developer payment in advance and prior to delivery.

7.2.23 Developers are advised to contact the Waste Services department at least 6 weeks before delivery of containers is required.

Management Companies

7.2.24 Where waste containers are hired from Royal Greenwich, there will be an annual hire charge for household waste containers which includes supply and maintenance of the containers.

General

7.2.25 Royal Greenwich would consider chutes in flatted accommodation, preferably two chutes, one for recycling and one for the remaining waste.

7.2.26 All new and future waste management requirements should be taken into account in new developments. Accordingly, applicants are encouraged to discuss with Waste Services any additional storage requirements that may be needed in the future around green waste, or any other newly recyclable commodity.

Provision for Non-Household Waste and Recycling Collection

7.2.27 For non-household developments such as offices, retail stores and restaurants, there needs to be sufficient waste container storage space to meet the anticipated waste output from the development. Containers should be stored in easily accessible locations and should be of a type suitable for the development. For example, a restaurant could expect to have additional need for organic waste containers while an office may have a higher proportion of dry recyclables.

Pollution

8.0.1 Pollution can be caused by a variety of activities and can have significant adverse impacts on the environment and the amenity of Royal Greenwich's residents. This SPD seeks to reduce pollution levels and provides guidance on how developers can achieve this.

8.0.2 This chapter covers:

- Contaminated land;
- Noise pollution; and
- Air pollution.

8.0.3 There are notable areas of contaminated land within Royal Greenwich. Section 8.1 sets out the process for investigating whether land is contaminated and guidance on remediation.

8.0.4 Section 8.2 sets out guidelines for when a noise assessment is expected and provides guidance on the attenuation of noise.

8.0.5 Air pollution is a serious issue for Royal Greenwich, section 8.3 provides guidance on the submission of air quality assessments and when they are required. It also covers the use of biomass and the reduction of odours.

8.1 Contaminated Land

Investigation

8.1.1 Development proposals on sites known or likely to have been in contaminative use in the past or for sensitive end uses, including housing, are expected to include a Preliminary Risk Assessment.

8.1.2 Where the Preliminary Risk Assessment has identified potentially unacceptable risks from contamination will be required. The Royal Borough expects that this work will include the following:

- An intrusive site investigation
- A quantitative risk assessment proposing remediation strategy options.

Remediation

8.1.3 Where the quantitative risk assessment identifies remediation is necessary, a remediation strategy shall be submitted to the Royal Borough for approval.

8.1.4 The Royal Borough supports sustainable remediation technologies. Any remediation strategy presented to the Royal Borough will be reviewed with regard to sustainability.

8.1.5 If any contamination is identified during development works that has not been considered in the Remediation Method Statement, then further remediation proposals for this material should be agreed with the Royal Borough and included in a revised Remediation Strategy.

8.1.6 On completion of remediation works a Validation Report must be submitted to the Royal Borough providing information on both the site investigations undertaken and remediation works completed, including the quality control of imported soils. This will be the final documentation kept on record for the development.

8.1.7 In assessing contamination, the developers should have regard to the following documents CLR II Model procedures for the management of land contamination – Environment Agency

<https://www.gov.uk/government/publications/managing-land-contamination>

<https://www.gov.uk/government/publications/managing-land-contamination> BS 10175:2011 Investigation of Potentially Contaminated Sites – British Standards Institution

www.britishstandard.org.uk/ A framework for assessing the sustainability of soil and groundwater remediation SuRF

http://www.claire.co.uk/index.php?option=com_phocadownload&view=file&id=61&Itemid=230

8.2 Noise Pollution

Assessment

8.2.1 New development should seek to reduce noise in noisy areas while not increasing noise in quiet areas. It will be necessary to establish the existing noise climate for the area by carrying out a baseline noise survey and determine, as a minimum, the background noise level (L_{A90}) for the area in question. It is recognised that it may not always be possible to achieve a reduction in or maintain the existing noise climate. Where this is the case, a development should implement all reasonably practical measures to avoid increasing noise levels.

8.2.2 A noise assessment is expected in the following circumstances:

- When a significant new noise source is introduced into an area. Details of noise levels of the development proposals that include plant or equipment should be submitted to the Royal Borough's Environmental Health Department to determine whether further noise assessment is required;
- When a new development is exposed to a significant existing noise climate, including new residential development adjacent to plant, processes or significant road, rail or road noise sources.

8.2.3 All noise assessments should be carried out by a suitably qualified acoustician. Noise assessments are expected to contain the following as a minimum:

- Details of the measurement / assessment of the existing noise climate in the area, prior to the proposed development, both during the day and at night. Noise sources such as road, rail, aircraft, commercial and industrial activities should be considered in any assessment.

- A prediction of the noise (and vibration) impact of demolition and construction activities on the surrounding area including any impact due to construction/demolition traffic in the vicinity of the site.
- Details of the likely noise impact of the proposed completed development on adjoining sensitive receptors.
- Details of the impact of the existing noise climate on the proposed development and on any future occupiers of the site.
- In carrying out any assessment regard should be had to current guidance including the National Planning Policy Framework 2012 (NPPF), BS 5228, BS 4142, BS 8223.

8.2.4 All residential units, including student units, are expected to achieve the guideline for internal noise level as per British Standard 8233:1999. New development proposals for residential units are expected to achieve 'good' internal noise levels as defined by BS 8233:1999.

Attenuation

8.2.5 Development should aim to maintain the existing noise climate and prevent 'ambient noise creep'. The Royal Borough expects that development will not cause the existing noise levels to increase when measured at one metre from the façade of the nearest noise sensitive premises.

8.2.6 Noise from plant or equipment such as air handling units, boilers, lifts and mechanical ventilation should be designed/selected (or attenuated) so that it is 10dB below the existing background level noise.

8.2.7 Noise impacts can be reduced through the design of buildings by ensuring that sources and receptors are appropriately separated and screened from each other. This could include positioning living rooms away from bedrooms in apartment blocks and windows and ventilation systems away from external sources of noise.

8.3 Air Pollution

Introduction

8.3.1 This SPD is a material planning consideration when determining applications for planning permission and forms part of the Local Development Framework.

8.3.2 In accordance, with the Environment Act 1995 and the Government's Air Quality Strategy, Royal Greenwich has designated the entire Borough as an Air Quality Management Area (AQMA) in 2001 and published an Air Quality Action Plan (AQAP) in 2002.

8.3.3 The AQAP contains initiatives to help reduce air pollution and work towards achieving the required air quality standards and objectives.

8.3.4 The primary aim of this SPD is to supplement existing UDP Policies which seek to improve air quality in the Borough. This SPD will also assist the implementation of objectives in the AQAP relating to land use.

Royal Borough of Greenwich's Air Quality Action Plan (AQAP)

8.3.5 The AQAP includes a number of initiatives to reduce vehicle emissions and include: graduated parking permits, expansion of the car club scheme, securing low levels of car parking for new developments and public transport improvements aimed at reducing traffic volumes and encouraging alternatives to the car, such as walking, cycling and public transport.

8.3.6 The AQAP also seeks to invest in alternative fuels and reduce emissions by requiring the uptake of the latest European standards (Euro Standards).

Air Quality and Climate Change

8.3.7 The Climate Change Act 2008 seeks to reduce greenhouse gas (GHG) emissions, such as carbon dioxide (CO₂).

8.3.8 As a result of the common sources of CO₂, NO_x, and particulate matter (PM_{2.5} and PM₁₀), measures which aim to tackle climate change and air quality are often likely to be mutually beneficial. However, the only exception is the combustion of diesel and biomass which emit more particulate matter and NO_x into the atmosphere.

8.3.9 Even when a proposal is expected to produce greater benefits in terms of CO₂ emissions the Royal Borough will not accept such proposals if they are likely to result in unacceptable levels of emissions of NO_x and particulate matter. In such cases preference will be given to non-emitting renewable technologies.

8.3.10 The Royal Borough supports measures which seek to improve air quality and reduce greenhouse gas emissions. For example, measures that result in energy efficiency and the inclusion of sustainable design in buildings; reducing energy demand; and requiring low emission strategies for transport.

