

Green roofs

Planning Advice Note 1



www.barking-dagenham.gov.uk

Green roofs Planning Advice Note 1

Green roofs are an important issue for the London Borough of Barking and Dagenham. We have produced this planning advice note (PAN) to give advice as to how we can have more green roofs in the borough. Although you do not have to follow the advice in this PAN to get planning permission, we will consider whether you have followed the advice when we are determining (deciding) planning applications. So, where appropriate, your development proposals should show how you have followed the advice in this PAN.



Useful Websites

www.uncommonplants.com	Provides advice on which plants are suitable for rooftop gardens.
www.blackredstarts.org.uk	Provides advice on designing roofs to benefit black redstarts.
www.greenroofs.com	Website dedicated to sharing and exchanging information on green roofs.
www.lbp.org.uk	The website for the London Biodiversity Partnership.
www.livingroofs.org.uk	This website outlines the A-Z on green roofs and includes information on manufacturers.

Glossary

Greening the urban environment	Growing trees and other plants in our towns and villages, alongside our roads and in, on and around our flats, houses, offices and shops.
Biodiversity	The variety of plant and animal life in the world and where they live (their habitats).
Amenity	A useful and pleasant facility

We have based this document on the Green Roofs research advice note which was produced jointly by the British Council for Offices and the Corporation of London in 2003.



This booklet is a green roof planning advice note. You can ask for a translation by ticking one of the boxes, filling in your name and address and returning this form to the address at the end of these translations.

☐ **Albanian**

Kjo broshurë është një paralajmërim për planifikimin e çatisë jeshile. Ju mund të kerkoni një përkthim të saj duke shënuar njerën prej kutive. Plotësoni emrin dhe adresën tuaj dhe kthejeni këtë formular në adresën në fund të këtyre përkthimeve.

☐ **Chinese**

這份小冊提供有關綠化屋頂計劃的指導。如果你想索取這份小冊的中文譯本，請在適用的空格內填上勾號，並填寫你的姓名和地址，然後將這份表格寄回在這些譯文之後的地址。

☐ **French**

Ce livret est un guide conseil sur l'établissement de toits verts. Vous pouvez en demander une traduction en cochant l'une des cases ci-dessous, en indiquant votre nom et adresse et en renvoyant ce formulaire à l'adresse indiquée à la fin de cette section de traductions.

☐ **Lingala**

Mwa mokanda oyo ezali note ya conseil ya planning po na environnement. Okoki kosenga ndemboli na yango soki oponi yoko ya ba boîtes, okomi kombo na adresse nayo pe ozongisi formulaire oyo na adresse oyo ezali na suka ya ba ndemboli oyo.

☐ **Polish**

Ta broszura dotyczy projektu ogrodu/zieleni na dachu. Może Pan/Pani poprosić o jej tłumaczenie zaznaczając jedna z kratek, wpisując swoje nazwisko oraz adres a następnie wysyłając ten formularz na adres podany na końcu.

☐ **Portuguese**

Este folheto é uma nota de aviso acerca do planeamento para coberturas verdes. Pode pedir uma tradução, ao pôr um sinal numa das caixas, preencher o seu nome e morada, e devolver esta forma para a morada no fim destas traduções.

☐ **Punjabi**

ਇਹ ਕਿਤਾਬਚਾ ਗ੍ਰੀਨ ਰੂਫ (ਮਕਾਨ ਦੀ ਛੱਤ ਉੱਤੇ ਫੁੱਲ ਬੂਟੇ, ਸਬਜ਼ੀਆਂ ਉਗਾਉਣੇ) ਦੀ ਯੋਜਨਾ ਬਾਰੇ ਇੱਕ ਐਡਵਾਈਸ ਨੋਟ ਹੈ। ਇਸ ਦੇ ਅਨੁਵਾਦ ਲਈ, ਤੁਸੀਂ ਇਹਨਾਂ ਵਿਚੋਂ ਇੱਕ ਬੋਕਸ ਵਿਚ ਟਿੱਕ ਕਰਕੇ, ਆਪਣਾ ਨਾਮ ਅਤੇ ਪਤਾ ਭਰ ਕੇ, ਇਸ ਫ਼ੋਰਮ ਨੂੰ ਅਨੁਵਾਦਾਂ ਦੇ ਅਖ਼ੀਰ ਵਿਚ ਦਿੱਤੇ ਗਏ ਪਤੇ ਤੇ ਵਾਪਸ ਭੇਜਣੇ ਦੇ ਜ਼ਰੀਏ ਕਹਿ ਸਕਦੇ ਹੋ।



