EASTLEIGH BOROUGH COUNCIL

LOCAL DEVELOPMENT FRAMEWORK

Environmentally Sustainable Development

SUPPLEMENTARY PLANNING DOCUMENT

ADOPTED

5 MARCH 2009

EASTLEIGH BOROUGH COUNCIL

APPENDIX 1: SUSTAINABLE DEVELOPMENT: Technical Guidance

CONTENTS

DEFINITIONS

[The Code for Sustainable Homes

This is for for **'Residential development'** (all new houses and flats but not extensions and conversions nor institutional accommodation).

The Code is an environmental assessment method for new homes based upon the BREEAM 'Ecohomes' which it replaced (in England) in April 2007. Each development to be assessed against the Code needs to be registered with the BRE by a BRE-licensed Assessor, who is employed by the developer. The development is assessed by the Assessor who awards credits when sufficient documentary proof has been supplied to satisfy each credit requirement. The Code covers 9 areas of environmentally sustainable development, namely:

- Energy/CO_2
- Water
- Materials
- Surface Water Runoff
- Waste
- Pollution
- Health and Wellbeing
- Management
- Ecology

There are minimum mandatory standards for Energy/Co2, Water Consumption, Waste, Surface Water Run-off and Materials at Level 1. There are further minimum mandatory standards for Water Consumption at levels 3 and 5. Energy/CO_2 has mandatory

minimum standards at each of the levels culminating in level 6 which requires “carbon neutral” development.
Lifetime Homes compliance is mandatory at level 6

The BRE audits the assessments and awards a certificate according to the final point score. Seven levels are possible (see table 1):

RATING	***Minimum Score Required (%)***
FAIL	< 36
Level 2	36
Level 2	48
Level 3	57
Level 4	68
Level 5	84
Level 6	90

Table 1: Code FSH Ratings

Certification is compulsory at both the design stage (interim certificate) and at the post construction review stage (final certificate). A certificate is issued for each individual dwelling rather than for the whole development. Dwellings can be grouped into ‘Code Dwelling Types’ that share the same features and hence receive the same credits to save unnecessary repetition.

For more general information about the Code and finding an Assessor refer to the BRE website, link below:

THE CODE FOR SUSTAINABLE HOMES

The Code for Sustainable Homes, Technical Guide, published by DCLG (October 2008), can be found on the following link:

http://www.planningportal.gov.uk/uploads/code_for_sustainable_homes_techguide.pdf

The Code Technical Guide, describes the aim of each category, the number of credits to achieve for each category and whether they are mandatory or optional. It explains the assessment criteria, lists the information that the BRE licensed Assessor will require from the development to demonstrate compliance and describes the assessment methodology for the design stage and post-construction stage and calculation procedures.

BREEAM

For 'Multi-residential' (institutional accommodation such as student halls of residence or sheletered housing for the elderly) and **'Non-residential'** devlopment (all other building uses such as offices, retail buildings, schools, industrial buildings etc.)

The Building Research Establishment Environmental Assessment Method (BREEAM) is an independent appraisal method to certify the environmental performance of a building. BREEAM Buildings can be used to assess the environmental performance of **any** type of building (new and existing). Standard versions exist for common building types and less common building types can be assessed against tailored criteria under the Bespoke BREEAM version.

BREEAM covers 8 areas of environmentally sustainable development, namely:

- Management
- Health and Wellbeing
- Energy
- Transport
- Water
- Materials and Waste
- Land Use and Ecology
- Pollution

The issues within these areas vary according to the specific assessment model being used but there are a lot of issues in common. One aspect that is strikingly different from the Code for Sustainable Homes (see below) is the BREEAM credits for access to the site, particularly for non-car users and its location in relation to key facilities.

To achieve a BREEAM rating, the minimum percentage score (see table 2) must be achieved and the minimum standards (i.e. number of credits achieved) applicable to that rating level complied with.

BREEAM Issue	BREEAM Rating/ Mininum number of credits				
	PASS	GOOD	VERY GOOD	EXCELLENT	OUTSTANDING
Man 1 - Commissioning	1	1	1	1	2
Man 2 - Considerate Constructors				1	2
Man 4 - Building user guide				1	1
Man 9 - Publication of building information (BREEAM Education only)					1
Man 10 - Development as a learning resource (BREEAM Education only)					1
Hea 4 - High frequency lighting	1	1	1	1	1
Hea 12 - Microbial contamination	1	1	1	1	1
Ene 1 - Reduction of CO2 emissions				6	10
Ene 2 - Sub-metering of substantial energy uses			1	1	1
Ene 5 - Low or zero carbon technologies				1	1
Wat 1 - Water consumption		1	1	1	2
Wat 2 - Water meter		1	1	1	1
Wst 3 - Storage of recyclable waste				1	1
LE 4 - Mitigating ecological impact			1	1	1

Table 2: Minimum BREEAM standards

Each development needs to be registered with the BRE by a BRE-licensed Assessor, who is employed by the developer. The development is assessed by the Assessor who awards credits when sufficient documentary proof has been supplied to satisfy each credit requirement. The BRE audits the assessments and awards a certificate according to the final point score. Five levels are possible (see table 3):

RATING	*Minimum Score Required (%)*
UNCLASSIFIED	<30
PASS	≥30
GOOD	≥45
VERY GOOD	≥55
EXCELLENT	≥70
OUTSTANDING	≥85

Table 3: BREEAM Ratings

Certification is compulsory at the design stage and is optional at the post construction review stage. A certificate is issued for the whole development rather than for individual buildings.

More information including pre-assessment estimators and technical guides for each of the BREEAM assessments can be found on the following website:

http://www.breeam.org/

The current models of BREEAM Assessment available are shown in the table 4 below.

BREEAM: Healthcare

BREEAM Healthcare can be used to assess all healthcare buildings containing medical facilities, and at different stages of their lifecycle.

An additional tool BREEAM Healthcare XB also offers a solution for existing buildings in operation.

BREEAM: Industrial

BREEAM Industrial can assess storage & distribution, light industrial units, factories and workshops at the design stage and post construction.

BREEAM: Multi-residential

BREEAM Multi-Residential can assess student halls of residence, sheltered housing for the elderly, supported housing and hostel type accommodation at the design stage and post construction.

BREEAM: Prisons

BREEAM Prisons can assess high and standard security prisons, young offenders institutions, local prisons and women's prisons at the design stage and post construction.

BREEAM: Offices

BREEAM Offices can assess new build or major refurbishment and existing offices, at the design stage, post construction and in use.

BREEAM: Retail

BREEAM Retail can assess new build or major refurbishment, post construction, tenant fit-out, existing (occupied), management and operation.

BREEAM: Education

BREEAM Education can assess new schools, major refurbishment projects

Table 4: The current BREEAM Assessment Models relevant to this document

1.0 GENERAL SUSTAINABLE DEVELOPMENT

1.1 Minimum Code For Sustainable Homes and BREEAM Requirements

Certification under the Code FSH and BREEAM provides a good indication of a certain level of sustainable development over a broad range of sustainable measures. Where the Council has more specific requirements these may be found within the detail of the assessment methods (specific credits required for a particular issue) or are requirements not specifically covered by the Code FSH or BREEAM. These specific issues are covered in subsequent Essential Requirements in this document.

The general sustainable development requirement needs to escalate over the next decade to keep pace with expected Building Regulations changes and the target for Zero Carbon Homes by 2016. The development industry also needs some time to employ new design strategies and use new technologies and materials before the top levels of the assessment methods are required for all development.

Policy Context

(See Appendix 2)

- **South East Plan Policies SH8 (iv); CC1; CC2; CC4**
- **PUSH Planning Policy Framework**
- **Eastleigh Local Plan Policies 37.ES; 20.CO; 25.NC; 26.NC; 28.ES; 33.ES; 36.ES; 38.ES; 45.ES; 59.BE.**

Essential Requirement ESD 1

The Council requires all residential development of 10 dwellings or more to:

- Achieve Level 3 of the Code up to the end of 2010*

The Council requires all residential development to:

-
- Achieve Level 3 of the Code from January 2011 up to the end of 2011*
  Achieve Level 4 of the Code from January 2012*
  Achieve Level 5 of the Code from January 2014*
- Achieve Level 6 of the Code
  from January 2016*

The Council requires all non-residential and multi-residential development above 1000 sq m of external floor space to:

- Achieve BREEAM level "very good" up to the end of 2010*

The Council requires all non-residential and multi-residential development above 500 sq m of external floor space to:

- Achieve BREEAM level 'very good' from January 2011 up to the end of 2011*

- Achieve BREEAM level 'excellent' from January 2012*

* At the time planning application is submitted

EBC G1 COMPLIANCE CHECK

Residential:

Up to 2011: Code FSH Level 3 certificates at both design and post construction phases
2012-2013: Level 4 certificates at both design and post construction phases
2014-2015: Level 4 certificates at both design and post construction phases
From 2016: Level 6 certificates at both design and post construction phases

Non-residential and Multi-residential:

Up to 2011: BREEAM 'very good' standard certificates at design stage and post construction stage

From 2012: BREEAM 'excellent' standard certificates at design stage and post construction stage.

Sustainability Checklist

Q.1.1: What level of the Code FSH or BREEAM is the development proposed to achieve?

Planning Implications

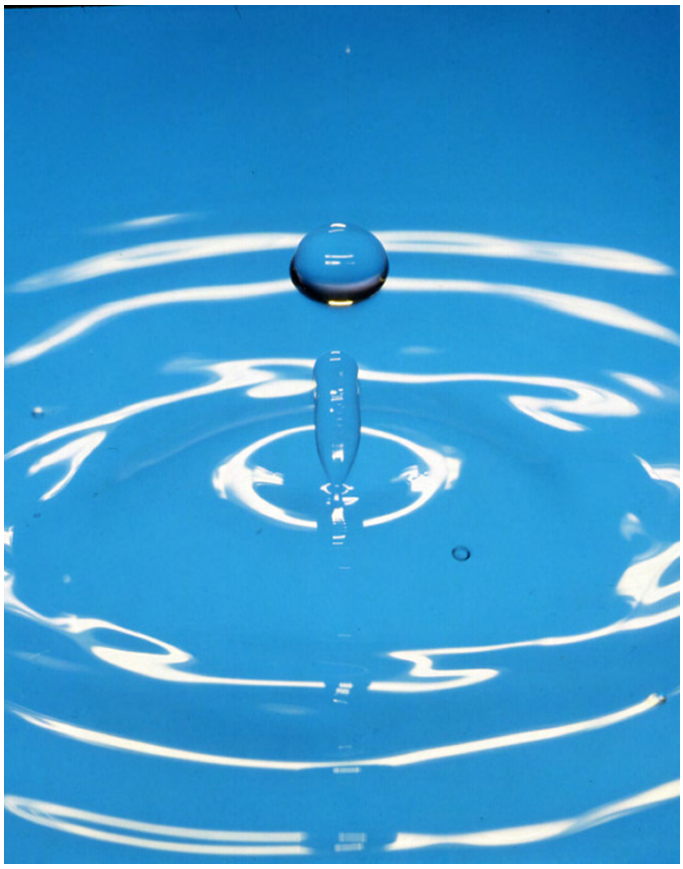
These can be very varied and sometimes significant. The developer and the appointed assessor should be using the Code FSH or BREEAM requirements to inform the development design from the earliest stage. Layout and choice of materials are likely to be influenced by this Essential Requirement.

Further Guidance

PUSH *Sustainable Development SPD Guidance 2009*

BRE: http://www.bre.co.uk/

2.0 WATER



Water is becoming increasingly scarce as demand continues to increase dramatically. Over the last 30 years water consumption in the UK has risen by 70%. The average domestic water consumption is approximately 160 litres/person/day (150 l/p/day for new dwellings). Certain levels of the Code FSH have mandatory maximum consumption levels. (see table x) These are predicted levels calculated from the water fittings in any particular dwelling rather than actual consumption (which will depend on individual circumstances and behaviour).

Water consumption (litres/person/day)	Credits	Mandatory Levels
≤ 120	1	Levels 1 and 2
≤ 110	2	
≤ 105	3	Levels 3 and 4
≤ 90	4	
≤ 80	5	Levels 5 and 6

Table 2.1 (From Wat 1 (Internal Potable water Use) CSH Technical Guide)

There are many actions that can be taken to minimise water consumption and all should be considered. Sanitary use of water within a dwelling is significant and a number of steps can be taken to minimise consumption. Water-saving/efficient devices and appliances are just as economical to install into an existing building as they are at the initial construction phase.

Once all the possible water efficient appliances have been fitted, further significant efficiencies can be attained through recycling of rainwater and 'greywater'. Sustainable Drainage Systems (SuDS) help to minimise the unnecessary loss of water to the mains drainage system and also reduce the likelihood of damaging flash floods

Measures for rainwater harvesting, greywater drainage and SuDS are more economical to install during the construction phase than as part of a retro-fitting scheme, particularly in domestic situations.

POLICY CONTEXT

Policy Context

(See Appendix 2)

- **South East Plan Policies SH8 (iv); CC1; CC2; CC4**
- **PUSH Planning Policy Framework**

Eastleigh Local Plan Policy 37.ES(ii) (General Sustainability)

Links to Essential Requirements:

- ESD 2 (Rainwater Harvesting and Greywater Recycling)
- ESD 3 (External Water Consumption)
- And links to section 2.1(Water Consumption)

Eastleigh Local Plan Policy 45.ES (Flooding and Erosion)

> 45.ES Development proposals must incorporate adequate measures for the disposal of surface water from the development including, where practicable, source control techniques and sustainable drainage systems, incorporating defined arrangements for the future maintenance of the system.

Links to Essential Requirement ESD 4 (Reducing Surface Water Runoff)

2.1 Water Consumption

Buildings can be designed with appliances and fittings and management systems can be put in place to make the predicted water use of that building substantially lower than would otherwise be the case. Although the subsequent water consumption behaviour of the building's users cannot be controlled the opportunities for using water much more sparingly are in place.

In residential buildings the following efficiency measures can be employed to reduce the building's predicted water consumption

APPLIANCES	DETAILS
Spray Taps	Many taps can be retro-fitted with a spray head to reduce the flow of water. Account should be taken of who would be using the tap and for what purposes.
Flow Regulation	Due to the water pressure being set by water companies,regulation is generally more applicable than restriction. The maintenance of a standard flow rate can be achieved by in-pipe fittings, or outlet fittings, such as specially adapted shower heads.
Water-efficient Toilets	Toilets can account for 25% of water-use in a typical household. Low-flush toilets and dual-flush toilets are inexpensive ways to rein in the amount of water used. Low-flush toilets simply use less water in the cistern, whereas dual-flush toilets can vary the flush depending on the amount of waste.
Urinals	Depending on the potential usage of urinals, systems to restrict flushing, or even remove flushing, can be employed.
Showers	Generally, showers use less water than baths, however this is mainly due to personal preference when washing. Power showers are actually more likely to waste water than a bath. Fitting a flow-regulation device to the shower head can maintain both the comfort and water-saving aspects of usage.
Washing Appliances	Although not strictly a construction issue, many new homes are fitted with washing machines and dishwashers, the use of energy efficient appliances (usually A or B rated) can help to cut water usage.
Meters	Water meters do not specifically save water themselves but can cut consumption. By linking water habits to a charging structure, it is likely that householders and businesses alike will take steps to ensure that less water is wasted.

Table 2.2 Devices and Appliances to Save Water (Source: Maidstone Borough Council Sustainable Construction SPD Part 1- Using Water July 2006)

In non-residential and multi-residential buildings the following efficiency measures can be employed:

- Water meter with a pulsed output installed on the mains supply to each building.
- Leak detection systems.
- Proximity detection shut off provided to water supply for all urinals
- Maintenance procedures covering all sanitary fittings.
- Water consumption monitored and recorded at least once every quarter.
- More efficient water fittings

Both residential and non-residential buildings can also significantly reduce water consumption through the use of systems that collect, store, and where necessary, treat rainwater or grey water for WC and urinal flushing and for some other uses (see.2.2 Rainwater Harvesting and Grey Water Recycling) reduction of supply through rainwater or grey water systems.

Code FSH Credits

Up to 5 credits are available based on the predicted average household consumption calculated using the BRE Code Water Calculator. This includes any reductions of mains supply due to rainwater harvesting and/or greywater recycling systems.

BREEAM Credits

BREEAM credits for non-residential buildings are awarded in the following ways:

- based on the improvement over standard specification of water fittings, calculated using the BREEAM water calculator including the reduction of supply through rainwater or grey water systems.
- where evidence that a water meter with a pulsed output will be installed on the mains supply to each building.
- where evidence that a leak detection system is specified or installed.
- where proximity detection shut off is provided to water supply for all urinals and
- where evidence that there are established and operational maintenance procedures covering all sanitary fittings.
- where evidence water consumption is monitored and recorded at least once every quarter.

- Where evidence is provided to demonstrate the specification of systems that collect, store, and where necessary, treat rainwater or greywater for WC and urinal flushing purposes. (Some BREEAM assessments only, e.g. BREEAM Schools)

Sustainability Checklist

Q.2.1: What measures will be taken to maximise water efficiency in buildings?

Planning Implications

More efficient appliances are unlikely to have any implications for the external visual appearance of buildings.

Further Guidance

PUSH *Sustainable Development SPD Guidance 2009* (*3.1 Water Consumption*)

ENVIRONMENT AGENCY *National Water Demand Management Centre. Conserving Water in Buildings* (2001)

ENVIRONMENT AGENCY: *Assessing The Cost Of Compliance With The Code For Sustainable Homes* WRc Ref: UC7231.

CIRIA. *C522, Sustainable Urban Drainage Systems - design manual for England and Wales,* (2000)

DEFRA *Water Supply (Water Fittings) Regulations*, (1999)

2.2 Rainwater Harvesting and Grey Water Recycling

Rainwater harvesting involves the channelling of water from one or more roofs via a filter into a storage tank placed in a convenient location. Table x displays the potential for water collection, depending on the size of roof used. Consequently, the installation of a single collection system is often more suited to a larger building; with smaller buildings benefiting from a linked, communal system, such as on a housing estate.

Rainwater harvesting potentially reduces the initial average consumption of 150 litres/person/day (55,000 litres/person/year) for modern houses to 80 l/p/d, although this will be dependent on rainfall and roof area. The potential rainwater yield is illustrated in the table below. The mean annual rainfall in South Hampshire is approximately 800mm.

Roof Area (m^2)	50	75	100	125	150
Annual Rainwater Yield (litres)	24000	36000	48000	60000	72000
Average Annual Consumption (litres)	55000				

Table 2.3 Rainwater Annual Yield

Water harvested from roofs has been shown to be suitable for use in toilets and washing machines.. A dual water supply ensures that when rainfall has been minimal, appliances such as washing machines (and any other use that relies principally on rainwater) can be switched to the mains supply.
The installation of a harvesting system is more cost-effective and less energy-intensive if incorporated at the outset of construction. Where the installation of a rainwater system is unlikely (such as in an existing single dwelling), smaller measures can be taken usefully e.g. the use of garden water butts, which cost less. All harvesting systems will require periodic maintenance to ensure their ongoing quality and effectiveness.

Main Benefits

- Up to 50% of main supply water can be substituted by stored rainwater thereby reducing overall water supply costs significantly.
- Dependence on the mains water supply is reduced and in remote areas rainwater harvesting can provide an off-site water supply.
- Used as part of a storm-water management scheme it reduces the amount of storm-water runoff and can control the flow-rate off site.

- The sustained water savings add value to the property as well as demonstrating commitment to conserving natural resources.
- Can dramatically reduce attenuation volumes for restricted run off situations

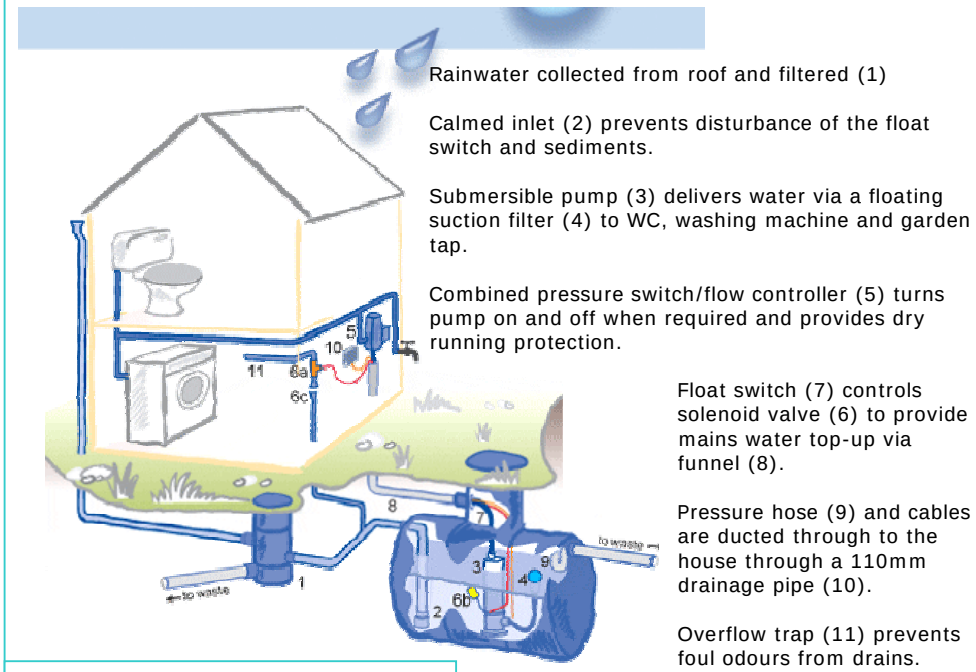


Fig 2.1 Typical domestic system

Source: rainharvesting.co.uk

Commercial systems are usually larger, more sophisticated versions of those used in the domestic situations.

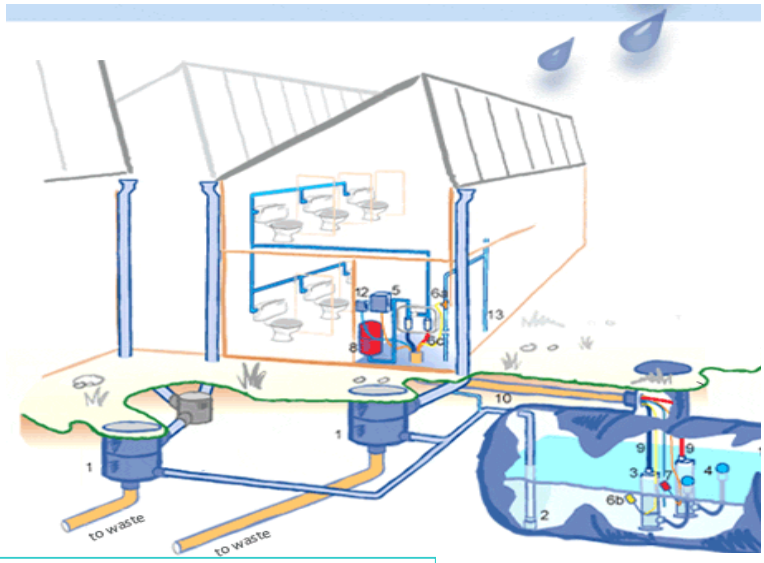


Fig 2.2 Typical commercial system

Source: rainharvesting.co.uk

Grey water is the water that has already been used in hand basins, baths and showers. It can be recycled to save up to 49 litres per person per day(l/p/day) representing on average 33% of household water use. After basic processing, the water can be reused around the home, including flushing toilets, watering the garden or general cleaning purposes i.e. windows, floors etc

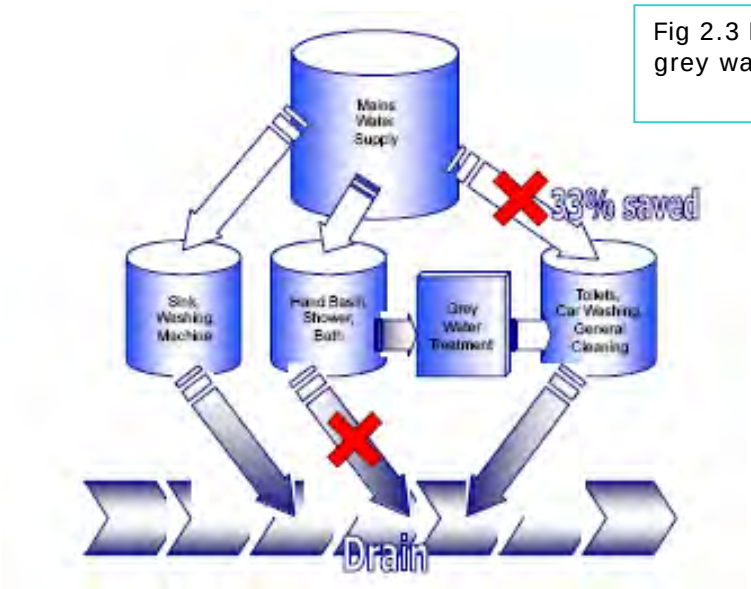


Fig 2.3 Potential water savings with grey water recycling

Source: Maidstone Borough Council Sustainable Constructio SPD Part 1 July 2006

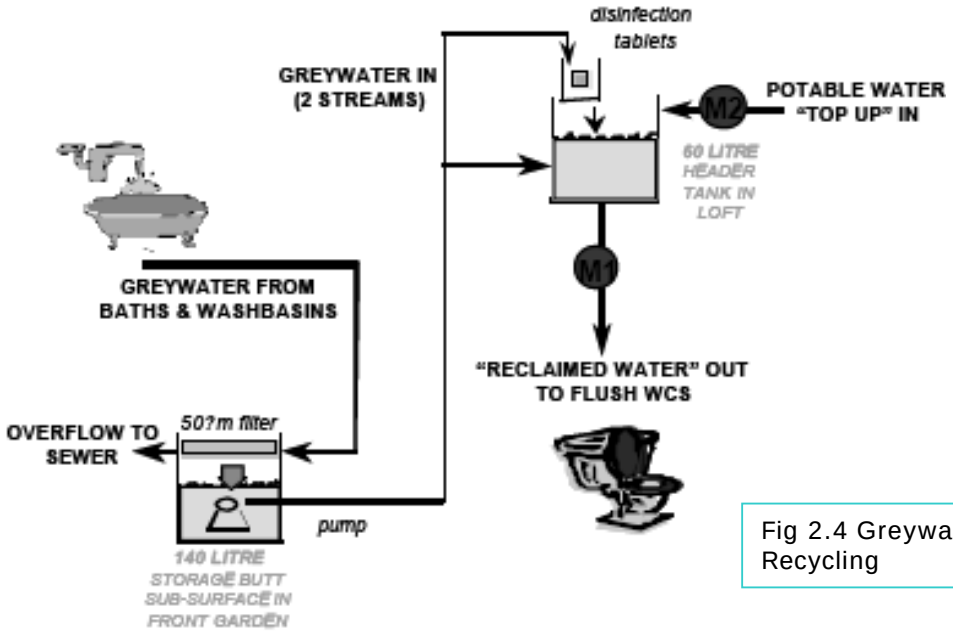


Fig 2.4 Greywater Recycling

Source: Maidstone Borough Council Sustainable Constructio SPD Part 1 July 2006

The installation of a grey water recycling system is more cost-effective and less energy-intensive if incorporated at the outset of construction.

