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ISLINGTON

Environmental Design Planning Guidance

Tackling fuel poverty, enhancing quality of life and environment for all

Contents

1 Introduction

The purpose of this document

1.0.1 This document provides guidance on how new development in Islington should be designed and built so that positive effects on people's quality of life and the local environment are maximised and negative environmental impacts are minimised or avoided. This document will be adopted as a supplementary planning document (SPD).

1.0.2 The SPD does not create new policy, but provides detailed guidance on how Islington's current planning policies relating to sustainable design will be applied to different types of development. Our current policies are set out in Islington's Local Development Framework (LDF). Policies covering sustainable design issues within the LDF include Policy CS10 of the Core Strategy and policies DM40 to DM44 of the Development Management Policies (Energy and Environmental Standards chapter).

1.0.3 The SPD is intended for a wide range of audiences: Planning officers, developers (and their clients), householders and any other interested stakeholders. Different users will find different sections of the guidance more useful (see How is the document structured? below). The overarching aim, in accordance with the National Planning Policy Framework, is to help applicants make successful applications.

1.0.4 This document applies to all planning applications that involve building or landscape works.

1.0.5 The SPD is important (a material consideration) in helping the council make decisions about planning applications.

1.0.6 The standards set out in this SPD will be kept under review as technologies, policies and practices advance. Where appropriate the SPD will be updated accordingly.

What is sustainable design?

1.0.7 **Sustainable design is about maximising the positive effects of development for people's quality of life and the local environment whilst minimising or avoiding negative environmental impacts**.

1.0.8 **Islington Council is seeking to improve the lives of all residents and make Islington a fairer place. Securing higher standards of sustainable design through the planning process will contribute directly to these overarching aims by providing benefits for Islington's residents, businesses and visitors. Benefits will include:**

- **Reduced fuel poverty, better health and improved social inclusion from healthier, more comfortable new and refurbished homes that are cheaper to run and more flexible (implementation of the carbon offset policy will generate significant funding for investment in the energy efficiency of existing social housing)**
- **Cheaper, more reliable energy supplies from new decentralised energy networks**
- **Reduced building running costs through energy and water efficient design, future proofing owners and tenants against rising utility bills**

- **Improved health and wellbeing, reduced health inequality and crime/anti-social behaviour, and greater social cohesion from a more attractive, safe and green environment that encourages physical exercise and supports children's development**
- **Reduced risk of damage and disruption from surface water flooding by ensuring buildings and spaces are designed to minimise water runoff (Islington is already at high risk due to its very high urban density[1] and rainfall is projected to increase by up to 19% by 2080 with more torrential downpours)**
- **Improved comfort, reduced hospital admissions and deaths, and lower risk of cooling poverty by ensuring that buildings and places are designed to stay cool in summer. Average summer temperatures measured in London have already risen over 2°C since 1977 and by 2080 are projected to increase by up to 3.9°C; more frequent and intense heat waves are also projected. Without design or retrofit for future temperatures, it is predicted that many buildings will suffer from overheating by the 2020s. The poorest and the elderly, particularly those living in high-density urban areas, are likely to be least able to adapt.**
- **Enabling businesses to improve productivity, enhance the rental and investment value of their buildings and demonstrate performance against Corporate Social Responsibility aims.[2]**

1.0.9 Robust and efficient implementation of sustainable design polices, supported by this guidance, will help to ensure that all of these benefits are maximised.

1.0.10 Securing sustainable design will also help to address climate change. Islington Council has set a target of reducing borough-wide CO_2 emissions by 40% by 2020 (relative to 2005/06 levels). Growth in population and employment is likely to make it challenging to reduce emissions, as will the increasing number of smaller households which tend to have higher per capita emissions. However growth also provides a number of opportunities for securing reduced CO_2 emissions. These include: through the construction of highly energy efficient homes and offices, the development of decentralised energy networks and retrofitting of existing homes to reduce their energy use and fuel bills (paid for through implementation of the carbon offset policy).

How is the document structured?

1.0.11 Section 1 provides important background information on what this document is and how it will be used.

1.0.12 Sections 2 to 8 provide information on Islington's sustainable design requirements:

- Energy use and carbon emissions (section 2)
- Sustainable building standards (section 3)
- Water consumption (section 4)
- Biodiversity and access to nature (section 5)
- Climate change adaptation: SUDS and overheating (section 6)

1 The Census 2011 indicates that Islington is the most densely populated local authority in England and Wales.
2 The RIBA guide to sustainability in practice. RIBA, March 2012.

- Sustainable materials, waste and construction impacts (section 7)
- Operational sustainability (section 8)

1.0.13 Each section provides a brief background to the issue, highlights the relevant planning policies (contained in the Core Strategy and Development Management Policies) and provides supplementary guidance on what is required to comply with policy.

1.0.14 A glossary of key terms and acronyms is provided in Section 9.

1.0.15 The Appendices contain additional technical guidelines and templates referenced in Section 2. These include **Sustainable Design and Construction Statement Guidance** for major developments and minor developments (in Appendix 7 and 8 respectively) which summarise the information that needs to be submitted on sustainable design issues as part of a planning application. These documents will be particularly useful for developers and householders who need a quick reference summary of the information requirements for planning.

1.0.16 A **Companion Guide** to this SPD (see www.islington.gov.uk/environmentaldesign) provides broader guidance on the seven key sustainable design topics, including useful principles, examples and sources of further information. This document will be particularly useful to those who lack a detailed knowledge of sustainable design issues or who wish to explore opportunities to maximise sustainable design performance in greater depth.

How does the SPD relate to other policies and regulations?

1.0.17 Sustainable design is a broad field and it has not been possible to cover all of its aspects in this guidance document. For example, the focus here is on environmentally sustainable design and the benefits that this brings for quality of life, but the 'triple bottom line' of sustainable development is recognised; as highlighted in the National Planning Policy Framework this encompasses the social and economic as well as the environmental. This is reflected in the overall vision of Islington's Core Strategy, which is *for the borough to be a place where real change has been achieved to create a stronger and economically, environmentally and socially sustainable community*.

1.0.18 This SPD should be read alongside Islington's Core Strategy and Development Management Policies which together set out the policies referred to in this SPD, as well as policies addressing wider social and economic sustainability issues. This SPD does not place additional burdens on developers, rather it explains in detail what applicants need to do to comply with policies in the Core Strategy and Development Management Policies. Policies in the London Plan 2011 that are relevant to each section of the SPD are highlighted in Appendix 9.

1.0.19 The pollution control and planning regimes are separate, therefore pollution control is not covered in detail in this document. However, various requirements relating to the minimisation of pollution are referred to within the relevant sections on key sustainable design topics, including: air quality impact assessment where biomass boilers are proposed, treatment of rainwater runoff, lighting design to minimise light spillage, sustainable transport

and compliance with Islington's Code of Construction Practice. For planning policy requirements relating to healthy development, including air quality and land contamination, see policy DM34; for noise see policy DM15.

1.0.20 Sustainable transport issues are only touched on in this SPD. These issues are generally considered separately by the council. Policies are set out in the Core Strategy and Development Management Policies.

1.0.21 The **Building Regulations** are set by the Government and provide technical standards for different aspects of a building's construction to ensure that minimum health and safety levels are achieved. These regulations apply to most new buildings and many alterations to existing buildings. Checking compliance with the Building Regulations is a separate process to getting planning approval. However as both the Building Regulations and planning policies need to be complied with it is more effective and faster if they are both considered together in the design process. Islington's planning policies and the guidance in this SPD will help to achieve (and surpass) minimum standards in the Building Regulations.

Using this guidance as part of a holistic design approach

1.0.22 The sustainable design considerations set out in this guidance should form an integral part of the design process so that minimum sustainability standards are met (and where possible exceeded) in the most elegant, timely and cost effective way possible. It is therefore recommended that this guidance is referred to from the very start of the design process, including in early discussions with the client. Early and meaningful collaboration of sustainable design specialists in the design team - including Code for Sustainable Homes/BREEAM advisors, services engineers, sustainable drainage specialists and landscape designers - is also strongly encouraged.

Integrating sustainable design into the building procurement process

If sustainable design is not fully considered from an early stage of the design/procurement process then problems, delays and increased costs can result. For example, if an internal temperature analysis to demonstrate mitigation of overheating risk is not completed until late in the design process and the study reveals a need for external solar shading, this could raise new planning/design issues. Similarly, if the sustainable drainage strategy is only developed at a late stage rather than as an integral part of site layout and landscape planning then it could result in a need for costly late changes to comply with policy requirements. Meeting BREEAM and Code for Sustainable Homes requirements will be far simpler if these standards inform the design process rather than being considered late on as a tick-box exercise.

RIBA's Green Overlay to the RIBA Outline Plan of Work provides a useful tool to fully embed sustainable design in the building procurement process - see www.architecture.com

1.0.23 For major planning applications, an overview of the information requirements at pre-application, application and discharge of condition stages is provided in Appendix 6.

1.0.24 Sustainable Design and Construction Statement Guidance for major and minor developments which summarises the information requirements at planning application stage is provided in Appendix 7 and 8.

1.0.25 Optimising the sustainable design of a site should not be viewed in isolation. Good quality, contextual design is key to enhancing Islington's character and distinctiveness, preserving and enhancing the character and appearance of its Conservation Areas and the special historic and architectural interest of its Listed Buildings. The wide-ranging actions required to reduce fuel poverty, limit further damaging emissions and adapt to a changing climate are likely to have important implications for the historic environment. Yet the significance and integrity of historic assets can be threatened by poorly designed interventions. Careful selection and high quality design of measures is therefore fundamental. Further guidance on this issue is provided in the council's guide for residents, "Reducing carbon emissions and adapting to climate change in historic buildings" (see www.islington.gov.uk/greenplanningguidance); English Heritage also provide a range of useful publications on climate change and the historic environment (see www.english-heritage.org.uk).

1.0.26 New developments also need to consider any negative impacts they may have on the operation of existing buildings, including impacts on renewable or low carbon energy supply (policy DM1). Where a proposed development is identified as being likely to have negative impacts on renewable or low carbon energy supply on adjoining land, the applicant will need to undertake the relevant analysis to demonstrate and quantify the nature of the impact (if any); this analysis should be submitted to and approved by the council. Where negative impacts are identified by the analysis, the design should be modified where possible to avoid adverse impacts. For example, where a proposed development is considered likely to overshadow existing solar panels on an adjacent building, an overshadowing assessment will be required to quantify the impact on light reaching the panels and hence on the energy generated from the panels. If a negative impact is identified, options for amending the proposed scheme to reduce or avoid the overshadowing (e.g. by adjusting the roof profile) should be evaluated and implemented where reasonably possible.

1.0.27 When developing a proposal, it is important to ensure effective consultation with the community. This document should provide a useful reference on important sustainable design considerations for all stakeholders, not least local residents.

2 Minimise energy demand and carbon emissions

Background

2.0.1 The Warm Homes and Energy Conservation Act 2000, supplemented by the UK Fuel Poverty Strategy, requires the government to eradicate fuel poverty for all households in England by 2016. Islington Council is committed to tackling fuel poverty in the borough and to reducing the impact of cold weather on the health of the most vulnerable. Fuel poverty is when a household needs to spend 10% or more of its income on maintaining adequate warmth whilst providing hot water, lighting and cooling. It is caused by a combination of low household incomes, energy inefficient housing and rising energy costs. The estimated level of fuel poverty in Islington is 22%; amongst single pensioners in private sector housing this rises to 53% and amongst those with support needs to 45%[(3)].

2.0.2 Implementation of the policies expanded on in this section will significantly reduce fuel poverty in the borough. By complying with these policies new and refurbished developments will be future proofed against rising fuel bills through being better insulated and more efficiently heated, including via decentralised energy networks. Implementation of the carbon offset mechanism (part of policy CS10) will generate significant funding for investment in the energy efficiency of housing, including existing social housing – given that around 75% of the current building stock is likely to be still standing in 2050, this mechanism will be crucial to addressing fuel poverty.

2.0.3 Islington Council is also committed to tackling climate change, in accordance with the National Planning Policy Framework's emphasis on supporting the transition to a low carbon future. Within the context of the Climate Change Act 2008 and UK and London targets on carbon dioxide (CO_2) emissions reduction, Islington Council has set itself a target of reducing borough-wide emissions by 40% by 2020 (relative to 2005/06 levels). The construction and use of buildings produces approximately 45% of the UK's CO_2 emissions, therefore new and redeveloped buildings have the potential to make a major contribution to reducing Islington's CO_2 emissions (e.g. by replacing or upgrading existing stock with more energy efficient buildings). Ensuring developments minimise CO_2 emissions is particularly important given the levels of growth planned for the borough, which, without carbon reduction policies, would lead to an increase in emissions.

2.0.4 Embodied energy/carbon - the sum of energy/carbon inputs to a material/product over its lifetime, from the point of extraction and manufacture, to delivery, use and disposal - is covered separately in Section 7 (Sustainable materials).

3 Seasonal health and affordable warmth strategy. Islington Council with NHS Islington, 2010.

Summary of relevant policies

- CS10 (A) - promotes zero carbon development by requiring all development to demonstrate it has minimised on-site CO_2 emissions, supports development of decentralised energy networks and offsets all remaining CO_2 emissions; establishes CO_2 reduction targets for major developments.
- DM40 – promotes renewable energy development in principle and sets out requirements for submitting details of sustainable design and construction and - for major developments - providing a Green Performance Plan.
- DM41 - sets out energy efficiency and carbon reduction requirements for minor schemes.
- DM42 - sets out decentralised energy network (DEN) requirements, including around enabling developments to connect to a DEN, making a direct connection to a DEN, and developing and/or connecting to Shared Heat Networks. Promotes development of decentralised energy networks in principle.

Guidance on meeting policy requirements

2.0.5 Guidance on meeting policy requirements is provided separately below for major applications[4] (immediately below); minor applications creating new units (see para 2.0.11); minor extensions and householder extensions (see para 2.0.14); and other minor developments (see para 2.0.16). Please also note that development of renewable energy technologies and decentralised energy networks is likely to be supported by the council where wider planning issues, including design and air quality, are satisfactorily addressed (see Policies DM40 and DM42 respectively).

Major developments

2.0.6 Core Strategy Policy CS10 (A) sets out onsite total CO_2 reduction targets (regulated and unregulated) for major developments of 40%, and 50% where connection to a decentralised energy network is possible. These targets are expressed relative to the total emissions from a building which complies with Building Regulations 2006, because this was the current version of the Building Regulations at the time the policy was developed. These targets have subsequently been translated against Building Regulations 2010 as 30%, and 40% where connection to a decentralised energy network is possible[5]. For the purposes of demonstrating compliance with the relevant target the baseline can be modelled against 2006 or 2010 Building Regulations. When the Building Regulations are updated again we will also provide guidance on how the policy targets can be assessed against the new baseline.

4 'Major application' refers to a planning application for a 'major development'. Major and minor developments are defined in the glossary.

5 Mott Macdonald Fulcrum, January 2011. Update of Islington Core Strategy Targets

2.0.7 The same CO_2 reduction targets apply to all major developments, including refurbishments. It is accepted that some schemes, particularly refurbishment schemes, may struggle to reach the relevant target. In such instances the onus will be on the applicant to demonstrate that CO_2 emissions have been minimised as far as reasonably possible.

2.0.8 As part of the Energy Statement (see template in Appendix 8) applicants will need to demonstrate how a scheme meets the relevant on-site CO_2 emissions reduction target by following the **energy hierarchy** below (policy CS10):

1. **Maximise energy efficiency**
2. **Supply energy efficiently using low carbon heating and cooling systems**
3. **Incorporate renewable energy**
4. **Offset remaining CO_2emissions**

2.0.9 Each of these steps is summarised below.

2.0.10 Applicants are already providing information on energy efficiency, low carbon heating and cooling and renewable energy in Energy Statements as part of all major planning applications. However, the Development Management policies (expanded on in this SPD) will strengthen the policy basis for securing high performance standards on all schemes; this guidance will also allow the council to begin implementing the carbon offset element of policy CS10 (part A), thereby securing funding for energy efficiency improvements to the existing building stock (e.g. insulation of social housing).

1. Maximise energy efficiency

- The highest possible standards of thermal insulation and air tightness and energy efficient lighting should be specified. At a minimum we would expect to see use of good practice fabric energy efficiency standards on both residential and non-residential schemes - current good practice fabric energy efficiency standards for new build schemes are set out in the table below. Where possible we would strongly encourage moving towards higher exemplar performance standards (e.g. Passivhaus standards of insulation and air tightness).

Table 2.1 Energy efficiency standards[6]

Aspect	Solution	
U-values (W/m^2.K area weighted average)	External wall	0.20
	Roof	0.13
	Floor	0.20
	Windows	1.50
	Doors	1.0 (solid); 1.5 (glazed)
Air tightness (m^{3}h.m^2 @ 50 Pa)	3.0 or below (where mechanical ventilation with heat recovery is proposed), 5.0 (where no MVHR is proposed)	
Proportion of energy efficient lighting	100% (e.g. T5/LED lamps, daylight sensing and absence detection)	

- Opportunities for modifying building orientation, form and the layout of rooms to ensure those spaces that require most warmth and daylight receive most passive solar gain (and those spaces that need least warmth/daylight, such as computer server rooms, receive least) should also be considered in order to minimise heating, lighting and cooling demands. This should be balanced with the need to minimise summer overheating risks (see section 6) and the need to use a simple external building form (minimising surface area in relation to volume) to reduce heat loss.

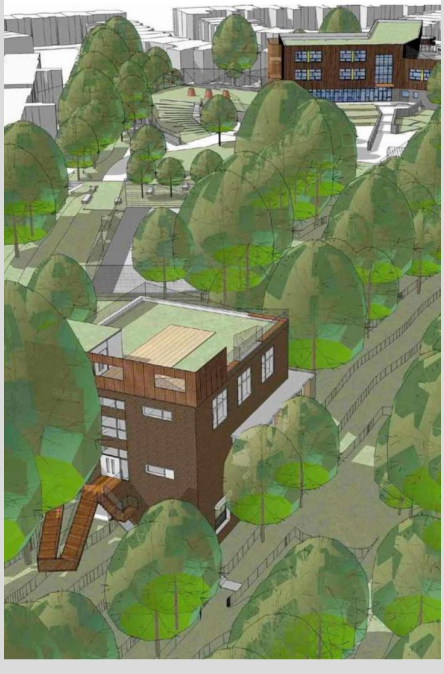
2. Supply energy efficiently using low carbon heating and cooling systems

- Supply energy efficiently using low carbon heating and cooling technologies and efficient distribution systems (e.g. chilled beams for cooling; large heating surfaces for heat pumps)
- The need for cooling should be designed out as far as possible through use of passive design and passive ventilation (see Section 6 on overheating);
- Connect to a decentralised energy network (DEN). The Citigen network in Farringdon already exists and Islington Council is currently delivering a heat network in Bunhill and Clerkenwell (see map in Appendix 4); further heat network development is also planned. Applicants should consult the council for the latest information on decentralised energy network development; the London Heat Map (www.londonheatmap.org.uk) will also be a useful resource.
- Where DEN connection is not possible, develop and/or connect to a shared heat network (SHN) with neighbouring existing buildings and/or new developments. To achieve this, the development itself could become an energy 'hub' which provides heat, via a heating network, to one or more existing neighbouring buildings (see case

6 Based on: Energy efficiency and the Code for Sustainable Homes Level 4. Energy Saving Trust, May 2008. www.energysavingtrust.org.uk/

study below); alternatively the development could be supplied with heat from an energy centre within a nearby building or development. Such a system would be likely to be more efficient, particularly where it makes use of Combined Heat and Power (CHP) viable. Reductions in CO_2 emissions made to existing buildings as a result of shared heat networks can be included within a development's CO_2 savings and support achievement of the 40% CO_2 reduction target relative to BRs 2006 (or the equivalent 30% target relative to BRs 2010).