□ Swahili

Kijitabu hichi kina maelezo kuhusu ujenzi wa paa. Unaweza kupewa maelezo zaidi kwa lugha yako ukiweka alama ya pata katika kisanduku kimojawapo, andika jina lako na anuani yako, na rejesha fomu hii katika anuani iliyoandikwa chini.

□ Turkish

“Yeşil Çatı Isı Tasarrufu” (*Green Roof Planning Advice Note*) başlıklı bu broşür, evinizin çatısını enerji ve ısı tasarrufu amacıyla nasıl daha iyi yalıtılabileceğiniz konusunda aydınlatıcı bilgiler vermekte ve en iyi uygulama şekillerini göstermektedir. Türkçe’ye çevrilmesini istiyorsanız, lütfen uygun kutuyu işaretleyip isminizi ve adresinizi yazdıktan sonra, bu formu sayfanın sonundaki adrese gönderin.

□ Urdu

یہ کتابچہ گرین روف (مکان کی چھت پر پھول بوٹے یا سبزیاں اگانے) کی منصوبہ بندی کے بارے میں ایک ایڈوائس نوٹ ہے۔ آپ اس کے ترجمے کے لئے ان میں سے ایک خانے پر ٹیک کر کے، اپنا نام اور پتہ لکھ کر اور اس فارم کو ان ترجموں کے آخر میں دیئے ہوئے پتے پر واپس بھیجنے کے ذریعے کہہ سکتے ہیں۔

Your name:

Your address:

If you would like this information on audio tape or in large print, please contact us at:

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Chapter 1 - Introduction

The aim of this planning advice note

- a The aim of this advice note is to provide guidance for planners, developers, architects and facility managers. We hope it will help you to build green roofs. This PAN will help us achieve policies set out in our Unitary Development Plan (UDP) and the London Plan.

Do I have to follow the advice in this planning advice note?

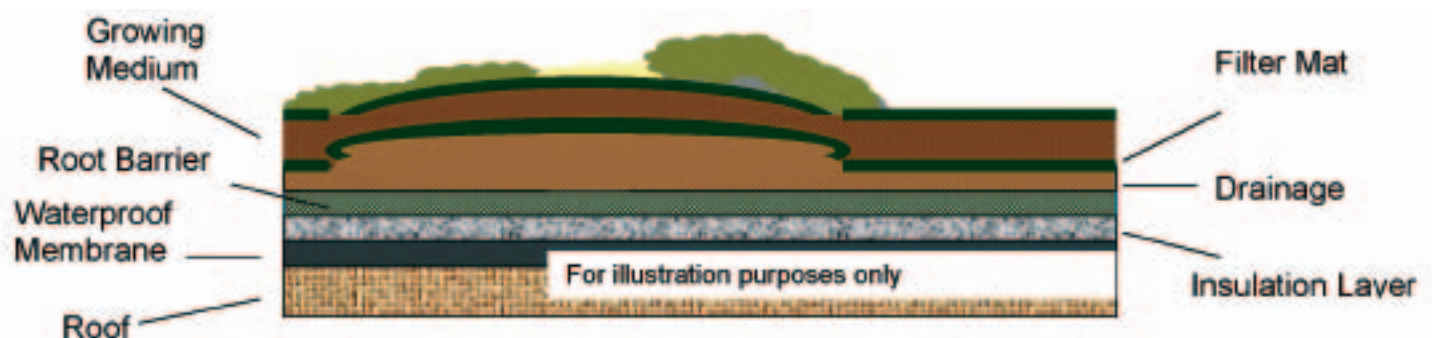
- b This planning advice note provides guidance on implementing the policies in our UDP. Although you do not have to follow the advice in this PAN to get planning permission, it provides important guidance about how to meet certain UDP policies. When we are deciding whether to approve planning applications, we will consider whether you have followed the advice in this PAN.

What are green roofs?