Essential Requirement ESD 2

The Council requires either:

all residential **flatted** development (of 10 dwellings or more)
and
all non-residential and multi-residential development (over 1000 sq m of external floor space) to:

Submit details of the rainwater harvesting and/or grey water recycling systems supplying all WC flushing and other appropriate uses for that development

OR

Compliance with Essential Requirement ESD 7 (Green Roofs)

OR

A combination of both

From January 2011 when a planning application is submitted the thresholds for this essential requirement will change to all residential development (1 unit and above) and to non-residential and multi-residential development above 500 sq m of external floor space.

ESD 2 COMPLIANCE CHECK:

Code FSH or BREEAM Assessor's report or other means to confirm the amount of predicted water consumption for each building or development which is reduced separately by rainwater harvesting and grey water recycling systems.

Code FSH Credits

The Code for Sustainable Homes has no specific credits for reducing the consumption of potable water in the home by rainwater harvesting but it will help to gain extra credits under **Wat 1**. The amount of rainwater that it is predicted can be collected and used per person is subtracted from the total potable water used per

person to arrive at the final predicted potable water consumption per person in **Wat 1**.

Wat 2 encourages the recycling of rainwater for external use (for landscape/garden watering).

BREEAM Credits

There are specific extra credits under some BREEAM assessments for greywater/rainwater recycling e.g. BREEAM School and BREEAM Courts (**Wat 5**). Other BREEAM assessments, e.g. BREEAM Office, do not have specific extra credits however all non-residential developments which reduce their total water consumption via rainwater harvesting will achieve more credits under the water consumption heading. (e.g. **Wat 1** for BREEAM Office).

Sustainability Checklist

Q.2.2: What percentage of the development's predicted water needs will be served by rainwater harvesting and/or greywater recycling?

Planning Implications

The visual impact would normally be minimal (ground level inspection covers) as the storage tanks are typically sited underground, or under the building's roof. There may be implications for tree planting which would not be possible over or near to underground tanks.

Further Guidance

PUSH *Sustainable Development SPD Guidance 2009* (*3.2 and 3.3 Rainwater harvesting and Greywater Recycling*)

WATER REGULATIONS ADVISORY SCHEME. *Information and Guidance Note 09-02-04. Reclaimed Water Systems. Information about Installing, Modifying or Maintaining Reclaimed Water Systems* (1999)

ENVIRONMENT AGENCY, *Conserving Water in Buildings 4: Rainwater re-use*, www.environmentagency.gov.uk

UK RAINWATER HARVESTING ASSOCIATION (UKRHA)
http://www.ukrha.org

Figures for UK rainfall are available from the Met Office www.met-office.gov.uk

CIRIA *Rainwater and Greywater Use in Building, Best Practice Guidance* (2001).

WRAS *Reclaimed water systems – information about installing, modifying or maintaining reclaimed water systems*"; 9-02-04, (1999)
BSI BS1710: Specification for identification of pipelines and services, (1984)

BSI BS EN 12056-3:2000: *Gravity drainage systems inside buildings. Roof drainage, layout and calculation*, (2000).

Grey Water website: http://www.grey-water-recycling.co.uk/

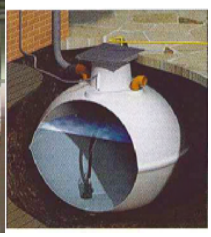
Rainwater harvesting website: http://www.ukrha.org/

Case Study

The Lighthouse

The Kingspan "Lighthouse" at the Building Research Establishment (BRE) site at Garston is a prototype house, the first to receive BRE Code for Sustainable Homes Level 6 certification in June 2007. Rainwater collects from the roof into a gutter which drains via a chain into the underground tank. The rainwater collected is used to supply the washing machine.

Grey water is recycled for flushing the toilets.



Underground storage tank

2.3 External Water Consumption

Approximately 13 % of domestic water consumption is via external taps mainly for watering the garden but also for cleaning cars and outside surfaces. Many non-residential buildings also use significant quantities of water for maintaining their landscaped areas.
Rainwater could be collected to reduce the amount of mains water used for these purposes as well as reducing the amount of water being discharged into drains and watercourses, and the risk of localised flooding and the overall water bills for householders and non-residential users.
The simplest and most cost effective system for rainwater collection is the water butt. This typically intercepts water from the rainwater down pipes. More complex central collection communal systems, (using the same principles as the water butt), are available for apartment blocks.
Collection of rainwater for use in the dwelling, e.g. for WC flushing, is covered in section 2.2 above. If a rainwater harvesting system is implemented for internal water use, external taps can also be supplied.

Fig 2.5 Water butts

Source: combinedharvesters.co.uk

Essential Requirement ESD 3

The Council requires all buildings in residential development of 10 dwellings or more to achieve the credit awarded for **Wat 2** in the Code for Sustainable Homes.

From January 2011, when a planning application is submitted the threshold for this essential requirement will change to all residential development (1 unit and above).

ESD 3 COMPLIANCE CHECK:

Residential:

Code FSH Assessor's reports at design stage and post construction stage stating Wat 2 credit achieved.

Code FSH Credits

Wat 2 (External Potable Water Use) awards one credit for a correctly specified system to collect rainwater for a garden, patio or communal garden space. The size requirement for the potential maximum storage of collected rainwater varies according to the size of the dwelling and the type of garden space. Detailed specifications are provided for the rainwater collector to meet the Code's requirements for this issue.

Pools hot tubs or other large water-using features which are fed by mains water, will automatically mean a score of zero for this issue. This rule applies whether it is an internal or external pool. Where pools are present, credits can only be awarded if the features use 100% rainwater or 100% recycled water.

BREEAM Credits

There are no specific extra credits under BREEAM assessments for rainwater recycling to supply outside taps for non-residential buildings.

Sustainability Checklist

Q.2.3: How will the development's landscape area be watered?

Planning Implications

Rainwater can be stored out of sight underground or directly under the roof. On a domestic garden scale water butts are potentially more visible if positioned on the street side of the building. The design of the water butt can vary from typically green or black plastic to a more rustic timber barrel. Large plastic butts can be unsightly and should not be visible from the public realm, especially in conservation areas.

The detailed landscape design, if confirmed by a recognised ecological consultant, could specify planting which requires little water in which case the requirement for rainwater collection could be halved.

Further Guidance

PUSH *Sustainable Development SPD Guidance 2009 (3.4. External Potable Water)*

WATER UK www.water.org.uk

UK RAINWATER HARVESTING ASSOCIATION (UKRHA)
http://www.ukrha.org

2.4 Reduction of Surface Water Runoff

Most of our streets, pavements and hard standings in the borough/city have been built using impermeable surfaces. Consequently, existing urban drainage systems have been constructed to remove the collected rainfall from streets, pavements and hard standing areas to a discharge point as rapidly as possible. The success of the system is tempered by adverse effects, notably:

- Flooding – caused by a rapid concentration of rainwater into discharge points.
- Pollution – many pollutants can be picked up with the surface run off, subsequently causing ill effects at discharge points.
- Ground Water – the level of ground water can be depleted as permeability is removed and rainwater is channelled away from the point that it fell.

Principles of Sustainable Drainage

Drainage systems can be developed in line with the ideals of sustainable development, by balancing the different issues that should be influencing the design. Surface water drainage methods that take account of quantity, quality and amenity issues are collectively referred to as Sustainable Drainage Systems (SuDS). These systems are more sustainable than conventional drainage methods because they:

- Manage runoff flow rates, reducing the impact of urbanisation on flooding.
- Protect or enhance water quality.
- Are sympathetic to the environmental setting and the needs of the local community.
- Provide a habitat for wildlife in urban watercourses.
- Encourage natural groundwater recharge (where appropriate).

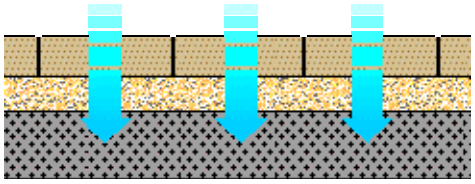
They do this by:

- Dealing with runoff close to where the rain falls.
- Managing potential pollution at its source now and in the future.
- Protecting water resources from point pollution (such as accidental spills) and diffuse sources.

They may also allow new development in areas where existing sewerage systems are close to full capacity, thereby enabling development within existing urban areas. (Source: CIRIA)

Sustainable Drainage Systems

The chief objective of a sustainable drainage system is to reduce the rate of (or 'attenuate') the flow of surface water from roofs and hard areas which would otherwise lead to problems of local flooding and pollution. There are a number of attenuation methods which meet the BRE criteria for achieving credits for surface water runoff in the Code (Sur 1) and in the BREEAM assessments (Pol 7). These are:

Swales	 Providing temporary storage and passage of water, with some filtration and infiltration potential, these shallow vegetated surface channels are very cost effective and also provide landscape features. A swale is often adjacent to roads, car parks and residential areas. Swales mimic natural drainage patterns by allowing rainwater to run in sheets through vegetation. The vegetation helps filter pollutants in the flow and swales may also permit infiltration. If available, alkaline soils and sub-soils should be used to promote the removal and retention of metals to encourage good vegetation growth. Increasing the surface area of the vegetation exposed to run-off improves the effectiveness of the system.
Green Roofs	Using the appropriate plant types, these roofs can limit discharge into drains as well as provide an element of filtration. For soil based grass roofs, calculation should be made on the basis of the infiltration, moisture retention and depth of soil. For sedum roofs, infiltration data should be provided by the manufacturer/installer
Permeable Paving	Porous ground cover can reduce or remove the need for drains and sewers, as well as maintaining ground water levels in areas where local geological and hydrological conditions allow this to function, e.g. block paved surface on permeable sub-base over gravel bed to store the water and allow it to seep in to the soil. For less-permeable soils the gravel layer might be deeper and the water taken to a soakaway although this is not an option in some areas. Roads, footways and carparks can be paved with either porous blocks  or with blocks which allow infiltration of water through their joints.

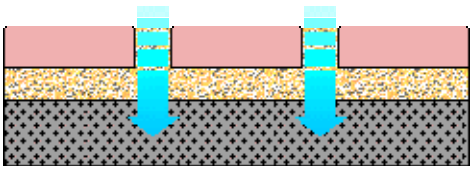
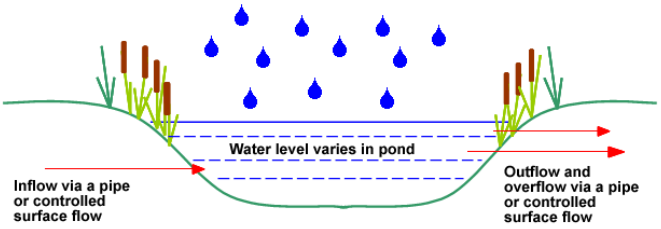
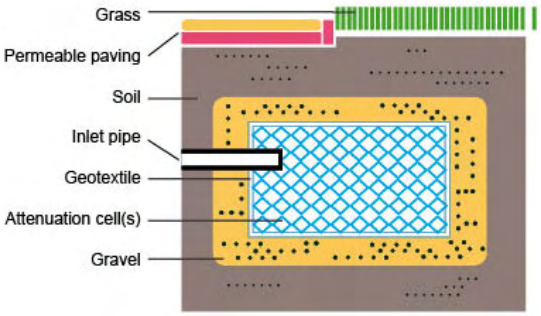
	 Porous asphalts and macadams are also being trialled.
Infiltration Trenches and Filter Drains	Similar structures to one another, the infiltration trench provides water storage and infiltration through a stone-filled trench. A filter drain filters water through soil into a perforated underground pipe, providing more storage and some infiltration.
Basin	As the name suggests, basins initially retain storm water, before a process of filtration and infiltration through the underlying rocks.
Rainwater Harvesting	Run-off from roofs is collected as a part of a rainwater harvesting system
Ponds and Wetlands	As part of a wider infrastructure of SUDS, ponds and wetlands can be designed specifically – by means of intended capacity and planting – to increase storage capacity and provide a high quality filtering system. 
Soakaways	Local or centralised soakaways either as full systems or as 'overflow' or 'holding' systems, in areas where local geological and hydrological conditions allow them to function. Confirmation of approval from relevant statutory body needs to be provided.  A modern soakaway using modular attenuation cells

Table 2.4 Different SuDS elements

APPENDIX 1: GUIDANCE: 2.4 REDUCTION OF SURFACE WATER RUNOFF

Essential Requirement ESD 4

The Council requires all residential development of 10 dwellings or more and
all non-residential and multi-residential development (over 1000 sq m of external floor space) to :

- show that run-off rates and annual volumes of run-off post development will be no greater than the previous conditions for the site.
- show that all roofs and hard surfaces are drained by sustainable drainage systems
- provide a drainage report for the whole site.

From January 2011 when a planning application is submitted the thresholds for this essential requirement will change to all residential development (1 unit and above) and to non-residential and multi-residential development above 500 sq m of external floor space.

ESD 4 COMPLIANCE CHECK:

Residential and Non-residential and Multi-residential:

Reports at design stage and post construction stage to confirm with Head of Engineering at Eastleigh Borough Council that the whole site:

- has run-off rates less or no greater than previous conditions
- employs SuDS for all roofs and hard surfaces (or demonstrates that this is **technically** unfeasible).
- provides an acceptable drainage report

Code FSH Credits

There are two possible Code credits under **Sur1** (Reduction of Surface Water Runoff from site). The requirement varies according to the level of flood risk in the site's area.
One credit is awarded for runoff from roofs and the other for hard surfaces. There is a requirement for the developer to employ a suitably qualified consultant to provide the calculation of surface water runoff.

BREEAM credits

One credit is awarded under **Pol 7** in BREEAM assessments: Where evidence provided demonstrates that Sustainable Urban Drainage techniques are specified to minimise the risk of localised flooding, resulting from a loss of flood storage on site through development.'

Sustainability Checklist

Q.2.4: What Sustainable Drainage Systems will be employed to attenuate storm water runoff from the development's roof areas and areas of hard standing?

Planning Implications

Many of the SUDS measures, such as swales, basins and balancing ponds can be incorporated into the development's surrounding landscape. They can also benefit the biodiversity of the site by creating new habitats. They can be positive assets but only if they are properly designed as part of that landscape and are appropriate to the site context and the development.

The measures that require large areas of surface area, such as ponds and basins, reed beds and swales may not be appropriate or feasible in high density developments. Where space at ground level is limited, soakaways, permeable hard surfacing and green roofs may be more appropriate design solutions.

It is essential that SUDS are properly maintained to ensure their successful operation. Where SUDS are proposed, legal agreements for their maintenance, or agreed acceptable alternatives, must be secured and approved by the Council.

Further Guidance

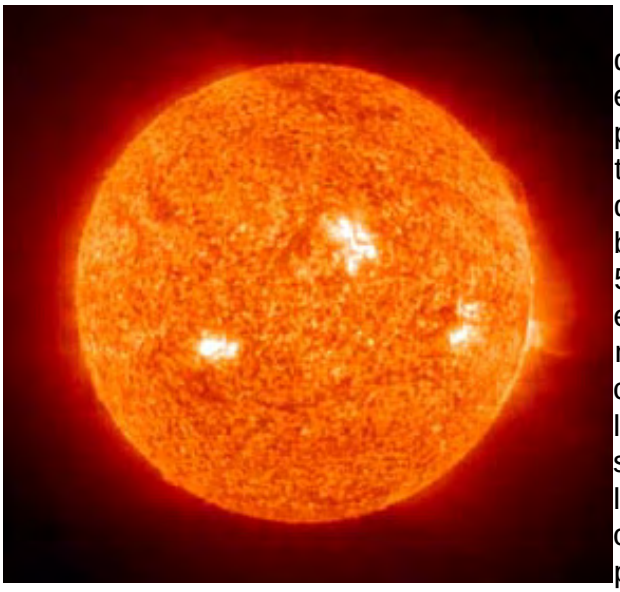
PUSH *Sustainable Development SPD Guidance 2009 (3.5.Reduction of Surface Water Runoff)*

CIRIA. *C522, Sustainable Urban Drainage Systems - design manual for England and Wales,* (2000)

SuDS web pages:

http://www.ciria.org/suds/
http://www.environment-agency.gov.uk/business/sectors/36998.aspx

3.0 ENERGY / CO_2



All energy ultimately derives from the sun. The energy stored in fossil fuels produces large quantities of the green house gas carbon dioxide when burned. With buildings responsible for 50% of the UK's carbon emissions, implementing measures to reduce consumption and to find less carbon intensive sources of energy to heat, light and power buildings is critical. . Electric power is particularly wasteful as more than 70 % of the energy is lost in production (as waste heat) and transmission before it reaches the consumer. Operating a building over 50 years or more has a higher environmental impact than its construction and demolition.

POLICY CONTEXT
(See Appendix 2)

- **South East Plan Policies SH8 (iv); CC1; CC2; CC4**
- **PUSH Planning Policy Framework**
- **Eastleigh Local Plan Policy:37.ES (General Sustainability)**

Links to Essential Requirements:

- ESD 5 (Passive Solar Heat Gain)
- ESD 6 (CO2 Reduction (Small Scale zero/low carbon technologies))
- And links to the following sections in Appendix 1:

Section 3.1(Natural Daylight)
Section 3.3 (CO2 Reduction (improved energy efficiency))
Section 3.4 (Exterior Lighting)
Section 3.6 (Zero Carbon Homes)

- **Eastleigh Local Plan Policy:36.ES (Lighting)**

Links to section 3.4 (Exterior Lighting)

- **Eastleigh Local Plan Policy:38.ES (v), (vi), (vii), (viii) (Renewable Energy)**

Links to Essential Requirement ESD 6 (CO2 Reduction (Small Scale zero/low carbon technologies))

Eastleigh Local Plan Policy:59.BE (Promoting Good Design)
Links to Essential Requirements:EBC E1 (Passive Solar Heat Gain)
And links to section 3.1 (Natural Daylight)in Appendix 1

PASSIVE ENERGY GAIN IN BUILDINGS

Natural daylight, the heat that falls on a building and the energy that drives a breeze into a building from outside are all forms of free energy. The building's design and orientation and place in the landscape can all maximise much of this free energy and reduce the need for electric lighting, for heating and cooling and for mechanical ventilation, thus saving significant carbon emissions. The issues of natural daylight, solar energy, wind sheltering and summer shading are all interrelated and need to be considered together.

3.1 Natural Daylight

Buildings which fail to take full advantage of this free energy and have rooms that unnecessarily require long periods of electric lighting waste energy and are badly designed. Natural daylight has a clear positive influence on people's environment is more comfortable when illuminated naturally as it provides a better quality of light. There is the added psychological benefit of views of the sky and of the outside environment. Studies have demonstrated benefits in worker productivity and health related to daylight in buildings. Minimum daylighting standards for new buildings are set out in BS 8206-2.Artificial lighting is generally the greatest single energy use in non-domestic buildings, being greater than both heating and cooling. Therefore, designing for daylighting can make a major impact on the energy consumption of the building.

Building design for Natural Lighting

- Long axis of the building faces N/S to maximize available daylight and reduce glare.
- Where practical eliminate east and particularly west facing glazing.
- Keep room depth shallow for good day lighting penetration
- Higher windows allow deeper room penetration

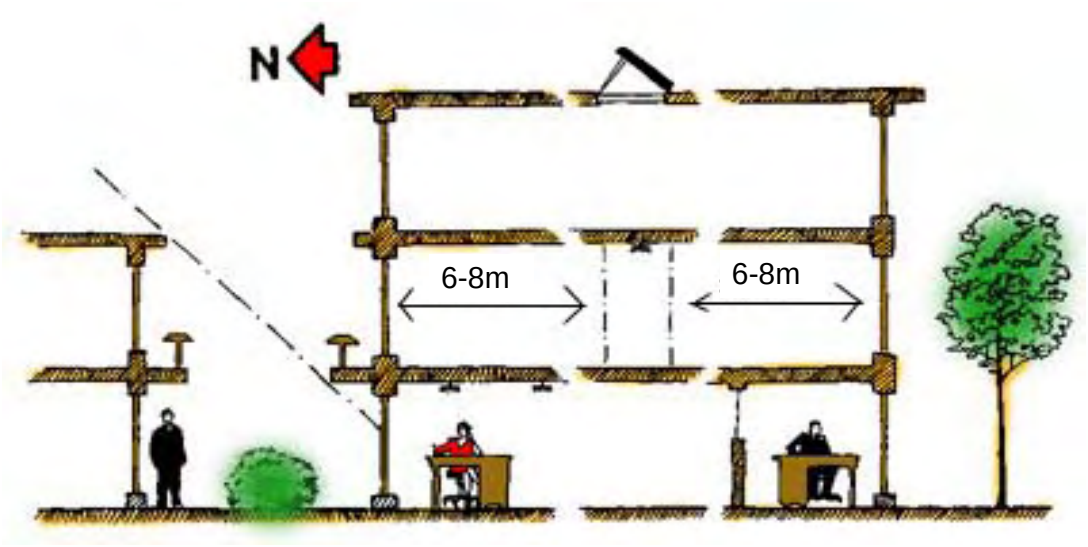
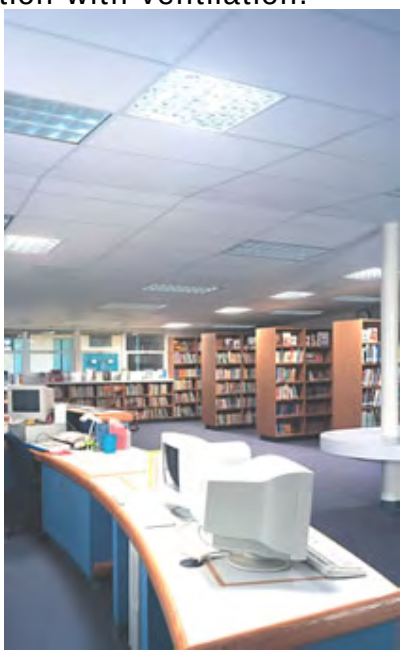


Fig 3.1 Maximum dimensions for daylight for a single aspect office

- Dual aspect buildings with a plan depth of up to 13m allows for natural daylighting and ventilation from windows on both sides
- Floor plans with relatively narrow wings, such as I-, H-, U-, or T-shaped plans, ensure that most interior spaces have good access to natural light (and winds).
- Courtyards and atria can also be used to bring light (and air) to surrounding narrow spaces.
- Single-story buildings and the top floors of multi-storey buildings can be top lit using skylights, roof monitors or light wells)
- Redirecting daylight with light shelves, prismatic glazing and other reflective systems can extend naturally lit interior space to 10 -11m deep.

Fig 3.2 Light Shelves (Light bounces off the top of the light shelf into the ceiling of the first floor offices. The overhang shades the window below it).

- The use of sun pipes enables sunlight to be directed into parts of a building where daylight from windows fails to reach and where electric lights would otherwise be necessary. Some products combine this function with ventilation.



Office

Home

Before After

Fig 3.3 Sun pipes

- New buildings need to ensure that they do not reduce daylight levels in neighbouring buildings to an unacceptable degree. As a rule of thumb for residential buildings this will require at least 12 metres clearance between the primary windows of

habitable rooms and adjoining buildings to retain adequate day lighting.

Code FSH Credits

There are 3 potential credits under **Hea 1**. One credit is given for providing a measured average minimum quantity of daylight for kitchens. A second is awarded for a reduced minimum average daylight for all living, dining and study rooms. A final credit is awarded when all day time habitable rooms have a minimum area with views of the sky.

BREEAM Credits

There are two separate credits available for day lighting **HW01** and **HW02** for e.g. BREEAM Offices. Where at least 80% of net lettable office floor area is adequately day lit and where evidence provided demonstrates that all desks are within a 7m radius of a window.

Sustainability Checklist

Q.3.1: How have Developers maximised the potential for natural daylight in their buildings?

Planning Implications

Further Guidance

The requirement to design to maximise the use of natural light will inevitably have visual implications on development. Orientation of buildings and living areas may change. Windows are likely to be larger and taller. Solar shading techniques to minimise summer overheating will also have an impact.

PUSH *Sustainable Development SPD Guidance 2009 (4.1Natural Light)*

BSI *BS 8206-2 Lighting for buildings*. Code of practice for daylighting (1992)

P.J.Littefair BR209., *Site layout planning for daylight and sunlight*: a guide to good practice (1998),

BRE BRE IP4/92. *Site layout for sunlight and solar gain* (1992),

James Bell and Bill Burt BR 288. *Designing buildings for daylight*. (1995)

CIBSE LG 10 Lighting Guide: *Daylighting and window design* (1999)

.

3.2 Passive Solar Heat Gain

Building orientation and design that aims to maximise the benefit of solar gain and day lighting is known as Passive Solar Design (PSD). For domestic buildings, PSD can contribute as much as 15% of the energy required for heating and lighting. Over 25% of UK primary energy production goes towards heating buildings, more than for any other purpose. By incorporating passive solar design into new buildings, annual fuel bills can be cut by about a third as well as saving CO_2.

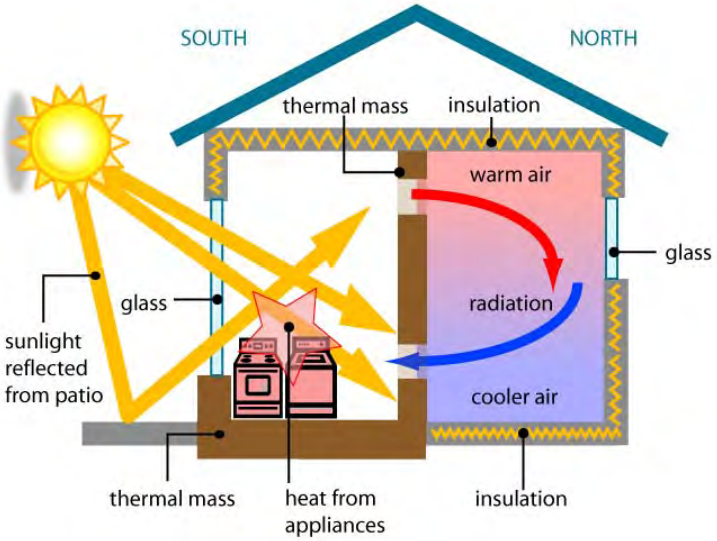
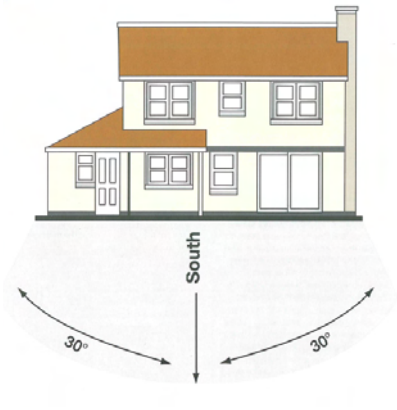


Fig 3.4 The principle of passive solar heat gain

The main aspects to consider are the orientation and shape of buildings, and the overall site layout, to avoid overshadowing and maximise sunlight penetration. Effective PSD will balance solar heat gain in winter for heating, cooling in summer, ventilation, and the provision of day lighting. Different approaches are needed depending on the size and use of buildings. PSD can be maximised in housing and smaller commercial buildings by measures such as:

PASSIVE SOLAR HEAT GAIN DESIGN MEASURE	**DETAILS**
Orientation	For buildings to maximise the use of natural energy sources to provide light and heat, the windows of the main habitable rooms should be orientated within 30^{o} of due south. Houses orientated east of south will benefit more from morning sun, while those orientated west of south will catch late afternoon sun delaying the evening heating period. Building design should make best use of high summer sun angles and low winter sun angles on southern exposures while minimising excessive solar gain on east and specifically west exposures from low year-round sun angles. North-facing slopes can result in significant overshadowing
Landscape	Make positive use of the local topography and landscape features to allow best use of natural daylight, solar energy, wind sheltering, summer shading and create development that responds to its context.
Thermal mass	Incorporate heavy internal walls to store the heat from solar gain. use thermal mass within the masonry walls or concrete or tiled floors to allow the sun to be 'soaked up' during daylight hours and then released into the building at night – suitable thermal mass prevents overheating during the summer and avoids cold conditions during the winter.
Glazing	Maximise the area of glazing on the south side of a building and minimise glazing on the north side. It is essential that any such design should incorporate means to regulate solar gain to prevent over-heating in summer and avoid winter heat loss
Obstructions	Avoid obstruction angles greater than 30^{o} above the horizon. Every percentage point increase in obstruction over 30^{o} results in the same percentage point increase in energy use.
Internal layout	Place the most frequently used rooms - requiring most heating – on the south side of the dwelling (i.e. living rooms) Foyers and entrance porches reduce heat loss through external doors, but these should not be heated. Rooms used less often or those that do not benefit from sunlight should be placed to the north of the building (i.e. hallways, bathrooms, utility rooms, stores and garages). Also they should have smaller windows to minimise heat loss.

