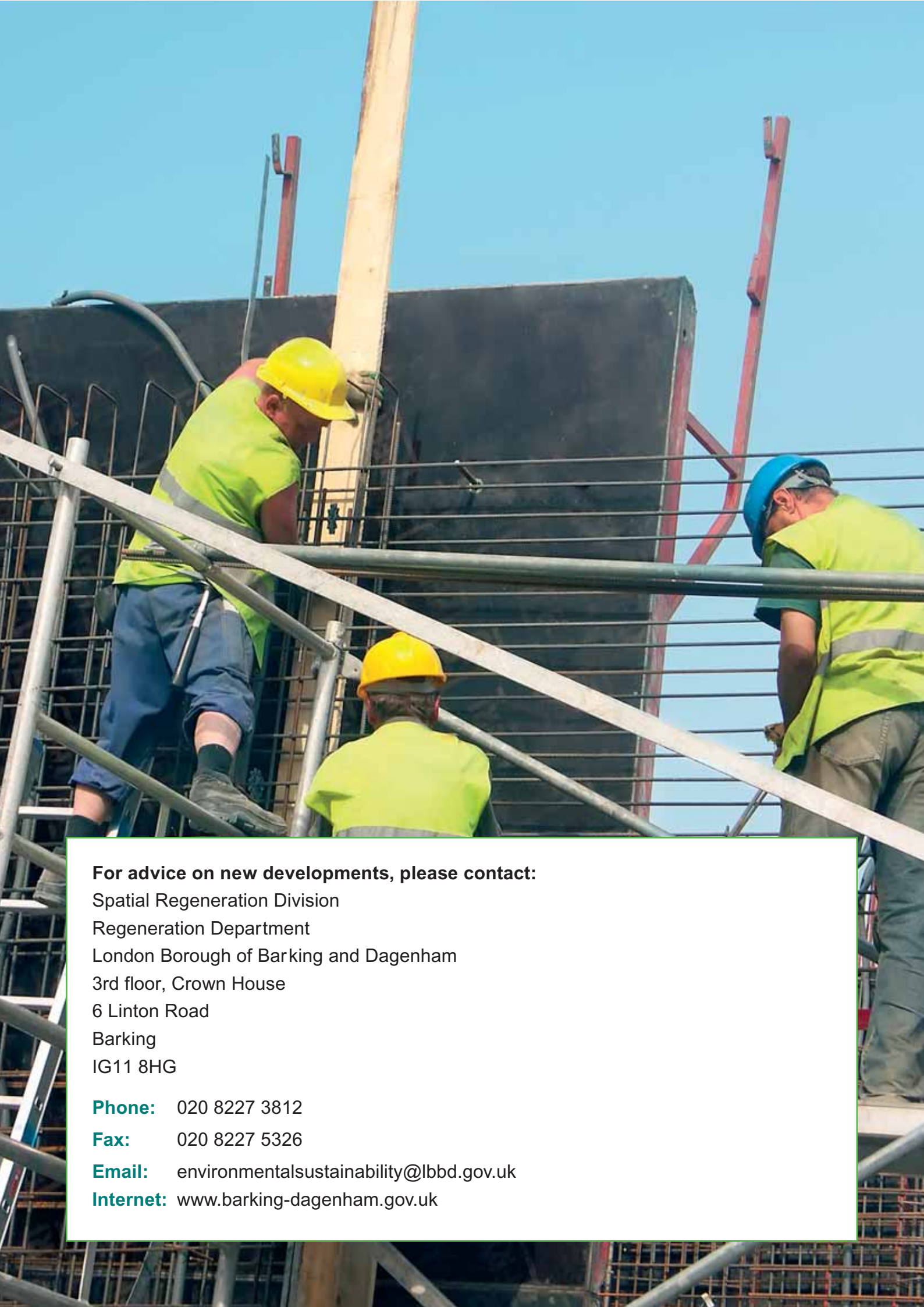
Sustainable Design and Construction

Planning Advice Note 5

The London Borough of
Barking & Dagenham

www.barking-dagenham.gov.uk



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Chapter 1 — Introduction

1.1 What is the Aim of this Planning Advice Note (PAN)?

1.1.1 The aim of this advice note is to provide guidance to planners, developers, architects and facility managers on how to achieve the Council's requirements in sustainable design and construction. This PAN will help the Council achieve policies set out in its Unitary Development Plan (UDP) and the London Plan, and will be used when considering new Local Development Framework (LDF) policies (see paragraph 2.6.2)

1.2 Do Developers have to Follow the Advice in this PAN?

1.2.1 Although developers do not have to follow the advice in this PAN to get planning permission, it provides important guidance about how to meet certain UDP policies. When the Council is deciding whether to approve planning applications, it will consider whether developers have followed the advice in this PAN. The most up-to-date policies at the national and regional level will always apply.

1.3 Why is the Council Promoting Sustainable Design and Construction?

1.3.1 'Sustainable design and construction' is an all-encompassing phrase for a large number of design elements which include maximising solar gain, using reused or recycled materials in the construction phase and installing water saving devices.

1.3.2 These measures are important to the Council because, when applied in a development project, they deliver buildings that not only provide a high quality environment for their occupants, but minimise the negative environmental impact any new building has on the planet.

1.3.3 Sustainable design and construction is underpinned by a number of principles including efficiency, longevity, health, local responsibility and sensitivity to place. Many of these principles are echoed in the Council's social, economic and environmental policies, which in turn are underpinned by the borough's community priorities.

1.4 What are the Benefits to Developers?

1.4.1 Developers can market the sustainable design and construction features of their buildings to their advantage. As home buyers become more aware of environmental issues through media exposure, the demand for sustainable homes is likely to grow — there are already cases of 'eco' homes achieving premium values above conventional new homes in the same area. Most buyers appreciate well lit and well insulated homes, cheaper energy bills and the opportunity to recycle or be less wasteful with water.

1.5 Where has the Specific Guidance in this PAN come from?

1.5.1 The guidance in this PAN is based on national, regional and local policy relating to sustainable design and construction (see chapter 2). This PAN highlights requirements that are of particular importance to Barking and Dagenham Council given the local circumstances in the borough. One such local circumstance is Barking Town Centre's designation as an Energy Action Area by the Mayor of London. This means that all developments within Barking Town Centre are expected to significantly reduce carbon dioxide emissions beyond Building Regulations 2006 and incorporate community heating.

1.5.2 While efforts have been made to include sources of information for each topic covered, the Council's Spatial Planning and Environmental Sustainability Group will be able to provide further advice. Developers are encouraged to contact the Council at the earliest opportunity to discuss sustainable design and construction.

The western harbour of the city of Malmo, Sweden, was built with the environment in mind. Although there is no special 'ecological look" to most houses, 1,000 homes in the Bo01 district get their entire energy supply from renewable sources: solar energy, wind power and water – the latter through a heat pump that extracts heat from seawater and an aquifer (a natural water reserve in the bedrock that facilitates seasonal storage of both heat and cold water).

1,400 m^2 of solar collectors, placed on top of ten of the buildings, complement the heat produced by the heat pump to supply the area. A large wind power station (2MW) placed in Norra Hamnen (the north harbour) and 120m^2 of solar cells produce electricity for the apartments, the heat pump, fans and other pumps within the area.

A unique part of the energy concept is that these technologies are linked to the energy systems in the city for district heating, district cooling and the electricity grid.

(Photos: City of Malmö, malmo.se/sustainablecity)

Chapter 2 — Relevant Policies

National Policy

2.1 National Planning Policy

2.1.1 Planning Policy Statements (PPSs)

These statements provide the planning policy context for sustainable development and impact on many design and construction issues:

Planning Policy Statement 1: Delivering Sustainable Development (2005).

PPS 1 outlines the Government's objectives for the planning system. It states that 'regional planning authorities and local authorities should promote resource and energy efficient buildings; community heating schemes, the use of combined heat and power, small scale renewable and low carbon energy schemes in developments; the sustainable use of water resources; and the use of sustainable drainage systems in the management of water run-off.'

Planning Policy Statement 9: Biodiversity and Geological Conservation (2005).

PPS 9 states that 'development policies should promote opportunities for the incorporation of beneficial biodiversity and geological features within the design of development.'

Planning Policy Statement 10: Planning for Sustainable Waste Management (2005).

PPS10 states that 'planning authorities should ensure that new development makes sufficient provision for waste management and promotes designs and layouts that secure the integration of waste management facilities without adverse impact on the street scene or, in less developed areas, the local landscape.' Furthermore 'proposed new development should be supported by site waste management plans.'

Planning Policy Statement 22: Renewable Energy (2004)

PPS 22 states that 'local planning authorities may include policies in local development documents that require a percentage of the energy to be used in new residential, commercial or industrial developments to come from on-site renewable energy developments.'

Planning Policy Guidance 25: Development and Flood Risk (2001)

PPG25 explains how flood risks should be considered at all stages of the planning and development process in order to reduce future damage to property and loss of life. It states that 'flood risk and other environmental damage can be managed by minimising changes in the volume and rate of surface runoff from development sites through the use of sustainable drainage systems'. The DCLG is at the time of publication consulting on Planning Policy Statement 25 (PPS 25) which will provide further clarity on these issues.

Further information:

Department for Communities and Local Government (DCLG)
www.communities.gov.uk
Planning Policy Statements

DCLG
http://www.communities.gov.uk/index.asp?id=1144113
Planning Policy Guidance: Development and Flood Risk

DCLG
http://www.communities.gov.uk/index.asp?id=1162059
Consultation on Planning Policy Statement 25: Development and Flood Risk

2.2 Building Regulations

2.2.1 Building Regulations Approved Documents and Associated Guidance, Part F (Ventilation), Part H (Drainage and Waste Disposal) and Part L (Conservation of Fuel and Power) (2002)

Part F and L relate to ventilation and conservation of fuel and power respectively, which when combined, set standards for energy efficiency of new buildings. Part H regulates the provision of refuse (and recyclables) storage in new developments.

2.2.2 Building Regulations 2006 (Parts F&L)

These revised Building Regulations on energy efficiency standards improve the minimum level of energy efficiency by 40% since the introduction of 1995 Part L Building Regulations. Compliance with Part L 2006 requires calculation of the home's carbon dioxide emission rate (DER) in accordance with the procedures set out in the Standard Assessment Procedure (SAP) 2005. This emission rate must not be greater than the target carbon dioxide emission rate (TER) derived according to the procedure published in Approved Document L1A 2006.