- c Green roofs convert a roof area into an area where plants can grow. Green roofs are made up of layers that create an environment suitable for plants to grow.

Structure of a green roof

- d Usually, a green roof has a waterproof membrane at the bottom to protect the building from leaks. There is then an insulation layer and another protective layer which will prevent damage from any penetrating roots, or other structural movement. Some designs may have the insulation layer as part of the protective layer. You could also put the insulation layer above the protective layer instead of below.
- e A drainage layer is put down over the insulation layer and the protective layer. The drainage layer can be made of lightweight gravel or light granulated clay. It helps to keep air in the green roof and soaks up any extra water. The drainage layer can also store water for the plants to use at a later time. For maintenance purposes, it is important that you can reach the drainage points from above. On top of the drainage layer, you can put a filter mat to allow water to soak through. This will also prevent the fine soil from eroding.
- f The top layers of a green roof system include the soil layer (or substrate), plants, and a wind blanket. The soil layer is made up of lightweight material (for example, crushed clay bricks, brick rubble, clay granules or crushed concrete) and will help with drainage as well as providing



nutrients to the plants. The wind blanket protects the soil layer until the roots of the plants take hold.

Types of green roof

- g There are two main types of green roof – intensive and extensive.
- h Intensive green roofs provide similar benefits as a small urban park. They have a deep layer of soil which can support a range of plants, trees and shrubs. If you plant native species (plants which would grow naturally in the local area) this can provide a rich habitat for wildlife. Intensive green roofs are designed to include access for people. These roofs need regular maintenance.
- i Extensive green roofs are lightweight with a shallow soil layer and are not normally designed to provide access for people. They need little maintenance. There are three main types of extensive green roof.
 - Extensive green roofs which are made up of sedum or vegetated mats – fabric mats which are prepared before the green roof is built. The mats are sprinkled with sedum cuttings. These are then left in appropriate conditions to grow into the fabric mat. Once the mats are ready, they are rolled up and delivered to the construction site and laid down on to the roof.
 - Extensive green roofs where a soil layer (often crushed recycled brick) is laid down and then planted directly with small plants. These plants (often sedum) will have been grown in small pots. They are often known as plug plants.

- Extensive green roofs where the soil layer is laid down and then planted with seeds (which are suitable for the local environment). This type of roof is often known as a 'biodiverse' or 'brown' roof.



Intensive Green Roof on Chicago City Hall, Autumn 2003
(Photo: City of Chicago-Mark Farina)



Intensive Green Roof on Chicago City Hall, Summer 2004
(Photo: City of Chicago-Mark Farina)

Extensive Green Roof at the Chicago Centre for Green Technology
(Photo: City of Chicago – Mark Farina)



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



The benefits of installing a green roof

Green roofs can be designed to give a wide range of benefits. These include:

- reducing the amount of surface water running off the roof and so reducing the risk of flooding;
- providing habitat (homes), shelter and feeding opportunities for wildlife;
- helping to meet the targets of our biodiversity action plan;
- improving the character and appearance of the building and the surrounding area;
- offering a design opportunity that can boost the environmental credentials of a business;
- providing extra heat and noise insulation;
- keeping the building cool in the summer;
- helping to reduce the amount of dust and pollutants in the air; and
- creating new open space for relaxation.

Chapter 2 – Relevant policies

- a Green roofs are recognised as a design tool for improving biodiversity (the variety of plant and animal life in the local area), improving air quality, managing rainwater and providing an open space for people to enjoy.
 - b The Government recognises green roofs for their ability to retain rainwater and reduce the amount of water running off roofs in its recent publication *Creating Sustainable Communities: Greening the Gateway* which sets out the Government's vision for the landscape of the Thames Gateway. The National SUDS (sustainable urban drainage) Working Group also recognises green roofs as a way of managing rainwater in their Interim Code of Practice for SUDS.
 - c The Mayor of London, the London Development Agency, the London Biodiversity Partnership and English Nature recognise the value which green roofs can bring to biodiversity in their joint publication *Design for Biodiversity: A Guidance Document for Development in London*.
 - d As well as these policy documents which specifically recommend green roofs, green roofs are also seen as a way off achieving wider national, regional and local policy objectives. These are set out below.
- planting, the creation, maintenance and management of landscape features important to wildlife, and the skilled adaptation of derelict areas can provide extended habitats' (see section 16).
- **Planning Policy Statement 9 (Draft PPS9), 'Biodiversity and Geology' Consultation Draft (2004)** says 'development policies should promote opportunities for the incorporation of beneficial biodiversity and geological features within the design of development' (see paragraph 1 (vii)).
 - **The Biodiversity Strategy for England, 'Working with the Grain of Nature' (2002)** - strongly encourages development that supports and improves wildlife habitats. It highlights how nature conservation is essential in creating long-term and successful urban communities in the built environment.