Case study of an energy hub: Ashmount School



Ashmount School is a *negative* carbon development. Energy efficiency was maximised by optimising form, maximising the insulation and the amount of exposed thermal mass, minimising room depths and designing for daylight. Other features include natural ventilation and daylight linked occupancy sensitive lighting. To service the remaining energy demand in the lowest carbon manner, the best solution was found to be to host a community energy centre (CHP and biomass) on the school site, designed to provide all the heating and some of the electricity for the site and the existing adjacent residential block, Coleman Mansions. The proposed energy centre will reduce the carbon footprint of the school site by 50%. By supplying heat to Coleman Mansions, the development will actually be carbon negative - that is to say the scheme will save more carbon by providing a more efficient energy supply to Coleman Mansions (168 tonnes CO_2 saved per annum) than is used on the school site (92 tonnes CO_2 per annum).

- Where a connection to a wider energy network is not possible (see criteria in Policy DM42), onsite heating systems (and where required cooling systems) should be designed to minimise CO_2 emissions. To enable this and to ensure schemes are future proofed for future connection to DENs, all schemes should incorporate a communal heating network linking all elements of the development (technical design standards to enable future connection are set out in Appendix 1). Communal heating systems should, where possible, be designed for very low return temperatures (e.g. using under floor heating or oversized radiators), maximising the temperature differential between the flow and return. Communal systems are the preferred heating and hot water solution because they future proof a scheme by providing one point of external connection enabling heat and hot water supply from a future decentralised energy system or onsite low carbon heating solution; and because they maximise energy efficiency and minimise CO_2 emissions (communal systems are more energy efficient

than individual heating systems; CIBSE, 2002[7]; London Borough of Camden, 2006[8]; London Borough of Southwark, 2007[9]. Any alternative heating proposal will be assessed against these criteria.

- Combined Heat and Power (CHP) should be incorporated wherever technically feasible and viable. Large schemes of 50 units or more, or 10,000sqm floorspace or more, should provide detailed evidence in the form of an hourly heating profile (and details of electrical baseload) where the applicant considers that CHP is not viable; simpler evidence will be accepted on smaller schemes. Thermal stores should be utilised to prevent CHP cycling on and off during low demand. A correctly sized thermal store will enable longer CHP running hours and may also allow extended electricity generation during high tariff hours.

3. Incorporate renewable energy

- Use of renewable energy should be maximised to enable achievement of relevant CO_2 reduction targets. The renewable energy technologies which are likely to be suitable in Islington are highlighted in Table 2.2.

Table 2.2 : Suitability of renewable energy technologies for Islington

Type of technology	Suitability for Islington
Solar photovoltaic (PV) panels	Likely to be suitable in a range of scenarios in Islington.
Solar thermal panels	Likely to be suitable in a range of scenarios in Islington.
Ground source heat pumps (GSHPs)	May be suitable where ground conditions and space allow and Environment Agency permits (for open loop GSHPs) are available.
Biomass	Technically suitable for Islington, however air quality, transport impacts and fuel sourcing need to be carefully considered. Where biomass is proposed additional information must be submitted (see Appendix 8).
Micro wind turbines	Generally ineffective in dense urban environments like Islington.
Large scale wind turbines	Generally unsuitable for Islington due to lack of space,noise and flicker.
Air source heat pumps (ASHPs)	Technically suitable, however the Council has concerns about the efficiency of existing ASHPs, therefore their use in residential schemes would only be supported where a mains gas connection is not possible. Where ASHPs are proposed in non-residential schemes additional information must be submitted (see Appendix 8).

7 CIBSE, 2002. Guide to community heating and CHP: Commercial, public and domestic applications. CIBSE.
8 London Borough of Camden, 2006. Appendix 1 – 1st revision of the heating policy for council-owned housing.
9 London Borough of Southwark, 2007. Item 2 Communal heating briefing paper: District heating as a concept.

4. Offset remaining CO_2 emissions

- After minimising CO_2 emissions onsite, developments are required to offset all remaining CO_2 emissions (Policy CS10) through a financial contribution, secured via s106 agreement, towards measures which reduce CO_2 emissions from the existing building stock (e.g. through solid wall insulation of social housing). For all major developments the financial contribution shall be calculated based on an established price per tonne of CO_2 for Islington. The price per annual tonne of carbon is currently set at £920, based on analysis of the costs and carbon savings of retrofit measures suitable for properties in Islington[10]. The calculation of the amount of CO_2 to be offset, and the resulting financial contribution, shall be specified in the submitted Energy Statement. The spending of carbon offset payments and monitoring of CO_2 savings delivered will be managed by the council.

Minor developments creating new units

2.0.11 All schemes must demonstrate that they have minimised on-site CO_2 emissions. Assuming that residential developments commit to achieving Code for Sustainable Homes Level 4 (which requires a 25% reduction in regulated CO_2 emissions over a building which complies with 2010 Building Regulations; see Section 3), no further details of energy will be required.

2.0.12 Developments that do not commit to achieving Code for Sustainable Homes Level 4 must demonstrate, as part of the Sustainable Design and Construction Statement (see Appendix 9 for template) that they have minimised on-site CO_2 emissions by using less energy through:

- **Maximising efficiency** - by specifying good practice fabric energy efficiency standards (see table 2.1 above) and using passive design principles (e.g. orientation, form and layout) to manage solar gain
- **Supplying energy efficiently** - communal heating systems should be specified where feasible; larger minor new-build schemes of 5 units or more or 500sqm floorspace or more should be designed to be able to connect to a Decentralised Energy Network wherever reasonably possible (technical design standards to enable future connection are set out in Appendix 1)
- **Using onsite renewable energy generation** - table 2.2 above highlights the technologies that are likely to be suitable in Islington.

2.0.13 Minor new-build developments of one unit or more are required to **offset all remaining regulated CO_2 emissions** not dealt with by onsite measures through a financial contribution (Policy DM41); see draft unilateral undertaking in Appendix 10. As minor schemes are not required to produce Energy Statements to the same level of detail as major developments the process for carbon offsetting has been simplified. The cost of the offset contribution is a flat fee based on the development type[11] as follows:

10 AECOM/Davis Langdon, 2010. Promoting zero carbon development phase 2.
11 Figures derived from: Promoting zero carbon development phase 2. AECOM/Davis Langdon, November 2010.

- Houses - £1500 per house
- Flats - £1000 per flat

2.0.14 Carbon offsetting is not required for other types of minor development.

Minor extensions and householder extensions

2.0.15 Applications for extensions of greater than 100m^2 are required to provide a Sustainable Design and Construction Statement (policy DM40) because large extensions can result in a significant increase in energy use and carbon emissions. Such developments should demonstrate that they have minimised on-site CO_2 emissions by using less energy through maximising efficiency (see table 2.1 above), supplying energy efficiently and using onsite renewable energy generation (policy CS10).

2.0.16 Policy DM41 (part C) encourages householder extensions to apply cost-effective energy efficiency measures to the existing property, where practical, in addition to requirements applicable to the extension itself. A list of recommended measures is provided in Apppendix 5. In future it is possible that amendments to the Building Regulations will require 'consequential improvements' to the existing home when an extension is added.

Other types of minor development

2.0.17 Other types of development - such as minor changes of use and extensions of less than 100sqm - are unlikely to have significant sustainable design implications, especially as they will need to meet minimum energy efficiency requirements under the Building Regulations; therefore no additional information is required through planning.

2.0.18 The development of renewable energy technologies will be supported in principle, subject to meeting wider policy requirements, including on design (Policy DM1 and DM3) and air quality (Policy DM34). Table 2.2 above sets out renewable energy technologies likely to be suitable in Islington.

3 High sustainable buildings standards (BREEAM/Code)

Background

3.0.1 The Code for Sustainable Homes (the Code) is the national standard for the sustainable design and construction of new homes. The Building Research Establishment Environmental Assessment Methodology (BREEAM) tools provide a nationally-recognised sustainable design standard for all other types of development. These standards provide a widely recognised and useful framework for the promotion of sustainable design, covering a range of issues from energy, waste and water to ecology, health and materials.

3.0.2 Applying these standards has multiple benefits for Islington's residents and businesses, for example by securing healthier more comfortable homes and offices that are more energy and water efficient and therefore cheaper to run.

3.0.3 Islington Council already requires new build developments to achieve high standards on the Code for Sustainable Homes and BREEAM; however, adoption and implementation of draft policy DM43, supported by this guidance, will strengthen the policy basis for securing high performance standards on all schemes.

Summary of relevant policies

- CS10 (B) - all development to achieve the highest feasible level of a nationally recognised sustainable building standard.
- DM43 - sets out requirements for different types of development to achieve specific standards under BREEAM and the Code for Sustainable Homes.

Guidance on meeting policy requirements

3.0.4 The requirements of policy DM43 for different types of development to achieve specific standards under BREEAM and the Code for Sustainable Homes are largely self explanatory (for full details of these assessments see www.breeam.org/ and www.communities.gov.uk/ respectively). The Ecohomes scheme was superseded by a new assessment scheme, BREEAM Domestic Refurbishment, in July 2012, therefore where Policy DM43 (part C) refers to “Ecohomes Excellent, or equivalent”, BREEAM Domestic Refurbishment Excellent is considered an equivalent standard. Minor non-residential schemes are not required to achieve a specific BREEAM standard because research indicated that achieving a high BREEAM standard on such schemes was unlikely to be viable. Major residential and non-residential changes of use/refurbishments of 1000sqm or more (Gross Floor Area) are required to achieve the relevant BREEAM standards as set out for major applications in DM43, unless it can be demonstrated that this is not feasible. In major mixed use developments, a full BREEAM assessment will not be required for non-residential elements sized under 500sqm internal floorspace.

3.0.5 Schemes are required to demonstrate that they will achieve the required level of the CSH/BREEAM via a pre-assessment as part of any application and subsequently via certification. Some forms of development will also be required to use CSH and BREEAM, where feasible, to demonstrate that they have achieved the required levels of performance in specific areas, including on water and materials/waste (see sections 4 and 7 respectively). All schemes should use the most up-to-date version of BREEAM and CSH.

3.0.6 Where new developments are non fitted-out buildings of a speculative nature ('shell and core' buildings), BREEAM can still be used. Options include use of a 'green lease', a Green Building Guide for tenant fit outs or developer/tenant collaboration. For further information see the relevant BREEAM manual (see web link above).

Case studies of BREEAM 'Excellent' buildings completed in Islington

A number of completed buildings in Islington have already achieved BREEAM 'Excellent' ratings. These include Ropemaker, a 20 storey office on the edge of the City which includes extensive green roofs and sophisticated glazing (see image above left); Angel Building, an office and retail scheme that reinvented an unloved 1980s commercial building on the edge of Angel town centre (middle image, courtesy of Derwent London plc); and Highbury Grove school, a low energy school that includes innovative underground cooling and energy displays so that children can monitor the energy generated through on site renewables.

3.0.7 BREEAM and the CSH, while useful tools, represent a one-size-fits-all approach to sustainable design; they are not tailored to local circumstances and priorities, and as a consequence there are key sustainability issues for Islington that are not sufficiently covered by these standards. Moreover, these standards focus predominantly on the site scale and do not always address wider issues such as development of and connection to decentralised energy networks. When designing a scheme it is therefore important to consider the full range of applicable sustainability policies, rather than merely focusing on designing a scheme that will meet the required BREEAM or CSH standard.

3.0.8 Complying with BREEAM and CSH will be cheaper and simpler if these standards form part of the design process rather than being considered late on as a tick-box exercise.

4 Minimising water consumption

Background

4.0.1 There is substantial and growing pressure on London's water resources due to growth in the population and the number of households[(12)], high levels of consumption and climate change. London has fewer water resources than any other UK city, yet has the highest per capita level of use. While climate change is projected to result in more frequent and intense rainfall events, there is projected to be a decrease in the more gradual rainfall needed to recharge groundwater. The occurrence of higher summer temperatures and lower levels of summer rainfall (and potentially also greater restrictions on the volume of water that can be removed from the environment) will increase the risk of water shortages and undermine drought resilience, particularly as hotter weather is also likely to result in increased water use (e.g. people showering more frequently) and increased losses through evaporation.

4.0.2 Conserving water is therefore important in order to ensure there are sufficient water supplies for all, including the environment, now and in the future. Saving water, and particularly hot water (e.g. by using low flow showers), will also save energy and help to cut carbon emissions and energy bills. As buildings are increasingly fitted with water meters, saving water will also save money.

Summary of relevant policies

- CS10 (C) - requires all development to demonstrate that it meets best practice water efficiency targets and, unless it can be shown not to be feasible, incorporate rain- and grey- water recycling. Residential schemes are required to achieve a water efficiency target of 95 litres/person/day or less.
- DM43 (G) - non-residential major developments, non-residential minor developments creating new units, and non-residential extensions of 100m^2 or greater, are required to demonstrate how they would achieve all credits for water efficiency in the relevant BREEAM scheme.

Guidance on meeting policy requirements

4.0.3 Major developments, minor developments creating new units, and non-residential extensions of 100m^2 or greater need to demonstrate that they have:

- Minimised water demand and maximised water efficiency
- Incorporated rain- and grey- water recycling where feasible

4.0.4 Where use of ground water is proposed a licence from the Environment Agency will be required; their advice should be sought at an early stage.

12 Water use in a single-person household is typically 40% higher per person than in a two-person household. DEFRA and DCLG, 2007. Water efficiency in new buildings.

4 Minimising water consumption

Minimise water demand and maximise water efficiency

4.0.5 Water consumption targets for different types of development are set out in the policies highlighted above. When the applicant has compiled a list of proposed water efficient fixtures and fittings (e.g. lower flush volume toilets, low flow showers and taps, 'A'-rated washing machines and dishwashers) and rain- and grey- water harvesting measures, water consumption can be estimated using the Code for Sustainable Homes or BREEAM water calculator tool (see www.breeam.org/ and www.communities.gov.uk/). An example of a list of fixtures and fittings that meets the 95l/p/d target for residential schemes is provided in the Companion Guide.

4.0.6 Use of soft landscaping and planting requiring high levels of irrigation should be avoided.

Incorporate rain and grey- water recycling

4.0.7 While minimisation of demand should be the first step to minimising mains water use (and associated energy and carbon), use of rainwater and greywater recycling are important additional measures. Unless it can be shown not to be feasible, major developments, non-residential minor developments creating new units, and non-residential extensions of 100m^2 or greater need to incorporate rain- and grey- water recycling.

4.0.8 Using rainwater and greywater recycling systems in buildings gives rise to additional CO_2 emissions compared to buildings without such systems. Systems need to be designed carefully to maximise benefits (e.g. mains water savings, reduced grey water volumes and/or possibly also reduced stormwater run-off) while minimising CO_2 emissions as far as possible.

4.0.9 **Major developments** should:

- Explore the feasibility of using rainwater harvesting or grey water recycling for internal use (e.g. toilet flushing). The suitability and viability of different systems will depend on an assessment of water demand, potential harvested supply and any other cost/benefit issues. While it is accepted that grey water systems currently (2012) tend to be relatively expensive, costs are likely to decline over time.
- Incorporate water butts for external irrigation where soft landscaping/planting is proposed. Water butt systems should be designed in accordance with the SUDS Manual with a throttled overflow system to attenuate storm runoff.

4.0.10 **Minor developments creating new units and non-residential extensions of 100m^2 or greater** should:

- Incorporate water butts for external irrigation where soft landscaping/planting is proposed.
- In larger schemes, explore the feasibility of using rainwater harvesting for toilet flushing.

5 Protect and enhance biodiversity and facilitate access to nature

Background

5.0.1 Islington is a densely built borough, yet the natural world - including trees and green spaces - provides a range of social, economic and environmental benefits to people:

- **Social benefits:** For many people, parks and green spaces are highly valued. Research indicates that access to biodiverse green spaces benefits people's mental and physical health and healthy child development[13], for example by encouraging physical activity and providing spaces where the sights and sounds of nature can be enjoyed. Improving the landscape and biodiversity of an open space can also increase its level of use, reducing crime/anti-social behaviour and providing opportunities for social interaction and improved social cohesion[14].
- Biodiversity can also have **economic benefits:** Property values are often increased by proximity to high quality greenspace, trees and managed water bodies; and businesses are attracted to areas with high quality natural environments[15].
- **Environmental benefits** of trees (particularly large canopy trees) and green spaces (with knock-on social benefits) include pollution control, cooling (through shade and evapo-transpiration) and flood prevention, all of which are likely to become increasingly important in Islington as the climate warms and rainfall becomes more intense.

5.0.2 Conservation of nature and biodiversity - the variety of life on earth or in a specified region or area - is an essential part of sustainable development. The National Planning Policy Framework and the Natural Environment and Rural Communities (NERC) Act 2006 require Local Planning Authorities to minimise impacts on biodiversity and provide net gains in biodiversity where possible. This includes safeguarding species protected under the Wildlife and Countryside Act 1981 and the Conservation (Natural Habitats etc) Regulations 1994.

Summary of relevant policies

- CS10 (D) - all development to demonstrate that it protects existing site ecology and makes the fullest contribution to enhancing biodiversity.
- DM35 - sets out requirements for provision of on-site publicly-accessible Open Space and the need for such space to maximise biodiversity benefits.
- DM36 - covers protection of open space, including Sites of Importance for Nature Conservation, and the need to avoid negative impacts on open spaces.
- DM38 - sets out specific requirements for landscaping, trees and biodiversity enhancement, including green roofs.

13 Faculty of Public Health, 2010. Great outdoors: how our natural health service uses green space to improve wellbeing. An action report.
14 Environment Agency, 2005. Quality of life, health and the Environment Agency. www.environment-agency.gov.uk
15 Islington Council, 2011. Islington Local Economic Assessment: Working Towards a Fairer Islington 2011

Guidance on meeting policy requirements

5.0.3 Key principles which should be addressed by all developments in order to demonstrate that the requirements of these policies have been met are:

- Ensure existing biodiversity is protected
- Maximise biodiversity enhancement including through:
  - Ecological landscaping and micro habitat creation
  - Green roofs and greening of walls
  - Wider biodiversity considerations

5.0.4 The council already applies these principles when reviewing planning applications for new developments, particularly major developments; however the Development Management policies listed above (and expanded on below) will strengthen our ability to secure improved outcomes.

Protection of existing biodiversity

5.0.5 Policies DM36 and DM38 provide protection to existing green spaces, trees and biodiversity. DM38 refers to the council's Biodiversity Action Plan (BAP, available at www.islington.gov.uk/) which identifies priority habitats and priority species in need of protection and enhancement. Priority species in Islington include: Native Black Poplar, House Sparrow, Common Swift, Bats (various species) and Bees (various species).

5.0.6 Ecological surveys and assessments should be carried out wherever the proposed development is likely to have a significant biodiversity impact, particularly where this involves protected species, sites designated as important for nature conservation and/or habitats or species identified in the borough's BAP. This includes refurbishment works which may impact species using the existing building, such as swifts or bats. Triggers for ecological surveys are set out in the table overleaf.