Air Quality Assessment

8.3.11 An Air Quality Assessments will be required:

- a. for an application which requires an Environmental Impact Assessment (EIA).
- b. for any new development(s) proposed in existing areas where the air quality objective is exceeded within the current air quality management area, and where people would be exposed for significant periods of the day;
- c. where an installation requires a permit application under the Pollution Prevention and Control Regime;
- d. for proposals which significantly alter the composition of traffic such that adverse air quality impacts may arise; and
- e. for any other development proposal within or adjacent to an Air Quality Management Area (AQMA) and not listed above which may, in the professional opinion of the officer,

be significant in terms of air quality impact and/or may impact on the working measures detailed in the Air Quality Action Plan.

8.3.12 It is recommended that developers or their consultants seek the advice of the Royal Borough at an early stage and pre-agree datasets and methodologies prior to submission of a planning application. More information is given in Appendix A.

8.3.13 A detailed study of the effects of a development on air quality will normally be required **before the planning application is validated** for:

- Schemes which will be subject to Environmental Assessment under the Town and Country Planning (Environmental Impact Assessment) Regulations 1999.
- Schemes which require a permit application under the Pollution Prevention and Control (PPC) regime.
- Other schemes which Royal Greenwich considers may have a significant impact on air quality.

Schemes Subject to an Environmental Assessment

8.3.14 Where a scheme is subject to an Environmental Assessment under the Town and Country Planning (Environmental Impact Assessment) Regulations 1999, a detailed study of the effects of the development on air quality will normally be required.

8.3.15 An EIA is likely to be required where a development is likely to have “significant effects on the environment.” Guidance regarding the need for an EIA has been issued from the Royal Town Planning Institute and is available from the Royal Borough's Planning Department.

Schemes which Require a Permit Application Under the PPC Regime

8.3.16 These regulations came into force on 1 August 2000. They seek to control the environmental impacts of installations listed in Part A of Schedule 1 of the regulations.

8.3.17 If an installation also needs planning permission, the Royal Borough recommends that the operator should make both applications in parallel, wherever possible.

Other Proposals Where an Air Quality Assessment Should Normally be Undertaken

8.3.18 The London Councils Air Quality and Planning Guidance offers advice concerning those applications which will require an air quality assessment. Royal Greenwich endorses these criteria. The three main ways a development may have a significant impact are:

- If the development is likely to cause a deterioration in 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).

- If the demolition/construction phase will have a significant impact on the local environment (e.g. through fugitive dust and exhaust emissions).

8.3.19 Air Quality assessments should be carried out in accordance with the London Council's Air Quality and Planning Guidance.

8.3.20 The London-wide Best Practice Guide: 'The Control of Dust and Emissions from Construction and Demolition' provides guidance to help reduce emissions from the construction stage of a development.

Air Quality Monitoring

8.3.21 It is important that the monitoring data used in modelling is appropriate to the proposed development.

8.3.22 The monitoring site circumstances should be similar to those at the proposed development including: street orientation, traffic flow and mix and proximity to junctions or the pollution source.

8.3.23 Should the Royal Borough's monitoring data be used then a full justification of site comparability will be required. The prevailing weather conditions and local topography will strongly influence the dispersion of air pollutants or, in the case of secondary pollutants, affect their production in the atmosphere.

8.3.24 However, all proposed developments which involve introducing receptors to sites adjacent to pollution sources which exceed AQ guideline values may require pollutant monitoring to assist air quality impact assessments if no suitable and current data is available. Defra's LAQM Technical Guidance (TG09) should be referenced in this instance.

8.3.25 Site monitoring can be an essential component to accurate modelling as this can assist in determining actual concentrations at the proposal site which are a result of congestion and queueing on busy roads that is not accounted for in AQ modelling. Conversely, it may be found through monitoring that concentrations are not as high as anticipated.

8.3.26 It is important that monitoring locations are chosen which reflect relevant exposure. Proposed development plans should be used to assist in determining monitoring locations such as the position of habitable rooms.

8.3.27 If on-site pollution monitoring is proposed, the methodology and locations should be agreed with the Royal Borough and must follow Defra's LAQM Technical Guidance (TG09).

8.3.28 In instances when monitoring is not carried out for a full year, the results will need to be adjusted to an annual mean equivalent using the methodology described in the Technical Guidance, LAQM.TG(09). This will add to the uncertainty associated with any model verification and adjustment, and must be recognised in the report submitted.

Supplementary Traffic Data

8.3.29 Where a transport assessment (TA) has been prepared for a proposed development, modelled or predicted development traffic flows in the TA should generally be used as the basis for the calculation of 'with development' emissions and subsequent model runs.

8.3.30 Before an air quality assessment based on a TA is undertaken, the TA should be approved by the Royal Borough's transport planners. It is imperative that the most up to date TA is used so that the air quality assessment does not become obsolete.

8.3.31 Where the proposed development is likely to result in additional congested traffic conditions, the TA will need to provide sufficient information to quantify the times when queueing around junctions is likely to occur. Particular care should be taken in selecting appropriate traffic speeds.

Air Quality Modelling

8.3.32 Whichever model is chosen to model air quality at the site the input parameters of the model must always be up to date. It is essential that emission factors are current and that changes to assumptions on emission trends are recognised.

8.3.33 Where changes to the model need to be made to account for out of date input parameters then this must be fully explained and accounted for in the Air Quality Impact Assessment (AQIA) report.

8.3.34 For some developments, screening models may be acceptable to assess potential impacts. For larger and more complex developments, detailed dispersion modelling may be required with the potential for on-site monitoring also to be conducted (as per 8.3.24).

8.3.35 All input parameters and emission factors **must** be up to date when using screening models. In the event they are not then a dispersion model must be used.

8.3.36 Guidance on appropriate models to use to assess air quality impacts can be found in Environmental Protection UK's guidance document 'Development Control: Planning for Air Quality'.

Assess and Minimise Exposure to Poor Air Quality through Mitigation

8.3.37 Mitigation is generally required where a development is planned for a site that is directly adjacent to a busy main road, junction or industrial process. This is of particular concern if the development includes new sensitive receptors such as: care homes, hospitals, housing, schools and nurseries.

8.3.38 If major developments are planned in locations where air quality assessments predict likely exceedances of the Government's air quality objectives (or if additional negative air quality impacts from a new development are identified), developers will be expected to include proposals for the reduction/mitigation of these emissions in a detailed emissions assessment.

8.3.39 Mitigation measures that should be considered include design solutions such as layout and orientation, the use of low emission heating systems, mechanical ventilation systems, buffer zones in the form of vegetation/open space and smarter travel measures that support and encourage sustainable travel. Habitable rooms should be located on the side of buildings which are not directly adjacent to the main source of pollution.

8.3.40 Where possible, ventilation and the location of opening windows should be on the side of buildings where traffic / ambient pollution levels are lowest. This will help to minimise exposure of occupants to pollutants and the potential detrimental effects of poor air quality on health.

8.3.41 In taller buildings the residential uses should be located on the higher floors away from air pollution (and noise) at ground level, allowing for balconies and the opening of windows. The lower floors would be suitable for other uses, such as retail, commercial or offices, where mechanical ventilation or windows that cannot be opened might be more acceptable.

8.3.42 The location of the outside space is also an important consideration and any exposure to gardens and roof terraces should be screened and, where practicable, minimised through appropriate positioning and orientation.

8.3.43 Green roofs and walls are also encouraged in new development as they help reduce air pollution, provide natural cooling and additional insulation. The general provision of trees may also act as a buffer to roads with high air pollutant concentrations.

8.3.44 If ventilation systems are being considered then developments must be compliant with the carbon dioxide reduction targets outlined in Policy 4A.2 of the London Plan. Major developments should reduce potential overheating and reliance on air conditioning systems.

8.3.45 The impact of outdoor air pollution on indoor air quality and human health in new developments should be taken into account at the earliest stages of building design and this should be addressed in the emissions assessment.

Low Emission Strategies

8.3.46 Due to a greater intensity of use and/or the development of vacant sites, most new development is likely to contribute to the already elevated levels of air pollution in Royal Greenwich.