Table 3.1 Passive Solar Design Elements



The ideal orientation for PSD is within 30° of south.

South elevation

Optimised glazing areas to maximise the benefits of passive solar design, whilst maintaining a conventional appearance (The Concrete Centre)

- South elevation with e.g. 13.2m^2 glazing
- Living rooms and bedrooms (with shading) on south side

North elevation

- North elevation with e.g. 7.15m^2 glazing
- Bathrooms, utility rooms, hallways, stores and garages on north side

Fig 3.5 Passive Solar Design orientation and fenestration

Solar Shading

- Light from the high summer sun is blocked by solar shading preventing excessive solar heat gain and glare.

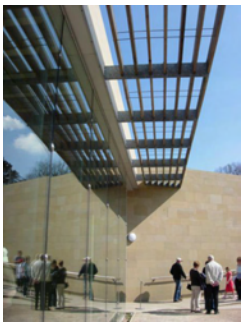


Fig 3.6 brise soleil solar shading

- The low winter sun passes beneath it and hits the window providing the building with the benefit of the sun's ene
- For most interiors it may be acceptable to restrict summer sunlight using balconies or overhanging roofs or by fixed louvres.
- For east and west facing facades, adjustable shading is often better suited to the low solar altitudes of the UK.
- Shading, especially fixed 'brise soleil' shading, should not be designed so that it reduces interior daylighting, natural ventilation or a view.
- The amount of sunlight blocked by fixed shading devices can be estimated using a sun path diagram such as the BRE Sunlight Availability Protractor.

Fig 3.7 PV solar shade louvres (Sustainable Energy Action)

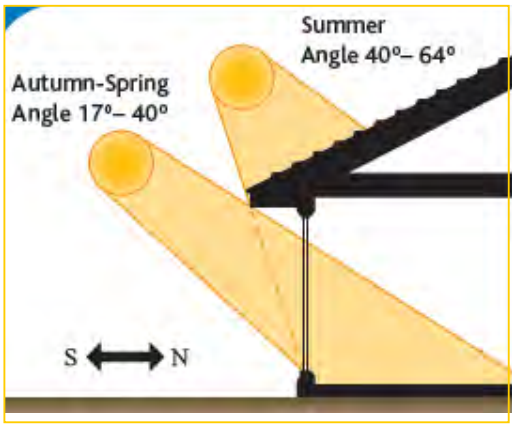


Fig 3.8 A simple overhang can provide shading on south facing windows (The Concrete Centre)

Some advanced glazing systems can filter out the infra-red energy from sunlight.

Code FSH Credits

There are none at present for passive solar gain. Building regulations calculations for the energy efficiency of buildings (SAP ratings) which are needed to determine credits under **Ene 1** do take orientation into account. Other passive solar gain considerations, such as thermal mass and landscape factors are not considered however.

BREEAM Credits

There are none at present for passive solar gain. Building regulations calculations for the energy efficiency of buildings (SAP ratings) which are needed to determine credits under **Ene1** do take

orientation into account. Other passive solar gain considerations, such as thermal mass and landscape factors are not considered however.

Essential Requirement ESD 5

The Council requires all new buildings in residential development of 10 dwellings or more and all non-residential and multi-residential development (over 1000 sq m of external floor space) to:

make full use of potential passive solar heat gain through orientation, building design and landscape design (while avoiding excessive summer heat gain and glare) within a framework of good urban design unless there are particular site or building use factors which make it unfeasible

This should be clearly demonstrated in the Design and Access Statement

From January 2011 when a planning application is submitted the thresholds for this essential requirement will change to all residential development (1 unit and above) and to non-residential and multi-residential development above 500 sq m of external floor space

ESD 5 COMPLIANCE CHECK:

Design and Access Statements should set out the design approach to making best use of passive solar heat gain. This needs to be confirmed in the development layout (where generously glazed living or working areas should, where possible, maximise opportunities for facing within 30 degrees of south) and building design (thermal mass, glazing, solar shading).

Planning Implications

Sustainability Checklist

Q.3.2: How have Developers maximised the potential for passive solar heat gain in their buildings?

Further Guidance and References

PUSH *Sustainable Development SPD Guidance 2009 (4.2 Passive Solar Heat Gain)*

|PASSIVE SOLAR DESIGN website:
http://www.esru.strath.ac.uk/EandE/Web_sites/01-02/RE_info/passive_solar.htm

3.3. Carbon Dioxide (CO_2)reduction (improved energy efficiency)

There is huge scope for reducing the carbon emissions and improving the energy efficiency of buildings. As new buildings gradually replace and augment existing stock there are great opportunities to raise standards which are often more difficult to achieve retrospectively in existing buildings. Greater efficiency (leading to lower emissions) can be achieved by improved building design (including passive energy design); less heat leakage (better air tightness); better materials (superior insulation) and by using or encouraging more efficient boilers, light fittings and appliances.

Domestic Buildings

Emissions from the domestic housing sector represent around 27% of all UK carbon emissions. The majority of this is generated by heating our homes and the hot water we use in them.

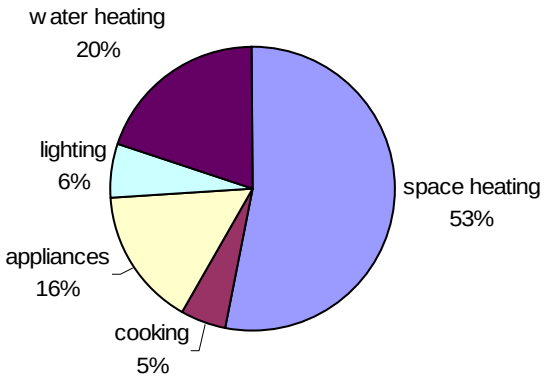


Fig 3.9 Domestic carbon dioxide emissions by end use for an average home

ENERGY EFFICIENCY MEASURE	DETAIL
Boiler efficiency	90% plus efficiency gas condensing boilers are much less carbon hungry than mains supplied electric heating systems.
Combined Heat and Power (CHP)	Also referred to as Cogeneration - On site generation of electricity, heat and/or cooling for the public and private sector. Significantly reduced losses through transmission compared with conventional energy supply. Can be installed for a new development or the development can link to an existing district level system.
Micro CHP	Micro Combined Heat & Power (micro CHP) is the simultaneous production of heat and electricity in individual homes or in small office buildings. Effectively the micro CHP unit replaces the gas central heating boiler and provides heat and hot water as usual, but additionally provides the majority of the home's electricity needs.
Insulation	Added insulation such as loft, floor or cavity wall insulation or green roofs. More efficient building products such as gas-filled double or triple glazing with low 'u-values' (high insulation properties).
Air tightness	Buildings need to keep heat leakage through cracks and heat bridges between walls to a minimum as required by building regulations.
Appliances	Appliances such as washing machines and fridges, which may in some cases be provided by the developer, are rated under the EU energy efficiency rating system (AA to G). AA rated appliances will save a significant amount of electricity. Where appliances are not supplied developers can provide residents with information on the most efficient appliances.
Lighting	Light fittings can be specified which can only take the most energy-efficient light bulbs which, typically last 12 times longer and use a quarter of the electricity of normal light bulbs

Table 3.2 Energy Efficiency Approaches

Non-residential Buildings

Emissions from the non-residential building sector represent around 13% of all UK carbon emissions. As with residential buildings the easiest gains in energy efficiency and reduction in carbon emissions are firstly through the design of building elements (walls, floors, roofs etc) with low u-values (good insulation properties), and secondly by the use of efficient power sources. Further significant

efficiency gains can be achieved through better maintenance, metering and the education of building users.

Cooling

Air conditioning

- Increasing by 8% pa in UK.
- 24% office space 11% retail in Eng & Wales.
- Attempts to market it for residential in UK.
- Air conditioning units are rated under the EU energy efficiency rating system (AA to G).
- Significant extra carbon emissions and add to urban heat island effect (exhaust heat raising summer air temperatures in towns).

Fig 3.10 Air conditioning

Air conditioned cooling should not be necessary with good building design in the UK, except for in particular applications (e.g. some computer rooms). Natural ventilation, solar shading and good thermal insulation should prevent excessive heat gain in most situations. If mechanical cooling is absolutely necessary this can be provided more efficiently via a variety of "free cooling methods" (See **PUSH** *Sustainable Development SPD Guidance 2008 (4.5 CO_2 reduction (improved energy efficiency)) for further details.*

Building Regulations

In 'Building a Greener Future' (2007) the Government set out a timetable for minimum standards for reducing carbon emissions from new homes. From 2010 all new homes must emit at least 25% less carbon dioxide than the present minimum standard and 44% less by 2013. All new homes will need to be zero carbon by 2016. These **minimum** standards will be reflected in the proposed changes to Building Regulations. Similar, more rigorous minimum standards for non-residential buildings are likely to follow.

At each level of the Code FSH there is a mandatory % improvement on the building regulations baseline figure.

CODE LEVELS	Minimum improvement on carbon emissions over 2005 building regulations
Level 1 (*)	10%
Level 2 (**)	18%
Level 3 (***)	25%
Level 4 (****)	44%
Level 5 (*****)	100%
Level 6 (******)	'zero carbon home'

Table 3.3 Code For Sustainable Homes Levels

Code FSH Credits

Up to 15 credits are available under **Ene1** (Dwelling Emission Rate as defined by 2006 Building Regulations Target Emission Rate (TER)). This measures the predicted carbon emissions from a building expressed as a percentage improvement on the minimum requirement under building regulations.

At each level of the Code there is a mandatory % improvement on the building regulations baseline figure.

BREEAM Credits

All non-residential buildings can gain credits under **Ene 1** (Percentage difference of CO_2 emissions of the assessed building over a notional building which is compliant to 2002 Building Regulations).
Other BREEAM credits designed to encourage energy efficiency for non-residential buildings are awarded for better maintenance, corporate energy policy, sub-metering and the education of building users.

Sustainability Checklist

Q.3.3: What percentage improvement on the maximum carbon dioxide emissions allowable under Building Regulations is proposed for the new buildings in this development?

Planning Implications

Many of the energy efficiency measures incorporated into the design of buildings have little or no impact on the external appearance. One exception is the use of green roofs which are generally seen to

be a positive visual element, unless the context makes them unsuitable.

Further Guidance and References

PUSH *Sustainable Development SPD Guidance 2009 (4.5 CO2 reduction (improved energy efficiency)*

DEPARTMENT FOR COMMUNITIES AND LOCAL GOVERNMENT. Building Regulations Approved Document L1A - *Conservation of fuel and power in new dwellings* (2006) www.communities.gov.uk
BUILDING RESEARCH ESTABLISHMENT LTD. *The Government's Standard Assessment Procedure for Energy Rating of Dwellings*, (2005).

ENERGY SAVING TRUST www.est.org.uk/housingbuildings/standards
EST, *Demonstrating compliance -Advanced practice* (2006 edition)
EST, *Demonstrating compliance -Best practice* (2006 edition)
EST, *Demonstrating compliance -Good practice* (2006 edition)

- Insulation materials chart - thermal properties and environmental ratings (CE71)
- *Improving airtightness in dwellings* (CE137/GPG224)
- *Energy efficient ventilation in housing. A guide for specifiers* (GPG 268)
- *Energy efficient lighting - a guide for installers and specifiers (CE61)*
- *Low energy domestic lighting (GIL20)*

PASSIVHAUS: www.passivhaus.org.uk

COMMUNITIES AND LOCAL GOVERNMENT *Improving the energy efficiency of our buildings:* A guide to energy performance certificates for the construction, sale and let of non-dwellings,(2008).
www.communities.gov.uk/publications/planningandbuilding/guidancenondwellings

C Stirling *Thermal insulation: avoiding risks*, BRE Press, (2002).

ODPM Approved Document L2A: *Conservation of fuel and power (New buildings other than dwellings), (*2006).

CARBON TRUST

- GIL065 *Metering and Energy Use in New Non-Domestic Buildings - A Guide to help designers meet Part L2 of the Building Regulations*", (2002).
- General Information Report 85 *New Ways of Cooling – information for building Designers*
- CTV006 Sports and leisure – *Introducing energy saving opportunities for business*

CIBSE CIBSE TM39 "*Building energy metering - A guide to energy sub-metering in non-domestic buildings*, (2006).

G Barney *Towards low carbon lifts*,
(http://www.cibseliftsgroup.org/CIBSE/Feature.htm)

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3.4 Exterior Lighting

There are two separate but related objectives which are to increase the energy efficiency and reduce the carbon emissions from lighting the outside environment and to reduce light pollution. What these two objectives have in common is a desire to reduce waste.

Light Pollution

Light pollution is probably best described as artificial light that is allowed to illuminate, or pollute, areas not intended to be lit. Among other effects, it disrupts ecosystems, can cause adverse health effects, obscures stars to city dwellers, interferes with astronomical observatories, and wastes energy. Specific categories of light pollution include **light trespass**, **over-illumination**, **glare**, **clutter**, and **sky glow**. It is common, however, for annoying or wasteful light to fit several of these categories.

The problem is getting worse. Between 1993 and 2000:

- light pollution increased 24% nationally
- the amount of truly dark night sky in this country fell from 15% to 11%
- the amount of light-saturated night sky rose to 7%

For more information on the different elements of light pollution, see: **PUSH** *Sustainable Development SPD Guidance 2008 (4.6 External Lighting)*

Reducing Light Pollution

Reducing light pollution implies many things, such as reducing sky glow, reducing glare, reducing light trespass, and reducing clutter. The method for best reducing light pollution, therefore, depends on exactly what the problem is in any given instance. Possible solutions include:

- Utilizing light sources of minimum intensity necessary to accomplish the light's purpose.
- Turning lights off using a timer or occupancy sensor or manually when not needed.
- Improving lighting fixtures, so that they direct their light more accurately towards where it is needed, and with fewer side effects.

- Adjusting the *type* of lights used, so that the light waves emitted are those that are less likely to cause severe light pollution problems.
- Evaluating existing lighting plans, and re-designing some or all of the plans depending on whether existing light is actually needed.

Energy Efficiency of External Lighting

Exterior space lighting may be provided with dedicated energy efficient fittings so that only the most efficient low wattage lights can be used. Lights in communal car parks and in other situations can also be powered via photovoltaic cells making them effectively carbon neutral.
Burglar deterrent security lighting should have a power restriction of no more than 150W and should have movement detecting control devices as well as daylight cut-off sensors to limit unnecessary use.

Case Studies

Solar Street Light: The Solartech “Pathfinder” street light. The compact fluorescent lamp is powered by a 110W solar panel. In summer this unit stays illuminated all night long. In winter the light is dimmed by 50% and shines for at least 3 to 6 hours. Although this performance would not be suitable for illuminating the highway, it is suitable for other applications and the technology is improving very rapidly.

Code FSH Credits

There are two potential credits in **Ene 6**, one for energy efficient space lighting and the second for security lighting. There are no specific credits for reducing light pollution.

BREEAM Credits

Issue **Ene 4** awards a credit “Where energy efficient external luminaires are specified and all light fittings controlled for the presence of daylight.” **Pol 7** awards another credit for reducing night time light pollution

Sustainability Checklist

Q.3.4a: What measures are proposed to minimise the carbon emissions from external space and security lighting and which relevant Code or BREEAM credits is the development designed to achieve?
Q.3.4b: How will the development minimise light pollution from external lights?

Planning Implications

- The reduction in light pollution from new developments helps to minimise the impact that development has on the night environment. This is particularly critical in rural environments or for sites that are near to sensitive habitats, where wildlife may be adversely affected by the lack of sufficient darkness.
- The daytime visual quality of lighting designed to reduce light pollution is indistinguishable from more polluting lighting units.
- More efficient light fittings are also not significantly different from conventional examples.
- An advantage of solar (or wind) powered street lights is that they can be used in off grid situations and do not need any underground cabling.
- Solar powered or micro wind powered street lights will have a visual impact which may not be suitable in all situations.
- Series of street lights can be powered from a bank of solar panels (which could be sited on a nearby roof or wall) or from a medium sized wind generator. This would make the street lights themselves less obtrusive in the day time.

Further Guidance and References

PUSH *Sustainable Development SPD Guidance 2009 (4.6 External Lighting)*

CARBON TRUST Lighting Guide 007 "*Installers' Guide to the Assessment of Energy Efficient Lighting Installations*",(2004).

SOCIETY OF LIGHT AND LIGHTING Lighting Guide 6 *The outdoor environment* (1992).

3.5 Carbon Dioxide (CO_2)reduction (Small Scale zero/low carbon technologies)

There are several technologies which can deliver heat or electrical energy to buildings with little or no implications for carbon dioxide emissions. These include**:**

- Domestic wind energy
- Photovoltaic cells
- Solar water heating
- Biomass Heating
- Micro hydro

Further technologies are able to deliver significantly lower carbon energy (largely due to their inherent efficiencies when compared to conventional grid-supplied energy). These include:

- Heat Pumps (air, water, ground and absorption)
- Micro Combined Heat and Power (serving a building)
- Local Combined Heat and Power (serving a site or district)
- District Heating
- Fuel cells

Each site and building type will suit a different technology or a combination of technologies. Small scale wind turbines are unlikely to be suitable in most residential parts of the borough. It is recommended that only installers and products certified by the Microgeneration Certification Scheme are used (www.uk-microgeneration.org.uk)

NB See PUSH *Sustainable Development SPD Guidance 2009 (4.7 CO2 reduction (Small Scale zero/low carbon technologies))* for further details on these technologies.

Code FSH Credits

One credit is available under **Ene7** (Zero or Low Carbon Energy Technologies) where energy is supplied from local renewable or low carbon energy sources designed and installed in a manner endorsed by a feasibility study prepared by an independent energy specialist and there is a 10% reduction in carbon dioxide emissions as a result of this method of supply.
A second credit is available if the carbon dioxide reduction is 15%

BREEAM Credits

There are up to three credits for employing zero or low carbon energy technologies in **Ene 5** and they will help to gain credits under **Ene1** which requires reductions in carbon dioxide emissions.

Important to use CarbonFREE and not Carbon Free consistently

The Council's Carbon Compensation Fund (CarbonFREE)

The Council's Carbon Fund for Reducing Emissions in Eastleigh (CarbonFREE) is dedicated to creating sustainable energy projects in the borough and also to making existing residential housing stock and community buildings more energy efficient.

Some smaller sites may find the on-site production of low/zero carbon energy more difficult. The developer would need to satisfy the Council that the full on-site or local provision is technically unfeasible. In these cases an off-site contribution to CarbonFREE will be an option. The financial contribution will be based on a figure equal to the most expensive zero carbon technology (in £'s per tonne of carbon saved), which currently is likely to be photovoltaic panels.

In these cases (which are expected to occur in only a small minority of applications) a financial contribution proportional to the shortfall in the carbon emissions reduction will be required. These figures will be inflation-adjusted every new financial year.
The base figure for the calculations of emissions reductions already includes all energy efficiency measures required to meet the mandatory levels in the Code for Sustainable Homes.

Essential Requirement ESD 6

The Council requires all buildings in new residential development of 10 dwellings or more to achieve*:

- **Up to the end of 2011** at least one Code **Ene 7** credit (10% carbon dioxide emissions reductions via local low/zero carbon energy)
- from January **2012** two Code **Ene 7** credits (15% carbon dioxide emissions reductions via local low/zero carbon energy)

The Council requires all new non-residential and multi-residential development (over 1000 sqm of external floorspace) to achieve*:

- at least two BREEAM **Ene 5** credits (10% carbon dioxide emissions reductions via local low/zero carbon energy)
- from January **2012** all three BREEAM **Ene 5** credits (15% carbon dioxide emissions reductions via local low/zero carbon energy)

From January 2011 when a planning application is submitted the thresholds for this essential requirement will change to all residential development (1 unit and above) and to non-residential and multi-residential development above 500 sq m of external floor space.

- For all developments where it can be proved to the satisfaction of the Council that the full percentage requirement cannot be met on site or local to the site for reasons of technical non feasibility, a contribution to the Council's 'CarbonFREE' fund may be negotiated for the shortfall based on a figure equal to the most expensive zero carbon technology (likely to be photovoltaic panels).
-

ESD 6COMPLIANCE CHECK:

Residential:

Up to the end of 2011: Code FSH Assessor's reports at design stage and post construction stage stating at least 1 Ene 7 credit achieved.
From 2012: Code FSH Assessor's reports at design stage and post construction stage stating both Ene 7 credits achieved.

Non-residential and Multi-residential:

Up to the end of 2011: BREEAM Assessor's reports at design stage and post construction stage stating at least 2 BREEAM Ene 5 credits achieved.
From 2012: BREEAM Assessor's reports at design stage and post construction stage all 3 BREEAM Ene 5 credits achieved.

CarbonFREE Applicants:

1. Developer submits technical feasibility report clearly showing all possible low/zero technologies have been considered with the conclusion that a full Carbon dioxide reduction under Essential Requirement ESD 6 is impossible for technical reasons.
2. Code or BREEAM Assessor's report at design stage and post construction stage confirms the shortfall from the target carbon reduction through local or on-site low/zero technologies
3. The manager of the Eastleigh Borough Council CarbonFREE fund confirms receipt of the Carbon Compensation Contribution from the developer according to the Council formula. The CarbonFREE manager will give the developer details of the typical local projects that such a contribution will fund.

Sustainability Checklist

Q.3.5: By what percentage will carbon dioxide emissions from buildings in this development be reduced by means of on-site zero or low carbon energy generation?

Planning Implications

Wind:

- The Council will need to give planning permission for the installation of wind turbines, particularly in urban areas.
- The government review of GPDO has relaxed domestic restrictions on the smaller wind turbines.
- There is a clear visual impact which will be particularly important in conservation areas and with listed buildings.
- Other considerations are the noise of the rotors and the structural safety of buildings that turbines are attached to.

Heat Pumps:

- Heat pumps produce some noise - similar to that of an oil fired boiler. Unlike a boiler, they also produce vibration. For this reason, heat pumps should always be installed away from occupied spaces. The best place is in a utility room, or at the back of a garage.
- No visual impact as all kit underground or in a plant room, unless air source (which looks like an air conditioning unit).
- Water open loop systems using a lake or other water body may need an EA licence.
- The suitability of geology/ soil and the presence of underground services need to be considered.
- Bore holes will also require suitable geology and possibly a permit from the Environment Agency.
- The Town and Country Planning (General Permitted Development) (Amendment) (England) Order 2008 make ground and water source heat pumps “within the curtilage of a dwelling house” permitted development.

Biomass Heating:

- Plant room should be in basement of tallest part of development.
- Requires a flue, ending above roof line.
- Can burn smokelessly to comply with Clean Air Act.
- Significant fuel storage is required adjacent to the boiler.
- Automatic feeding from hopper/ silo/ walking floor may be proposed for larger projects.

- The fuel storage needs to be accessible by lorry. 1 delivery a week in the winter might be typical.
- Where the fuel is coming from and supply chain issues need to be considered.
- The Town and Country Planning (General Permitted Development) (Amendment) (England) Order 2008 make "the installation, alteration or replacement of a flue, forming part of a biomass heating system, on a dwelling house" permitted development.
- Expected flue emissions may need to be discussed with the Council's Environmental Health section.

PV Cells:

- Can be roof mounted, roof integrated, building integrated
- Roofs should be orientated within 45° of south, 30° angle is optimum and unshaded by adjacent buildings/trees
- Visual impact of the systems, particularly in conservation areas
- The Town and Country Planning (General Permitted Development) (Amendment) (England) Order 2008 make PV cells permitted development (subject to certain restrictions), for residential development with the exception of listed buildings and with some further restrictions in a conservation area.
- It can be possible to locate these on the ground in the right circumstances rather on the roof.

Solar Water Heating:

- To maximise the efficiency of systems, larger hot water storage cylinders than would normally be installed for gas or oil-fired systems are usually required. (Airing cupboards will need to be designed to allow for this.)
- Sufficient roof space is necessary for mounting the collector (usually 2-5m^2) in a southerly orientated direction (this may require reorientation of some properties or the use of hipped roofs).
- The intended location for the collector must not be shaded by any obstructions (such as trees and other buildings).
- The Town and Country Planning (General Permitted Development) (Amendment) (England) Order 2008 make solar thermal heating cells permitted development (subject to certain restrictions) for residential development, with the exception of listed buildings and with some further restrictions in a conservation area.
- It can be possible to locate these on the ground in the right circumstances rather on the roof.

Micro CHP:

- Few planning issues but space will be required to accommodate the generator unit.
- Biomass CHP will have similar implications as Biomass heating systems.

Micro Hydro:

- EA permission may be required.
- Possible effects on local biodiversity and/or amenity.

CHP / District Heating:

- A chimney will be required
- Size of energy demand will dictate size of power plant

Further Guidance and References

PUSH *Sustainable Development SPD Guidance* 2009 (4.7 CO2 reduction (Small Scale zero/low carbon technologies)) for further details on these technologies

ODPM
Planning Policy Statement 22: "*Renewable Energy*", (2004)
Planning for Renewable Energy: "*A Companion Guide to PPS22*", (2004)
London Renewables Toolkit, available to download from
http://www.london.gov.uk/mayor/environment/energy/renew_resources.jsp

Quality Assurance for Combined Heat and Power: http://www.chpqa.com/

3.6. Zero Carbon Residential Developments

Government definition of a zero carbon home:
A zero carbon home is one with 'zero net emissions of Carbon Dioxide (CO_2) from all energy use in the home'. The definition encompasses all energy use in the home (including energy for cooking, TVs, computers and other appliances) rather than just those energy uses that are currently part of building regulations (space heating, hot water, ventilation and some lighting). It means that over a year there are no net carbon emissions resulting from the operation of the dwelling. This could be achieved either through steps taken at the individual dwelling level or through site wide strategies. So it will not be necessary for each dwelling to have its own micro generation capacity where development level solutions would be more appropriate.
(Source: DCLG press release 13 December 2006).