5.0.7 Ecological surveys and assessments should be carried out:

- by suitably experienced, trained and qualified ecologists
- at appropriate times of year, in suitable weather conditions – surveys conducted outside optimal times may be unreliable (see www.naturalengland.org.uk)
- to published guidelines and methodologies
- to an appropriate level of scope and detail

5.0.8 Appointing an ecologist to survey a site early in the design process will be important in order to avoid costly delays later. This will also be able to advise on enhancement options.

Table 5.1 Triggers for conducting ecological surveys

Trigger	Survey required					
	Phase 1 habitat survey	Bat	Abori-cultural	Breeding bird	Swifts	Amphibian/ reptile
1. GiGL or other records show a protected species has been recorded on the site or nearby area	Y*	Y*	Y*	Y*	Y*	Y*
2. Site is adjacent to a SINC	Y	Y				
3. Site is adjacent to an open space or other feature judged to be of potential value for wildlife	Y	Y**				
4. Proposal involves loss of more than 50% of a garden area	Y					
5. Site was previously derelict/brownfield and has been colonised by shrubs, etc	Y					
6. Proposal involves significant tree works or removal of large/veteran trees or hedgerows		Y	Y	Y		
7. Derelict or pre-1914 building on the site		Y			Y	
8. Proposal involves removal of significant stands of vegetation				Y		
9. Wetland or standing water on the site						Y

5.0.9 *Phase 1 habitat survey and/or individual species surveys should be carried out as appropriate depending on the protected species recorded on or near the site. ** A bat survey should be carried out where a site is adjacent to an open space, garden, row of trees, etc which is judged to provide a potential habitat for bats.

5.0.10 The survey and assessment must identify and describe potential development impacts likely to harm the protected species, priority habitats, designated sites or other biodiversity features identified by the survey (these should include both direct and indirect effects both during construction and afterwards). Where harm is likely, evidence must be submitted to show:

- How alternatives designs, layouts or locations have been considered;
- How adverse effects will be avoided wherever possible;
- How unavoidable impacts will be mitigated or reduced;
- How impacts that cannot be avoided or mitigated will be compensated.

5.0.11 All ecological surveys should be submitted to Greenspace Information for Greater London (GiGL, www.gigl.org.uk)so that the results can contribute to building up the biodiversity information for Greater London.

5.0.12 European Protected Species Licenses will be required when a development impacts directly or indirectly on bats or any other protected species. For more information on licensing see: www.naturalengland.org.uk/ourwork/regulation/wildlife/

5.0.13 Trees, individually or in groups/lines, make an important contribution to biodiversity, as well as providing wider benefits. Policy DM38 requires developments to minimise any impacts on trees. Islington's Tree Policy (2011) aims for retention of trees of high amenity/environmental value taking consideration of both their individual merit and their interaction as part of a group or broader landscape feature.

Ecological landscaping and micro habitat creation

5.0.14 Once an assessment of existing biodiversity has been carried out, the potential to enhance soft landscaping and wildlife value within the development site, and to increase opportunities for people to connect with nature, should be fully explored as an integral part of the design of a development. This could include enhancing existing green spaces, providing new green spaces and improving links between spaces. This should be informed by an understanding of the network of green open spaces, corridors and links in Islington, including links across the borough's boundaries (see Islington's Open Space and Green Infrastructure SPD; the All London Green Grid Central Area Framework; and Natural England's London Natural Signatures)

5.0.15 Landscape schemes should be designed to benefit wildlife and support Islington's BAP objectives through careful choice of planting, for example of trees, native hedges, climbers and other plants which encourage wildlife. Further information, including design principles for landscape schemes, is provided in the Companion Guide (see www.islington.gov.uk/environmentaldesign).

5.0.16 Ecological landscape schemes can be complemented with other small scale habitat features. Artificial nest boxes/bricks should be incorporated within developments to provide nesting and roosting opportunities for birds - including species under threat such as house martins, swifts, swallows and house sparrows - and, where appropriate, bats. Nest boxes/bricks can be retro-fitted to existing buildings and incorporated into new developments relatively easily and at little cost.

Nesting boxes and bricks

Nesting boxes/bricks can be used on walls or vertical surfaces, under eaves, on trees or can be incorporated into the fabric of a new building. Boxes should generally be sited away from direct mid-day sun and wet westerly winds. Where possible provision of bird/bat boxes should be complemented by provision of suitable foraging habitats so the target species have plants and insects to feed on. Invertebrate (insect) boxes are also available.

5.0.17 Use of other microhabitat features should also be considered including nesting/ hibernation spaces for reptiles, amphibians, hedgehogs and invertebrates.

Green roofs and greening of walls

5.0.18 Islington is already securing strong delivery of green roofs on new developments. In a dense urban environment like Islington with limited green space and large areas of hard surfacing, green roofs are a particularly important technology for enhancing biodiversity and amenity, as well as reducing rainfall run-off and increasing cooling. However, green roofs cannot be considered as a direct replacement for green space lost to development as they will tend to have more limited biodiversity potential (e.g. due to their raised location and limited depth of growing medium).

The Muse, Islington - Bere:architects

5.0.19 Green roofs should be incorporated over all flat or gently sloping (less than 20 degrees) roof space which is not allocated for other essential uses, for example as accessible roof or plant space. This is already achieved for all major planning applications, with opportunities on minor applications reviewed on a case by case basis.

5.0.20 To maximise the range of benefits they offer, green roofs should be specified to be biodiversity-based extensive substrate green roofs with a substrate (growing medium) depth of 80-150mm. These roofs support a wider range of wildlife species and have greater water holding benefits (green roofs can attenuate up to 60% of runoff). The variety of life supported by a green roof can be further increased by varying the depth and type of substrate, using other features such as logs, rocks or areas of bare sand/shingle and ensuring that the roof is planted with a high proportion of native herbs and wildflowers of significant ecological value (see recommended species list for green roofs in London in Appendix E).

5.0.21 Walls should also be greened where possible, particularly where lack of space limits other biodiversity enhancements. Climbing plants can be grown directly up a wall, or, increasingly common on more modern buildings, can be supported by a wooden trellis, steel frame or cables parallel to a façade. Further design guidance is provided in the Companion Guide.

5.0.22 Depending on the particular plant species used, green walls can provide nesting habitat for birds, berries for birds in winter, and important habitats for insects. Green walls can also provide amenity and energy conservation benefits and help to protect walls from rain and sun damage.

Wider biodiversity considerations

5.0.23 Further biodiversity issues to consider in the design and construction of developments include:

- **Design of external lighting** – this can have serious effects on a range of species, particularly bats and nesting birds. Any lighting scheme should seek to minimise these impacts as far as possible (whilst ensuring that the design meets wider requirements e.g. security), including by minimising lighting provision, hours of lighting and light spillage/pollution (by directing light downwards).
- **Disturbance during construction** – this should be reduced as far as possible including through: *effective timing* of site clearance, demolition and construction activities to avoid impacts during sensitive times of year (see www.naturalengland.org.uk); ensuring *effective briefing* of site personnel about possible construction disturbance to habitats and how this can be reduced; and, where sensitive habitats/species are present, developing a *habitat management plan*. Wherever a species is identified which is protected under legislation, detailed surveys and impact assessments will be required as well as consultation with English Nature before development proceeds.
- **Invasive species** - Japanese Knotweed is present on some sites in Islington. The removal/treatment of such species should be undertaken sensitively giving due consideration to possible wider negative impacts on other species onsite or in surrounding areas. Where possible information on how this is to be carried out should be provided to the Council before works are completed.

6 Climate change adaptation: SUDS and overheating

Background

6.0.1 The effects of climate change have already been measured in London: average summer temperatures in London have warmed by over 2˚C over the period 1977-2006[16] and the frequency of heavy rainfall days has also increased over recent decades [17]. The UK Climate Change Impacts Programme (UKCIP) and the Hadley Centre have developed a range of projections about the future impacts of climate change on the UK climate. The projections below are based on a medium emissions scenario, using a central estimate from climate models. All figures are to the 2080's using a baseline of 1961-1990[18].

- Summer will become warmer, with more frequent and intense heat waves and an increase in the number of days over 25°C. By 2080 the average summer temperature in London is projected to increase by up to 3.9°C (this may be an underestimate as it does not take account of the urban heat island effect which results in central London often being significantly warmer than surrounding rural areas).
- Winters will be characterised by milder weather (with an increase of around 3°C) and increased rainfall (increasing by up to 19% by 2080) in the form of torrential downpours rather than consistent rainfall. Combined with a larger decrease in summer rainfall (potentially -23%) the risk of drought will be significantly increased.
- Weather events will become increasingly unpredictable and extreme. Whilst overall temperatures are set to increase, London and the South East will still experience extremes in temperature and severe storms.

6.0.2 Further changes to our climate will have an impact on our economy, quality of life and social equality as well as on our natural and built environments. Potential impacts include an increase in discomfort, hospital admissions and deaths due to heat waves or other extreme weather[19]; increased demand for air conditioning, putting pressure on energy supplies and service infrastructure (and potentially also on energy bills); increased surface water flooding, resulting in damage to buildings and infrastructure and disruption to transport[20]; increased need for water conservation (water efficiency is dealt with separately under section 4); and increased subsidence risk.

16 Managing risks and increasing resilience: The Mayor's climate change adaptation strategy. October 2011

17 Lloyd's of London, 2010. East London extreme rainfall: importance of granular data.

18 Climate Projections 09 were the most up to date presentation of the impacts of climate change on the UK at the time of publication. For more detailed information on different emissions scenarios and their impact on temperature and rainfall (for London) please visit ukclimateprojections.defra.gov.uk

19 London's urban heat island: a summary for decision makers. GLA, 2006. This study indicated that living in high-density urban areas may be an important risk factor for heat related mortality and morbidity. The number of deaths per head of population from the 2003 heat wave was greatest in London (approximately 600), and especially amongst the elderly. The NHS Heat Wave Plan 2011 recommends taking action to maximise passive cooling and minimise summer solar gain to reduce building overheating.

20 Islington Council participated in the Drain London project which mapped surface water flood risk across the borough and delivered the Surface Water Management Plan.

6.0.3 Preparing for continued climate change is about managing risks and increasing our resilience to them. New buildings and places need to be designed to withstand the impacts of climate change over the next 50 to 80 years to ensure that they are fit for purpose over their lifetimes. Early action will not only manage current and future risks, but save money and create jobs.

Summary of relevant policies

- CS10 (E) - requires all development to demonstrate that it is designed to be adapted to climate change, particularly through design which minimises overheating and incorporates sustainable drainage systems (SUDS).
- DM39 - sets out specific requirements for SUDS design.
- DM44 - sets out a sequential cooling hierarchy and requirements for internal temperature modelling (expanded on below).

6.0.4 Applicants should also be aware of the Sustainable Drainage Systems provisions of The Flood and Water Management Act 2010, including the forthcoming (as of February 2012) implementation of the requirement for construction work with drainage implications to have its systems for managing surface water runoff approved by a SUDS Approval Body (SAB, established by the local authority) before construction can begin. Compliance with Islington's planning requirements on SUDS and the guidance below will facilitate SAB approval.

Guidance on meeting policy requirements

6.0.5 Key principles which should be addressed are:

- Incorporate sustainable drainage features to meet quantity, quality and amenity/biodiversity criteria
- Ensure buildings are adapted to the higher summer temperatures projected as a result of climate change and have carried out thermal modelling to demonstrate this
- Consider the need to make foundations climate resilient.

6.0.6 Within each section guidance is provided separately for major applications and minor applications creating new units.

6.0.7 Further issues to consider when designing a building to be future proofed for the changing climate are highlighted in the Companion Guide.

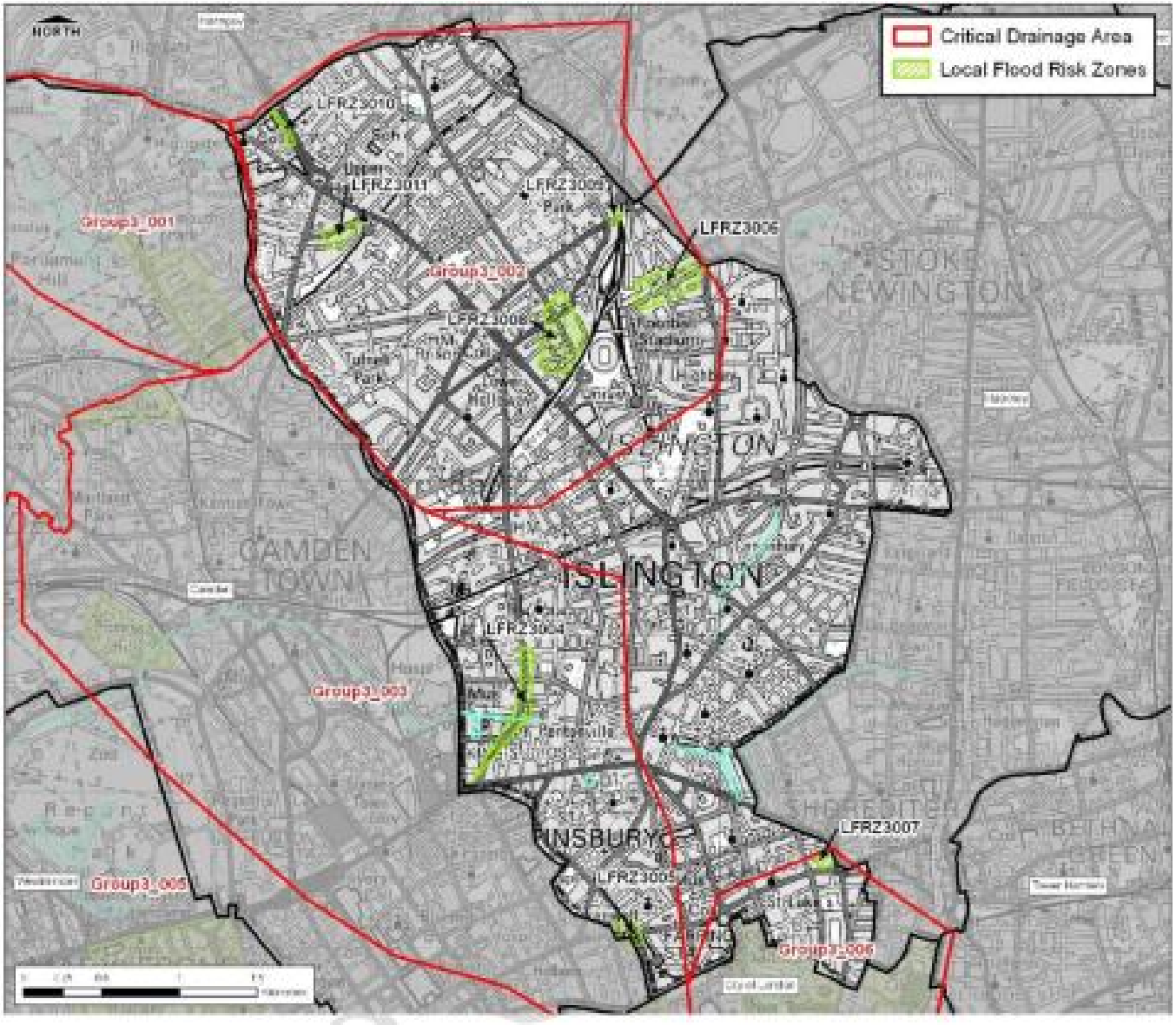
Sustainable drainage systems

6.0.8 Islington is highly urbanised borough with few permeable surfaces. As a result it is deemed to have a high risk of surface water flooding, which is likely to be increased by further growth and intensification of the built environment as well as the projected increase in heavy rainfall due to climate change. The Drain London project has mapped a number of Critical Drainage Areas (CDAs) and Local Flood Risk Zones (LFRZs) in Islington (see

indicative map below). The council's flood risk mapping is likely to be updated as better data becomes available; if you think your site may fall within an LFRZ please contact the council for confirmation. While CDAs cover much of the borough, modelling indicates that these lead to flooding in a limited number of more concentrated LFRZs. LFRZs are discrete areas of flooding that do not exceed the national criteria for a 'Flood Risk Area' but still affect houses, businesses or infrastructure. A LFRZ is defined as the actual spatial extent of predicted flooding in a single location.

6.0.9 Sustainable drainage systems (SUDS) are preferable to conventional drainage methods for minimising surface water flood risk. Besides reducing flood risk they also provide a number of co-benefits, including: contributing to a higher quality, more attractive public realm by creating attractive landscape features; reducing the need for artificial watering of trees and landscaped areas; creating wildlife habitat such as small ponds; and improving the quality of runoff water.

Map of Islington's Critical Drainage Areas and Local Flood Risk Zones



Minor developments creating new units

6.0.10 Requirements for minor new build schemes of one unit or more are set out in Policy DM39 and the supporting text. As a minimum such schemes should avoid any increase in runoff from a site, for example by maximising the area of soft landscaping and using green roofs and permeable paving.

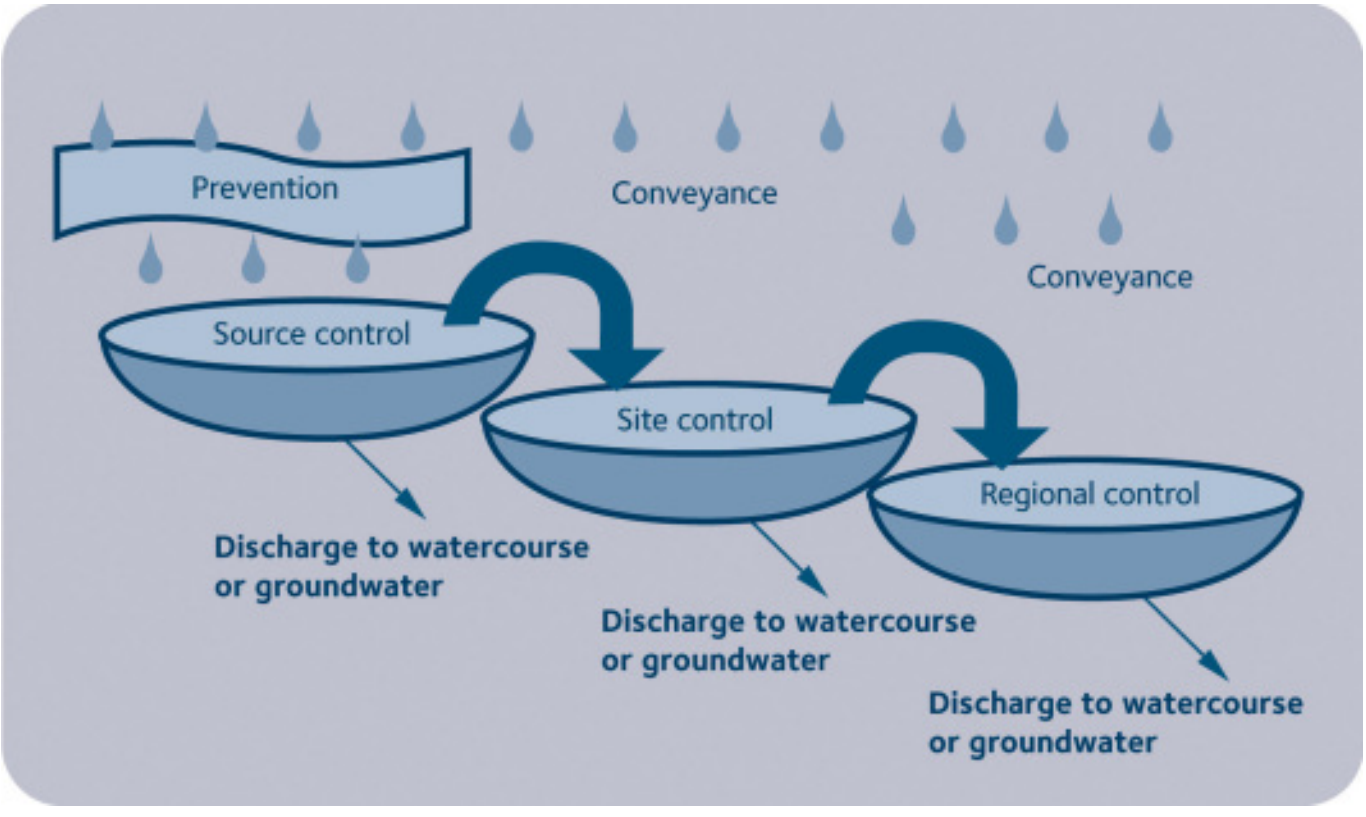
Major developments

6.0.11 SUDS aim to mimic natural catchment processes as far as possible. All major developments should demonstrate this by following the SUDS **'management train'** (see diagram below). This begins with 'prevention measures' to prevent runoff and contamination (e.g. capturing rainwater for reuse) and 'source control' measures (e.g. green roofs, permeable surfaces) to intercept, slow/hold, infiltrate (where ground conditions allow) and cleanse runoff as close as possible to where it falls as rain. Open conveyance, for example in swales and small vegetated channels, can provide additional cleaning of runoff by trapping and treating any pollution that has passed through the 'source control' stage; it can also provide further attenuation and infiltration. Runoff then flows slowly to storage or 'site control' features (e.g. small detention basins or ponds, or where space is not available, sub-surface attenuation tanks) usually toward the edge of a development. These volumes should be clean enough to provide amenity and biodiversity interest. In some developments where public open space is available, 'regional control' can be incorporated to provide additional storage and 'polishing' of runoff. Finally any remaining runoff volume is discharged to the mains sewer/drain.