Regional policy

- f Encouraging developers to include green roofs in building design is consistent with a number of regional planning policy documents.
- **The London Plan, 'Spatial Development Strategy for Greater London' (2004) - Policy 4B. 1** Design Principles for a Compact City outlines that developments should not harm the environment and should be longlasting and adaptable, attractive to look at and should respect the natural environment. Paragraph 4.43 goes on to say: 'London is a green city with rich biodiversity. Development proposals should respect and enhance the natural environment and incorporate greening and planting initiatives. They should identify new opportunities for creating private space,

National policy

- e Encouraging developers to include green roofs in building design is consistent with a number of national policy documents.
- **Planning Policy Guidance Note 9 (PPG9), 'Nature Conservation' (1994)** provides advice on how nature conservation priorities can be reflected in land-use planning. One of the things it says is 'sensitive landscaping and

for example, in roof gardens and terraces.'

- **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.'

Local policy

- g Encouraging developers to include green roofs in building design is consistent with a number of local policy documents.
- **The Barking and Dagenham Partnership's Community Strategy 'Building Communities Transforming Lives' (2004)** sets out a framework that aims to make the borough a better place to live, work and spend leisure time. Under the Local Government Act 2001, all the plans and programmes we prepare must meet policies and priorities set out in the Community Strategy. Green roofs can help us to meet the Community Priority of making the borough 'cleaner, greener, and safer' by increasing natural habitats in the built environment, reducing the risk of local flooding (resulting from heavy rainfall), providing a pleasant area for people to enjoy and improving air quality.

Our Unitary Development Plan, 1995

includes a number of policies which aim to protect and improve local wildlife. These include the following.

- G50 Diversity of Habitats
- G36 Noise and Vibration
- G46 New Developments
- DE3 Nature Conservation and the Built Environment
- DE10 Waterfront Developments
- DE9 Energy Conservation
- H20 Residential Developments

For more information on these policies and their links to green roofs, please see Appendix B.



Extensive Green Roof, Chasewater Visitors Centre (Photo: Bauder Ltd)

Chapter 3 – What type of roof is most appropriate for my development?

- a The main benefit of the green roof will vary from one development to the next. The following guide should help you to work out the best type of roof for each development proposal.

Designing for amenity (a useful and pleasant facility)

- b Both extensive and intensive green roofs can add to the character and appearance of an area. However, only intensive green roofs can provide an area for people to relax in.
- c If you are designing an extensive green roof as a pleasant area to look at, it needs to be clearly seen from the street level or other parts of the development (for example, high-rise flats or offices).
- d Intensive green roofs provide a pleasant area to look at, and people can also go onto the roofs and enjoy an outdoor open space. These can be particularly valuable in built-up areas. However, intensive green roofs cannot be used to justify losing open spaces at street level.
- e Commercial developments such as offices, community facilities and residential developments may be best suited for this type of roof as they are used by the community.



Extensive Green Roof, Riverhead Infants School (Photo: Bauder Ltd)

Designing for biodiversity (the variety of plant and animal life in the local area)

- f Although all green roofs support biodiversity, some can be specifically designed to increase these benefits. A green roof built for biodiversity purposes will have to be 'extensive'. This is because extensive roofs are not used by people and can provide undisturbed habitats for plants, birds and insects. It is particularly important to choose plants which will benefit the existing local environment. You should get advice from a organisation that understands both the local ecology and the ability of plant species to survive at roof level.
- g 'Biodiverse' or 'brown' roofs (see chapter 1, paragraph i) are designed to copy the ecological environment of the sites where building is taking place. They are particularly suitable where development is taking place on brownfield land (a habitat suitable for many types of plants and birds such as the black redstart). This is because the habitats that are lost from developing the brownfield site can be made less severe by providing a replacement habitat at rooftop level.