8.3.47 In this regard, any increase in air pollution, especially from new development, will contradict the requirements of the Royal Borough's AQAP. As a result of this, the Royal Borough is moving away from only considering air pollutant concentrations and towards requesting explicit emission reduction strategies. However, there may be circumstances, as set out in Appendix A, where an air quality assessment may still be required.

8.3.48 Developments should be designed to encourage and facilitate walking and cycling and the use of public transport. This will enable air pollutants deriving from a particular development to be minimised. It is expected that development proposals demonstrate that the minimum standard emission benchmarks for transport (as per the London Mayor's

Sustainable design and construction SPG) are adhered to. Car free developments are also encouraged. This will ensure development proposals align with policy set out in the London Plan, the Mayor's Air Quality Strategy and are 'Air Quality Neutral'.

Assessment of Biomass Boilers and Borough Requirements

8.3.49 When fuel is combusted in biomass boilers, NO_x and particulate air pollution are the products of the emissions of burning fuels.

8.3.50 The biomass boiler must be fitted with a ceramic filter to mitigate air pollutants otherwise other forms of 'non-combustible' renewable energy technologies are the preferred options.

8.3.51 Applicants will need to demonstrate that biomass units are better than other alternatives and provide a comparison of the carbon footprint as given within an Energy Assessment. The Greater London Authority's 'Sustainable Design and Construction: The London Plan Supplementary Planning Guidance' should be referred to.

8.3.52 The whole of Royal Greenwich has been declared an Air Quality Management Area due to breaching the air quality standards for particulates and strategic air pollutants in urban areas. Royal Greenwich is also a designated Smoke Control Area under the Clean Air Act 1993. In accordance with this legislation all biomass boilers operated in Royal Greenwich must be certified as 'exempt' appliances and boiler stack height must be calculated and approved.

8.3.53 Chimney height approval is required for appliance designed to burn fuel at a rate greater than 45.4kg per hour by the Royal Borough's Environmental Health service. The height of the boiler exhaust stack must be calculated in accordance with the Third Memorandum contained within the Clean Air Act 1993. An assessment also needs to be carried out using dispersion modelling software to demonstrate that predicted emissions and concentrations associated with the calculated stack height do not have a significant impact on the air quality objectives for NO₂ and PM₁₀. This assessment is essential in establishing whether or not the biomass plant will significantly affect air quality within the AQMA.

8.3.54 If an appliance is a non-domestic medium-sized boiler, it is required to have adequate arrestment equipment to prevent a number of pollutants from being emitted.

8.3.55 Applicants considering biomass plant for development will be requested to complete and submit a biomass boiler information request form and should refer to the guidance leaflet 'Biomass and Air Quality Information' by Environmental Protection UK (EPUK). The information request form will need to be completed and submitted to the local planning authority for approval.

Biomass and CHP Emission Standards

8.3.56 It is imperative that any proposal for biomass or CHP irrespective of whether gas or biofuel is used includes an assessment which adheres to the Greater London Authority's Sustainable Design and Construction SPD. This will ensure major development proposals

align with policy set out in the London Plan and the Mayor's Air Quality Strategy and are "Air Quality Neutral". Guidance issued by DCLG (Code for Sustainable Homes Cost Review, 2010) notes that individual gas boilers with NO_x emissions lower than 40 mg/kWh are now standard. Where individual and/or communal gas boilers are proposed to be installed in commercial and domestic buildings they should achieve a NO_x rating of <40 mg NO_x/kWh.

8.3.57 The Royal Borough will require all planning applicants proposing the use of biofuel and biomass-fuelled systems to submit a detailed air quality analysis, demonstrating that the heat generated from biomass is an effective alternative to conventional fuels and not in conflict with the Royal Borough's AQAP, the Clean Air Act and the London Plan.

8.3.58 The Royal Borough's Environmental Health service will consider the information submitted in accordance with the above to determine whether a biomass furnace is acceptable and whether any mitigation technologies will be required. The Royal Borough may use Section 106 obligations to set requirements for controlling emissions from biomass boilers.

The Royal Borough's Approach in Using Planning Conditions and S106 Agreements

8.3.59 Many planning permissions are granted subject to various planning conditions. Conditions are a useful tool to enhance the quality of a development and to ameliorate any adverse impacts that might otherwise follow from the development.

8.3.60 Section 106 of the Town and Country Planning Act 1990 allows the Royal Borough to enter into a legally-binding agreement or unilateral obligation.

8.3.61 Planning Obligations (known as Section 106 Agreements that are sometimes applicable to minor and major applications) are applicable to nearly all non-householder applications.

8.3.62 The Royal Borough's [Planning Obligations SPD](#) sets out the approach to formulae and standard charges towards applicable development. These calculated charges are quantitative indications of the level of contribution likely to be sought by a local planning authority, through a planning obligation, towards the provision of infrastructure that is necessitated by a new development.

8.3.63 The Planning Obligations SPD will be revised following the introduction of the forthcoming Community Infrastructure Levy (CIL) which will largely replace the existing system of Section 106 planning obligations.

8.3.64 Conditions and planning obligations seeking to improve air quality may take a number of forms and may require the consideration of, but are not limited to, the following issues:

Construction Phase:

- restricting certain types of vehicles; and

- setting emissions standards for vehicles used on site.

Operational Phase:

- requiring the developer to submit an emissions assessment and a site specific low emission strategy;
- measures to reduce emissions including implementation of travel plans and sustainable building design;
- restricting on site car parking provision, including the provision of parking permit free development;
- making provisions for alternative forms of transport, such as car clubs; electronic charging points for vehicles or contributions to public transport improvements; and
- making a standard one-off financial contribution to an air quality action fund

Cumulative Effects on Air Quality

8.3.65 When assessing the impact of a particular development on local air quality, the applicant will take into account the cumulative impacts of committed developments in the local area (i.e. proposals that have been granted planning permission at the time the assessment is undertaken) and any other proposals which planning officers consider are likely to proceed.

8.3.66 Owing to the incremental effect of each development on air quality and the difficulty in calculating cumulative effects of numerous developments, Royal Greenwich will require that applicants for planning permission for major development (as defined in the London Plan) demonstrate a reduction in the expected emissions from a development relative to its previous or current use.

Traffic Reduction and Low Emission Strategies

8.3.67 The Royal Borough may also require developers to reduce emissions from vehicles entering and leaving the development, which may be achieved through requiring all servicing contractor vehicles to meet certain Euro standards. This effectively creates a mini Low Emission Zone (LEZ) around the development. This will be secured through a S106 agreement.

Construction and Demolition

8.3.68 The dust and emissions from the construction and demolition of buildings has a significant impact on local air quality.

8.3.69 Whilst the planning system should not seek to duplicate the controls available under the environmental health Acts, there is obviously a close relationship between the granting of planning permission and the demolition and construction on site. The Royal Borough will expect that developers comply with the minimum standards on construction management, detailed in the London Councils' best practise guidance to Control Dust and Emissions from Construction and Demolition. The Institute of Air Quality Management also produces guidance on dust from construction sites <http://iaqm.co.uk/guidance/>

8.3.70 Additional measures to minimise emissions during the construction phase may also be required and could form part of a number of low emissions strategies. In this regard, S106 planning obligations may be used to ensure that construction sites meet various requirements for the control of dust and emissions from construction and demolition.

8.3.71 The Royal Borough is also currently considering the use of planning conditions, attached to planning approvals, to ensure that the applicant or landowner is a member of the Considerate Constructors Scheme.

Odour

8.3.72 In cases where the generation of odours from the development can be readily anticipated, the Royal Borough will require submission of objective evidence that demonstrates that the odour emissions have been fully addressed. In the case of small scale emissions (e.g. commercial kitchen ventilation systems), the evidence will demonstrate that odour emissions will be adequately controlled to prevent significant loss of amenity to neighbouring sensitive land uses. Typically this will be by submission of a detailed ventilation scheme incorporating high level discharge and additional odour abatement. Low level discharge will be discouraged.

8.3.73 For large processes and more significant odour discharges a detailed odour assessment will be required. The assessment will be required to model the impact of the new proposal compared to benchmarks.

