Revised Sustainable Design Supplementary Planning Document

Epsom & Ewell Borough Council

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1. Introduction

1.1 Delivering more sustainable forms of development and effectively tackling the causes and effects of climate change in the way we plan new development requires careful thought and openness to innovative ideas. This guide is designed to aid all those involved in the planning, design and construction of new developments within the Borough.

1.2 National planning policy states that there will be a presumption in favour of sustainable development. The Council is committed to ensuring that Epsom and Ewell grows sustainably and Policy CS6 of the adopted Core Strategy requires that new development should result in a sustainable environment and reduce or have a neutral impact upon, pollution and climate change.

1.3 By following this Guidance Document, prospective developers can help ensure and demonstrate that their development proposals are genuinely environmentally sustainable.

Status of this Guidance

1.4 This Guidance provides detailed information on how planning policy will be implemented, specifically Core Strategy Policy CS6 (set out below). It forms part of the adopted Development Plan for the Borough and carries significant weight when making planning decisions. How sustainable design is considered as part of the planning process from the pre-application stage through to post completion monitoring is set out in Annex 1.

1.5 The measures and opportunities available to developers and householders to integrate sustainability into their development are contained within the Guidance. It provides a mixture of advice, good practice, case studies and references. Importantly the Guidance also sets out how developers can clearly demonstrate that they have met our requirements for sustainable design and how their proposals are in compliance with our Core Strategy and Development Management Policies.

Planning Policy Context

1.6 Sustainable development and design objectives are well established through national and local planning policy and underpinned by law[1]. The following policies provide the wider context for this Guidance Document.

<u>Local Plan Policy</u>

The Core Strategy:

1.7 This is the most important policy document as it sets out the vision and core strategic policies that will ensure the delivery of sustainable communities across the Borough. Its policies are based upon strong local evidence and reflect local conditions. In respect of this Guidance Document, key policies include Policy CS5, which seeks

[1] S39 Planning and Compulsory Purchase Act 2004 on sustainable development – local planning authorities "must exercise the function with the objective of contributing to sustainable development." ; and S183 Planning Act 2008 on good design – " .. must in particular have regard to the desirability of achieving good design; and the Planning and Energy Act 2008 – requirements for energy use and energy efficiency in local plans.

high quality and inclusive design from all development proposals. The Core Strategy also includes Policy CS6, which sets out the requirements for sustainable design and which forms the policy basis for the guidance contained within this document.

Core Strategy Policy CS6

Proposals for development should result in a sustainable environment and reduce, or have a neutral impact upon, pollution and climate change. The Council will expect proposals to demonstrate how sustainable construction and design can be incorporated to improve the energy efficiency of development - both new build and conversion.

In order to conserve natural resources, minimise waste and encourage recycling, the Council will ensure that new development:

- *minimises the use of energy in the scheme by using an appropriate layout, building design and orientation;*
- *minimises the emission of pollutants, including noise, water and light pollution, into the wider environment;*
- *has no adverse effects on water quality, and helps reduce potential water consumption, for example by the use of water conservation and recycling measures and by minimising off-site water discharge by using methods such as sustainable urban drainage;*
- *avoids increasing the risk of, or from, flooding;*
- *minimises the energy requirements of construction, for example by using sustainable construction technologies and encouraging the recycling of materials;*
- *encourages the use of renewable energy by the incorporation of production facilities within the design of the scheme;*
- *incorporates waste management processes, for example for the recycling of water and waste. The waste hierarchy (Reduce-Reuse-Recycle-Recover- Dispose) should be applied to all stages of development design, construction and final operation.*

Plan E Epsom Town Centre Area Action Plan:

1.8 Although Plan E is primarily focused with maintaining and enhancing the economic vitality and viability of Epsom Town Centre, it also contains policies that relate to sustainable design, which are complemented by this Guidance.

1.9 These include Policy E7 Town Centre Building Height, Policy E8 Town Centre Energy Generation and Policy E9 Public Realm improvements. Policy E8 seeks to maximise the opportunity for decentralised and renewable energy sources in the Town Centre. A variety of high intensity uses may lend themselves to such schemes, or have the ability to link in at a later date. Policies E7 and E9 aim to enhance the character and appearance of the town centre helping to ensure its long term its environmental, social and economic sustainability.

Development Management Policies Document:

1.10 This recently adopted document helps to deliver the strategic objectives and vision of the Core Strategy. Many of the policies are directly related to sustainability. Policy DM10 is a detailed policy which identifies numerous principles of good sustainable design. Policy DM12 requires certain internal and external space standards to be met while also identifying specific targets for water consumption. Policy DM19 sets out the Council's broad approach to addressing flood risk. Many of these policies are elaborated upon in this Guidance.

National Planning Policy

National Planning Policy Framework:

1.11 The National Framework sets out the government's objectives for the planning system and makes a presumption in favour of sustainable development proposals. Our Sustainable Design Guidance helps to identify what this means for Epsom & Ewell in terms of a development's environmental performance and will help us identify whether a proposal is genuinely 'sustainable development'.

1.12 The Framework seeks the delivery of quality homes, and high quality design that goes beyond aesthetic considerations. The Government's commitment to wider climate change objectives is stated in chapter 10, which includes the need to reduce carbon dioxide emissions, increase the delivery of renewable and low-carbon energy and minimise the adverse impacts of climate change and manage flood risks. Chapter 11 recognises the need to conserve and enhance the natural and local environment, requiring impacts on biodiversity to be minimised and where possible, gains to be made. In response to this the Council has produced a local guide on Biodiversity and Planning in Epsom & Ewell.

National Planning Practice Guidance:

1.13 This national guidance sets out how the Government's planning policies are expected to be applied. For example it contains a chapter on Flood Risk, setting out (amongst many other things) how Flood Risk Assessments should be prepared. The NPPG is updated on a regular basis.

Other influences on Planning Policy

Housing Standards Review:

1.14 Planning policy has been influenced by the 2012 Housing Standards Review, which involved a thorough assessment of the building regulations framework and voluntary housing standards (including the Code for Sustainable Homes). In order to simplify the system the Government has withdrawn the Code for Sustainable Homes and created some new 'optional' Building Regulations for water consumption and access. This has been reflected in our Development Management Policies Document, which requires the 'optional' higher standards. The Government has stated that it does not intend to proceed with the 2016 zero carbon homes target but will keep energy efficiency standards under review, "recognising that existing measures to increase energy efficiency of new buildings should be allowed time to become established." The energy efficiency requirements are set out in Part L of the Building Regulations. Our Sustainable Design Guidance reflects these changes to national legislation.

Surrey Climate Change Strategy:

1.15 The Council is committed to addressing climate change and has demonstrated this through signing up to the Surrey Climate Change Strategy. This partnership seeks to establish a consistent approach across the 11 Surrey Boroughs. It has a wide ranging agenda addressing issues such as improving the energy efficiency of homes, improving supply chains for local renewable resources and highlighting the importance of sustainability in schools.

2. Using the Sustainable Design Guidance

2.1 Sustainable design is an integral part of achieving truly sustainable development and the Council will seek to ensure that it is a consideration throughout the planning process.

2.2 Our Core Strategy Policy CS6 requires that proposals for development shall result in a sustainable environment and reduce, or have a neutral impact upon, pollution and climate change. Proposals shall demonstrate how they achieve this by providing information on the following areas:

- Minimising the Energy Requirements of Construction
- Waste Management
- Air Quality, Noise and Light Pollution
- Managing Water (water consumption, quality and reducing flood risk)

2.3 This Guidance sets out what information applicants must provide under these separate chapter headings, with specific requirements set out at the start of each chapter. Information to support most development proposals should be provided in the form of a Sustainability Statement.

2.4 This Guidance also contains a chapter on Energy (chapter 7). However, due to government policy requiring development to meet the standards set out in part L "Conservation of fuel and power' of the Building Regulations, information relating to energy is not included in the Sustainability Statement.

To demonstrate compliance with Core Strategy Policy CS6 and to enable the Council to establish whether a proposal constitutes 'sustainable development', all minor[2] and major[3] development proposals are required to be accompanied by a Sustainability Statement or appropriate BREEAM[4] Assessment (see BREEAM section on page 10).

The level of detail contained within the Sustainability Statement should be proportionate to the scale of the development and its potential impact.

Applicants for householder developments are encouraged to consider how they can make their development proposals more sustainable (see Householder application section on page 11).

2.5 Applicants are encouraged to enter into pre-application discussions with the Council, particularly those proposing major schemes, which will help identify the level of detail required in the sustainability statement and whether any additional supporting studies are needed.

2.6 The Council will use the information contained in the Sustainability Statement to assess whether the proposal meets the requirements of CS6. Should the Statement

[2] Minor development is defined as residential: 1 to 9 dwellings / under 5ha, office / light industrial / general industrial / retail: up to 999sqm / under 1ha

[3] Major development is defined as residential: 10 dwellings & over / 5 ha & over, office / light industrial / general industrial / retail: 1000sqm+ / 1 ha+

[4] This is the Building Research Establishment Environmental Assessment Method, an established environmental assessment method and rating system for buildings.

demonstrate that the proposal does not constitute ‘sustainable development’ we will use the information in seeking to negotiate the mitigation necessary to achieve compliance with Core Strategy Policy CS6. Failing that the outputs from the Statement will form the basis for refusing the application.

2.7 Proposals for non-residential development, such as commercial or community uses (for example schools or other education facilities) will be encouraged to submit an appropriate BREEAM assessment. This will help an applicant demonstrate how they are meeting the requirements of Core Strategy Policy CS6 and also aid the subsequent stages of the development process, when the Building Regulations come into consideration.

2.8 The matrix below provides a brief summary as to what information is likely to be required as part of the sustainability statement for a minor or major development proposal. Further details on the requirements are set out under each section of the SPD.

Section in SPD	**Requirements for minor[5] or major[6] development proposals**
3) Minimising the energy requirements of construction	Applicants will need to demonstrate how energy use will be minimised during the construction process (not how the development itself will perform in energy terms).
4) Waste management	Applicants will need to provide details as to how the proposal performs in relation to construction waste, and where applicable, householder recycling and on-site composting facilities
5) Air quality, noise and light pollution	The Sustainability Statement should identify potential air quality, noise and light pollution issues related to the proposal and set out how they are to be addressed.
Air quality	*Major Development:* An Air Quality Impact Assessment is required. *Minor Development:* If development is located within a designated Air Quality Management Area an Air Quality Impact Assessment may be required in support of an application.
Noise	An acoustic study may be required to support an application if the proposal will generate noise with the potential to cause nuisance or harm or if it is located in proximity to such sources of noise.
Light	A report setting out lighting isochrome details may be required if a proposal will generate a significant source of light.

[5] Minor development is defined as residential: 1 to 9 dwellings / under 5ha, office / light industrial / general industrial / retail: up to 999sqm / under 1ha
[6] Major development is defined as residential: 10 dwellings & over / 5 ha & over, office / light industrial / general industrial / retail: 1000sqm+ / 1 ha+

Section in SPD	Requirements for minor or major development
6) Water consumption, quality and reducing flood risk	The Sustainability Statement should provide information on the following categories, where relevant:
Sustainable Drainage Systems (SuDS)	*Major Development:* Applicants will need to demonstrate how SuDS will be incorporated into the proposal site in perpetuity – such information to be referred to Surrey County Council as the Lead Local Flood Authority. *Minor Development:* All applicants are required to consider the feasibility of SuDS at the design stage of a scheme. The incorporation of SuDS is required if the development is located within an area of surface water flood risk.
Water quality	*Major Development:* Applicants will need to demonstrate that the proposal will not create unacceptable pollution risks to water quality or allow existing risks to continue, particularly if located in a Source Protection Zone. *Minor Development:* If development is located in a Source Protection Zone[7] applicants will need to demonstrate that the proposal will not create unacceptable pollution risks to water or allow existing risks to continue.
Fluvial flood risk	If the site is over 1 hectare in size or located within Flood Zones[8] 2 or 3 a Flood Risk Assessment is Required.
Surface water flooding	If the proposal will increase the built footprint it should be demonstrated that it will not increase the site's risk of or from flooding (e.g. through SuDS).