Extensive Green Roof with sedum, Great Notley Primary School (Photo: Bauder Ltd)



- h Extensive roofs are lightweight and so may also be considered appropriate for industrial developments.



Extensive Green Roof on Scottish Public Pension Agency, Galashiels
(Photo: Bauder Ltd)

Reducing the amount of surface water running off a roof

- i All types of green roofs will reduce the amount of surface water running off a roof. Green roofs hold on to rainwater in the short term and when the water begins to be slowly released, a lot of it will stay with the plants and the soil layer. Some rainwater will also evaporate back into the atmosphere.
- j How much water the roofs will hold will depend on the time of year (plants and the soil layer will keep more water during the summer months), the size and depth of the green roof and the type of plants used. Intensive roofs are likely to keep more water because of their size and deeper layer of soil.
- k In some countries and cities, developers must create green roofs specifically for their ability to reduce the amount of surface water running off buildings as this will relieve pressure on local drainage systems and reduce the likelihood of flooding during heavy rainstorms.
- l Green roofs which are designed to reduce the amount of surface water running off a building are particularly suitable in areas which are likely to flood during heavy rainstorms.

Chapter 4 – Cost and maintenance

Costs

- a The cost of a green roof per square metre (m²) varies depending on the type of green roof, what it will be used for and the quality. Extensive green roofs start from approximately £90 per square metre, although a basic 'biodiverse' extensive roof can be installed for much less than this. An intensive green roof will be more expensive than an extensive green roof and the cost will vary depending on the design and the features to be included (for example, trees and ponds).
- b However, green roofs can also save you money as they provide insulation during both the winter and summer. This has been demonstrated in Canary Wharf, one of the largest areas of green roofs in the UK. In 2003, it was discovered on one of the buildings that, since a green roof had been installed, the temperature stabilised on the level immediately below the roof. Ventilation is no longer needed during the summer, and heating is not needed in winter. Dusty Gedge, Director of Livingroofs.org (see contact details at the end of this report) has studied the insulation effects of this green roof. A report on his findings is in the November/December 2004 edition of the Heating and Air Conditions Magazine (HAC).



Extensive Green Roof, Lillie Road, London (Photo: Matthew Frith)

Maintenance

- c It is not difficult or expensive to maintain a green roof.
- d You should check extensive green roofs every year, and remove any unwanted plants.
- e You should water and weed intensive green roofs in the same way you would a normal garden. You must prune larger plants, shrubs and trees to make sure they are safe during windy conditions. You will also need to check and clear drains and gutters often to avoid blockages.

Chapter 5 – Design

When to build your green roof

- a An ideal time to consider building a green roof is when the existing roof needs to be replaced, or when a new building is to be developed. This way, features such as a waterproof layer and a protective root-resistant layer can be made part of the new roof. It is possible to install a green roof onto an existing roof, but this will mean taking into account the roof's faults, such as any leaks and damage, and the roof will not be able to resist roots.

Structural capacity of the roof

- b The structural capacity of the roof is the weight which the roof can hold without risking damage to the building. This will be an important factor in deciding what type of roof you can install. It should be included in the development proposal from the beginning. New buildings can be designed with suitable structural capacity for any type of green roof. Extensive roofs weigh approximately 60 to 150 kg/m² and intensive roofs weigh about 200 to 1000Kg/m².
- c To work out the exact weight, you should consider:
 - the type of green roof to be installed;
 - the water-storage system;
 - the type of soil or substrate and plants;
 - equipment for heating, ventilating and air conditioning; and
 - how many people will be using the green roof.

Access to the roof

- d It is important to consider how people will get onto the roof, and how equipment and material will be taken onto the roof. Green roofs can be developed at any slope. However, the flatter the roof is, the easier it will be for people to get onto the roof and maintain it.