8.3.74 The assessment will detail the following:

- Source description
- Odorous materials
- Containment/release point
- Odour description
- Intensity
- Pattern of release
- Risk of Abnormal Conditions
- Potential impact

8.3.75 The impact shall be expressed in odour units (ouE/m^3). The target for 98% of hourly values shall not exceed 1.5 odour units for highly offensive odours, 3 odour units for moderately offensive odours and 6 odour units for less offensive odours. The applicant must reach agreement with Royal Greenwich in determining the offensive character of the odour.

8.3.76 According to the Department for Environment, Food and Rural Affairs's 'Odour Guidance for Local Authorities' (March 2010), the European odour unit is *"that amount of odorant(s) that, when evaporated into 1 cubic meter of neutral gas at standard conditions elicits a physiological response response from a panel(detection threshold) equivalent to that elicited by one European Reference Odour Mass (EROM), evaporated in one cubic metre of neutral gas at standard conditions"*.

Flood Risk

9.0.1 Planning applications must demonstrate consideration of flood risks by preparing flood risk assessments, in line with guidance from the Environment Agency. This requirement is set out in the Government's policy on development and flood risk as stated in the National Planning Policy Framework (NPPF).

9.0.2 [The Strategic Flood Risk Assessment \(SFRA\) Report for the Royal Borough of Greenwich](#) highlights areas in Royal Greenwich that are at risk of flooding and is used by the Royal Borough to inform the level of flood risk for all planning applications. The SFRA includes guidance for developers with recommendations for mitigating against flood risk to be considered when undertaking future developments in the Royal Borough.

9.1 Flood Risk

9.1.1 Planning applications must demonstrate consideration of all flood risk as required in the Government's policy on development and flood risk as stated in the National Planning Policy Framework (NPPF). The Royal Borough has several key documents available for developers to make informed decisions and choices when preparing applications, these are:

- Strategic Flood Risk Assessment (SFRA)
- Preliminary Flood Risk Assessment (PFRA)
- Surface Water Management Plan (SWMP) available from Greenwich website
- Local Flood Risk Management Strategy (LFRMS), available late 2014
- Flood Risk Management Plan (FRMP)

9.1.2 An overarching document has been prepared specifically for developers who intend to work within Royal Greenwich, this is the Highways Developers Design Guidance Flood Risk chapter, this sets out how Flood Risk Assessments should be undertaken, the document also sets out evacuation plans, Ordinary Watercourse consents, and Sustainable Drainage Systems and clearly references all relevant documents developers need to consider.

Sustainable Drainage Systems (SuDS)

9.1.3 Sustainable Drainage Systems (SuDS) are drainage management techniques designed to reduce the rate of rainwater run-off and in effect the risk of flooding. They provide a more sustainable approach to managing water and aim to mimic the way water moves naturally in and around a green field site. SuDS differs from conventional drainage systems which are designed with a finite capacity, where rainwater runs quickly off hard surfaces, straight into drains and then into rivers, carrying pollution with it.

9.1.4 Development should utilise SuDS unless it can be demonstrated that there are practical reasons for not doing so. All developments should aim to achieve green field run-off rate, or ensure the site's pre-development run off rate is maintained, and ensure that surface water run-off is managed in line with SuDS principles as outlined in the SuDS Manual. The following list highlights possible solutions for managing surface water run-off:

- store rainwater for later use;
- use infiltration techniques;
- attenuate rainwater in ponds or open water features for gradual release;

- attenuate rainwater by storing in tanks or sealed water features for gradual release;
- discharge rainwater direct to a watercourse;
- discharge rainwater to a surface water sewer/drain; and
- discharge rainwater to the combined sewer.

9.1.5 Drainage should be designed and implemented in ways that deliver other policy objectives set out in other planning documents, including water use efficiency and quality, biodiversity and amenity.

9.1.6 The benefits of SuDS over conventional drainage systems include:

- **Reduced flood risk** – SuDS slow down the flow of rainwater from a site by filtering and storing it. This reduces pressure on the existing drainage system. A well designed system can increase the capacity of the drainage system which can reduce the risk of flooding.
- **Improved water quality** – SuDS features such as green roofs and permeable paving filter and clean rainwater on site helping to reduce the risk of pollution via surface water run-off which subsequently enters London's rivers.
- **Benefits for people and wildlife** – SuDS creates opportunities for rainwater recycling and for creating both attractive water features and soft landscaping which can support and enhance biodiversity in the local environment.
- **Health and well-being** – SuDS and other green infrastructure can contribute to both a reduction in air pollution and assist in reducing the Urban Heat Island Effect in urban environments.

9.1.7 When considering SuDS for a development many techniques will be appropriate. These are highlighted in the Urban chapter of the SuDS Manual and the Royal Borough's Highways Developers Design Guidance, SuDS chapter. However any development should consider the following techniques from the outset:

- Rainwater harvesting (i.e. from water butts);
- Living roofs;
- Ponds and wetlands;
- Soakaways, swales, Rain Gardens and Bio-Retention (vegetated landscape features)
- Filter strips;
- Permeable and porous surfaced areas; and
- Tanks and storm cells.

9.1.8 To ensure maintenance of SuDS, responsibility for their maintenance will be determined at the planning application stage, or if in place by the SuDS approval body (SAB).

9.1.9 More information about SuDS, including free guidance and case studies, can be found at www.susdrain.org.

Air Quality Assessment Report

A.0.1 This SPD includes (but is not limited to) prescribed methods for developments where an assessment is required. It is important that datasets and appropriate methodologies are agreed with the Royal Borough before this work is undertaken. As new methodology and technology arises and should government legislation and policy change these should also be incorporated into assessments.

A.0.2 The basis of assessments will be to compare the existing situation with that following completion of the development. Three basic steps are required:

- Assess the existing air quality (baseline);
- Predict future air quality without the development (future baseline); and
- Predict future air quality with the development (with development).

Air quality assessment reports will normally be required to detail the following:

A.0.3 - Details of proposed development, including the following;

- d. An overview of the development proposal;
- e. Identification of on-site sources of pollutants;
- f. An overview of expected traffic changes or changes in emissions from the site for a specified year; and
- g. Identification of local receptors including residential properties, other sensitive properties, ecologically sensitive areas and any specific locations where people are likely to be exposed for the appropriate averaging time (dependant on the air quality objective being assessed against).
- h. Evidence of a site visit and assessment of local issues (as discussed above);
- i. Set out the relevant air quality standards and objectives (these would normally be UK Air Quality Objectives and/or EU Air Quality Limit Values);
- j. An overview of the development proposal in the context of any local air quality issues (e.g. within an AQMA or area undergoing a Detailed Assessment), a review of the most recent Updating and Screening or Progress Reports or other Review and Assessment reports published by Royal Greenwich is therefore essential;
- k. A justification of which pollutants require an assessment and set out the assessment methodology, including the following local input data and assumptions;
 - i. Traffic data used in the assessment;
 - ii. Emission data (point source and road traffic);
 - iii. Meteorological data;
 - iv. Baseline pollutant concentrations;
 - v. Choice of baseline year and whether it is a low, typical or high pollution year
 - vi. Examination of any available long-term local air quality monitoring data for trend;
 - vii. Justification of monitoring data used in the model; if the Royal Borough's monitoring data be used then a full justification of site comparability will be required taking into consideration street orientation, incline, traffic flow, proximity to crossings and junctions;
 - viii. Ensure that the average traffic speed is representative of the actual road. Check the LAEI data;

- ix. NO_x:NO₂ relationship used; and
- x. Other relevant input parameters used.

l. Full justification and sufficient detail of how the modelling was carried out

A.0.4 - Set out the results and provide a summary, including the following as a minimum:

- d. Details of the model verification including a comparison of predicted versus measured concentrations used to derive adjustment factors to account of systematic errors;
- e. Impacts of the construction phase of the development at local receptor locations;
- f. Impacts that changes in emissions will have on ambient air quality at local receptor locations;
- g. Any exceedances of the air quality objectives brought about by the development, or any worsening of a current breach (including their geographical extent); and
- h. Whether any measures or actions specified in an Air Quality Action Plan will be directly compromised or rendered inoperative by the development proposal.