Further information:

Department for Communities and Local Government (DCLG)
http://www.communities.gov.uk/index.asp?id=1130474
Building Regulations and Approved Documents

2.3 National Strategies

2.3.1 Sustainable Communities: Building for the future (2003)

Also known as the Sustainable Communities Plan, this document sets out a long-term programme of action for delivering sustainable communities in both urban and rural areas.

2.3.2 National energy, waste and biodiversity strategies

Our Energy Future – Creating a Low Carbon Economy (2003)
The national energy strategy outlines the Government's objective to radically reduce the consumption of fossil fuels over the next fifty years as a means of reducing greenhouse gas emissions and delivering long term energy security.

Working with the Grain of Nature (2002)
This national biodiversity strategy strongly encourages development that supports and improves wildlife habitats. It highlights how nature conservation is essential in creating successful urban communities in the built environment.

Waste Strategy 2000

The national waste strategy sets a framework for reducing the amount of waste produced by municipalities, commerce and industry, recycling more of the waste that is produced and extracting energy from any residual waste before landfilling.

Further information:

Department of Trade and Industry (DTI)

Our Energy Future — Creating a Low Carbon Economy (2003)

Department of Food and Rural Affairs (Defra)

http://www.defra.gov.uk/wildlife-countryside/biodiversity/biostrat/biostrategy1to4.pdf
Working with the Grain of Nature (2002)

Defra

http://www.defra.gov.uk/environment/waste/strategy/cm4693/pdf/wastvol1.pdf
Waste Strategy 2000

The PV installation on the National Trust New Central Building (Heelis) in Swindon received funding from the Energy Savings Trust's(EST) "Major PV Demonstration Programme". The modules cover a total area of 1306m^2. (Photo: solarcentury.com)

Regional Policy

2.4 Regional Planning Policy

2.4.1 The London Plan, 'Spatial Development Strategy for Greater London' (2004)

The London Plan has development plan status and includes a number of policies on the environment which developments must adhere to. The guidance in this PAN is intended to help developers implement these policies.

Policy 4A.9 Providing for renewable energy

'The Mayor will, and boroughs should, require major developments to show how the development would generate a proportion of the site's electricity or heat needs from renewables, wherever feasible.'

Policy 4A.7 Energy efficiency and renewable energy

'The Mayor will, and boroughs should, support the Mayor's Energy Strategy and its objectives of reducing carbon dioxide emissions, improving energy efficiency and increasing the proportion of energy used generated from renewable sources by:

- requiring the inclusion of energy efficient and renewable energy technology and design, including passive solar design, natural ventilation, borehole cooling, combined heat and power, community heating, photovoltaics, solar water heating, wind, fuel cells, biomass fuelled electricity and heat generating plant in new developments wherever feasible.'

Policy 4A.8 Energy assessment

'The Mayor will, and boroughs should, request an assessment of the energy demand of proposed major developments, which should also demonstrate the steps taken to apply the Mayor's energy hierarchy. The Mayor will expect all strategic referrals of commercial and residential schemes to demonstrate that the proposed heating and cooling systems have been selected in accordance with the following order of preference: passive design; solar water heating; combined heat and power, for heating and cooling, preferably fuelled by renewables; community heating for heating and cooling; heat pumps; gas condensing boilers and gas central heating. Boroughs should apply the same criteria to major developments.'

Policy 4B.6 Sustainable design and construction

'The Mayor will, and boroughs should, ensure future developments meet the highest standards of sustainable design and construction and reflect this principle in UDP policies. These will include measures to:

- Re-use land and buildings;
- Conserve energy, materials and other resources;
- Ensure designs make the most of natural systems both within and around the building;
- Reduce the impact of noise, pollution, flooding and micro-climatic effects;
- Ensure developments are comfortable and secure for users;
- Conserve and enhance the natural environment, particularly in relation to biodiversity;
- Promote sustainable waste behaviour in new and existing developments, including support for local integrated recycling schemes, CHP schemes and other treatment options;
- Applications for strategic developments should include a statement showing how sustainability principles will be met in terms of demolition, construction and long-term management;
- Boroughs should ensure that, where appropriate, the same sustainability principles are used to address planning applications.'

2.4.2 London Plan Supplementary Planning Guidance on Sustainable Design and Construction (2006)

This document offers further guidance on London Plan Policy 4B.6 and sets out the Mayor's essential and preferred standards on a whole array of issues related to sustainable design and construction. All strategic developments that are referable to the Mayor are expected to meet all the essential standards and also to demonstrate how they have met, where feasible, the Mayor's preferred standards.

2.5 Regional Strategies

2.5.1 Mayor of London's energy, biodiversity and waste strategies

The Mayor's Energy Strategy, Green Light to Clean Power (2004)

This document aims to reduce London's contribution to global climate change, tackles fuel poverty and promotes London's economic development through renewable and energy efficient technologies.

The Mayor's Municipal Waste Strategy, Rethinking Rubbish in London (2003)

This document outlines a series of policies and proposals for local authorities in London, aimed at moving waste management up the waste hierarchy and exceeding national recycling and composting targets.

The Mayor's Biodiversity Strategy, Connecting with London's Nature (2002)

Proposal 5 says 'The Mayor will, and boroughs should, take account of the protection of wildlife habitats and biodiversity in the consideration of all planning applications.' Policy 5 says 'The Mayor will seek to ensure that opportunities are taken to green the built environment within development proposals and to use open spaces in ecologically sensitive ways.'

Further information:

Greater London Assembly (GLA)

London Plan, the Mayor's Spatial Development Strategy (2004)

Sustainable Design and Construction: Supplementary Planning Guidance (2006)

Mayor's Energy Strategy, Green Light to Clean Power (2003)

Mayor's Municipal Waste Strategy, Rethinking Rubbish in London (2003)

Mayor's Biodiversity Strategy, Connecting with London's Nature (2002)

Local Policy

2.6 Local Planning Policy

2.6.1 Barking and Dagenham's Unitary Development Plan (UDP) (1995)

The borough's planning policy document includes a number of policies that promote sustainable design and construction. These include:

- Energy conservation: G40, DE9 and H20
- Micro climates: DE2
- Reuse and recycling of building materials: G53
- Water management and flooding: G34, G38, DE3 and SPG5
- Habitats and nature conservations: strategic policy M, G42,G43, G46, G50, G54 and DE3
- Noise and Vibration: G36
- New developments and sustainability: G46 and DE10

2.6.2 Local Development Framework

The Council is in the process of replacing its UDP with a new plan called the Local Development Framework (LDF), which is expected to be adopted in 2008. Sustainable design and construction issues will be addressed in both the core strategy and borough-wide development policies. This PAN will help us achieve policies set out in our LDF.

2.6.3 Barking Town Centre Interim Planning Guidance (IPG) (2004)

The IPG provides policy guidance that bridges the UDP (1995) and more recent, adopted national and regional policy. The IPG provides a framework for considering development proposals and highlights the main issues developers will have to consider, including sustainability issues, in any new development or redevelopment within the town centre. The IPG is a material consideration when deciding planning applications.

2.6.4 Green Roofs Planning Advice Note (PAN) 1 (2005)

This PAN provides developers and architects with guidance on building green roofs.

2.6.5 Planning Advice Note (PAN) 3: Refuse and Recycling Facilities in New and Refurbished Residential Developments (2006)

This PAN provides guidance on what refuse and recycling facilities new developments should incorporate into their designs and offers advice on location, design and on-going waste management issues.

2.7 Local Strategies

2.7.1 The Barking and Dagenham Partnership's Community Strategy 'Building Communities Transforming Lives' (2004)

The Community Strategy provides a framework for making the borough a better place to live, work and spend leisure time in. Under the Local Government Act 2001, all plans and programmes prepared by the Council must conform to policies and priorities set out in the Community Strategy. Buildings built according to sustainable design and construction principles meet the Community Priority of making the borough Cleaner, Greener and Safer.

2.7.2 Delivering a low carbon borough: A sustainable energy strategy for Barking and Dagenham (2005)

The Council's energy strategy sets eight strategic objectives with accompanying policies and actions for reducing the borough's carbon dioxide emissions.

2.7.3 Barking and Dagenham's Local Biodiversity Action Plan (2005)

The Action Plan sets out a framework for the protection and enhancement of the borough's flora and fauna.

Chapter 3 — Environmental Assessment Methods

3.1 INTRODUCTION

3.1.1 In order to ensure developers consider and include a wide range of sustainability features in their building plans, they are required to follow a certified assessment method. The Council's preferred tool is BREEAM but there are other assessment methods developers can follow.

3.2 BREEAM

3.2.1 BREEAM stands for the Building Research Establishment Environmental Assessment Method. BREEAM is used to assess the performance of buildings in the following areas:

- management: overall management policy, commissioning site management and procedural issues;
- energy use: operational energy and carbon dioxide (CO_2) issues
- health and well-being: indoor and external issues affecting health and well-being;
- pollution: air and water pollution issues;
- transport: transport-related CO_2 and location-related factors;
- land use: greenfield and brownfield sites;
- ecology: ecological value conservation and enhancement of the site;
- materials: environmental implication of building materials, including life-cycle impacts;
- water: consumption and water efficiency

3.2.2 Credits are awarded in each area according to performance. A set of environmental weightings then enables the credits to be added together to produce a single overall score. The building is then rated on a scale of PASS, GOOD, VERY GOOD or EXCELLENT.

3.2.3 BREEAM covers a range of building types including:

- Offices;
- Homes (known as EcoHomes);
- Industrial units;
- Retain units;
- Schools;
- Hospitals/health centres (Neat)

3.2.4 Developers in Barking and Dagenham are expected to achieve an **EXCELLENT BREEAM** score on all strategic developments and aim for this score on major developments (1,000 sq m + or 10 C3 units +). VERY GOOD will be accepted only in those cases where developers can present robust arguments why an EXCELLENT rating is not viable for their development.

The Green Building in Manchester achieved EcoHomes Excellent thanks to its energy efficient design, use of sustainable materials, renewable technologies and savings in water consumption.
(Photo: Farrells: Daniel Hopkinson)

3.3 Code for Sustainable Homes (2006)

3.3.1 The Code for Sustainable Homes is a voluntary standard of design and construction for sustainable homes. Championed by the Department of Communities and Local Government, the Code is intended as a single national standard to guide the construction industry. The Code builds upon BREEAM's EcoHomes scheme which will continue to operate during the transition to the Code.