[7] These seek to protect groundwater sources such as wells, boreholes and springs used for public drinking water supply. These Zones are defined by the Environment Agency. Further information can be found on their website.

[8] These refer to the probability of river and sea flooding. Areas defined as Flood Zone 1 have a low probability of flooding. Areas defined as Zone 2 have a medium probability. Zone 3a is defined as having a high probability, whilst Zone 3b is the functional floodplain, where water has to flow or be stored in times of flood. Further information can be found in the (national) Planning Practice Guidance.

BREEAM

2.9 For non-domestic buildings the Building Research Establishment Environmental Assessment Method (BREEAM) standards can be used to assess the environmental performance of buildings. BREEAM has become one of the most comprehensive and widely recognised measures of a building's environmental performance.

2.10 A BREEAM assessment uses recognised measures of performance, which are set against established benchmarks, to evaluate a building's specification, design, construction and use. The measures used represent a broad range of categories and criteria from energy to ecology. They include aspects related to energy and water use, the internal environment (health and well-being), pollution, transport, materials, waste, ecology and management processes.

2.11 A Certificated BREEAM assessment can be provided by licensed organisations, using assessors trained under a UKAS accredited competent person scheme, at various stages in a buildings life cycle. BREEAM addresses wide-ranging environmental and sustainability issues and can be used by those making a planning application to demonstrate to the Borough Council how their development proposal meets the criteria for sustainable development set out under Core Strategy Policy CS6.

2.12 A BREEAM assessment is a two-stage process. The first part of the assessment is undertaken during the design stage, to indicate the likely score for the scheme. The second stage is undertaken post-construction, and reviews the design stage assessment to ensure all the specified issues have been implemented. If the required standard has not been achieved at the construction stage, measures should be undertaken retrospectively to increase the BREEAM score until it meets the required standard. More information can be accessed from the BRE's website at www.breeam.org

2.13 BREEAM 'Very Good' is currently secured through planning conditions. The conditions can only be fully discharged when a post-construction certificate is provided, although partial discharge of conditions may be possible with a design stage assessment.

The Council recommends that developers pursuing a non-residential or commercial scheme use the BREEAM assessment methodology to demonstrate the sustainable design performance of their proposal and how it meets the criteria for sustainable development set out under Core Strategy Policy CS6.

Householder Development

While householder applications are not required to be supported by a Sustainability Statement, the Council strongly encourages the consideration of how sustainability principles can be incorporated into a proposal, particularly those elements which are not covered in detail by national policy or building regulations.

These suggestions can help make a proposal more environmentally friendly and could help the occupiers save on utility bills. Key sustainability elements worth considering include:

- **Sustainable drainage systems (SuDS)** – incorporating such measures can help reduce the risk to and from flooding. This is particularly important if the development is located within an area identified as being at risk from surface water flooding[9]. Examples include, green roofs, permeable paving and water butts which can also help reduce water consumption. Larger schemes may wish to consider rainwater harvesting and greywater recycling which can significantly decrease water bills if the property is on a water meter (further information is provided in chapter 6).

- **Incorporating renewables** – new development can be an opportunity to install renewable technologies, such as solar panels, which as well as being environmentally friendly can significantly reduce energy bills (further information is provided in chapter 7)

- **Energy and water efficient white goods** – such as low flow taps, showers and water efficient white goods. These may help provide savings to utility bills.

- **Waste facilities (composting)** - while the provision of well-designed refuse and recycling facilities are required by planning policy, composting facilities can help reduce the amount of waste sent to landfill and provides an excellent resource for the garden (further information is provided in chapter 4).

- **Minimising energy requirements of and waste arising from construction** – consider using recycled materials where possible or those with 'low embodied energy' such as timber. Sourcing materials locally is also more environmentally friendly (further information is provided in chapter 3).

[9] Further information on this source of flood risk can be found within the Borough Council's Surface Water Management Plan and on the Environment Agency's website.

3. Minimising the energy requirements of construction

REQUIREMENTS

As part of the Sustainability Statement developers shall demonstrate how they have sought to minimise energy within their construction process. This will include details of how embodied energy costs within materials have been reduced. Reference should be made to how recycled, reclaimed, sustainable and locally sourced materials will be used.

Where an applicant is unable to demonstrate that they have sought to minimise energy within their development, a clear statement setting out the reason why not must be submitted as part of the application. If viability is cited as a reason, a financial open-book assessment will be required as supporting evidence.

3.1 All materials have an embodied energy cost. For example, a clay brick will have costs associated with extracting the raw material from the earth, which is then coupled with a manufacturing cost and finally a transportation cost. Some relatively cheap materials, such as Chinese slate, will have significant embodied energy costs generated by extraction and transportation.

3.2 There are a number of relatively simple measures that developers and homeowners can take that effectively reduce the energy requirements of construction, not only benefiting the environment but also saving them money and in some cases supporting the local economy.

Recycling of materials

3.3 In Epsom & Ewell the availability of greenfield development land is heavily constrained by the Green Belt and other policy designations, and consequently most future developments will be on sites within the existing urban area. Many of these development opportunities will be on brownfield sites. Ideally, we believe that new developments should consider the potential re-use/ conversion of any existing buildings that may be on-site. This significantly reduces the need to bring new materials into the Borough. Reuse of existing structures can, in some circumstances, also reduce the cost of the development.

3.4 Where the re-use of existing buildings is not an option, the developer should explore the potential to recycle or reclaim on-site materials as part of the development. This is particularly relevant where a historic building is involved. The Council's Conservation Officer is available to provide guidance to developers or homeowners who are considering this approach. If it is not possible to recycle on-site materials as part the development proposal, we strongly recommend that developers consider the re-sale value of these materials as part of their waste management strategy (see Section 4).

3.5 Alternatively, developers and homeowners should consider optimising the use of reclaimed or recycled materials where appropriate. This approach is present in countless historic buildings, is inherently sustainable and can benefit the visual character and appearance of the proposal. This may be particularly beneficial for developments within or adjoining the Borough's numerous conservation areas. However, over-specification of reclaimed materials can sometimes result in the unnecessary stripping of traditional buildings and so a cautionary approach is recommended when sourcing such materials. Examples of potential materials include:

Reclaimed

- Re-used timber sections or floorboards
- Bricks – cleaned up and reused
- Re-used glass panels or windows

Recycled

- Panel products with chipped recycled timber
- Crushed concrete or bricks for hardcore
- Crushed glass recycled as sand or cement replacement

Maximise the use of materials with a low embodied energy

3.6 This is the amount of energy required to extract, make and transport a product. For example, products which have long manufacturing processes, such as plastics and silicon, have high-embodied energy because they use up fuel and other resources. These materials also tend to be less bio-degradable, having a significant cost implication for the waste management stage of the development (see Section 4).

3.7 In contrast timber, which in some cases only needs sawing before it is ready for use, has low embodied energy. Timber window frames are strongly encouraged over uPVC and aluminium. Equally the use of timber building frames is also encouraged where appropriate. Notably, timber products and waste are significantly easier to re-use, reclaim or recycle. There are a number of publications, such as the Green Building Bible, that suggest alternatives to other high embodied energy materials such as cement.

Locally sourced materials

3.8 Materials extracted, or manufactured locally (within Surrey or the South East) have significantly less embodied energy than those imported from overseas. Their use can help to make a development proposal more viable and contribute to local economic vitality and viability. Use of local materials can serve to visually enhance the character and appearance of a development – particularly if it is located within or close to one of the Borough's Conservation Areas.

Use materials efficiently

3.9 We believe that it is common sense that developers and homeowners should seek to minimise the volume of materials used in a development project. We suggest that developments are planned and monitored carefully in order to avoid waste. This can be achieved through measures that utilise whole units of construction materials.

3.10 We also recommend that where materials are being stored on-site, they are maintained in a way that minimises losses to damage caused by rain and damp. Ultimately the efficient use of materials will help reduce the cost of development – both in cost of materials and in removal of waste off-site.

4. Waste management

REQUIREMENTS

For all development proposals the Sustainability Statement shall demonstrate how the scheme performs in relation to construction waste, and where appropriate, householder recycling and on-site composting facilities.

Details of how construction waste will managed in terms of the waste hierarchy (i.e. minimised, sorted, reused and recycled) should be provided. If the construction process involves the disposal of hazardous waste, then the Council will require details of how this operation will be carried out.

Where appropriate, the statement will specify how householder recycling will be collected and how it will fit with the Council's existing recycling collection service. Details as to what on-site composting facilities will be provided need to be set out.

4.1 Most development proposals, whether they are the subject of a planning application or fall under householder permitted developments rights, will produce waste in one form or another. This could include the packaging used to transport materials onto the site (such as brick pallets or cement bags), right through to building rubble and spoil.

4.2 In order to reduce the generation of waste our Core Strategy requires that developments apply the waste hierarchy – **Reduce-Reuse-Recycle-Recover and Dispose.** This approach must be applied to all stages of the development process; particularly during site preparation, construction and final operation in order to sustainably manage waste generated by development.

What is meant by the Waste Hierarchy?

4.3 The waste hierarchy encourages more efficient management of construction materials in order to reduce the amount of waste produced during the development process. It also provides an opportunity to recover value from the waste materials that are produced during construction. Thereby reducing the amount of waste being disposed of through landfill or incineration. It acknowledged that it may not be possible to apply it in totality because there are many complex factors that influence the optimal management for any given waste material. However, as a positive guide that firstly encourages the prevention of waste, followed by the reuse and refurbishment of goods, then value recovery through recycling and composting.

4.4 The following diagram illustrates how the waste hierarchy should work with the most desirable waste management solutions being at the top and the least favoured options at the bottom. The most desirable approach is to actively prevent the generation of waste in the first place – the least favoured option requires the disposal of all waste generated by development proposals, either through incineration or land-fill. These are the least sustainable solutions to waste and have the greatest long term impact upon the Borough. Recent research demonstrates that the prevention and minimisation of waste from the outset of the development process saves money - it makes sense for householders and businesses to adopt the waste hierarchy.

Figure 1: The Waste Hierarchy

Avoidance: means measures taken before a substance, material or product has become waste, that reduce:

(a) the quantity of waste, including through the re-use of products or the extension of the life span of products;

(b) the adverse impacts of the generated waste on the environment and human health; or

(c) the content of harmful substances in materials and products;

Reduction: involves efforts to minimise resource and energy use during the construction or manufacture stages. For the same output, usually the fewer materials are used, the less waste is produced. It is worth noting that in the United Kingdom, construction and demolition are the highest sources of waste.

Re-use: means any operation by which products or components that are not waste are used again for the same purpose for which they were conceived. Preparing for re-use means checking, cleaning or repairing recovery operations, by which products or components of products that have become waste are prepared so that they can be re-used without any other pre-processing.

Recycling: means any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery.

Recovery: means any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy.

Disposal: means any operation which is not recovery even where the operation has as a secondary consequence by the reclamation of substances or energy.

4.5 The Waste (England and Wales) Regulations 2011 formally sets out the requirements for the waste hierarchy. It gives top priority to preventing waste in the first place. When waste is created, it gives priority to preparing it for re-use, then recycling, then other recovery such as energy recovery, and last of all disposal (for example landfill).

4.6 Regulation 12 of the Waste (England and Wales) Regulations 2011 says that businesses that import or produce, collect, transport, recover or dispose of waste, or who operate as dealers and brokers, must take all reasonable measures to apply the waste hierarchy when the waste is transferred off-site.

4.7 Those developers that have or required to hold an environmental permit for an operation that generates waste will have to comply with a permit condition concerning the application of the waste hierarchy.