Ashby Grove estate raingarden

6.0.12 The council is already securing SUDS solutions on major developments but adoption of policy DM39 and this guidance will strengthen the policy basis for ensuring that these are designed effectively.

Figure 1: SUDS management train



6.0.13 For major developments the proposed SUDS solution will need to demonstrate it meets the standards for quantity, quality and amenity/biodiversity set out in policy DM39[21]

6.0.14 The quantity standards are self explanatory. To meet the quality requirements schemes should demonstrate that they have:

- Provided the relevant number of **'treatment stages'** as part of the SUDS management train (see above) – as necessary to ensure runoff is of sufficient quality. The number of treatment stages should be based on a risk assessment of pollution. For example, runoff from roofs and housing areas requires at least one treatment stage (e.g. green roof), while runoff from roads and commercial sites needs two stages.
- Addressed treatment of the polluted **'first flush'** – this is the volume of runoff (10-15mm) that flows from hard surfaces during short rainfall events or at the start of storms, carrying with it accumulated silt and pollutants. This polluted volume needs to be intercepted for treatment via small sub-catchments or rain collection areas.

6.0.15 The applicant will also need to demonstrate how the proposed SUDS solution maximises amenity and biodiversity benefits. This can be achieved by:

- Designing attractive, safe SUDS features and details (e.g. channels, raingardens, pools, spouts, cascades, inlets/outlets) and making water part of the landscape plan

21 These standards are based on recognised best practice and detailed advice from SUDS expert Robert Bray. The proposed national SUDS standards have similar requirements (e.g. regarding quantitative runoff targets and the number of treatment stages) but it is not currently clear when these will be introduced.

- Creating ecological habitats such as small ponds and raingardens
- Designing-in water reuse opportunities (e.g. for irrigation of soft landscaping)

6.0.16 Major developments located in LFRZs will be required to submit a Flood Risk Assessment (FRA) as part of the planning application (policy DM39). The FRA should assess:

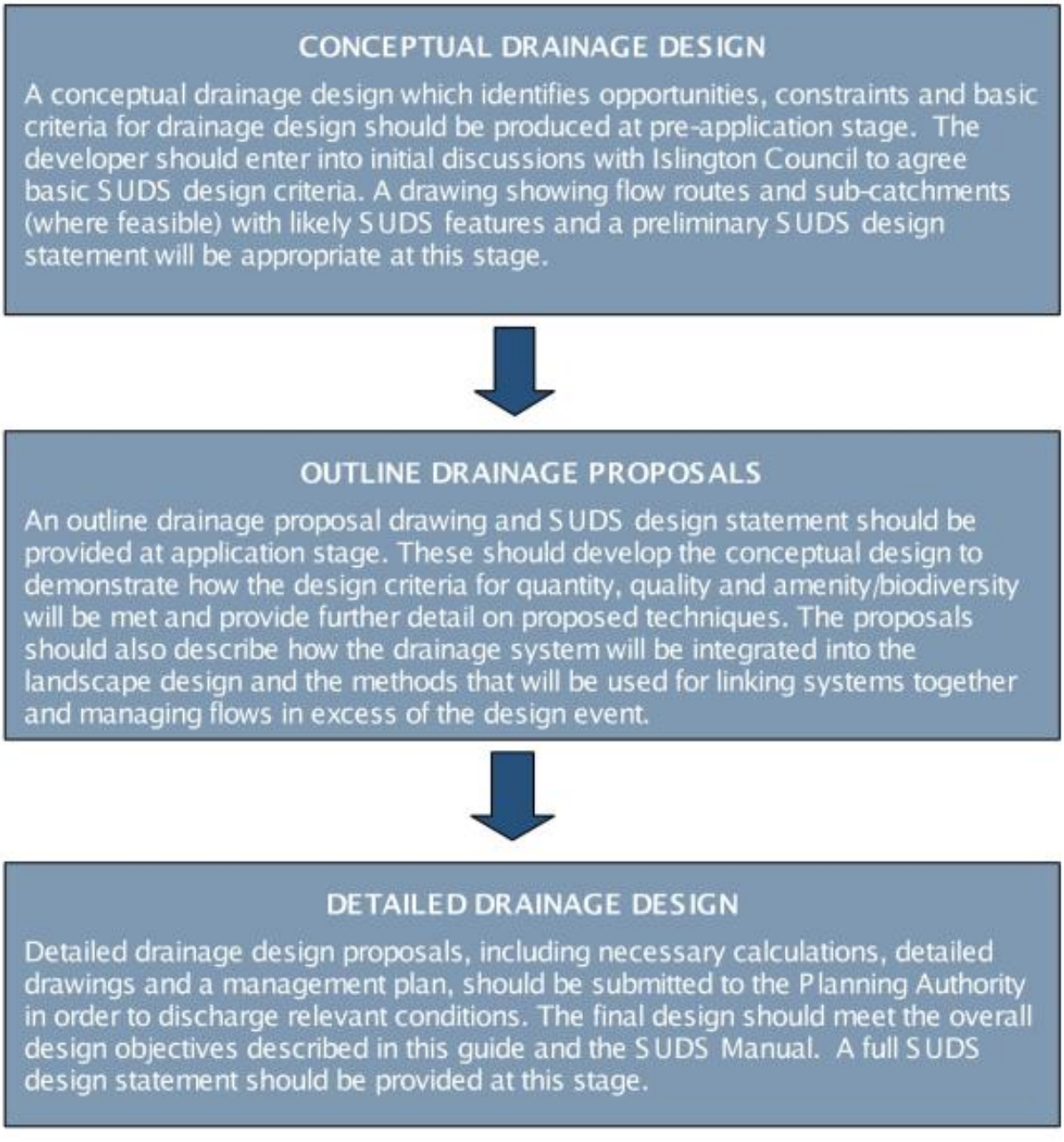
- Whether a proposed development is likely to be affected by current or future flooding (particularly surface water flooding), based on latest climate change projections;
- Whether it will increase flood risk elsewhere;
- Whether the measures proposed to deal with these effects and risks (e.g. raised floor levels, measures to exclude water from basements) are sufficient to make the scheme safe for its lifetime.

6.0.17 The FRA should be based on both qualitative and quantitative appraisal. Where the FRA indicates that an additional volume of run-off must be stored above and beyond the amount calculated based on the method above, this must be provided on site. The FRA should be prepared in consultation with the council.

Design process

6.0.18 Figure 2 overleaf indicates what SUDS information should be provided at different stages of the design process. When the Sustainable Drainage Systems provisions of The Flood and Water Management Act 2010 are implemented, the detailed SUDS design will need to be approved by a SUDS Approval Body (SAB, established by the local authority) at the same time as planning permission is sought, therefore all SUDS design work will need to be completed upfront.

Figure 2: Design process for SUDS schemes



Overheating mitigation

Solar panels/solar shading

6.0.19 Buildings need to provide comfortable environments for their users, including by regulating temperature, but the average summer air temperature in London is projected to rise by up to 3.9°C by 2080 due to climate change (UKCIP, www.ukcip.org.uk/). The urban heat island effect is likely to exacerbate the intensity of heat waves in central London – current temperature projections do not take this into account. Without design or retrofit for future higher temperatures, it is predicted that many buildings will suffer from overheating by the 2020s. Yet increased use of air conditioning would further exacerbate external air temperatures through heat generation and would also increase CO_2 emissions (as well as having potentially negative visual and amenity impacts). Moreover, increasing energy costs and climate change mitigation programmes, such as the Carbon Reduction Commitment, mean that buildings which use large amounts of energy for cooling will be increasingly expensive to operate (potentially leading to issues of cooling poverty). For all of these reasons, use of low energy cooling systems is critical.

All schemes, excluding householder extensions

6.0.20 All schemes, excluding householder extensions, are required to demonstrate that they are adapted to climate change through design which minimises overheating. Developments are required to demonstrate how the proposed design has maximised incorporation of passive design measures to control heat gain and to deliver passive cooling, following the sequential cooling hierarchy, below (expanded from Policy DM44):

1. **Passive design** to minimise unwanted heat gain and manage heat – for example by using building orientation, reduced fenestration, external shading (including from vegetation), a well insulated and air tight building envelope, exposed thermal mass (e.g. aim for a minimum of 1m² of room exposed thermal mass - walls and ceilings - per m² of floor area), green roof, high albedo surfaces and energy efficient lighting and equipment.
2. **Passive/natural cooling** – use outside air (perhaps pre-cooled by soft landscaping, a green roof, or by passing it underground e.g. Highbury Grove School) to ventilate and cool a building without the use of a powered system, for example by maximising cross ventilation, passive stack and wind-driven ventilation and enabling night-time purge ventilation. Single aspect and deep plan developments are discouraged as effective passive ventilation can be difficult or impossible to achieve. Windows and/or ventilation panels should be designed to allow effective and secure ventilation (see Companion Guide).
3. **Mixed mode cooling** with local mechanical ventilation/cooling provided where required in order to supplement the above measures using (in order of preference): i. Low energy mechanical cooling (e.g. fan-powered ventilation with/without evaporative

cooling or ground coupled cooling) ii. Air conditioning (not a preferred approach as these systems are energy intensive)

4. **Full building mechanical ventilation/cooling system** using (in order of preference): i. Low energy mechanical cooling ii. Air conditioning

6.0.21 Measures at the highest possible level of the above cooling hierarchy should be utilised to the fullest extent possible before the next level of the hierarchy is utilised. Use of technologies from lower levels of the hierarchy shall not be supported unless evidence is provided to demonstrate that technologies from higher levels of the hierarchy cannot deliver sufficient heat control.

6.0.22 Where mechanical ventilation/cooling systems are required, the location(s) for dumping heat into the outside air should be carefully considered to minimise negative impacts on pedestrians, biodiversity and external air being drawn into buildings.

6.0.23 **Where only minor refurbishment works are proposed**, simple retrofitting of measures to improve passive cooling should be incorporated, for example maximising natural ventilation and installing *brise soleil* above south-facing windows.

Major developments

6.0.24 All major developments should demonstrate effective adaptation to projected future summer temperatures via modelling of the building under future temperature scenarios, taking into account climate change projections. Details of the council's modelling requirements are set out below. Islington Council already requires modelling of internal temperatures for major applications, however adoption of policy DM44 and this guidance will strengthen the policy basis for securing more robust modelling to ensure that the risk of overheating is effectively mitigated.

6.0.25 The council will require applicants to demonstrate that overheating has been effectively addressed by meeting standards in the latest CIBSE (Chartered Institute of Building Service Engineers) guidance. As of January 2012 CIBSE's overheating standard is contained in CIBSE Guide A: Environmental design (2006); this provides the following standards:

- For living room, less than 1% of occupied hours are over an operative temperature of 28°C;
- For bedrooms, less than 1% of occupied hours are over 26°C;
- For office space and other commercial uses, less than 1% of occupied hours are over 28°C;
- For community developments, such as schools and care homes, less than 1% of occupied hours should be over 26°C.

6.0.26 In 2012 CIBSE will be releasing a new overheating methodology, based on the adaptive comfort model. When this is available this shall be used instead of the 2006 version. Any future replacements, additions or alterations to CIBSE's overheating guidance shall be used in preference to older methods/standards.

6.0.27 All major developments shall be designed and built to comply with CIBSE overheating standards. The methodology to deliver the cooling of the development should be in line with the cooling hierarchy above.

6.0.28 Overheating analysis should be carried out using dynamic simulation modelling software approved by the Building Energy Calculation Software Approval Scheme for use with the revision of The Building Regulations Part L in force at the time of the application. Modelling results should be provided for a representative sample of rooms with no active cooling (in accordance with the cooling hierarchy, the aim should be to minimise and where possible avoid the need for active cooling)

6.0.29 Overheating calculations shall be carried out using both (i) a primary Design Summer Year (DSY) against which buildings have to be modelled to demonstrate overheating has been designed out, and (ii) a secondary DSY against which designers must make specific provision for the inclusion of further design elements (which may not be present in the original design) to ensure that overheating does not become an issue[(22)].

6.0.30 The Islington 90th percentile DSY for the 2030s (medium emissions scenario) shall represent the primary DSY, and the Islington 90th percentile DSY for the 2050s (medium emissions scenario) shall represent the secondary DSY (ibid). Applicants should use weather files based on the latest climate change projections (e.g. UKCP09 as of 2011). Both DSYs can currently be obtained from either the ARCC COPSE or Prometheus projects. In 2012 CIBSE are expected to release updated UKCP09 based weather files for energy and overheating assessments.

6.0.31 The Building User Guide (see Section 8) should include a section explaining how the building can be cooled efficiently and effectively.

Climate resilient foundations

6.0.32 Islington is predominantly built on clay. Changes in the water content of clay soils can cause them to shrink or expand, which can affect foundations when conditions fall outside the normal range. Damage can occur to shallow foundations (and hence the domestic sector in particular) when there are a series of consecutive dry summers and winters, an event that could become more common as a result of climate change. The effect will be intensified where buildings are close to trees, which can remove moisture from the ground as far as six metres below the surface.

6.0.33 Architects, developers and clients are therefore encouraged to consider whether a relatively small increase in initial cost for deeper foundations - to cope with periods of drought - may be a worthwhile insurance against very expensive and disruptive remedial work later in a building's life.

6.0.34 The types of trees planted, or likely to be planted, in close proximity to buildings should also be considered in the context of subsidence risk.

22 Thermal modelling, weather years and overheating. A report for the London Borough of Islington. Doug King et al, 2011

7 Sustainable materials, waste and construction impacts

Background

7.0.1 The construction industry in England uses over 400 million tonnes of materials per annum. The production (including resource abstraction, processing and manufacture), delivery, use and disposal of building materials accounts for significant quantities of energy and CO_2 emissions (known as 'embodied energy' and 'embodied CO_2'), and natural resources (including waste to landfill and water). Production and use of materials can also release toxic emissions, HCFC/CFCs (greenhouse gases with much greater global warming impact than CO_2), and have negative impacts on biodiversity. Materials therefore need to be selected carefully to create safer, higher quality spaces for building users whilst minimising environmental impacts over their lifecycle.

The increasing significance of embodied carbon

Typical estimated whole life carbon splits between CO_2 emissions embodied in a building's materials and emissions from operating a building are 55:45 for offices and 70:30 for houses[(23)]. These are already significant proportions but as building operational efficiency increases and operational emissions drop, the proportion of total CO_2 due to embodied emissions is set to become an ever more important fraction of the whole life CO_2 burden. Minimising the embodied CO_2 of buildings is therefore of significant and increasing importance.

7.0.2 **Responsible sourcing** of materials, which has environmental, social and economic dimensions, is also important. Supply chain management and material stewardship are essential elements of responsible sourcing. Certification by independent bodies (e.g. Forest Stewardship Council) confirms compliance with the required standards (e.g. that no-one in the supply chain has been exploited; that environmental impacts associated with the product are minimised).

7.0.3 **Waste generation** is partially related to use of materials in construction – over 90 million tonnes of waste is produced annually by construction and demolition in the UK. It is a requirement of the Landfill (England and Wales) Regulations 2002 that the amount of material sent to landfill is reduced and recycling and composting is increased. Minimising waste to landfill from construction and demolition requires a focus on waste **reduction, re-use and recycling**.

7.0.4 Minimising waste from demolition and construction and minimising impacts of demolition and construction works are covered below. Operational waste and recycling is dealt with separately under Section 8.

23 Sturgis, S. and Roberts, G. 2010. Redefining zero carbon. RICS.

7 Sustainable materials, waste and construction impacts

Summary of relevant policies

- CS10 (F) - all development to minimise the environmental impact of materials, for example through use of sustainably-sourced, low impact and recycled materials, and to take all possible measures to minimise the impact of construction on the environment, including by minimising construction waste.
- DM43 (E) - major developments to score a minimum number of BREEAM / Code for Sustainable Homes credits on materials and waste [set out in the supporting text]. As a minimum, 10% of the total value of materials used should derive from recycled and reused content in the products and materials selected.
- DM43 (F) - all developments are required to comply with Islington's Code of Practice for Construction Sites.

Guidance on meeting policy requirements

7.0.5 The policy requirements are relatively self explanatory. Major developments need to achieve minimum credits in key areas under BREEAM / Code for Sustainable Homes; the technical manuals for these assessment methods are available online (see www.breeam.org/ and www.communities.gov.uk/ respectively).

7.0.6 Key principles which should be addressed by all developments in order to minimise negative materials, waste and construction impacts are:

- **Minimise materials use**, including by reusing/refurbishing existing buildings rather than demolishing and rebuilding (e.g. the redevelopment of the Angel Building reused the in-situ concrete structural frame, generating an enormous saving in embodied energy and carbon; see picture); and minimising/recycling waste from demolition and construction.
- **Minimise waste to landfill** - major developments should aim to divert at least 85% of demolition and construction waste from landfill.
- **Maximise use of recycled, low impact and sustainably-sourced materials,** including by maximising materials ratings on the BRE Green Guide.

- **Minimise impacts of demolition and construction** - all schemes should comply with Islington's Code of Practice for Construction Sites (available on the council's website, www.islington.gov.uk) in order to minimise the possible negative effects of construction, such as air pollution, noise and vibration, traffic congestion, dust and contamination of land and water and disturbance of local ecology.

Embodied impacts of tall buildings

Tall buildings will almost certainly use more materials in construction than low rise buildings with an equivalent usable area - depending on its location a tall building is estimated to use around 150kg/m² of steel whilst a low rise building might use 75kg/m². Tall building designers therefore need to pay particular attention to minimising the environmental impacts of the materials they use, as well as to flexibility (so that it can be adapted to future needs) and to facilitating the reuse and recycling of materials at the end of a building's life.