3.3.2 The Code uses a one to six star rating system to asses the sustainability of homes across nine design categories. One star is the entry level and six stars is the highest level. A number of the nine design categories have minimum standards which must be achieved to gain a one star sustainability rating. Energy efficiency and water efficiency categories also have minimum standards that must be achieved at every level of the Code. Apart from these requirements the Code is flexible and developers can choose which and how many standards they implement to obtain points under the Code.

3.3.3 Compliance with the Code will be ensured by a team of assessors, along the lines of the team of assessors used to validate EcoHomes standards. The Council will expect all housing developments to reach higher levels of the Code if not using BREEAM.

The new building of the National Assembly for Wales is the latest high profile building to obtain BREEAM Excellent status. The building has an energy consumption currently running at approximately half the current best practice for office buildings. Heating is provided by a biomass boiler and controlled through the thermal mass of the building and an earth heat exchanger system.
The building also has a huge funnel and roof cowl which help naturally ventilate the building and provide natural lighting to the chamber.

Photo: National Assembly for Wales
(photos protected under Crown copyright)

Further information:

BREEAM
www.breeam.org

DCLG
http://www.planningportal.gov.uk/uploads/code_for_sust_homes.pdf
Code for Sustainable Homes

Chapter 4 — Sustainable Materials in Construction

4.1 Introduction

4.1.1 Each year in the UK construction activity consumes around 420 million tonnes of material. The materials used in the construction and refurbishment of property affects the embodied energy of a building. Embodied energy is the energy consumed by all the processes associated with the production of a building, from the acquisition of natural resources to product delivery.

4.1.2 This includes the mining and manufacturing of materials and equipment, the transport of the materials and the administrative functions. For example quarries can damage landscape, wood can come from unsustainable sources, metals use a lot of energy in production and PVC production produces atmospheric pollution.

4.1.3 The embodied energy of a building can be reduced by using:

- Local supplies that reduce the energy use of transport;
- Materials that require low energy to produce;
- Recovered materials (reclaimed and recycled).

4.2 Locally Sourced Materials

4.2.1 Developers should procure materials locally (wherever practical) and rationalise transportation of materials to a site. This should include plant and equipment to be used in the development wherever possible.

4.2.2 In accordance with the Mayor's preferred standards, developers should source 50% of construction materials by mass from a factory/ plant, quarry, wharf, railhead or recycling centre within 35 miles of the site wherever feasible.

The BedZed development of 83 mixed tenure homes in Sutton achieved considerable success with sustainable materials. Most existing site material was retained there and much of the heavier building materials were sourced within a 55km radius. Reused structural steel was used in the workspace framing structure and reclaimed timber for internal partitions. FSC certified timber was used extensively.

(Photo: Peabody Trust)

Further information:

Barking and Dagenham Chamber of Commerce
'The Barking and Dagenham Directory' is a directory listing businesses in the borough. Copies can be obtained from Dorchester Production on 020 7531 1146.

Building East
http://www.buildingeast.com/
Local supplier hub set up to help local businesses take advantage of the construction projects generated in the area by the Thames Gateway development initiative.

4.3 Reclaimed and Recycled Materials

4.3.1 Reclaimed materials are recovered from the waste stream and put back into use with minimal or no reprocessing. Examples include bricks, which may require removal of any adhering mortar and inspection for cracks, or timber doors, which may only require simple repairs.

4.3.2 Recycled materials require reprocessing before reuse, either as a primary material such as aluminium, or as a secondary material. An example of the latter is rubber floor tiling made from motor vehicle tyres.

4.3.3 Reclaimed and recycled materials can be used in many parts of the house building process, as well as for external site works such as roads and landscaping features.

4.3.4 The low impacts of reclaimed materials can be increased if they are transported very long distances compared with raw materials. The table below shows the maximum distance a reclaimed material can be transported by road before it will have a greater impact than a new material manufactured locally:

Maximum transport distances for reclaimed materials

(source: BRE's Green Guide to Housing Specification)

Materials	Distance (miles)
Reclaimed tiles	100
Reclaimed slate	300
Reclaimed bricks	250
Recycled aggregates	150
Reclaimed timber (eg. floor boards)	1000
Reclaimed steel products	2500
Reclaimed aluminium products	7500

4.3.5 WRAP (Waste & Resources Action Programme) has established the validity of setting a requirement for recycled content in house building construction projects. They have demonstrated that 12.5% of the materials' value of a construction project can derive from recycled content[1].

4.3.6 The 12.5% target is considered by WRAP to be good practice, meaning that the level of recycled content is better than standard and readily available, but not necessarily as high as current technology or market conditions allow. A WRAP case study of a four-bedroom semi-detached masonary house shows that substituting products with best available recycled content in four elements of the house — external walls, internal walls, ground floor and foundation — increases the overall recycled input from 12.5% to 33% by value[2].

4.3.7 WRAP has developed a number of reference guides to support the process of identifying which materials can be procured with the most significant levels of recycled material content (without additional cost to the project).

4.3.8 Developers are also encouraged to use the Institution of Civil Engineers (ICE) Demolition Protocol to arrive at an ambition target for the incorporation of recovered or recycled materials in the new build. It should be noted that such targets are developed on the basis of recovered materials being available at the right quality, quantity and price, i.e. they must be either cost neutral or lower in price.

[1] The requirement is defined as a % of materials value, not total project value, i.e: it excludes labour and various other costs. The selected metric is value and not mass as this reflects the availability of cost data within standard construction practice — whereas a percentage by mass or volume would be expensive and impractical to implement. It also encouraged high-value application of recycled materials.

[2] WRAP — Opportunities to use Recycled Materials in House Building: Reference Guide

Further information:

WRAP
http://www.wrap.org.uk/procurement

http://www.aggregain.org.uk/procurement/quick_wins/opportunities_to.html
Opportunities to use Recycled Materials in House Building: Reference Guide

http://www.aggregain.org.uk/procurement/quick_wins/opportunities_3.html
Opportunities to use Recycled Materials in Preliminary Building Works and Civil Engineering: Quick Wins Guide

http://www.aggregain.org.uk/procurement/quick_wins/opportunities_1.html
Opportunities to use Recycled Materials in Building: Reference Guide

4.3.9 The Protocol's methodology for new-build includes an assessment of the supply chain to provide cost effective recovered materials which sets a target for procurement and requires evidence of compliance with targets.

Examples of reclaimed materials which can be reused in new buildings (Photos: www.bioregional-reclaimed.com and NGS GreenSpec)

Further information:

WRAP

Targeted brochures on Demolition Protocol

NGS GreenSpec
http://www.greenspec.co.uk/
Technical specifications, design and product information for sustainable construction

Aggregain (WRAP)
http://www.aggregain.org.uk/
'One-stop' source of practical information on the use of recycled and secondary aggregates

The Recycled Product Guide (WRAP)
www.recycledproducts.org.uk
Comprehensive listing of recycled products available in the UK

Salvo
http://www.salvo.co.uk/
Market place for reclaimed construction materials/products

Further information:

Ecoconstruction
http://www.ecoconstruction.org/
Details of "green" products for house-building

BioRegional Reclaimed
www.bioregional-reclaimed.com

Other websites

http://www.sustainablehomes.co.uk/
Advice on sustainable construction for Housing Associations

http://www.greenstreet.org.uk/
Information on improving environmental performance in housing refurbishments

http://www.sustainabilityworks.org.uk/sus.php
Guidance on sustainable housing development

4.4 Materials with a Low Environmental Impact

4.4.1 BRE's Green Guide to Housing Specification assesses the relative environmental performance of over 150 materials and components over a 60 year life-cycle. The materials cover basic building elements which refer to walls – external and internal walls and partitions; floors – upper and suspended ground floor; roofs and ceilings – suspended ceilings and ceiling finishes. They also cover other building components such as insulation and landscaping.

4.4.2 The performance of each specification is measured against a range of environmental impacts including:

- climate change;
- toxicity and ozone depletion;
- levels of emissions and pollutants;
- and mineral and water extraction.

Timber windows are much more environmentally friendly than PVC windows.
(Photo: National Green Specifications).

4.4.3 Environmental performance is indicated by a simple-to-use A-B-C rating system. To further aid specifiers, guidance on capital costs, typical replacement intervals and information on recycling is also provided for each material and component.

4.4.4 Depending on development type (strategic, major or minor), a set percentage of the volume of each basic building element should be A rated, while the majority of the remaining materials should be B rated (see table in chapter 9 for the requirements for your development type).

Further information:

Building Research Establishment (BRE)
The Green Guide to Housing Specifications is available for purchase from www.brepress.com, reference number BR390

4.5 Sustainable Timber

4.5.1 Sustainable timber means that the harvest of timber and non-timber products maintains the forest's biodiversity, productivity and ecological processes. It ensures that forest operations are structured and managed so as to be sufficiently profitable, without endangering forests' resources, the ecosystem or affected communities.

4.5.2 Barking and Dagenham Council requires that 60% of timber products come from a Forest Stewardship Council (FSC) source and the balance from a known temperate source. The scheme links the finished timber product to an independently certified forest via timber mills and merchants who are also certified. By using a Chain of Custody (CoC) certification system for timber processors and merchants checked by regular inspection, it prevents timber substitution and ensures an unbroken audit trail for the timber from user to forest.

4.5.3 While other forest certification schemes exist, the FSC is recognised by many Local Authorities, timber companies and environmental organisations as the best standard of sustainable forestry. It is also the only forest certification scheme recommended by the World Wildlife Trust (WWF) and Friends of the Earth.

Further information:

Forest Stewardship Council (FSC)

Information on sustainable timber and list of suppliers of timber sourced through the FSC scheme

Pan European Forest Certification (PEFC)
http://www.pefc.org/internet/html/index.htm
Besides the FSC, the main European system is the PEFC (Pan European Forest Certification). This is an umbrella organisation of a number of national forestry schemes. Whilst some PEFC schemes are rigorous, others are less so. The Finnish Forest Certification Scheme, for example, has received serious criticism from the Finnish Nature League for allowing logging in old growth forests and insufficient regard for indigenous people.

Boatemah Walk is a block of 18 flats in Angell Town, Lambeth. The block was made of prefabricated timber frames and used non-toxic and natural materials.

It includes Warmacell recycled newspaper insulation and timber windows. The timber frame, cladding and internal timber and composite boards are all FSC certified.

(Photo: solarcentury.com)

4.6 Peat or Weathered Limestone

4.6.1 In accordance with the Mayor's preferred standards, no peat or weathered limestone should be used in buildings or landscaping.

4.6.2 Peat is made of partially decomposed plant remains, mainly sedges, grasses, reeds and mosses. Peat lands are important for four main reasons:

- They form unique natural habitats;
- They are an important carbon sink;
- They contain vital geochemical and palaeological archives;
- They help maintain both water quantity and quality.

