SUSTAINABLE BUILDING DESIGN

Supplementary Planning Document





February 2013

EASTBOURNE
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Adopted by Full Council on Wednesday 20 February 2013

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www.eastbourne.gov.uk/spd

Foreword

Eastbourne is committed to becoming a more sustainable, resource efficient town, resilient to the changes in climate that are predicted for the future.

The sustainable design and construction of new buildings throughout the town will be a crucial part of how we maintain Eastbourne's quality of life for our residents and competitive edge for our businesses.

We know that Climate change is a reality and that we need to plan to adapt to the effects of a warmer world, particularly in a south coast town such as ours. We will make the most of renewable energy opportunities on our own buildings and continue to pay particular attention to managing flood risk, with our statutory partners at the Environment Agency and East Sussex County Council.

This new Sustainable Building Design Supplementary Planning Document will offer help and guidance to developers on how to create new buildings in Eastbourne that make the most of their opportunities for producing alternative renewal energy whilst at the same time slotting in with their surrounding environment with minimal impact.

Applying this guidance will result in buildings that provide healthy, comfortable places to live and work in while minimising their impact on the environment. Guidance in the Sustainable Building Design SPD should help ensure that Eastbourne leaves a legacy that future generations will thank us for.

We look forward to working with all developers, to help us build for tomorrow today.

Councillor David Tutt

Leader of the Council

1 Introduction

1.1 What is the Sustainable Building Design SPD?

1.1.1 A Supplementary Planning Document (SPD) is one of the material considerations that can be taken into account when determining a planning application. It forms part of the Local Development Framework (LDF) and is intended to expand or add details to planning policies in the Development Plan Documents (DPD), such as the Eastbourne Plan.

1.1.2 In preparing this SPD, the Council has had particular regard to the following policy documents:

- Planning Policy Statement 1 (Sustainable Development) and Supplement to Planning Policy Statement 1 (Planning and Climate Change);
- Pride of Place – East Sussex Integrated Community Strategy; and
- The Eastbourne Plan (Core Strategy) 2006-2027 policies.
- The Eastbourne Environment Strategy 2010-2013
- The Eastbourne Cycling Strategy 2012

1.1.3 The Sustainable Building Design SPD provides detailed guidance on the acceptable design of domestic and commercial development, responding to sustainability policies set out within the Eastbourne LDF Core Strategy. The SPD incorporates guidance on energy reduction measures, renewable energy, minimising water consumption, reducing the risk of flooding and surface water run-off, waste recycling, air quality, transport, and the provision of wildlife habitats.

1.1.4 This SPD will provide guidance on acceptable design of environmentally friendly developments in order to minimise the environmental impacts of construction and increase the provision of renewable resources.

1.2 What Pre-Consultation Exercises have Informed the SPD?

1.2.1 The preparation of the Sustainable Building Design SPD has been led by a steering group consisting of officers with relevant experience in this field from across the Council: the Energy Initiatives Officer; the Housing Development Officer; and officers from the Building Control and Development Control teams.

1.2.2 Consultants AECOM undertook a Renewable Energy Potential Study of Eastbourne in 2010, which included the production of an Energy Opportunities Plan for the Borough, as well as providing detailed guidance on Sustainable Building Design technologies.

1.3 What is Sustainable Building Design and What Benefits Will it Bring?

1.3.1 The way in which buildings are designed, built, operated and decommissioned has significant impacts on the environment. Greenhouse gas emissions, particularly carbon dioxide, are the main cause of climate change. In the UK each person produces approximately 12 tonnes of CO2 emissions per annum - a large percentage of this is generated from the energy used in homes and buildings.

1.3.2 Approximately 27% of the UK's total carbon emissions come from the domestic housing sector through energy use in the home for heating, hot water, lighting and appliances. New homes and buildings provide a real opportunity to deliver substantial cuts in carbon emissions, and to reduce further the environmental impact of new buildings. This is recognised through the publication of the Governments policy statement 'Building a Greener Future' which sets out proposals to tighten building regulations to ensure all new homes are constructed to zero carbon by 2016.

1.3.3 Designing and constructing buildings with improved environmental performance is an essential part of delivering sustainable development. This means looking at:

- Energy efficiency: how buildings can maintain a comfortable indoor temperature and appropriate light levels but use less energy for heating, cooling and lighting (space and water heating are responsible for 73% of domestic UK emissions);
- Approaching resource use sustainably: minimising waste, minimising water use, sourcing locally and using sustainable materials (that are non-polluting, from renewable sources, recyclable and have recycled content, sourced locally and have low embodied energy);
- Enhancing biodiversity;
- Promoting sustainable transport provision; and
- Reducing noise impacts and improving air quality.

1.3.4 In shaping the pattern of development, as well as controlling the nature and quality of development, effective building design plays a fundamental role in tackling climate change. It achieves this by controlling the spatial arrangement of development. Sustainable building design can reduce the need to travel and capitalise on public transport to reduce associated emissions. In locating development, effective planning can help identify opportunities and deliver centralised low and zero carbon power generators and ensure communities are adequately powered. And, through development management, sustainable building design can encourage energy efficient buildings and on-site/micro-renewable energy generation.

2 Planning Policy Context and Key Sustainable Building Design Objectives

2.1 International and National Planning Policy Context

2.1.1 The UK signed up to the European Declaration on Sustainable Development in 1999. As a member of the European Union, the UK ratified the Kyoto Protocol and this became a legally binding treaty in 2005. This is an international agreement, with the objective of reducing greenhouse gases that cause climate change.

2.1.2 These international agreements have resulted in action from the UK Government introducing a set of policies targeting climate change and sustainable development in planning. The Government has set a legally binding target of at least an 80% cut in greenhouse gas emissions by 2050, to be achieved through action in the UK and abroad. Also a reduction in emissions of at least 34% by 2020. Both targets are against a 1990 baseline. Eastbourne Borough Council is committed to achieving a 40% reduction by 2020.

2.1.3 Planning Policy Statement 1 (PPS1): Delivering Sustainable Development states that: '*Planning should facilitate and promote sustainable and inclusive patterns of urban and rural development by (specific to this SPD)':*

- Ensuring high quality development through good and inclusive design, and the efficient use of resources.

2.1.4 The National Planning Policy Framework, 2012, states that Local Plans should follow the approach of presumption in favour of sustainable development, with clear polices that will guide how the presumption should be applied locally. The Eastbourne Plan- the Core Strategy, sets out a policy covering sustainable development and this is discussed in more detail within the Local Policy section. For new homes; local standards should be based on the Code for Sustainable Homes.For all new commercial development, standards will be based on the British Research Establishment Environmental Assessment Method (BREEAM).

2.2 Local Planning Policy Context

2.2.1 This SPD supplements several policies in the Eastbourne Plan, giving greater detail to each one. It will be a material consideration in the determination of planning applications. The relevant policies are:

D1: Sustainable Development

There is a presumption in favour of sustainable development. All new development should be sustainable and be well designed and constructed and demonstrate that it has taken account of the principles of sustainable development by:

- **Delivering economic, social and environmental well-being;**
- **Enhancing the natural and built environment;**
- **Conserving scarce resources, making efficient use of land and infrastructure;**
- **Ensuring a balanced mix of uses that work together encouraging sustainable living;**

- **Utilising sustainable construction techniques;**
- **Being easily accessible to all users;**
- **Ensuring good connections to public transport , community facilities and services; and**
- **Reducing the opportunities for crime and the fear of crime using Secured by Design principles.**

All development proposals will need to demonstrate that:

- **The Energy Opportunities Plan (EOP)[(i)] has been considered, ensuring that:**
- **Planning applications for new development demonstrate how they contribute to the current Energy Opportunities Plan. Contributions towards national energy and CO2 targets, applications for standalone energy generation and other CO2 reductions in the borough will be considered favourably**
- **Developments in areas designated as having potential for Combined Heat and Power (CHP) should ensure the development is connection ready to a potential District Heating Network.**
- **New development should be designed to maximise the opportunities to accommodate a district heating solution, considering: density, mix of use, layout and phasing.**
- **Developments where this is shown to be unviable will be subject to a financial payment into a Carbon Buyout Fund. [(ii)]**
- **All new residential developments meet the minimum requirement of Code Level 4 for all new homes from April 2013.**
- **Non-residential developments over 1000m² must meet BREEAM [(iii)]'Very Good' standard.**
- **Site waste generation must be minimised and specific measures incorporated into schemes to contribute towards achieving increased levels of household waste recycling.**
- **New residential buildings must achieve water use of less than 105 litres/head/day (as required by Code for Sustainable Homes Level 4)**

i The Energy Opportunities Plan is a map of Eastbourne identifying all potential opportunities for Renewable Energy technologies across the town.

ii The Carbon Buyout Fund is a fund into which payments will be made when the opportunity for carbon reduction can be demonstrated as not viable within a development.

iii BREEAM – BRE Environmental Assessment Methods

D8: Sustainable Travel

Sustainable travel will be promoted through a variety of measures aimed at reducing the need to travel and reducing the reliance on the private car. Alternative sustainable travel choices will be supported by shaping the pattern of development and influencing the location, scale, density, design and mix of land uses.

Services and facilities, such as local shops, health facilities, schools, open spaces and community centres, should be provided locally and be accessible to each neighbourhood to help reduce the need to travel. All new development should be located within 800m of local services and facilities and within 400m of a bus stop with a regular service.

New development that generates significant demand for travel should be provided in locations that are well served by a variety of transport methods, especially public transport. Travel Plans will therefore be required for development that is expected to create a significant number of additional trips in line with EastSussexCounty Council's 'Guidance on Travel Plans for New Developments'.

The development of a network of safe walking and cycling routes will be promoted, especially where they link existing residential areas to employment areas and educational establishments, and offer the potential for modal shift. This will include the development of new routes, enhanced pedestrian and cycle crossings, better signage and street lighting and a sustained promotion of these routes. The introduction of innovative pedestrian-focused layout designs such as shared surfaces, reduced pedestrian segregation and public realm improvements will be supported as a way of creating an improved pedestrian network.

The standard and quality of public transport will be significantly enhanced by developing and strengthening opportunities for bus and rail integration at Eastbourne and HampdenPark railway stations. Bus priority measures will be promoted along the A2270, A2021; and A259, which will be formally designated as Quality Bus Corridors.

New development should:

- **Reduce the need to travel;**
- **make walking, cycling and accessibility to public transport a priority in the design of their layouts;**
- **provide for the needs of pedestrians and cyclists, including people with disabilities and mobility difficulties;**
- **contribute towards sustainable travel schemes and activities, including the County Council's *Local Sustainable Accessibility Improvement Contributions;***
- **support safe and effective traffic movement along existing highways.**

New development should also provide for the travel demand that they create through a balanced provision for access by powered two-wheelers, public transport, cycling and walking. Development proposals will be assessed in relation to their compliance with approved maximum car and cycle parking standards, related to the accessibility and location of the site.

D9: Natural Environment

Policy D9: Natural Environment

Protect and support a diverse and multi-functional network of green space by:

- **Producing a Green Network Plan and creating environmental interpretive focal points in Eastbourne's parks and gardens and natural areas. Improved infrastructure will encourage walking and cycling as a means of accessing and connecting the green network and countryside.**
- **Identifying a network of strategically and locally important green space areas through a Green Network Plan. Development will only be permitted where it does not cause the fragmentation of these existing habitats or landscapes.**
- **Requiring development proposals to improve the quality and quantity of green spaces and address local deficiencies in accessible green space where appropriate.**

Protect and enhance the allotment provision in Eastbourne by:

- **Protecting all allocated allotment sites and only permitting development if it can be proven that the site is genuinely surplus to requirements.**
- **Providing new, high quality and easily accessible allotment sites in order to meet future local demand.**
- **Seeking to enhance the quality of existing allotment sites across the Borough, promoting sympathetic management in line with the Biodiversity Assessment Report.**

Promote effective conservation and enhancement of the Borough's wildlife by:

- **Producing Biodiversity Action Plans (BAPS) to identify measures to preserve and enhance the geology, habitats and species of importance in Eastbourne.**
- **Safeguarding local, national and international protected sites for nature conservation from inappropriate development.**

- **Ensuring that development seeks to enhance biodiversity through the inclusion of wildlife needs in design, and ensuring any unavoidable impacts are appropriately mitigated for.**
- **All developments over 500m² or 5 dwellings will be required to produce a Biodiversity Survey to ensure development does not impact on species of importance. The Survey must also include proposals to show how any impacts will be addressed by enhancement and mitigation measures.**

Support development proposals that avoid areas of current or future flood risk, and which do not increase the risk of flooding elsewhere. A risk based sequential approach will be required to determine the suitability of land for development.