Source: Guthrie, A. 2008. Tall Buildings Sustainability from the bottom up.

WRAP's Quick Wins for maximising recycled and reused content

Reuse or recycle the following:

- bulk aggregates (sub-base, pipe bedding, fill, etc);
- ready-mix concrete (foundations, floor slabs, etc);
- asphalt;
- drainage products/pipes;
- pre-cast concrete products (paving, slabs);
- concrete tiles, reconstituted slate tiles and ceiling tiles;
- dense and lightweight blocks;
- clay facing bricks;
- plasterboard, chipboard and other wood-based boards;
- insulation (floor, wall and roof); and
- floor coverings (carpet, underlay, etc).

7.0.7 Further guidance on these issues is provided in the Companion Guide.

8 Operational sustainability

Background

8.0.1 No matter how energy efficient, comfortable and sustainable a building may be in its design and construction, it will only perform to its full potential in use if it is effectively operated and maintained and is flexible enough to meet changing user demands. This common sense assertion is supported by the research finding that nominally similar houses can display a large variation in both heating and electricity consumption in use[24].

8.0.2 Improving performance in use depends upon:

- how a building and its systems are designed to facilitate effective use, management (including performance monitoring) and maintenance.
- how a building and its systems are designed to facilitate its adaptation to changing requirements over a long lifetime.
- provision of appropriate information, training and support to building/site operators, maintenance personnel and building users in general on how to use, maintain and adapt the building effectively and how to monitor, evaluate and optimise performance in use.

Summary of relevant policies

- CS10 (G) - requires all developments to be designed and managed to promote sustainability through their ongoing operation, for example through measures which raise awareness about environmental issues and support sustainable lifestyles, and to be adaptable to changing needs and circumstances over their lifetime.
- DM40 (D) - Applications for major developments are required to include a Green Performance Plan (GPP) detailing measurable outputs for the occupied building, particularly for energy consumption, CO_2 emissions and water use, and should set out arrangements for monitoring the progress of the plan over the first years of occupancy.

Guidance on meeting policy requirements

8.0.3 Key areas which should be addressed by **all developments** in order to demonstrate that the requirements of policy CS10 (G) have been met are:

- Design to facilitate effective use, management and maintenance
- Ensure buildings are 'long life, loose fit'
- Provision of appropriate information, training, support and monitoring/evaluation

8.0.4 Key issues to address under each of these headings are summarised in this section, with further details provided in the Companion Guide.

24 E.g. Lomas, K. J. 2009. Energy use in dwellings. Paper presented at How people use and misuse buildings: Public policy seminar. 26th January 2009.

8.0.5 In addition, **major developments** will need to provide a Green Performance Plan, as explained below.

Design to facilitate effective use, management and maintenance

8.0.6 All developments should be designed to facilitate/promote ongoing sustainability in operation. Where possible this should include:

- **User friendly design of building systems/controls** - (e.g. heating controls, energy generation systems) to ensure they are easy to understand and use and work effectively
- **Provision of smart meters** - to make energy and water consumption highly visible (see below)
- **Use of energy efficient white goods, appliances and equipment** - e.g. A-rated boilers and fridges (this scores credits under the Code for Sustainable Homes and BREEAM)
- **Provision of space for food growing** - in the ground or in containers
- **Design to facilitate operational waste disposal and recycling** - schemes should comply with Islington's Refuse and Recycling Storage Guide (available online at www.islington.gov.uk).

8.0.7 Further details are provided in the Companion Guide.

Smart Meters

Smart meters offer the dwelling's occupants a real-time view of their energy usage (electricity, energy associated with heat and hot water, and sometimes also water use), and so can help to eliminate unnecessary use, and reduce running costs, resource use and CO_2 emissions. Some displays can also provide local public transport information.

8.0.8 Looking beyond the building/site scale, **transport use** associated with occupation of a site is also a key operational sustainability consideration. Appropriate locations for different types of developments, use of Green Travel Planning, provision of cycle facilities and support to use of car clubs are covered in the Core Strategy and Development Management Policies. Minimising travel needs, for example by supporting telecommuting and teleconferencing or by maximising access to local services and facilities will also be an important wider consideration.

Ensure buildings are 'long life, loose fit'

8.0.9 One of the fundamental ingredients of a 'sustainable place' is the ability to accommodate diverse communities and changing needs and circumstances over a long lifetime, thereby reducing the need for demolition and rebuilding. Design for 'long life, loose fit' will include:

- **Selection of durable, easy to maintain materials**

- **Design for adaptability to meet users' diverse and changing needs** (e.g. by meeting standards for flexible homes set out in Islington's Accessible Housing SPD)
- **Future proofing for renewable technologies and climate change adaptation** (e.g. by designing in flexible, generously sized services spaces; and by reserving space in boiler rooms and pathways across the site for heat pipes, so that developments can be connected to future district heat networks; see Appendix 1).

Provision of appropriate information, training, support and monitoring/evaluation

8.0.10 All developments involving should provide building occupiers with as much information as possible about how to operate and manage a development effectively. At minimum this shall involve provision of **building user guides** for operators/owners/users of any new building (this scores credits under Code for Sustainable Homes and BREEAM). Building user guides should be designed to be easy to read and understand for the non-specialist. They should cover all significant operational and maintenance issues, including how to heat and cool the building efficiently and effectively.

8.0.11 Applicants are also encouraged to:

- **Provide dedicated training and support as part of the handover process** to ensure that building/site managers, maintenance personnel and building users fully understand the sustainability features of a building, how to operate and maintain them efficiently and effectively and how to monitor and fine-tune performance.
- **Plan for post occupancy monitoring and evaluation** of building performance to help close the gap between predicted and in use performance (for major developments, see Green Performance Plans below). Voluntary adoption of a Display Energy Certificate and/or use of Carbon Buzz (www.carbonbuzz.org/) to anonymously benchmark building performance would be particularly encouraged.
- **Adopt BSRIA's Soft Landings framework** (www.bsria.co.uk, see further details in the Companion Guide) – this includes post occupancy evaluation but goes beyond it by seeking a closer working relationship between designers/constructors and building users/operators from the design stage onwards in order to try to close the gap between client/design expectations and delivered performance in use.

Provision of a green performance plan (major developments only)

8.0.12 Surveys of recently completed buildings regularly reveal a substantial gap between client/design expectations for building performance and delivered performance, especially with regard to energy performance. This may be due to a variety of factors including technologies not performing as expected (for example due to incorrect installation and commissioning or inaccurate performance claims), value engineering, buildings being used and managed in unexpected ways, or solutions that appear good in theory proving too complicated to be manageable in practice.

8.0.13 In order to try to learn how to close this gap, and to deliver on national, regional and local climate change mitigation and adaptation targets (including in particular the Council's target to reduce the borough's CO_2 emissions by 40% by 2020/21 relative to 2005/06 levels), the council requires that all major developments provide a Green Performance Plan. This approach is based directly on the model provided by the Green Travel Plan.

8.0.14 A Green Performance Plan (GPP) is a plan for monitoring the performance of a building in use against key sustainability indicators. It should cover the first two years of occupation. The plan should set out:

- measurable performance targets and indicators;
- arrangements for management and monitoring of the plan over the first two years of occupation;
- arrangements for addressing performance in the event that the agreed objectives are not met at the end of the two year monitoring period.

Measurable performance targets and indicators:

8.0.15 The GPP should specify measurable performance targets and indicators for the occupied building. The targets should be based on commitments made in the Sustainable Design and Construction Statement (including the Energy Statement) submitted as part of the planning application.

8.0.16 It is anticipated that monitoring of residential schemes is likely to be more difficult than for non-residential schemes (for example, due to larger numbers of tenants and no practice of data sharing with building managers). For this reason, core indicators - which should be monitored against in a GPP except where this is demonstrated not to be feasible - are set out separately for residential schemes and non-residential schemes in Table 8.1 and Table 8.2 below. Suggested data sources are also provided. Optional additional indicators are listed in Table 8.3.

Table 8.1 Core performance indicators for residential schemes

Indicator	**Data source**
Energy consumption (kWh/yr)(disaggregated by end use where possible)	• *For schemes with communal heating:* meter readings for, at minimum, gas communal heating/domestic hot water and landlord supply of electricity • *For schemes without communal heating:* meter readings for, at minimum, landlord supply of electricity • It may also be possible to provide a mechanism to enable meter readings to be collected from owner-occupiers (e.g. some residential developments now provide monitoring as a service to help occupiers to maximise wellbeing and efficiency).
Annual energy generation from low zero carbon (LZC) technology A, B, C (kWh/yr)	• Meter reading(s) (electricity or heat)
Annual CO_2 emissions (kg/yr) (disaggregated by end use where possible)	• Calculation based on emissions from energy consumption minus emissions avoided through low zero carbon (LZC) generation (using the emission factors used in the Energy Statement submitted as part of the planning application)
Total annual water consumption (m3/yr) / estimated consumption per person	• This may be possible to measure where a single meter has been installed to measure a shared supply • Consumption per person can be calculated based on data on occupant levels

Table 8.2 Core performance indicators for non-residential schemes

Indicator	Data source
Total annual energy consumption (kWh/yr)	• Meter reading(s) • Display Energy Certificates (DECs)
Annual energy consumption by energy end use (kWh/yr)	• Meter reading(s) – note that Building Regulations Part L2A require sub metering of new non-domestic buildings so that at least 90% of the estimated annual energy consumption of each fuel can be assigned to end use categories (e.g. lighting, heating). TM39 (Building energy metering) provides best practice guidance on the design of energy metering and sub-metering in non-domestic buildings. See also the 'Better Metering Toolkit' from Better Buildings Partnership. • Degree day correction (see 'Better Metering Toolkit' from Better Buildings Partnership).
Annual energy generation from low zero carbon (LZC) technology A, B, C (kWh/yr)	• Meter reading(s) (electricity or heat) – note that Building Regulations Part L2A requires the output of any renewable energy system to be separately monitored.
Total annual CO_2 emissions (kg/yr)	• Calculation based on emissions from total energy consumption minus emissions avoided through low zero carbon (LZC) generation (using the emission factors used in the Energy Statement submitted as part of the planning application)
Total annual CO_2 emissions by energy end use (kg/yr)	• Calculation using emission factors used in the Energy Statement submitted as part of the planning application
Total annual water consumption (m3/yr) / Total annual water consumption per person (m3/person/yr)	• Meter reading(s) • Consumption per person can be calculated based on data on occupant levels

Table 8.3 Optional additional indicators to include in a GPP

Indicator	Data source
User perceptions of building performance/comfort	• User survey – to collect qualitative feedback from building users about comfort and satisfaction with a building. For methods see http://www.usablebuildings.co.uk/fp/index.html (e.g. BUS domestic survey). Avoid 'survey fatigue'. • BREEAM 2011 (Man 4 Stakeholder participation) offers credits where, amongst other requirements, feedback is gained from a wide range of building users including Facilities Management on the design and environmental conditions of the building.
Internal environment indicators (e.g. temp, humidity, CO_2)	• Wireless sensors and dataloggers
Total annual volume of rainwater harvested	• Meter reading(s) - assuming rainwater harvesting system is individually metered.

Management and monitoring arrangements

8.0.17 The management and monitoring arrangements will be a key part of the GPP. The developer is required to clearly set out how the ongoing management, monitoring and reporting of the plan will be coordinated and – in cases where the end occupier is not known – arrangements for the hand over of the GPP to occupiers/managers of the site or another relevant body (as currently happens with Green Travel Plans). The council will determine the acceptability of the management and monitoring arrangements on a case-by-case basis depending on the nature and scale of the development.

8.0.18 Monitoring of the GPP is critical to ensure that its aims are delivered as far as possible and that the building's performance is as close as possible to that predicted in the Sustainable Design and Construction Statement at planning application stage. A monitoring and reporting schedule and outline of the approach to monitoring should be set out in the plan. A monitoring period of two years minimum will be required for all GPPs.

Arrangements for addressing performance where objectives are not met

8.0.19 The GPP is intended to be a learning based process. In the event that the agreed objectives are not met at the end of the two year monitoring period, the final report (see below) will need to analyse and explain the reasons for why the targets were missed. The GPP should include arrangements for addressing performance in the event that the agreed objectives are not met, to be agreed with the Council (and included in a legal agreement where relevant). These could include:

1. The extension of the monitoring period for an agreed time interval with submission of an updated report at the end of this period (to be approved by the Council).
2. Implementation of new measures and/or management processes as considered necessary for the scheme to perform in accordance with the targets in the GPP.

8.0.20 It is accepted that there may be circumstances where performance targets (set based on modelling) are revealed to have been over optimistic and unachievable in practice. In such cases the onus will be on the applicant/owner to demonstrate that, over the two year monitoring period, they have made reasonable endeavours to maximise the performance of the building as far as practicable.

8.0.21 The Council's Energy Team will be able to provide expert assistance to enhance building performance if required.

8.0.22 Further information on Green Performance Plans is provided in Appendix 3, including a checklist of what to cover in the plan and when information needs to be submitted.

9 Glossary

- **Car clubs**: Clubs where a number of people share a pool car(s) for rent or otherwise for personal use.
- **Car-free housing**: Car-free development means no parking provision will be allowed on site and the occupier will have no ability to obtain car parking permits, except for parking needed to meet the needs of disabled people. Car-free housing can help to reduce traffic congestion and associated pollution from new developments.
- **Combined Heat and Power:** The combined production of heat, usually in the form of steam, and power, usually in the form of electricity.
- **Core Strategy:** The Core Strategy is a Development Plan Document setting out the long-term spatial vision for the local planning authority area and the spatial objectives and strategic policies to deliver that vision.
- **Decentralised Energy Networks:** An existing or proposed district heating/ electricity/ cooling network to which a building or buildings can connect.
- **Development Plan Documents**: Statutory planning documents, produced by the planning authority, that form part of the Local Development Framework including the Core Strategic, Site Specific Allocations, Development Management Policies and Area Action Plans.
- **Embodied energy / carbon:** The sum of energy / carbon inputs to a material/product over its lifetime, from the point of extraction and manufacture, to delivery, use and disposal.
- **Fuel Poverty**: Fuel poverty means spending more than 10% of a household's income on simply keeping warm and providing basic hot water and lighting.
- **Green roofs**: Green roofs are vegetated layers that sit on top of the conventional roof surfaces of a building, which can support a wide range of plant life. Green roofs can create or improve biodiversity, contribute minimising flood risk, improve thermal efficiency and improve the microclimate.
- **Green infrastructure:** A network of connected, high quality, multi-functional open spaces, corridors and the links in between that provide multiple benefits for people and wildlife.
- **Grey-water recycling**: Grey water refers to waste water from showers, baths and washbasins (it does not include the more contaminated water from washing machines, kitchen sinks and washing machines). As long as drinking quality is not required, this water can be treated and re-used, e.g. for flushing toilets, watering gardens and for washing machines.
- **Heat wave:** In London a heatwave is declared when daytime temperatures exceed 32ºC for two consecutive days and the intervening night-time temperature remains at or above 18ºC.
- **Lifetime Homes/Flexible Homes**: A set of 16 design criteria to produce a stock of housing that is flexible and adaptable to meet diverse and changing needs.
- **Major development**: Defined in the Town and Country Planning (General Development Procedure) Order 1995 - includes development involving 10 or more dwelling houses or buildings where the floorspace to be created is 1000 square metres or more.

- **Minor development:** Development involving less than 10 dwelling houses or buildings where the floorspace to be created is less than 1000 square metres (see also definition of major developments above).
- **Passivhaus:** Refers to a rigorous, voluntary standard developed in Germany for highly energy efficient buildings that require little or no heating. See www.passivhaustrust.org.uk
- **Shared Heat Network:** A heat network created as part of a new development which includes the connection of neighbouring buildings (see also Decentralised Energy Network).
- **Supplementary Planning Documents**: Supplementary Planning Documents provide supplementary information to support the policies in Development Plan Documents. They do not form part of the Development Plan and are not subject to independent examination.
- **Sustainable transport**: Alternative modes of transport to the low-occupancy private car, including walking, cycling, public transport, car sharing, water transport and city car clubs.
- **Sustainable Urban Drainage**: A means of managing surface water runoff (see section 6).
- **Urban Heat Island Effect**: Localised heating of the urban micro-climate due to the density of built development (buildings and roads absorb more solar radiation than green space and vegetation) and associated man-made heat sources. This can make central London up to eight degrees Celsius warmer than the Green Belt on hot summer nights.

Acronyms

- **BREEAM** Building Research Establishment Environmental Assessment Methodology
- **CAZ** Central Activity Zone
- **CHP** Combined Heat and Power
- **CCHP** Combined Cooling, Heat and Power
- **CIL** Community Infrastructure Levy
- **CO_2**Carbon Dioxide
- **DE** Decentralised Energy
- **GLA** Greater London Authority
- **LDF** Local Development Framework
- **SPD** Supplementary Planning Document
- **SUDS** Sustainable Urban Drainage Systems
- **TfL** Transport for London

Appendix 1: Technical standards to enable future connection

1.0.1 This section provides guidance on how the secondary heat network and systems contained within a new development should be designed to allow efficient future connection to a Decentralised Energy Network (DEN). The council already secures details of design for future connection via planning condition for major developments; by setting out clear standards in this guidance we seek to provide clarity about our requirements for all stakeholders.

1.0.2 Secondary systems shall be designed based on constant operating temperatures and variable flow rate criteria to ensure full compatibility with district primary supply systems.

1.0.3 Differential temperatures (difference between flow and return temperature) in the secondary distribution networks must be kept as large as possible to minimise pipe size, enable the supply of DEN heat from various heat sources and optimise any CHP output. To ensure that low grade waste heat, and other heat sources, can be utilised on the DENs the secondary design must focus on low return temperatures. The temperature differential at the primary / secondary interface will depend on the design of the internal building services. Therefore, all internal systems must ensure compatible designs that maintain optimum differential temperature and low secondary return temperature at the interface during all demand scenarios.

1.0.4 Key considerations for the design of building internal systems are as follows:

- The selection of low temperature operating systems such as under floor heating systems to significantly reduce return temperature.
- Low flow rate radiator circuits for buildings, complete with thermostatic control.
- Where used radiator circuits should be designed to operate satisfactorily at low temperatures with a maximum 70°C / 50-40°C flow and return (as opposed to the traditional 82°C / 71°C) without compromising the ability of the system to deliver the required level of heat. Return temperatures should be minimised and systems capable of operating at very low flow and return temperatures should be considered.
- The use of direct instantaneous hot water generation should be considered. This removes the need for hot water storage, reducing energy consumption and heat losses, reduces pipework, space and pumping costs and more importantly secures low return temperatures by adopting a heat exchanger arrangement that uses the DH return water to pre-heat the cold water makeup.
- Ensure minimum return temperature from hot water service connections, whether storage or instantaneous.
- Taking advantage of unique opportunities, like heat sinks such as swimming pools, to optimise return temperatures.

- The primary circuit will be sized for a nominal maximum pressure of 16 bar (PN16). Therefore the head loss at the primary circuit connections within the building and the plant room will be a target of 1.5 bar.

1.0.5 **Shunt Pump and Low Loss Header:** This is a common inclusion in heating systems but should **not** be used on a district heating system. This arrangement will only serve to return supply temperature water back to the heat exchanger as demand reduces on the main building sub-circuits.