The Government has announced that by 2016 all new homes built in the UK should be Zero Carbon and since October 2007 all new build Zero Carbon Homes are Stamp Duty Land Tax Exempt.
This level of environmentally sustainable development will be more challenging for developers. Although each site and each building will adopt different design measures to achieve a net zero carbon development, listed below are some common factors which will need to be considered:

Reduce Energy Demand

- Incorporate high levels of insulation in roof and walls (down to 0.11 U-Value)
- Design to achieve maximum air tightness throughout the building envelope
- Install windows and doors with greater thermal performance
- Orientate the home to maximise space heating from winter sun and shade from cold Northerly winds
- Incorporate draft lobby at entrances to reduce mass migration of heat when doors are opened
- Install ventilation with heat recovery that are at least 95% efficient
- Use low energy lighting throughout (1W LED equal to 60W standard lamp)
- Incorporate the most energy efficient appliances
- Reduce hot water pipe runs with efficient plumbing design and insulate all pipes

Reduce Peak Energy Demand

- Use intelligent software to prioritise the use of appliances and stagger their use
- Incorporate electrical circuit design reducing power demand whilst appliances are on standby
- Install motion detection lighting and timer delay lighting

Install Renewable Energy Generating Devices

- Consider using ground or air source heat pumps for hot water and space heating
- Consider use of biomass fuelled hot water and space heating
- Consider small scale urban wind turbines to generate electrical power
- Consider installing photovoltaics (PV) to generate electrical power
- Consider biomass fuelled micro or community combined heat and power plants
- Consider small scale hydro electric (Where applicable)

Store or Export Unused Energy Generated

- Incorporate 'kinetic' battery systems to store unused energy generated
- Design to export back to the national grid any unused energy generated

Code FSH Credits

Zero Carbon achieves the maximum 15 **Ene1** credits. Code level 6 requires net zero carbon dwellings.

BREEAM credits

Zero Carbon achieves the maximum number of **Ene 1** credits.

Essential Requirement: none

Sustainability Checklist

Q.3.6: What percentage of buildings in this development will be designed to emit net zero carbon emissions annually?

Planning Implications

Zero Carbon and Code Level 6 homes are likely to exhibit design elements which are a product of their highly efficient function and often their on-site production of renewable energy. Some changes will be relatively insignificant visually (CHP or district heating supplied energy) or invisible (more efficient insulation, ground source heat pumps).
Micro-renewable technologies such as wind turbines, solar water heating and photovoltaic cells or tiles are likely to have much greater visual impact. Building shape and orientation will also need to respond to the requirements of passive solar gain and natural ventilation systems.

Case Study

In 2007 the first Code Level 6 show home, "The Lighthouse", was constructed at the BRE site at Garston. One of the key requirements of Code Level 6 is for the home to be designed to produce zero net carbon emissions once occupied.

The Lighthouse Ecohouse by Kingspan

Further Guidance and References

PUSH *Sustainable Development SPD Guidance* 2009 (4.8 Zero Carbon Residential Developments)

Government Guidance:
http://www.communities.gov.uk/archived/publications/planningandbuilding/buildinggreener

3.7 Natural Ventilation

Natural ventilation is the process of supplying and removing air through an indoor space by natural means. Development which maximises the potential for natural ventilation will minimise the tendency to employ electric powered air conditioning which is very carbon intensive. There are two types of natural ventilation occurring in buildings: *wind driven ventilation* and *stack ventilation*. The most efficient design for a natural ventilation building should implement both types of ventilation.

Sustainability Checklist

Q.3.7: How will buildings be ventilated?

Further Guidance and References

PUSH *Sustainable Development SPD Guidance* (2009)(4.3 Natural ventilation)

Carbon Trust General Information Report 85 *New Ways of Cooling – information for building designers*, (2001).

Useful website: http://www.wbdg.org/resources/naturalventilation.php

Handbook methods such as those presented in **ASHRAE**'s *Handbook of Fundamentals* or **Bansal and Minke**'s *Passive Building Design: A Handbook of Natural Climatic Control* (ISBN: 044481745X) are very useful in calculating airflow from natural sources for very simple building geometries.

4.3.8 Drying Space

The use of electric powered clothes dryers in residential properties is increasing and is making a significant contribution to carbon emissions from the home. The best way to minimise the use of these machines is to make it convenient for residents to dry clothes 'naturally'.
For properties with gardens, developers can simply provide washing lines. Where properties do not have access to a private garden, internal drying space can be provided in an appropriate, adequately heated and ventilated room.

Sustainability Checklist

Q.3.8: What facilities for non-mechanical clothes drying will residents have?

Further Guidance and References

PUSH *Sustainable Development SPD Guidance* (2009) (4.4 Drying Space)

Code For Sustainable Homes technical guide:
http://www.planningportal.gov.uk/uploads/code_for_sustainable_homes_techguide.pdf

4 0 Materials and Waste

POLICY CONTEXT

Policy Context
(See Appendix 2)

- **South East Plan Policies SH8 (iv) CC1; CC2; CC4**
- **PUSH Planning Policy Framework**
- **Eastleigh Local Plan Policy 37.ES (iii)**

Links to the following sections:
4.1 (Construction Waste)
4.2 (Construction Materials)
4.3 (Waste Recycling)

- **Eastleigh Local Plan Policy 28.ES (Waste Collection and Recycling)**

Links to the following section:
4.3 (Waste Recycling)

4.1 Construction Waste

Historically, the level of waste generated by construction on site has been high with significant impacts, particularly at a local level Construction uses over 420 million tonnes of materials per year and produces 92m tonnes of construction and demolition waste per year (around 50% of which is recycled) (CIRIA). An estimated 13 million tones of completely unused building materials are discarded every year (BRE).

Significant reductions in waste and better management can be achieved by good design, improved logistics, better on-site construction practices and re-use/recycling wherever possible. The ability to segregate waste for re-use/recycling will depend on the construction stage as the waste will vary in terms of type and amount. It will also depend on the amount of space available on-site for segregation. Good storage facilities for raw materials to minimise damage should be provided during construction works. Targets should be set with the aim of minimising waste production on each project.

Site Waste Management Plans

Since April 2008, Site Waste Management Plans (SWMPs) have been compulsory in England for all construction projects on one site with an estimated cost greater than £300,000 (The Site Waste Management Plans Regulations 2008 (Department for Environment Food and Rural Affairs). For projects above £500,000, a more detailed SWMP will be required.

To fully comply with the duties under these and other regulations, the SWMP will have to include construction and demolition waste**.** The developer will also have to:

- Estimate the amount and type of waste Show how you intend to improve efficiency in using materials.
- Set out how you intend to reuse, recycle and lawfully dispose of such waste.
- Update the SWMP during the project
- Measure actual performance of the SWMP against estimates.

NB For further details on SWMP requirements see **PUSH** *Sustainable Development SPD Guidance 2009 (5.1 Construction Waste)*

SWMPs will apply to all construction work including:

- preparatory work such as demolition and excavation
- civil engineering and engineering projects
- projects involving maintenance, alteration and decoration of existing structures
- the installation, maintenance or removal of related services such as electrical, gas, water, sewage and telecommunications.

Code FSH Credits

There is a mandatory requirement for a SWMP to be produced and implemented where construction costs are more than £300,000 (Feb 2008).
One credit in **Was 2** (Construction Site Waste Management) requires procedures and commitments to minimise site waste and a second credit for commitments to re-use and recycle construction waste.

BREEAM Credits

There are up to 3 credits available in **Wste 1** (Construction site Waste Management).

Sustainability Checklist

Q.4.1: What measures will be taken to minimise construction waste?

Planning Implications

There are unlikely to be significant visual impacts on the finished development. More space may be required on site during the development period to cater for the increased recycling of materials.

More recycling and less waste will lead to less rubbish on site and fewer lorry trips to remove waste and bring in more materials. Both these effects reduce the impact of construction on neighbouring communities.

Further Guidance

PUSH *Sustainable Development SPD Guidance (*2009) (5.1 Construction Waste)

For information and further advice on Site Waste Management Plans and to freely download BRE's new SMARTWaste Plan tool visit: www.smartwaste.co.uk

Environment Agency guidance on waste: www.environment-agency.gov.uk/subjects/waste/ and www.netregs.gov.uk

DEFRA provides information and associated guidance on the Site Waste Management Plan Regulations 2008: www.defra.gov.uk/constructionwaste

For help in finding local waste management companies and opportunities to reuse and recycle materials try BREMAP free of charge at: www.bremap.co.uk

Both WRAP and Envirowise can provide advice and guidance on SWMPs: www.wrap.org.uk/construction and www.envirowise.gov.uk

4.2 Construction Materials

The major environmental impacts to be considered when selecting construction materials are as follows:

- Global Warming

The production use and disposal of building materials accounts for significant quantities of extra greenhouse gas emissions, both internationally and in the UK.

- Embodied Energy

Embodied energy is the energy consumed by all of the processes associated with the production of a building, from the acquisition of natural resources to product delivery. Every building is a complex combination of many processed materials, each of which contributes to the building's total embodied energy. Renovation and maintenance also add to the embodied energy over a building's life.

Recent research has shown that the embodied energy content of a building can be the equivalent of many years of the energy used in operating the building over its life.

	EMBODIED ENERGY			EMBODIED ENERGY	
MATERIAL	MJ/Kg	MJ/M^3	**MATERIAL**	MJ/Kg	MJ/M^3
Aggregate	0.1	150	Plywood	10.4	5720
Straw bale	0.2	31	Mineral wool insulation	14.6	139
Soil-cement	0.4	819	Glass	15.9	37210
Stone (local)	0.8	2030	Fibreglass insulation	30.3	4930
Concrete block	0.9	2350	Steel	32.0	251200
Concrete (30Mpa)	1.3	3180	Zinc	51.0	371280
Concrete (precast)	2.0	2780	Brass	62.0	519560
Timber	2.5	1380	PVC	70.0	93620
Brick	2.5	5170	Copper	70.6	631164
Cellulose insulation	3.3	112	Paint	93.3	117500
Plasterboard	6.1	5890	Linoleum	116	150930
Chipboard	8.0	4400	Polystyrene insulation	117	3770
Aluminium (recycled)	8.1	21870	Carpet (synthetic)	148	84900
Steel (recycled)	8.9	37210	Aluminium	227	515700
Asphalt shingles	9.0	4930			

Table 4.1 An international list of the embodied energy of common building materials

The single most important factor in reducing the impact of embodied energy is to design long life, durable and adaptable buildings,resilient to the effects of future climate change.

Pollution

Several different kinds of pollutants are emitted as a byproduct of material production, supply and maintenance

Resources

As well as using energy resources, which in the case of fossil fuels are finite, the production, supply and maintenance of building materials has a significant impact on both mineral and water extraction.

Responsible Sourcing

This can only be demonstrated through auditable third party certification schemes. There are a variety of schemes designed to assess the ethical production and supply of materials. The most advanced are in the timber industry (e.g. the Forestry Stewardship Council (FSC)) with Environmental Management Systems (EMS) being applied to most other materials

The BRE 'Green Guide to Specification'

The Green Guide (latest edition June 2008) contains more than 1200 specifications used in various types of building.

See: http://www.thegreenguide.org.uk/

The Guide examines the relative **environmental impacts** of the construction materials commonly used in six different generic types building, including:

- Residential
- Commercial buildings, e.g. offices
- Educational
- Healthcare
- Retail
- Industrial

The environmental rankings are based on **Life Cycle Assessments** (LCA), using BRE's Environmental Profiles Methodology 2008.

Materials and components are arranged on an elemental basis so that designers and specifiers can compare and select from

comparable systems or materials as they compile their specification. The elements covered are:

- External walls
- Internal walls and partitions
- Roofs
- Ground floors
- Upper floors
- Windows
- Insulation
- Landscaping
- Floor finishes

Across these building element categories the Guide provides an extensive, but not complete catalogue of building specifications covering most common building materials.

This data is set out as an **A+** to **E** ranking system, where **A+** represents the best environmental performance / least environmental impact, and **E** the worst environmental performance / most environmental impact. BRE has provided a summary environmental rating - The Green Guide rating, which is a measure of overall environmental impacts. covering the following issues

- Climate change
- Water extraction
- Mineral resource depletion
- Stratospheric ozone depletion
- Human toxicity
- Ecotoxicity to freshwater
- Nuclear waste
- Ecotoxicity to land
- Waste disposal
- Fossil fuel depletion
- Eutrophication
- Photochemical ozone creation
- Acidification

By evaluating the performance of materials and building systems against these specific environmental impacts, which have also been ranked on an A+ to E basis, it is possible for the specifier to select specifications on the basis of personal or organisational preferences or priorities, or take decisions based on the performance of a material against a particular environmental impact.

Green Building Materials

New green building materials and techniques are being developed.

- The use of timber for timber framed buildings is inherently more sustainable than the use of concrete blocks and/or steel frames.
- Green roofs (see Essential Requirement EBC GI1) are able to provide enhanced thermal performance as well as benefits for biodiversity, urban cooling and amenity amongst other things. The substrate can often consist of recycled spoil (such as crushed brick) from site.
- Straw bales are a cheap agricultural by-product which, in combination with lime mortar can provide very high levels of wall insulation.
- Glulam timber products are laminated timber layered beams whose tensile strength makes them a sustainable alternative to steel beams.
- Various 'green concrete' products are being used and developed which exhibit much greater insulation properties or have a much lower embodied energy than conventional concretes.

Code FSH Credits

There is a mandatory requirement for at least 3 out of the main 5 key building elements (roof, windows, internal/external walls and upper/ground floors) achieve at least a 'D' rating from the 2007 edition of the Green Guide. Increasing numbers of credits are awarded as materials are rated from D to A+ under the Green Guide the more credits are achieved (up to 15) in **Mat 1** (Environmental impact of Materials). **Mat 2** and **Mat 3** award up to 6 and 3 credits respectively for the responsible sourcing of materials.

BREEAM Credits

There are a range of issues (**Mat1- Mat7**) which award credits for reducing the environmental impact of construction materials.

Sustainability Checklist

Q.4.2: How many Code or BREEAM Materials credits will the development aim to achieve?

Planning Implications

The pursuit of many credits in this area will inevitably lead to some restriction in the palette of materials used. The majority of materials in the Green Guide do appear to rate either A or A+ so this restriction may not be too onerous.

Further Guidance and References

PUSH *Sustainable Development SPD Guidance* (2009) (5.2 Construction Materials)

The Green Guide to Specification: www.thegreenguide.org.uk

4.3 Waste Recycling

Waste Treatment Alternatives

Reducing waste is an important contributor to sustainable development. In 2004/5 nearly 36 million tonnes of municipal waste was generated in the UK, 30 million tonnes of which was collected from households. This equates to approximately 0.5 tonnes of household waste per person.
The hierarchy of priorities for tackling this problem is to "reduce, reuse and recycle". Although recycling is the least sustainable solution out of these three for conserving resources, it is much better than the main alternatives which are landfill and incineration. At present most waste from homes and businesses (nationally) ends up in **landfill** where the biodegradable part generates methane (a greenhouse gas 21 times more potent than CO_2) while valuable energy is used in extracting and processing new raw materials. Very little of the waste produced in Hampshire goes to landfill.

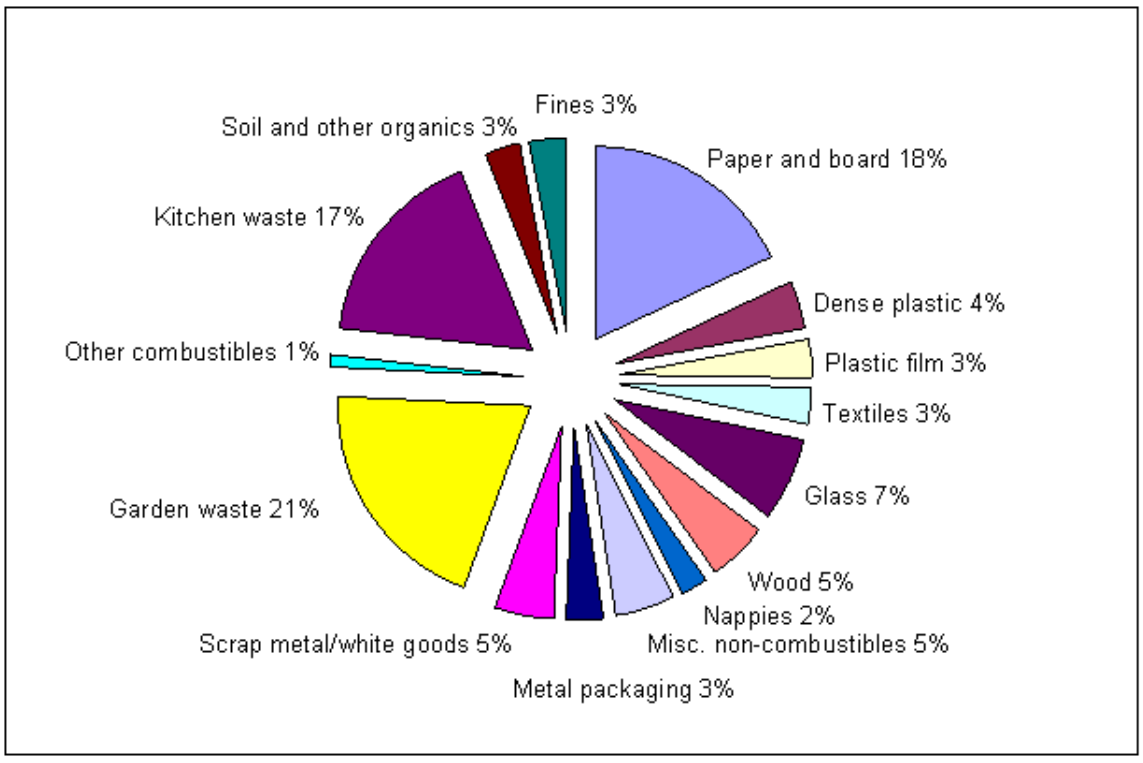


Fig 4.1 Source: Analysis of household waste composition and factors driving waste increases - Dr. J. Parfitt, WRAP, December 2002

Incineration has the benefit of producing energy which may then be used for heating or for power generation. Most waste in Hampshire is incinerated. The disadvantages are that incinerators need a minimum quantity of rubbish to operate which can be a

disadvantage for minimising waste; they generate energy inefficiently and produce more greenhouse gases than gas fired power stations. Some commentators also believe that incinerators are guilty of emitting harmful toxins such as dioxins into the atmosphere.

Anaerobic digestion of organic waste is a waste treatment method which generates biogas as a byproduct. This process is relatively expensive and requires a major capital investment. Waste water from the process may contain a high concentration of metals, nitrogen and organic materials.

Eastleigh Borough Council has recycling and composting rates at nearly 40% in 2008. This is slightly above the European average while Austria already recycles more than 60%. The Eastleigh target is to reach 50% by 2009/10
UK Government targets are:

- recycling and composting of household waste – at least 40% by 2010, 45% by 2015 and 50% by 2020.
- Commercial and industrial waste landfilled: 20% reduction from 2004 levels by 2010.

In 2002/3 Industrial and Commercial waste in England totalled 68 million tonnes. Of this about 38 million tonnes was attributable to industry and 30 million to commerce. The individual sector that produced the most waste was the retail sector, which generated nearly 13 million tonnes of waste.

To help facilitate greater efficiency and higher rates of recycling by local authorities adequate storage for collection of waste and recycling matter is critical.

Eastleigh Borough Council is planning to provide a kitchen waste collection service for all houses from March 2009 and for flats at a later date. The **Eastleigh Borough Council** Supplementary Planning Guidance (2005) for the *Storage and Collection of Domestic Waste and Recyclable Materials* sets out the Council's current minimum requirements for residential development. This is due to be updated in 2009.

Code FSH Credits

A mandatory requirement of the Code is for the provision of a minimum capacity of external containers for household waste as set

out by the Local Authority. There are 2 potential credits in **Was 1** (Household Waste Storage and Recycling Facilities) for the (defined) adequate internal storage of recyclable waste and a further 2 credits for a Local Authority collection scheme or (defined) adequate external storage of recyclable waste.

BREEAM Credits

A single credit is awarded in **Wst 3** (**Recyclable waste Storage**) when a central dedicated storage space (defined) is provided for recycled materials.

Sustainability Checklist

Q.4.3: What measures will be taken to best facilitate waste recycling from the finished development?

Planning Implications

External storage for recycling and access to it both by residents and by the collection agents will have an impact on the layout of developments. For apartments and commercial buildings storage facilities may be integrated into the main building or in dedicated buildings nearby. Separate buildings are more problematic in design terms as they can create a cluttered appearance to the external works and may be more likely to attract vandals and graffiti.
Bin storage for houses must not be allowed to dominate the public realm. If easy rear garden or garage access is not feasible and front garden bin storage is unavoidable this should be well thought out and properly integrated with either main building or front garden boundary structures. (see: *Storage and Collection of Domestic Waste & Recyclable Materials SPD*, **EBC**, Feb 2005)

Further Guidance

PUSH *Sustainable Development SPD Guidance (*2009) (5.3 Waste Recycling)

EBC *Storage and Collection of Domestic Waste & Recyclable Materials SPD*, Feb 2005

EBC Waste Strategy http://www.eastleigh.gov.uk/PDF/EBCWasteStrategy.pdf

WRAP (The Waste and Resources Action Programme) www.wrap.org.uk

Recycle Now www.recyclenow.com

Defra www.defra.gov.uk/environment/waste/

APPENDIX 1: GUIDANCE: 4.3 WASTE RECYCLING

ODPM Building Regulations Approved Document H - Drainage and waste disposal (2001) www.communities.gov.uk

BSI BS 5906:2005 Code of Practice for Waste Management in Buildings
Household Waste Recycling Act; 2003

4.4 Composting

In 2003-2004, 72% of municipal waste in England ended up in landfill sites, at least 40% of which was organic in nature. Organic waste is a problem if sent to landfill, because it is impossible to separate out from other waste once mingled, and will rot producing methane, a greenhouse gas responsible for global warming but 21 times more potent than CO_2. The organic materials within a landfill also produce a liquid called leachate, which may enter and contaminate water supplies. The alternative to landfill, incineration, whilst reducing the mass of the waste, does not dispose of it altogether; approximately 30% of the original mass remains, it still needs to be landfilled, and is still a waste of resources.

The best way to dispose of organic waste is to compost it either through a centralised composting scheme run by the Council or at home. Over 30% of household waste can be diverted from landfill by composting. Eastleigh Borough Council provides a kerbside collection service. Alternatively, individuals can use a home composter for the garden or try a worm bin for indoor use. The Council can supply reduced-cost composter bins.

Compost forms as a result of the natural breakdown of organic material derived from living animals and plants. The "breaking down" is aerobic i.e. an oxygen using process performed by the bacteria, fungi, insects and animals, which inhabit soil. In a compost heap these organisms generate heat as they decompose organic matter and break it into fine particles. Composting is nature's own and oldest method of waste disposal and soil fertilisation.

Code FSH Credits

There is a single credit available in **Was 3** (Composting) when developers provide individual home composting facilities or a communal/community composting service or by default if there is a Council kitchen waste collection scheme.

BREEAM Credits

There are no credits for encouraging composting in BREEAM.

Essential Requirement none

Sustainability Checklist

Q.4.4: What provision is being made to encourage composting in the residential development?

Planning Implications

Composting bins will normally be located in the private back gardens of individual houses. Communal composting facilities on site will need careful siting and design. The council collection system involves strong garden waste sacks which would not be expected to be visible in the public realm except on collection day.

Further Guidance and References

PUSH *Sustainable Development SPD Guidance (*2009) (5.4 Composting)

Compost Information Sheet. 2005: *Composting and disposing of garden and kitchen waste*. www.wasteonline.org.uk

Community Composting www.communitycompost.org

Composting troubleshooting www.compostguide.com

5.0 Green Infrastructure

POLICY CONTEXT
(See Appendix 2)

- **South East Plan Policies SH8 (iv); CC1; CC2; CC4**
- **PUSH Planning Policy Framework**

Eastleigh Local Plan Policy 37.ES (i), (ii), (iii), (iv) (General Sustainability)

Links to the following essential requirements:

- ESD 7(Green Roofs)

Eastleigh Local Plan Policy 33.ES (Air Quality)

Links to Essential Requirements:

- ESD 7 (Green Roofs)
- ESD 8 (Trees)

Eastleigh Local Plan Policy 45.ES (Flooding and Erosion)

Links to Essential Requirements:

- ESD 7 (Green Roofs)

Eastleigh Local Plan Policies 146.ES and 147.ES (Public Open Space)

Links to Essential Requirements

- ESD 7 (Green Roofs)
- ESD 8 (Trees)

Links to the following section:

5.1 (Green Infrastructure)

5.1 Green Infrastructure

Green infrastructure is the term used to describe the network of green spaces, landscapes and natural elements that intersperse and connect our cities, towns and villages It includes:

- Street trees
- Allotments and gardens
- Amenity space, such as communal green spaces within housing areas, children's play spaces and playing fields
- Cemeteries and churchyards
- Parks, e.g. pocket parks, town parks and country parks
- Green corridors, including hedgerows, ditches, disused railways, verges
- Farmland, particularly land providing other public benefits such as access, recreation, education, management for biodiversity and renewable energy
- Wildlife sites and habitats, e.g. natural and semi-natural habitats, local nature reserves, county wildlife sites, Sites of Special Scientific Interest and Natura 2000 sites
- Public rights of way, cycle-ways and other recreational routes
- Registered commons and village and town greens
- Historic assets such as Scheduled Monuments, locally designated heritage sites, historic landscapes, historic parks and gardens
- Other features and assets such as waterways, water-bodies and woodland

The Benefits of Green Infrastructure

Well-designed and integrated green infrastructure can deliver a range of benefits, often in combination. It can:

- provide opportunities for exercise, such as walking, active recreation and sport, and space for spiritual well-being and quiet contemplation
- provide community resources for learning and training
- provide a leisure focus and attraction for people of all ages
- help to establish local identity or sense of place
- improve environmental quality, e.g. better air and water quality, local climate control and noise attenuation
- improve and sustain land values
- provide areas of value for biodiversity and links to neighbouring areas
- help to mitigate against the impacts of climate change through sustainable urban drainage, flood mitigation and reducing the impacts of the urban heat island effect
- provide opportunities for renewable energy provision (e.g. through improved management of existing woodlands for wood fuel production)

- can be a source of local food production

Green Infrastructure Scale

Green infrastructure can be found at the different scales from, the 'doorstep' and neighbourhood to town through to sub-regional scales. The illustrations on the following page describe some of the features which Eastleigh will expect to be considered at the different scales of development from neighbourhood to sub-region.
For appropriate town or sub-regional scale green infrastructure refer to the Eastleigh District Biodiversity Action Plan (BAP) and PPS17 Open Space Strategies. Such green infrastructure should meet the Biodiversity objective of the Council's Climate Change Strategy 2008-2012 which states

"Objective: Increase the resilience and reduce the vulnerability of ecosystems in the Borough (flora, fauna and their associated habitats) so that they can accommodate and respond to climate change".