Minimising the risk of flooding will be achieved by:

- **Ensuring that development is subject to a flood risk assessment which conforms to national policy, in order to demonstrate it will be safe, without increasing flood risk elsewhere.**
- **Liaising closely with the Environment Agency when determining applications for development.**
- **Applying a sequential test for assessment of applications for development.**
- **Requiring development to incorporate Sustainable Drainage Systems (SDS) to manage surface water drainage.**

D10: Historic Environment

All significant heritage assets will be protected and enhanced, where practicable:

- **There is a presumption in favour of protection of all heritage assets from inappropriate change, including both designated (Listed Buildings, Conservation Areas) and non-designated (Buildings of Local Interest, Areas of High Townscape Value).**
- **Development within Conservation Areas will be permitted if:**

1. **it preserves and enhances the character, setting and appearance of the area;**
2. **it does not involve the loss of important features which contribute to the character of the building itself or wider area;**
3. **its form, bulk, scale, height, massing, materials and function of the development are appropriate to the development site and surrounding buildings, spaces and views;**

4. it does not involve all or the partial demolition of a building or feature which contributes to the character of the area, unless it can be demonstrated to be wholly beyond repair, incapable of beneficial use or is inappropriate to the character of the area.

- **Areas of High Townscape Value and Buildings of Local Interest will be conserved and enhanced through the application of the guidelines contained in the approved Eastbourne Townscape Guide and the use of Article 4 Directions.**
- **Listed buildings will be protected from demolition, and from proposed additions and alterations that would adversely affect their character, appearance and/or fabric. Development should not adversely affect the setting of listed buildings.**
- **Designated Historic Parks, Gardens and Open Space as well as those of importance will be protected from development that would adversely affect their character and historic interest. Views into and from these sites will be protected. Sites should not be subdivided.**
- **There will be a presumption against any development that would directly or indirectly have an adverse effect on Scheduled Monuments or Archaeologically Notification Areas. Where development is proposed in Archaeologically Notification Areas, appropriate assessments will be required and discovered remains will need to be preserved in situ or by record.**

2.3 Key Sustainable Building Design Objectives

2.3.1 The principal aim of the Sustainable Building Design SPD is to inform the preparation of planning applications and to contribute to the achievement of sustainable development in Eastbourne through a step-change in building design.

2.3.2 Seven key objectives have been identified as being essential to the delivery of sustainable building design in Eastbourne:

1. To promote the highest practicable and viable standard of resource and energy efficiency in new developments.
2. To provide clear guidance for developers about adapting to or mitigating the harmful impacts of climate change.
3. To improve construction techniques to reduce waste and adverse environmental impacts.
4. To encourage the use of renewable energy and reduce dependency on non-renewable energy sources.

5. To reduce the proportion of waste that goes to landfill.
6. To enhance the biodiversity and nature conservation interest of Eastbourne
7. To promote sustainable forms of travel by encouraging the provision of high quality cycling facilities and the provision of a convenient and safe walking environment in new developments.

2.3.3 A Sustainability Checklist (please refer to Appendix 2) will be required to be submitted as part of a planning application. This will enable officers to quickly check compliance with the guidance in this SPD.

3 Submitting a Planning Application

3.1 Which Checklist do I Need to Submit?

3.1.1 In order to ensure that all elements of sustainable building design are addressed, an online sustainable building design checklist should be completed by the applicant and submitted as part of a planning application.

3.1.2 This SPD and the accompanying checklists will be a material consideration in the determination of planning applications. The information provided by applicants completing the relevant Checklist will be used by the Council in the assessment of the application. There are two checklists that accompany the SPD, in **Appendix 2** and are summarised as follows:

- **Checklist A – Applications for household and small scale developments:** this covers new residential and/or mixed use developments of 2 units or fewer, residential extensions and conversions, and also retail of 150sq m or less, or any other development of 235sq m or less.
- **Checklist B – Applications for large scale development:** this covers new residential and/or mixed use developments of 3 or more units, (including residential extensions and conversions), and also retail of 151sq m or more, and any other development over 236 sq m.

3.1.3 The checklist will be publicly available to view alongside the application for anyone to see. Failure to submit a completed checklist may cause delay in determining the planning application and could ultimately result in refusal of the application.

3.1.4 In some instances, a checklist will not be required to support a planning application for minor development. The checklist will not be required for:

- Fences
- Advertisement consents
- Walls
- Change of Use where no alterations are proposed.

3.2 Checklist A: Applications for Household and Small Scale Developments

3.2.1 Checklist A has been designed to raise awareness of initiatives and steps that householders can take to make their homes more efficient and sustainable. Many of the initiatives and features within this SPD can be easily implemented alongside the other work proposed and whilst an extension or other work is taking place on a home. It may be more cost effective to install sustainability initiatives at the same time, minimising disruption to occupiers. The benefit of a more energy efficient home is that it not only reduces a family's carbon footprint, but it can help save on utility bills by reducing the amount of energy and water used.

3.2.2 Checklist A should be submitted as part of any household and small scale development application, to provide information on proposed sustainability initiatives and features. Some of the criteria included in Checklist B have been omitted from Checklist A as it is considered unreasonable to expect householder and small scale development applications to meet all of these requirements.

3.2.3 Not all development requires a planning application. Prior to carrying out any work, it is strongly advised that applicants check with the Council whether planning permission is required. Householders are strongly encouraged by the Council to consider sustainability initiatives in developments even in instances where planning permission is not required. Details can be found on the Council's website or by telephoning the planning team.

3.3 Checklist B: Applications for Large Scale Development

3.3.1 Checklist B has been designed to raise awareness of sustainability issues in all large scale development. By completing the checklist, applicants demonstrate the consideration and inclusion of sustainability initiatives in their development. The amount of information provided in Checklist B should reflect the complexity of the application. For example, small extensions to commercial property will require less information than proposals for large scale residential developments.

3.3.2 Applications for the conversion of houses or other buildings into flats, will be required to complete all aspects of Checklist B.

4 Performance Benchmarks

4.1 The Code for Sustainable Homes

4.1.1 The Code for Sustainable Homes (CSH), supported by the Government, sets out a national rating system to assess the sustainability of new residential development. The Code consists of a number of mandatory elements which can be combined with a range of voluntary credits to achieve a credit level rating of between 1 and 6, covering 9 sustainability criteria, including carbon reduction, water, ecology, waste, materials, management and pollution.

4.1.2 If the mandatory elements for a particular level are not reached, irrespective of the number of voluntary credits, then that code level cannot be achieved. This means that to achieve a full code rating, a range of sustainability considerations will have been incorporated into the building and site design. These are set out in Appendix 3.The full CSH guidance can be downloaded from: www.planningportal.gov.uk/uploads/code_for_sust_homes.pdf

4.1.3 From 1 May 2008, it has been mandatory for all new housing to have the Code assessment, even if it is unrated in terms of performance. In addition, the Homes and Communities Agency (HCA) requires that all grant funded housing meets at least the Code for Sustainable Homes Level 3.

4.1.4 The Council requires all new residential developments to meet Code level 4 from 2013.

4.2 British Research Establishment Environmental Assessment Method (BREEAM)

4.2.1 The British Research Establishment Environmental Assessment Method (commonly referred to as BREEAM) is similar to the Code for Sustainable Homes. It sets out a sustainability performance rating system, but it is used for office, retail, industrial, healthcare and education buildings. It can also be used to derive bespoke assessment for a wide range of commercial buildings.

4.2.2 BREEAM, like the Code for Sustainable Homes, consists of mandatory and tradable credits that can be combined to give a performance rating from 'pass', 'good', 'very good', 'excellent' to 'outstanding' and is carried out in various stages. Further BREEAM guidance can be downloaded from http://www.breeam.org/

4.2.3 The Council requires that non-residential development over 1000sq m meets the BREEAM 'very good' standard.

5 Sustainable Building Design Topics

5.0.1 This section of the SPD provides good practice examples to indicate how the Code for Sustainable Homes and BREEAM standards can be achieved. Guidance follows the ten key sustainability themes:

- Improving energy efficiency;
- Contributing to the Energy Opportunities Plan (EOP);
- Generating energy;
- Using water efficiently;
- Minimising flood risk and reducing surface water run-off;
- Increasing recycling and reducing waste;
- Creating and enhancing wildlife habitats;
- Building with sustainable materials;
- Reducing noise pollution and improving air quality; and
- Encouraging more sustainable methods of transport.

5.1 Improving Energy Efficiency

Existing Building Stock

5.1.1 Energy used to heat rooms and water in existing residential properties accounts for some 13% of the UK's greenhouse gas emissions, this is known as the regulated energy use. In addition to the regulated energy uses, are other unregulated uses such as kitchen appliances; as such the energy used in our homes potentially accounts for 25% of all carbon emissions.

5.1.2 Two-thirds of the residential stock that will exist in 2050 is already built. Improving the energy efficiency of existing buildings and providing opportunities for existing development to connect to low carbon or renewable technologies will provide significant carbon savings. PPS1 Climate Change Supplement encourages planning authorities to, not only utilise decentralised low and zero carbon energy supply as part of new strategic development, but also foster opportunities to supply existing development.

5.1.3 The retrofitting of energy efficiency measures is likely to provide the most cost effective carbon savings. These measures include:

• **Wall insulation** – A great deal of heat energy is lost through walls, particularly in detached and semi detached properties, which have more external walls. Insulating walls can dramatically reduce this wasted energy. There are two main types of wall insulation:

  • **Cavity insulation** – The external walls of most buildings post-1920s are built with two layers, with a gap or cavity in between. This gap can be filled by injecting an insulating material through the outside layer. On an average 3 bed property this is likely to save 650kg of CO_2 a year.

  • **Solid wall insulation** – Pre-1920s buildings are more likely to have solid walls, which allow even more heat to pass through. Insulation can either be put on the outside, as a decorative treatment between 50mm and 100mm thick, or internally using insulation/plaster board laminates or wooden battens in-filled with insulation. This is likely to save 2 tonnes of CO_2 a year.

• **Loft insulation** – In an un-insulated property, around 25% of heat is lost through the roof space. Applying 270mm of insulating material to a loft can save around a tonne of CO_2 a year.

• **Floor insulation** – Laying insulating material under suspended timber floorboards and filling gaps around skirting boards, can contribute to a combined saving of around 400kg of CO_2 a year.

• **Double and triple glazing** – Installing double glazing can reduce the heat lost through windows with a CO_2 saving of 700kg per year. Triple glazing will improve performance further.

• **Water tank and pipe insulation** – Insulating hot water tanks and piping keeps water warmer for longer, reducing the need to reheat. Placing an insulating jacket around a water tank is a cheap and effective way of saving 150kg of CO_2 a year.

• **Draft proofing** – It is important that areas around windows and external doors have effective seals to prevent heat loss.

Historic Buildings and Conservation Areas

5.1.4 Reducing the carbon emissions from historic buildings can often present greater challenges than for more recently constructed buildings. Changes in building approaches means that traditional buildings tend to perform differently too. In addition, individual and collections of historic buildings may be of architectural importance and/or create an important character that would not suit modern energy efficiency measures.