Selection of plants and growing materials

- e The types of plants suitable for growing on a green roof will partly depend on the level of maintenance that will be available during its lifetime. It will also depend on whether the roof has an in-built irrigation and watering system, or has areas of protection such as shade and shelter.
- f However, choosing local seed varieties will mean that both extensive and intensive green roofs can help local biodiversity. The windy conditions that often exist on a rooftop will also mean that hardy plants, such as mosses and stonecrops, will establish themselves and thrive more easily.
- g We recommend that you use crushed demolition waste on an extensive green roof. This has environmental benefits including recycling materials, and reducing the need for transporting and getting rid of the waste. Crushed bricks and concrete form drainage and a soil layer that can support a range of plants and insects. This in turn, benefits other types of wildlife.
- h The possibilities for an intensive green roof are considerably greater. The roof can contain trees, shrubs, meadows, flowerbeds and even features such as a pond.

Watering

- i Ideally, you should design extensive and intensive roofs to reduce the need for watering. You can do this by planting plants which do not need a lot of water. More formal types of planting may need an irrigation system or water connection to the roof. You can collect and store rainwater and use it to water the plants when necessary.

Drainage

- j Water that is not absorbed within the green roof must be effectively drained from the rooftop. Otherwise, the water will be held on the roof and this could cause rot and add weight. A waterlogged green roof will also have little insulation effect.



J.W. Garland's Shop, c. 1902, Garland's Corner at the junction of East Street and Ripple Road. Note the attractive roof garden –green roofs are not a new phenomena to Barking & Dagenham! (Photo: LBB&D)



ExtensiveTurf roof, Segal House, Lewisham
(Photo: EcoSchemes)

Appendix A:

Other ways of providing green, open spaces in built-up areas

- a Installing a green roof is one of several ways in which plants and trees can be used to improve the quality of life in our built-up environment. These include:
 - planting trees by the roadside and by buildings;
 - planting trees and plants in courtyards;
 - creating rockeries, loggeries (piles of logs suitable as a habitat for stag beetles and other insects), and compost heaps where possible;
 - creating balcony gardens;
 - creating vertical habitats for wildlife alongside walls of buildings; and
 - attaching bird and bat boxes to the sides of buildings.
- b As well as some obvious benefits such as improving the way an area looks, and providing habitats for wildlife, there are some other, perhaps less appreciated benefits of having more plant life and trees in the built-up environment.
- c Plants and trees improve air quality. Trees filter out dust from the air as their leaves absorb dust particles. Plants absorb carbon dioxide in our atmosphere, and so maintain a healthier balance in our built-up environment. Plants growing alongside the walls of buildings absorb pollutants from the air and protect the building from the effects of the sun, rain and wind. Some people believe that plants will always damage buildings – this is not true.
- d Plants also absorb pollutants such as copper and lead from rainwater and prevent them from getting into our groundwater, streams and rivers. Rainwater is kept for much longer because of the absorbent surfaces provided by trees, soil and plants, and this eases the pressure on sewers during periods of wet weather.

Appendix B:

Explanation of our Unitary Development Plan policies

- a Our Unitary Development Plan, which we adopted in 1995, includes policies which set out our commitment to protecting and improving local wildlife within the planning process. These policies are set out below.

UDP Policy G50 – ‘Diversity of Habitats’

- b This policy says:

‘The Council will endeavour to increase the diversity of ecological habitats in the borough either through its own initiatives or by encouraging other public or private agencies, or developers to do so.’

Extensive green roofs can help deliver this policy by providing extra undisturbed habitats for plants, birds and insects.

UDP Policy G46 – ‘New Developments’

- c This policy says:

‘The Council will encourage the integration of nature conservation into new developments’

Justification paragraph 46.2 continues:

“This would involve, for example, the use of particular features and/or habitat types, such as native tree and shrub species in groups, hedges, grasses, and wild flowers. Where appropriate the Council would expect landscape schemes to include proposals for the 'greening of buildings' with the use of wall-favouring plant and shrub species that are a benefit to wildlife.”

Green roofs can help deliver this policy as they are an ideal way of combining nature conservation and new developments.

UDP Policy DE3 – ‘Nature Conservation and the Built Environment’

- d This policy says:

‘The Council will ensure that there is a nature conservation input into large development schemes by the use of sympathetic design criteria in the layout and landscape detail of the scheme.’

Green roofs can help deliver this policy as they can help a development to fit into the surrounding environment, particularly where a biodiverse extensive green roof is designed on a brownfield site.