A.0.5 - In some cases the following additional information may be required:

- d. Source apportionment (the contribution of specific sources and vehicle classes to the overall contribution);
- e. Longer-term air quality predictions (e.g. an assessment for 2010 air quality objectives and against EU Limit Values);
- f. A wider/more detailed assessment scope which takes into account other permitted major development proposal(s) in the same area; and
- g. Consideration of potential impact upon neighbouring local authorities;
- h. Set out the significance of the results; and
- i. Details of Mitigation Measures – where identified as necessary, information of the mitigation measures planned to cut emissions during construction/ demolition and the operational phase of developments should be included in the assessment. Examples of measures include:
 - i. Minimising the number of parking spaces;
 - ii. Implementing Travel Plans which cover issues such as:
 - iii. safe pedestrian routes;
 - iv. secure cycle parking and changing facilities;
 - v. facilities for public transport, such as bus stops and lay-bys;
 - vi. the management and use of parking spaces;
 - vii. the provision of information on public transport, walking and cycling access to the site; and Encouraging use of vehicles that run on clean fuels (e.g. by including vehicle recharging points);

A.0.6 While the focus of this guidance is on residential mixed use developments and developments giving rise to increased traffic, air quality assessments will also be required for industrial developments where installations will need to be permitted under the Environmental Permitting Regulations (England and Wales; PPC Regulations) and for major road schemes.

Policy Context

Energy

National Planning Policy

B.0.1 The National Planning Policy Framework (NPPF) promotes resource and energy efficient buildings, decentralised energy generation and the use of small scale renewable and low carbon energy schemes.

London Plan 2011

B.0.2 In accordance with Policy 5.2 development proposals should make the fullest contribution to minimising carbon dioxide emissions in accordance with the following energy hierarchy:

- Be Lean: Use less energy
- Be Clean: Supply energy efficiently
- Be Green: Use renewable energy

B.0.3 The London Plan sets targets for carbon dioxide emissions reduction in buildings (refer to the London Plan for further details). Major development proposals should include a detailed Energy Assessment to demonstrate how the minimum targets for carbon dioxide emissions reduction are to be met within the framework of the energy hierarchy. Policy 5.2 sets out the minimum level of detail to be included in an Energy Assessment.

B.0.4 Policy 5.2 states that the carbon dioxide reduction targets should be met onsite. Where it is demonstrated that this cannot be fully achieved, any shortfall may be provided offsite or through a cash in lieu contribution to the Borough to be ring fenced to secure delivery of carbon dioxide savings elsewhere.

B.0.5 Policy 5.7 presumes that all major development proposals will seek to reduce carbon dioxide emissions by at least 20% through the use of on-site renewable energy generation wherever feasible.

B.0.6 In accordance with Policy 5.9 major development proposals should reduce potential overheating and reliance on air conditioning systems and demonstrate this in accordance with the cooling hierarchy which is set out in the Policy.

B.0.7 New development in London should also be designed to avoid the need for energy intensive air conditioning systems as much as possible.

B.0.8 The Mayor expects 25% of the heat and power used in London to be generated through the use of localised decentralised energy systems by 2025. To achieve this target the Mayor prioritises the decentralised heating and cooling networks at the development and area wide level, as well as larger scale heat transmission networks. In accordance with Policy 5.6 development proposals should evaluate the feasibility of Combined Heat and Power (CHP) systems, and where a new CHP system is appropriate also examine opportunities to extend the system beyond the site boundary to adjacent sites. Major development proposals should select energy systems in accordance with the following hierarchy:

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

B.0.9 The Mayor seeks to increase the proportion of energy generated from renewable sources, and sets minimum targets for installed renewable energy capacity for London. In accordance with policy 5.7 within the framework of the energy hierarchy, major development proposals should provide a reduction in carbon dioxide emissions through the use of onsite renewable energy generation, where feasible. All renewable energy systems should be located and designed to minimise any potential adverse impacts on biodiversity, the natural environment and historical assets.

Royal Greenwich Local Plan: Core Strategy with Detailed Policies

B.0.10 Policy EI requires all major developments to submit an Energy Assessment and states that carbon emissions will be reduced in line with the energy hierarchy by:

- i. Requiring all development to reduce demand for energy through its design;
- ii. Requiring all developments, with a gross floor area greater than 500sqm, or residential developments of five or more units, to connect to an existing decentralised energy network. Where this is not available a site wide decentralised energy network is required. Where it is demonstrated that a site wide decentralised energy network is unfeasible and or unviable developments will be required to provide sufficient infrastructure to enable a connection to a decentralised energy network for immediate or future use; and
- iii. Supporting the incorporation of renewable energy generation within development proposals.

B.0.11 Policy DHI expects development proposals to maximise energy conservation through effective layout, orientation, use of appropriate materials, detailing and landscape design.

B.0.12 Policy DHI also expects non-residential buildings in major developments to achieve BREEAM rating of 'Excellent'.

B.0.13 Policy H5 expects all new residential development within the Borough to achieve Code for Sustainable Homes level 4 as a minimum. For domestic refurbishment the BREEAM "Excellent" rating is required.

Climate Change Strategy

B.0.14 The Strategy encourages new developments to use passive solar design features to reduce heat impacts and the energy needed to provide heating and lighting.

The Strategy promotes the move towards the generation of heat and power through community heating, combined heat and power or combined cooling and the establishment of a heat and power network.

London Mayor's Sustainable Design and Construction SPG

B.0.15 Guidance is provided on preparing energy demand assessments; using less energy, including through both passive and active design measures; planning for, using or installing an efficient energy supply, including developing energy master plans; planning for and installing renewable energy; carbon dioxide off-setting; retrofitting energy measures.

Water

National Planning Policy

B.0.16 In accordance with the NPPF local authorities should promote the sustainable use of water resources.

London Plan 2011

B.0.17 In accordance with Policy 5.15 development should minimise the use of treated water by incorporating water saving measures and equipment and meeting water consumption targets of 105 litres per day in residential development. Policy 5.15 also states that new development for sustainable water supply infrastructure will be supported.

Local Plan: Core Strategy with Detailed Policies

B.0.18 The Local Plan seeks to reduce water consumption in Royal Greenwich. In accordance with Policy DHI development proposals will be expected to demonstrate water efficiency and demand management measures.

Climate Change Strategy

B.0.19 The Strategy expects all development to install water efficient fittings and encourages the use of rainwater harvesting techniques on a site-wide basis through SUDS as far as possible as a substitute for mains water.

Code for Sustainable Homes

B.0.20 In line with the mandatory elements of the Code for Sustainable Homes residential development schemes should be designed to ensure that no more than 80 litres of water is consumed per person per day.

Flood Risk

National Planning Policy

B.0.21 In accordance with the NPPF inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere.

London Plan 2011

B.0.22 In accordance with Policy 5.12 development proposals must have regard to measures proposed in the Environment Agency's Thames Estuary 2100.

B.0.23 In accordance with Policy 5.13 Sustainable Drainage requires that developments should use sustainable drainage systems (SUDS) unless there are practical reasons for not doing so, and should aim to achieve green field run-off rates and ensure that surface water run-off is managed as close to its source as possible.

Local Plan: Core Strategy with Detailed Policies

B.0.24 Policy DH1 states that development proposals should be of a high quality of design and will be expected to demonstrate measures that reduce surface water flood risk.

B.0.25 Policy E2 states that Royal Greenwich's Strategic Flood Risk Assessment should be used to inform development and reduce flood risk in the Borough.

B.0.26 In addition to the measures within policy E2, development within those areas protected by flood defences but with a high residual risk classification should implement risk reduction measures with the primary aim of reducing risk to life.

Climate Change Strategy

B.0.27 The Strategy expects the design and construction all new developments in Royal Greenwich to incorporate measures for adapting to the impacts of climate change, including flooding.

B.0.28 SUDS are required in all new developments to manage surface water run-off into waterways that could result in severe flooding. Developers are expected to carry out SUDS site surveys to determine which SUDS technique is best suited for the site.

London Mayor's Housing SPG

B.0.29 Where development is permitted in an area at risk of flooding, it should incorporate flood resilient design.

B.0.30 New development should adhere to standards for surface water run-off as set out in the Code for Sustainable Homes. Surface water run-off is to be managed as close to source as possible. A SUDS hierarchy is provided.