4.8 The Regulation 12 hierarchy duty came into force from **28 September 2011**, six months after commencement of the regulations. The Department of Environment Fisheries and Rural Affairs (DEFRA) has produced guidance in England on applying the hierarchy which can be accessed via the following link.

How do I demonstrate that I have followed the waste hierarchy?

4.9 Advice on this is provided within Government guidance and various best practice guides for industry sectors. It is best practice to consider the most appropriate management option for any waste produced during the development process and to record in some way any advice received and decisions taken in relation to the waste.

4.10 Developers holding an environmental permit which has the new hierarchy condition should be able to demonstrate that they have taken the hierarchy guidance into consideration when deciding how to minimise and manage the waste produced. Under those circumstances we will not require detailed written justification of the decisions made but those decisions must be reasonable.

4.11 Transfer notes and, for hazardous waste, consignment notes, should contain a declaration that the waste hierarchy has been considered in deciding the most appropriate waste management option for that waste.

Where do I go if I have no choice but to dispose of the waste?

4.12 Disposal of construction waste is the least sustainable and ultimately the most costly way of dealing with this issue. Those responsible for project managing a development, whether it is a household extension or a new housing development, should actively plan for the prevention, minimisation, reduction or recycling of waste materials before work commences on-site. By doing so there will be considerable cost saving to the developer.

4.13 Nevertheless, there will be situations when disposal of waste materials is the only option and details of the Borough's Civic Amenity Site can be accessed from www.surreywaste.co.uk

Providing recycling facilities within new developments

4.14 Whilst there are statutory requirements with regards to provision for waste and recycling, there are additional measures that can be taken to ensure that the development has a negligible impact on the environment. Provision for the storage, collection and recycling of waste needs to be an integral part of any design for a new development since it is fundamental in its operation.

4.15 Internal and external storage areas, designated for recycling purposes, should be integrated into a development.

4.16 The Council has produced detailed guidance on the storage and collection of household waste to clearly set out the access requirements for the Borough's refuse collection fleet and the types and size of refuse and recycling storage containers that will need to be provided. A copy of this guidance is included in annex 2.

4.17 For commercial developments, space should be allowed for the collection and storage of bulk material for recycling.

Useful links

4.18 The Waste and Resource Action Programme WRAP website contains useful information including case studies and good practice guidance for the construction industry.

4.19 The revised European Waste Framework Directive introduces a changed hierarchy of options for managing wastes. It gives top priority to preventing waste in the first place. When waste is created, it gives priority to preparing it for re-use, then recycling, then other recovery such as energy recovery, and last of all disposal.

5. Air Quality, Noise and Light Pollution

REQUIREMENTS

The Sustainability Statement should identify potential air quality, noise and light pollution issues related to the proposal and set out how they are to be addressed. Further detailed studies may be required to support an application as set out below:

Air Quality

All major development proposals are required to be accompanied by an Air Quality Impact Assessment, particularly where the location, proposed use, building design and number of vehicle trips generated has a potential air quality impact. The AQIS should feature an assessment of pollutants generated by the development itself (such as the use of diesel boilers or Combined Heat and Power) as well as associated emissions from road traffic directly and indirectly generated from the development.

Should a development (of any size / type) be located in an identified Air Quality Management Area (AQMA) then an AQIS may be required.

Noise

An acoustic study will be required from development proposals / new uses that will generate noise with the potential to cause nuisance / harm, or are located in proximity to sources of significant noise. Examples of the former could include proposals for large retail uses located in proximity to residential properties, and the latter, proposals in proximity to a railway line. Residential developments in the town centres should be designed to comply with the standards in BS8233.

Light

Where appropriate, applicants will be required to submit a report setting out lighting isochrome details; specifically mapping lighting contours and lux levels emanating from source.

Air Quality

5.1 All local authorities have a responsibility to review and assess the current and likely future air quality within their borough from time to time. Air quality is assessed against objectives for various pollutants which are set out in the National Air Quality Strategy. These objectives are based on scientific and medical evidence on the effects of each pollutant on human health.

5.2 Where a local authority identifies that an air quality objective for a particular pollutant is being or may be exceeded in a particular area where there is relevant public exposure, they must declare an air quality management area. Details of the Council's role can be found on our website.

5.3 The impact on air quality from small developments can be difficult to quantify, as it may only be negligible. However, the cumulative impact of smaller schemes can contribute to worsening air quality, so the Council will seek to secure mitigation measures such as travel plans for these schemes. This is particularly relevant in

those locations where the Council has identified an Air Quality Management Area (AQMA) or is currently monitoring air quality.

5.4 For major developments which are likely to impact upon air quality, an Air Quality Impact Assessment (AQIA) will be required. However an AQIA may be required for smaller schemes (which do not require an Environmental Impact Assessment) and advice should therefore be sought from the Council's Development Management Team as to whether an AQIA would be required with a particular application. For large schemes, a package of mitigation measures will be required, which could include travel plans, site specific design measures and air quality monitoring equipment.

5.5 Within some urban locations, especially AQMAs, building design can impact upon air quality. In particular, taller buildings that contribute to an existing 'canyon effect', where road and street networks are enclosed by surrounding tall buildings, which can hinder air circulation and trap vehicle produced particulates. In such locations, the Council will seek to negotiate with developers to ensure that the design of new buildings has at worst a neutral impact upon existing air quality.

5.6 The Council's Development Management team work closely with the Council's Environmental Health service to ensure that the appropriate measures are secured to mitigate the impacts of development on air quality.

Noise

5.7 Under Section 79 of the Environmental Protection Act 1990, local authorities have a duty to take reasonably practicable steps to investigate complaints of statutory nuisance, including: "Noise emitted from premises so as to be prejudicial to health or a nuisance."

5.8 Minimising the adverse impacts of noise is a significant issue for the Borough Council. This is because most new development takes place within the existing urban area. This is particularly relevant in locations where there are a combination of different uses, such as residential accommodation, retail, employment and leisure uses. Recent developments in Epsom Town Centre provide good examples of how of how this issue could be considered.

5.9 In that respect applicants are encouraged to enter into pre-application discussions with the Council to identify whether acoustic studies are required to support a proposal. The Council's Development Management team will work closely with the Environmental Health service to ensure that the impact/potential impact of noise pollution is mitigated.

Light

5.10 Artificial light from premises can have a detrimental impact on the quality of the local environment. Under Section 79 of the Environmental Protection Act 1990, local authorities have a duty to take reasonably practicable steps to investigate complaints of statutory nuisance, including: “Artificial light emitted from premises so as to be prejudicial to health or a nuisance.”

5.11 Developers are advised to refer to the environmental zones for exterior lighting control contained within International Commission on Illumination Publication No. 150:2003 Guide on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting Installations. It is recommended that developments be designed in accordance with the zones in which they are proposed as well as the appropriate standards (such as the British Standard on Illumination of Sports Grounds)

Common sources of artificial light nuisance include:

- domestic security lights
- industrial and commercial security lights
- sports lighting
- car parks
- commercial advertising

6. Managing water

REQUIREMENTS:

The Sustainability Statement should provide information on the following categories where relevant:

Sustainable Drainage Systems – SuDS

All development proposals are required to consider the feasibility of SuDS being incorporated into the scheme at the design stage and where appropriate incorporate SuDS into the development.

Major development proposals (10 or more dwellings or over 1000 sq m of floorspace) are required to demonstrate how sustainable drainage systems (SuDS) will be incorporated into the site in perpetuity. This information will be passed to Surrey County Council who as the Lead Local Flood Authority for this area is a statutory consultee.

Proposals for developments falling within an area of surface water flood risk (as identified on the Environment Agency's[10] "Risk of Flooding from Surface Water" maps, available via the EA website) must consider whether the layout of the scheme could be modified to better respect the natural drainage routes; and if SuDS could be incorporated into the development to reduce / mitigate the impact of the development.

Surface water flooding

New development that increases the built footprint on site, that fall within an area at risk of surface water flooding (as identified on the Environment Agency's "Risk of Flooding from Surface Water" maps, available via the EA website) must demonstrate that it will not increase the site's risk of or from flooding. This could be achievable through introducing Sustainable Drainage Systems on the site to ensure the run-off rate is not increased.

Fluvial Flooding

Any development proposed within Flood Zones 2 or 3 (as identified on the Environment Agency's "Flood Map for Planning (River and Sea)", available via the EA website) or over 1 hectare in size within Flood Zone 1 must prepare a site specific Flood Risk Assessment.

Water consumption

All residential developments are required to meet the tighter Building Regulations optional requirement of 110 litres per person per day. This will be included as a condition in any planning permission for a new dwelling/s.

Water quality

Applicants must show that their proposal will not create unacceptable pollution risks to the water or allow existing risks to continue.

Major development proposals and other development proposals falling within the identified SPZs (as set out on the Council's GIS mapping service) should be supported by documentation that clearly and concisely sets out the type of measures that will be incorporated into the proposal to ensure that there are no adverse impacts on water quality – both during the construction stage and the life of the development.

[10] The Council will consult the Environment Agency on planning applications, where appropriate. Details of when the Environment Agency will be consulted can be found in the External Planning Consultation List. Developers may seek a preliminary opinion from the Environment Agency.

Sustainable Drainage Systems (SuDS)

6.1 SuDS are an alternative to conventional means of managing surface water. They aim to mimic the way rainfall drains in natural systems. The prime function of SuDS, as with conventional drainage, is to provide effective flood risk protection over the long term both within and downstream of the development. However, SuDS approaches can bring wider benefits too; including

- adding amenity for the community,
- benefits to local biodiversity,
- treating the quality of surface water run-off
- reducing water consumption
- minimising the unnecessary loss of water to the mains drainage system
- reduce the likelihood of damaging and potentially polluting surface water floods

Therefore the Council encourages that SuDS be integrated into development wherever possible.

From April 2015 all major planning applications are required to demonstrate how sustainable drainage system (SuDS) will be implemented within their scheme in perpetuity. Surrey County Council is the Lead Local Flood Authority for this area and is therefore a statutory consultee on such applications.

SuDS that are potentially suitable in the Borough include:

Detention Basins
These are surface water storage areas that provide flow control and reduction through attenuation. They are normally dry and could be used for alternative purposes for much of the time (e.g. car parks recreational facilities)

Ponds and Wetlands
These are designed to be areas of permanent standing water which can provide attenuation of flows, and a certain degree of treatment. In doing this they can also provide ecological, aesthetic and amenity benefits.

Swales
Linear vegetated drainage features which can store and convey water. As part of a management train they can pass water from one storage area to the next and provide infiltration where suitable. Swales can be designed to be permanently wet or generally dry and are often located next to roads, car parks or open spaces.

Porous or Permeable Pavements
Suitable for pedestrian and vehicular traffic and allow rainwater to infiltrate through the surface where it can be temporarily stored, reused, or released into the drainage system. Construction can use porous material which permits infiltration across the entire surface or material which is impervious to water but which is laid with void spaces to permit infiltration.

Soakaways
These are filled excavations which store runoff from single properties or larger developments and roads and allow infiltration into the surrounding soil. They only work in freely draining soils.

Water butts

Approximately 13% of domestic water consumption is via external taps mainly for watering the garden or cleaning cars. A water butt is the simplest solution. These can be used to collect the rainwater that falls directly onto the roof of a building by connecting it to a downpipe and collecting rainwater from the gutters. If you are using a downpipe, you will also need an overflow pipe or a rain diverter to redirect water into the butt. Once it's full, water flows down the drainpipe. A gutter filter will also keep out unwanted debris.

Large plastic water butts can sometimes be unsightly and ideally should not be visible from the public realm, especially in Conservation Areas.

Rainwater Harvesting

Rainwater harvesting is the collection of water directly from the surface it falls on. This water would otherwise have gone directly into the drainage system or be lost through evaporation and transpiration. Once collected and stored it can be used for non-potable purposes. These include toilet flushing, garden watering and clothes washing using a washing machine.