UDP Policy DE9 and H20 'Energy Conservation'

e Policy DE9 says:

'The Council will seek to ensure that new developments and refurbishments are energy efficient through greater thermal insulation, more efficient layout and design of buildings.'

Policy H20 says:

'The Council will encourage the use of energy efficient building techniques in the construction of new residential development. Account should also be taken of orientation and aspect in devising site layouts.'

UDP Policy G36 'Noise and Vibration'

f This policy says:

'When considering applications for new development the Council will seek to ensure that new noise sensitive development is protected from unacceptable noise from existing sources'

The combination of soil, plants and trapped layers of air on a green roof can act as an insulation barrier against sound. Sound waves are absorbed, reflected or deflected. The soil layer tends to block lower sound frequencies and the plants block higher frequencies. The amount of sound insulation depends on the system used and the depth of the green roof. A green roof with a 12cm substrate layer can reduce sound by 40 decibels and a green roof with a substrate layer of 20cm can reduce it by 46 to 50 decibels. We consider installing green and brown roofs as best practice in reducing noise and vibration in line with planning policy G36.

Appendix C:

References and further information

As well as the literature available on green roofs, there are also a number of websites and organisations which may be useful if you are considering developing a green roof. We are not responsible for the external weblinks and addresses set out below.

Useful Publications	Comment
Dunnett, N. and Kingsbury, N. (2004) <i>Planting Green Roofs and Living Walls</i> . Timber Press, Portland, Oregon.	This is the UK's first book on green roofs.
Johnston, J. and Newton, J. (1993) <i>Building Green</i> , London Ecology Unit, 1993 ISBN 1 871045 18 5	A useful guide with information on types of plants appropriate for green roofs.
English Nature (2003) ' <i>Green Roofs: their existing status and potential for conserving biodiversity in urban areas</i> ', English Nature Research Report 498.	A technical report on green roofs including a schedule of intensive green roofs and extensive green roofs in England and Wales. The report was published in May 2003.
Mayor of London, London Development Agency, London Biodiversity Partnership and English Nature (2004) ' <i>Design for Biodiversity – A guidance document for development in London</i> '.	This is available from www.london.gov.uk .
ODPM (2005) ' <i>Creating Sustainable Communities: Greening the Gateway</i> '	This document sets out the Government's vision for the landscape of The Thames Gateway. This is available at www.odpm.gov.uk .
National SUDS Working Group, July 2004 ' <i>Interim Code of Practice for SUDS</i> '	This is available at www.ciria.org.uk .

Useful Contact	Comment
<p>Gary Grant, Eco-Schemes Ltd 7 Lea Combe, Axminster EX13 5LJ Phone: 01297 34552 Email: gary.grant@ecoschemes.com</p>	<p>Gary Grant is an ecologist and designer of green roofs. He is also the main author of English Nature's Green Roof Study (English Nature Research Report 498).</p>
<p>James Farrell Biodiversity Team Greater London Authority (GLA) Phone: 020 7983 4990 E-mail: James.Farrell@London.gov.uk City Hall, The Queen's Walk London SE1 2AA</p>	<p>The Biodiversity Team members at the GLA specialise in a range of biodiversity topics including green roofs.</p>
<p>William Moreno The London Biodiversity Partnership c/o The London Wildlife Trust, Harling House 47 – 51 Great Suffolk Street London SE1 0BS Phone: 020 7921 5479</p>	<p>The members of the London Biodiversity Partnership (LBP) represent a broad range of interest groups and expertise in London. The LBP is responsible for producing the London Biodiversity Action Plans for London.</p>
<p>Lucy-Anne Bishop Education and Environment Project Officer The Horniman Museum Forest Hill Phone: 020 8699 1872</p>	<p>Lucy-Anne Bishop will be able to provide information on the environmental aspects of the Centre for Understanding the Environment (CUE) Building, including its turf roof.</p>
<p>Gyongyver Kadas E-mail: g.kadas@btinternet.com</p>	<p>Gyongyver has carried out an MSc study of "invertebrates on green roofs: how roof design can maximise biodiversity in the urban environment". She is currently working on long-term research to inform planners and designers about the biodiversity benefits of green roofs.</p>