1.0.6 **Two-port Control Valves and Variable Speed Pumping:** The use of two port control valves in constant temperature system applications is fundamental in ensuring that the unnecessary return of supply water temperature back to the heat exchanger is avoided. The use of variable speed pumps, in conjunction with differential pressure control valves for system balance should be considered as it provides an efficient method of delivering only the energy that is needed and when combined with the parallel pumping, provides the required turn down of the system to maintain optimum return temperatures throughout the annual demand profiles.

1.0.7 **Circuit Mixing:** Wherever possible, water returning from one heating circuit at a high temperature should be used in a second circuit. This is not always possible since one circuit may demand energy at a different time to another.

1.0.8 **Metering:** Energy meters measure volume flow rates and supply and return temperatures to provide an accurate record of energy usage. The preferred choice in a modern system is an ultrasonic device. Metering shall be installed to record flow volumes and energy delivered on the primary circuit. For residential connections, meters will also be installed on the secondary circuit where individual dwelling billing is required. The energy metering system must include a flow meter, two temperature sensors and a stand alone integrator unit complete with battery back up.

1.0.9 **Route onto and through site:** It is a requirement that there is space on site for piping connecting the point at which primary piping come onto onsite with the on site heat exchanger/ plant room/ energy centre. If the proposed site for the heat exchanger and the point at which DHN piping comes onto site are separated by an obstacle such as deep water feature, it may not be possible to connect them. Therefore proposals must demonstrate a plausible route for heat piping and demonstrate that suitable access could be gained to the piping at short notice and that the route is protected throughout all planned phases of development.

1.0.10 **Plant Layout:** New developments where the detailed connection arrangement to a DEN is unknown will require physical space to be allotted for installation of heat exchangers and any other equipment required to allow connection. The table below indicates the space required as dictated by the site heat demand.

Table 1.1 Plant room spacing requirements

Output (kW)	**250**	**500**	**800**	**1000**	**1500**	**2000**	**3000**
Number of heat exchangers	1	1	1	2	2	2	2
Length (mm)	1500	2250	2250	2750	2750	3000	3000
Width (mm)	500	750	750	1500	1500	1500	1500

Output (kW)	250	500	800	1000	1500	2000	3000
Height (mm)	2000	2500	2500	2500	2500	2500	2500
Approximate dry weight (kg)	725	1050	1300	1725	1800	1925	2000

1.0.11 The figures indicated in the table above are the packaged skid dimensions only. The sizes listed are indicative and space requirements should be considered on an individual site and system design basis. Additional space allowance for access and maintenance requirements must be considered (an allowance of at least 1m should be incorporated all around the skid to facilitate access and maintenance).

1.0.12 If the development has a plant room/energy centre it should include provision for the following requirements to ensure it can accommodate a connection to an off site area wide DHN:

Table 1.2 Provisional plant room specifications

Item	Specification requirements
ROOM ILLUMINATION	Minimum light level: 150 lux.
ELECTRICAL CONNECTION (for maintenance)	III 380 V to earth / 32 A (See Note 1 below).
ELECTRICAL SUPPLY (Control box)	220 V AC (+/- 5%), 50 Hz (+/- 3%) Thermo-magnetic protection recommended 16 A curve C (the box incorporates a thermomagnetic protection of 10 A curve C in the supply).
WATER SUPPLY	DN 25.
WATER DISCHARGE	Provide wastewater discharge line in the plant room and a sump to collect condensation from heat exchangers.
CONCRETE STANDS	Provide concrete stands for heat exchangers and pumps (if present).
VENTILATION	Mechanical and continuous, with a minimum of three air changes per hour.
HEALTH & SAFETY	Plan showing evacuation route in case of fire, located in a visible place. The plant room should not have elements of risk to health and safety (sharp metallic objects, holes in roof or floor without protection, …)
LAYOUT & DIMENSIONS	As described for the relevant packaged substation unit.

Appendix 2: Recommended species list for green roofs in London

Latin Name	Common Name
Agrimonia eupatoria	Agrimony
Anthyllis vulneraria	Kidney Vetch
Centaurea nigra	Common Knapweed
Galium verum	Lady's Bedstraw
Hypericum perforatum	Perforate St John's-wort
Knautia arvensis	Field Scabious
Leucanthemum vulgare	Oxeye Daisy
Lotus corniculatus	Bird's-foot-trefoil
Origanum vulgare	Wild Marjoram
Ranunculus bulbosus	Bulbous Buttercup
Sanguisorba minor	Salad Burnet
Leontodon autumnalis	Autumn Hawkbit
Echium vulgare	Viper's-bugloss
Leontodon hispidus	Rough Hawkbit
Linaria vulgaris	Common Toadflax
Malva moschata	Musk-mallow
Plantago media	Hoary Plantain
Primula veris	Cowslip
Prunella vulgaris	Selfheal
Ranunculus acris	Meadow Buttercup
Reseda lutea	Wild Mignonette
Silene vulgaris	Bladder Campion
Sedum acre	Biting stonecrop
Sedum album	White stonecrop
Centranthus ruber	Red Valerian
Trifolium arvense	Hare's-foot clover
Agrostemma githago	Corn Cockle
Chrysanthemum segetum	Corn Marigold
Anthemis arvensis	Corn Chamomile
Centaurea cyanus	Cornflower

Source: Dusty Gedge, livingroofs.org

Appendix 3: Green Performance Plans

What to cover in a Green Performance Plan and when to submit

3.0.1 The coverage and detail of a Green Performance Plan will vary depending on the size and complexity of development. An acceptable draft GPP will consider, and where necessary address, the same issues as the final GPP but in less detail. Ideally, council officers will have the opportunity to specify the required coverage and level of detail of the GPP during pre-application discussions.

Table 3.1

Chapter	Content
Introduction	• Give an overview of the development • Summarise the sustainable design measures incorporated in the development • Introduce the organisation(s) and occupier(s) involved (where known), and provide an overview of how the development is expected to be used
Performance targets and indicators	• Set out the indicators to be monitored and the monitoring targets. Indicators should at least cover energy use, CO_2 emissions and water consumption (based on those set out in the SDC Statement). Targets should have a three-year timeframe, with interim annual targets where appropriate • Justify the selection of the indicators and targets, referring in particular to the modelling undertaken and targets committed to as part of the planning application.
Data collection, analysis and reporting	• Explain how the indicator information will be measured and collected, when and by whom • Explain how, when and by whom to whom this data will be analysed and reported on
Management and monitoring	• Identify the GPP coordinator and individuals and organisations that the applicant will work with to deliver the plan (including handover arrangements for the GPP where the occupier is different to the developer) • Outline how the GPP process will be managed, for example via a steering group • Specify who will be ultimately responsible for the GPP throughout its lifespan • Present the timetable for monitoring of the GPP and for annual reporting of progress against the targets to the council
Arrangement for addressing performance	• Set out the arrangements for addressing performance in the event that the agreed objectives are not met at the end of the two year monitoring period

When does GPP information need to be submitted to the Council?

3.0.2 **A draft Green Performance Plan** shall be provided as part of a planning application for all major developments. This should form an appendix to the Sustainable Design and Construction Statement. Where the end occupier/manager of the development is known, the plan should be developed jointly. The draft GPP will follow the same format as the full GPP, but may be missing some detail, such as the exact arrangements and timetable for monitoring.

3.0.3 **A full GPP** shall be submitted within six months of occupation of a major development. This will be a refined version of the draft GPP, with updated targets (e.g. adjusted to reflect the latest information on occupation, equipment, etc) and full details of the arrangements for management, monitoring and reporting of the plan, and of the arrangements for addressing performance in the event that agreed objectives are not met. The final GPP will be secured as part of a legal agreement or via planning condition.

3.0.4 **A final report on implementation of the GPP** shall be submitted following completion of two years of monitoring. The report shall include the following sections:

- Full indicator data for the two year period;
- Analysis of performance against the GPP targets;
- Discussion of progress made and the reasons for why the targets were missed/achieved/surpassed (including interpretation from Facilities Managers/relevant stakeholders);
- A summary of any lessons learned;
- Next steps, including any future work planned to improve performance further or any additional actions to be undertaken to address performance where objectives were not met.

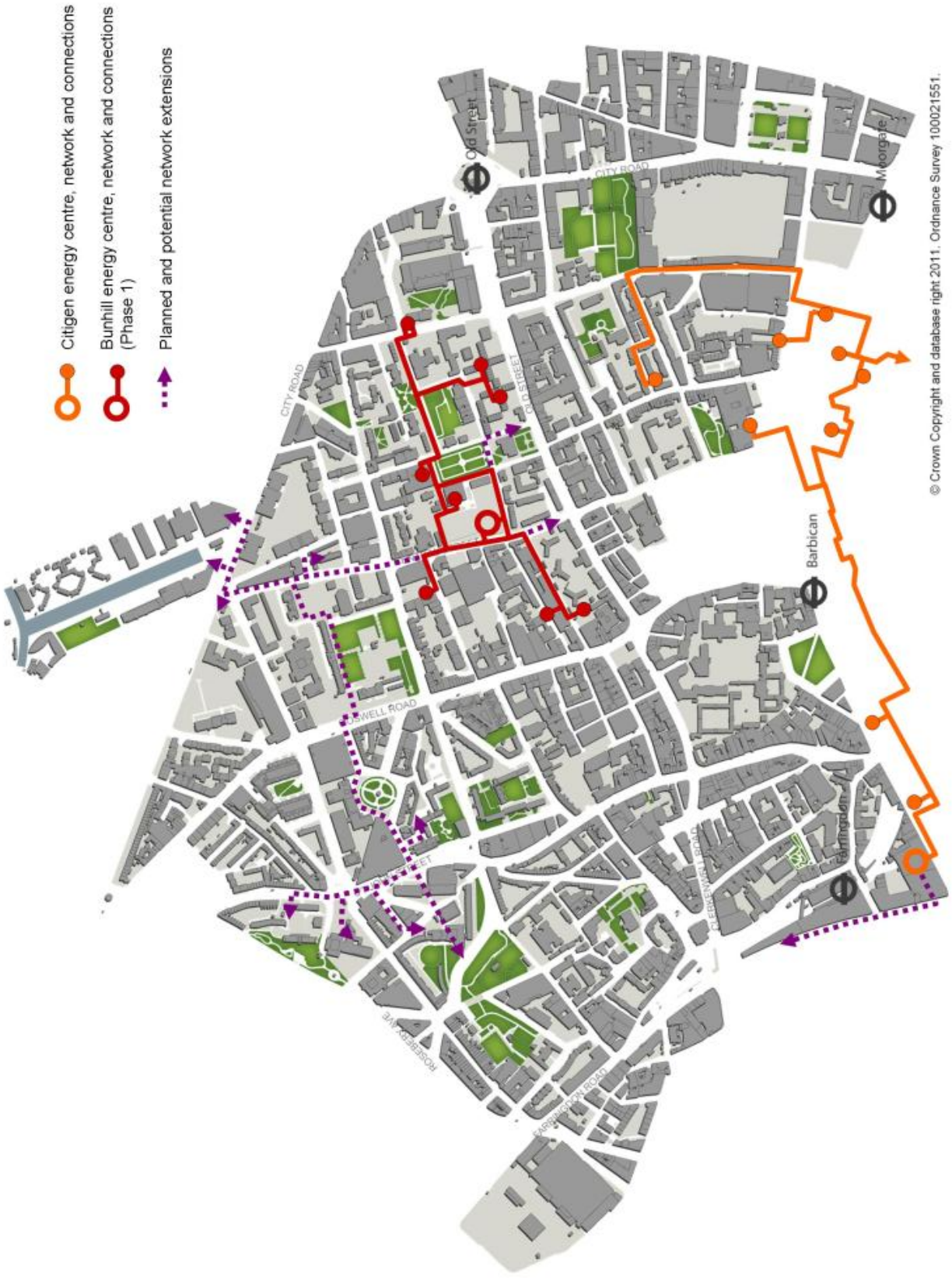
3.0.5 The online Carbon Buzz tool may be useful for facilitating data collation, analysis and reporting.

How will GPP information be disseminated?

3.0.6 Any information that is submitted relating to a GPP will not be disseminated or publicised outside of the normal requirements of the planning process and Environmental Information Regulations and Freedom of Information requirements without the prior approval of the stakeholders involved.

3.0.7 Dissemination of information on a building's post occupancy performance (e.g. via published case studies) in order to share any good practice and lessons learned is strongly encouraged in order to aid wider learning. Such dissemination can also contribute to securing credits under BREEAM 2011.

3.0.8 Subject to approval from stakeholders, high performing developments will be recognised through Islington Council's Green Building Best Practice Case Studies.



Appendix 4: Decentralised energy map

Appendix 5: Recommended energy efficiency measures for existing buildings

5.0.1 Extensions to properties result in an increased carbon footprint, due to the increased surface area of the property, increased heating and lighting requirements, and the ability of the property to accommodate a greater number of occupants. Part D of policy DM41 (Energy efficiency and carbon reduction in minor schemes) seeks to **encourage** proposals for householder extensions to apply cost-effective energy efficiency measures to the existing property, where practical, in addition to requirements applicable to the extension itself.

5.0.2 The council recommends the following energy efficiency measures for extensions, which can be applied to existing properties to mitigate the impact of extensions:

- Low energy light bulbs
- Hot water tank insulation
- Improving heating controls i.e. TRVs, programmers and thermostats
- Improving draft proofing
- Installing reflective panels behind radiators
- Upgrading loft insulation
- Insulating cavity walls

5.0.3 These measures should have a pay-back period of no more than 5 years and will cost no more than 5% of the build costs of the proposed extension.

Appendix 6: Summary of information requirements for major applications by stage

Pre-application stage

- Outline Sustainable Design and Construction (SDC) Statement (and related plans) including:
  - Outline energy strategy - key targets and preferred technologies and systems
  - BREEAM/Code for Sustainable Homes targets
  - Outline water efficiency/recycling measures
  - Green roof plans and outline landscape plans
  - SUDS conceptual design
  - Outline of design measures to mitigate overheating risk
  - Outline materials targets
  - Outline plans for sustainability in operation

Application stage

- Full SDC statement (and related plans; see template in Appendix 7), including full energy strategy, Code for Sustainable Homes and BREEAM pre-assessments (as appropriate), draft green performance plan, internal thermal modelling and (as a minimum) outline SUDS proposal

Via condition or s106 agreement (as relevant)

- Code for Sustainable Homes and BREEAM certification
- Full Green Performance Plan
- Carbon offsetting
- Full details of (as necessary):
  - Energy technologies to meet CO_2 target (e.g. preferred and alternative strategies where DEN connection is deemed possible)
  - Green roofs
  - Rainwater and/or greywater recycling
  - SUDS
  - Overheating mitigation/cooling measures
  - Materials
  - Landscaping
  - Nesting boxes

Appendix 7: SDC statement guidance for major applications

Sustainable Design and Construction Statements

Guidance on Content for Major Planning Applications in Islington

7.0.1 Islington requires all applications for major developments to include a Sustainable Design and Construction (SDC) Statement (Policy DM40). This statement should demonstrate that the proposed development will meet the highest standards of sustainable design and construction throughout all stages of the development, including demolition, construction and long-term management. This requirement is based on the policies of the London Plan 2011, the Mayor's SPG on Sustainable Design and Construction and a range of national and local policies and guidance, including Policy CS10 Sustainable Design of Islington's Core Strategy and the Development Management Policies. For further guidance see the Environmental Design SPD.

7.0.2 The SDC Statement should set out how the development will comply with policies on sustainable design. The key areas which should be covered include:

- **Energy and CO_2** - the SDC Statement should include an Energy Statement (Policy DM40) as a separate document or appendix. The Energy Statement should provide an assessment of the baseline energy demand and carbon dioxide (CO_2) emissions from proposed developments, and demonstrate the expected energy and CO_2 emission savings from following the energy hierarchy (see section 2 of the Environmental Design SPD). The Energy Statement is critical to demonstrating compliance with the total (regulated and unregulated) CO_2 emissions targets in Policy CS10 of the Core Strategy and to quantifying the remaining emissions to be offset through a financial contribution in order to achieve zero net carbon emissions. A suggested template for an Energy Statement is provided below. If biomass or air source heat pumps are proposed as part of the renewables mix, additional information on the proposed technology will need to be provided, as summarised at the end of this note. For further guidance on energy issues see section 2 of the Environmental Design SPD
- **BREEAM and Code for Sustainable Homes (CSH)** – the statement should include, as an appendix, a CSH pre-assessment report (for new build residential schemes or elements of schemes) and/or relevant BREEAM pre-assessment report(s) (for all other schemes or elements of schemes). These should summarise the design strategy for achieving BREEAM Excellent and/or CSH Level 4 and include details of the credits proposed to be achieved (see section 3 of the Environmental Design SPD).
- **Water consumption** – the statement should demonstrate how water efficiency has been maximised and provide a predicted water use target. Residential development should demonstrate how it meets the water use target for residential development of 95 litres per person per day (Policy CS10); non-residential development should demonstrate how it will achieve the required BREEAM water consumption credits (Policy DM43). Also required is an analysis of the feasibility of using rainwater harvesting (for internal and/or external use) and grey water recycling, including the likely yield from such systems, the proportion of water demand they could provide for and any other cost/benefit information (see section 4 of the Environmental Design SPD).

- **Biodiversity** – all developments should assess whether they are likely to have an impact on biodiversity. Where a proposed development could have negative impacts on wildlife/biodiversity, a survey of the existing biodiversity value of the site should be undertaken so that any potential impacts can be fully assessed. Details of how a development will enhance on-site ecology should also be provided (Policy CS10 and DM38), for example through ecological landscape design (including tree planting), biodiversity-based extensive substrate green roofs and artificial nesting boxes (see section 5 of the Environmental Design SPD).
- **Climate change adaptation** – details of measures to minimise the rate of surface water run off and avoid overheating should be provided (Policy CS10, DM39 and DM44). SUDS details should include a drainage strategy and outline plan, details of how the proposed scheme follows the SUDS management train to achieve quantity, quality and amenity/biodiversity criteria and information about specific techniques proposed. SUDS should form part of the landscape plan. Overheating should be designed out by maximising passive design and passive ventilation measures, with active cooling avoided where possible. Thermal modelling is required to demonstrate how overheating has been effectively designed out (see section 6 of the Environmental Design SPD).
- **Materials, waste and construction impacts** – the statement should demonstrate how the scheme has minimised materials use, including by minimising waste; maximised use of recycled, low impact and sustainably sourced materials; and minimised impacts of demolition and construction (Policy CS10 and DM43). Relevant performance targets should be provided along with evidence demonstrating that the required credits will be achieved under BREEAM/CSH (see section 7 of the Environmental Design SPD).
- **Operational sustainability** - details are required of how the development has been designed, and how it will be managed, to promote effective and sustainable performance in use (see section 8 of the Environmental Design SPD).