Benefits

- Rainwater harvesting reduces the dependence of a household on the mains water supply by up to 50%
- For customers with water meters, water bills may also be reduced.
- Less water is taken from lakes, rivers and aquifers, and more is left to benefit ecosystems
- Potential reduction in risk of surface water flooding due to less rainwater being discharged to drains and sewers

Figure 2: Rainwater harvesting

Green Roofs

6.2 Green roofs are roof areas that are intentionally covered in vegetation. These are an increasingly common feature on buildings. There are three main types of green roofs:

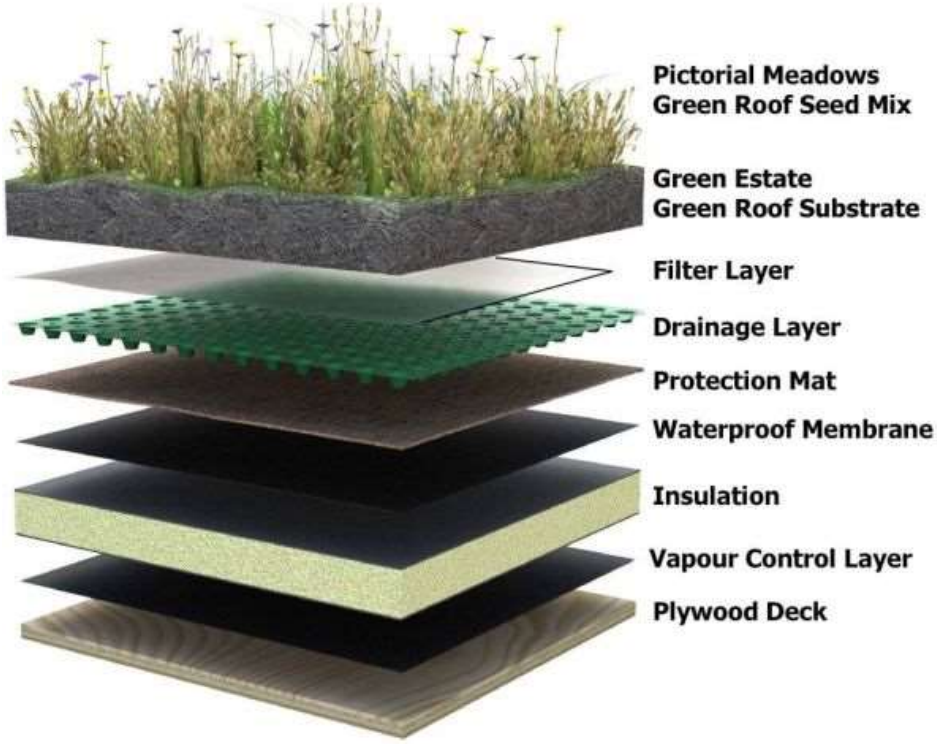
1. ***Extensive*** green roofs are composed of lightweight layers of draining materials, supporting low- growing, hardy plant species. The depth of the substrate is usually around 6-20cm. This is the lightweight option particularly used where weight is a design issue. It requires little maintenance.
2. ***Intensive*** green roofs have deeper substrate of up to 40cm, and can support a range of vegetation types including plants and trees. They are heavier as a result and require more maintenance than extensive roofs
3. ***Semi- intensive*** green roofs consist of a slightly deeper layer of growing materials than extensive roofs allowing different varieties of plants to grow. These roofs are not suitable for recreational use.

6.3 Retrofitting green roofs is feasible on many buildings providing spare load capacity is available. Extensive as well as intensive roofs can be retrofitted whether supported by wood steel or concrete. Although the capital cost of retrofitting a green roof will typically be greater than simply replacing a traditional flat roof, the whole life costs of the green roof may well be less and could be considered if the existing roof is in need of replacement.

Benefits:

- Surface water source control
- Improved durability of the roof
- Aesthetic and amenity value
- Enhanced biodiversity
- Promotion of evaporative cooling and reduction of urban heat island effect

Figure 3: Cross Section of a Green Roof



(Source: www.environmentaltopics.net)

Wilberforce Court (student accommodation) in Epsom has an extensive green roof.

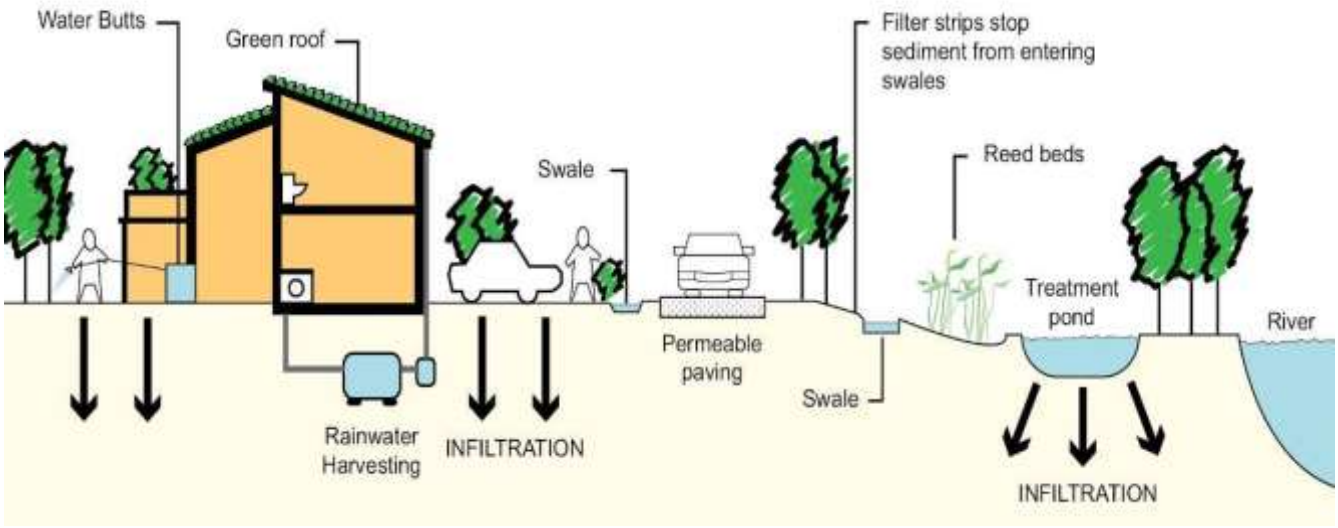
Figure 4: Image of the Wilberforce Court green roof

6.4 Before you decide to install a green roof you are advised to contact Building Control first. They will be able to advise you on a number of issues before starting including;

- Possible increase in weight to the roof
- Insulation levels
- Minimising the potential risk of fire
- Protecting from damp
- The provision of safe maintenance access to the roof.

Some of these issues may affect the type of green roof you install, so it's always wise to check first.

Figure 5: Diagram of potential SuDS schemes



Local SuDS Suitability Map and advice

6.5 A SuDS Suitability map and local advice has been produced as part of the Council's Surface Water Management Plan (SWMP). This shows the type of sustainable drainage techniques suitable in the different geological areas of the borough. The geology of the borough is made up of chalk, London clay, Lambeth group and Thanet sands. Chalk allows for infiltration whereas the bedrock in the other areas may not be suitable for infiltration techniques. This map, provides useful advice on appropriate local SuDS and a summary of individual measures to improve surface water management in the Borough can be found in Annex 3.

6.6 Many of the SUDS measures such as swales, ponds and basins can be incorporated into the design and landscaping of a development. They have additional benefits of enhancing biodiversity and enhancing the appearance and setting of a development if properly designed into the development in an appropriate location. Some of these measures require large areas of land, and may not be appropriate in high density developments. Therefore it is important that permeable hard surfacing and roofs/ walls are considered on the higher density development sites to address the cumulative effect of these types of developments on off-site water discharge.

6.7 Existing and new SUDS and road drainage should be properly maintained to ensure their continued effectiveness.

Case Study: Bristol Business Park, Bristol

6.8 This is a commercial development located to the northeast of Bristol, which has been developed over a number of phases since 1993. The final three phases of development have incorporated a series of SUDS measures that seek to mitigate surface water flood risk to the neighbouring village of Hambrook. Initial SUDS measures included traditional features such as ditches and ponds. More innovative approaches were introduced during the later stages of the site's development. These included extensive areas of permeable paving, and swales and a detention pond. Further information can be found at the following link.

6.9 Further information, guidance and case studies on SuDS can be found on the Susdrain website.

Reducing flood risk

6.10 The Council has produced a Strategic Flood Risk Assessment (SFRA) and a Surface Water Management Plan (SWMP). These identify the different types of flood risk present in the Borough and how this should be considered when proposing development.

Strategic Flood Risk Assessment (SFRA)

6.11 The SFRA delineates the borough into zones of low, medium and high probability of fluvial flooding. The delineation is based largely upon existing available information provided by the Environment Agency.

6.12 Areas of the Borough that fall within flood zones 3b and 3a are the most susceptible to fluvial flooding and development within these areas may only be considered following application of the Sequential Test, and 'more vulnerable' development should be avoided wherever possible. The Environment Agency and DEFRA have produced information and guidance on conducting a sequential test.

6.13 Any development proposed within Flood Zones 2 or 3 or over 1 hectare in size within Flood Zone 1 must prepare a site specific Flood Risk Assessment.

6.14 Since the SFRA was published, the Environment Agency has amended the flood zones for the Borough. The most up to date flood zones can be viewed on the Environment Agency's website. These should be viewed in conjunction with the SFRA.

6.15 The SFRA can be viewed on the Councils website at the following link.

Case Study: Stanmore Place, Harrow

6.16 A high density housing scheme in a suburban neighbourhood that incorporates features such as a large lake and extensive lush planting (as part of the scheme's wider landscaping) to help mitigate flood risk from the adjoining Edgware Brook. These features, have contributed to the overall attractiveness and marketability of the scheme.

Surface Water Management Plan

6.17 Work undertaken in partnership between Epsom and Ewell Borough Council, Surrey County Council, the Environment Agency and Thames Water has identified a significant risk of flooding from surface water runoff within the Borough[11]. The Borough's Surface Water Management Plan recommends that surface water flooding should be managed cumulatively, with each new development and household ensuring they do not contribute further to the risk of flooding in the Borough.

6.18 The SWMP identifies sustainable responses to manage surface water flooding and provides an evidence base upon which future decisions and funding applications can be based. The SWMP identifies the areas particularly at risk of surface water flooding and mitigation measures that should be introduced to alleviate this risk.

[11] Epsom & Ewell Surface Water Management Plan, River Hogsmill Defra Integrated Urban Drainage Pilot and Epsom and Ewell Borough Council Strategic Flood Risk Assessment

6.19 All applications should consider surface water flood risk and show how the proposal will contribute positively towards the reduction of this risk across the borough.

Paving Over Front Gardens - Changes to Permitted Development:

6.20 The combined effect of many homeowners within the Borough paving over their front gardens can increase the amount of surface runoff which adds to the risk of flooding. The additional hard surfaces also increase the amount of pollution (oil, petrol etc.) which can be washed off into the drains and enter the streams and rivers, as well as decreasing the amount of water which can infiltrate naturally to recharge underground aquifers. The cumulative increase in paved surfaces is known as 'urban creep'.

6.21 At a national level, following the summer floods of 2007, urban creep was identified by Sir Michael Pitt in his scrutiny review to Government as '[having] *a significant impact on the natural drainage of surface water, as water that previously soaked into the ground has nowhere to go and can increase the risk of surface water flooding.'* The review also identified that, *'Householders should no longer be able to lay impermeable surfaces as of right on front gardens.'* These findings are in line with the Borough's Surface Water Management Plan (SWMP) and supported by the SWMP partnership of organisations.

6.22 For this reason, permitted development rights that previously allowed householders to pave their front garden with hardstanding without planning permission have been removed. Since 1 October 2008, planning permission is required if more than five square metres of a new or replacement driveway is to be covered with traditional, impermeable materials that do not provide for the water to run to a permeable area.