B.0.31 The SPG states that new development should incorporate SUDS and green roofs where available.

London Mayor's Sustainable Design and Construction SPG

B.0.32 The SPG gives guidance on surface water flooding; sustainable drainage; flooding and the resilience and resistance of buildings; safety; flooding and basement developments; flood defences; flood risk management from tidal and fluvial flooding; and other sources of flooding.

Biodiversity

National Planning Policy

B.0.33 The NPPF encourages planning system to minimise impacts on biodiversity and provide net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures; maintain and enhance, restore and add to biodiversity and geological conservation interests and promote opportunities for the incorporation of beneficial biodiversity and geological features within the design of development.

London Plan 2011

B.0.34 Policy 5.3 states that major development proposals should meet the minimum standards outlined in the Mayor's Supplementary Planning Guidance on Sustainable Design and Construction. The standards include measures to achieve sustainable design principles including promoting and protecting biodiversity and green infrastructure.

B.0.35 In accordance with Policy 7.19 Development Proposals should, wherever possible, make a positive contribution to the protection, promotion and management of biodiversity. Development proposals should also prioritise assisting in achieving targets in Biodiversity Action Plans and/or improving access to nature in areas deficient in accessible wildlife sites.

B.0.36 With regards to the Blue Ribbon Network (Policy 7.28) development should increase habitat value and development which reduces biodiversity should be refused.

B.0.37 In accordance with Policy 5.11 major development proposals should be designed to include roof, wall and site planting, especially green roofs and walls where feasible.

Local Plan: Core Strategy with Detailed Policies

B.0.38 The Local Plan (Policy OS4) seeks to protect, restore and enhance biodiversity and geodiversity, in particular Sites of Special Scientific Interest (SSSIs), Sites of Importance for Nature Conservation (SINCs), Local Nature Reserves (LNRs), Regionally Important Geological and Geomorphological Sites (RIGs), Locally Important Geological and Geomorphological Sites (LIGs) and the priority and species and habitats identified in the Greenwich Biodiversity Action Plan (BAP).

B.0.39 When considering the design of a development Policy DHI expects the development proposal to enhance biodiversity consistent with the Greenwich Biodiversity Action Plan.

B.0.40 Policy OS(f) expects development proposals to take account of ecological factors, including paying attention to the need for a survey of flora and fauna on Sites of Importance for Nature Conservation and on sites over one hectare and an appropriate level of survey to enable decisions to be made about the existing trees on the site.

London Mayor's Housing SPG

B.0.41 The design and layout of new residential development should avoid areas of ecological value and seek to enhance the ecological capital of the area in accordance with GLA best practise guidance on biodiversity and nature conservation.

London Mayor's Sustainable Design and Construction SPG

B.0.42 In accordance with London Plan Policy 7.19 developers should adhere to the following hierarchy when considering biodiversity on their development site:

1. avoid adverse impact to the biodiversity interest
2. minimise impact and seek mitigation
3. only in exceptional cases where the benefits of the proposal clearly outweigh the biodiversity impacts, seek appropriate compensation

B.0.43 In addition to following the hierarchy described above new habitat provision should be provided as part of a development's urban greening measures. The potential to increase biodiversity in public realm improvements should be maximised.

Materials

London Plan 2011

B.0.44 Policy 5.3 in the Draft London Plan states that Major development proposals should meet the minimum standards outlined in the Mayor's Supplementary Planning Guidance on Sustainable Design and Construction, this includes measures to achieve sustainable procurement of materials and the use of local supplies where feasible. Supporting paragraph 5.25 states that where practicable materials with a high embodied energy should be avoided.

B.0.45 In accordance with Policy 5.9 major development proposals should demonstrate how the design, materials, construction and operation of the development would minimise overheating and also meet its cooling needs.

Local Plan: Core Strategy with Detailed Policies

B.0.46 Policy DHI Design in the Local Plan supports high quality design. Development proposals are expected to provide a positive relationship between the proposed and existing urban context by taking account of the quality and nature of materials, both traditional and modern. Development proposals are also expected to maximise energy conservation through use of appropriate materials and obtain building materials from sustainable sources.

London Mayor's Housing SPG

B.0.47 The SPG states that all new residential development should meet the CfSH level 4 with regard to using materials with low environmental impacts over their life cycle. Good practice standard 6.5.1 refers to CfSH standard Mat1 which requires that at least 80% of assessed building elements are legally sourced in order to achieve credits.

London Mayor's Sustainable Design and Construction SPG

B.0.48 Developers are encouraged to limit the environmental impact of their developments by selecting construction materials that are the least resource intensive, by sustainable use of existing materials before considering introducing new materials. This can be done by managing existing resources; Specifying materials using the Building Research Establishment's Green Guide to Specification; Ensuring that materials are responsibly sourced; Sourcing materials from local sources; Minimising the harmful effects of some materials on human health; and Ensuring that specified materials are robust and sensitive to the building type and age.

Waste

National Planning Policy

B.0.49 PPS10: Planning for Sustainable Waste Management states that planning authorities should ensure that new development makes sufficient provision for waste management and promote designs and layouts that secure the integration of waste management facilities without adverse impact on the street scene or, in less developed areas, the local landscape.

B.0.50 PPS10 supports the use of the Waste Hierarchy:

1. Reduce the generation of waste - *reduction*
2. Reuse products and materials for the same or for a different purpose - *re-use*
3. Resources can often be recovered from waste - *recycling and composting*
4. Value can also be recovered by generating energy from waste - *energy recovery*
5. Only if none of the above offer an appropriate solution should waste be *disposed of*

London Plan 2011

B.0.51 According to Policy 5.3, major development proposals should clearly demonstrate in a design and access statement that it meets the minimum standards outlined in the Mayor's Supplementary Planning Guidance. The standards follow a range of sustainable design principles, including:

- Minimise, reuse and recycle demolition waste
- Specify use of reused or recycled construction materials
- Provide facilities to recycle or compost at least 35% of household waste by means of separated dedicated storage space
- Recycling facilities should be as easy to access as waste facilities

B.0.52 Policy 5.16 sets out how London will work towards achieving waste self-sufficiency, including having levels exceeding 95 per cent for recycling and reuse of construction, demolition and excavation (CD&E) waste by 2020.

Local Plan: Core Strategy with Detailed Policies

B.0.53 In Policy DH1, proposals will be expected to demonstrate on-site waste management including evidence of waste reduction, use of recycled materials and dedicated recyclable waste storage space.

B.0.54 Policy H5 states that Royal Greenwich will consider waste recycling when assessing proposals for housing developments. The policy emphasises the minimisation of waste production, the reuse and recycling of waste materials and the disposal of waste in an environmentally responsible way.

London Mayor's Housing SPG

B.0.55 Communal refuse and recycling containers, communal bin enclosures and refuse stores should be accessible to all residents including children and wheelchair users, and located on a hard, level surface. The location should satisfy local requirements for waste collection and should achieve full credits under the Code for Sustainable Homes Technical Guide. Refuse stores within buildings should be located to limit the nuisance caused by noise and smells and provided with means for cleaning.

B.0.56 Storage facilities for waste and recycling containers should be provided in accordance with the Code for Sustainable Homes Technical Guide and local authority requirements.

London Mayor's Sustainable Design and Construction SPG

B.0.57 Developers are encouraged to reduce waste from the outset at the design stage and by purchasing pre-used materials and monitoring over supply. Where demolition is necessary developers should optimise the re-use and recycling of materials.

Pollution (Air Quality, Noise and Contaminated Land)

Local Plan: Core Strategy with Detailed Policies

Policy E(c) Air Pollution

B.0.58 Development states that proposals with the potential to result in any significant impact on air quality will be resisted unless appropriate measures to minimise the impact of air pollutants are included. Such planning applications should be accompanied by an assessment of the likely impact of the development on air quality.

B.0.59 All new developments with a floor space greater than 500sqm or residential developments of 10 or more units are required to reduce carbon dioxide (CO₂), particulate matter (PM10) and nitrogen dioxide (NO₂) emissions from transport through the use of measures set out in DEFRA guidance 'Low Emission Strategies: using the planning system to reduce transport emissions Good Practice Guidance – January 2010'.