4.6.3 Limestone is a hard sedimentary rock formed under the sea in ancient times from the shells of small sea creatures. The removal of limestone pavement for the construction of garden features destroys a remarkable habitat, which cannot be replaced or recreated.

4.6.4 A wide number of alternatives to peat exist such as bark wood waste, coir, green waste and biosolids. Similarly alternatives to weathered limestone exist such as sandstone, slate and granite supplied from reputable sources. Furthermore, limestone can also be obtained from legitimate quarrying.

Chapter 5 — Sustainable Waste Management during Construction and Occupancy of Development

5.1 Introduction

5.1.1 At present in the UK, landfill is the most utilised method of waste disposal. It is also the most unsustainable. Not only do landfill sites contribute to global climate change by generating large quantities of methane but also, by landfilling waste, the resources and energy that went into making once useful goods are lost forever.

5.1.2 A more sustainable approach to waste management is being driven by the European Union (EU) Landfill Directive. The UK has a national target to reduce the amount of biodegradable waste going to landfill to 35% of 1995 levels by 2020. It also has a national target to recycle or compost at least 33 percent of household waste by 2010 and recover value (recycle, compost or extract energy) from 67 percent of municipal waste by 2015. Meanwhile, escalating landfill taxes are making landfilling equally unattractive for businesses and industry.

5.1.3 For these reasons, minimising and recycling waste on construction sites as well as designing facilities that encourage recycling in new developments, are crucial steps in driving waste management up the waste hierarchy of reduce, reuse, recycle and compost, energy extraction and finally landfill as the least desirable option. Developers are encouraged to consult the Environment Agency regarding waste regulations.

5.2 Site Waste Management Plans (SWMPs)

5.2.1 The purpose of SWMPs is to ensure that developers comply with their legislative duties related to waste. They are also intended to minimise waste at source on construction sites through the accurate assessment of the use of materials and the potential for their re-use and recycling both on and off site.

5.2.2 Medium to large developers should have an effective SWMP and are recommended to follow the methodologies in the Department of Trade and Industry (DTI) 'Voluntary Code of Practice – Guidance for Construction Contractors and Clients on Site Waste Management Plans'.

5.2.3 Smaller companies may gain operational improvements by introducing SWMPS on their projects. The DTI are considering the introduction of mandatory SWMPs as part of the Clean Neighbourhoods & Environment Act 2005.

5.3 Prefabricated Construction

5.3.1 In accordance with the Mayor's preferred standards, developers should use prefabricated and standardised modulation components to minimise waste. If this is not feasible, low waste fabrication should be used.

Further information:

Environment Agency (EA)
http://www.environment-agency.gov.uk/subjects/waste/?lang=_e
Information on waste regulation

Department of Trade and Industry (DTI)
http://www.dti.gov.uk/construction/sustain/site_waste_management.pdf
A voluntary code of practice on site waste management plans for construction contractors and clients.

5.4 Material Resource Efficiency: the ICE Demolition Protocol

5.4.1 Before demolition developers should conduct an appraisal of the materials that can be recovered from the building by using the Institute of Civil Engineers (ICE) Demolition Protocol. Application of the Protocol to a demolition project involves the following:

- A pre-demolition audit is carried out to identify potential for material recovery;
- A material segregation / recovery methodology is drawn up;
- A materials recovery target is set based on good practice;
- Evidence is provided of compliance with target.

Bricks being segregated on a demolition site so they can be reused. (Photo: EnviroCentre)

Further information:

WRAP

http://www.aggregain.org.uk/demolition/the_ice_demolition_protocol/index.html

Targeted audience brochures on Demolition Protocol

BRE

http://www.smartwaste.co.uk/

SMARTWaste (Site Methodology to Audit, Reduce and Target Waste) can be used to record, categorise and track wastes by source, amount, cause and costs

5.5 Internal and External Recycling Facilities

5.5.1 Developers and architects should follow the guidance provided in the Council's Planning Advice Note (PAN) 3: Refuse and Recycling Facilities in New and Refurbished Residential Developments.

5.5.2 This PAN — adopted by the Council in 2006 — sets out the amount of space developers should set aside for storing refuse and recyclable materials as well as the type of facilities developers are expected to provide. The PAN also sets out location, design and management considerations that developers must have regard to when planning for waste storage in new developments.

Further information:

LBBD

Copies of PAN 3 can be obtained from the Council.

5.6 Dealing with Waste over the Lifetime of the Development on Site

5.6.1 On strategic developments, developers should provide reuse centres, recycling or composting plants on site that can deal with a por tion of the waste generated by that development over its lifespan.

Further information:

ICE

http://www.ice.org.uk/knowledge/document_details.asp?Docu_id=982&intPage=1&faculty=17

"Planning for Resource Sustainable Communities" introduces the steps and infrastructure that should be considered for sustainable waste management in a community. The document provides a guide on the roles of those involved with a development and sets out 10 Sustainable Design Principles for consideration.

Comely Green Place is a housing project of 95 flats in Edinburgh. Waste minimisation measures during construction — such as waste management training to all site personnel and waste segregation — led to a wastage rate below 2.5% on key materials (10% is usual). Waste generated on-site only accounted for 0.4% of the project cost with a total saving in disposal costs of around £400,000.

(Photo: NGP Architects, a.k.a. Norman Gray & Partners)

Chapter 6 — Energy Efficiency and Renewable Energy

6.1 Introduction

6.1.1 Temperatures throughout the world have risen by 0.6°C over the last 100 years due to human activity releasing polluting gases in the atmosphere, especially carbon dioxide. This is predicted to rise by a further 5°C during the next 100 years. Unless we reduce CO_2 and other 'greenhouse gases', climate change will have a huge effect on the world's economy, societies and wildlife.

6.1.2 The Council has responded to this challenge by producing its own Sustainable Energy Strategy for Barking and Dagenham (September 2006) with the target of improving the energy efficiency of existing housing and reducing the impact of new buildings.

6.1.3 Existing homes in Barking and Dagenham are responsible for approximately 31% of total greenhouse gas emissions across the borough. The majority of this energy consumption is for space heating and electrical appliances.

6.1.4 Although the Council is working to improve the energy performance of existing homes, energy efficient features are much easier and cost-effective to introduce at the design phase rather than post-occupancy. For this reason, developers are strongly encouraged to consider energy efficient building design, community heating and combined heat and power (CHP), as well as renewable energy generation from the outset of their plans.

6.2 Site Layout and Passive Solar Design (PSD)

6.2.1 During the initial survey of a site, developers should consider the most energy efficient layout for the planned development. This is the most inexpensive way of reducing the energy demand of a development and paves the way for further savings if passive solar design elements are incorporated into buildings. A passive solar estate with all its houses designed for solar gain produces energy savings of up to 10% at no extra cost when compared to a non-solar estate with non-solar houses.[3]

6.2.2 The key elements of a site layout that maximises solar gains are:

- Orientation of as many dwellings as possible within 30° of south;
- Minimising overshadowing of south facing elevations by positioning taller buildings to the north;
- Using deciduous vegetation to block the high summer sun to reduce the chance of overheating and use of air-conditioning.

Heating

6.2.3 Passive solar heating techniques generally fall into one of three categories: direct gain systems; indirect gain systems; and isolated gain. For all three systems, the main rooms, with maximum occupancy, should be south facing.

6.2.4 **Direct gain systems** allow the sun's rays to directly penetrate the house through glazed areas (eg, windows) and store the heat in the living space's thermal mass. Thermal mass refers to materials that are particularly good at absorbing heat and releasing it slowly as the temperature drops. These materials include concrete, masonry, wallboard and even water.

6.2.5 **Indirect gain systems** collect, store and distribute solar radiation using some thermal storage material. For example, the sun's heat can be collected and trapped in a narrow space between the window and a thick masonry wall after it passes through the windows. This heats the air, which rises and spills into the room

[3] The Energy Saving Trust 'Passive solar estate layout' (GIR27)

through vents at the top of the wall. Cooled air then moves to take its place from vents at bottom of the wall. The heated air circulates throughout the room by convection.

6.2.6 **Isolated gain systems** (e.g., sunspace) collect solar radiation in an area that can be selectively closed off or opened to the rest of the house, for example a conservatory.

Further information:

Carbon Trust

Planning for Passive Solar Design

The Energy Saving Trust

1) Passive solar estate layout (GIR27)
2) Passive solar house designs — the Farrans study (GIL25)
3) Reducing overheating — a designers' guide (CE129)

All Energy Saving Trust documents can be downloaded free of charge from www.est.org.uk/housingbuildings / or alternatively ordered by telephoning 0845 120 77 99

Renewables in Scotland

http://www.esru.strath.ac.uk/EandE/Web_sites/01-02/RE_info/index.htm
Information on Passive Solar Design

The Jubilee Library in Brighton — a BREEAM Excellent building — uses the thermal mass in exposed concrete and Termodeck slabs to cool temperatures inside the building during summer and keep the temperature even in the winter both day and night.

(Photo: The Concrete Centre, www.concretecentre.com)

Natural Lighting

6.2.7 Natural lighting refers to reliance on sunlight for daytime interior lighting. Glazing characteristics include high-VT[4] glazing on the east, west, and north facades combined with large, south-facing window areas. Windows should be large enough to provide adequate day lighting — a general guidance is to size the glazing so that it is between 15 to 25 percent of a room's floor area.

6.2.8 Sun-pipes can also be used to provide natural lighting in places where daylighting cannot easily reach. Sun-pipes capture light via a tube from the roof, using mirrors and other reflective devices.

6.2.9 Low-emissivity (low-E) coatings can help minimise glare while offering appropriate improved climatic heat gain or loss characteristics. Sloped or horizontal glass (e.g., skylights) admit light but are often problematic because of unwanted seasonal overheating.

The Voltaics warehouse in Dagenham Dock makes the most of natural light through roof design.

Further information:

Carbon Trust

Daylighting Design in Architecture — Making the Most of a Natur al Resource

[4] VT stands for Visible Transmission and refers to the percentage of light allowed through.

Ventilation & Cooling

6.2.10 Appropriate use of outdoor air often can cool a home without need for mechanical cooling, especially when effective shading, insulation, window selection, and other means already reduce the cooling load.

6.2.11 Cross-ventilation techniques capture cooling, flow-through breezes. Exhausting naturally rising warmer air through upper-level openings (stack effect, e.g. clerestory windows) or fans (e.g. whole-house fan) encourages lower-level openings to admit cooler, refreshing, replacement air.