6.23 The Council is supported by the SWMP Partnership (consisting of the Environment Agency, Thames Water, Surrey County Council and EEBC) in refusing permission for further impermeable front gardens where no provision has been provided to ensure the surfaces will not increase the amount of surface water runoff leaving the site.

6.24 Instead, there are a number of options for a new or replacement driveway to use permeable (or porous) surfacing, or to direct the runoff to a lawn or border to drain naturally. These alternative options will not require planning permission and can be better for the environment, provide attractive parking areas, do not necessarily cost more or require a lot of maintenance. Examples of options, as well as further background information, can be found in the guidance document 'Guidance on the permeable surfacing of front gardens'

Reducing potential water consumption

6.25 The UK's population is growing, and this is placing an increasing demand on the water supply. The demand is forecast to increase further, as climate change leads to warmer temperatures and more periods of drought. Therefore it is important that developments minimise water consumption and maximise water recycling.

6.26 The increased frequency of drought conditions mean that areas like Epsom that are already stretched for water capacity, will be under increasing pressure. The Environment Agency has produced a "Water Stressed Areas – Final Classification" document, which identifies the stress situation for each water company across the UK. The Borough of Epsom & Ewell is served by Thames Water and Sutton & East Surrey Water both for which the stress levels have been identified as "serious".

While all new homes already have to meet the mandatory national standard set out in Building Regulations (of 125 litres per person per day), the Council has adopted the tighter Building Regulations optional requirement of 110 litres per person per day from October 2015. This requirement is set out in Policy DM12 in the Development Management Policies Document.

6.27 The website www.water-efficient-buildings.org.uk provides a valuable source of information about costs and benefits of water efficient new development, as well as advice on the specification and delivery of water-efficient developments.

Water Efficiency Calculator

6.28 The Water Efficiency Calculator for New Dwellings (Water Calculator) is the government's national calculation method for the assessment of water efficiency in new dwellings. The calculator assesses the contribution that each internal water fitting has on whole- house water consumption. The figures are calculated by using the manufacturer's' product details multiplied by an assumed use factor. More information can be found at the following link.

6.29 There is a wide range of water efficiency measures that can be implemented, including:

- Installing flow restrictors to taps
- Installing aerated showers that use less water but increase perceived flow rate
- Low flush/ dual flush WCs
- Taps with water brakes that require additional force to be turned on more than a specific amount
- Low volume baths
- Washing machines and dishwashers with eco settings

6.30 In addition to specifying water efficient fixtures, water consumption can be reduced further by recycling. The recycling measures such as rainwater harvesting, water butts, greywater drainage and SUDS are more economical to install during the construction phase rather than as part of a retro- fitting scheme.

Greywater recycling

6.31 Grey water is waste water from showers, baths, washbasins, washing machines and kitchen sinks. You can collect it from some or all of these sources and, after treatment, use around the home for purposes that do not require drinking water quality such as toilet flushing or garden watering. It is important that contaminants such as soap, salt and grease are removed. A sand filter can be used to reduce the amount of chemicals in the water.

Benefits:

- If used for toilet flushing, a greywater system could potentially save a third of the mains water used in the home.
- For customers with water meters, water bills may also be reduced.
- Less water is taken from lakes, rivers and aquifers, and more is left to benefit ecosystems
- Potential reduction in risk of flooding due to less rainwater being discharged to drains and sewers

Water Quality

6.32 Hard surfaces, such as paved over areas used for car parking or as garden patios can have a harmful impact on water quality. For example from oil and petrol spillages that is washed into the drains then entering streams, rivers and groundwater.

6.33 Groundwater is a valuable resource that provides water for domestic, agricultural and other commercial uses. Both European and national legislation, requires the prevention of groundwater pollution for the public good.

6.34 Locally the groundwater for human consumption is abstracted from the chalk aquifer. The chalk is a 'principal aquifer' capable of storing and transmitting groundwater in commercial quantities. The chalk aquifer is present at the surface in the south and east where groundwater could be affected by development and/or land contamination.

6.35 The Environment Agency has produced some 'standard groundwater protection advice on the discharge of surface water to ground'. This states that where disposal of surface water to the ground is the only option, it should conform to current best practice for designing SuDS to prevent the pollution of groundwater from 'diffuse' sources and ensuring compliance with the objectives of the water Framework Directive.

EA Groundwater protection advice on discharge of surface water

6.36 The Environment Agency has defined Source Protection Zones (SPZs) for numerous groundwater sources used for public drinking water supply. A large proportion of the Borough has been designated as a SPZ with a significant area surrounding Epsom town centre. Further information on SPZs and a map showing where they are located can be found on the Environment Agency's webpage 'Groundwater source protection zones'.

7. Energy

7.1 While there is no requirement for information relating to the energy performance of a building to be contained in the Sustainability Statement, this chapter contains a wealth of information on how energy consumption can be reduced and supplied more sustainably.

7.2 The application of the Energy Hierarchy is a tried and tested approach that reduces the adverse environmental impacts of new development. This approach seeks to minimise the development's energy use before meeting its demand by the cleanest means possible. We recommend this approach.

The Energy Hierarchy

A. Reduce the need for energy – Site layout and orientation of buildings can reduce the energy demand of buildings by capitalising on passive solar gain which utilises the energy from the sun to heat and provide light for certain rooms of a building.

B. Use energy efficiently - There are many measures that you can incorporate that help to save and efficiently use energy. These include thermal efficient glazed windows, draught proofing, insulation, and energy efficient appliances (light fittings etc).

C. Supply energy efficiently - By using existing energy supplies more efficiently greenhouse gas emissions can be significantly reduced (also termed low carbon sources), e.g. distributing waste heat energy via power networks improves the efficiency further still; or using Combined Heat and Power (CHP) networks.

D. Use renewable energy – Developments can incorporate technologies that obtain energy from flows that occur naturally and repeatedly in the environment – such as from the wind (wind turbines), from the sun (Solar PV and Solar Thermal) and from biomass.

A Reduce the need for energy

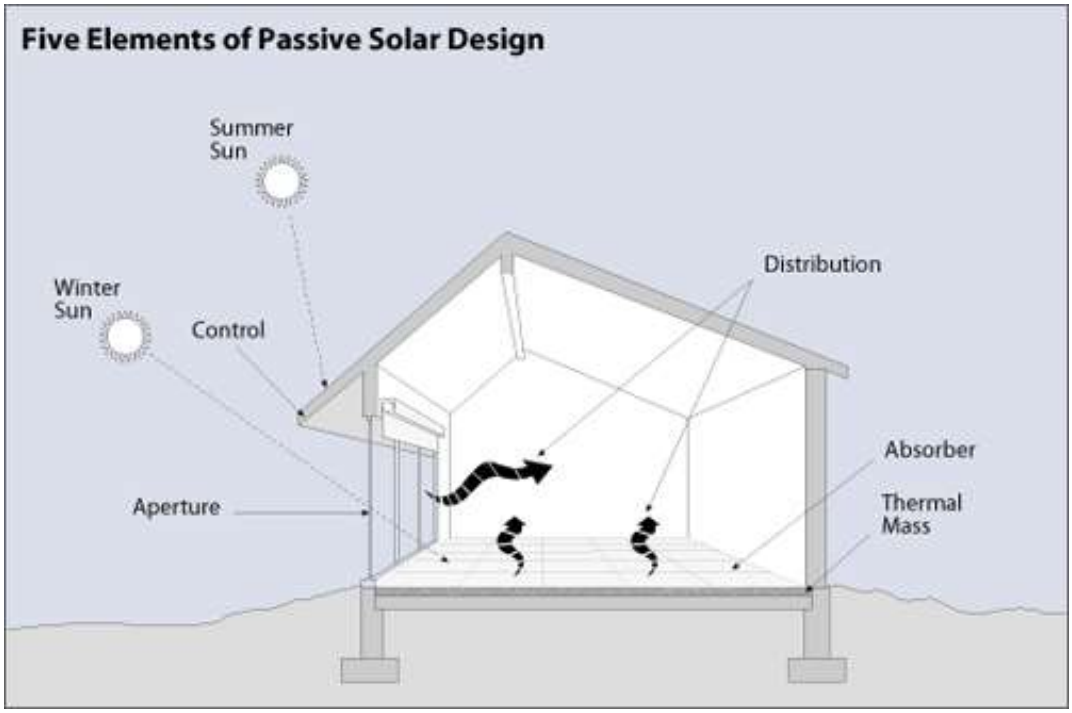
Passive Solar Building Design/ climatic design

7.3 This is the use of the sun's energy for the lighting, heating and cooling of living spaces. The building (or element of the building) takes advantage of natural energy characteristics in materials and air created by exposure to the sun. It is achieved through orientation, layout and glazing. It does not involve the use of mechanical and electrical devices. For domestic buildings this can contribute as much as 15% of the energy required for heating and lighting. By incorporating PSD into new buildings, annual fuel bills can be reduced and CO2 emissions can be reduced.

7.4 In most situations measures to maximise the potential for passive solar heat gain in new developments will be possible within the design of the scheme at no significant extra cost. For example, where appropriate buildings should be compact in shape to reduce their surface area, with windows orientated towards the south to maximise passive solar gain.

The following are important elements of passive solar home design:

Figure 6: Elements of passive solar design



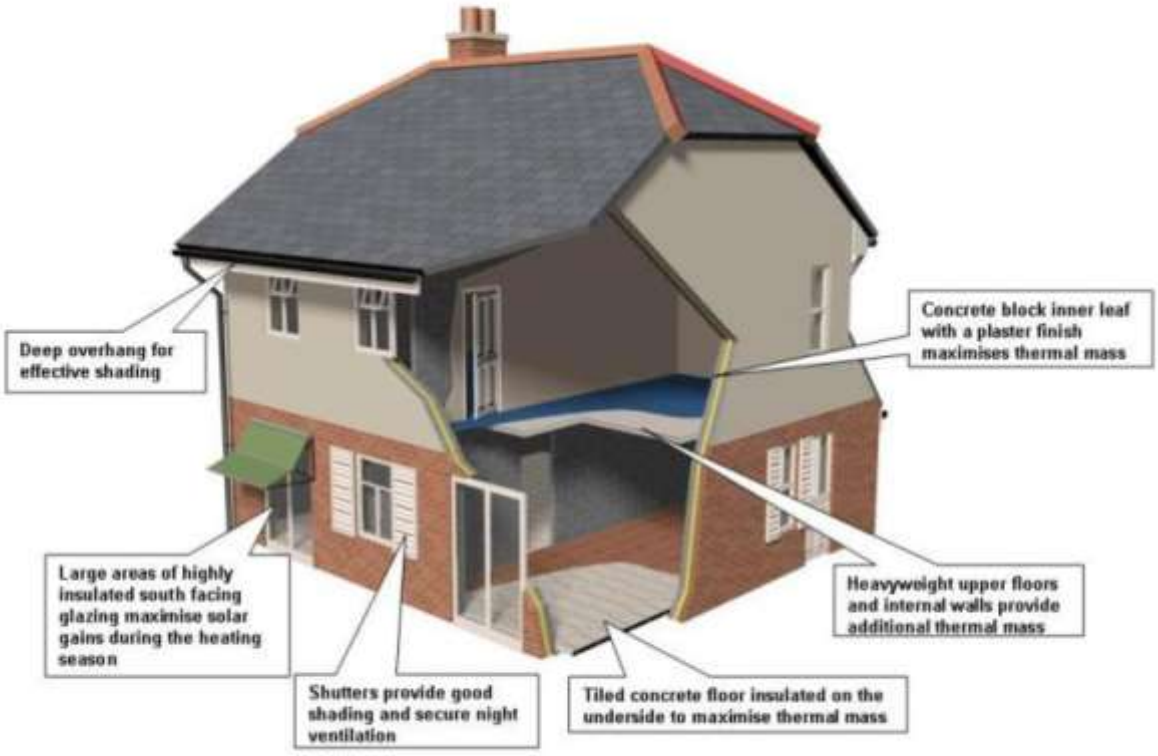
Source: http://www.energysavers.gov/your_home/designing_remodeling/index.cfm/mytopic=10270

Thermal Mass

7.5 A central feature of any building designed to make the most of passive solar energy is high thermal mass. Exposed thermal mass elements have the ability to absorb and store heat, and release heat to the internal spaces of the building. Materials with a high thermal mass absorb heat during the day and release it during the night, helping to regulate the temperature. A high thermal mass construction could be a brick and block wall with a plaster finish. A timber framed wall has a lower thermal mass.