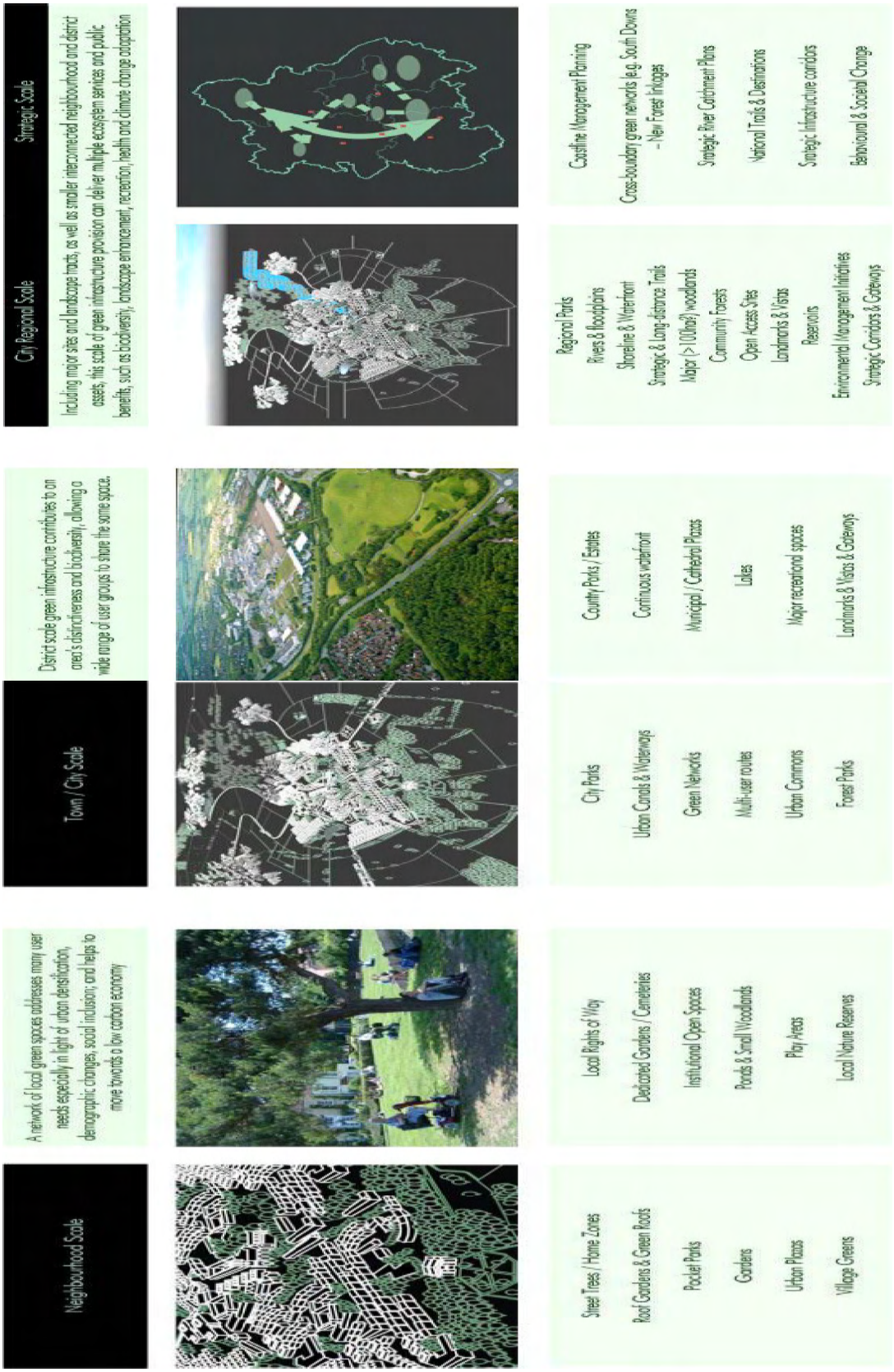


Fig 5.1 Illustration from Towards a Green Infrastructure Strategy, TEP, 2008

Code FSH Credits

The requirements of green infrastructure help to support the Code FSH credits available for:

- 9 potential credits available for 5 different issues, namely:

Eco1 (Ecological Value of Site)
Eco2 (Ecological Enhancement)
Eco3 (Protection of Ecological Features)
Eco4 (Change of Ecological Value of Site)
Eco5 (Building Footprint)
(see section (biodiversity) 4.6.1 below)

- 2 potential **Sur 1** credits (see section 4.2.4 (reduction in surface water run-off) above)
- 1potential **Hea 1** credit (see section 4.6.3 (private space) below)

BREEAM Credits

The requirements of green infrastructure help to support the BREEAM credits available for:

- :several potential credits available for 6 different issues, namely:

LE01 (building on a 'brownfield' site)
LE02 (building on previously contaminated land).
LE03 (building on land of low ecological value and protection of ecological features)
LE04 (minimizing impact on ecological value)
LE05 (ecological enhancement)
LE06 (longterm biodiversity impact)
(see section (biodiversity) 4.6.1 below)

- 1 potential **Pol 7** credit (see section.2.4 (reduction in surface water run-off) above)

Sustainability Checklist

Q.5.1 What elements of green infrastructure are proposed with the development and how will they be managed?

Planning Implications

The extent and quality of new green infrastructure associated with development and the quality of the subsequent maintenance and management arrangements especially with future inevitable climate change in mind will have a critical effect on the success of that development. Applicants will also need to comply with the Council's Planning Obligations SPD (2008)

Further Guidance

PUSH *Sustainable Development SPD Guidance* (2009) (4.5 CO2 reduction (improved energy efficiency)

PUSH *Towards a Green Infrastructure Strategy for Urban South Hampshire*, TEP,2008

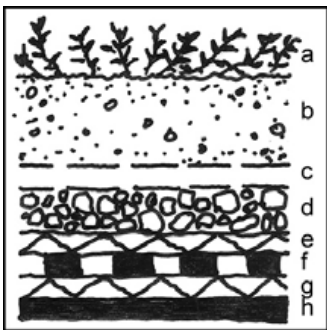
EBC *Planning Obligations SPD* (2008)

5.2 Green Roofs

Green roofs consist of plants grown on roofs. They have been around for millennia but with climate change and dwindling urban green space their popularity is increasing worldwide. Although best known as a method of water-attenuation, the many different sustainable development benefits of green roofs mean that they perform a unique contributory role in achieving general sustainable development policies. Modern green roofs can be categorized as 'intensive' or 'extensive' systems depending on the plant material and planned usage for the roof area.

Extensive Green Roofs

Extensive green roofs have minimal planting depths (as shallow as 2.0 cm) and sometimes only a mineral substrate. They are limited to herbs, grasses, mosses, and drought tolerant succulents such as *Sedum*, chosen for their ability to regenerate and maintain themselves over long periods of time, in addition to being able to withstand the harsh conditions of cold, heat, drought and wind. Native species are often preferred. Extensive green roofs require minimal maintenance, and are generally not accessible to the public. They do not necessarily require irrigation, and they have fewer other requirements, such as guardrails. Extensive green roofs are the least expensive form of roof greening to implement and maintain.



- Vegetation (a)
- Growing medium (b)
- Filter layer (c)
- Drainage layer (d)
- Protection layer (as required) (e)
- Root barrier (as required) (f)
- Separation layer (as required) (g)
- Waterproof membrane (h)

Fig 5.2 Typical Green Roof Components

Source: Goya Ngan: Green Roof Policies: Tools for Encouraging Sustainable Design Dec 2004

Meadow on Roof of Commercial Building, Germany

Traditional Scandinavian turf roof

Affordable Housing, Gold Lane, London

Sedum roof on garages, Germany

Self build, Shropshire

Fig 5.3 Extensive green roofs

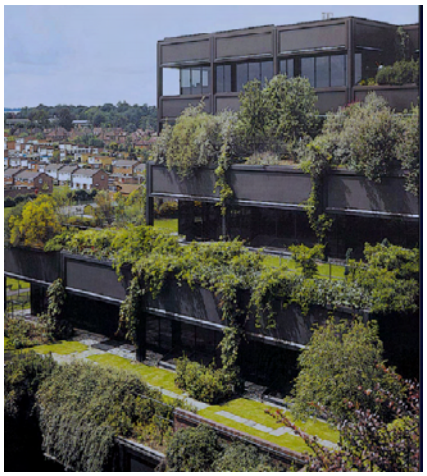
Intensive Green Roofs

Canary Wharf, London

Roof of Coast Plaza Hotel, Vancouver

Carlton House, Royal Leamington Spa

Moorgate Business Centre, Rotherham



Former Gateway House, Basingstoke built by Arup in 1970s. (© Arup Associates, photographer Martin Charles)

Roof Garden on top of 11 storey Chicago City Hall

Fig 5.3 Intensive Green Roofs

Intensive green roofs use a wide variety of plant species that may include trees and shrubs, require deeper substrate layers, are generally limited to flat roofs, require 'intense' maintenance, and are often park-like areas accessible to the general public. They are often built in high density areas where green space is limited. Intensive green roofs are more costly than extensive green roofs to build and maintain.

Benefits

The benefits of green roofs are numerous and contribute to different aspects of sustainable development.

In summary the recognised benefits are:

- **Storm Water Management**
- **Rainwater Harvesting**
- **Improve Building's Thermal Performance**
- **Counter Greenhouse Effect (absorb CO2)**
- **Urban Biodiversity**
- **Roof Membrane Protection**
- **Improve Building's Sound Attenuation**
- **Improved Air Quality**
- **Urban Heat Island Effect**
- **Amenity Value**
- **Aesthetic value**
- **Enhanced environmental image**
- **Enhanced fire resistance.**
-

For more detailed information about the benefits see **PUSH** *Sustainable Development SPD Guidance 2008 (7.1 Green Roofs)*

Gaining Code FSH or BREEAM credits with Green Roofs

While neither the Code nor the BREEAM assessment methods award credits specifically for green roofs they do contribute to achieving a wide range of other credits as follows:

Code FSH Credits

- Green roof water attenuation as a component of a Sustainable Drainage System (SuDS) can achieve up to two Code credits in **Sur 1** (Surface water Run-Off).

- A green roof in combination with a storage tank can be part of a rainwater harvesting system which helps to gain credits in **Wat 1** by reducing the use of mains water.
- A green roof planted with appropriate native species, as approved by a suitably qualified ecologist would gain a credit under **Eco 2** (Ecological enhancement). An additional credit under **Eco 4** (Change of Ecological Value of the Site) would be possible if the planted green roof area is a significant proportion of the building footprint.
- Green roofs will improve a building's thermal performance. This will help reduce the predicted Dwelling Emission Rate (DER) for the building which is the estimated carbon dioxide emissions per m^2 for energy use in heating, hot water and lighting. The lower DER produced with the green roof may help to gain an extra credit under the Code's **Ene1** (Dwelling Emission Rate DER).
- The Code's **Hea1** (Private Space) awards a credit where private or semi-private outdoor space is provided. In a high density development this can be difficult to achieve. Roof terraces, i.e. intensive green roofs, whether private or communal gardens, would provide the requirement for this issue.

BREEAM Credits

- Green roof water attenuation can be component of a Sustainable Drainage System (SuDS) which can achieve 1 credit under BREEAM **Pol 7.**
- A green roof in combination with a storage tank can be part of a rainwater harvesting system which helps to gain credits in BREEAM **Wat 1** by reducing the use of mains water.
- There are potential credits for both ecological enhancement and change of ecological value of the site by planting the green roof with native plant species as approved by a suitably qualified ecologist. BREEAM **LE 5.**
- Green roofs will improve a building's thermal performance. This will help reduce the predicted Dwelling Emission Rate (DER) for the building which is the estimated carbon dioxide emissions per m^2 for energy use in heating, hot water and lighting. The lower DER the green roof causes may help to gain an extra credit under BREEAM **Ene 1.**

Essential Requirement ESD 7

The Council requires either:

Green Roofs on at least 80% of the area of :

all flatted residential development roofs(of 10 dwellings and above)
and
all non-residential and multi-residential development roofs (over 1000 sqm of internal floorspace),

provided they are compatible with the Council's design objectives.

OR

Compliance with Essential requirement EBC W2 (Rainwater harvesting/

ESD 7 COMPLIANCE CHECK:

Residential, Non-residential and Multi-residential

The developer submits plans and square area figures for both total roof area for the development and the total green roof area, enabling a percentage green roof area to be calculated. A post–construction check will be needed to ensure that the planning condition has been satisfied for this essential requirement.

Sustainability Checklist

Q.5.2: What percentage of the development's total roof area will consist of green roofs?

Planning Implications

The construction and planting of green roofs should normally be viewed by the planning authority as a positive development as long as there is a clear commitment that adequate maintenance provision has been made. (some green roofs (e.g. sedum) require almost zero maintenance). In some cases green roofs may meet some of the Council's requirement for public open space or private amenity space associated with the development. In some situations such as in Conservation Areas the Council might take the view that roof design considerations should override the requirement for green roofs. Well designed, high quality contemporary buildings can still be appropriate in Conservation Areas if they are deemed to enhance the area. Such buildings could have green roofs.

Further Guidance

PUSH *Sustainable Development SPD Guidance* (2009)(7.1 Green Roofs)

EA Green Roof Toolkit for Developers:
http://www.environment-agency.gov.uk/business/sectors/91967.aspx

Useful website*: http://www.greenroofs.com/*

5.3 Trees

Benefits

Street trees and garden trees have several benefits which contribute to creating a more sustainable public realm. These include:

- **Health and Wellbeing**
  - **Air quality**
  - **Psychological**
  - **Aesthetic**
  - **Community identity**
- **Energy/CO2**
  - **Urban cooling**
  - **Solar shading**
- **Biodiversity**
  - **Habitat value**
  - **Green links**
- **Water**
  - **Storm water attenuation**

In addition the benefits listed above make streets and districts with generous street tree planting more attractive as places to live and work which is reflected in increased property values.

Code FSH Credits

There are no specific credits for trees in the Code FSH but they do count as ecological features if existing trees are incorporated into the new development in **Eco 1**and **Eco 3** or as new ecological features (if native species) in **Eco 2.**

BREEAM Credits

There are no specific credits for street trees in BREEAM

Essential Requirement ESD 8

The Council requires in all residential developments of 10 dwellings or more

- all new streets created for residential development to provide at least **1 street tree[1] per 30 linear metres of street**
- All new off-street[2] car parks accessible to the public to provide at least **1 tree[1] per 6 vehicle spaces**
- All **new private back gardens** to retain existing trees or (if no existing trees to retain) receive **at least 1 newly planted tree**

and

in multi-residential and non-residential development of at least 1000 sq m of internal floor space :

- All new off-street[2] car parks accessible to the public to provide at least **1 tree[1] per 6 vehicle spaces**

1 and the appropriate maintenance cost to Hampshire County Council for each tree where these are in areas adopted by the Highway Authority.
2 these include rear court parking and other surface communal car parking areas.
NB the selection, planting location and specification to be in accordance with the forthcoming Eastleigh Borough SPD: Design (expected 2009) and the HCC Manual for Streets (2008)

From January 2011 when an outline planning application is submitted the thresholds for this essential requirement will change to all flatted residential development (1 unit and above) and to non-residential and multi-residential development above 500 sq m of internal floor space.

ESD 8 COMPLIANCE CHECK:

Plans at an appropriate scale clearly showing the proposed trees and written confirmation that the appropriate maintenance costs for each tree in the Highway have been provide for by the developer.

Sustainability Checklist

Q.5.3: How many trees will be provided in every 30 linear metres of new street and in all communal car parks?

Planning Implications

The provision of street trees in both small infill developments and in larger new developments creates an extra design constraint on the buildings and the location of building lines. Street trees need to be resilient to climate change (e.g be resilient to increased incidences of drought and storm damage), large enough to make a significant impact on the street and to be in scale with adjacent buildings but

this requires space. The street layout, building location and interior layout and tree planting position as well as the selection of the tree variety must prevent future excessive 'pressure to prune' from the Highway Authority on the road carriageway side and from the building occupier or owner on the building side of the tree. Detailed guidance will be given in the forthcoming Eastleigh Borough SPD on Design (expected 2009).

Further Guidance

Wolf, K *City Trees and Property Values* (2007)
http://www.cfr.washington.edu/research.envmind/policy/Hedonics.pdf

6.0 Health and Wellbeing

There are many different ways in which development can have an influence on people's health and wellbeing. These range from the pleasure many of us derive from observing nature to the more profound effect that natural ecosystems have on the health of the environment that we live in. The protection and enhancement of the **biodiversity** of an area, as well as the nature conservation benefits, can also have a positive impact on the quality of environment for the human inhabitants of the development.

Natural daylight has a well proven positive impact on the psychological health of inhabitants and on the comfort and productivity of workers. (See Essential Requirement EBC E1 Natural Daylight).

Noise plays an important role in the quality of people's lives. This might be the background noise of outside sources, such as busy roads or noise impacts at frequent intervals (such as railways or aeroplanes). The noise levels experienced between neighbours can also be an issue where greater sound insulation may be required than previous standards have allowed.

The availability of some **private exterior space**, even as small as a balcony with a view and room to sit out, can make an enormous contribution to people's wellbeing.

There is an increasing awareness that buildings should be more adaptable to change with the occupants evolving needs. This is more environmentally sustainable as it gives buildings a potentially longer lease of life. In the case of **lifetime homes** it can also allow residents to stay in a house or flat for longer even as their household size or needs change. A more stable population is likely to increase community interaction and contribute to the general health of a neighbourhood.

The **pollution** of the planet's environment has many negative effects which ultimately impact on people's health. The most destructive pollutants, such as those that effect the ozone layer or contribute most to global warming should be minimised or avoided altogether.

Policy Context
(See Appendix 2)

- **South East Plan Policies SH8 (iv); CC1; CC2; CC4**
- **PUSH Planning Policy Framework**

Eastleigh Local Plan Policies 25.NC and **26. NC (Biodiversity)**
Links to Essential Requirement ESD 7 (Green Roofs)
Also links to section 6.1 (Biodiversity).

Eastleigh Local Plan Policy 33.ES (Air Quality)
Links to section 6.5 (Pollution)

Eastleigh Local Plan Policy 37.ES (vi) General Sustainability
Links to section 6.4 (Lifetime Homes)

6.1. Biodiversity

Development has a potentially critical impact on biodiversity. This can be minimised with careful site selection, by protecting elements of ecological value and by enhancing the ecological value by judicious introduction of appropriate landscape design works. Maximising the efficient use of the building's footprint also helps to reduce the overall impact of development on the natural world.

Ecological Value

The Council wishes to minimise development on ecologically valuable sites and to encourage development on land that already has limited value to wildlife.

The ecological value of a site is affected by previous uses and the presence of ecological features such as trees, hedges, watercourses, wetlands, meadows and other vegetation. Therefore, the reuse of existing brownfield or other sites of low ecological value will help to slow down the destruction of natural habitats and the wildlife they support, as well as preventing loss of land used for agriculture, parkland and other informal recreational space.

Wherever homes are constructed, there is always a risk that however environmentally benign the building or development itself is, it may present a threat to local ecology or areas of natural beauty. The principle here is to minimise the damage to existing local ecology and
then, where possible, to enhance it. Damage can be minimised either by selecting a site of low ecological value or by developing a site in a way that protects the most important ecological features. Building need not reduce the ecological value of the site; it may enhance it in many cases. There will always be some temporary disturbance to the local ecology, but wildlife will return once construction is complete, provided an appropriate habitat is provided.

Whilst it may be an attractive option to build on and revitalise a previously derelict site, care must be exercised if it has been derelict for some time. The site may be inhabited by rare, protected or locally important species and, therefore have high, but hidden ecological value.

The BRE self assessment checklist can be used to determine whether a site can be defined as of low ecological value.

Ecological Enhancement

The Council wishes to encourage the enhancement of the ecological value of every development site wherever possible. In many cases this is possible; however this requires careful consideration of the existing and neighbouring features in addition to careful selection of plant species and habitats. This is an area of specialist expertise and requires input from a suitably qualified ecologist at both site master planning and detailed design stages.

Recommendations adopted to enhance the ecology of the site, may include:
- the planting of native species that are also resilient to climate change;
- the adoption of horticultural good practice (e.g. no, or low use of residual pesticides);
- the installation of bird, bat and/or insect boxes at appropriate locations on the site;
- development of a full Biodiversity Management Plan including the avoidance of site clearance and other works at key times of the year (e.g.
breeding seasons); or
- the proper integration, design and maintenance of SUDs and Green Roofs, community orchards, allotments, wildlife gardens and other spaces management for wildlife and community benefit

Only native floral species or those with a known attraction or benefit to local wildlife can be considered for the purpose of enhancing the ecological value of the site. However, any such species must be resilient to the effects of inevitable climate change, such as hotter drier summers and warmer wetter winters.

Ecological Protection

Construction sites often contain existing ecological features that need to be protected from damage (both direct and indirect). Such damage can be caused by impacts, fires, pollution, soil compaction, changes in the water table, etc. Steps need to be taken to minimise the risk of such damage. Protecting the ecological features on site

both during and after construction can ensure that the local 'wild' areas are sustained.

For further details on Biodiversity and SSSI duties for Local Authorities, see **PUSH** *Sustainable Development SPD Guidance 2008 (6.1 Biodiversity)*

Building Footprint

Maximising useable space on development sites generally will involve building higher to remove the need to build wider. This can allow more space within the site for recreational space and for sustainable urban drainage elements which provide opportunities for ecological protection and enhancement. The location of car parking and other storage (e.g. bins and cycles) underground, beneath buildings also takes some of the pressure off the remaining surface level space.
For these reasons, single storey development should be resisted unless there are overwhelming functional reasons for it.

Code FSH Credits

There are a total of 9 optional credits available for 5 different issues, namely:
Eco1 (Ecological Value of Site)
Eco2 (Ecological Enhancement)
Eco3 (Protection of Ecological Features)
Eco4 (Change of Ecological Value of Site)
Eco5 (Building Footprint)

BREEAM Credits

In **LE 1** there is a potential credit for building on a 'brownfield' site
In **LE 2** there is a potential credit for developing on cleaned up , previously contaminated land.
A credit is awarded in **LE 3** where development is on land of low ecological value and all existing features of ecological value are fully protected.
In **LE 4** credits can be earned for minimizing the net impact of development on ecological value.
There are potential credits in **LE 5** for ecological enhancement of a site.
LE 6 awards credits for appropriate ecological management and compliance with all relevant UK and EU legislation relating to protection and enhancement of ecology.

Essential Requirement : none

Sustainable Checklist

Q. 6.1: How many Code FSH or BREEAM Ecology credits is the development designed to achieve for each building type?

Planning Implications

Ecological value: Protecting and enhancing the ecological value of a site should be possible while meeting other planning objectives such as an attractive landscape setting for the buildings or for an area of passive recreation on the site. There is also an opportunity to coordinate the need for sustainable drainage with habitat creation, particularly with the creation or protection of water features such as ponds and swales. These can have an additional amenity benefit in rural areas and locally native plant species (that are also resilient to climate change) should be used. In more urban areas, non-native ornamental species may be acceptable and much more resilient to climate change but should only be used if they have a proven benefit to local wildlife.

Building Footprint: Storey heights and building mass of development do need to be appropriate in urban design terms, respecting the existing physical context. This will depend on the individual characteristics of the site and could be mitigated by an articulated roof line. The Design and Access Statement should describe the amount of building that will is proposed and explain how the analysis of the site has taken the site context into consideration, in order to produce a development that is visually and physically appropriate.

Further Guidance

PUSH *Sustainable Development SPD Guidance* (2009) (6.1 Biodiversity)

Association of Wildlife Trust Consultancies (AWTC)
www.awtc.co.uk/contact.htm

Chartered Institution of Water and Environmental Management (CIWEM) -
15 John Street,London, WC1N 2EB.
Tel: 020 78313110
Fax: 020 74054967
admin@ciwem.org
www.ciwem.org

The Institute of Ecology and Environmental Management (IEEM)

45 Southgate Street,Winchester, Hampshire SO23 9EH
www.ieem.co.uk

Institute of Environmental Management and Assessment (IEMA)
St Nicholas House,70 Newport, Lincoln, LN1 3DP.
Tel 01522 540069.
Fax 01522 540090.
E-mail info@iema.net
www.iema.net

The Landscape Institute *(LI)* - The Chartered Institute of the UK for Landscape Architects, 33 Great Portland Street, W1W 8QG
www.l-i.org.uk

Department of the Environment, Transport and the Regions.
Digest of Environmental Statistics, No 19, Vol 2.

British Standard BS5837: 2005 'Trees in relation to Construction'
www.bsi-global.com

Office of Public Sector Information (formerly The Stationery Office) *The Hedgerows Regulations* 1997. London:

RSPB Good Practice Guide for Prospective Developments - Available from the RSPB. www.rspb.org.uk

CIRIA
Environmental Good Practice on Site (CIRIA C502) Environmental Good Practice - Working on Site (CIRIA C503)
Working with Wildlife Site Guide (CIRIA C567) www.ciria.org.uk

The Environment Agency www.environment-agency.gov.uk

The Local Biodiversity Action Plan www.ukbap.org.uk

6.2. Noise

One of the most common causes for disputes between neighbours is noise. Environmental Health Officers in England and Wales received nearly 6000 noise complaints per million people in 2003/2004 from domestic premises. This accounts for 75% of all noise complaints received. (BRE) As the density of development increases the potential for noise problems increases if measures to reduce its impact on residents and occupants are not taken. Increased emphasis on developing on brownfield sites, at higher densities and in mixed developments, also makes the potential for noise intrusion on building occupants from the external environment greater.

Noise impacts experienced by people, either within the home or at work, usually arise in two ways; either noise is transmitted into the home or office from an adjoining property or room through the fabric of the building, or noise impacts arise inside or on the property from activities outside the building envelope or beyond the property boundary.

With respect to the transmission of sound within and between buildings the Council wishes to encourage higher standards of sound insulation and other means of noise mitigation through a commitment to design and build constructions that exceed the minimum performance standards in Approved Document E of the Building Regulations.

The normal way of satisfying Part E of the Building Regulations is to implement a programme of sound insulation testing, called pre-completion testing. The current guidance describes the normal programme of testing, based on at least one set of tests for every 10 houses, flats or rooms for residential purposes in a group or sub-group. From 1st July 2004, 'Robust Details' have been introduced as an alternative to pre-completion testing for demonstrating compliance with Part E. Robust details have been developed for separating wall and floor constructions. These have been tested in the field against the performance standards in Approved Document E. The constructions are described in guidance produced by Robust Details Ltd (www.robustdetails.com).

Where noise sensitive development is proposed in areas impacted by noise, or new noisy development is proposed in proximity to noise sensitive development, the council has policies in the Eastleigh Local Plan to ensure that the development is adequately protected from noise.

The broad principle of the Local Plan is to reduce noise impacts by site and building layout and design, ahead of conventional noise mitigation techniques such as acoustic barriers or glazing.

Noise Mitigation Measures

- Site Layout

See PUSH *Sustainable Development SPD Guidance 2009 (6.2 Noise).*

- Building layout

Locating the less noise sensitive rooms of a development on the noisiest façade can help to shield the facades of the noise sensitive rooms, bedrooms and living rooms from the highest noise impacts, reducing the need and standard of other acoustic protection required. In cases were incident noise levels are very high a single aspect design is likely to be the preferred option.

BS 8233.1999 – Sound Insulation and Noise Reduction for Buildings – Code of Practice – sets out guidance on good acoustic planning in section 7.6.1.3. The following principles are recommended for minimising disruption from noise in dwellings (see the standard for full details):

- Keep services away from bedrooms in houses and flats;
- Keep stairs, lifts and circulation areas in apartment buildings away from sensitive rooms such as bedrooms;
- Corridors in apartment buildings should have acoustically absorbent ceilings. Carpets can also help to reduce disturbance in adjacent apartments;
- Separating walls between bathrooms and sensitive areas should be designed to minimise acoustic transmissions;
- Ensuring compatibility between rooms of adjacent dwellings
- Isolate pipe work and ductwork from the building structure to avoid vibration being transmitted and all penetrations of services should be sealed.