Further information:

The Energy Saving Trust
'Energy-efficient ventilation in housing – A guide for specifiers on the requirements and options for ventilation' (GPG268)

6.3 Low Carbon Buildings

6.3.1 The carbon emissions of new buildings can be lowered beyond current Building Regulation 2006 (Part L) specifications through a combination of energy efficiency measures such as better insulation and glazing, improved heating systems, natural ventilation, installation of efficient lighting and appliances, as well as the use of renewable energy.

6.3.2 Developers in Barking and Dagenham are expected to achieve a further 20% reduction in carbon emissions beyond Building Regulations 2006 in new developments. 10% of this reduction has to be achieved through on-site generation of renewable energy. The remainder 10% can be achieved through increased energy efficiency, combined heat and power (CHP) or through further generation of renewable energy.

6.2.12 Naturally ventilated buildings will incorporate openable windows or other means of outdoor air intakes including roof- mounted 'windcatchers' to induce vertical and horizontal airflow. If mechanical ventilation is needed it should use low wattage motors and incorporate heat recovery with a minimum efficiency of 80%.

The RSPB's Rainham Marshes Environment and Education Centre has two roof funnels which allow excess heat and exhausted air to escape. The funnels also act as lightwells. This Thames Gateway building has a BREEAM Excellent rating and aspires to be carbon neutral.
[Photo: Royal Society for the Protection of Birds (RSPB)]

The Energy Saving Trust Energy Efficiency Standards

6.3.3 To achieve energy efficiency levels beyond Building Regulations 2006 developers can refer to the Energy Saving Trust's performance standards. These are:

- Energy Efficiency Good Practice in Housing — achieves a further 10% reduction over Building Regulations 2006;
- Energy Efficiency Best Practice in Housing — achieves a further 25% reduction;
- Energy Efficiency Advanced Practice in housing — achieves a further 60% reduction.

6.3.4 The main difference between the three standards lies in the levels of insulation they require buildings to achieve. Improvements in insulation are primarily measured through the U-value and air tightness of a building. U-value is the

measure of insulation and is the overall rate of heat transfer through a wall, door, window or roof – the lower the U-value the better the thermal insulation. Air tightness refers to the extent to which uncontrolled movement of air, both into and out of the building through the cracks and gaps in the building envelope, is restricted. In this case, the higher the air tightness the better the thermal insulation.

Further information:

The Energy Saving Trust

1) Energy efficiency in new housing (Summary specification for England, Wales and Scotland) (CE12);
2) Best Practice in New Housing – A Practical Guide (CE95);
3) Central Heating System Specifications 2005 (CHeSS) (CE51/GIL59)

Lighting Systems and Efficient Appliances

6.3.6 Developers should ensure that lighting systems incorporate fluorescent lamps with high efficiency ballasts and include lighting controls (solar cells and occupancy sensors) in non-domestic buildings to maximise daylight use and avoid lighting unoccupied spaces.

6.3.7 To minimise energy use of lighting, the following aspects should be specified:

- Use the most energy- efficient light fittings available;
- Design lighting to provide the correct levels - excess lighting levels can produce harmful glare as well as wasting energy;
- Ensure controls, e.g. switches, are easily understood and accessible, otherwise the temptation may be to leave lights on unnecessarily;

6.3.5 Furthermore, to achieve the Best or Advanced Practice standards, electric heating will not be viable due to its inefficiency and high carbon emissions — current legislation already requires all heating systems to use highly efficient condensing gas boilers.

This 149 unit apartment block in Frankfurt was built in 2006 to PassiveHaus standards. The term PassivHaus refers to the German standard for energy use in buildings. A PassiveHaus requires little energy for space heating due to its excellent use of solar gain, levels of insulation and airtightness. More than 8,000 buildings have been built in Europe to PassiveHaus principles.

(Photo: Passivhaus Dienstleistung GmbH, Darmstadt, Germany).

- Design wiring to allow smaller areas to be switched on or off instead of the whole room at the same time. This is useful where only part of an office is being used at night or tends to be darker than another part during the day;
- Use automatic switches such as movement sensors (PIR) or timers in areas where lights are not needed continuously such as toilets or security lighting.

6.3.8 'Energy Saving Recommended' appliances should be installed for all appliances in the development. The 'Energy Saving Recommended' logo endorses the most efficient products available and is equivalent to an A rate on the EU Energy Label.

Further information:

Energy Saving Trust

1) Energy efficient lighting (CE61)

2) Low energy domestic lighting – looking good for less (CE81), the Energy Saving Trust

Energy Efficiency Recommended products are listed on the Energy Saving Trust website, www.est.org.uk/myhome/efficientproducts

Renewable Energy

6.3.9 According to the London Plan and Barking and Dagenham policy, new developments must achieve a 10% reduction in their carbon emissions beyond Building Regulations 2006 through on-site generation of renewable energy. Renewable energy technologies must be integrated into the design of the building and add to the design rather than detract from it. In addition, because Barking Town Centre has been designated as one of the four Energy Action Areas in London, developments in the town centre are expected to meet their 10% renewable energy target from electricity generating technology such as small-scale wind turbines or photovoltaic panels.

Queens Cross Phase 2 in Glasgow integrates photovoltaics on the roof. (Photo: solarcentury.com)

6.3.10 All other developers have a range of renewable energy technologies to choose from, which includes solar, wind or biomass:

- **Solar Water heating** systems provide between 50 and 70% of a household's annual hot water requirement and are a fairly low cost technology;
- **Photovoltaic (PV) panels** convert solar radiation directly into electricity. Since the introduction of the Government's PV Major Demonstration Programme in 2002, PVs have been employed in many buildings across the UK. PV roof panels integrate into buildings extremely well and have a very low visibility impact. However, they are more expensive than the other renewable energy technologies listed;
- **Small-scale wind turbines** are a new technology that fix directly onto roofs or walls and generate electricity that is fed directly into the building;
- **Ground source heat pumps** are environmentally friendly heating technologies that use a small amount of electricity to generate heat. They require open space adjacent to the building so that a pipe network can 'capture' the ambient heat under the ground – or alternatively a more expensive borehole can be used beneath the building;
- **Biomass boilers** use a wood chip fuel instead of natural gas – specialist suppliers can regularly deliver the wood fuel in a similar way to coal deliveries in the past.

Further information:

GLA

www.london.gov.uk/mayor/environment/energy/london_renew.jsp

London Renewables: Integrating Renewable Energy into New Developments: Toolkit for Planners, Developers and Consultants – Sept 2004

The Energy Saving Trust

1) Meeting the 10 per cent target for renewable energy in housing – a guide for developers and planners (CE190);
2) Renewable energy sources for homes in urban environment (CE69), the Energy Saving Trust

REAL (Renewable Energy Action London)

0845 6780677, real@cen.org.uk

Free advice on incorporating renewable energy technologies within developments

Residents in a building with a CHP plant or communal boiler will have consumer interface units in their dwellings instead of individual boilers. These units must be metered to discourage wastage.

(Photo: Vital Energi)

Combined Heat & Power (CHP) and Community Heating

6.3.11 Developers are expected to undertake an assessment of the energy demand of their development and demonstrate the steps taken to apply the **Mayor's Heating Hierarchy**. The heating hierarchy is:

- Solar water heating;
- Combined heat and power for community heating and cooling (preferably fuelled by renewables);
- Community heating for heating and cooling;
- Heat pumps;
- Gas condensed boilers (individual boilers);
- Electric heating

6.3.12 This heating hierarchy is based on the carbon dioxide emissions associated with each heating system. The hierarchy illustrates that solar water heating and combined heat and power systems are more sustainable than the conventional approach to heating of individual gas boilers or electric heaters. Developers are required to consider combined heat and power (CHP) for their development and if CHP is not adopted, then good reasons need to be provided.

6.3.13 CHP systems are now available at a range of different scales from micro-CHP (for single dwellings) to neighbourhood heating systems, and many new developments across London and the UK are incorporating CHP systems. CHP will be most cost-effective and environmentally-effective for larger mixed tenure developments, as these have a balanced heating load with retail or office demand greatest in the day, and residential demand greatest in the evening.

Further information:

The Energy Saving Trust
Community heating – a guide (CE55)

The Carbon Trust

Advice and help on CHP – 0800 585794

The CHP Club

Provides case studies and also a calculator on energy consumption and cost of CHP systems

The Combined Heat and Power Association

Provides information on companies and consultancies that deliver CHP systems – 020 7828 4077

6.4 Barking Town Centre Energy Action Area

6.4.1 In 2005, the Mayor of London designated Barking Town Centre as one of four Energy Action Areas in London to showcase energy efficiency and renewable energy technologies. The Council has modelled the energy consumption of the regeneration plans for the town centre, which highlighted a number of options for ensuring that the growth in new homes and businesses does not lead to a significant increase in energy consumption.

6.4.2 The Council has produced an Implementation Plan for the Barking Town Centre Energy Action Area based around community heating from a low carbon heat source, such as waste heat from Barking Power Station or an energy-from-waste combined heat and power (CHP) plant. A Guide to the Barking Town Centre Energy Action Area summaries our plans and requirements.

6.4.3 New developments in Barking Town Centre are required to achieve a 32% reduction in carbon emissions on top of what is required by Building Regulations 2006. Developers can meet this target by:

- Achieving a 22% reduction in carbon emissions by connecting to a town centre community heating network served by a low carbon heat source;
- Meeting their 10% renewable target through electricity-generating renewable energy technologies such as small scale wind turbines or photovoltaic panels. Solar hot water systems and heat pumps will not be appropriate as these generate hot water and heating – and this will already be provided by the community heating system.

Further information:

LBBD

1) Barking Town Centre Energy Action Area Implementation Plan
2) A Guide to the Barking Town Centre Energy Action Area

Chapter 7 — Water Resources

7.1 Introduction

7.1.1 Climate change projections predict a decrease in annual rainfall in the South East of up to 10%. Although significantly wetter winters are predicted, the increase in the frequency of exceptionally dry summers — with a predicted decrease in summer rainfall of 30 to 40% — will lead to an overall decrease in rainfall. Furthermore, the predicted drier summers may also lead to an increased risk in flash flooding when sudden storms cause very rapid run-off over dry, impermeable ground.

7.1.2 For these reasons, new development should provide appropriate Sustainable Drainage Systems (SUDS) for the disposal of surface water. Water demand should be reduced as much as possible and water reuse systems, such as rainwater harvesting or greywater recycling, should be installed.