7.6 The diagram below shows examples of how the thermal mass of a building can be exploited all year round.

Figure 7: Exploiting thermal mass on a year-round basis



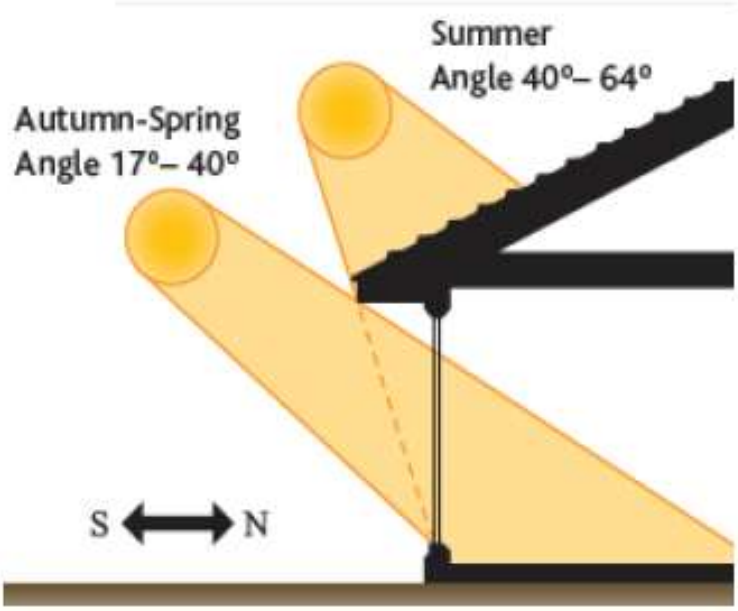
(Source: www.sustainableconcrete.org.uk/sustainable_design_constructio/thermal_mass.aspx)

7.7 Some of the features identified above can be easily installed on existing properties – particularly measures such as higher-value insulated glazing and window shutters. However, these measures can in certain circumstances have an unintentionally negative impact upon the visual character and appearance of a building and its wider surroundings. This is especially true in conservation areas. A number of the Borough's Conservation Areas are subject to Article 4 directions where certain permitted development rights have been removed. For example planning permission may be required to install new windows or doors We suggest that if you are considering installing such measures that you contact the Council's Development Management Team.

Solar Shading

7.8 This is designed to prevent excessive solar gain and glare. In the summer the sun is high and the solar shading acts to block sunlight from hitting the window. During the winter the sun is lower in the sky and sunlight passes beneath the shade and can pass through the window. Solar shading can be achieved through the use of overhanging roofs, balconies, fixed louvres (brise soleil) or screens. The amount of sunlight blocked by fixed shading devices can be estimated using a sun path diagram.

Figure 8: Solar Shading



Case Study: Passivhaus, Camden

7.9 The UK's first certified "Passivhaus"[12] has been built in Camden. The timber frame 120m² two bedroom home has a predicted annual heating demand of 3kWh/m²/yr (at standard occupancy maintained at 20°C in winter). This is achieved by 380mm of insulation, negative Psi values throughout (no cold bridging), triple glazing, "Passivhaus" sliding windows, draught free construction, and 92% efficient heat recovery ventilation consuming only 15 watts of power in extract and supply. Summer temperatures are controlled by blinds, a well-insulated structure, and two green roofs.

B Use energy efficiently

7.10 The first step towards reducing fossil fuel dependence is to increase energy efficiency and reduce usage wherever possible. Well-insulated buildings, designed to take advantage of passive heating, cooling and ventilation, and incorporating efficient lights and appliances can considerably reduce the energy needed in a home. It will also make the building cheaper to heat and power, which is becoming increasingly important as energy prices rise.

7.11 Practice has shown that well insulated buildings, which also incorporate other aspects of passive solar design, can be used throughout the year with very little additional heating other than that gained from occupants and electrical appliances such as TV's and computers.

[12] "Passivhaus" is a German standard for energy efficiency in construction and is increasingly being used across the World. More information can be found at www.passivhaus.org.uk

Insulation

7.12 Around half of the heat lost in a typical home is through the walls and loft. Increasing insulation levels significantly beyond current building regulations requirements is the cheapest and most effective method of reducing CO2 emissions. It requires no maintenance and should last the life time of the building. It reduces heat losses and gains through the fabric of the building and minimises the costs of heating and cooling systems. Buildings are kept warmer in winter and cooler in the summer.

Insulation measures include:

- Cavity Wall Insulation
- Solid Wall Insulation
- Floor Insulation
- Loft Insulation
- Draught Proofing
- Tanks and Pipe Insulation
- Glazing

7.13 Thermal insulation is measured using U-values. The U value is a measure of how readily heat will flow through the structure. An increased thickness of insulating materials will increase energy efficiency and reduce the 'U value'.

More information on home insulation can be found on the Energy Saving Trust's website.

Airtightness

7.14 Significant reductions in heat loss can also be achieved by reducing air infiltration through the building fabric and making the building air tight. Air leakage occurs in a number of places, particularly draughty windows and doors and joints between ceilings and walls.

7.15 Air leakage can be reduced through careful construction practices, to ensure gaps in the fabric are minimised. Measures include:

- Ensuring gaps around window and door frames are properly sealed.
- Draught-stripping external windows and doors (other than kitchens and bathrooms unless other ventilation measures are included).
- Sealing holes around services passing through the external walls including water pipes, gas pipes, boiler flues and electrical cables.
- Choosing airtight light fittings or sealing gaps around light fittings and ceiling pull cords.
- Sealing the joint between the ceiling and the external wall.
- Sealing the joint between the dry-lining and the skirting board.

For more information about draught proofing visit the following link.

Ventilation

7.16 Natural ventilation involving supplying and removing air through a building using natural means reduces the need to mechanically ventilate a building, and reducing energy consumption. There are a number of possible approaches to natural ventilation:

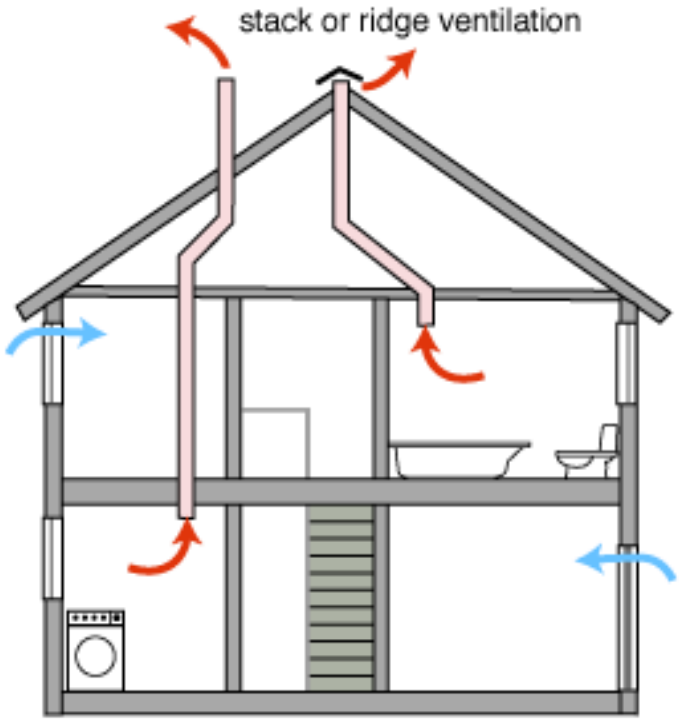
Wind driven ventilation

7.17 This can be created by taking advantage of the natural air pressure differences that occur when air flows over a building. By placing ventilation openings on the low pressure side of the building, air will be drawn into the building providing natural ventilation.

Passive stack ventilation

7.18 Passive stack ventilation is driven by differences in internal and external temperatures, and is achieved by placing ventilation openings at different heights. It is based on the 'stack' effect whereby warm air naturally rises and is replaced with cooler air entering at a lower level. In order to make a passive stack approach work, vents should be placed in rooms which require fresh air to replace moisture-laden or odorous air. Ducts draw the warm air up and out of the building, and ventilation openings (such as trickle vents in winter or open windows in summer) draw in fresh air from 'dry' rooms.

Figure 9: Passive stack ventilation



(Source: www.greenspec.co.uk/whole-house-ventilation.php)

Ventilation is covered by part F of the Building regulations. More information on this can be found on the Planning Portal

C Supply energy efficiently

Energy Efficient Appliances/ Building Infrastructure

7.19 Heating and lighting and other building appliances can be major consumers of energy. By carefully choosing energy efficient systems and appliances developers and homeowners can reduce the energy demand from their buildings and therefore reduce their costs significantly.

7.20 We encourage developers and homeowners to consider fitting the most energy efficient appliances/ infrastructure available to them. Whilst this approach may cost more in the short-term, long-term savings will be significant (see case study below). Specification of high standards of energy efficiency for appliances (for example A rated white goods), and the use of low-energy light bulbs, which consume significantly less power than ordinary bulbs to generate the same amount of light, can make a substantial contribution to the efficiency with which energy is used.

Case Study: Ashley Centre and Hook Road Car Parks, Epsom

7.21 We are committed to significantly reducing our gas and electricity consumption as an objective of our Climate Change Action Plan. In particular we are investing in energy efficient appliances/ infrastructure, which is being fitted to all of our buildings. Especially noteworthy is the impact of work to reduce electricity usage at the Ashley Centre and Hook Road multi-storey car parks. The car parks are major users of electricity mainly for lighting and have historically accounted for between 20% and 25% of the Council's electricity consumption at an annual cost of c£48,000pa.

7.22 In January 2010, the Council agreed to reduce electricity use in the above two car parks. This involved the introduction of variety of different measures including voltage optimisers and LED lighting. These works were carried out in January 2011 at a cost of c£40,000. As a result in a full year, electricity consumption will be reduced by 25% saving c£12,000pa, and achieving a payback on the investment in a few years.

D Use renewable / low carbon energy

7.23 Incorporating on-site renewable or low-carbon energy sources is not only good for the environment it also makes good financial sense. Low-carbon technologies such as wind turbines, solar panels and wood fuel boilers use renewable sources of energy, so you use less fossil fuel, which reduces your carbon footprint as well as your fuel bills. The availability of government financial incentives can help make this an attractive proposition either as an integrated component in new developments, or installed on existing buildings. The Energy Saving Trust provides valuable information on the many different forms of renewable and low-carbon energy.

7.24 Our Core Strategy encourages the use of renewable or low carbon energy technologies as an integral part of a proposals design. Since adopting the Core Strategy the Borough has been successful in ensuring that new development proposals demonstrate that at least 10% of their predicted energy needs are provided from renewable or low carbon sources.

Renewable and Low Carbon Energy Sources

7.25 There are many different sources of renewable and low-carbon energy that can either be incorporated into new development or fitted to existing buildings. Not all sources are viable in Epsom and not all sources will be appropriate for all types of development. It is recommended that developers of new housing which incorporate complex renewable energy installations should ensure that future occupiers are provided with clear instructions on their future operations and maintenance.

7.26 The following are common examples of renewable and low-carbon energy sources that can be easily integrated into the design of new developments, or fitted to existing buildings. This list is not intended to be exhaustive and there are other technologies that may be appropriate. It will be entirely up to the developer to demonstrate the value of these alternatives.

Air Source Heat Pumps

7.27 Air source heat pumps absorb heat from the outside air. This heat can then be used to heat radiators, underfloor heating systems, or warm air convectors and hot water in your home.