- Noise barriers

Where site and internal layout cannot adequately reduce noise levels to acceptable standards then developers will need to consider further mitigation measures. Acoustic screens can reduce the level of noise incident upon a development site, which can result in lower external noise levels for areas such as gardens, and also inside buildings as less noise is impacting the property. The effectiveness of barriers is maximized when the barrier is closest to the source of the noise, or nearest the receptor, and least effective when equidistant between the two.

Good acoustic practice is to reduce noise at source meaning that the preferred option should be to locate the barrier closest to the source rather than the receptor. Acoustic screens can be formed as part of the landscaping features of a development site, as well as the more traditional wooden screens which adorn motorway verges. Careful siting of buildings ancillary to the main development, such as garages, bin stores etc. can provide useful acoustic screening. On mixed-use developments commercial uses should be located where noise levels are highest and with their least noisy façade orientated toward any more noise sensitive uses.

- Insulation

See PUSH *Sustainable Development SPD Guidance 2009 (6.2 Noise)*.

Noise in the Design Context

The requirement to reduce noise needs to be viewed together with other design and layout requirements, which may have a positive or negative impact on noise levels experienced by people in the development.

Green Roofs

Green roof designs will help with the additional noise insulation required for structures subject to elevated/high levels of aircraft noise such as those under the Southampton Airport flight path. The deeper the substrate or soil layer, the greater the mass of the roof structure, the more effective the sound insulation.

Natural Ventilation

Where noise levels are such that ventilation via opening windows is likely to be unacceptable, rapid ventilation will be required. At the design stage consideration should be given to how to maximize natural ventilation and/or to power mechanical ventilation via on-site zero carbon energy sources. Because of the coincidence of high noise levels and air pollution from busy roads the inlet for this ventilation air would need to be as far away from the roadside as is practicable.

Passive Solar Gain and Attractive Vistas

Orientation of buildings will be influenced by the need to maximize passive solar gain and to take advantage of any new or existing green space or other attractive views. Inevitably there will be situations where these important drivers on design and layout will conflict with the need to reduce the impact of high noise levels from a certain direction. In such cases the developer needs to set out the

conflicting policy requirements and show how they intend to resolve them in the development design.

Code FSH Credits

Credits are awarded (up to a maximum of 4) in **Hea 2**. These are for the combination of a commitment to a certain minimum level of testing as well as minimum performance standards. These standards are either certain improved dB levels beyond the minimum standard or specifications as approved by Robust Details Ltd.

BREEAM Credits

In BREEAM Offices 1 credit is available in **Hea 13** (Acoustic Performance)
To comply indoor ambient noise levels in different types of unoccupied room have to meet certain ranges:

In BREEAM Schools 3 credits are available in **Hea 13** for higher acoustic standards relative to Building Bulletin 93 (Acoustic Design of Schools)

Essential Requirement: none

Sustainable Checklist

Q.6.2: What measures is the developer proposing to quantify and, where necessary mitigate, the noise impact on the development's occupants?

Planning Implications

The implications of building in the noisiest environments need to be considered, particularly in the case of residential development. The worst affected sites may not be suitable for housing. Site layout and building materials and design can have a very positive effect on reducing noise pollution on building occupants and external spaces in the development. Good design can only begin when there is a good understanding of the environmental challenges that noise poses on any particular site. Developers are required by the local plan to adequately measure and assess noise on such sites (policy 31ES), and a proper understanding of the noise climate in the vicinity of the development will lead to a development which is

suitable to that area. Inadequate assessment and understanding of the noise climate on a site, and poor design, can lead to a development being unsuccessful at the planning stage.
Sound insulation barriers come in a large variety of materials, some of which can be unsightly in the wrong context. Earth bunds can also have a significant visual impact and may influence drainage patterns but they can be positive elements in an integrated landscape design for the site.

Further Guidance

PUSH *Sustainable Development SPD Guidance* (2009)(6.2 Noise)

Department for Communities and Local Government. *Building Regulations Approved Document E - Resistance to the passage of sound* (2003 edition incorporating 2004 amendments).

Robust Details Limited. www.robustdetails.com

The United Kingdom Accreditation Service (UKAS). www.ukas.com

Association of Noise Consultants (ANC).
www.association-of-noise-consultants.co.uk/

BSI BS 8233:1999 *Sound insulation and noise reduction in buildings* - Code of Practice.

6.3. Private Space

The provision of private space or semi-private space is an important contributor to the health and wellbeing of the occupants of a residential development.
The Code for Sustainable homes defines this space as:

- of a minimum size that allows all occupants to sit outside
- allows easy access by all occupants, including wheelchair users
- accessible only to occupants of designated dwellings

The quality of these spaces is a product of many factors, both internal and external. The space should allow access to fresh air and sunshine (at least for part of the day). Spaces next to sources of continuous air pollution (next to busy roads or industrial processes for instance) or those cast in deep shade for most of the day, even in summer, will not be attractive and will be used correspondingly little. Another external influence on the quality of outside private space is noise. Close proximity to busy roads, railways and airports are common examples of how a noisy activity in the area around a space can blight it.

Private Back Gardens

This will be the most common provision for houses. The quality of these spaces will partly depend on the degree of privacy and overlooking they experience. Excessive shade by other buildings and by established mature trees can also reduce the quality and usability of private back gardens. Note that EBC Essential Requirement ESD 8 (Trees) requires a planted tree in each new garden (which will need to be appropriate in scale and form to the site's circumstances. but be resilient to climate change)

Communal Gardens

Communal Gardens are usually provided for apartments. They should be semi-private in nature, discouraging their use by the general public. Some degree of overlooking from surrounding residential buildings is valuable as it provides some passive surveillance of the space. Appropriate planting can provide additional benefits to the residents such as food sources and sensory plants.

Green Roofs

In urban areas, developments of high density may find that room for attractive outside private or communal space is difficult to find after other requirements, particularly for car parking and cycle and bin storage, are met in the area around the new buildings. One solution is for at least some of the private or communal outdoor space to be located on the roofs of the buildings. Green roofs have many additional positive attributes, including: water attenuation; building sound and thermal insulation; biodiversity; reducing the urban heat island effect (see Essential Requirement ESD 7 Green Roofs). 'Intensive' green roofs are designed to be used by the building's occupants and can be planted up with shrubs and even trees in a similar way to that suggested in Communal Gardens above.

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Balconies

Balconies should be large enough to accommodate a small table and at least two chairs comfortably (a depth of at least 1.2m). They are opportunities to grow plants and even a few herbs and vegetables. Balconies have the added benefit of providing some 'passive surveillance' of the street, making public areas more secure due to the increased feeling of being overlooked. The corollary of this is that balconies should never overlook fully private spaces.

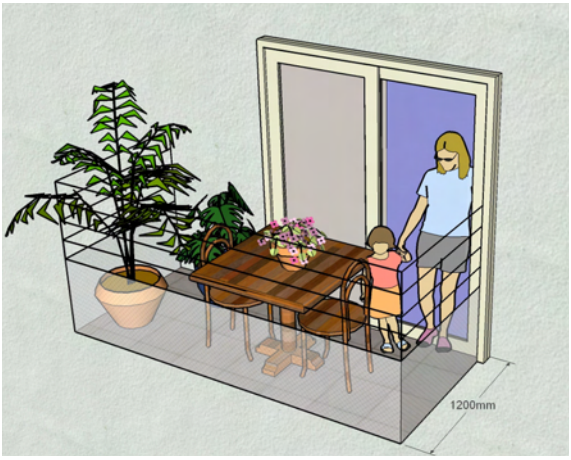

Fig 6.1 Ideal minimum depth of balcony

Non Residential Development

Offices, retail units and industrial developments all employ people who would appreciate easy access to some area of nearby attractive open space, particularly for lunch breaks. Unlike residential development there is no real requirement for private outdoor space

or space necessarily within the site. The proximity of an existing park or public garden would be just as valuable.

Code FSH Credits

The Code has one credit available in **Hea 2** for private or shared open space for each dwelling type (private space: 1.5 m^2/bedroom or shared space: minimum 1m^2/bedroom). "Juliet" balconies generally do not comply with the criteria as they are too small. Conservatories and other enclosed areas also do not comply with the criteria.

BREEAM Credits

Some BREEAM assessments have a credit available in Hea 15 (Open Space), e.g. BREEAM Education.

Essential Requirement: none

Sustainable Checklist

Q.6.3: What provision for private or shared space will be made for the development?

Planning Implications

Most residential developments will already be required to provide a minimum level of private or semi-private open space. The Code requirement for at least 1 sqm per apartment bedroom is most at risk in high density developments where surface level space between buildings will be at a premium. This is where balconies and 'intensive' green roof gardens are particularly valuable in helping to produce an attractive and healthy living environment.

Further Guidance

PUSH *Sustainable Development SPD Guidance 2008 (6.3 Private Space)*

Eastleigh Borough Council *Design SPD* (expected 2009)

Architectural Press. *New Metric Handbook* - Planning and Design Data, Section 2.09, (1999)

CABE - *The Value of Public Space* www.cabe.org.uk

Department for Communities and Local Government *Building Regulations Approved Document M* (2004),

The Stationery Office, Accessible thresholds in new housing: guidance for house builders and designers (2006)

6.4 Lifetime Homes

The Council wishes to encourage the construction of homes that are accessible to everybody and where the layout can easily be adapted to meet the needs of future occupants. Future adaptability will also lead to an increase in community stability as residents do not feel the need to move as their needs and mobility change.

In 1991 the Lifetime Homes concept was developed by a group of housing experts who came together as the Joseph Rowntree Foundation Lifetime Homes Group. The scheme involves the incorporation of 16 design features that together create a flexible blueprint for accessible and adaptable housing in any setting and add the built-in flexibility that make homes easy to adapt as people's lives change. 'Lifetime Homes' is currently a voluntary standard. Some elements of the standards were introduced into the Building Regs Part M in 1999.

Lifetime Homes will be suitable for older people and for the vast majority of disabled people, as well as non-disabled people; they will have a wider market of potential buyers and residents, most likely increasing their value and the ease with which they can be re-sold[1]. A recent study found that the additional cost of building Lifetime Homes ranged from £165 to £545 per dwelling depending on the circumstances ands in addition, Lifetime Homes bring about many savings and cost benefits in adaptations and flexibility in use as well as increasing the marketability of the property (The Chartered Institute of Housing in Northern Ireland & the Joseph Rowntree Foundation)

The Lifetime Homes Checklist

The Lifetime Homes Checklist has 16 standards which the developer or designer should use to check whether the development meets the necessary criteria for a Lifetime Home. These are set out in detail on the Lifetime Homes website or in the current issue of the Code for Sustainable Homes Technical Guide. In brief they are as follows:

No.	LIFETIME HOME STANDARD	BRIEF DESCRIPTION
1	Car Parking	Wider parking space
2	Access from Car Parking	Minimum distance and slope to car space
3	Approach	Minimum slopes to building entrances
4	External Entrances	Entrance areas should be level, illuminated and covered from the elements
5	Communal Stairs	Minimum dimension standards for stairs and design standards for lifts (where applicable)
6	Doorways and Hallways	Minimum dimensions for door openings and corridors
7	Wheelchair Accessibility	Minimum turning dimensions in dining and living rooms
8	Entrance Level Living Room	Living room must be at entrance level
9	Entrance Level Bedspace	Convenient bedspace must be possible at entrance level
10	WC	Wheelchair-accessible toilet and potential for future shower in all houses with at least 3 bedrooms. In smaller houses ground floor toilet must meet with Building Regulations Part M.
11	Bathroom and WC walls	Walls must be strong enough to take future handrails
12	Lift Capability	Minimum dimensions to allow for potential stair lift and appropriate space for a through the floor lift
13	Main Bedroom	Suitable design and specification to allow for reasonable route for potential hoist to the bathroom
14	Bathroom Layout	Minimum dimensions for ease of access to bath, WC and wash basin
15	Window Specification	Maximum height of start of glazing above floor and ease of opening
16	Fixtures and Fittings	Switches, sockets, ventilation and service controls all at useable height by all

Table 6.1 The 16 Lifetime Homes Criteria

Code FSH Credits

The Code has four credits available in **Hea4** for full compliance with all of the Lifetime Homes standards. At present compliance with Lifetime Homes requirements is mandatory at Code level 6. The Government has signaled that Lifetime homes compliance will become compulsory at Code level 4 in 2010 and at level 3 in 2013.

BREEAM Credits Not applicable

Essential Requirements: none

Sustainable Checklist

Q.6.4: Is the residential development being designed to comply with all of the Lifetime Homes standards?

Planning Implications

There are several Lifetime Homes standards which are likely to have some planning implications.

- Ramped accesses to ground floor entrances in streets with significant changes in level may have a significant negative visual impact on the street scene unless designed carefully.
- Increasing car parking spaces by 900mm will either result in even more space devoted to car parking (and less to other elements, such as trees and outdoor amenity space) or will reduce the amount of spaces possible on a site. The larger car space increases the typical car parking area by 37.5% although circulation space remains the same.
- Maximum heights above floor level of start of glazing could present a design issue, particularly in a conservation area.

Further Guidance

PUSH *Sustainable Development SPD Guidance 2009 (6.4 Lifetime Homes)*

BRE *The Code for Sustainable Homes Technical Guide*
www.planningportal.gov.uk/uploads/code_for_sustainable_homes_techguide.pdf

Lifetime Home Standards www.lifetimehomes.org.uk

6.5. Pollution

Pollution appears in many forms, in the immediate environment in which we live (in the air, soil and water) via past and present activities, such as old industrial waste products or from current emissions from traffic. Pollution is also experienced indirectly through the impact that products and activities have on the wider global environment. Local pollution is addressed by national and European legislation and is controlled by The Council's Environmental Health officers. and/or the Environment Agency.

Pollution from Traffic

Air pollution, typically from motor vehicles, is an important health issue, particularly in an air quality management area, where exposure to nitrogen oxides, (NOx), will need to be reduced. Here ventilation will be required in new buildings as an alternative to open windows (particularly but not exclusively on the roadside façade). The inlet for this ventilation air would need to be as far away from the roadside as is practicable. Particulates from car exhausts are another pollutant linked with health problems. Research has shown that street trees can have a very significant effect on reducing particulates in the air

Greenhouse Gases

The most urgent case of global pollution is the effect of 'greenhouse gases' on global warming. The main greenhouse gas is carbon dioxide emitted through the burning of fossil fuels. The Council's requirements for reducing carbon dioxide emissions are set out elsewhere in this document (Essential Requirements EBC G1, E1 and E2). Some of the products still commonly used in building products (for their insulation qualities) produce gases (such as HFCs, PFCs and SF6) in their manufacture which have a global warming potential (GWP) thousands of times more significant (per weight) than CO_2. Because these building products cause such highly polluting emissions the Council wishes to encourage developers to use safer alternatives. Such substances are prohibited within the EU and only products manufactured outside the EU are at risk of containing them. The BRE has listed the alternative insulation products which have much lower GWP, including many natural products, which can be found in The Code for Sustainable Homes Technical Guide.

Nitrogen Oxides (NO_X)

Nitrogen oxides (NOx) are emitted from the burning of fossil fuels and contribute to both acid rain and to global warming in the upper atmosphere. Different classes of boilers and CHP systems have different rates of NOx emissions. The most efficient boilers have NOx emission rates below 40mg/kWh. This contrasts with mains electrical energy which emits levels of 1200mg of NOx for every kWh. The Council wishes to encourage new developments to provide space and water heating with the lowest NOx emissions through efficient boilers, CHP systems or renewable energy technologies.

Code FSH Credits

The Code has 1 credit in **Pol 1** (Global Warming Potential (GWP) of Insulants). Up to 3 credits are available in **Pol 2** (NOx emissions).

BREEAM Credits

BREEAM issues **Pol1- Pol 4** provide potential credits for products with low GWP in insulation and refrigeration products and low NOx levels for space and water heating.

Essential Requirement: none

Sustainable Checklist

Q.6.5: What measures will be taken to minimise the pollution impacts of road pollution on the development (if in an air quality management area) and of nitrogen oxides and materials with high Global Warming Potential on the wider environment?

Planning Implications

The most common implications of the above relate to a development response to minimise the effects of traffic pollution on a building's occupants. This may influence the orientation and the internal organisation of a building. There is a potential conflict between these considerations and the need to design developments to maximise both passive solar gain and natural daylight. Street trees should be encouraged wherever possible.

Further Guidance

PUSH *Sustainable Development SPD Guidance 2009 (6.5 Pollution)*

CIBSE, Guidance note 1 "*New CFC's, HCFCs, HFC's and halons, Professional and practical*
guidance on substances that deplete the ozone layer, (2000)

Institute of Refrigeration, *Code of practice for the minimisation of refrigerant emissions from refrigerating systems, Institute of Refrigeration*", (1995).
www.ior.org.uk
ASHRAE, *Thermal Guidelines for Data Processing Environments*, (2004)

BSI BS EN378-1:2000 "*Refrigerating systems and heat pumps – Safety and environmentalrequirements – Part 1: Basic requirements, definitions, classification and selection criteria*",

F-gas regulations:
http://www.defra.gov.uk/environment/climatechange/uk/fgas/pdf/fluorgasreg-guidance.pdf

7.0 Sustainable Management

Even the most sustainably designed and constructed buildings are still dependent on the behaviour of its occupants for its actual performance. Much 'bad behaviour' is the result of ignorance. 'Good behaviour' is encouraged by access to information that is easy to understand by the building's occupants or those implementing its construction. This information enables the occupants or constructors to minimise the unnecessary waste of resources and will often save money too.

Policy Context
(See Appendix 2)

- **South East Plan Policies SH8 (iv); CC1; CC2; CC4**
- **PUSH Planning Policy Framework**
- **Eastleigh Local Plan Policies 37.ES (i) (ii)**

Links to:
section 7.1 (Construction Site Impacts)
section 7.2 (Building User Guides)
section 7.3(Considerate Constructors Scheme)

7.1 Construction Site Impacts

The largest site impacts tend to be disturbance and noise, pollution and waste. Other significant impacts are energy and water use. Much of these environmental impacts can be reduced through good practice. Good practice includes setting targets for sustainable site activities and low resource consumption as well as and monitoring performance.

Code credits

There is one credit available in Code **Man 3** (Construction Site Impacts) for achieving at least 2 out of 6 Construction Site Impacts criteria and a second credit for achieving at least 4 of the criteria.

BREEAM credits

There is one credit available in BREEAM **Man 3** (Construction Site Impacts) for achieving 2 out of 7 Construction Site Impacts criteria;
2 credits for achieving at least 4 of the criteria;
3 credits for achieving at least 6 of the criteria.
A fourth credit is available for proof that all the site timber is responsibly sourced

Essential Requirement: none

Sustainable Checklist

Q. 7.1: What measures will be taken to minimise the site impacts during construction?

Planning Implications

Reduction in disturbance and noise from development sites will improve the image of development and remove one obstacle to gaining public acceptance of necessary new buildings and settlements. The other measures to reduce the use of resources are unlikely to have a noticeable local impact on the environment.

Further Guidance and References

DCLG, *The Code for Sustainable Homes Technical Guide*

Office of Government Commerce (OGC).

Sustainability Action Plan (or Achieving Sustainability in Construction Procurement);Government Construction Client's Panel (GCCP)

DTI *Construction Industry KPI Pack* includes Methods of Measurement, Handbook, KPI Wall Chart, (www.constructingexcellence.org.uk), (2005)

Environment Agency
PPG 1 – *General guide to the prevention of pollution*.
PPG 5 – *Works in, near or liable to affect watercourses*.
PPG 6 – *Working at demolition and construction sites*.
http://www.netregs.gov.uk/netregs/resources/278006/277807/?version=1&lang=_e

V Kukadia, S Upton, D Hall *Control of Dust from Construction and Demolition Activities"*. BRE Press, (2003).

V Kukadia, S Upton, C Grimwood *Controlling particles, vapour and noise pollution from construction sites"* - set of five Pollution Control Guides., BRE Press, (2003).

BRE and DTI *Construction Site Transport*, April (2003). Measures for traffic movements and distances,. Available from:
www.bre.co.uk/pdf/constructiontraffic.pdf

DEFRA *Guidelines for Company Reporting on Greenhouse Gas Emissions*, Annex 6 Transport conversion tables, (2002)
.
COPERT II Computer programme to Calculate Emissions from Road Transport - Methodology and Emissions Factors". Technical report No 6.
http://reports.eea.eu.int/TEC06/en

Freight Transport Association Good Practice Guide (GPG) 273, "*Computerised Routing and Scheduling for Efficient Logistics*, (2000).

BSI BS8555 2003 *Environmental Management Systems – Guide to the phased implementation of an environmental management system including the use of environmental performance evaluation*. (2003).

7.2 Building User Guides

The BRE Home User checklist (The Code for Sustainable Homes) provides a template for developers to enable them to create a Guide for home owners and tenants.
The BREEAM technical guides provide a contents checklist for developers to enable them to create a Guide for both the facilities manager and the building user in non-residential and multi-residential buildings.

Home User Guide

The CFSH checklist covers the following:
Operational Issues

- Environmental strategy/design and features
- Energy systems and energy efficiency
- Water efficiency measure
- Site recycling and waste facilities
- Sustainable DIY recommendations
- Emergency Information
- Further information sources
- Guide provision in alternative formats

Site and Surroundings

- Local recycling facilities
- Local public transport details
- Local amenities
- Information on responsible purchasing
- Local emergency services
- Further information sources

BREEAM Building User Guides

The BREEAM checklist covers the following:

- Building service information
- Emergency information within sites and buildings
- Energy and water efficiency measures
- Local transport information
- Materials and waste information
- Refit/re-arrangement considerations
- Problem reporting
- Training
- Further information sources

Code FSH Credits

Three credits are available in Code **Man 1**(Home User Guide) for providing a guide according to the Code checklist.

BREEAM Credits

One credit is available in BREEAM **Man 4** (Building User Guide) for the provision of a simple guide according to the BREEAM checklist.

Essential Requirement: none

Sustainable Checklist

Q.7.2: What provision will be made for building or home user guides?

Planning Implications

There are no obvious immediate planning implications for the use of building user guides. The hope is that individuals will become more aware of how their actions influence their impact on the environment. Whether this will eventually have an effect on key indicators such as carbon emissions from buildings and a reduction in car use is still to be seen.

Further Guidance

Construction (Design and Management) Regulations (1994).

Building Regulations 2006 - Approved document, Part L.

BRE Digest 474 "*HOBO protocol - Handover of Office Building Operations*" 2003.

CIBSE Building Log Book Toolkit (CD-ROM) (2003)

Carbon Trust : www.thecarbontrust.co.uk/carbontrust/

7.3 Considerate Constructors Scheme

The Considerate Constructors Scheme is the national initiative, set up by the construction industry, to improve its image.

Sites that register with the Scheme sign up and are monitored against a Code of Considerate Practice, designed to encourage best practice beyond statutory requirements.

The Scheme is concerned about any area of construction activity that may have a direct or indirect impact on the image of the industry as a whole.

The very best performing sites are recognised with **Annual National Awards.**

All sites registered with the Scheme are monitored by an experienced industry professional to assess their performance against the eight point Code of Considerate Practice which includes the categories Considerate, Environment, Cleanliness, Good Neighbour, Respectful, Safe, Responsible and Accountable.

The three main areas that the Scheme's Code covers are:

The environment
Registered sites should do all they can to reduce any negative effect they have on the environment. They should work in an environmentally conscious, sustainable manner.

The workforce
Registered sites should provide clean, appropriate facilities for those who work on them. Facilities should be comparable to any other working environment.

The general public
Registered sites should do all they can to reduce any negative impact they may have on the area in which they are working. Sites should aim to leave a positive impression on those they affect.

All registered sites are given a score indicating the level of performance they have reached against the Code of Considerate Practice.

Sites are given a score between 0-40 points against the 8 point Code, with each of the 8 sections warranting between 0-5 points. 3 points in any of the sections indicates that a site is complying with the Code and is therefore operating beyond standard industry requirements.

The average score of all sites registered with the Scheme is: **30**

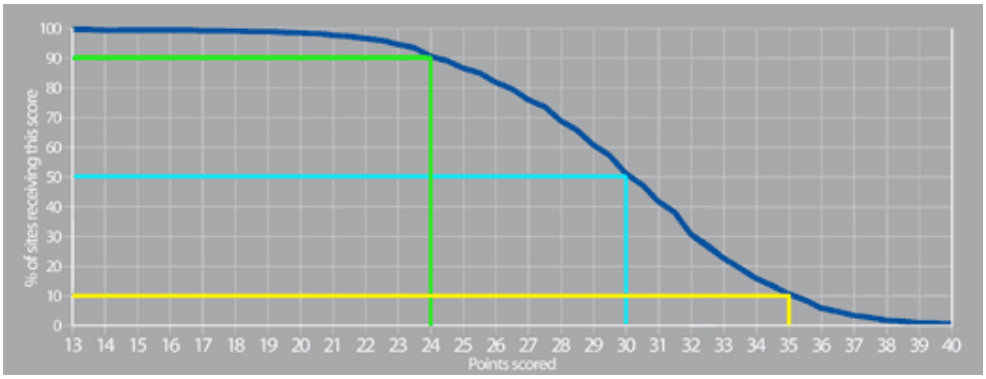

Fig 7.1 graph showing the percentage of sites that achieve specific scores.

- The green line, 24 points, represents compliance with the Scheme's code.
- The blue line, 30 points, is the average score of all registered sites.
- The yellow line, 35 points, shows all sites that will be reviewed for a National Award.

Case Studies

Examples of best practice are given on the Considerate Constructors Scheme website: www.consideratecon structorsscheme.org.uk

Code FSH Credits

There is one credit available in **Man 2** (Considerate Constructors Scheme) for a commitment to achieving Best Practice under a recognised certification scheme like the Considerate Constructors Scheme. A further credit is available for a commitment to go significantly beyond Best Practice.

BREEAM credits

There is one credit available in BREEAM **Man 2** (Considerate Constructors) for a commitment to achieving Best Practice under a recognised certification scheme like the Considerate Constructors Scheme. A further credit is available for a commitment to go significantly beyond Best Practice.

Essential Requirement: none

Sustainable Checklist

Q. 7.3 What level of certification for the Considerate Constructors Scheme (or equivalent) is the development aiming to achieve?

Planning Implications

Sites that are managed in an environmentally and socially considerate and accountable manner make better neighbours and cumulatively should help to make the principle of new development less unwelcome to established communities.

Further Guidance and References

Considerate Constructors Scheme
PO Box 75
Ware
Hertfordshire
SG12 0YX

Telephone: 01920 485959
Fax: 01920 485958
Free phone: 0800 7831423

www.ccscheme.org.uk
enquiries@ccscheme.org.uk

8.0 Major Developments

Policy Context
(See Appendix 2)

- **South East Plan Policies SH8 (iv); CC1; CC2; CC4**
- **PUSH Planning Policy Framework**
- **Eastleigh Local Plan Policies 37.ES (General Sustainability)**

8.1 Major Developments

Major developments (defined here as more than 500 dwellings or 50,000 sq m of internal floor space) are opportunities to plan for more sustainable outcomes due to their scale and greater autonomy.

Sustainable Opportunities

WATER

- Sustainable Urban Drainage Systems (including green roofs, ponds, swales and possibly reed beds) can be designed in from the very beginning and integrated with the green infrastructure
- Rainwater harvesting can be rolled out (together with green roofs) on a large scale across the development

ENERGY/CO2

- District Heating and/or Combined Heat and Power will be appropriate (as long as the housing density is at least 50 dph) and potentially even more economic in a mixed development.
- Depending on the site conditions there may be scope for some community wind turbines.
- The larger areas of open space or water courses could be sites for ground or water source heat pumps
- The greater scope for changing orientation to maximise the potential for passive solar energy should be exploited.