7.2 Sustainable Drainage Systems (SUDS)

7.2.1 All developments (strategic, major or minor) in Barking and Dagenham in flood zones 2 (medium probability) and 3 (high probability) must be accompanied by a Flood Risk Assessment — a map of the flood zones is available from the Council. For developments in flood zone 1 (low probability) only developments of 1 hectare or greater require a Flood Risk Assessment.

7.2.2 The Flood Risk Assessments will recommend the SUDS technique(s) most appropriate to the site, taking into consideration the site characteristics and proposed development use.

7.2.3 SUDS aim to achieve surface water discharge that mimics its greenfield equivalent. SUDS attenuate surface water run-off, encourage recharge of groundwater which can provide significant amenity and wildlife enhancements as well as protect water quality by employing pollutant trapping and degradation processes. There are a range of SUDS techniques available:

Preventive Measures

The best preventative measure is to minimise the amount of surface water run-off by reducing the area of impervious surfacing used on a site. Rainwater recycling systems, water butts and storage tanks can be utilised to further reduce the amount of water entering the storm water system.

Permeable Surfaces

These can comprise gravel surfacing, block paving with gaps between the blocks and porous paving that allows water to soak through. Filter drains can be employed along the edges of roads where permeable surfacing can not be used. These are source control systems, which are designed to allow the rainwater to infiltrate naturally into the ground.

Filter Strips and Swales

Filter strips can be utilised in areas of shallow slope where water is allowed to run along the ground passing over the filter strip. These can be areas of loosely compacted topsoil planted with grasses, shrubs or trees that allow water to naturally infiltrate into the ground. Swales operate on the same principle as filter strips but are also used as a method of conveying surface water away from the area being drained. Normally these features will be dry.

Infiltration Devices

Soakaways and infiltration trenches encourage the natural infiltration of run-off into the ground but have added storage capacity to detain run-off when the rainfall rate is higher than the rate at which water soaks into the ground.

Basins and Ponds

Basins are temporarily wet water features that fill with water during and after periods of rain, whilst ponds are permanent water bodies. Both provide storage capacity during periods of heavy or prolonged rain and include balancing ponds, attenuation ponds and flood storage reservoirs that may allow water to naturally infiltrate into the ground.

7.2.4 Developers and their design teams are encouraged to[5]:

- Carry out a site survey to determine which SUDS techniques will be appropriate for use on the site, for example ground conditions will determine the suitability of infiltration systems. The SUDS techniques chosen should mirror as much as possible the recommendations from the Flood Risk Assessments;
- Ensure, in consultation with the Environment Agency, that the requirements of the Groundwater Regulations are complied with (please note that shallow, extensive infiltration systems will minimise risks to groundwater);
- Demonstrate consideration is given to future maintenance requirements of SUDS including the need, where necessary, for the removal of silt which will be treated as a controlled waste, and that space requirements for this purpose are allowed for in the design;
- Ensure that responsibility for maintaining SUDS is clear at the planning application stage;
- Consider using permeable paving anywhere that loadings will not cause structural failure. In practice, all pavements, driveways, footpaths, car parking areas and access roads could have permeable surfaces.

Local flooding from the combined sewage system in storm conditions creates major problems in cellars, underground car parks and on roads and paths throughout the residential area of Augustenborg in Malmo, Sweden. In order to minimise these problems, rainwater is being led into a series of surface canals of different dimensions which collect run-off from most hard surfaces and take it to a number of holding ponds and flooding ponds before some of the water leaves the area.

(Photo: City of Malmö, malmo.se/sustainablecity)

[5]These recommendations are based on those made by the South East Climate Change Partnership in 'Adapting to climate change: a checklist for development'.

Further information:

Environment Agency
http://www.environment-agency.gov.uk/business/444304/502508/1188512/464710/?version=1&lang=_e
Comprehensive information on SUDS, including a guide for developers

CIRIA

For information on different SUDS techniques, including case studies

Sustainable Urban Drainage Systems Design Manual for England and Wales (C522, CIRIA 2000)

Sustainable Urban Drainage Systems — best practice manual (C523, CIRIA 2001)

South East Climate Change Partnership
Adapting to climate change: a checklist for development

Woking Borough Council
http://www.woking.gov.uk/council/planning/publications/climateneutral2/sustainabledrainage.pdf
Good Practice Guidance to Sustainable Drainage Systems

7.3 Water Conservation

7.3.1 London's water supplies are under pressure. Supply is reducing whilst demand is increasing. It is essential that all new developments in Barking and Dagenham incorporate measures to avoid water wastage. Because of this pressure, water consumption targets are often set on new residential development. The table below sets out some of these targets:

Water consumption targets in residential development	
Mayor's Essential Standards	Less than 40 m^2 per bedspace per year – approximately 110 litres/head/day
Mayor's Preferred Standards	Less than 25 m^2 per bedspace per year – approximately 70 litres/head/day
Code for Sustainable Homes	Ranging from 12 litres per person per day for one star to 80 litres per person per day for six stars.
BREEAM's EcoHomes	Top points scored if less than or equal to 30 m^2 per bedspace per year is achieved

7.3.2 Developers should consider integrating water conservation into the design of a building's plumbing, mechanical, fire-safety and landscaping systems. This is more cost-effective than measures taken post construction. As with energy, developers should first seek to reduce demand and then look for alternative, renewable sources.

Reducing Demand

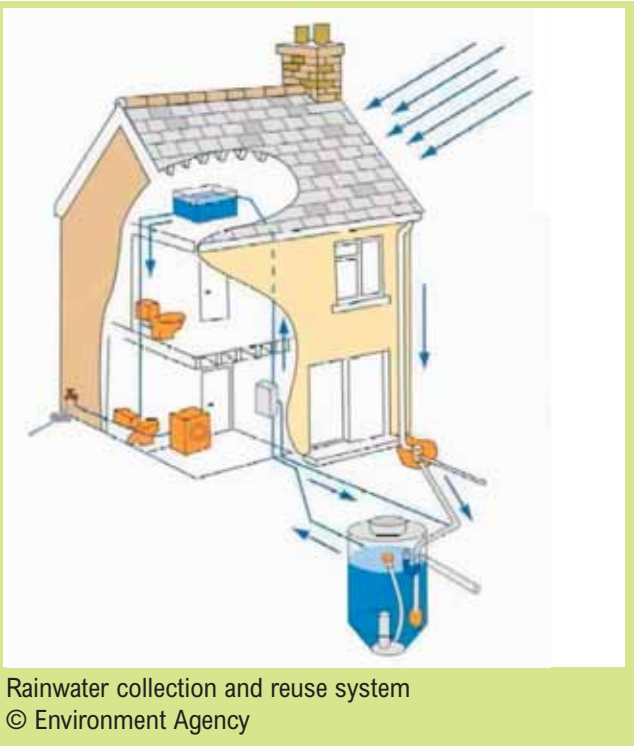
7.3.3 A number of steps can be taken to reduce water consumption. Developers should ensure that water saving fixtures and appliances are used in all new developments. Some examples include:

- Aerated and spray taps on handbasins typically save up to 80% of the water and energy used with standard pillar taps;
- Low-flow showerheads which create finer drops or aerate the water;
- Tapered or peanut-shaped baths provide more space for bathing with less water. Insulation of the bath reduces the need for regular topping up with hot water;
- A or B eco labelled washing machines and dishwashers if these are provided in the development.

7.3.4 Furthermore, installing dual-flush and low-flush toilets can save more than half the water used for flushing toilets and can cut household water use by up to 20%. Under the Water Regulations 1999 all new toilet fixtures must use no more than 6 litres per flush (previously 7.5-9 litres) or be dual-flush in a ratio no more than 6:4 litres (with a notice on or near cistern explaining its use). There are toilets currently available that only require 4 litres on full flush and 2 litres on half flush.

7.4 Reusing Water

7.4.1 Developers are encouraged to have a design strategy for water which creates multiple uses for each litre of water, such as rainwater or greywater recycling.



Rainwater collection and reuse system
© Environment Agency

Rainwater collection

7.4.2 It is important that homes become increasingly self reliant in collecting their own rainwater for grey water recycling for non-potable domestic use. At the simplest level, rainwater can be collected in a water butt for garden use. More advanced rainwater harvesting systems can provide water supply for all non-potable consumption such as for WCs, washing machines, the garden and car washing. Rainwater harvesting can save around 50% on mains water consumption, depending on roof areas of dwellings and annual rainfall.

7.4.3 Space for storage tanks must be provided in the roof or underground, with down pipes located appropriately. Separate pipes are required to carry rainwater and mains water and a mains supply back-up should be provided. This means that when there is insufficient water in the storage tank, the system automatically draws water from the mains so that from the point of view of the user no difference is apparent.

Greywater Recycling

7.4.4 Typically, about a third of household water is used for flushing the WC. Greywater — the waste water from baths, showers and washbasins — can be collected in a household-scale reuse system and treated to a standard suitable for WC flushing.

7.4.5 Systems to collect, cleanse and re-use greywater can operate on a single dwelling or a whole development. The greywater requires basic disinfection or microbiological treatment. Filtering the water prior to disinfecting it prevents biological activity for long enough to allow the treated water to be stored until needed.

Further information:

Environment Agency
http://www.environment-agency.gov.uk/subjects/waterres/286587/286599/286911/548861/861599/?lang=_e
Information on water efficient fixtures, greywater and rainwater recycling systems. The website includes suppliers' lists.

UK Rainwater Harvesting Association
http://www.ukrha.org/
For information on rainwater harvesting

Water Cycle Management for New Developments (WaND)
http://www.wand.uk.net/
WaND supports the delivery of integrated, sustainable water management for new developments by providing tools and guidelines for project design, implementation and management.

Chapter 8 — Nature Conservation and Biodiversity

8.1 Introduction

8.1.1 It is well documented that throughout the twentieth century, the increased modernisation of our lives has harmed biodiversity. The planned regeneration of Barking and Dagenham will see the number of homes in the borough increase by an additional 25,000 over the next 20 years. In order to prevent the detrimental effects of this regeneration, it is imperative that new developments factor-in nature conservation and biodiversity considerations into their master plans and building designs.

8.2 Nature Conservation Sites

8.2.1 The borough has five Local Nature Reserves and is home to 26 Sites of Importance for Nature Conservation (SINCs) as identified by the GLA. Details of the SINCs and a map of their location can be found in a document entitled 'Sites of Importance for Nature Conservation in Barking and Dagenham' (2004) referenced in the 'Further information' box below. The borough is also home to a variety of species of conservation concern and priority. This includes the black poplar tree, the black redstart, the great nested newt, serotone bats and water vole.