7.28 An air source heat pump extracts heat from the outside air in the same way that a fridge extracts heat from its inside. It can get heat from the air even when the temperature is as low as -15° C. Heat pumps are not entirely renewable energy sources as they need electricity to run, but the heat they extract from the ground, air, or water is constantly being renewed naturally.

Air source heat pumps could:

- lower fuel bills, especially if they are replacing conventional electric heating
- generate an income through the government's Renewable Heat Incentive
- lower carbon emissions, depending on which fuel is being replaced
- reduce the need for fuel deliveries
- both heat and provide and hot water for the property
- require little maintenance - they're called 'fit and forget' technology
- be easier to install than a ground source heat pump , though efficiencies may be lower.

3.31 Unlike gas and oil boilers, heat pumps deliver heat at lower temperatures over much longer periods. During the winter they may need to be on constantly to heat the property efficiently.

Ground Source Heat Pumps

7.29 Ground source heat pumps use buried pipes to extract heat from the ground. This heat can then be used to heat radiators, underfloor or warm air heating systems and hot water.

7.30 A ground source heat pump circulates a mixture of water and antifreeze around a loop of buried pipe - called a ground loop. Heat from the ground is absorbed into the fluid and then passes through a heat exchanger into the heat pump. The ground stays at a fairly constant temperature under the surface, so the heat pump can be used throughout the year - even in the middle of winter.

7.31 The length of the ground loop depends on the size of the proposed building and the amount of heat needed. Longer loops can draw more heat from the ground, but need more space to be buried in. If space is limited, a vertical borehole can be drilled instead.

7.32 Ground source heat pumps have similar advantages to the air source heat pumps outlined above. However, the latter are usually easier to install (particularly in terms of retrofitting to an existing property) than ground source as they don't need any trenches or drilling, but they are often less efficient.

7.33 In most retrofitting circumstances ground source heat pumps can be considered under permitted development rights. Equally, in most circumstances the Council can favourably consider proposals for new development that incorporate this renewable heating source. However, underlying geological conditions, particularly where a Major Aquifer[13] is present may make the installation of ground source heat pumps impractical or inappropriate. We recommend that you contact the Council to establish the suitability of this renewable source prior to installation in order to avoid abortive and potentially costly work.

Micro Combined Heat & Power (Micro CHP)

7.34 This technology generates heat and electricity simultaneously, from the same energy source, in individual homes or buildings. The main output of a micro-CHP system is heat, with some electricity generation, at a typical ratio of about 6:1 for domestic appliances.

7.35 Domestic systems are currently powered by mains gas or liquid petroleum gas (LPG); in the future there may be models powered by oil or bio-liquids. Although gas and LPG are fossil fuels rather than renewable energy sources, the technology is still considered to be a 'low carbon technology' because it can be more efficient than just burning a fossil fuel for heat and getting electricity from the National Grid.

7.36 A typical domestic system will generate up to 1kW of electricity once warmed up: the amount of electricity generated over a year depends on how long the system is able to run. Unused electricity generated by this system has the potential to be sold back to the National Grid.

7.37 Micro-CHP systems are similar in size and shape to ordinary, domestic boilers and like them can be wall hung or floor standing. The only difference to a standard boiler is that they are able to generate electricity while they are heating water. In many respects these systems provide an attractive and cheap alternative to traditional renewable or low-carbon energy sources as the differences between them and conventional heating systems are minimal. In most cases installation of a micro-CHP system is unlikely to have a visual impact upon the building in question or the surrounding environment. As a consequence retrofitting is unlikely to require planning permission – in most circumstances it will be no different than simply updating an existing household boiler system.

[13] A natural underground water source which supplies water for human consumption.

Solar Panels

Solar Thermal

7.38 Solar thermal panels use the sun's energy to generate hot water. The two main types of solar thermal panels are evacuated tube and flat plate collectors. Evacuated tube collectors are more efficient than flat plate collectors, and require less roof space. However, they are also more fragile as the tubes are made of glass.

7.39 Solar panels have over time become a popular source of renewable energy, either as component of new development proposals, or more commonly as a retrofitted solution to domestic properties.

7.40 Solar panels should be located on south facing roofs, or within 30 degrees of south, to maximise efficiency, and should not be shaded. They are best suited to buildings which have a particular demand for hot water, such as dwellings, hospitals and swimming pools.

Solar Photovoltaic cells

7.41 Photovoltaic (PV) cells use the sun's energy to generate electricity. They do not require the sun to be shining for them to work, although they are most efficient on sunny days. To ensure the efficiency of PV panels is maximised, the orientation of the building, and the tilt and shading of the panels should be considered. "Solar Century's" website contains guidance on the orientation and tilt of solar PV panels.

7.42 The two main types of PV panels are crystalline and thin-film. Mono-crystalline PV cells are currently the most efficient technology available and the most commonly used, in the form of aluminium framed, glass covered panels, although they are more expensive than thin-film PV. For optimum performance, PV panels should face between south-east and south-west, and should be installed at an angle of 30-40°. They should not be installed where they are overshadowed.

Council Guidance Note on Solar Panels

7.43 The Council has produced a Solar Panel Guidance Note which provides advice on installing solar panels lawfully by describing the type of installation that does not need planning permission on an existing building (i.e. "permitted development") and installation that does require permission.

Case Study: Brookwood Farm, Knapp Hill, Surrey

7.44 This is one of the very first mainstream housing developments to be built to the Code for Sustainable Homes Level 5 standard in the Country. It incorporates many of the approaches and features outlined within this document. Significantly it has attained the Code Level 5 standard without sacrificing its visual character and appearance. For example, all of the houses on the development incorporate large solar panel arrays that typically cover the east roof plane. The visual impact of these arrays has been significantly minimised through the use of solar slates, as opposed to bolt-on panel arrays.

Wind Turbines

7.45 Wind turbines harness the power of the wind and use it to generate electricity. Government statistics suggest that up to 40% of all the wind energy in Europe blows over the UK, making it an ideal location for domestic turbines; also known as 'microwind' or 'small-wind' turbines. Wind is entirely renewable and free, so once a turbine has been installed on-site electricity costs will be reduced[14].

7.46 However, wind turbines can have a significant impact upon either the building that they are mounted upon, or the surrounding environment – both in terms of their visual appearance and their potential for generating noise. As a consequence proposals to install wind turbines, either as part of a new development or fitting to an existing property should seek to minimise visual and noise impacts.

Permitted Development

7.47 The installation of some sources of renewable or low-carbon energy on domestic dwellings can, subject to specific criteria, be carried out under permitted development rights. However, under certain circumstances proposals will require planning permission in spite of meeting permitted development criteria because of their visual impact upon the building or the surrounding area. This is particularly the case where this involves the installation of equipment on the outside of a house – such as solar panels, air source heat pumps and wind turbines. In order to avoid problems, we recommend that homeowners contemplating the installation of renewable and low-carbon energy sources contact the Council in advance to establish whether their proposal requires planning permission. Even where proposals fall under permitted development we strongly recommend that homeowners apply for a Lawful Development Certificate.

7.48 Information on Permitted Development Rights and details of how to make an application for a Lawful Development Certificate or for Planning Permission can be accessed on the Planning Portal website.

Case Study: Cardiff University 'Smart' Carbon Positive Energy House

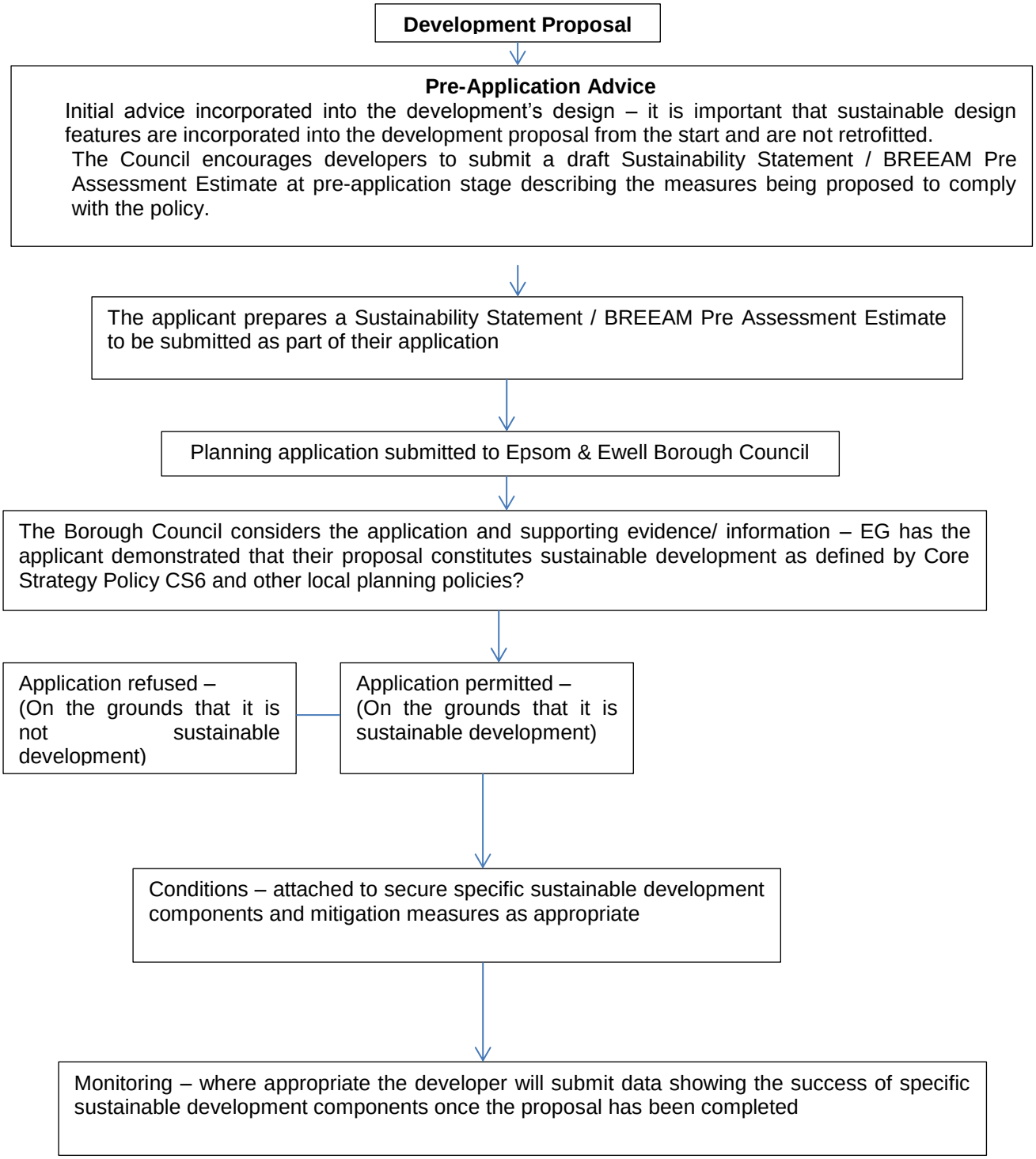
7.49 In early 2015 designers at Cardiff University have constructed a house in Bridgend that exports more power to the national grid than it uses. Its unique design combines for the first time reduced energy demand, renewable energy supply and energy storage to create an energy positive house. The cost of constructing the house fell within the normal budget for social housing at £1,000 per sq m and took only 16 weeks to build. This makes it an 'affordable' option for house builders to deliver truly zero carbon homes.

7.50 The house has glazed photo-voltaic (PV) panels fitted into the south-facing roof, allowing the space below to be naturally lit. Solar generation and battery storage run both the combined heating, ventilation and hot water system, and the electrical power system , which includes appliances, LED lighting and a heat pump. The solar air system preheats the ventilation air, which is also warmed by the water store.