Islington Energy Statement Template

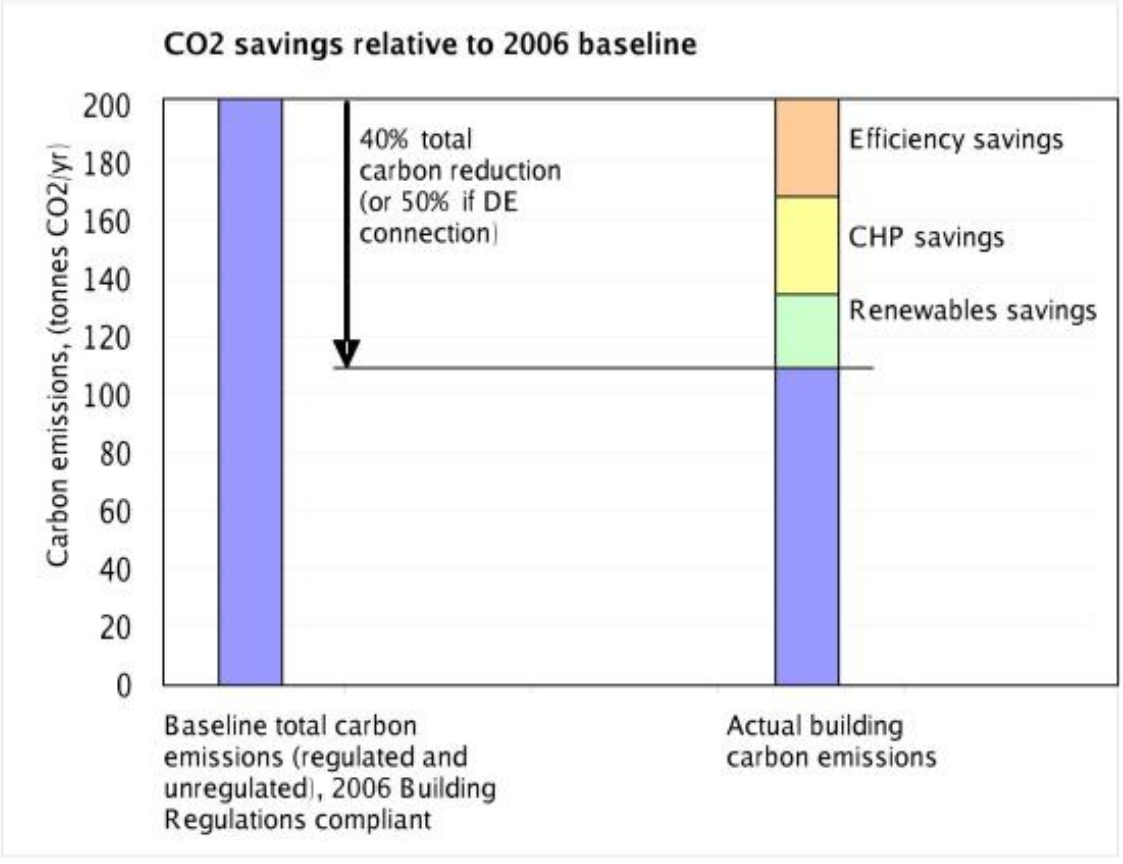
1 Executive Summary

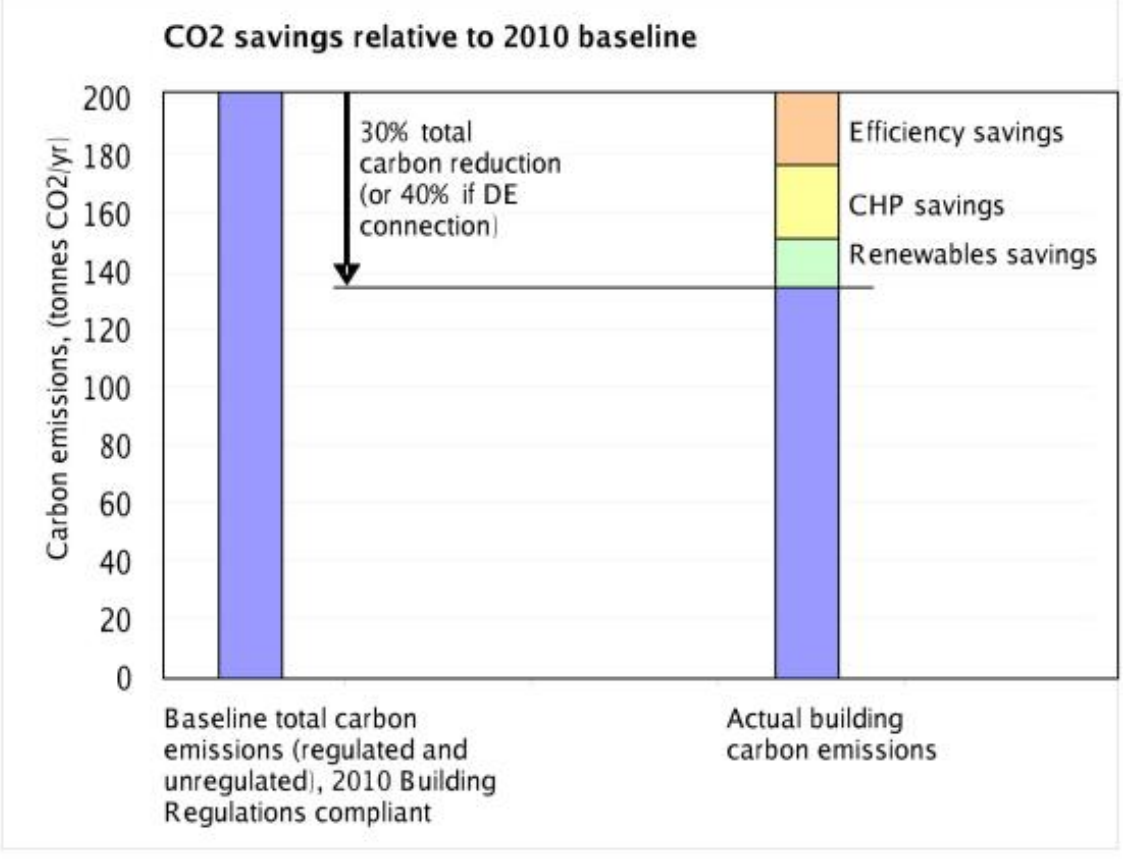
7.0.3 *Energy demand summary* – completion of the following table:

	Energy demand (kWh/yr)	Energy consumption savings (%)	CO_2 emissions (kg/yr)	CO_2 emission savings (%)
2006/2010 compliant baseline scheme*				
Proposed scheme after energy efficiency measures				
Proposed scheme after CHP savings				
Proposed scheme after renewables savings				
Total savings (against baseline)				
CO_2 emissions to be offset via a financial contribution				

*The baseline scheme must be a 2010 Building Regulations compliant building or a 2006 Building Regulations compliant building (please note that use of the building regulation backstops/software default is not equivalent to a compliant building and is therefore not acceptable) – relevant planning policy targets are identified below.

7.0.4 Also represent graphically (against the 2006 or 2010 baseline), clearly showing CO_2 savings from energy efficiency;Combined Heat and Power (CHP) / Combined Cooling Heat and Power (CCHP) and then renewables, as per the examples below (note, percentage savings shown are illustrative only):





7.0.5 The following information should then be set out:

- **1.1 Key energy efficient design measures** – outline main measures proposed, including u-values for all building fabric elements; air tightness; passive measures to minimise overheating and details of other low energy measures such as lighting controls and variable speed drives.

- **1.2 Summarise proposed low carbon heating and cooling systems** – including Decentralised Energy Network (DEN)connection or shared heat network (SHN) connection/development, outcome of CHP/CCHP feasibility study

- **1.3 Choice and impact of renewable energy technology(s) -** if biomass or air source heat pumps are proposed as part of the renewables mix, additional information on the proposed technology will need to be provided, as summarised at the end of this note.

- **1.4 Remaining emissions to be offset**

2 Energy demand assessment

7.0.6 Applicants should utilise dynamic modelling to produce an assessment of the energy demand and CO_2 emissions from proposed major developments, which should demonstrate the expected energy and CO_2 emission savings from, in order of preference:

i. Energy efficiency measures;

ii. Supplying energy efficiently using low carbon heating and cooling systems (DEN connection, SHN connection/ development and/ or CHP/CCHP where feasible);

iii. Onsite renewable energy measures (section 2 of the Environmental Design SPD for further details).

7.0.7 The total energy and CO_2 emission savings from the development (relative to the baseline) and the remaining CO_2 emissions to be offset via a financial contribution (to achieve zero carbon) should also be stated.

7.0.8 The assessment should include:

- calculation of a 2006/10 Building Regulations (BRs) compliant baseline energy demand and CO_2 emissions, including the energy consumed in the operation of the space heating/cooling and hot-water systems, ventilation, all internal lighting, cooking and all electrical appliances
- proposals for reduction of energy demand and CO_2 emissions from heating, cooling and electrical power
- proposals for meeting residual energy demands to achieve the relevant Core Strategy CO_2 reduction target through renewable energy measures
- calculation of the remaining energy demand and the CO_2 emissions to be offset via a financial contribution.

2.1 Baseline calculations

7.0.9 Baseline emissions for dwellings should establish:

- A Target Emissions Rate (TER) calculated through the standard BRs 2010 methodology SAP 2009
- Additional emissions associated with non BRs elements established by using BREDEM (BRE Domestic Energy Model).

7.0.10 The modelling should be completed for a representative sample of domestic properties.

7.0.11 Baseline emissions for non-domestic development should establish:

- A Target Emissions Rate (TER) calculated through the standard BRs 2010 methodology established through dynamic modelling
- Additional emissions associated with non BRs elements established by using individual end use figures (for example catering and computing) from CIBSE guide baselines (e.g. CIBSE Guide F), Energy Consumption Guide 19, or evidence established through previous development work.

7.0.12 A short summary of the modelling work output (e.g. a BRUKL report) should be provided in an appendix of the energy assessment.

3 Energy efficiency savings

7.0.13 Planning policies are not in place to duplicate regulations. Energy statements should therefore set out the building fabric and services measures specific to the scheme and demonstrate the extent to which they exceed building regulations. Benchmark estimates are not acceptable. Applicants are encouraged to demonstrate site-specific or innovative measures that show energy efficiency is fundamental to a scheme's design. As Islington's Core Strategy takes a 'whole energy' approach, baselines emissions should also take account of emissions associated with uses not covered by Building Regulations including all internal lighting, cooking and all electrical appliances.

7.0.14 Applicants should complete the following table to demonstrate the likely heating, hot water, cooling and electricity demand. This is to help identify the technical feasibility of energy efficient and renewable energy technologies, and to identify where an applicant can make the most effective energy and carbon emissions savings in a scheme. It will also validate whether a scheme achieves the relevant CO_2 target.

Energy/carbon efficiency savings summary

	Baseline scheme		Proposed scheme after efficiency measures		Change		
	kWh	CO_2 (kg)	kWh	CO_2 (kg)	kWh	C O $_2$ (kg)	CO_2(%)
Electricity							

Heating							
Hot water							
Cooling							
Total							

4 Supplying energy efficiently using low carbon heating and cooling systems

All developments should seek to minimise such CO_2 emissions as far as possible, including through connecting to a DEN; connecting to or developing a shared heat network (SHN); and/or utilising CHP/CCHP. Applicants should complete the following table to demonstrate the predicted energy and CO_2 savings.

Low carbon heating and cooling summary

	Amount (kWh / tonnes)	%
Reduction in energy demand from DEN connection / SHN / CHP / CCHP		
Reduction in CO_2 emissions from DEN connection / SHN / CHP / CCHP		

Future proofed design which should enable a future connection

The Energy Statement should include details of how the development has been designed to be future proofed to allow connection to a district heating network if/when such a network becomes available in the future. Technical design standards to enable connection are set out in the Environmental Design SPD.

Overheating and active cooling demand

The need for active cooling should be reduced as far as possible. The extent to which the cooling demand has been minimised – through use of passive design features (e.g. solar shading to control heat gains, thermal mass to manage heat, building massing, orientation and layout) and passive ventilation (e.g. passive stack ventilation) – should be specified (see section 6 of the Environmental Design SPD). Where the use of passive design and passive ventilation is not sufficient to guarantee building occupants' comfort, proposals for mechanical ventilation and/or cooling should include details of the infrastructure being proposed including energy/carbon efficiencies and any opportunities to take advantage of free cooling and/or renewable cooling sources. Where appropriate, opportunities should be investigated to improve cooling efficiencies through the use of locally available sources such as ground cooling and canal water cooling. The early involvement of services engineers is encouraged to ensure that opportunities for low/zero carbon heating, cooling and ventilation systems are optimised as an intrinsic part of the building design.

5 Renewable energy technologies

Developments should maximise the use of renewable energy in order to meet the overall CO_2 reduction target.

Energy assessments should set out consideration of the renewable energy technologies listed as suitable for Islington in section 2 of the Environmental Design SPD. Full details of the proposed renewable technologies should be provided, including how they will be integrated into a communal heating network. Please note that if air source heat pumps or biomass are proposed Islington Council will require submission of additional information as a supplement to the energy statement, as explained further below.

Renewable energy/carbon savings summary

	Amount (kWh / tonnes)	%
Proposed energy generation from renewables (kWh)		
Required minimum CO_2 reduction from renewables		
Proposed CO_2 reduction from renewables		

Air source heat pumps - suitability and additional information requirements

7.0.15 The Council has concerns about their efficiency of current air source heat pumps (ASHPs) and the need to ensure heating systems are compatible with Decentralised Energy Networks. In accordance with the results of field trials by the Energy Saving Trust[25], use of ASHPs in residential schemes would therefore only be supported in situations where a mains gas connection is not possible. Use of ASHPs to heat domestic hot water is not acceptable.

7.0.16 In non-residential schemes, an ASHP system would need to demonstrate that it provides one external point of connection enabling heat and hot water supply from a future decentralised energy system; and that it has lower CO_2 emissions compared to highly efficient gas fired boiler(s). As with all heat pumps, when calculating the contribution that ASHPs make towards onsite CO_2 reduction, clear calculations should demonstrate which portion of the heat load met by the ASHP is actually renewable (i.e. the electrical energy used to operate the pump, and the associated CO_2, should be subtracted from calculations of energy provided and CO_2 saved by renewables). In addition, any ASHP system would need to demonstrate that it would not negatively impact on neighbours' amenities (e.g. due to noise or heat/coolth generation).

Biomass - additional information requirements

7.0.17 If your scheme proposes use of biomass Islington Council requires submission of the following additional information as a supplement to the energy statement. This is important because of the need to ensure that the utilisation of biomass is appropriate (e.g. is in an

25 Energy Saving Trust. Getting warmer: a field trial of heat pumps. September 2010.

accessible location for fuel deliveries, has a fuel store sized to minimise the frequency of fuel deliveries, does not require a large boiler stack out of keeping with the building/area), and makes use of the best available technology and effective operation/management so as to maximise efficiency and carbon emissions savings while minimising air pollution.

7.0.18 The Mayor's Air Quality Strategy (December 2010) states that "*The Mayor considers that the planning system should be used to strike a balance between ensuring London drives down its carbon emissions and making sure that development does not have a negative impact on air quality*."(para 4.8.1). Further, it states that "*biomass boilers can be valid tools to help developers meet their carbon dioxide reduction targets*" and advocates "*a risk-based approach to help local authorities mitigate any negative air quality impacts from their use*".

7.0.19 The Mayor's Sustainable Design and Construction SPG (see www.london.gov.uk/priorities/planning/londonplan) provides guidance on the use of biomass in London and sets out biomass emissions standards.

Biomass Boiler Information Request

7.0.20 1 Particulars of the boiler and operation/maintenance

i. Description of biomass boiler including make, model, manufacturer, thermal capacity (kw/MW)
ii. Maximum rate of fuel consumption in kg/hr or m3/hr
iii. Identify efficiency of the boiler. Does the boiler comply with EN303-5; provide details
iv. Describe the boiler combustion system and grate design
v. Describe how combustion will be optimised and controlled in order to reduce pollution emissions
vi. Describe the fuel feed system
vii. Provide details of the abatement equipment in place for controlling particulate matter emissions.
viii. If no abatement system for particulate matter is fitted, justify what boiler design features are in place to effectively reduce particle emissions.
ix. How does the biomass boiler deal with variable heat loads - is the boiler linked to an accumulation tank
x. Is the biomass boiler an exempt appliance in accordance with the Clean Air Act 1993. If yes provide evidence to demonstrate the biomass boiler has been tested and certified as an exempt appliance.
xi. Describe arrangements for cleaning and de-ashing the boiler
xii. Who will be responsible for operating and maintaining the boiler
xiii. Provide details of the maintenance schedule associate with boiler, abatement equipment and stack. This should include frequency of boiler inspection and servicing by a trained boiler engineer.
xiv. Describe how incidences of boiler or abatement system failure are identified & mitigated.

2 Boiler Stack Details

i. Identify the height of the boiler exhaust stack above ground. The height should be calculated using dispersion modelling software such as ADMS Urban or Aermod. Evidence shall be presented to demonstrate that predicted emission concentrations associated with the calculated stack height do not have a significant impact on the air quality objectives for NO_2 and PM10.

- Air quality modelling shall be carried out in accordance with the procedures outlined in Air Quality and Planning Guidance, London Councils (2006) and Technical Guidance Note TG(08) (currently being drafted)
- The modelling work should consider variable emissions rates associated with the biomass boiler operating on full and partial load.
- A report shall be submitted outlining the following

- Details of the modelling software chosen
- Emission rates and stack parameters used in the modelling exercise
- Building parameters
- Meteorological data
- Terrain and surface roughness
- Background concentrations
- Method used to calculate background and predicted concentrations
- The predicted results for specific receptors should be tabulated, this should include location of receptors and distance from the stack. The location and grid reference of maximum pollution concentrations should also be identified.
- A full discussion of any potential breaches of air quality criteria should be provided. This should also include discussion of model sensitivity and variation.

ii. Identify stack internal diameter (m)
iii. Does the stack terminate vertically and is the stack insulated
iv. Provide maximum particulate matter and nitrogen oxides emission rates (mg/m3) to standard reference conditions. Provide emissions test data as evidence of emissions rates from the boiler. This shall reference the test method used to determine emission concentrations.
v. Identify the exhaust gas efflux velocity (m/s)
vi. Is the boiler exhaust stack fitted with draft fans with adjustable speed control
vii. Identify grid reference of boiler exhaust stack.

3 Fuel Details

i. Description of the fuel specification including origin, type of wood (chips, pellet, briquettes), particle size, nitrogen, moisture, ash content (%) and mechanical durability. Islington Council strongly encourages use of fuel types that release fewer particulate matter (PM) emissions when burnt and have higher energy density (thus requiring less transportation and generating fewer transport emissions) such as wood pellets.
ii. Does the fuel comply with European or equivalent fuel quality standards such as CEN/TS 14961:2005?

iii. Describe what fuel quality control procedures will be adopted to guarantee constant fuel quality from your supplier.
iv. Provide evidence to demonstrate that the biomass boiler combustion system is applicable to the fuel specification
v. Location and distance of fuel supplier(s) from site
vi. Identify where and how fuel will be stored on site (eg bunker or silo)
vii. Identify the capacity of the fuel store and the frequency of fuel deliveries required
viii. Will the biomass store be fitted with ventilation, provide details
ix. Describe how fuel will be unloaded from the delivery vehicle into the storage facility and what control measures will be in place to reduce particulate matter emissions to atmosphere.
x. Identify the type of fuel delivery vehicle and provide evidence to demonstrate that there is sufficient space for the fuel delivery vehicle to access, exit and manoeuvre the site.

4 Building Details

I. Distance of adjacent buildings from boiler exhaust stack
II. Height of adjacent buildings from boiler exhaust stack
III. Dimensions of building to which the boiler exhaust stack is attached
IV. Indicate the distance from the boiler exhaust stack to the nearest fan assisted intakes and openable windows.

5 Plans

I. Provide a site plan showing the location of the boiler room, fuel storage area and the access and exit route for fuel delivery vehicles
II. Provide a site plan showing the position of the boiler exhaust stack, fan assisted intake air vents and nearest openable windows.