8.2.2 A list of significant species known to be present in the borough — as identified by the London Species Audit commissioned by the GLA London Biodiversity Partnership — can be obtained from the London Biodiversity Partnership or the Council. The Council and the community have identified the following flagship species and habitats through the Biodiversity Action Plan:

Species

- the common frog and amphibians;
- bats;
- the house sparrow;
- the native black poplar;
- the stage beetle; and
- butterflies

Habitats

- wastelands;
- gardens and allotments;
- river margines and reed beds;
- acid grasslands; and
- woodland

8.2.3 It is important that efforts are made to minimise the negative impact which new development can have on biodiversity in the borough. It is also important to remember that development and nature conservation need not always conflict with one another. There are ways in which they can in fact complement each other. With a few key steps, planning applicants can ensure that they comply with biodiversity legislation and achieve best practice. These steps are outlined in the rest of this chapter.

Further information:

LBBD

http://www.barking-dagenham.gov.uk/8-leisure-envir/park-country/pdf/sincbardag.pdf
Sites of Importance for Nature Conservation in Barking and Dagenham (2004)

http://www.barking-dagenham.gov.uk/8-leisure-envir/park-country/biodiversity/species-habitat/bio-habitat-species-action-main.html
The Local Biodiversity Action Plan (LBAP) (2005) includes a local species and habitat action plan

http://www.barking-dagenham.gov.uk/8-leisure-envir/park-country/pdf/parks-green-spaces-strategy.pdf
Strategy for Parks and Green Spaces (2004)

8.3 Consultation and Scoping Studies

8.3.1 On strategic developments referable to the Mayor of London, and on all development of any size within or adjacent to SINCs, we will expect developers to consult the Council as well as appropriate nature conservation organisations on the presence of important species and habitats on the proposed development site. For non strategic development proposals that are not adjacent to SINCs, developers are encouraged to submit a short statement detailing the presence of existing species and habitats present on the site.

8.3.2 Whatever the size of the development proposal, wherever a species is found which is protected under legislation such as Schedule I of the Wildlife & Countryside Act, the Council will require developers to consult English Nature before any development proceeds.

Further information:

Defra

Wildlife & Countryside Act (1981)

English Nature
http://www.english-nature.org.uk/
Information on legislation governing the protection of biodiversity

Greater London Authority Biodiversity Team
http://www.london.gov.uk/
City Hall, The Queen's Walk, London, SE1 2AA

London Biodiversity Partnership, c/o London Wildlife Trust,

Skyline House, 200 Union Street, London, SE1 0LW

Extensive Green Roof at Canary Wharf (Photo: Dusty Gedge)

8.4 Detailed Surveys and Impact Assessments

8.4.1 Where it is found that the site does or could support important species and habitats, further survey work may be required. It is important that surveys are carried out during the optimum survey season (which varies depending on the species).

8.4.2 The potential impacts associated with a proposed development can be predicted once an appropriate level of baseline data has been collected.

8.5 Designing your Development to Incorporate Biodiversity Objectives

8.5.1 The nature conservation opportunities and constraints should be identified and designed into development proposals by the time a planning application is submitted.

8.5.2 Even where little biodiversity interest has been identified on a site, we will expect developers to aim to create features that will provide wildlife with opportunity to colonise. Paragraph 8.6.2 lists a number of measures which can be used to create such nature conservation features.

8.5.3 Further guidance on green roofs can be found in the Council's Green Roofs Planning Advice Note (PAN) 1, December 2005. This PAN provides guidance on the benefits of installing a green roof, the type of green roof most appropriate for individual developments, cost and maintenance considerations as well as design issues. The PAN also provides references to further sources of information on installing a green roof.

Further information:

LBBD
http://www.barking-dagenham.gov.uk/8-leisure-envir/planning/plan-online.html
Green Roofs Planning Advice Note 1 (2005)

Living Roofs
www.livingroofs.org.uk
An independent UK website to specifically promote green roofs

8.6 Enhancement, Mitigation and Compensation

8.6.1 When incorporating nature conservation measures into development proposals, the Council will expect developers to follow the following hierarchy of objectives set out in the London Development Agency (LDA)'s 'Design for Biodiversity':

- Retain, enhance or create features of nature conservation value and avoid harm;
- Mitigate the impacts to nature conservation where it has been impossible to avoid all adverse impacts;
- Where damage is unavoidable, compensate for the loss of features of nature conservation value.

8.6.2 There are a variety of measures through which the above objectives can be met. What the appropriate measures are will depend on each particular scheme but they include the following:

- appropriate siting of buildings;
- creation of an ecological park and centre as part of the development scheme
- landscaping scheme designed to benefit local habitats including tree planting, planting of wildlife encouraging plants, wall climbers and green roofs;
- planting of native wetland species around areas of existing water areas;
- developing a habitat management plan for the construction and operation phase of the development;
- developing a habitat management plan for the construction and operation phase of the development
- provision of roost sites for bats;
- nesting boxes and/or swift bricks to encourage new populations of birds;
- supplying feeding areas for birds and/or bats as part of the landscaping;
- creating water features or containers that can capture rainwater which can benefit birds;
- incorporating a green roof where your development leads to a loss of open land;
- Incorporating a green roof if located close to a water course or SINC;
- Incorporating a green 'biodiverse' roof where your development replaces a derelict site with an established 'brownfield' habitat;
- Incorporating a green roof to reduce storm water run-off

Developments such as this one in the City of Malmo, Sweden, can be designed to encourage wildlife. © Town and Country Planning Association (TCPA)

Chapter 9 — Sustainable Design and Construction Checklist

Depending on the development type, developers will be required to meet certain sustainability standards – these apply to both residential and non-residential developments. Developments have been classified in four categories and developers should address the sustainability criteria required for the category they fall under as summarised in the table below. The four development types are:

- Strategic developments — these are developments that are referable to the Mayor over 500 units or 10 hectares;
- Major developments — developments over 10 units or 1,000 sq m;
- Developments within Barking Town Centre Energy Action Area;
- Minor developments — fewer than 10 units (but no flat conversions or single house extensions and above 100 sq m if non-residential)

Topic	Strategic Developments referable to the Mayor	Major Developments (1,000 sq m + or 10 C3 units +)	Minor developments	Developments within Barking Town Centre Energy Action Area
Assessment methods (either BRE or Code for Sustainable Homes)				
BREEAM Assessment (ie. Ecohomes for residential)	Excellent (Post Construction certification required)	Aim for Excellent. Very Good will be accepted in exceptional circumstances (Post Construction certification required)	Very good encouraged (Post Construction certificate is not required)	Depends on whether the development is strategic, major or minor
Code for Sustainable Homes	Aim for Code Level 5. Code Level 4 will be accepted in exceptional circumstances	Aim for Code Level 4. Code Level 3 will be accepted in exceptional circumstances	Code level 3	Depends on whether the development is strategic, major or minor
Building Materials				
Locally sourced materials	50% of construction materials by mass to be sourced from a factory/plant, quarry, wharf, railhead or recycling centre within 35 miles of site wherever feasible		Encouraged	Depends on whether the development is strategic, major or minor
Reused and recycled materials	Incorporate reused and recycled materials in the new build to a minimum of 12.5% of the total value of construction materials. Demolition Protocol can be used to reach levels beyond 12.5%		Encouraged	Depends on whether the development is strategic, major or minor
Materials with low embodied energy	80% of the volume of each basic building element (i.e. walls, floors, roofs and ceilings) should be A rated in the 'Green Guide to Housing Specification', and the majority of the remaining materials should be B rated[6]	60% of the volume of each basic building element (i.e. walls, floors, roofs and ceilings) should be A rated in the 'Green Guide to Housing Specification', and the majority of the remaining materials should be B rated	Encouraged	Depends on whether the development is strategic, major or minor
Sustainable timber	60% timber products to be sourced from Forest Stewardship Council (FSC) source and the remainder from a known temperate source		Endeavour to use timber products from FSC source.	Depends on whether the development is strategic, major or minor
Peat or weathered limestone	No peat or weathered limestone to be used in buildings or landscaping			

Topic	Strategic Developments referable to the Mayor	Major Developments (1,000 sq m + or 10 C3 units +)	Minor developments	Developments within Barking Town Centre Energy Action Area
Sustainable waste management during construction and occupancy of development				
Site Waste Management Plans (SWMP)	Developers should have an effective Site Waste Management Plan (SWMP) and follow methodology prescribed by DTI (Department of Trade and Industry)		Not required	Depends on whether the development is strategic, major or minor
Demolition Protocol if project involves demolition	Where the project involves demolition, developers should follow the methodology in the Institute of Civic Engineers' (ICE) 'Demolition Protocol' to maximise the recovery of materials from the demolition site for reuse or recycling.		Not required	Depends on whether the development is strategic, major or minor
Internal and external recycling facilities	Follow recommendations set out in Planning Advice Note 3 on 'Refuse and Recycling Facilities in New and Refurbished Residential Developments'			
Reuse centres, recycling / composting plants on site	Applicable	None	None	Applicable if a strategic development
Energy Efficiency and Renewable Energy				
Site layout and Passive Solar Design	Consideration of site layout for solar gain and incorporation of passive solar design elements for heating, lighting and cooling			
Low Carbon Buildings	20% reduction in carbon emissions above Building Regulations 2006:			32% reduction in carbon emissions above Building Regulations 2006:
	10% of the above 20% reduction to be met through on-site generation of renewable energy. Remaining 10% to be met through energy efficiency measures beyond Building Regulations 2006, further generation of renewable energy and/ or community heating and combined heat and power (CHP). Electric heating is not acceptable.			At least 10% of carbon reductions to be met through on-site generation of electricity (only electricity generating technologies are compatible in the Energy Action Area).
				Remaining 22% carbon reductions to be met through community heating from a low carbon heat source which all developments will be expected to connect to. Electric heating is not acceptable.
Lighting systems and efficient appliances	High efficiency lighting and lighting controls 'Energy Saving Recommended' appliances to be installed in the development			

[6] The 'Green Guide to Housing Specifications' is produced by the Building Research Establishment and uses an A-B-C rating system to evaluate the environmental impacts of materials. The guide is available for purchase from www.brepress.com , reference number: BR390.