5.1.5 Eastbourne has 12 conservation areas, designated for their historic and architectural importance. There are also numerous listed and historic buildings that contribute to areas highlighted for their high townscape values, in the Eastbourne Townscape Guide SPG (2004). Further details can be found on the Council's website.

5.1.6 Maintaining the historic character and appearance of these buildings is paramount, as loss of historic fabric would negate the value of retro-fitting. Inappropriate alterations or installation of energy efficient equipment could compromise historic character and appearance. Once lost, historic fabric cannot be replaced, so careful consideration of alterations is important and should focus on works which are easily 'reversible'.

5.1.7 Traditional buildings are often permeable. They are able to 'breathe', allowing moisture, from condensation or rising damp for example, to be absorbed and move through the building fabric until it can evaporate and be released. Modern building materials are often impermeable and impair this process, potentially trapping moisture within the building and accelerating decay.

5.1.8 Modern loft insulation materials such as fibreglass and mineral wool tend to hold moisture and are therefore not suitable for use in traditionally built buildings. Suitable substitutes could include sheep's wool and hemp fibre, which still have high thermal insulating properties but do not prevent moisture movement.

5.1.9 Although it is important not to reduce ventilation rates too much, which could trap moisture within older buildings, they are still often over ventilated and draughty. Simple measures, such as heavy curtains and removable draft excluders could provide effective, low cost solutions without being too intrusive. Replacing windows with double glazing might not be aesthetically appropriate. A more suitable solution could be provided by sensitively installed secondary glazing which sits behind the retained original windows.

5.1.10 Careful consideration should also be given to low carbon or renewable technologies. Not only could installation require structural changes to the fabric of the building, but the modern technologies can be a visual intrusion. Invisible low carbon or renewable technologies like biomass boilers, district heating or ground source heat pumps might be more suitable.

5.1.11 In addition to improving the efficiency of the building, carbon savings can be made by improving the efficiency of heating systems, principally the boiler. This is particularly important if the boilers are over 15 years old, as efficiency is reduced over time.

5.1.12 Once opportunities to improve energy efficiency have been utilised, small scale decentralised energy generation, or connections to community scale heat networks or renewable energy generation networks, as detailed above, can be used to reduce emissions further. Opportunities to retrofit a heat network should also be explored. This is easier and more cost efficient where a gas network already exists.

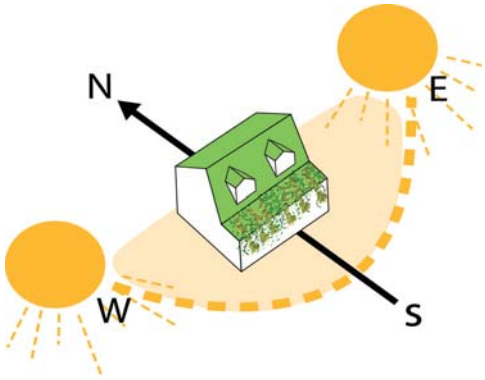
Improving Energy Efficiency in New Build

<u>Site Scale Considerations</u>:

5.1.13 Effective master planning of developments can help reduce the energy demands:

5.1.14 **Orientation–** Correct orientation will reduce space heating needs and also increase natural daylight levels. The ideal orientation of buildings is with the longest face of the building orientated towards the south. Orientation is also vital to the use of solar technologies for energy generation. Photovoltaic Cells and solar water heating units should be used on roof tops that are angled within 15 degrees of south and should avoid being shaded in anyway. Figure 1 shows the ideal orientation.

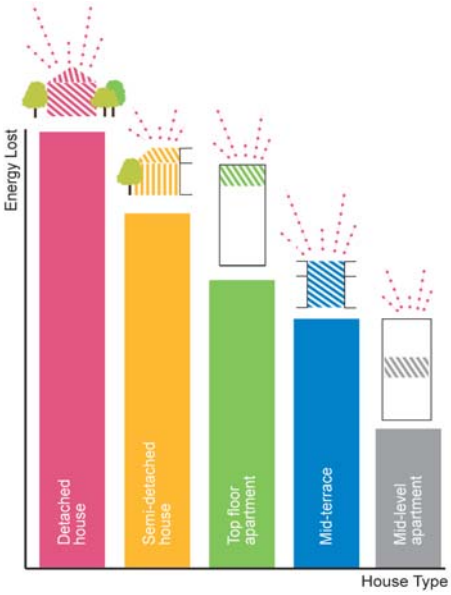
Figure 1 Building Orientation



5.1.15 Consideration of floor plan depth will help improve natural daylighting and consequently reduce the energy demand associated with electrical lighting.

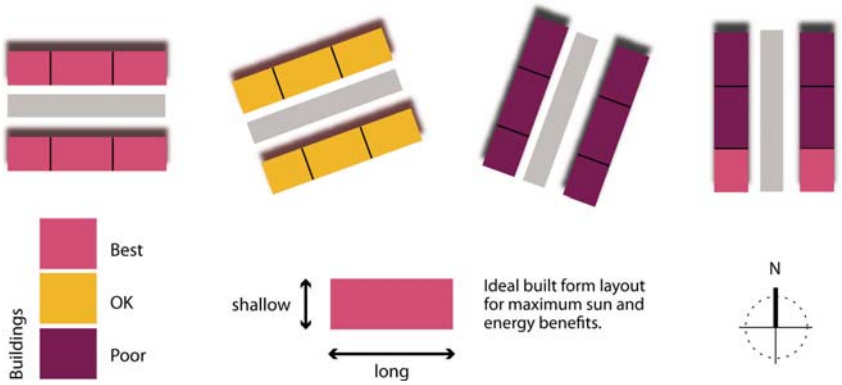
5.1.16 **Built form** – Some building designs are inherently more efficient than others. For example, flats and terraces are generally more efficient than detached properties because they have less external walls in relation to living space, through which heat is lost, as demonstrated in figure 2.

Figure 2 Heat Loss



5.1.17 **Street layout** – Good urban design principles demand that buildings face onto the street, especially in medium high density areas. Street-layout has a significant impact on energy efficiency, as set out in figure 3. Utilising natural light and heat to minimise the need for additional man-generated sources is known as passive design.

Figure 3 Street Layout

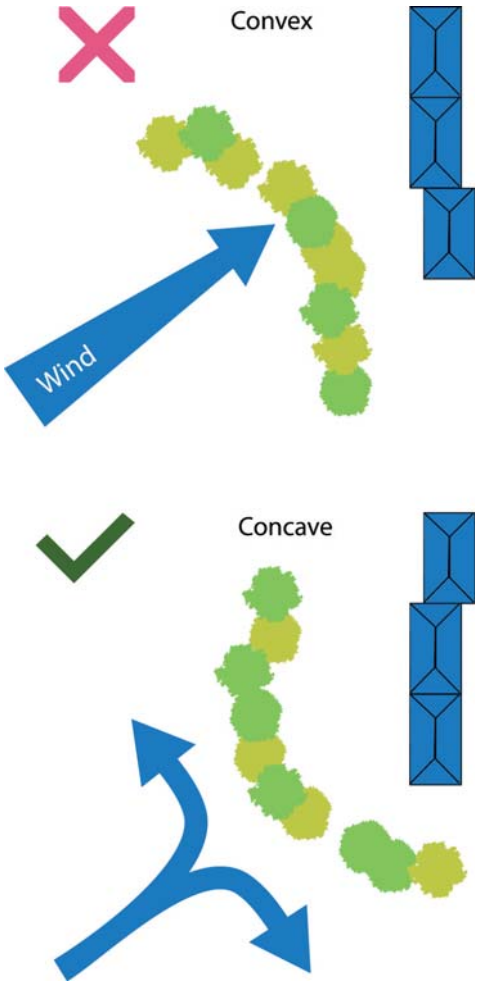


5.1.18 **Urban form** – Buildings and open spaces should not be overshadowed where possible. Street widths and building placement should ensure that there is good daylight exposure to building frontages and key public spaces. Wider east-west streets will expose south-facing buildings, allowing for good day lighting and natural heating.

5.1.19 **Trees** – Deciduous trees can be planted near buildings to provide shade in the summer, and heat and light throughout the winter. Wind should also be considered in site layout; exposure to wind can result in significant heat loss from buildings.

5.1.20 **Shelter belts** – Shelter belts can be planted on the edge of sites to shield from prevailing winds and cold northerly winds, as in figure 4. With good design breezes can also be used to assist energy efficiency, providing natural ventilation in buildings. 'Wind cowls' can be placed on the roof of buildings which respond to breezes and circulate air through the building.

Figure 4 Shelter Belts



Building Scale Considerations:

5.1.21 Good architecture and building design can create a very efficient structure. Various strategies can be taken to reduce energy demand in a building (see previous section), in regard to retro-fitting. Table 1 sets out some of the CO_2 saving of energy efficiency measures:

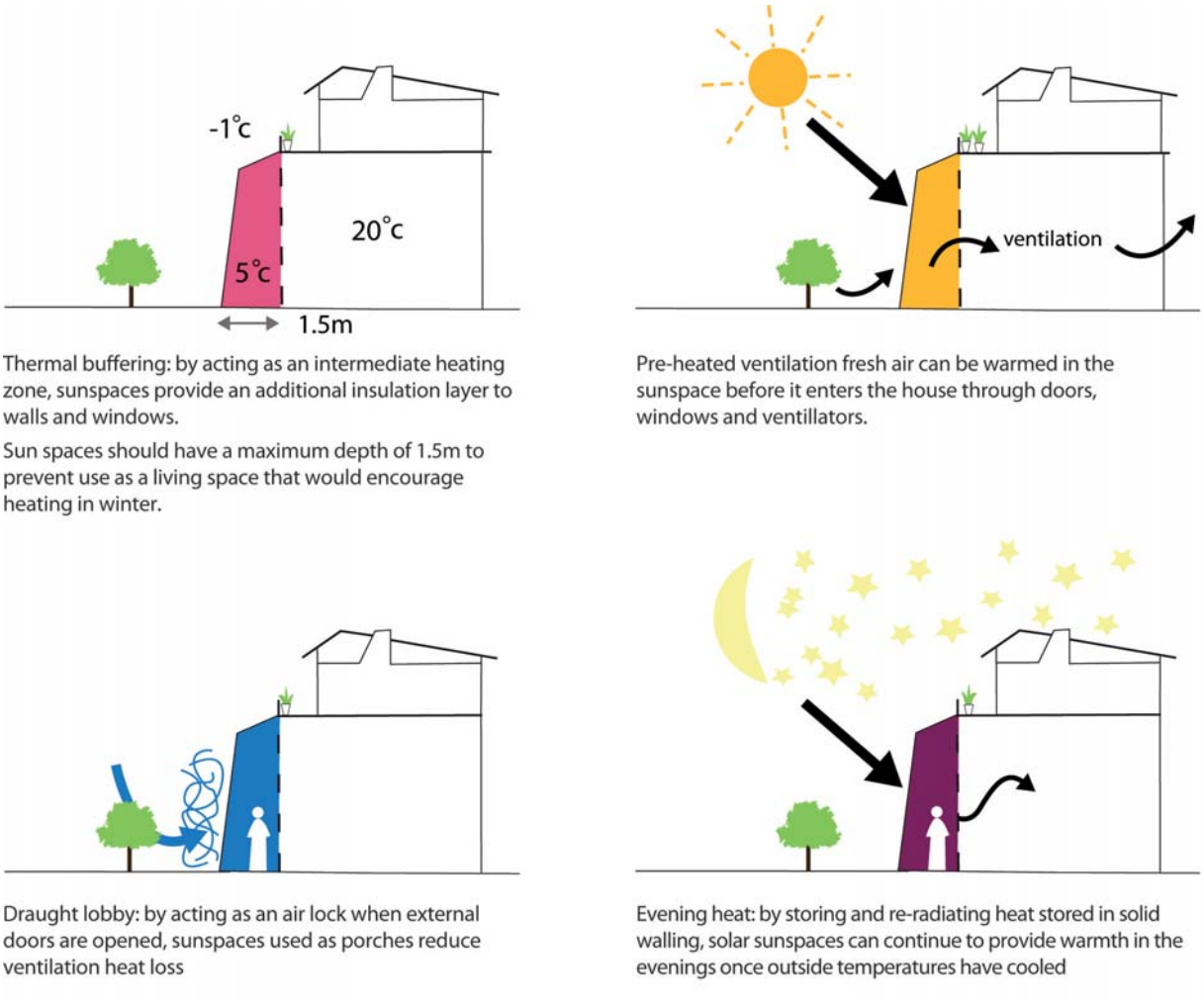
Table 1 Energy Efficiency Measures

Energy Efficiency Measures	Typical Energy Savings
Improved wall, floor and roof insulation performance	Reduced heating energy by up to 20-30% depending on insulation levels
Improved glazing insulation performance	Reduced heating energy by up to 20-30% depending on insulation levels
Reduced areas of glazing	Reduced heating energy by up to 20-30% depending on areas. Care needs to be taken not to increase lighting energy use
Increased areas of glazing	Reduced lighting energy use by up to 20-30% depending on areas. Care needs to be taken not to increase heating energy use.
Improved building air-leakage	Reduced heating energy use by 10-20% depending on insulation levels
High efficiency heating systems	Reduced heating and hot water energy use by up to 5-10% depending on efficiencies
Heat recovery on ventilation systems	Reduced air heating energy use by up to 50-60% depending on efficiencies
Heating system controls	Reduced heating and hot water energy use by up to 5-10% depending on efficiencies
High efficiency appliances	Reduced electrical energy use by up to 10-20% depending on efficiencies
High efficiency lighting	Reduced lighting energy use up to 20-30% depending on efficiencies
Lighting controls	Reduced lighting energy use by 10-30% depending on controls
Greater use of natural ventilation	Reduced ventilation and cooling energy by up to 100% depending on systems, locations and use
Introduction of roof lights	Reduced lighting and energy use by up to 20-30% depending on areas. Care needs to be taken not to increase heating energy use
Thermal mass and night cooling	Reduced cooling energy use by up to 100% depending on systems, location and use. Care needs to be taken not to increase heating energy use

Energy Efficiency Measures	Typical Energy Savings
Solar shading or solar control glass	Reduced cooling energy use by up to 100% depending on systems, location and use. Care needs to be taken not to increase heating energy use
Energy Metering	Energy metering (applicable to larger developments). Sub-metering of areas and floors will allow energy usage to be monitored, and subsequent plans to improve performance can then be implemented.

5.1.22 **Sunspaces** can be designed into a building to maximise the use of natural heat, as explained in figure 5:

Figure 5 Sunspaces



Thermal buffering: by acting as an intermediate heating zone, sunspaces provide an additional insulation layer to walls and windows.

Sun spaces should have a maximum depth of 1.5m to prevent use as a living space that would encourage heating in winter.

Pre-heated ventilation fresh air can be warmed in the sunspace before it enters the house through doors, windows and ventillators.

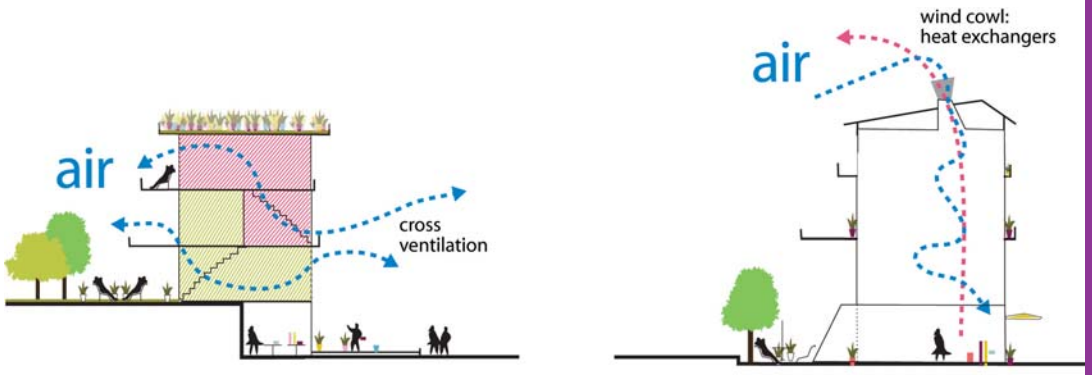
Draught lobby: by acting as an air lock when external doors are opened, sunspaces used as porches reduce ventilation heat loss

Evening heat: by storing and re-radiating heat stored in solid walling, solar sunspaces can continue to provide warmth in the evenings once outside temperatures have cooled

5.1.23 **Natural Ventilation -** Optimising natural ventilation can help reduce the energy demand required to circulate air, as explained in figure 6.

5.1.24 Furthermore, heat exchangers can be fitted to wind cowls to recover energy from dispelled air, reducing energy demands for heating as also demonstrated in figure 6:

Figure 6 Natural Ventilation

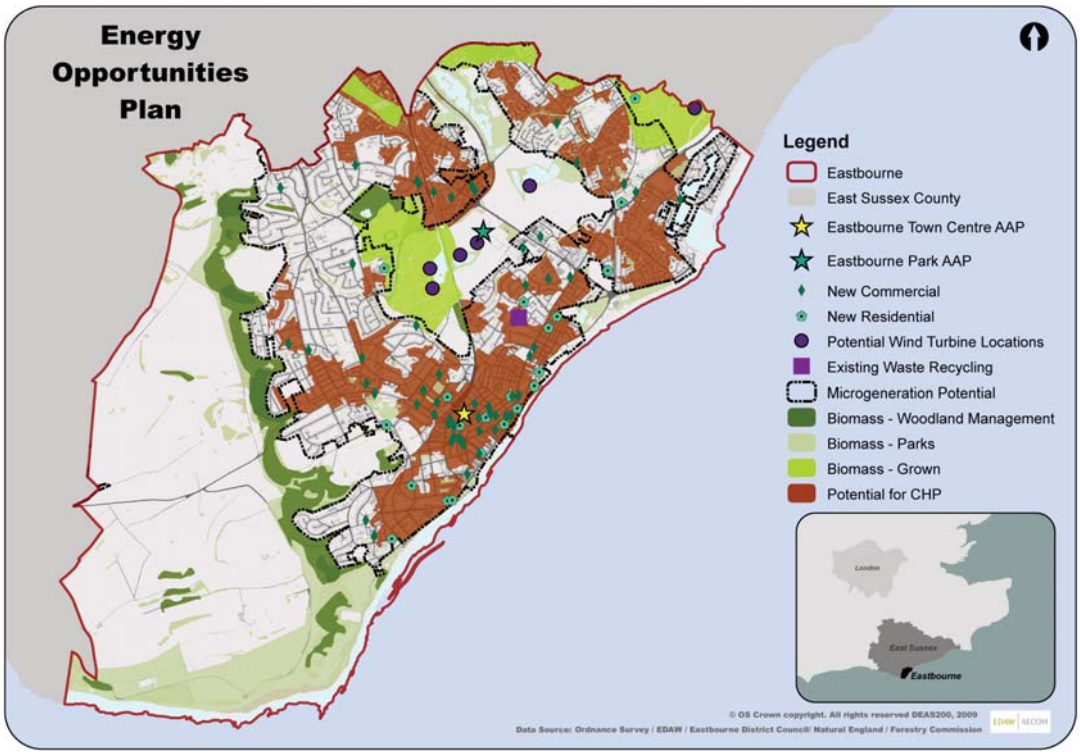


5.2 Contributing to the Energy Opportunities Plan (EOP)

5.2.1 Developers are encouraged to consider opportunities for delivering low carbon or renewable energy projects identified on the EOP, particularly when required to carry out allowable solutions in order to build zero carbon homes and non-domestic buildings. All applications will be subject to visual, environmental and residential amenity considerations.

5.2.2 Large scale developments that are located in areas of the Energy Opportunities Plan designated as suitable for Combined Heat and Power (CHP), should install the secondary elements of a district heating network (see section 5.3 for further details).

Figure 7 Energy Opportunities Plan (EOP) produced by AECOM



The Renewable Energy Potential Study identifies locations where various types of renewable technologies could potentially function. The Study did not assess the visual, environmental or residential amenity impacts of each technology. Wind turbines will not be permissible in Eastbourne Park on the basis of a negative impact to the environmental, visual and residential amenity.

5.3 Generating Energy

5.3.1 Low and renewable carbon energy generation can be undertaken on a range of scales. The Energy Opportunities Plan, produced as part of the Renewable Energy Potential Study for Eastbourne by consultants AECOM, identifies sites that may be appropriate for renewable technology that may be acceptable subject to the usual planning consents . This section will go into further detail about the different types of renewable energy technology.

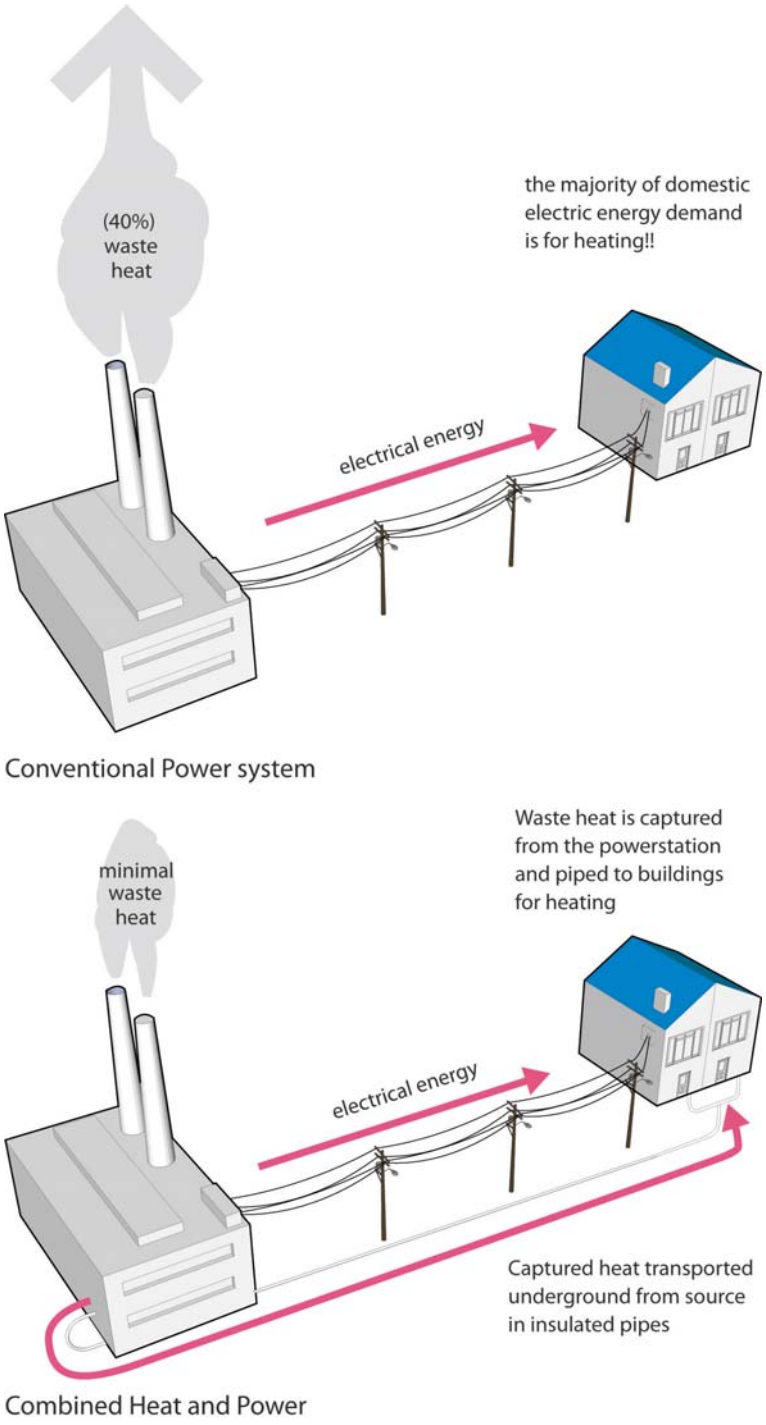
Site Wide Infrastructure

5.3.2 **District Heating -** District heating networks distribute heat generated from a centralised point to help meet space and water heating requirements in surrounding residential and commercial properties. Heat can be generated from a number of sources, including as a by-product of industrial processes or through dedicated boilers. If these boilers are bio-fuelled, burning biomass (such as woodchip, wood pellets or straw), bio-diesels (such as rapeseed oil, vegetable oil) or bio-gases (such as bio-methane) to provide heat they are considered to be low carbon or near carbon neutral, as the bio-fuel usually absorbs similar levels of carbon dioxide emissions in its growth as it gives off in its combustion.