Appendix 8: SDC statement guidance for minor applications

Sustainable Design and Construction Statements

Guidance on Content for Minor Applications

8.0.1 Islington Council requires all minor developments creating new residential and/or commercial units, and extensions of 100m^2 or greater, to submit a Sustainable Design and Construction (SDC) Statement (Policy DM40).

8.0.2 The SDC statement should demonstrate that the proposed development will meet the highest standards of sustainable design and construction. This requirement is based on the primarily on Policy CS10 of Islington's Core Strategy (2011) and policies contained in Islington's Development Management Policies. Further guidance is provided in the Environmental Design SPD.

8.0.3 The SDC Statement should set out how the development will comply with policy requirements. Some issues may be appropriately addressed via condition, subject to agreement with the case officer. Information requirements are summarised separately below for minor new build applications and extensions of 100m^2 or more.

Minor new build applications creating new units

8.0.4 New build minor schemes should submit a SDC Statement addressing the following issues:

Topic	Standard
Code for Sustainable Homes / BREEAM	**Residential schemes** are required to achieve Code for Sustainable Homes Level 4 (Policy DM43). No target will be applied to **non-residential or refurbishment schemes** (research indicates viability of achieving BREEAM standards varies significantly between such schemes).
Energy and CO_2 emissions	*On site CO_2 emissions:* Developments that commit to achieve Code for Sustainable Homes Level 4 do not need to provide additional information about how CO_2 emissions are being minimised on site. Developments that do not commit to achieving this standard (which requires a 25% reduction in regulated CO_2 emissions over a building which complies with 2010 Building Regulations) must demonstrate that they have minimised on-site CO_2 emissions by using less energy through maximising efficiency (for standards see section 2 of the Environmental Design SPD), supplying energy efficiently (e.g. communal heating systems) and using on site renewable energy generation (Policy CS10). *Carbon offsetting:*All remaining regulated CO_2 emissions not dealt with on site must be offset through a s106 contribution (Policy DM41). Further details and carbon costs are provided in section 2 of the Environmental Design SPD. *Heat network connection:* Developments should be designed to be able to connect wherever reasonably possible (Policy DM42).
Water efficiency and recycling	**Residential schemes** should achieve a water efficiency target of 95 l/p/d (Policy CS10).

	Non-residential schemes should demonstrate how they would achieve all credits for water efficiency in the relevant BREEAM scheme (Policy DM43). Rainwater harvesting options should also be explored (see section 4 of Sustainable Design SPD).
Biodiversity	All schemes should demonstrate that they protect existing site ecology and make the fullest contribution to enhancing biodiversity including by maximising soft landscaping and green roofs (Policy CS10 and DM38). Ecological surveys and tree surveys should be completed where required (see section 5 of Environmental Design SPD).
Adaptation to climate change	All developments should demonstrate adaptation to climate change (Policy CS10). Existing surface water run-off levels must be reduced as far as possible, and as a minimum existing run-off levels should be maintained (Policy DM39) (e.g. by maximising soft landscaping and using green roofs and permeable paving). Overheating risk should be minimised through passive design (e.g. by avoiding large areas of south-facing glazing and using solar shading) and passive ventilation measures (e.g. openable windows for cross ventilation); active cooling should be designed out (Policy DM44; see section 6 of SPD).
Sustainability in operation	All developments must be designed and managed to promote sustainability through ongoing operation (e.g. by incorporating smart meters and easy-to-read user guides explaining how to operate and maintain a development efficiently; see section 8 of SPD).

Extensions of 100m^2 or greater

8.0.5 Applications for extensions of 100m^2 or more should provide a SDC Statement addressing the following issues:

Topic	Standard
Energy	Developments must demonstrate that they have minimised on-site CO_2 emissions through maximising efficiency (for standards see section 2 of the Environmental Design SPD), supplying energy efficiently and using onsite renewable energy generation (Policy CS10).
Water efficiency and recycling	Non-residential extensions of 100m^2 or greater, are required to demonstrate how they would achieve all credits for water efficiency in the relevant BREEAM scheme (Policy DM43). Rainwater harvesting options should also be explored (see section 4 of SPD).
Biodiversity	All schemes should demonstrate that they protect existing site ecology and make the fullest contribution to enhancing biodiversity including by maximising use of green roofs (Policy CS10 and DM38). Ecological surveys and tree surveys should be completed where required (see section 5 of Environmental Design SPD).
Adaptation to climate change	All developments should demonstrate adaptation to climate change (Policy CS10). Rainwater run-off should be minimised, including by maximising use of green roofs and permeable paving. Overheating risk should be minimised through passive design (e.g. by avoiding large areas of south-facing glazing and using solar shading) and passive ventilation measures (e.g. windows that can be opened for cross ventilation); active cooling should be designed out (Policy DM44; see section 6 of SPD).
Materials	Developments must be designed to minimise the environmental impact of materials (e.g. by using the BRE Green Guide).
Sustainability in operation	All developments must be designed and managed to promote sustainability through ongoing operation (e.g. by incorporating smart meters and easy-to-read user guides explaining how to operate and maintain a development efficiently; see section 8 of SPD).

Appendix 9: Relevant London Plan policies

9.0.1 Polices from the London Plan 2011 that are relevant to each of the sections of the Environmental Design SPD are highlighted below by section:

2 Minimise energy demand and carbon emissions

9.0.2 Minimise energy use and CO_2 emissions (policy 5.2), including through high standards of sustainable design and construction (policy 5.3); use of decentralised energy (policy 5.6) and renewable energy (policy 5.7); and reducing the need for active cooling systems as far as possible through passive design (policy 5.9).

3 High sustainable building standards

9.0.3 Developments should achieve the highest standards of sustainable design and construction (policy 5.3)

4 Minimising water consumption

9.0.4 Developments should minimise the use of main water by incorporating water saving measures and equipment; residential developments to apply a maximum water use target of 105 l/p/day (policy 5.15). The use of rainwater harvesting and dual potable and grey water recycling systems is promoted where they are energy and cost-effective (policy 5.15).

5 Protect and enhance biodiversity and facilitate access to nature

9.0.5 Developments should promote and protect biodiversity and green infrastructure (policy 5.3); integrate green infrastructure from the beginning of the design process to contribute to urban greening (e.g. tree planting, green roofs and walls, and soft landscaping) (policy 5.10); and include roof, wall and site planting, especially green roofs and walls where feasible (policy 5.11).

6 Climate change adaptation: SUDS and overheating

9.0.6 Developments should reduce potential overheating and reliance on air conditioning systems and demonstrate this in accordance with the cooling hierarchy (policy 5.9).

9.0.7 Development should utilise sustainable urban drainage systems (SUDS) unless there are practical reasons for not doing so, and should aim to achieve greenfield run off rates and ensure that surface water is managed as close to its source as possible in line with the drainage hierarchy (store rainwater for later use, use infiltration techniques, attenuate rainwater above ground, etc) (policy 5.13). The Mayor's Sustainable Design and Construction SPG sets out additional SUDS standards.

7 Sustainable materials, waste and construction impacts

9.0.8 Major developments should make efficient use of natural resources and secure sustainable procurement of materials, using local supplies where feasible (policy 5.3).

9.0.9 Developments should meet the highest standards of sustainable construction, including by minimising pollution (policy 5.3). The Mayor's Sustainable Design and Construction SPG outlines key principles and standards for the construction phase of new development; it refers to the Mayor and London Councils' best practice guidance on the control of dust and emissions during demolition and construction.

9.0.10 Major developments should minimise the generation of waste and maximise reuse and recycling (policy 5.3). The Mayor's Sustainable Design and Construction SPG outlines key principles and standards for the construction phase of new development.

8 Operational sustainability

9.0.11 Development proposals should demonstrate that sustainable design standards are integral to a proposal, including to its operation (policy 5.3).

9.0.12 Major developments should minimise the generation of waste and maximise reuse and recycling (policy 5.3).

APPENDIX 10: DRAFT UNILATERAL UNDERTAKING FOR CONTRIBUTIONS TO OFFSET CARBON DIOXIDE EMISSIONS FOR MINOR NEW-BUILD DEVELOPMENTS

The draft has been prepared without prejudice to the Council's discretion to properly determine this planning application at a future committee date/ under delegated powers and is not to be construed as giving any indication as to how the planning application may be determined.

The final wording of this draft deed remains subject to reasonable negotiations in each case and is subject to change without notice and may need to be amended in individual cases

The parts of the draft deed in square brackets are to be deleted /amended /completed as appropriate

ISLINGTON

DATED **201[ ]**

Unilateral Undertaking pursuant to section 106 of the Town and Country Planning Act given By:

1. [**Owner**];
2. [**Lessee**];
3. [**Mortgagee**]; and

To:

4. **THE MAYOR AND BURGESSES OF THE LONDON BOROUGH OF ISLINGTON**

In respect of:

[address of the Application Site]

THIS UNILATERAL UNDERTAKING made as a Deed is given on 201[ ]

By:

1) **[name(s) of freehold owner(s)] of [address of Owner(s)] / [**a company incorporated in England and Wales (Company No:) whose registered office is at [ ]] ("**Owner**");

2) **[names(s) of leasehold owner(s)]** of [address of Lessee (s)] / [a company incorporated in England and Wales (Company No:) whose registered office is at [ ]] ("**Lessee**");

3) **[ ]** a company incorporated in England and Wales (Company No.) whose registered office is at [ ] ([1]"**Mortgagee**"); and

[if there are any other interests in the Application Site further additional drafting will be required]

To:

4) **THE MAYOR AND BURGESSES OF THE LONDON BOROUGH OF ISLINGTON** Town Hall Upper Street London N1 2UD ("**Council**")

BACKGROUND

(A) The Council is the local planning authority for purposes of the Act for the area in which the Site is located

(B) The Owner is the registered proprietor of the [freehold] of the Site with title absolute under title number [ ].

(C) [The Lessee is the registered proprietor of the leasehold of the Site with [absolute] title under title number [ ]].

(D) [The Mortgagee is the owner of a charge over the Site dated [ ] between the Mortgagee and the [Owner/Lessee].

(E) The Application has been submitted to the Council and the Parties give this undertaking by way of this Deed in order to secure the planning obligations contained in this Deed.

OPERATIVE PROVISIONS

1 DEFINITIONS

In this Deed the following words and expressions have the following meanings:

Act	the Town and Country Planning Act 1990
Carbon Offset Contribution	£[see SPD paragraph 2.0.13 [1]] to be spent by the Council on the reduction of carbon dioxide emissions from the existing build stock in the borough
Application	the application for full planning permission submitted to the Council for the Development and allocated reference number [P] *application number to be inserted by the council*
Commencement	the date on which any material operation (as defined by section 56(4) of the Act) forming part of the Development begins to be carried out (for the purposes of this Deed and for no other purpose) and "Commencement" and "Commenced" shall be construed accordingly
Development	[*Insert the description of what has been applied for]*
Decision Date	the date that the Council resolves to grant planning permission being the date of the Committee report or the delegated decision which ever is applicable
Interest	interest at four per cent above LIBOR from time to time
Index	the Retail Prices (All Items) Index as published by

	the Office for National Statistics or (if such index is at the relevant time no longer published) such other comparable index or basis for indexation as the Council may reasonably decide
Index-Linking	means linked to movements in the Index between the Decision Date and the date of the payment so that the particular payment is adjusted in accordance with the following formula: Amount Payable = Relevant Amount x (A÷B) Where: Relevant Amount = the payment to be Index-Linked A = the figure for the Index which applied when the Index was last published prior to the date that the Relevant Amount is payable B = the figure for the Index which applied when the Index was last published prior to the Decision Date PROVIDED THAT the Index Linked sum can never be less than the original sum payable
Parties	means the [Owner /Lessee /Mortgagee]
Planning Permission	the full planning permission subject to conditions to be granted by the Council pursuant to the Application

Site	the land against which this Deed may be enforced as shown edged red on the Plan and known as [*address where development will take place*]
Site Plan	means the plan annexed at the Schedule showing the Site outlined in bold red
SPD	means Environmental Design Planning Guidance (Supplementary Planning Guidance)

2 Construction of this Deed

2.1 Where in this Deed reference is made to a clause paragraph schedule or recital such reference (unless the context otherwise requires) is a reference to a clause paragraph schedule or recital in this Deed.

2.2 Words importing the singular meaning where the context so admits include the plural meaning and vice versa.

2.3 Headings appearing in this Deed are for ease of reference only and shall not affect the construction of this Deed.

2.4 Words of the masculine gender include the feminine and neuter genders and words denoting actual persons include companies corporations and firms and all such words shall be construed interchangeable in that matter.

2.5 Wherever there is more than one person named as a party and where more than one party undertakes an obligation all their obligations can be enforced against all of them jointly and against each individually unless there is an express provision otherwise.

2.6 Any reference to an Act of Parliament shall include any modification extension or re-enactment of that Act for the time being in force and shall include all instruments orders plans regulations permissions and directions for the time being made issued or given under that Act or deriving validity from it.

2.7 References to any party to this Deed shall include the successors in title to that party and to any deriving title through or under that party and in the case of the Council the successors to their respective statutory functions.

2.8 Save in respect of the Planning Permission (which at all times shall prevail) in the event of any conflict between the terms conditions and provisions of this Deed and any

document or referred to therein the terms conditions and provisions of this Deed will prevail.

2.9 The Interpretation Act 1978 shall apply to this Deed.

2.10 All Parts Schedules and Annexes attached to this Deed are to be read as if the same were incorporated into the main body of the Deed.

3 Legal Basis

3.1 This Deed is made pursuant to Section 106 of the Act.

3.2 The obligations covenants restrictions and Deeds on the part of the [Owner/Lessee/Mortgagee] under this Deed create planning obligations pursuant to Section 106 of the Act and are enforceable by the Council as local planning authority against the Parties without limit of time.

4 Conditionality

This Deed is conditional upon the grant of the Planning Permission.

5 The Owner / Lessee Undertakings

The [Owner / Lessee] give the undertakings set out in Schedule 1 to the Council.

6 Miscellaneous

6.1 No provision of this Deed shall be enforceable under the Contracts (Rights of Third Parties Act 1999.

6.2 This Deed shall be registrable as a local land charge by the Council.

6.3 Insofar as any clause or clauses of this Deed are found (for whatever reason) to be invalid or unenforceable then such invalidity or unenforceability shall not affect the validity or enforceability of the remaining provisions of this Deed.

6.4 This Deed shall cease to have effect (insofar only as it has not already been complied with) if the Planning Permission shall be quashed, revoked or otherwise withdrawn or (without the consent of the Owner) it is modified by any statutory procedure or expires prior to Commencement.

6.5 No person shall be liable for any breach of any of the planning obligations or other provisions of this Deed after it shall have parted with its entire interest in the Site or that part of the Site in relation to which such breach occurs but without prejudice to liability for any subsisting breach arising prior to parting with such interest.

6.6 Nothing in this Deed shall prohibit or limit the right to develop any part of the Site in accordance with a planning permission (other than the Planning Permission) granted (whether or not on appeal) after the date of this Deed.

6.7 It is agreed and declared by the Parties that nothing contained or implied in this Deed shall prejudice fetter or otherwise affect the rights powers duties and obligations of the Council in the exercise by it of its statutory functions rights powers or obligations.

7 Mortgagee's Consent

[The Mortgagee acknowledges and declares that this Deed has been entered into by the Owner / Lessee with its consent and that the Site shall be bound by the obligations contained in this Deed and that the security of the mortgage over the Site shall take effect subject to this Deed PROVIDED THAT the Mortgagee shall otherwise have no liability under this Deed unless it takes possession of the Site in which case it too will be bound by the obligations as if it were a person deriving title from the Owner/Lessee].

8 Waiver

No waiver (whether expressed or implied) by the Council of any breach or default in performing or observing any of the covenants terms or conditions of this Deed shall constitute a continuing waiver and no such waiver shall prevent the Council from enforcing any of the relevant terms or conditions or from acting upon any subsequent breach or default.

9 Change of Ownership

The [Owner/Lessee] agree to give the Council immediate written notice of any change in ownership of any of their interests in the Site occurring before the obligations under this Deed have been discharged such notice to give details of the transferee's full name and registered office (if a company or usual address if not) together with the area of the Site or unit of occupation purchased by reference to a plan

10 Indexation

All sums payable to the Council pursuant to this Deed shall be Indexed Linked and for the avoidance of doubt such payment shall be Index Linked from the Decision Date.

11 Interest

The Owner / Lessee agree that any money payable to the Council pursuant to this Deed shall be paid in full without deduction or set-off and if not paid on the date due shall in every case bear Interest on so much thereof as shall from time to time be due and owing from the date the payment was due to actual payment.

12 Legal Fees

The Owner / Lessee shall pay to the Council on completion of this Deed the Council's reasonable legal fees of **[£X]** incurred in the drafting negotiation and execution of this Deed.

13 Notices

13.1 Any notice or other communication to be given under or in connection with this Deed shall be in writing which for this purpose shall not include e-mail and such notices or other communications should be addressed as provided in Clause 13.3 below.

13.2 Any such notice or other communication, if so addressed, shall be deemed to have been received as follows:

a) if delivered by hand, upon delivery at the relevant address;

b) if sent by first class post, at 9.00 a.m. on the second working day after the date of posting

13.3 The address relevant addressee and reference for each party are:

for the Council:

Address: Strategic Planning and Regeneration, 222 Upper Street, London N1 1XR

Relevant addressee: S106 Planning Obligations Team

for the Owner:

Address:
Relevant addressee:
Reference:

If a party changes its name, address, or relevant addressee for the purposes of this clause it shall notify the other party in writing.

SCHEDULE 1

THE OWNER/ LESSEE UNDERTAKINGS

1 Notices

The [Owner/Lessee] must give at least 14 days prior written notice to the Council of the date of Commencement of the Planning Permission.

2 Carbon Offset Contribution

2.1 The [Owner/Lessee] will pay the Carbon Offset Contribution to the Council prior or on Commencement.

2.2 The [Owner/Lessee] agree and acknowledge that the Council will decide in its sole discretion how to spend the Carbon Offset Contribution on the reduction of carbon dioxide emissions from the existing building stock in the borough.

SCHEDULE 2

SITE PLAN

IN WITNESS whereof the Parties hereto have executed this Deed on the day and year first before written.

Execution Clauses [NB: delete amend as appropriate]

1. Execution by an individual

SIGNED AS A DEED BY [INSERT NAME OF INDIVIDUAL]

……..

in the presence of [INSERT NAME OF WITNESS]

……
[INSERT NAME OF OCCUPATION OF WITNESS]

2. Execution by a company with or without seal

EXECUTED AS A DEED BY
LIMITED)
)
in the presence of)

……
Director

……

Director/Secretary

THE COMMON SEAL OF)

)
was hereunto affixed)
BY ORDER)

Director

Director/Secretary

3. Execution by a foreign company

SIGNED ON BEHALF OF [NAME OF COMPANY]
a company incorporated in [JURISDICTION] BY
[NAME OF THE DIRECTOR SIGNING] being a person
Who in accordance with the laws of that territory
is acting under the authority of the company

4. Execution by attorney

SIGNED AS A DEED BY [NAME OF ATTORNEY]
as attorney for [NAME OF DONOR COMPANY]
under a power of attorney dated [DATE]
in the presence of [NAME OF WITNESS]

[SIGNATURE OF WITNESS]

……

[NAME AND ADDRESS AND OCCUPATION OF WITNESS]

……