Topic	Strategic Developments referable to the Mayor	Major Developments (1,000 sq m + or 10 C3 units +)	Minor developments	Developments within Barking Town Centre Energy Action Area
Water Resources				
Sustainable Drainage Systems (SUDS)	Flood Risk Assessments in Flood Zones 2 and 3 and Zone 1 if development is 1 hectare or greater. Appropriate Sustainable Drainage Systems (SUDS) anywhere in the borough.		Flood Risk Assessment and appropriate Sustainable Drainage Systems (SUDS) only required if the development is in Flood Zone 2 and 3.[7]	Depends on whether the development is strategic, major or minor.
Water demand	Less than 30m^3 per bed space per year	Less than 35 m^3 per bed space per year	Less than 40 m^3 per bed space per year	Depends on whether the development is strategic, major or minor.
Water efficient devices	Water saving devices to be included in toilets, taps and showers			
Design strategy for water conservation	Rainwater collection and/or grey water recycling		Encouraged	Depends on whether the development is strategic, major or minor
Nature conservation and biodiversity				
Consultation and Scoping Studies	Consultation with Council and nature conservation organisations on the presence of important species and habitats on the site.	If site is within or adjacent to a Site of Important Nature Conservation (SINC)[8] the Council will expect developers to consult the Council and appropriate nature conservation organisations on the presence of important species and habitats on the proposed development site.		
Detailed Surveys and Impact Assessments	Wherever a species is identified which is protected under legislation, detailed surveys and impact assessments are required as well as consultation with English Nature before development proceeds.			

[7] A map of Flood Zones 1, 2 and 3 is available from the Council.

[8] A map of Sites of Important Nature Conservation is available in the Local Biodiversity Action Plan on the Council's website http://www.barking-dagenham.gov.uk/8-leisure-envir/park-country/biodiversity/biodiversity-action-main.html

Topic	Strategic Developments referable to the Mayor	Major Developments (1,000 sq m + or 10 C3 units +)	Minor developments	Developments within Barking Town Centre Energy Action Area
Nature conservation and biodiversity continued				
Biodiversity hierarchy on new developments: **1. Retain, enhance and create;** **2. Mitigate adverse impact;** **3. Compensate for loss of features**	Follow and implement the biodiversity hierarchy when planning developments. Even where little or no biodiversity value has been identified on a site, developers should aim to create features that will provide opportunity to colonise. The appropriate measures will depend on each particular scheme but they include the following: ■ creation of an ecological park and centre as part of the development scheme; ■ landscaping scheme designed to benefit local habitats including tree planting, planting of wildlife encouraging plants, wall climbers and green roofs; ■ planting of native wetland species around areas of existing water areas; ■ developing a habitat management plan for the construction and operation phase of the development; ■ provision of roost sites for bats; ■ nesting boxes and/or swift bricks to encourage new populations of birds; ■ supplying feeding areas for birds and/or bats as part of the landscaping; ■ creating water features or containers that can capture rainwater which can benefit birds; ■ incorporating a green roof where your development leads to a loss of open land; ■ incorporating a green roof if located close to a water course or SINC; ■ incorporating a green 'biodiverse' roof where your development replaces a derelict site with an established 'brownfield' habitat; ■ incorporating a green roof to reduce storm water run-off.		Create features that will encourage wildlife such as ■ tree planting; ■ planting of wildlife encouraging plants; ■ provision of roost sites for bats; ■ provision of nesting boxes and/or swift bricks to encourage new populations of birds; ■ supplying feeding areas of birds and/or bats as part of the landscaping scheme; ■ creating water features or containers that can capture rainwater for birds to feed from and to bathe' ■ incorporating a green 'biodiverse' roof where your development replaces a derelict site with an established 'brownfield' habitat; ■ incorporating a green roof where your development replaces open land; ■ Incorporating a green roof if located close to a water course or SINC.	Depends whether the development is strategic, major or minor

Chapter 10 — How to Demonstrate Sustainable Design and Construction Standards are Being Met?

New development must demonstrate how it intends to achieve the above requirements through a sustainability statement.

If new development undertakes a BREEAM assessment, it still needs to submit a sustainability statement and meet the above requirements. Where these are already met through the BREEAM assessment, a cross reference should be made in the sustainability statement.

A template for the sustainability statement can be downloaded from our website at **http://www.barking-dagenham.gov.uk/8-leisure-envir/planning/plan-documents.html** or obtained from:

Spatial Planning and Environmental Sustainability Group
Regeneration Department
London Borough of Barking and Dagenham
3rd floor, Crown House
6 Linton Road
Barking
IG11 8HG

Phone: 020 8227 3812

Fax: 020 8227 5326

E-mail: environmentalsustainability@lbbd.gov.uk

Chapter 11 — Case Studies in the Borough

1. The Millennium Centre, Eastbrookend Country Park

The building was a Millennium project designed as a visitor and education centre to provide a focal point to Eastbrookend Country Park. Every part of the building has been built and designed with the environment in mind. Sustainability features of the site include:

Foundations

There are no conventional foundations under the Millennium Centre. There are a number of large helical screws that anchor the building to the ground.The anchors can be taken out leaving the earth unspoilt should the building be removed at any time in the future.

Wind Turbine

There is a wind turbine by the building which generates electricity to power all the lighting in the building.

Photovoltaic Panels

An array of PV panels generates electricity for the building – an internal display panel provides real time data on the power output of the panels.

Roof

The roof is south facing to catch as much light and heat as possible. It is made of recycled aluminium which means that the roof is made of old drink cans.

Glu-Lam Beams

The roof of the Millennium Centre is supported by 'glu-lam' (or laminated) beams.

These are constructed by using wood cut from young trees (from sustainable forests), and 'pressure-glues' hold them together creating a much stronger material.

This process means old mature woodlands are left intact and only young trees of lesser conservation value are cut down.

Walls and Insulation

The walls are constructed using masonite wood fibre composite studs. External walls (and roof) are insulated with recycled newspaper or 'cellulose blown fibre'. This enables the walls to breathe eliminating condensation.

The external walls are all clad in Canadian Douglas fir wood and two trees replace every tree harvested.

Windows

The windows are doubled or triple glazed to allow maximum heat retention.

Floor

Underneath the paving slabs the floor is made of layers of sand and gravel, there is also a layer of foam glass made in part from recycled windscreens, which acts as further insulation. In the summer the slabs keep the centre cool and in the winter they store heat and help keep it warm.

Boiler

Despite the building being 4-5 times bigger than an average house, the boiler used is the same size.

Rainwater recycling

Rainwater from the roof is drawn into channels and collected in an underground reservoir to be recycled for watering the surrounding plants.These features all help to reduce the energy consumption of the building, ensuring cost-effective building management.

2. Voltaics, Dagenham Dock, Essex, RM9 6RJ

The Voltaics building in Dagenham Dock

Voltaic is a 232,965 sq ft distr ibution/ warehouse building developed by Gazeley UK Limited. The building incorporates a number of Eco Initiatives including:

Energy:

- Solar photovoltaic cells on top of the warehouse as well as the bike shelter which power about 40% of external lighting
- Solar thermal which provides 50% of the hot water needs for staff and facilities
- Ground source heat pumps which provide space heating and cooling by capturing earth energy and provide 100% of heating and cooling for the office
- 15% natural roof lighting reducing energy bills and providing a pleasant working environment.

Water

- Dual flush toilets and low flow taps to conserve water
- Rainwater harvesting which reuses 400,000 litres roof water per annum and saves 40% of washroom water.

Materials

- sustainable timber used for windows and doors;
- organic paint;
- recycled yarn in the carpet tiles and natural marmoleum;
- low embodied energy solutions for plasterboard and roof tiles.

3. Ford Dagenham Wind Turbines

One of Ford's two wind turbines in Dagenham
© Ecotricity

Ford is one of the borough's largest employers and has been synonymous with Dagenham for decades. Ford has embraced sustainability as part of its development ethos and the two wind turbines on the Ford site at Dagenham have become a local landmark recognised from miles by residents and visitors alike.

The two 85m high wind turbines, with a combined capacity of up to 3.6MW generating up to 6.7million kWh of clean electricity every year, provide all the electricity needed to power Ford's new Dagenham Diesel Centre.

This is equivalent to enough electricity to power over 2,000 homes (nearly 7 million units per annum). The wind turbines were built by Ecotricity through the Merchant Wind Power scheme. Through this scheme Ecotricity own, operate and maintain wind turbines on site. Customers agree to purchase the electricity, typically over a 12 year period, and in return receive a supply of green energy.

4. Ford Dagenham Plant – Habitat Management Plan for Black Redstarts

As part of a planning consent in 2005, Ford are implementing a Habitat Management Plan for black redstarts and associated invertebrate life on site to protect and enhance habitats during operational activities including the construction of new buildings.

The aim of the plan is to enhance Ford Dagenham for a number of key National and Local biodiversity action plan species and habitats, both at a national and regional [London] level. The plan recognises that Ford Dagenham is a working environment and that incorporating or enhancing biodiversity within the area takes into account the operational constraints and commercial realities of a corporate business.

The Plan includes the following measures:

- Site surveys in March 2006 to establish potential of certain areas for seeding which can provide habitats for invertebrates.
- Creation of mounded areas using secondary aggregates and appropriate seed mix.
- Construction of sand walls and moss poles to provide nesting for rare invertebrates and foraging for black redstarts.
- Invertebrate and black redstart monitoring.

5. Jo Richardson School, Barking and Dagenham

The Jo Richardson Community School has been constructed with energy efficiency measures in place from the outset. For example, the building has a sophisticated building management system — there is a high level of insulation and the high building mass and concrete concentration means that the building has efficient heat storage. It is anticipated therefore that the school will have low running costs and fuel usage.

Due to the proximity of the school to the A13 the building does not have windows which open, but instead has an air supply and extraction system which also contributes to localised heat exchange. The school also has soak-aways so that rainwater is used for ground-watering.

6. Charlecote Road

This is a new-build development of 65 timber-framed houses and flats in Charlecote Road, Dagenham, a brownfield site within the Thames Gateway area which has been vacant for over five years. The development is of mixed tenure, providing affordable rented and shared ownership homes. Environmental features include six PV systems on roof, eco-homes rating of 'very good' and lifetime homes design criteria.

7. All Saints Catholic School and Technology College – completed 2003

The school has photovoltaic panels and solar water heating. The PV panels are also connected to small fountains in the College's pond which allows pupils to see how the power output varies with sunlight intensity. The building is naturally ventilated through windcatchers on the roof and naturally lighted through sun-pipes.

8. St Mark's Church, Marks Gate – completed late 2005

This is a church extension with solar PV panels installed on mono pitch south facing roof – visible from across the pasture.

POSITIVE ABOUT DISABLED PEOPLE

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