5.3.3 **Combined Heat and Power (CHP) -** In conventional electricity generation stations, heat is usually a waste product that dissipates into the atmosphere (losing over 40% of the energy generated). Further losses then occur in the transmission of electricity. A CHP system works by generating electricity near or onsite and has the advantage of allowing the capture of the waste heat for space and water heating, as demonstrated in figure 8. This can either be done by district heating, or small scale by central heating of buildings (micro CHP).

5.3.4 The CHP can be powered by fuels such as gas/biogas, diesel/ bio-diesel, biomass as well as waste producing around 30% electricity, 50% heat with 20% losses. When linked to an absorption chiller (a device which uses waste heat as its power to provide cooling), unwanted summer heat can be used to provide cooling. With biomass or biogas fuels, carbon emission savings can reach up to 100%. Typically, fossil fuel powered CHP can achieve a 35% reduction in primary energy usage, compared with conventional power stations and heat only boilers. CHP linked to a neighbourhood via a district heating arrangement could meet the home's annual heating, hot water and most if not all of their electrical requirements.

Figure 8 Combined Heat and Power Plant



5.3.5 **Large Wind Turbine –** The most common design of a wind turbine is three blades mounted on a tall shaft, which is free to rotate into the wind driving a generator to produce electricity. Wind is a completely renewable energy source with no carbon emissions associated with its operation.

5.3.6 Wind power is considered most likely to make the most substantial contribution towards meeting renewable energy targets, however, output can fluctuate and be unpredictable, requiring it to be balanced by a different energy source.

5.3.7 A single large wind turbine (~1MW) could meet the annual equivalent electricity requirements of 500 homes. During calm periods an alternative back-up energy source would be required, such as a grid connection (which could also potentially enable electricity export). Wind turbines will not be permissible in Eastbourne Park, due to visual and amenity considerations.

5.3.8 **Biomass –** Biomass is the collective term for all plant and animal material. Wood from forests, urban tree pruning, farmed coppices or farm and factory waste can be burnt directly to provide heat in buildings. More recently, most of these wood sources have become commercially available in the form of wood chips or pellets, which makes transport and handling on site easier. Biomass is usually considered a renewable fuel, as the CO_2 emitted during energy generation has been recently absorbed from the atmosphere.

5.3.9 There are two methods of using biomass heating in housing: single room heaters (for example, wood burning stoves) or boilers, where the biomass replaces gas or oil as the heating fuel. The most common application is as one or more boilers in a sequenced installation where there is a communal block or district heating system. All types of biomass heating systems need an adequate, preferably local, supply of biomass material, with arrangements in place to ensure that fuel is delivered to site on a regular basis. Some suppliers have established national fuel supply networks and can provide long term supply contracts.

Building Scale Infrastructure

5.3.10 **Ground Source Heat Pumps –** Although ground source heat pumps can be utilised by individual properties, there are better efficiencies gained in providing them for 10 or more dwellings. Ground source heat pumps are used to extract heat from the ground to provide space and water heating.

5.3.11 A heat exchange fluid circulates in collectors (coils) buried in the ground and transfers the heat to a heat pump via a heat exchanger. The ground has a near constant temperature at about the annual average external temperature, making it more efficient and robust than a heat pump using the external air or water as a heat source. For every kilowatt hour (kWh)

of electricity put into it, the heat pump returns 3-4kWh heat, meaning that a ground source heat pump uses only a third of energy compared to conventional heating systems. Compared to electrical heating, only using a third of the electricity means carbon emissions are reduced to a third. However, as other means of heating may have lower carbon emissions per unit of energy, carbon savings are smaller. Energy savings for cooling can be as high as 90%.

5.3.12 **Air Source Heat Pumps –** Air source heat pumps extract heat from the outside air in a similar way to which a fridge extracts the heat from within itself. This heat can then be used to heat water or heating the internal air to reduce heating bills.

5.3.13 **Photo-voltaic Cells (PV) –** Photo-voltaic panels consist of semi conducting cells that convert sunlight into electricity. The panel produces electricity even in cloudy conditions, but the power output increases with the intensity of the sun. PV systems can be connected to buildings via batteries or via an inverter to the mains supply. This way excess electricity production can be sold to the national grid. There are other large scale technologies for producing electricity from solar energy (concentrated solar power plants), but these are mainly located in sunny climates.

5.3.14 The Council actively supports the use of solar technologies, as Eastbourne is one of the sunniest places in the country and this is an excellent way of utilising this resource.

5.3.15 **Solar water heating –** Solar water heating systems comprise solar collectors (evacuated tubes or flat plates), a heat transfer system (fluid in the pipes) and a hot water store e.g. domestic hot water cylinder. The solar collector heat exchanger preheats water from the mains, and a conventional boiler (gas or electricity) is used to reheat the water to a temperature high enough to prevent Legionella growth in the storage tank. A 4m² collection area will provide between 50% and 60% of a typical home's hot water demand.

5.3.16 **Micro wind power –** Modern turbines without gearboxes are very quiet which makes them viable to use in urban areas. There are currently a few successful practical installations of roof mounted wind turbines in the UK but it is anticipated that this will be a growing market with new products being developed to overcome many of the key issues.

5.3.17 A small wind turbine (2 to 5kW) could meet the annual equivalent of a typical household's annual electricity requirements. The use of small wind turbines in an urban area like Eastbourne may be restricted due to inconsistent wind flow caused through turbulence from other buildings.

5.4 Using Water Efficiently

5.4.1 **Minimising Water Consumption –** The Code for Sustainable Homes Level 4 and the Core Strategy Sustainable Development policy, set water consumption in residential developments at a maximum level of 105 litres per head per day.

5.4.2 The main uses of water consumption in new developments are:

- Water consumed within the buildings for the purposes of drinking, washing and flushing toilets
- Water used for watering plants, irrigating landscaping and washing cars.

5.4.3 Developments should minimise the need for water. In larger developments, sub-metering of areas and floors means water use can be monitored and subsequent plans for improved performance to be implemented.

5.4.4 Water saving devices should be incorporated into new and refurbished buildings that will reduce the amount of water consumed. The simplest way to do this is through the installation of efficient water fitting and plumbing, such as:

- Dual flush toilets
- Low flow shower fittings

- Low water consuming white goods and other appliances such as washing machines
- As well as the use of more durable plumbing, which can prevent leakages.

5.4.5 **Rainwater Harvesting –** On average around 200 litres of rainwater falls on the roof of a 100 m^2 house each day in the UK. In residential developments the provision of water butts and/or community storage facilities to collect rainwater is a simple and low cost measure. These may include:

- Water Butts to all downspouts where appropriate, including any outbuildings such as garages or garden buildings where designed into a scheme
- Underground water storage tanks for rainwater collection that could be used for many grey water uses in the development; and
- Retention ponds as a rainwater storage facility.

5.4.6 **Reclaimed Water -** The use of rainwater and grey water for non-potable uses such as the flushing of toilets and outdoor water use such as watering the garden is very substantial. To facilitate the best use of reclaimed water, the introduction of a separate or dual supply system is encouraged where these are feasible.

5.4.7 **Prevention of Water Loss-** The use of water leak detection systems and solenoid-linked sanitary supply shut off will help reduce the risk of long term water loss.

5.5 Minimising Flood Risk and Reducing Surface Water Run-Off

5.5.1 The cause of flooding can come from different sources:

- Rising river levels
- Tidal flooding
- Fluvial flooding
- Directly from heavy sustained rainfall
- Rising ground water
- Incapacity of sewers and drainage systems

5.5.2 Measures to minimise the risk of flooding, both on site and elsewhere, should be designed into developments.

5.5.3 Development should ideally be located in areas which will avoid flood risk to people and property in accordance with Planning Policy Statement 25. The Council will seek to ensure that flood risk is taken into account at all stages of the planning process, to avoid inappropriate development in areas at risk of flooding and to direct development away from areas at highest risk. Therefore, the Council insists that:

- Development is subject to a flood risk assessment which conforms to national policy

- There is no objection to the development from the Environment Agency
- Sustainable Drainage is incorporated, taking into account future projected climates
- The development connects to the sewerage system at the nearest point of adequate capacity, as advised by Southern Water
- No surface water is connected to the foul sewerage system unless evidence is provided to demonstrate that all other options are not practicable

5.5.4 Flood Risk Assessments should be carried out and means to mitigate flood risk should be incorporated into the design of new development. Further advice can be found on the Environment Agency's Flood Risk Map of the UK, the Flood Risk Standing Advice (FRSA) and Eastbourne Borough Council's Strategic Flood Risk Assessment (SFRA), which can be viewed on the Council's website.

Sustainable Drainage Systems – Sustainable development includes reducing flood risk to and from new development through location, layout and design, incorporating Sustainable Drainage Systems (SDS). SDS are an alternative to traditional drainage systems, and attempt to reduce the total amount, flow and rate of surface water run-off. SDS fall into three main groups:

- Source Control Techniques, which aim to reduce the quantity of run-off at source
- Permeable Conveyance Systems, which slow the velocity of the run-off to allow settlement, filtering and infiltration; and
- Passive Treatment Systems, which are end-of-pipe systems and provide passive treatment to collected water before discharge into a storm sewer or watercourse.

5.5.5 Not all SDS techniques will be appropriate for individual sites. However a sustainable drainage approach should be taken wherever possible on any site. The effectiveness of SDS type systems will depend on many factors, including run-off rates, ground conditions and typography in relation to size, type and density of the development. It is therefore important that SDS are designed to match local geological and hydrological conditions. It is also essential that the ownership and responsibility for maintenance of every sustainable drainage element is clear and that durable, long-term accountable arrangements are made for their management.

Types of Sustainable Drainage Systems:

5.5.6 **Pervious Pavements -** Most contemporary streets, pavements and hard standings have been built using impermeable surfaces. Consequently, the need for surface water drains and off-site sewers can be reduced where

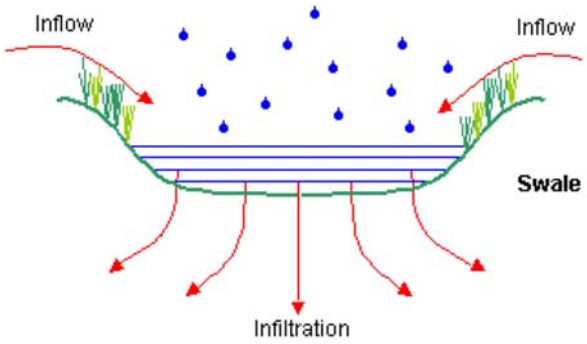
run-off is encouraged to permeate through pavements. Constructing pavements and other areas of hard standing from permeable concrete blocks, crushed stone, asphalt or other similar surfacing allows water to infiltrate directly into the subsoil,or be stored in an underground reservoir before slowly soaking into the ground. In addition,during the process pollutant removal occurs either within the surfacing material itself, or by the filtering action of the reservoir or subsoil.