B.0.60 Requires that residential development proposals within areas that are currently exposed to air quality concentrations above the National Air Quality (NAQS) Objectives for particulate matter (PM₁₀) and nitrogen dioxide (NO₂) should take into account the need to reduce exposure by the following design mitigation hierarchy:

- i. Separation by distance;
- ii. External layout; and
- iii. Internal layout.

B.0.61 Circumstances where the impacts of a development on air quality are considered "unacceptable" and therefore air quality is likely to be a significant material consideration are listed below:

- the application is in conflict with the Borough's AQAP;
- the application would render some elements of the AQAP unworkable; and
- the application will result in increases in emissions of key pollutants from the development compared to emissions of previous or current use.

B.0.62 Policy H5 Housing Design

B.0.63 New residential development, redevelopment, refurbishment or conversions will be expected to achieve a high quality of housing design and integrated environment. Royal Greenwich will take into account the key relationships between the character of the area, site location and housing densities and expects at least Code level 4 for new build and BREEAM "excellent" for domestic refurbishment.

B.0.64 Policy IM4 –Sustainable Travel

B.0.65 Royal Greenwich supports the development of an integrated and sustainable transport system that is extensive in coverage and meets the needs of residents, businesses, workers and visitors in the Borough. All development in the Borough should help with accessibility, safety and the use of public transport, reducing the use of the private car.

B.0.66 Cycling and walking will be promoted within the Borough. The needs of pedestrians, including those with disabilities, and cyclists should be prioritised in development and the design and layout of development should reflect this. High standards of safety, accessibility and convenience will be encouraged.

B.0.67 Existing footpaths and cycleways, including the existing riverside and Thames paths, will be safeguarded and the development of new and improved footpaths and cycleways will be supported. Developments along the riverside should ensure that they incorporate the provision for a riverside walkway and contribute to improvements to this where it is required.

B.0.68 Policy IM(c) Parking Standards

B.0.69 Developments, including redevelopments and change of use, must not go above those maximum parking standards set out in the London Plan and, where appropriate, should go below these. Residential developments must provide a maximum of one space per unit.

B.0.70 Developments must provide the minimum level of car parking provision necessary, for people with disabilities, servicing, taxi and coach facilities as set out in the Draft London Plan.

B.0.71 Developments in appropriate locations in town centres and Controlled Parking Zones, and where they are supported by a high level of public transport accessibility should be car free. Development in areas of on-street parking stress should be ‘car-capped.’ For car capped developments, Royal Greenwich will limit on-site car parking to spaces designated for disabled people any operational or servicing needs, and spaces designated for the occupiers of development specified as car capped;

- not issue on-street parking permits; and
- use a legal agreement to ensure that future occupants are aware they are not entitled to on-street parking permits.

B.0.72 Royal Greenwich will also strongly encourage contributions to car clubs and pool car schemes in place of private parking in new developments across the Borough and seek the provision of electric charging points as part of any car parking provision, following the minimum standards set out in the Draft London Plan. Developments must meet, as a minimum, the standards for cycle parking as set out in the London Plan.

London Plan 2011

B.0.73 The London Plan 2011 Policy 7.14 Improving air quality: Development proposals should:

B.0.74 “ promote sustainable design and construction to reduce emissions from the demolition and construction of buildings following the best practise guidance in the GLA and London Councils’ The control of dust and emissions from construction and demolition’

B.0.75 where biomass boilers are included, set out a detailed air quality assessment comparing forecast pollutant concentrations with that of a conventional gas boiler. Permission should only be granted if adverse impacts from the biomass boiler relative to the use of a conventional gas boiler are identified

B.0.76 aim to be ‘air quality neutral’ and not lead to further deterioration of existing poor air quality (such as areas designated as Air Quality Management Areas). Offsetting should be used to ameliorate negative impacts associated with development proposals. Increased exposure to existing poor air quality should be minimised”

Air Quality Neutral (AQN)

B.0.77 New developments are required to be air quality neutral. The draft London Mayor's Sustainable Design and Construction SPG sets out in Appendix 5 "Air Quality Neutral" Emissions benchmarks.

The London Councils’ Air Quality and Planning Guidance (revised January 2010)

B.0.78 This guidance is the primary source for developers and their consultants to refer to. It provides technical advice on how to deal with planning applications that may have an impact on air quality.

Development Control: Planning For Air Quality (2010 Update) Environmental Protection UK

B.0.79 This is another source of guidance. However, the Magnitudes of Change (Table 4 p. 18) from EPUK guidance should not be used. Contrary to the values given in the EPUK document the Royal Borough considers 0.6 µg/m³ to be a substantial change in pollutant concentration and is the trigger value for revision or mitigation within a proposed scheme. This is a consequence of pollution creep from London’s continuing population growth and construction to meet this demand, resulting in high background NO_x levels in London. Any changes to limit values after the publication of this document must be taken into consideration when assessments of air quality are undertaken.

B.0.80 The following revised table should be used:

Magnitude of Change	Annual Mean
Large	Greater than or equal to 1.0 µg/m ³
Medium	0.6 – 0.99 µg/m ³
Small	0.3 – 0.59 µg/m ³
Interceptible	0 – 0.29 µg/m ³

Table B.0.1 Magnitudes of Change

B.0.81 When conducting predictive modelling where the resulting predicted concentrations at the locations modelled are greater than or equal to $39 \mu\text{g}/\text{m}^3$ for NO_2 and $29 \mu\text{g}/\text{m}^3$ for PM_{10} , then the proposed scheme will need to be revised. Care should be taken in determining if the level of vehicles at the proposed development will impact access roads and road networks.

The Control of Dust and Emissions from Construction and Demolition – Best Practise Guide, Greater London Authority (2013 Update)

B.0.82 This guidance provides a consistent approach across London to controlling dust and emissions from construction and demolition and is designed to be used by developers, architects, environmental consultants, and any other relevant parties concerned with the demolition and construction of new developments.

B.0.83 This guidance follows a hierarchy to control emission of dust and other emissions and reduce human exposure, namely: 1. Prevention; 2. Suppression; and 3. Containment.

Biomass and CHP Emission Standards, Greater London Authority (2013)

B.0.84 The guidance covers a number of combustion plant and abatement plant and several available techniques which further reduce emissions from modern biomass and CHP plant.

B.0.85 It is imperative that this guidance is adhered to with respect to proposed biomass or CHP plant.

B.0.86 Promotion of technologies in order to achieve challenging CO_2 targets must not be at the expense of equally important air quality standards. The standards expressed within guidance document use different units and therefore care should be taken when applying this guidance to ensure that the correct units are used.

The Mayor of London’s Air Quality Strategy (MAQS; 2010)

B.0.87 The MAQS outlines the specific air quality concerns and planning constraints in London and provides a holistic approach to improving air quality.

B.0.88 This strategy seeks to identify the main areas in which emissions should be reduced, namely road traffic, individual vehicles, air travel, reducing emissions through sustainable building design and reducing pollution from industry and construction.

The Mayor of London’s Energy Strategy

B.0.89 This is a non-statutory document which sets out the Mayor’s vision for improving the energy efficiency of London’s building stock.

B.0.90 This strategy states that energy efficiency measures and renewable energy are at their most economic when installed in new developments, rather than retrofitted.

B.0.91 The significant quantity of new housing and commercial floor space that is expected in London will clearly place additional pressure on London's energy consumption and therefore increase emissions of CO₂, NO_x and PM₁₀.

B.0.92 The Mayor also strongly recognises the importance of London's air quality. In most cases, measures to tackle CO₂ emissions will have an air pollution benefit as well.

B.0.93 Emissions of local air quality pollutants from biomass fuels can be higher than those from natural gas. Therefore, in some cases the deployment of fuel-burning renewable energy systems will not be appropriate and alternatives will need to be proposed through the planning process. Ultra low NO_x boilers are cost effective and can often be less polluting than biomass equivalents.

B.0.94 Should biomass boilers be proposed in the Royal Borough they **must** be fitted with a PM₁₀ filter and NO_x abatement equipment.

National Planning Policy Framework

B.0.95 The Core Principle of the National Planning Policy Framework (NPPF) states the following: "*actively manage patterns of growth to make the fullest possible use of public transport, walking and cycling, and focus significant development in locations which are or can be made sustainable*".