WASTE

- Major residential sites should have the capacity for the most efficient waste and recycling infrastructure.

GREEN INFRASTRUCTURE

- Large sites should augment and link to the local green infrastructure with tree planting, new ground level green space and/or green roofs.

HEALTH AND WELLBEING

- On larger sites the design is able to take more strategic decisions influencing such things as the impact of noise and pollution and the best use of natural daylight and natural surveillance on the development.
- Improvements to access to existing off-site facilities can be more feasible on larger sites or new facilities can be sited within the development.
- A large new development of a minimum density can attract new or improved public transport links

Code FSH Credits

None specific to major developments

BREEAM Credits

None specific to major developments

Sustainability Checklist

Q.8.1: If the development is over 500 dwellings or 50,000 sq m of non-residential or multi-residential floor space, what extra measures to create an environmentally sustainable development are proposed?

Planning Implications

Major developments should make the most of their ability to use the scale of the buildings and the site area to enhance their sustainable standards. There is likely to be particular scope for layout flexibility and access improvements.

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APPENDIX 2: Policy Guidance

The UK government has become increasingly aware of the need to address the problem of global warming and climate change. This has been reinforced by various international reports including that of the International Panel for Climate Change which confirmed the overwhelming scientific consensus that climate change is happening and that human activity (through the emission of greenhouse gases) is the cause.
The UK Treasury commissioned a report on the implications of climate change from the world-renown economist Sir Nicholas Stern. The Stern Review of the Economic Effects of Climate Change (October 2006, HM Treasury) concluded that were the world's population to continue warming the planet through its activities at the same rate then the impact on the world economy would be very significant and in the worst case scenario it would reduce the world's GDP by 20% or more. The positive finding was that the world could stabilise the global warming and prevent it reaching the 'tipping point' (beyond which global warming would not be reversible) if it only invested the equivalent of 1 % of global GDP to address the problem of excessive greenhouse gas emissions.

The Planning & Compulsory Purchase Act 2004 sets out the duty of planning authorities towards sustainability. Section 39 requires that regional planning bodies and local planning authorities (LPAs) "have a statutory duty when preparing the regional spatial strategy and local development documents to exercise their functions with the objective of contributing to the achievement of sustainable development." The role of LPAs is not restricted to plan-making and development control, but involves facilitating and promoting the implementation of good quality development.

Planning Policy Statement (PPS)1: Delivering Sustainable Development (2005) places sustainable development as the core principle underpinning planning. The guidance requires planning authorities to "ensure that development plans contribute to global sustainability by addressing the causes and potential impacts of climate change through policies which reduce energy use, reduce emissions, promote the development of renewable energy resources and take climate change impacts into account in the location and design of development". Key objectives should include ensuring that developments are sustainable, durable and adaptable (including taking account of natural hazards such as flooding) and make efficient and prudent use of resources".

Planning Policy Statement 1 Supplement 'Planning and Climate Change' sets out how planning, in providing for the new

homes, jobs and infrastructure needed by communities, should help shape places with lower carbon emissions and make them resilient to climate change.

Planning Policy Statement 22: Renewable Energy (2004) promotes the increased development of renewable energy sources. It states "local planning authorities and developers should consider the opportunity for incorporating renewable energy projects in all new developments" (para. 18). It promotes the use of "solar panels, biomass heating, small scale wind turbines, photovoltaic cells and combined heat and power schemes". It states that local planning authorities may include policies in local development documents that require a percentage of the energy to be used in new residential, commercial or industrial development to come from on-site renewable developments (para. 8).
Other policy context is available from a range of PPS, including those on sustainable development in rural areas **(PPS7)**, biodiversity **(PPS9)**, waste **(PPS10)**, and pollution control including Sustainable Urban Drainage **(PPS23)**.

The Government's **Climate Change Bill**, which sets targets for reducing carbon dioxide emissions from 2008 to 2050 became law in November 2008.

South East Plan Policies

Achieving sustainable and environmentally sensitive development across the sub region requires joint working and the application of consistent standards and principles. This joint working is being coordinated through the Partnership for Urban South Hampshire (PUSH). The impact of all development on, and its resilience to, climate change is a global challenge which each authority within PUSH will need to meet with local innovation and through collaboration with its spatial partners. Each Council's spatial plans and its development proposals must include measures to mitigate their impact on, and adapt to, climate change.
Recognising the importance of the climate change challenge, PUSH submitted a sub regional policy to SEERA and that policy was incorporated into the Draft South East Plan as Policy SH14. Recognition of the sub region's need for a specific policy to meet the challenge of ensuring that development growth is sustainable has been confirmed by the Panel Report into the South East Plan. The Panel supported Policy SH14, which sought higher standards than the general sustainability policies for the region as a whole. SH14 was amended (and renumbered SH8) as part of the Government's proposed changes to the SE Plan in 2008.

POLICY SH8: ENVIRONMENTAL SUSTAINABILITY

The South Hampshire authorities will:

i. produce a common framework, for incorporation into Development Plan Documents, that establishes density ranges for development related to accessibility to services and public transport, that favours development around transport hubs and community infrastructure within a reasonable radius to encourage pedestrian and bicycle movement, and where possible joins development to the natural environment through linked and accessible open spaces that promote both recreational opportunities and high biodiversity

ii. jointly plan the infrastructure and approaches necessary to make effective management and use of natural resources an integral part of a growing economy in the sub-region.

iii co-operate on assessment of and planning for effective coastal zone management to address the risk of sea level rise, and co-operate to minimise the risk of other forms of flooding and realise opportunities for more sustainable flood risk management options.

iv. achieve a decrease of between 8% and 20% in water use (compared to the national average in 2005) for all new development, help promote more efficient water use in existing developments and require implementation of sustainable urban drainage systems where feasible in all new developments.

The authorities will develop common policies to achieve these aims in their Development Plan Documents.

POLICY CC1: SUSTAINABLE DEVELOPMENT

The principal objective of the Plan is to achieve and to maintain sustainable development in the region. Sustainable development priorities for the South East are identified as:

- Achieving sustainable levels of resource use
- Reducing greenhouse gas emissions associated with the region
- Ensuring that the South East is prepared for the inevitable impacts of climate change
- Ensuring that the most deprived people also have an equal opportunity to benefit from and contribute to a better quality of life

POLICY CC2: CLIMATE CHANGE

to mitigate and adapt to the current and forecast effects of climate change will be implemented through application of local planning policy and other mechanisms. Behavioural change will be essential in implementing this policy and the measures identified.

In addition, and in respect of carbon dioxide emissions, regional and local authorities, agencies and others shall include policies and proposals in their plans, strategies and investment programmes to help reduce the region's carbon dioxide emissions by at least 20% below 1990 levels by 2010 and by at least 25% below 1990 levels by 2015. A target for 2026 will be developed and incorporated in the first review of the Plan ~~.~~

Adaptation to risks and opportunities will be achieved through:

- **i.** Guiding strategic development to locations offering greater protection from impacts such as flooding, erosion, storms, water shortages and subsidence
- **ii.** Ensuring new and existing building stock is more resilient to climate change impacts
- **iii.** Incorporating sustainable drainage measures and high standards of water efficiency in new and existing building stock
- **iv.** Increasing flood storage capacity and developing sustainable new water resources
- **v.** Ensuring that opportunities and options for sustainable flood management and migration of habitats and species are not foreclosed

Mitigation, through reducing greenhouse gas emissions, will primarily be addressed through greater resource efficiency including:

- **i.** Improving the energy and carbon efficiency performance of new and existing buildings and influencing behaviour of occupants
- **ii.** Reducing the need to travel and ensuring good accessibility to public and other sustainable modes of transport
- **iii.** Promoting land use that acts as carbon sinks
- **iv.** Encouraging development and use of renewable energy
- **v.** Reducing the amount of biodegradable waste landfilled

POLICY CC4: SUSTAINABLE DESIGN AND CONSTRUCTION

The design and construction of all new development, and the redevelopment and refurbishment of existing building stock will be expected to adopt and incorporate sustainable construction standards and techniques. This will include:

i) Consideration of how all aspects of development form can contribute to securing high standards of energy and water efficiency

ii) Designing to increase the use of natural lighting, heat and ventilation, and for a proportion of the energy supply of new development to be secured from decentralised and renewable or low-carbon sources

iii) Encouraging reduction and increased recycling of construction and demolition waste and procurement of low-impact materials

iv) Designing for flexible use and adaptation to reflect changing lifestyles and needs and the principle of 'whole life costing'

v) Local planning authorities should promote best practice in sustainable construction and help to achieve the national timetable for reducing carbon emissions from residential and non-residential buildings. There will be situations where it could be appropriate for local planning authorities to anticipate levels of building sustainability in advance of those set out nationally, for identified development area or site-specific opportunities. When proposing any local requirements for sustainable buildings, local planning authorities must be able to demonstrate clearly the local circumstances that warrant and allow this and set them out in Development Plan Documents.

PUSH Planning Policy Framework

On March 18 2008 the Partnership for Urban South Hampshire (PUSH) Joint Committee agreed that all Local Development Frameworks within the PUSH area should include policies to deliver all of the following principles:

The LDF Sustainability Policies will apply to all development[1]; and

The scale and density of development is matched by its level of accessibility to the necessary social, environmental and economic infrastructure, especially by walking, cycling or by public transport, as demonstrated through the design and access statement; and

All new development will incorporate best practice principles of urban design and ensure that the completed development creates and contributes to a high quality public realm including green infrastructure for the local community; and

Adequate land or funding has been provided for waste management infrastructure; and

It meets the sequential and exception test (where required) in relation to PPS25 and the findings of the PUSH Strategic Flood Risk Assessment; and

It protects and enhances the natural and built environment. Where development unavoidably has an adverse impact on the natural or built environment, mitigation measures will be required; and

It contributes to the delivery of xx MW of new renewable energy by 2020 and carbon neutrality in the authority

Where it is part of a major area of development, it either links to existing or produces its own local renewable energy and also maximizes resource efficiency opportunities; and

When permitted it meets the following minimum Code for Sustainable Homes threshold level, and equivalents for non-residential development, as set out below:

All residential development achieves at least the following level (Star rating) of the Code for Sustainable Homes		**All Multi-residential and Non-residential developments with a floor space of over 500 m^2 must achieve at least the following BREEAM standards**
Until end of 2011	3	BREEAM **'very good'**
from 2012	4	BREEAM **'excellent'**
from 2016	6	BREEAM **'excellent'**

1 For these purposes, "development" means 1 dwelling or more and 500m_2 or more of non-residential floorspace.

For further details see:
http://www.push.gov.uk/pdf/Official%20Documents/080318/Reports/pjc-080318-r03-abi.pdf

Eastleigh Policies

Adopted Eastleigh Borough Local Plan Review 2001-2011 Eastleigh

General Sustainability

37.ES Permission will be granted for development, provided the Borough Council is satisfied that where appropriate consideration has been given to all the following issues:

(i) the need to maximise energy efficiency, including opportunities for passive solar gain, in the layout, siting and landscaping of development;

(ii) the need to reduce water consumption;

(iii) the need to minimise waste during construction and in terms of materials;

(iv) opportunities for linking the development to renewable energy schemes; and opportunities to extend the useful life of buildings and ensure that they are adaptable to other uses.

Links to Essential Requirements:

- ESD 1 (General Sustainable Development) ESD 2 (Rainwater Harvesting and Greywater Recycling) ESD 3 (External Water Consumption)
- ESD 5 (Passive Solar Heat Gain)
- ESD 6 (CO2 Reduction (Small Scale zero/low carbon technologies))
- ESD 7 (Green Roofs)

- Also links to the following sections in Appendix 1:

section 2.1(Water Consumption)
section 3.1 (Natural Daylight)
section 3 3 (CO2 Reduction (Improved Energy Efficiency)
section 3.4 (Exterior Lighting)
section 4.1 (Construction Waste)
section 4.2 (Construction Materials)
section 4.3 (Waste Recycling)
section 4.4 (Composting)
section 6.4 (Lifetime Homes)
section 7.1 (Major Developments)

Landscape Improvements

20.CO In the areas identified for landscape improvements, as shown on the Proposals Map, proposals which would prejudice such improvements or which in themselves would be detrimental to the quality of the landscape in these areas, will not be permitted. Developers' willingness to contribute towards landscape improvements will be a material consideration in the assessment of planning applications.

Links to Essential Requirements

- ESD 7 (Green Roofs)

Also links to the following sections in Appendix 1
section 5.1 (Green Infrastructure)
section 5.3 (Trees)

Biodiversity

25.NC Development which will adversely affect a habitat or feature of importance for wild fauna and flora will not be permitted, unless it can be demonstrated to the satisfaction of the Council that:

(i) the benefits of the development outweigh the adverse impacts;

(ii) the adverse impacts are unavoidable, and

(iii) appropriate measures are taken which would mitigate or compensate

26.NC Development proposals will be required to include measures to enhance the value of features and habitats of nature conservation importance where reasonable opportunities exist in connection with the development.

Links to

- Essential Requirement ESD 7 (Green Roofs)

Also links to section 6.1 (Biodiversity) in Appendix 1.

Waste Collection and Recycling

28.ES Provision should be made in the design and layout of housing developments for the storage and collection of domestic waste and recyclable materials. These facilities must be sited in locations that would not give rise to disturbance to the occupiers of residential property.

Links to

section 4.3 (Waste Recycling) in Appendix 1

-

Air Quality

33.ES Where new development appears likely to have a significant impact on air quality in the locality, or future occupiers of the development may be subject to unacceptable air quality, the Council will require a suitable air quality assessment to be carried out prior to consideration of the application.

Links to Essential Requirements:

- ESD 7 (Green Roofs)
- ESD 8 (Trees)

Links to section 6.5 (Pollution) in Appendix 1

Lighting

36.ES Permission will be refused for proposals which do not incorporate well designed lighting, where lighting is necessary. Lighting should be concentrated in those areas where it is required and spillage, either horizontally or vertically, should be minimised. The size and design of the lighting columns should not detract from the character of the locality.

Links to section 3.4 (Exterior Lighting) in Appendix 1

Renewable Energy

38.ES Proposals for renewable energy schemes will be permitted provided they meet all the following criteria:

(i) they are appropriately designed, sited and located and do not cause unacceptable visual intrusion;

(ii) the benefits of the scheme for the environment, economy and local community outweigh any harmful effects;

(iii) they make use of the best available technology; and

(iv) they are accompanied by a thorough analysis of the scheme which satisfactorily demonstrates their viability.

Links to

- Essential Requirement ESD 6 (CO_2 Reduction (Small Scale zero/low carbon technologies))

Flooding and Erosion

45.ES Development proposals must incorporate adequate measures for the disposal of surface water from the development including, where practicable, source control techniques and sustainable drainage systems, incorporating defined arrangements for the future maintenance of the system.

Links to Essential Requirements:

- ESD 4 (Reducing Surface Water Runoff)
- ESD 7 (Green Roofs)

Promoting Good Design

59.BE Development proposals which are in accordance with the other policies in this plan will be permitted provided they meet all the following criteria:

i they take full and proper account of the context of the site including the character and appearance of the locality or neighbourhood and are appropriate in mass, scale, materials, layout, density, design and siting, both in themselves and in relation to adjoining buildings, spaces and views, natural features and trees worthy of retention
ii. they make the most efficient use of the land;
iv. they provide a high standard of landscape design and appropriate planting where required. Development should use native plants in landscape schemes to benefit biodiversity. …….
viii. they make adequate provision for the storage and collection of refuse and where appropriate include facilities for the collection of recyclable materials;
ix. they include, where appropriate, measures which provide shade and protection from the sun; …….

Links to Essential Requirement:

- ESD 5 (Passive Solar Heat Gain)

- Also links to the following sections in Appendix 1:

section 3.1(Natural Daylight)
section 4.1 (Construction Waste)
section 4.2 (Waste Recycling)
section 5.1 (Green Infrastructure)
section.6.1 (Biodiversity)

Public Open Space

146.OS Development which would have a detrimental impact on the green network will be refused. Contributions, where appropriate, from adjoining development proposals will be sought to enhance the environment and facilities within the green network.

147.OS The Borough Council will require, in connection with new residential developments, the minimum provision of 2.85 hectares of public open space per 1,000 population. In practice;

i. where the development involves the net increase of between 1 and 24 residential units, the Council will seek agreements for a contribution towards open space provision or towards improving equipment/facilities on sites in the locality;

ii. where the development involves a net increase of between 25 and 44 residential units, open space provision will be sought on-site, unless the open space requirement arising can be accommodated by enhancing existing public open space within a 300 metre walking distance of the development, in which case a financial contribution will be sought towards off-site improvements;

iii. where the development involves a net increase of 45 residential units or more, appropriate open space provision will be sought on-site to meet

Links to Essential Requirements

- ESD 7 (Green Roofs)
- ESD 8 (Trees)

- Also links to section 5.1 (Green Infrastructure) in Appendix 1

APPENDIX 3: EVIDENCE BASE

The evidence base for the borough of Eastleigh is highly dependent on its geographical location in the heart of South Hampshire. There are two major challenges facing the South Hampshire sub-region which in combination make the area almost unique nationally in terms of the scale of change that the environment will experience over the coming decades. The first is the impact of rapid climate change on the South East of England and on the coastal zone in particular. At the same time the area is under pressure to significantly and rapidly increase development in an already crowded sub-region. The large number of national and international sites of landscape and biodiversity importance as well as its position between two national parks makes the South Hampshire environment particularly vulnerable to these major impacts.

Climate Change

Adaptation and mitigation of the impacts of climate change are fundamental to all our futures. Our climate has and will always change. However, there is a scientific consensus that this change will continue and accelerate more quickly than humanity has ever previously experienced. The rate of climate change will be greater if we fail to make significant changes to the way we use energy. Most of the predicted climate changes in South East England are even more significant than for other parts of the country. These consist of the following:

- More extreme weather events
    - Since 1961 in all regions of the UK the average duration of summer heat waves has increased by 4-16 days, the average duration of winter cold snaps has decreased by 6-12 days and there has been a trend towards heavier winter precipitation for most parts of the UK.
    - The number of very hot summer days is expected to increase, and high temperatures similar to those experienced in August 2003 or July 2006 (>3 °C above average) are expected to become common by the end of this century, even under the Low Emissions scenario
    - The number of very cold winter days is expected to decrease, and low temperatures similar to those experienced in February 1947 or January/February 1963 (>3 °C below average) are expected to become highly uncommon by the end of this century, even under the Low Emissions scenario
    - Heavier winter precipitation is expected to become more frequent

- Winter storms and mild, wet and windy winter weather are expected to become more frequent

- Increasing average temperatures

In all scenarios the sub-region is in the part of the country where the most extreme change is expected in summer average temperatures. This pattern is repeated for all seasons of the year. Increased summer temperatures (on average perhaps as high as 4 extra degrees Celsius) will lead to greater cooling demand in buildings as well as a greater loss of summer rains to evaporation. Higher temperatures throughout the year will damage and destroy ecosystems unable to adapt to rapid change and are likely to increase populations of pests and vermin. Partly driving the increase in the average temperatures is the expected increase in significant numbers of days experiencing very high summer temperatures. This will lead to human health problems and premature deaths as well as to more forest and heath fires and greater water stress. South Hampshire is predicted to be more seriously affected than most other parts of the UK.

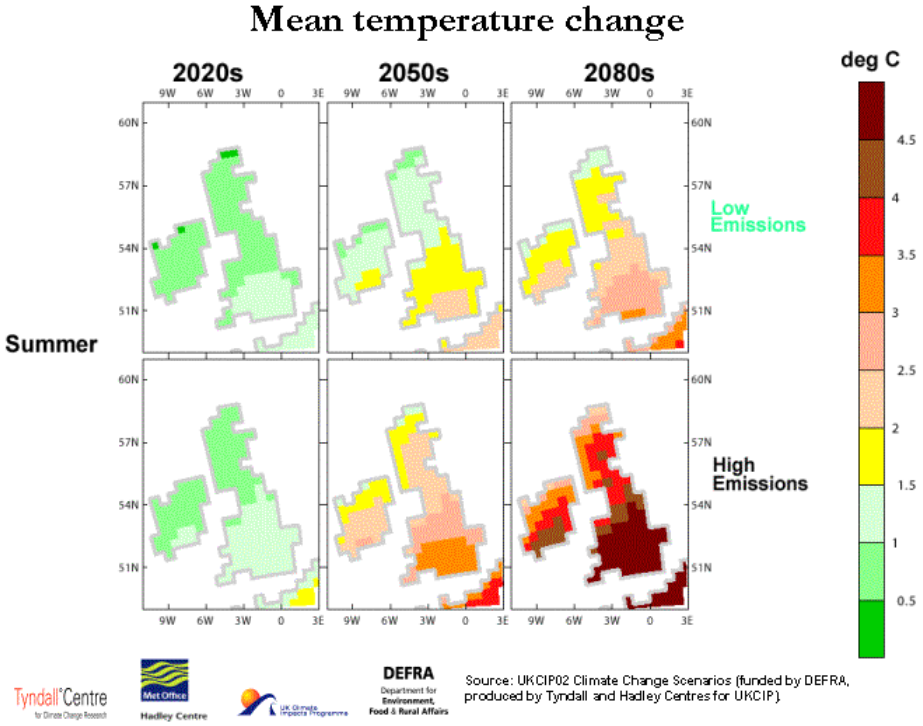


Fig 1. Predicted mean Temperature Change in Summer

- Drier Summers

The South Hampshire sub-region is predicted to be in the zone of the UK most affected by drier summers. The sub region is

already recognised by the Environment Agency as being an area of serious water stress (see figure 3). Less summer rainfall will increase water stress on both households and businesses as well as on the natural environment. Drier summers will also make many natural environments much more susceptible to fire damage. In a “do nothing” scenario, with continuing high carbon emissions, summer precipitation is predicted to drop by more than 50% in the southern half of the UK by 2080. Even under the “lower emissions” scenario a coastal strip of the UK, (roughly the southern and south western coastal counties, including South Hampshire) is predicted to have the most significant summer precipitation reduction (30-40%) in the whole of the UK.

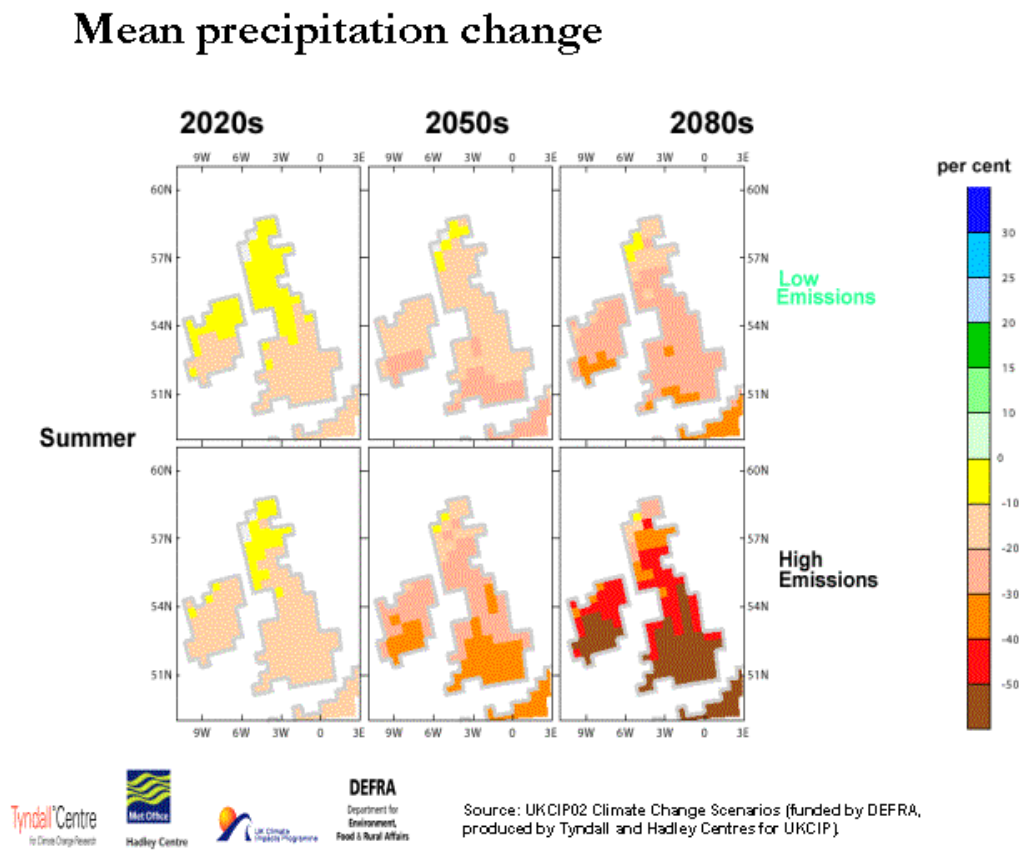


Fig 2. Predicted mean Precipitation Change in Summer

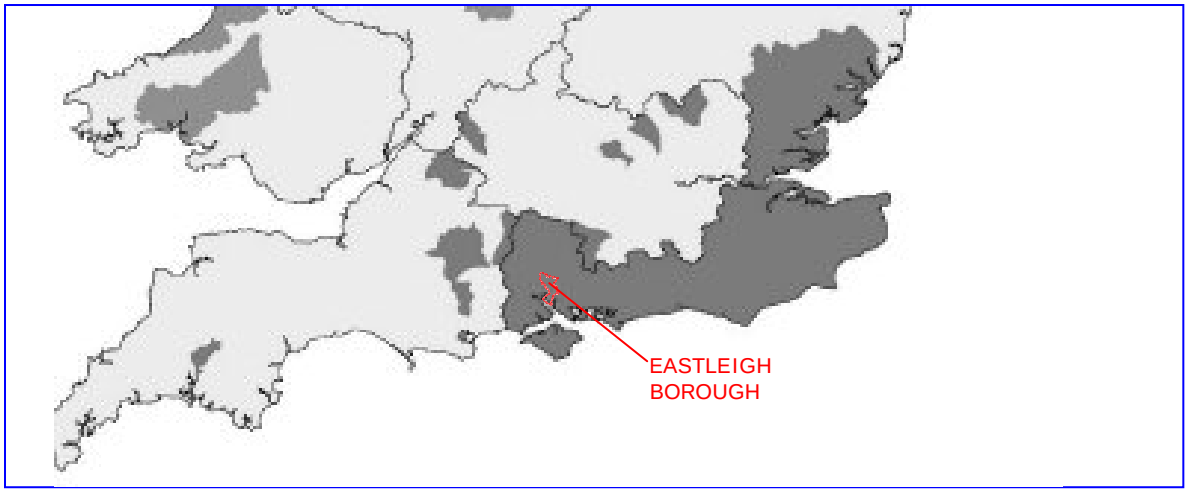


Fig 3. Unsustainable or unacceptable abstraction regime (dark shaded area)

- Greater winter rainfall

South Hampshire is again in one of the areas of the UK worst affected by the expected increase in winter precipitation. Under the high emissions scenario this could increase by more than 30% towards the latter part of the century. More frequent and heavy rainfall in winter will lead to greater river flooding and localised flash flooding as well as accelerated coastal erosion.