5.5.7 **Infiltration Trenches and Filter Drains -** Infiltration trenches comprise stone filled reservoirs to which storm water run-off is diverted,and from which the water gradually infiltrates the ground. Their longevity is enhanced through the incorporation of a filter strip, gully or sump pit to remove excessive solids at the inflow. A filter drain filters water through soil into an underground pipe, providing more storage and some infiltration. The underground pipe is perforated to allow filtering and some infiltration of the water passing from the source to the discharge point.

5.5.8 **Swales and Basins -** Swales and basins are simple grassed depressions, leading run-off to a channel that provides temporary storage for storm water, therefore reducing peak flows to receiving waters (Figure 9). The grass and other vegetation, which needs very little management, filter the runoff by trapping organic and mineral particles that are then incorporated into the soil, while the vegetation takes up any nutrients. Swales and basins are often installed as part of a drainage network connecting to a pond or wetland prior to discharge to a natural watercourse. Due to the filtration process the discharged water has a much lower pollutant load than if the run-off had gone straight to the watercourse.

5.5.9 Swales and basins may be installed alongside roads to replace conventional kerbs, therefore saving construction and maintenance costs. They can also be created as features within the landscaped areas of a site or incorporated into ornamental, amenity and screen planted areas where they would be maintained as a part of the normal maintenance contract. However, care must be taken in the choice of vegetation; Shrubs and trees can be planted but the vegetated area will need to be wider and have a gentler slope. When choosing the plant species, consideration should also be given to the use of locally native and/or wildlife friendly species in order to maximise the benefits for biodiversity.

Figure 9 Swales and Basins



5.5.10 **Ponds and Wetlands -** Ponds and Wetlands can be designed specifically as part of the wider infrastructure of SDS to provide an enhanced flood storage capacity. Ponds and wetlands can be fed by swales, filter drains or piped systems. Where practical, storm water run-off from a development can feed a pond, which overflows into a vegetated wetland area to act as a natural soakaway. By allowing adequate detention time, the level of solids removal can be significant. Furthermore, the algae and plants of wetlands provide an effective filtering and nutrient removal system. Consequently, ponds and wetlands can significantly improve water quality.

5.5.11 Ponds or wetlands can be designed to accommodate considerable variations in water levels during storms. Although these can be designed as wet or dry ponds, or wetlands, they are most likely to contribute to visual amenity and biodiversity where they include a permanent water body. Ponds and wetlands should be designed to promote safety. The use of shallow side slopes, shallow shelving edges and strategically placed vegetation barriers can ensure that these features are as safe as any natural watercourse. When developing ponds and wetlands, it may be useful to introduce a surface water management train to change the flow and quality of the runoff in stages.

5.5.12 **Green Roofs -** A green roof is essentially the growing of plants on a rooftop. The plants and their growing medium (substrate) provide temporary storage of storm water and can reduce both the speed and volume of run-off. In terms of hydraulic performance any rainfall can be taken up by the soil substrate and removed by evapo-transporation. Only when the soil is fully saturated will water percolate through to the underlying drainage layer at significant volumes. A green roof will also provide a degree of attenuation.

5.5.13 Deeper substrates offer greater attenuation performance and support greater plant diversity, thus improving the energy efficiency and biodiversity potential benefits. Useful independent advice and guidance on the wide

range of options green roofs can offer for small or large scale developments can be obtained from www.livingroofs.org/ For further details on Green Roofs, please refer to section 5.7.5.

5.5.14 **Grey Water -** Correctly collected and stored, rainwater can meet a significant proportion of a building's water requirement. Using rainwater before it goes down the drain can also help to relieve the pressures on the drainage system but will not in itself normally attenuate all storm water. Instead of using water from the mains, the collected rainwater can be used for toilet flushing, clothes washing and outdoor uses where this is feasible. Further guidance on rainwater recycling systems is provided within section 5.4.4.

5.6 Increasing Recycling and Reducing Waste

5.6.1 The design and layout of a development is critical to ensure that sustainable waste management can be maximised. Well-designed and adequate refuse and recycling storage facilities can assist occupiers of a dwelling to develop actions that promote recycling and minimising refuse in a sustainable way in their day to day lives.

5.6.2 **Refuse and Recycling Storage -** Sufficient and appropriate space for refuse and recycling bin storage should be provided in new development. Designs should ensure that:

- Recycling facilities should be as easy to access as waste facilities;
- The location of bins does not have the potential to cause nuisance to occupiers of the development or those nearby; and
- There is no adverse impact on the amenity of the area.

5.6.3 **Refuse and recycling storage facilities -** must be considered early in the design stage of any development. Consideration must be taken as to the location of bins to ensure there is no nuisance caused to occupiers of the development or negative impact on the amenity of the area. Integration of sustainable waste management principles into design includes:

- Storage and recycling facilities: recycling facilities should be as easy to access as waste facilities. Developers must ensure that sufficient space is available for appropriate level of bin storage and that easy access is available for the collection of bins.
- Composting: provision for composting in properties with gardens or landscaped space.

5.6.4 Siting on frontage could be unacceptable where the proposed site would be highly visible, in a small garden, or where there is a change in levels from street to frontage.

5.7 Creating and Enhancing Wildlife Habitats

5.7.1 Development should seek to maintain and enhance the overall level of biodiversity, either through the provision of on-site habitats and in many cases secure enhancements. Recent legislative changes now impose a duty on planning authorities to conserve Biodiversity. New developments offer opportunities to create habitats and incorporate beneficial biodiversity features as part of good design.

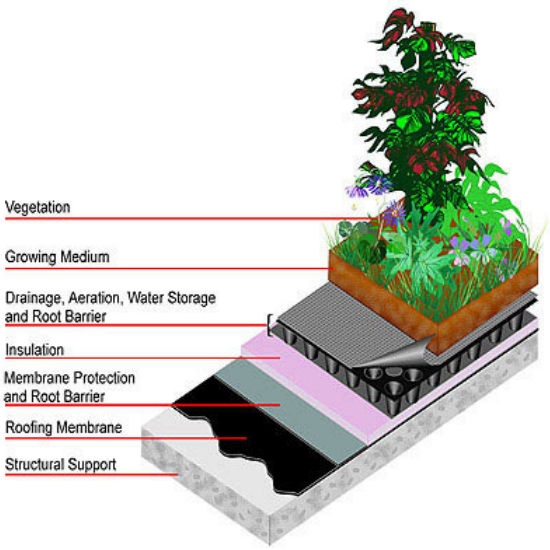
5.7.2 However, developments also have the potential to result in significant damage to or loss of habitats, both temporary and permanent. Consequently, it is imperative that the indirect as well as direct impacts of development activity on biodiversity are taken into consideration. There are opportunities within many development proposals to create, manage and enhance wildlife habitat and the natural landscape. In many instances, it will be possible to achieve habitat creation and enhancement.

5.7.3 Existing on-site valuable trees and vegetation should be retained wherever possible and linkages into the existing network of semi-natural and other open spaces should be maintained or enhanced in order to provide 'buffer' habitats, 'stepping stones' and 'corridors' for wildlife.

5.7.4 Opportunities for integrating on-site habitats into new buildings should be considered at the earliest stage in the design of new development. The specific measures incorporated will depend on local conditions. However, measures on buildings could include: green roofs, bird and bat boxes, and wall/façade planting. Measures within new landscaping could include the use of locally native and/or wildlife friendly species.

5.7.5 **Green Roofs -** A green, or living, roof is essentially the growing of plants on a rooftop. In order for plants to grow on roof tops, natural environmental conditions have to be created. This can be achieved by installing a series of functioning layers that, while retaining the necessary water to support the plants, allow excess water to drain off and protect the rood surface from plant roots and mechanical damage. The structure of a green roof is illustrated in Figure 10.

Figure 10



5.7.6 There are three main types of green roof:

- Extensive - normally consisting of mosses, succulents, herbs or grasses. They are intended to be self-sustaining, with no need for irrigation and minimal maintenance requirements. This form of green roof is the least demanding on the building structure. However, the biodiversity contribution of this kind of roof is restricted and it also has the lowest capacity for water retention.

- Simple intensive - slightly greater depth than extensive systems, they allow for a greater diversity of plants to be grown and local habitats recreated.

- Intensive - effectively roof gardens, similar to gardens at ground level, which consist of a thick layer of soil (150mm+) in which a variety of plants, vegetables, shrubs and trees can be grown. This type of roof has the potential to make the greatest contribution to water retention and biodiversity. They are often accessible and can even be used for recreational spaces. However, they require frequent maintenance (comparable to that of a normal garden) and place significant weight on the building structure.

5.7.7 Green roofs not only provide a useful wildlife habitat but can also deliver a wide range of economic, environmental and social benefits. They reduce the rate and volume of rainwater run-off, thereby decreasing the risk of flash flooding following high-intensity rainfall. The insulating properties of a green roof also improves the thermal efficiency of the building by diminishing heat loss during the winter and preventing overheating during summer, therefore decreasing the need to consume energy in order to heat or cool the building. Furthermore, the vegetation on a green roof can augment the acoustic performance of a building, enhance air quality by absorbing carbon dioxide and other pollutants, and alleviate the urban heat island effect by lowering temperatures around the building through evapo-transpiration.

5.7.8 In addition to cutting energy costs, green roofs can lessen the drainage infrastructure requirements on site, further decreasing costs for the developer. Green roofs can also provide a public amenity of value to local residents and workers, and can even be used for recreational purposes. The on-going maintenance associated with a green roof should be carefully considered before a decision is taken to incorporate one.

5.7.9 **Brown Roofs -** Brown roofs are intended to reduce the adverse affects associated with the loss of wildlife sites from development. A brown roof involves covering the roofs of new developments with a thin layer of crushed rubble and gravel, ideally obtained from the development itself. Brown roofs are intended to be gradually colonised by spiders and insects and provide a feeding site for insectivorous birds.

5.7.10 **Nest Boxes and Bat Boxes -** Installation of nest boxes for birds and bats at suitable locations around a development can provide valuable habitats and maintain/increase the nature value of the site. Consideration should be given to the landscaping in the vicinity of nest boxes. Further information on the provision of bird and bat boxes can be found at www.rspb.org.uk and www.bats.org.uk respectively.

5.7.11 **Landscaping -** High quality on-site landscaping can create attractive environments that improve the setting of a development. Landscape schemes should also be seen as an opportunity to retain, enhance or create habitats.

5.7.12 When choosing plant species for new landscaping, consideration should be given to the use of locally native and/or wildlife friendly species in order to maximise the benefits for biodiversity. Wherever possible, new landscaping should be linked to areas of existing landscaping, open space and any semi-natural habitats.

5.7.13 **Green Façades/Walls -** Planting on flanking/façade walls has a number of biodiversity benefits including providing additional wildlife habitats. As with green roofs, planting on flanking/façade walls can deliver a number of additional benefits, such as reducing heat loss during the winter and maintaining a comfortable internal temperature during the summer.

5.7.14 A range of species may be suitable for green facades, including lichens, grasses, flowering and climbing plants. Locally native species should be used as far as practicable. Planting should be planned so that safe access to the wall surface and particularly any services (such as downpipes, gutters or flues) are maintained.

5.8 Building With Sustainable Materials

5.8.1 Materials used in development can have a significant impact on the building's carbon emissions. This may be through the role of the materials specified and their contribution to the efficiency of the building. Further considerations include embodied energy (the energy used in obtaining the raw materials, manufacturing and transport to the development site) and sustainably sourced materials for use.

Sustainable Material Use

5.8.2 Material specifications should consider the impact of the procurement of materials carefully to ensure they are as lean, clean and green as possible. Materials from a sustainable, renewable or a recycled source can limit the amount of the earth's finite resources used. Materials such as timber from sustainable forests certified by an organisation such as the Forest Stewardship Council (FSC) which is independent, non-governmental, not for profit and established to promote the responsible management of the world's forests.

5.8.3 Materials should be sourced with minimal impact on the environment and with low embodied energy. Materials such as aluminium that requires a large amount of energy to extract, process and transport is an example of having a high embodied energy.