B.0.96 The NPPF was published in March 2012 and was designed to consolidate all policy statements, circulars and guidance documents into a single simpler document.

B.0.97 The crucial driving principle of this document places sustainability at the heart of development process. Air quality is a material planning consideration and is acknowledged in paragraph 124:

B.0.98 "*Planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan*".

B.0.99 The whole of the Royal Borough is designated an AQMA so it is important to ensure that planning decisions are consistent with AQAPs. Furthermore, on a strategic level the cumulative impact of individual sites within an area must also be considered.

B.0.100 Paragraphs 109 and 120 refer to unacceptable risk and this relates to placing sensitive uses in areas of known poor air quality. Guideline values have been developed to include unacceptable levels of air pollutants.

B.0.101 The development needs to be appropriate for its location, particularly at sites where air pollution is significant. Mitigation is not always appropriate because quality of life issues must be considered with any scheme where new receptors are introduced to an area where adverse effects from air pollution will occur.

B.0.102 Paragraph 109 states that the planning system should contribute to and enhance the natural and local environment by: preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability.

B.0.103 Paragraph 120 states that to prevent unacceptable risks from pollution and land instability, planning policies and decisions should ensure that new development is appropriate for its location. The effects (including cumulative effects) of pollution on health, the natural environment or general amenity, and the potential sensitivity of the area or proposed development to adverse effects from pollution, should be taken into account. Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.

B.0.104 In areas where public transport accessibility ratings (PTAL) are high it is necessary to encourage the use of public transport.

Contacts

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Table C.0.1 Contact Details

Screening Assessment for Strategic Environmental Assessment

Screening Assessment for Strategic Environmental Assessment (SEA)

D.0.1 The Screening Assessment for the Greener Greenwich SPD which is set out below was completed following the full Sustainability Appraisal on the Draft Core Strategy which was completed in November 2010. An updated Sustainability Appraisal was subsequently done on the Submission Version Core Strategy in 2012. The 2012 Sustainability Appraisal did not identify any further significant environmental effects arising from the changes to the Core Strategy between Draft and Submission stages. Therefore no update Screening Assessment for the Greener Greenwich SPD is now required.

Screening Assessment for Greener Greenwich Supplementary Planning Document

D.0.2 This screening assessment considers the need for a Sustainability Appraisal (SA)/ Strategic Environmental Assessment (SEA) to be carried out in respect of the Greener Greenwich Supplementary Planning Document (SPD):

D.0.3 Under the Environmental Assessment of Plans and Programmes Regulations 2004, Councils must carry out a Strategic Environmental Assessment (SEA) of land-use and spatial plans. Where the Council can demonstrate that any land use or spatial plan is unlikely to have significant environmental effects an SEA will not be required. In principle, SPDs should not be subject to SA/SEA because they usually supplement new policies or proposals, which have already been subject to Sustainability Appraisal through statutory development plan documents.

D.0.4 This screening statement sets out the Royal Borough's consideration of whether the proposals put forward in the Greener Greenwich SPD are likely to have a significant effect on the environment over and above the effects already identified through the Sustainability Appraisal/ SEA undertaken to support the Draft Core Strategy.

SEA Screening Procedure

D.0.5 An assessment has been undertaken, screening for the likely significant effects of the SPD. This screening has been made taking into account the criteria set out in Annex 2 of the European Directive 2001/42/EC and the Environmental Assessment of Plans and Programmes Regulations 2004.

Sustainability Appraisal and SEA of the Draft Core Strategy

D.0.6 The Draft Core Strategy sets out the spatial strategy, long term spatial vision, spatial objectives and core policies for development within Royal Greenwich to cover the period up until 2027. It is based on the social, economic and environmental objectives of the Greenwich Strategy (Greenwich's Sustainable Community Strategy) together with other relevant plans, programmes and strategies all of which have implications for development and land use within the borough.

D.0.7 The Draft Core Strategy outlined the spatial framework for future development and land use within Royal Greenwich. It sets out the broad locations for delivering sustainable development and enhancement, including new housing and other important strategic development needs such as employment, retail, leisure, community, public services, transport as well as mitigating and adapting to the effects of climate change.

D.0.8 The Draft Core Strategy underwent a full sustainability appraisal ahead of the document’s publication in November 2010.

Greener Greenwich SPD

D.0.9 The purpose of the Greener Greenwich SPD is to provide guidance on how new development in Royal Greenwich should be designed and built so that it has a positive impact on the environment and achieves the highest standard of sustainable design and construction.

D.0.10 An assessment of the likely significant effects of the SPD was undertaken and the findings are shown in the following table.

SEA Directive Criteria	Summary of significant effects
<i>1. The characteristics of the Greener Greenwich Supplementary Planning Document (SPD), having particular regard to:</i>	
(a) the degree to which the SPD sets out a framework for projects and other activities, either with regard to the location, nature, size or operating conditions or by allocating resources	The Greener Greenwich SPD provides guidance on how new development in Greenwich should be designed and built so that it has a positive impact on the environment and achieves the highest standard of sustainable design and construction. It is a material consideration when determining planning applications. No resources are allocated.
(b) the degree to which the SPD influences other plans and programmes including those in a hierarchy	The SPD provides greater detail to complement the policies in the Core Strategy. The Core Strategy contains policies which seek to reduce carbon emissions, protect biodiversity, reduce pollution and waste, and mitigate the risk of flooding. The SPD provides detail in these areas in relation to design and construction.
(c) the relevance of the SPD for the integration of environmental considerations in particular with a view to promoting sustainable development	The SPD integrates environmental considerations by promoting sustainable design and construction.
(d) environmental problems relevant to the plan or programme	The environmental problems relevant to the SPD are carbon emissions, water supply and use, flooding, biodiversity issues, the sourcing of materials for construction, waste management, and pollution control.

SEA Directive Criteria	Summary of significant effects
(e) the relevance of the SPD for the implementation of Community legislation on the environment (for example plans and programmes related to waste management or water protection)	The SPD will have a positive impact in line with Community legislation regarding climate change, biodiversity and air quality and will therefore contribute to local implementation of this legislation. The SPD will have a positive effect on water protection sustainable waste management.
2. Characteristics of the effects and of the area likely to be affected, having regard, in particular, to:	
(a) The probability, duration, frequency and reversibility of the effects	The probability of increasing sustainable standards of design and construction for most major developments on a permanent basis is relatively high. The probability for minor developments is relatively low. Therefore overall the environmental effects are expected to be long term positive and permanent.
(b) the cumulative nature of the effects	The cumulative effects are expected to be positive.
(c) the transboundary nature of the effects	The effects in terms of carbon reduction, air quality improvement, and waste reduction are expected to be transboundary in nature.
(d) the risks to human health or the environment (e.g. due to accident)	No increased risk.
(e) the magnitude and spatial extent of the effects (geographical area and size of the population likely to be affected)	The geographical area of the SPD is Royal Greenwich, covering 5,044 hectares, and with a population of 235,235 (2010).
(f) the value and vulnerability of the area likely to be affected due to: <ul style="list-style-type: none"> ■ Special natural characteristics or cultural heritage; ■ Exceeded environmental quality standards or limit values; and ■ Intensive land use. 	No detrimental environmental effects are expected to impact any vulnerable or valuable areas within Royal Greenwich.

SEA Directive Criteria	Summary of significant effects
(g) the effects on areas or landscapes which have a recognised national, Community or international protection status.	The Habitats Regulations Assessment on the Draft Core Strategy did not identify any likely significant effects or impacts on the integrity of any European (Natura 2000) Site.

Table D.0.1

Conclusions

D.0.11 The policy approach to the development of the Greener Greenwich SPD has been sufficiently appraised by the higher level Draft Core Strategy. The SPD expands on and provides greater detail for the broad sustainability principles and policies contained in the Draft Core Strategy. The Royal Borough considers that the SPD discussed above will result in no additional significant effects to those already identified through the higher level sustainability appraisal/SEA. The SPD will provide more detailed guidance to developers to help to ensure that the potential positive effects identified in the Draft Core Strategy SA/SEA are realised.