[14] Gatwick Airport Ltd will be consulted on any application for 'non domestic' wind turbines in the Borough as it falls within the 30km wind turbine consultation zone. Further information is available from the Airport Operators Association Advice Note: Wind Turbines and Aviation.

Annex 1 - Sustainable Design and the Development Management Process

The following flow diagram illustrates how the Council, as local planning authority, will, in conjunction to other key partners[15], determine how a proposal meets the sustainable development requirements of Core Strategy Policy CS6.



[15] These are comprised of those statutory bodies and other consultees who have a consultative input into the planning development management process.

Annex 2 – Guidance on the storage and collection of Household Waste

- **Introduction**

a. To ensure waste is collected cleanly, safely and efficiently and to encourage waste minimisation the Council has specified that it will only collect domestic waste and materials for recycling in the containers provided by the Council. It can make this a legal requirement under Section 46 of the Environmental Protection Act 1990.

b. Where new or redevelopment homes are being built, the Council may ask the developer to accommodate and contribute towards the cost of containers. The following information is therefore provided to assist developers in complying with planning conditions requiring the provision of storage areas for the containers. This note should be read in conjunction with Part H of the Building Regulations 2002. Manual for streets (paragraphs 6.8.4 to 6.8.18) and BS5906:2005 Waste Management in Buildings – Code of Practice.

c. Applications for planning permission should include appropriate provision for the storage and collection of household waste and materials for recycling on the application site. Details of the siting, size and design of the refuse and recycling storage areas for each property will be required with planning applications. These details, particularly the siting and size of the storage areas, should be included on the site layout plan.

- **Houses and Bungalows**

a. These properties will normally be provided with one 240 litre wheeled bin for waste, one 180 litre wheeled bin for plastic and cardboard recycling, one 23 litre food waste bin, one 47 litre recycling bag (for paper) and a 55 litre recycling box. Please see full dimensions of all containers listed in section 4.

b. Residents are also able to subscribe, at a cost, to a garden waste recycling service where a 240 litre wheeled bin or 60 litre recycling bag can be issued. A nappy waste service is also offered to residents where they would be issued with an additional 180 litre bin.

c. The Council may provide two 240 litre wheeled bins for waste for properties where there are more than eight occupants, where requested.

d. Wheeled bins, boxes and bags should be stored on a hard, impervious, free-draining surface, in a position with convenient access to the kitchen door but also where they can be easily moved by the residents to the property boundary for emptying by the Council.

e. Where it is intended for the wheeled bins and boxes to be permanently stored at the front of the property, a suitable enclosure should be constructed in an accessible, but inconspicuous position. Enclosures which are located in a prominent position are likely to be refused permission. Any enclosure should be of adequate height to permit the bin lids to be fully opened without having to move the bins.

f. For developments with limited or no vehicular access, the occupiers will need to bring the wheeled bins, box and bags to the kerbside adjacent to the highway for collection. These arrangements can cause obstruction of the footpath, vehicular accesses and annoyance to other local residents. In such circumstances the occupier(s) of such properties should make their own arrangements for removing the emptied bins and boxes from the kerbside as soon as practicable after they have been emptied. Paragraph 6.8.13 of the Manual for Streets states that “waste bins on the footway pose a hazard for blind or partially sighted people and may prevent wheelchair and pushchair users from getting past”.

- **Flats and Communal Properties**

a. For flats and communal developments with more than four properties, communal wheeled bins will be provided, at cost to the developer, for refuse and recycling collection. The total wheeled bin capacity will be based on the approximate total refuse and recycling litre requirement of 500 litres per property. This will be split among containers to allow waste streams to be separated. Please contact your planner to discuss the required litre capacity for your proposed development.

b. The average flats and communal property development will require capacity for the following refuse and recycling containers. This example is based on 8 properties; container dimensions are available in section 4.

    - 1 x 1100 litre refuse bin
    - 2 x 1100 litre mixed recycling bins[16]
    - 2 x 240 litre glass (bottles & jars) recycling bins
    - 1 x 180 litre food waste recycling bin

c. In these properties communal wheeled bins should be provided and stored in an area close to the access road with a suitable access pathway. The collectors will collect, empty and return the communal wheeled bins and boxes to the storage area.

d. The **storage areas** for communal wheeled bins and recycling needs to:

    - Be at ground level
    - Allow sufficient room for both refuse and recycling containers to be stored and manoeuvred.
    - Be within 6 metres of the public highway
    - Residents should not be required to carry waste and recycling more than 30 metres to the storage area
    - Have a suitable level hard surface
    - Access pathway
    - Dropped kerb
    - Hatching adjacent to the dropped kerb prohibiting parking

[16] Such co-mingling bins are provided on properties and sites where there is insufficient space to accommodate the full range of separate recycling bins. These bins are used for storage and collection of all forms of non-food recyclable waste.

e. **Access pathways** from the storage area to the collection point (where the vehicle stops) need to:

- Be level, unless the gradient falls away from the storage area in which case the gradient should not be steeper than 1:12
- Be at least 1.5 metres wide
- Be free from kerbs and steps
- Have solid foundations and a smooth continuous impervious surface
- Have shallow ramps where they meet roadways
- Be no more than 5 metres from the point where the collection vehicle will stop

f. The collection vehicle will need to park near the storage area. So **access roads** need to:

- Have suitable foundations and surfaces to withstand the maximum weight of the vehicle (generally 26t GVW, 11.5t axle loading)
- Have heavy-duty manhole covers, gully gratings etc.
- Be designed to ensure reasonable convenience for the collection vehicle.
- Be a minimum of 5 metres wide.
- Be arranged for the collection vehicle to continue in a forward direction.
- Offer adequate space for turning. The minimum turning circles are 18.5m (kerb to kerb) and 20.3m (between walls).
- Allow a minimum of 4.1 metres clearance under any obstruction such as an archway or trees.
- Road hatchings at the entrance, to prevent parking at all times

g. For tracking purposes, the dimensions of the vehicles currently used in Epsom & Ewell are 10.8m long and 2.6m wide.

h. If more than four 240 litre bins (960 litres total) are to be emptied, then the collection vehicle should be able to enter the development to avoid the risk of obstructing traffic. In all such instances the road crossing the footway shall be designed so that the reversing vehicle does not encroach on the footway.

i. Collection vehicles should not generally be expected to reverse into a development from a busy main road. Collection vehicles can be reversed into the development over a distance not exceeding 12 metres to a point within 5 metres of the storage area. It is requested that where possible developments are designed to avoid the reversing of collection vehicles.

j. Appropriate measures must be incorporated into any scheme to control unauthorised parking of vehicles that would prevent access by the waste collection vehicle or the movement of bins and boxes from the enclosure to the collection vehicle.

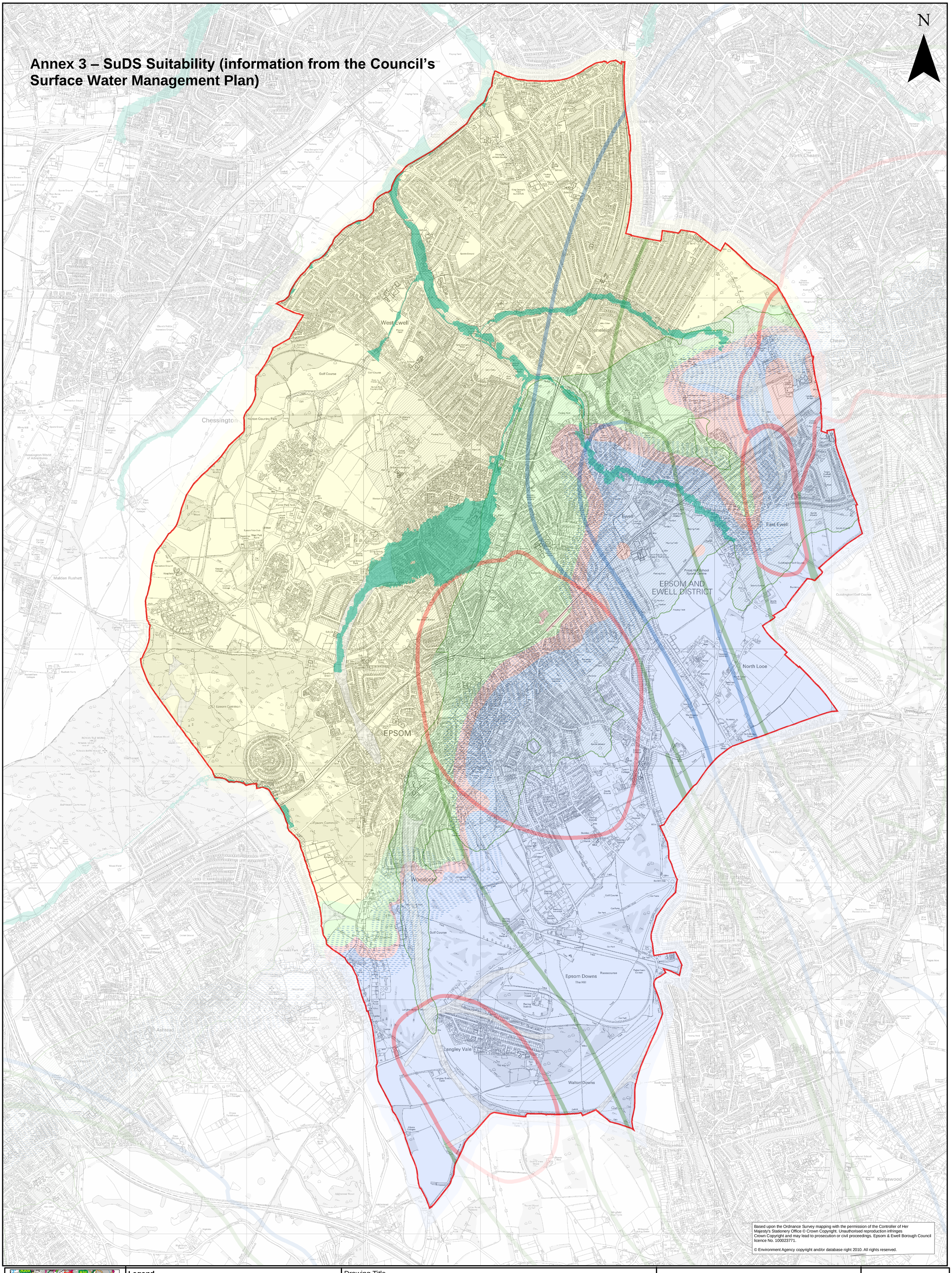
- **Container Dimensions**

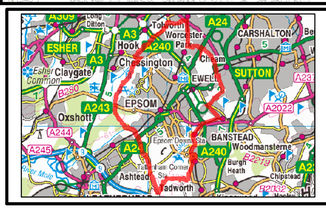
	Height	Width	Depth
1100L	132cm	122cm	92cm
660L	119cm	120cm	74cm
360L	105cm	55cm	86cm
240L	105cm	57cm	73cm
180L	99cm	48cm	65cm
Food waste Container	41cm	32ccm	40cm
Kerbisde recycling box	35cm	56cm	44cm

For further information please contact:

Planning Department
Epsom & Ewell Borough Council
Town Hall
The Parade
Epsom, Surrey
KT18 5BY
01372 732000
contactus@epsom-ewell.gov.uk

Annex 3 – SuDS Suitability (information from the Council's Surface Water Management Plan)





Legend

Solid Geology	Superficial Geology	Source Protection Zones
Lambeth Group	Alluvium	Zone 1 (Inner)
Upper Chalk Formation	Head	Zone 2 (Outer)
London Clay Formation	River Terrace Deposits	Zone 3 (Total)
Thanet Sand Formation	EA Flood Zone 3 (1%)	Spring Zone
Groundwater Emergence Map		

Drawing Title: Epsom & Ewell SWMP

Drawing Number: Sustainable Drainage System Considerations

0 0.5 1 2 Kilometers

Epsom & Ewell SWMP

EPSOM & EWELL BOROUGH COUNCIL

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