5.8.4 Care should be taken to avoid detrimental impacts on biodiversity, which are caused by the use of materials such as peat, weather-worn limestone or other materials from vulnerable habitats.

5.8.5 Durability and the adaptability of the materials should also be considered. Thought needs to be given to the whole life cycle of the development. Consideration such as the durability and the amount of maintenance the materials will require, should be answered during the planning and design of the development.

5.8.6 Also the role that materials can play in passive solar design should be considered at the design stage, for example when seeking pre-application advice.

Re-used or Recycled Materials

5.8.7 Building materials can be re-used or recycled in new projects. Examples of materials that can be re-used include bricks, hardcore or timber doors. These may require inspection to ensure their suitability, or in the case of timber, simple repairs. This can reduce the amount of raw natural resources used in the construction of a building and may also help retain the character of an area, particularly for Listed Buildings and Conservation Areas.

5.8.8 Recycled materials are those which require re-processing before re-use. Re-use materials are preferred in environmental terms because energy, resource use, and often energy used in transport, are less than is the case with recycled materials.

5.8.9 The design and the procurement of materials for a development should also maximise the proportion of materials and components that can be re-used or recycled at the end of the buildings life.

5.8.10 Rather than demolition, sustainable buildings should use materials that can be used after deconstruction or disassembly. Deconstruction or disassembly means that the building is dismantled, or taken apart, in a way that various components can be reused or recycled in a future development. Therefore, there is less resultant waste going to landfill. This further limits the amount of the earth's resources that we use and minimises waste.

5.9 Reducing Noise Pollution and Improving Air Quality

5.9.1 Planning policies at all levels are constantly trying to balance the need to provide ever-increasing demand for development land, with the protection of ever-decreasing environmental assets. This has led in recent years to higher density developments, the construction of buildings close to major roads, the need to utilise previously developed land and, to improve accessibility. As a consequence, in some cases developments have been built in close proximity to neighbours that are less compatible than would previously have been expected.

Reducing Noise and Improving Air Quality

5.9.2 The mitigation of noise, especially in housing and other sensitive uses, needs to be carefully designed into new development, particularly where it is located near to busy roads, railway lines or other noise generating activities. Similarly, although a number of measures are proposed in this

SPD and elsewhere to try to reduce car use, through promotion of public transport use, cycling and walking, it is essential that the impact of ambient air pollution, from vehicular emissions and other sources, be considered when looking at proposed locations for new developments. The affects of poor air quality on health increase gradually as pollution levels rise. However for those with lung or heart conditions, such as bronchitis or emphysema, the effects of poor air quality can be serious.

5.9.3 New buildings need to be constructed in line with Building Regulations Approved Document E 'Resistance to the Passage of Sound' to ensure levels of sound insulation are acceptable internally and to reduce external noise. Features such as acoustic glazing, acoustic barrier fencing and landscaping belts can also be used to significantly decrease the impact of noise on the occupiers/users of new developments.

5.9.4 Natural ventilation systems, which rely on opening windows, can make it difficult for developments to provide an adequate level of protection from ambient air and noise pollution whilst maintaining a comfortable internal temperature during the summer. However, air conditioning and/or mechanical ventilation systems generate high-energy demands and in some cases rely on refrigerants that are far more harmful to climate change than CO_2. Consequently, where housing and other sensitive uses have to rely on air conditioning and/or mechanical ventilation systems owing to their proximity to sources of noise and/or ambient air pollution, the development should achieve a proportionate increase in energy efficiency and/or use of renewable energy supplies.

The Construction Process

5.9.5 The construction process itself can also generate significant amounts of noise and air pollution. Consequently, the Council will welcome development proposals that are accompanied by proposals to minimise the impact of construction activities on the amenity of neighbours. The Considerate Constructors Scheme is a voluntary scheme designed to promote and encourage safe, considerate, clean and responsible builders and building sites and includes information on environmental issues such as the minimisation of waste and the consumption of energy.

5.9.6 Further guidance on the Considerate Constructors Scheme is available from www.considerateconstructorsscheme.org.uk. Guidance on best practice on noise and air pollution can be found at www.quiet.org.uk, www.noisenet.org and www.constructingexcellence.org.uk.

5.9.7 Green Travel Plans, as encouraged through the BREEAM standards, can also be put in place to encourage the use of low carbon transport to site for operatives and the better planning of deliveries to limit the overall generation of carbon in the construction industry.

5.10 Encouraging More Sustainable Methods of Transport

5.10.1 Transport and movement should be a key consideration when designing a new development, and forms an important part of the CSH and BREEAM assessment criteria. Issues for consideration are;

- Public transport
- Parking capacity
- Site design for pedestrian and cycle safety
- Proximity of local amenities
- Traffic management
- Car clubs
- Cycle paths and;
- Cycle storage facilities

5.10.2 The way people travel to and from a development is an important consideration. A significant amount of energy in the Borough is wasted through inefficient transport. More efficient energy consumption can be achieved through the greater use of public transport and the promotion of cycling and walking and the reduced reliance of private vehicles such as cars.

5.10.3 **Car Parking and Public Transport Accessibility Level (PTAL) ratings-** Road space is a finite resource as building new roads is often unfeasible, impractical and very disruptive. Reliance on cars as the primary transport option can lead to congestion, in terms of traffic generation, parking requirements and poorer air quality (particularly along main transport routes). This can lead to an increasingly unhealthy and inefficient way of travelling.

5.10.4 It is important to consider whether the location is appropriate for the proposed development in terms of transport accessibility. Planning applications for high density housing should be located within close proximity of public transport, walking and cycling routes, and shops, thereby reducing the need to travel by car. Moreover, applications that involve increasing the density of a site, including flat conversions, may not be acceptable in locations of relatively low Public Transport Accessibility Level (PTAL) rating unless fully justified, having regard to the development as a whole or where development includes proposals to make the site more accessible by public transport. This can lead to an increased reliance on cars for transport, the cumulative impact can lead to increased congestion.

5.10.5 Please refer to the Eastbourne Borough Council Parking at Development and Local Sustainable Accessibility Improvement Contributions Supplementary Planning Guidance, for further clarification on minimum car parking requirements.

5.10.6 **Facilities for Cyclists -** Provision for cycle parking is essential to support the development of cycling as a practical transport choice. Eastbourne Borough Council is committed to providing a safer network of routes across the town for cycling and other sustainable means of transport. The Eastbourne Cycling Strategy 2012 website provides details of cycling and cycle routes within Eastbourne.

5.10.7 Communal parking areas should incorporate secure cycle parking unless there are overriding circumstances why this is not possible.. The minimum standards for the provision of cycle parking in new developments are set out in the Eastbourne Borough Council Parking at Development and Local Sustainable Accessibility Improvement Contributions Supplementary Planning Guidance.

5.10.8 When a cycle parking area is being provided it should:

- Incorporate Sheffield stands (or the equivalent) or wall mounted bars. Wheel slots or butterfly racks are not usually acceptable;
- Be protected from the weather with a roof over the stands;
- Be positioned where it would be overlooked by the public or staff; or at least CCTV, in order to maximise the actual and perceived level of security;
- Be positioned where it can be easily reached from access routes and where its use would not conflict with pedestrians; and
- Be appropriately lit in order to discourage crime and improve visibility for users.

5.10.9 If the cycle parking is intended for long-stay use, the applicant should consider providing shelters with lockable gates in order to provide greater security for the bicycles.

5.10.10 In major employment developments it should also be practicable to incorporate showers, changing facilities and lockers to enable employees to travel to work by bicycle.

5.10.11 **Facilities for Pedestrians -** Patterns of development and the location, scale, density, design and mix of land uses is a key influence upon the need to travel and the convenience of walking as a viable alternative to travel by private car.

5.10.12 Facilitating movement to/from and around developments includes, for example, providing pedestrian routes to/from the public highway, pedestrian improvements to the local highway, incorporating pedestrian crossings and ensuring that pedestrian environments are safe, accessible,

free from barriers and attractive. This is particularly relevant where journeys are made by public transport, since walking is always the first and last element of such journeys.

5.10.13 The Department for Transport's guide 'Manual for Streets' provides guidance on the planning and design of new residential streets, and modifications to existing ones. It aims to increase the quality of life through good design and create more people-orientated streets. The 'Manual for Streets' guidance is available on the Department for Transport's website.

6 Implementation, Monitoring and Review

6.1 Implementation

6.1.1 The provisions of this SPD will be implemented primarily through the development control process and the determination of applications for planning permission or prior approval. The SPD does not have the status of the development plan but will be an important material consideration in determining applications for planning permission.

6.2 Monitoring

6.2.1 The effectiveness of the SPD will be assessed annually in Eastbourne's Local Monitoring Report (LMR). This will identify whether there have been any problems in implementing the SPD, and assess whether it is having its intended effects. The key indicators will be:

- % of development proposals that provides its energy supply from on-site renewable energy sources or through connections to a renewable or low-carbon decentralised energy supply.
- % of new residential developments that incorporate measures to achieve an internal potable water consumption of no more than 105 litres per person per day
- % of waste that is turned into compost or recycled.
- % of new residential developments within 30 minutes' public transport travel time of various key facilities.

6.3 Review

6.3.1 The assessment of the SPD's performance in the LMR will help to identify whether there is a need for the SPD to be reviewed. If a need for review is identified, then a timetable for this process will be included in Eastbourne's Local Development Scheme (LDS).

Appendix 1 Summary Table

This table summarises what is required of new development in order to meet the Sustainable Design criteria. Planning applications should be accompanied by a relevant 'Checklist', which can be found in Appendix 2.

Household and Small Scale Developments

(To Complete and Submit Checklist A)

- New residential and/or mixed use developments with 2 or fewer residential units; or
- Residential extensions, conversions, and change of use and/or mixed-use developments numbering 2 or fewer residential units; or
- Retail development of 150 sq m or less; or
- Any other development of 235 sq m or less.

Table 2 Household and Small Scale Development Checklist Summary

Development	What is required?
New build residential	• Level 4 of the Code for Sustainable Homes • Demonstrate how the development contributes to the Energy Opportunities Plan
Non-residential (including new build, conversions and extensions)	• Reduction in energy use • Reduction in water use • Reducing the risk of flooding and minimisation of surface water run-off • Improved access to sustainable transport

Large Scale Developments (To Complete and Submit Checklist B)

- New residential and/or mixed use developments with 3 or more residential units; or
- Residential extensions, conversions, and change of use and/or mixed-use developments numbering 3 or more residential units; or
- Retail development of more than 150 sq m; or
- Any other development over 236 sq m or being developed on a site of 0.5ha or greater.

Table 3 Large Scale Development Checklist Summary

Development	What is required?
New build residential	• Level 4 of the Code for Sustainable Homes • Water use of less than 105 litres per head per day • Demonstrate how the development contributes to the Energy Opportunities Plan

Development	What is required?
	• Measures to increase levels of household waste recycling • Developments in areas on the Energy Opportunities Plan designated as suitable for Combined Heat and Power should ensure developments are connection ready • Improved access to sustainable transport Developments of 5 units or more: • Biodiversity Survey to ensure development does not impact on species of importance
Non-residential (including new build, conversions and extensions)	Developments of 5 units or more: • Biodiversity Survey to ensure development does not impact on species of importance • To meet BREEAM 'very good' standard

Appendix 2 Checklist to be Submitted with Planning Application

Appendix 2 Checklist to be Submitted with Planning Application

Checklist A – Applications for household and small scale developments

- New residential and/or mixed use developments with 2 or fewer residential units; or
- Residential extensions, conversions, and change of use and/or mixed-use developments numbering 2 or fewer residential units; or
- Retail development of 150 sq m or less; or
- Any other development of 235 sq m or less.

Please refer to the numbered sections of the Sustainable Building Design SPD for more detailed information, and the Code for Sustainable Homes (CLG, 2006) and BREEAM criteria in Appendix 3.

Or visit the websites www.planningportal.gov.uk/uploads/code_for_sust_homes.pdf or http://www.breeam.org/

Compulsory Criteria

Table 4 Compulsory Criteria Relating to Applications for Household and Small Scale Developments

Sustainable Building Design Topic (Section)	Sustainable Outcomes Sought	Yes/No Please Indicate	Details
(4.1) Code for Sustainable Homes (CSH) Level 4 (New Build Residential Only)	Will the development achieve the Code for Sustainable Homes Level 4 standard? *Provide certification and other details in the Design and Access statement.*		Provide details separately
(5.2) Contributing to the Energy Opportunities Plan	What renewable energy technologies will be incorporated into the development, to meet the requirements of the Energy Opportunities Plan?: • Solar water heating systems • Solar photovoltaic tiles		

Sustainable Building Design Topic (Section)	Sustainable Outcomes Sought	Yes/No Please Indicate	Details
	• Generation from biomass or bio fuels • Wind generated energy • Heat pumps • Other renewable energy technologies (please give details)		

Checklist B – Applications for large scale developments

- New residential and/or mixed use developments with 3 or more residential units; or
- Residential extensions, conversions, and change of use and/or mixed-use developments numbering 3 or more residential units; or
- Retail development of more than 150 sq m; or
- Any other development over 236 sq m or being developed on a site of 0.5ha or greater.

Please refer to the numbered sections of the Sustainable Building Design SPD for more detailed information, and the Code for Sustainable Homes (CLG, 2006) and BREEAM criteria in Appendix 3.

Or visit the websites www.planningportal.gov.uk/uploads/code_for_sust_homes.pdf or http://www.breeam.org/

Compulsory Criteria

Table 5 Compulsory Criteria Relating to Applications for Large Scale Developments

Sustainable Building Design Topic (Section)	Sustainable Outcomes Sought	Yes/No Please Indicate	Details
(4.1) Code for Sustainable Homes (CSH) Level 4 (New Build Residential Only)	Will the development achieve the appropriate level to meet the Code for Sustainable Homes Level 4 standard? *Provide certification and other details in the Design and Access statement.*		Provide details separately
(4.2) BREEAM 'Very Good' standard (Non-Residential over 1000 sq. M. Only)	Will the development achieve the appropriate level to meet the BREEAM 'Very Good' standard? *Provide certification and details in the Design and Access statement.*		Provide details separately
(5.2) Contributing to the Energy Opportunities Plan	What renewable energy technologies will be incorporated into the development, to meet the requirements of the Energy Opportunities Plan?: • Solar water heating systems		Provide details separately

Sustainable Building Design Topic (Section)	Sustainable Outcomes Sought	Yes/No Please Indicate	Details
	• Solar photovoltaic tiles • Generation from biomass or bio fuels • Wind generated energy • Heat pumps • Other renewable energy technologies (please give details) Is the development connection ready to a potential district heating network? (Developments of 10 units or more) *** Please refer to the technical note on contributing to the Carbon Buyout Fund, should this option not be viable.**		
(5.7) Creating and enhancing wildlife habitats	Has a Biodiversity Survey been submitted with the application? (Development of 5 units or more only)		Provide details separately

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Appendix 3 Glossary of Terms

Air Pollution: air pollution is the introduction into the atmosphere of chemicals, particulates, or other materials that cause harm or discomfort to humans or other living organisms, or damages the environment.

Air Source Heat Pumps: these absorb heat from the outside air, which can then be used to heat buildings through radiators or warm air convectors.

Biodiversity: the range and variety of life (including plants, animals and micro-organisms) as well as habitats, ecosystems and ecological processes.

Bio-fuels: a type of fuel that can be made from crops including corn, rapeseed or sugarcane.

Biomass: a renewable energy source, often made from plant based material that can be used as fuel, for example, wood chippings.

BREEAM: Building **R**esearch **E**stablishment **E**nvironmental **A**ssessment **M**ethod (see Chapter 4)

Brownfield (site/land): previously developed land.

Brown roofs: use brick or rubble to cover the roof and are not planted, but left to colonise naturally.

Building a Greener Future: a document published by the Government, detailing how to reduce the Carbon Footprint of new development.

Building Research Establishment (**BRE**) - Acting a Trust, the BRE Group are a UK based world leading research, consultancy, training, testing and certification organisations delivering sustainability and innovation across the built environment. The BRE Trust is to be held as a national asset on behalf of the construction industry and its clients, independent of specific commercial interests. This protects BRE's impartiality and objectivity in research and advice.

Carbon Emissions: Carbon dioxide (CO2) is an atmospheric gas comprised of one carbon and two oxygen atoms. It is recognised that emissions of CO2 is a contributor to the Greenhouse Effect.

Cavity insulation: a method of reducing heat loss through cavities (such as walls) by filling the space with an insulating material, which retains the heat in a building.

Combined Heat and Power (CHP): two thirds of energy generated by centralised power stations is lost as 'waste' heat. CPH is the simultaneous generation of usable heat and power (usually electricity) in a single process that can be used within the local area.

Climate Change: is any long-term significant change in the "average weather" that a given region experiences. Average weather may include average temperature, precipitation and wind patterns. Mainstream scientific consensus suggests a link between human activity and modern climate change.

Code for Sustainable Homes: this is a Government accreditation system for measuring the sustainability of new housing development.

Conservation Area: an area of special architectural or historic interest, the character of which is desirable to preserve or enhance.

Density (of dwellings): a measure used to describe the numbers of housing units within a given area, usually expressed in terms of the number of habitable rooms per hectare. The site area includes the total area within the defined site including roads within the site and also private garden space, car parking space, incidental open space and landscaping, and children's play areas where these are provided.

District heating: is the use of a centralised boiler to provide heat for a number of buildings.

Eastbourne Plan, The: showcases visions and policies which set out the future development of Eastbourne to 2027.

Eastbourne Townscape Guide Supplemenmtary Planning Guidnace (SPG): builds on the policies in the Urban Heritage and Townscape Chapter of the Eastbourne Borough Plan 2001-2011. The Eastbourne Townscape Guide is mainly concerned with the built historic environment although some advice applies to the general urban area.

Embodied energy: the energy used in obtaining the raw resource and then the manufacturing and transport of the materials to the development site.

Environment: includes the 'natural' environment (air water, land, plants and animals and all associated cycles and ecosystems) and the 'built' environment (buildings and other structures built by humans).

Evapo-transporation: the term used to describe the sum of evaporation and plant transpiration from the Earth's land surface to atmosphere.

Filter drains: a type of drainage system using a material membrane to prevent pollution and flooding.

Floor insulation: insulating material is put under the floorboards to prevent loss of heat through the floor.

Forest Stewardship Council: is an independent, non-governmental, not for profit organisation established to promote the responsible management of the world's forests.

Greenfield(site/land): Land that has not had buildings or development on it before, undeveloped land or open space.

Greenhouse Effect: greenhouse gases trapping heat within the atmosphere rather than letting the heat escape into space.

Green façades/walls: are essentially a living, and therefore self-regenerating, cladding system using climbing plants.

Greenhouse Gas: the gases present in the earth's atmosphere which warm near-surface global temperatures through the greenhouse effect. Greenhouse gases are essential to maintaining the temperature of the Earth; without them the planet would be so cold that it would be uninhabitable. The most abundant greenhouse gases are, in order of relative abundance: water vapour (including clouds), carbon dioxide, methane, nitrous oxide, ozone and chlorofluorocarbons (CFCs).

Green roofs: a roof of a building which is partially, or completed covered in living plants and a growing medium, which absorbs rainwater and provides insulation.

Grey Water: waste water from all sources in a property other than toilet, which can often be recycled for purposes that do not require drinking water quality.

Habitat: It is the environment in which an organism lives.

Ground Source Heat Pumps: uses pipes to buried in the ground to extract heat from the earth, which is often used to warm radiators or under floor heating.

Hectare: 10,000m^2.

Infiltration Trench: a shallow excavated trench, backfilled with stones to create an underground reservoir that will divert storm water.

Kyoto Protocol: a protocol to the international 'Framework Convention on Climate Change', which is an international agreement signed by one hundred and thirty-seven countries including the European Union acting as a single party. This agreement has the objective of reducing greenhouse gases produced through human activity in an effort to prevent climate change.

ListedBuilding: a building that is of national, architectural or historic importance. The Secretary of State (Department of Media, Culture and Sport) is responsible for the Statutory List of Buildings of Architectural or Historic Interest. Any building they deem to be of national historic and architectural value can be added to this list, and therefore becomes a listed building.

Local Development Documents (LDDs): individual planning documents comprising of Development Plan Documents and Supplementary Planning Documents.

Local Development Scheme (LDS): sets out the timetable the Council will follow in its production of planning policy documents over a three-year period.

Local Monitoring Report (LMR): the primary role this report is to monitor policies in the Borough Plan, and in the future, the Eastbourne Plan- Core Strategy.

'Manual for Streets': published by the Department for Transport, gives advice for the design of residential streets in England and Wales.

Micro-generation: is the small-scale generation of heat and power by individuals, small businesses and communities to meet their own needs.

National Planning Policy Framework: a draft document published by the Government, aiming to make the planning system less complex.

Natural ventilation: is the process of supplying and removing air through an indoor space by natural means.

Non-potable water: water that is not of drinking water quality, but which may still be used for many other purposes, depending on its quality.

Passive Shading: buildings can be designed to make the best use of winter sun, whilst Shading that can make the best use of sunlight on north facing windows, whilst shading walls and windows from the more direct hot summer sun.

Passive Ventilation: can naturally ventilate homes by using the natural upward movement of warm air and the downward movement of cool air, without the need for air conditioning or electric fans.

Permeable or porous materials: allow water to soak through the surface and into the ground. When used on driveways, permeable or porous materials can help prevent flooding.

Pervious pavements: is a permeable pavement surface with an underlying stone reservoir that temporarily stores surface runoff before infiltrating into the subsoil.

Photo-voltaic Cells (PV): the process used by solar cells in energy production by converting sunlight directly into electricity.

Planning and Compulsory Purchase Act (2004): An Act to make provision relating to spatial development and town and country *planning;* and the *compulsory* acquisition of land.

Potable water: water of a quality suitable for drinking, cooking and personal bathing.

Public Transport Accessibility Level (**PTAL):** the extent and ease of access, by public transport, from one place to another. Usually given a rating from 1 to 6, the PTAL is calculated taking into account the distance from any given point to the nearest public transport stops and the frequency of the service from those stops. On the scale, 6 is close to public transport and **1** is further away.

Rainwater harvesting: systems to collect the rain for use in the house and garden.

Reclaimed water: is highly treated wastewater and can be used for irrigation and other uses.

Recycled water: any water that has been used at least once and then supplied for reuse, either treated or untreated.

Solar water heating: uses free heat from the sun to warm domestic hot water.

Solid wall insulation: insulation by means of render or plaster to the solid walls of a house.

Sunspaces: allows you to collect enough free alternative energy to produce up to 50 percent of the heating needs of a typical household.

Strategic Flood Risk Assessment: details potential areas and causes of flooding within an area.

Supplementary Planning Document (SPDs): SPDs expand upon or add detail to policies within Development Plan Documents. They do not introduce new policies and must be consistent with local, regional and national policies. This SPD provides greater detail to higher level policies in the Eastbourne Plan requiring sustainability measures to be included in building design within the Borough.

Supplementary Planning Guidance (SPGs): SPGs expand upon or add detail to policies within the Core Strategy. Similar to SPDs, SPGs do not introduce new policies and must be consistent with regional and national policies. They too can take the form of design guides or area development briefs.

Sustainable Community Strategy: shows how the organisations making up the Eastbourne Strategic Partnership will try to shape the effects of global, national, regional and local trends and events to work towards successful outcomes for Eastbourne.

Sustainable development: development that meets the needs of the present generations without compromising the ability of future generations to meet their own needs.

Sustainable drainage systems: designed to reduce the potential impact of additional water from a development.

Swales and basins: shallow drainage channels in the ground where run-off can collect and soak away or carry water through a site.