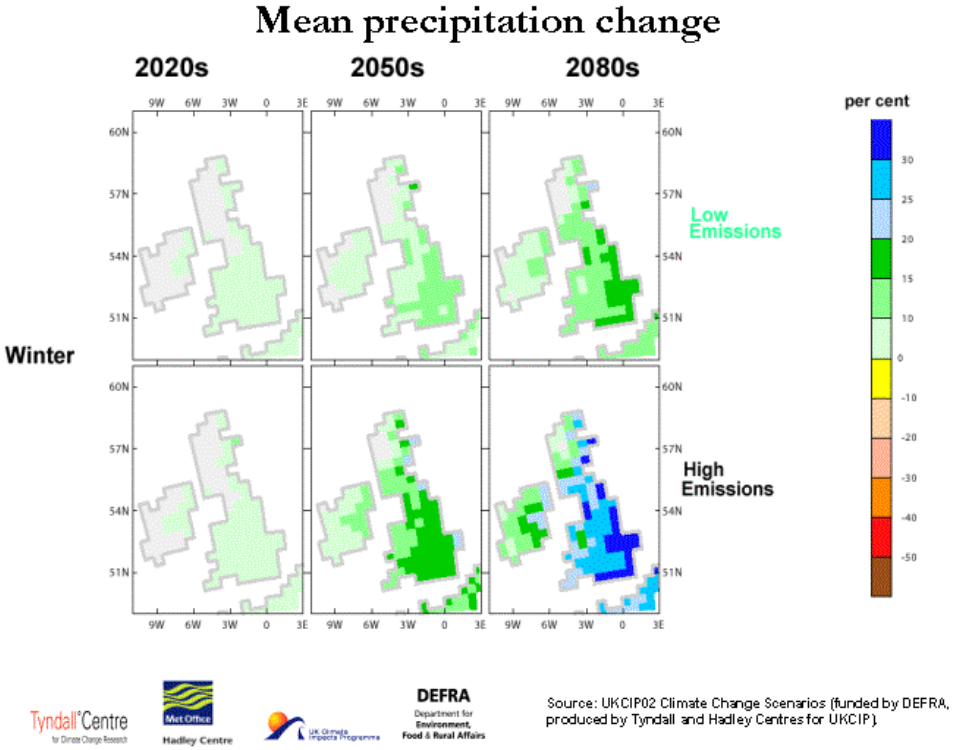


Fig 4. Predicted mean Precipitation Change in Winter

- Higher Sea levels
- Absolute sea-level has increased by approximately 10 cm around the UK coast during the twentieth century. (UK Climate Impacts Programme). The South Hampshire sub-

region is exposed to the tilting of the South of England land mass caused by the pre-historic melting of ice–sheets which accounts for an additional sea level rise of approximately 5 cm in the twentieth century.

- Global sea level is expected to continue to rise and by 2100 it could have risen by as much as 94 cm (DEFRA) around the South Hampshire coast, depending on the emissions scenario and assuming another 5-8 cm contribution from the post glacial tilting effect.
- Extreme sea levels are expected to be experienced more frequently, and by 2100 storm surge events could occur up to 20 times more frequently for some coastal locations and emissions scenarios
- The sub region's low lying coastal landscape is most susceptible to the impacts of climate change through rising sea levels and increasing frequency of storm events. The sub region's coastal built heritage is worthy of protection in the national interest. The vulnerability of low-lying and previously reclaimed commercial and residential land, particularly in Southampton and Portsmouth, presents the prospect of a choice between the huge cost of the extra sea defensive works that would be necessary and the economically ruinous abandonment of areas of urban land to the sea.

Development Pressure

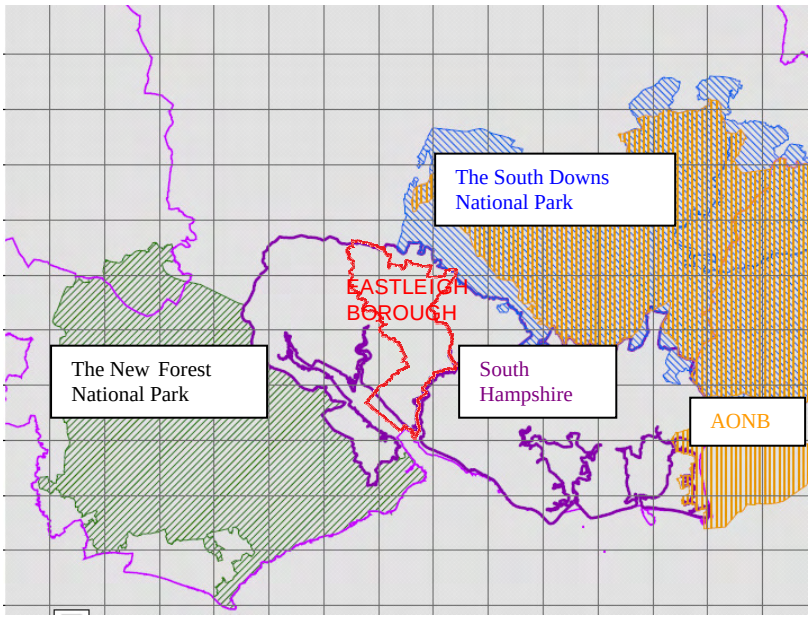
In the light of the sub-regional climate change scenarios the challenge is to ensure that the 80000 new homes that are required in South Hampshire (by 2026) to cater for demographic changes and to provide sufficient new homes for workers helping the economy to grow are built sustainably.

The borough is already a highly developed area with on average 1477 people for every square kilometre (p/sq km). This compares with the national population density of 246 p/sq km and a density of 419 p/ sq km for the rest of the South East of England. The South East Plan projection for the borough is for 7080 new homes by 2026. The projected percentage increase in the borough's population up to 2026 is 12% (HCC). This figure would increase the density of the borough area to 1654 p/ sq km.
This excludes the proposed Special Development Area new settlement of 6000 homes north northeast of Hedge End. Depending on what proportion of this development takes place on the Eastleigh side of the borough boundary with Winchester, this could increase the projected 2026 population by another 7-10%.

Another aspect of development pressure is the requirement to provide 332,000 square metres of net new business floor space over the same period (2006-2026). (PUSH).

The implications of this rapid and significant rise in buildings and population in Eastleigh as well as the objective to achieve above UK trend economic growth (SE Plan) are an inevitable increased use of resources (energy, water and construction materials) and a potentially greater production of waste. The pressure on the green space that remains will also intensify with a greater population using a diminished resource.

Biodiversity and Landscape

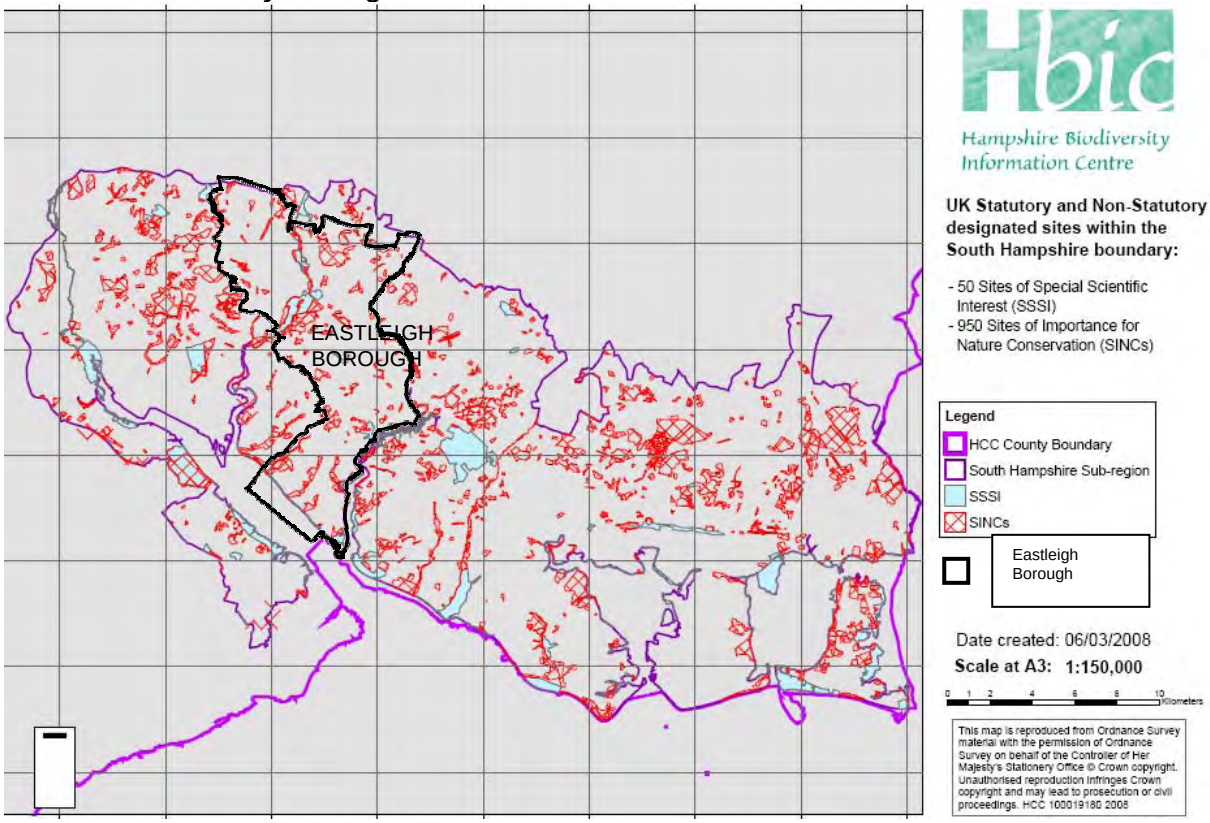


Designated areas of outstanding natural beauty around South Hampshire

Climate change and increased development of the already crowded sub-region will impact on the areas of biodiversity and landscape value inside South Hampshire and in neighbouring areas.
To the north is the East Hampshire AONB, forming part of the proposed South Downs National park; to the south east is the Chichester Harbour AONB; to the south west is the New Forest National Park. This is a landscape with a high degree of sensitivity due to its cultural and natural significance. It is bordered and crossed by internationally and nationally important coastal and river habitats, the Solent Special Protection Area, and numerous SACs, SSSIs and SINCs,

It has been said that 'the economy is a wholly owned subsidiary of the environment'. In a speech in 2005, Gordon Brown, expanded on

this idea when he said[1], *'Environmental issues - including climate change – have traditionally been placed in a category separate from the economy and from economic policy. But this is no longer tenable. Across a range of environmental issues –from soil erosion to the depletion of marine stocks, from water scarcity to air pollution – it is clear now not just that economic activity is their cause, but that these problems in themselves threaten future economic activity and growth.'*

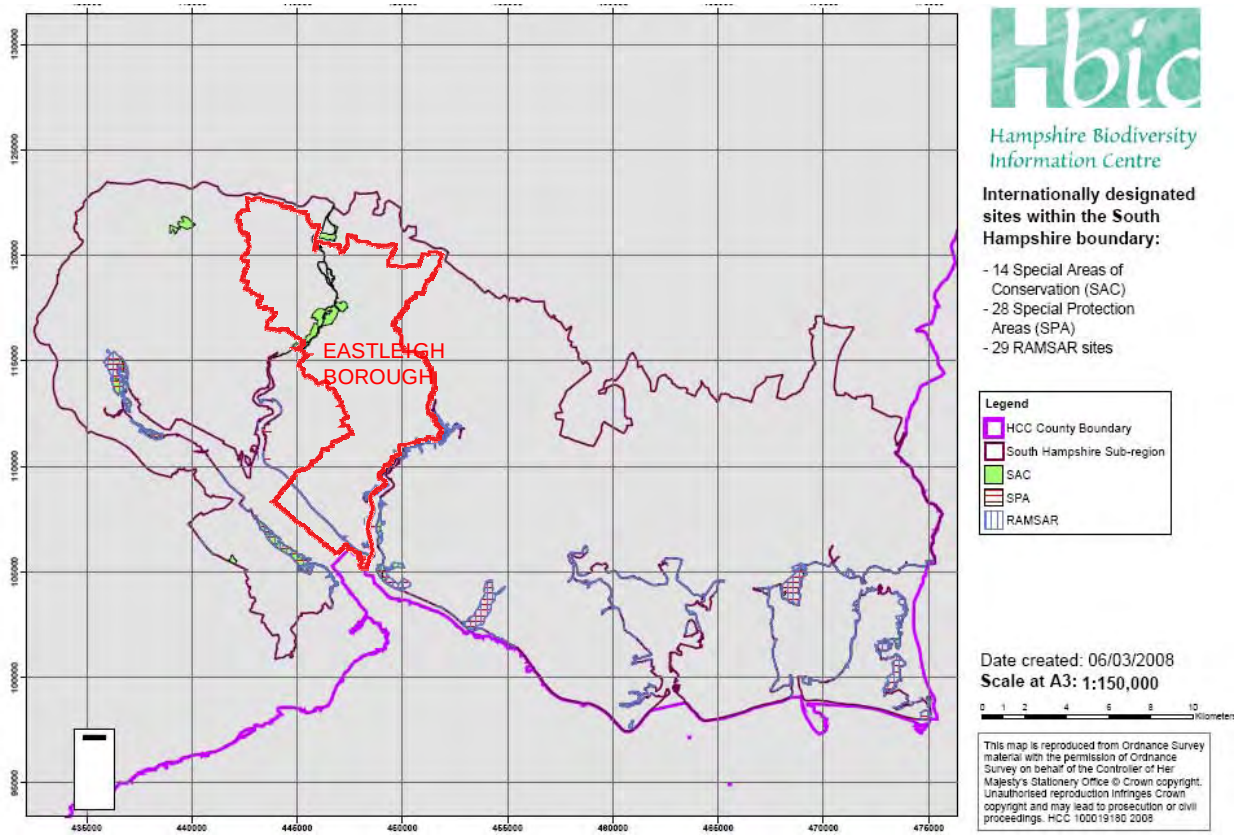


Nationally designated sites within South Hampshire

Protection and enhancement of the sub region's environment is fundamental to the future success of the area. Whilst the internationally designated sites enjoy legal protection and the impacts of development will be carefully considered through Habitat Regulation Assessments, all the other environmental features of the area should be protected and enhanced. The principle of seeking win/win solutions to any conflicts between the need for development and the protection of the environment should be at the heart of a sustainable borough. Maximising the potential of local green space to help absorb pressure on these landscapes will be essential to delivering development that supports the economic aspirations of the sub-region. Vulnerable landscapes and habitats should expect more visitor and neighbour disturbance pressure as well as having to adapt to a changing and more unpredictable climate.

[1] address to the Energy and Environment Ministerial Roundtable, 15 March 2005

The large amount of nationally and internationally designated sites of biodiversity importance in the sub-region as well as the neighbouring AONB and the two national parks will put even more pressure on undesignated areas of green space in Eastleigh and other parts of South Hampshire (which are still valuable collectively in local landscape and biodiversity contexts). This pressure will be in the form of new development proposals and greater impacts from a larger population using a reduced resource.



Internationally designated sites within South Hampshire

Environmental Challenges

There are specific environmental challenges within the sub-region that require well planned and robust responses.

- The sub region is already recognised as being an area of serious water stress. There is a major issue regarding planning for the level of water supply to support the ambitious development proposed and, given the sensitivity of the water sources in the area, the preservation of water flow and quality. Climate change in South Hampshire with hotter and drier summers will make this situation worse. Greater water efficiency, especially within existing and future housing stock, is essential for the sustainable management of water resources.

- Increased development and infrastructure has the potential to exacerbate existing problems of excessive run-off. Wetter winters and heavier rainstorms predicted for the Eastleigh area make this likely to be an even greater problem in the future.
- Climate change poses particular threats to low lying areas adjacent to the coast, including in the two cities. The sub region's coastal location is fundamental to its economy and the coastal built heritage is worthy of protection in the national interest. This requires joint action in planning coastal zone management as an adaptive response.
- Climate change will also increase the likelihood and magnitude of river flooding. The likelihood of flooding will also be affected by changes in land management – such as more development in flood risk areas. Local planning authorities need to consider flood risk when determining planning policies and assessing applications for planning permission.
- Energy use adds to carbon emissions and so adds to climate change. The UK aims to cut carbon emissions by at least 80 per cent by 2050. This will be a challenge for Eastleigh, where the energy used in construction, and occupying and operating new buildings will add to our emissions. We need greater energy efficiency in the construction process as well as more energy-efficient homes.
- Waste handling and resource usage are issues that become critical in planning for significant new development, given the shortage of existing and potential landfill sites and the current trend of more than 50% waste to landfill coming from construction and demolition activities. The EU Landfill Directive sets targets to reduce the amount of waste going to landfill and to increase the amount of waste being recycled and re-used.
- Adding a further 80,000 homes and related employment, office and retail development in a relatively constrained area will require the enforcement of high standards of design and construction and greater use of recycled materials.
- Road traffic presents the greatest threat to air quality in Eastleigh. The increase in transport emissions shows that improvements in vehicle energy efficiency have been outweighed by the overall increase in road traffic. And road traffic nationally is predicted to increase by more than a third over the next 20 years. This may well increase even further in South Hampshire with the projected population increase of 12-22%. To minimise air quality impacts, we need to increase the use of public transport and other forms of

transport. Public and alternative transport should be incorporated into all proposed development in the borough.

- Not only should new development help mitigate its contribution to climate change but it also needs to adapt to the changing climate. This will include the expectation of hotter drier summers (more cooling demand (preferably addressed through natural methods);and a need to counter the 'urban heat island effect' in built up areas (with trees and green roofs), as well as
- wetter, stormier winters (leading to more risk of flash flooding).

Conclusion

Climate change is already being experienced in Eastleigh and global greenhouse emissions are predicted accelerate this. South Hampshire's important and sensitive **sites of biodiversity and landscape value** will be under pressure from an increasing population. The **development growth** proposed in South Hampshire over the next 20 years is inevitable. As a priority the new development should be planned to **adapt** to the consequences of climate change. Environmentally this growth can be viewed negatively or in a pragmatic way that the development industry must be address positively.

The unique pressures facing Eastleigh make the case for **heightened sustainable development standards**. This new development is of such significance to the future of the borough that it must be built to higher standards of sustainable design. Insisting on certain minimum standards of sustainable design helps to **mitigate** the contribution to global warming and the other environmental costs that the development causes in its construction and by the future residents, visitors and employees. It also helps to mitigate the **local environmental impact** of the development in Eastleigh.

APPENDIX 4
RESIDENTIAL DEVELOPMENT PRO-FORMA 2009-11*

*At time outline planning application submitted.

The Essential Requirements apply to:
all new residential development of **10 dwellings or more**

All certificates and Assessors reports to be at both design and post-construction stages

N0.& ISSUE	**PRE-APPLICATION SUSTAINABILITY CHECKLIST**		**ESSENTIAL REQUIREMENT**	**COMPLIANCE CHECK**	**CONFIRM**
	QUESTION	**ANSWER**			
ISSUE REQUIRING CODE FOR SUSTAINABLE HOMES CERTIFICATES					
ESD 1 General Sustainability	What level of the Code For Sustainable Homes will the residential; development be designed to achieve?		**Level 3 of the Code FSH**	Code FSH Level 3 (or higher) certificates for each dwelling type at: design stage before work on site …and	
				post construction before occupation	
ISSUES REQUIRING SPECIFIC CODE FOR SUSTAINABLE HOMES CREDITS					
ESD 3 External Water Consumption	How will the development's landscape area be watered?		**1 Code FSH Wat 2 credit**	Code FSH Assessor reports confirming 1 no. Wat 2 credit for each dwelling type at: design stage before completion on site …and	
				post construction before occupation	

ESD 6 Reduction (Small Scale Zero/Low Carbon Technologies)	By what percentage will carbon emissions from buildings in this development be reduced by means of on-site zero or low carbon energy generation?		**1 Code FSH Ene 7 credit**	Code FSH Assessor reports confirming 1 no. Ene 7 credit for each dwelling type at: design stage before work on site (OR agreed contribution to 'Carbon Free' if technically unfeasible)…and	
				post construction before occupation	
ISSUES REQUIRING OTHER COMPLIANCE CHECKS					
ESD 2 Rainwater & Greywater *(FLATS ONLY)*	What % of the development's predicted water needs will be served by rainwater harvesting and/or grey water recycling?		**Submit details of the rainwater harvesting and/or grey water recycling systems** supplying all WC flushing and other appropriate uses for that development **OR** comply with EBC GI1 (Green Roofs)	Drawings and specifications clearly showing grey/rain water systems at design stage. Enforcement check after construction.	
ESD 4 Surface Water Runoff	What Sustainable Drainage Systems will be employed to attenuate storm water runoff from the development's roof areas and areas of hard standing?		*Run-off rates no greater post development *All roofs and areas of hard standing will be drained according to recognised sustainable drainage systems (SuDS) * Flood Risk Assessment (FRA)	Head of Engineering to Approve details showing run-off rates, SuDS and drainage report	
ESD 5 Passive Solar Heat Gain	How have Developers maximised the potential for passive solar heat gain in their buildings?		All new buildings: **make full use of potential passive solar heat gain** through orientation, building design and landscape design (while avoiding excessive summer heat gain and glare) unless there are particular site or building use factors which make it unfeasible. And within	Design and Access Statements and submitted design plans	

			good urban design framework.		
ESD 7 Green Roofs *(FLATS ONLY)*	What percentage of the development's total roof area will consist of green roofs?		At least 80% of roof areas to be green roofs (provided they are compatible with the Council's design considerations). **OR** comply with EBC W2 (Rainwater/Greywater)	Developer submits plans and sq area figures for roofs	
ESD 8 Trees	How many trees will be provided in every 30 linear metres of new street and in all communal car parks?		1 street tree per 30 linear metres of new residential street 1 street tree per 10 linear metres of existing street frontage of that development All new off-street[2] car parks accessible to the public to provide at least 1 tree per 6 vehicle spaces All new private back gardens to retain existing trees or (if no existing trees to retain) receive at least 1 newly planted tree	Developer submits plans, linear quantity of new street frontage and numbers of street trees Developer submits plans, with numbers of car spaces and trees in car parks Developer submits plans, with numbers of back gardens and trees in back gardens	

ISSUES WITH NO ESSENTIAL REQUIREMENT

N0.& ISSUE	**PRE-APPLICATION SUSTAINABILITY CHECKLIST**	
	QUESTION	**ANSWER**
2.1 Water Consumption	What measures will be taken to maximise water efficiency in buildings?	
3.1 Natural Daylight	How have Developers maximised the potential for natural daylight in their buildings?	
3.3 CO2 Reduction (Improved Energy Efficiency)	What percentage improvement on the maximum carbon emissions allowable under Building Regulations is proposed for the new buildings in this development?	
3.4 CO2 Exterior Lighting	Q.EBC E4a: What measures are proposed to minimise the carbon emissions from external space and security lighting and which Code credits is the development designed to achieve? Q. EBC E4b: How will the development minimise light pollution from external	

	lights?	
3.6 Zero Carbon Residential Developments	What percentage of buildings in this development will be designed to emit net zero carbon emissions annually?	
3.7 Natural Ventilation	How will buildings be ventilated?	
3.8 Drying	What facilities for non-mechanical clothes drying will residents have?	
4.1 Construction Waste	What measures will be taken to minimise construction waste?	
4.2 Construction Materials	How many Code or BREEAM Materials credits will the development aim to achieve?	
4.3 Waste Recycling	What measures will be taken to best facilitate waste recycling from the finished development?	
4.4 Composting	What provision is being made to encourage composting in the residential development?	
5.1 Green Infrastructure	What elements of green infrastructure are proposed with the development and how will they be managed?	
6.1 Biodiversity	How many Code FSH or BREEAM Ecology credits is the development designed to achieve for each building type?	
6.2 Noise	What measures is the developer proposing to quantify and, where necessary mitigate, the noise impact on the development's occupants?	
6.3 Private Space	What provision for private or shared space will be made for the development?	
6.4 Lifetime Homes	Is the residential development being designed to comply with all of the Lifetime Homes standards?	
6.5 Pollution	What measures will be taken to minimise the pollution impacts of road pollution on the development (if in an air quality management area) and of nitrogen oxides and materials with high Global Warming Potential on the wider environment?	
7.1 Construction Site Impacts	What measures will be taken to minimise the site impacts during construction?	
7.2 Building User Guides	What provision will be made for building or home user guides?	
7.3 Considerate Constructors Scheme	What level of certification for the Considerate Constructors Scheme (or equivalent) is the development aiming to achieve?	
8.1 Major Developments	What further sustainable measures are being proposed if the development is above 500 dwellings in size?	

APPENDIX 5: NON & MULTI-RESIDENTIAL DEVELOPMENT PRO-FORMA 2009-11*

*At time outline planning application submitted.

Essential Requirements apply to all new non-residential and multi-residential development (over 500 sqm of net internal floorspace)

All certificates and Assessors reports to be at both design and post-construction stage

N0.& ISSUE	PRE-APPLICATION SUSTAINABILITY CHECKLIST		ESSENTIAL REQUIREMENT	COMPLIANCE CHECK	CONFIRM
	QUESTION	ANSWER			
ISSUE REQUIRING CODE FOR SUSTAINABLE HOMES CERTIFICATES					
ESD 1 General Sustainability	What level of BREEAM will the development be designed to achieve?		**BREEAM 'very good'**	BREEAM 'very good' (or higher) certificates at: design stage before work on site …and	
				post construction before occupation	
ISSUES REQUIRING SPECIFIC CODE FOR SUSTAINABLE HOMES CREDITS					
ESD 6 CO2 Reduction (Small Scale Zero/Low Carbon Technologies)	By what percentage will carbon emissions from buildings in this development be reduced by means of on-site zero or low carbon energy generation?		**2 BREEAM Ene 5 credits**	BREEAM Assessor reports confirming 2 no. Ene 5 credits at: design stage before work on site …and	
				post construction before occupation	
ISSUES REQUIRING OTHER COMPLIANCE CHECKS					
ESD 2 Rainwater & Greywater	What percentage of the development's predicted water needs		**Submit details of the rainwater harvesting and/or grey water recycling systems** supplying all WC flushing and other	Drawings and specifications clearly showing grey/rain water systems at design stage.	

	will be served by rainwater harvesting and/or grey water recycling?		appropriate uses for that development **OR** comply with EBC GI1 (Green Roofs)	Enforcement check after construction.	
ESD 4 Surface Water Runoff	What Sustainable Drainage Systems will be employed to attenuate storm water runoff from the development's roof areas and areas of hard standing?		*Run-off rates no greater post development *All roofs and areas of hard standing will be drained according to recognised sustainable drainage systems (SuDS) * Flood Risk Assessment (FRA)	Head of Engineering to Approve details showing run-off rates, SuDS and drainage report	
ESD 5 Passive Solar Heat Gain	How have Developers maximised the potential for passive solar heat gain in their buildings?		All new buildings: **make full use of potential passive solar heat gain** through orientation, building design and landscape design (while avoiding excessive summer heat gain and glare) unless there are particular site or building use factors which make it unfeasible. And within good urban design framework.	Design and Access Statements and submitted design plans	
ESD 7 Green Roofs	What percentage of the development's total roof area will consist of green roofs?		At least 80% of roof areas to be green roofs (provided they are compatible with the Council's design considerations). **OR** comply with EBC W2 (Rainwater/Greywater)	Developer submits plans and sq area figures for roofs	
ESD 8 Trees	How many trees will be provided in every 30 linear metres of new street and in all communal car parks?		1 street tree per 30 linear metres of new residential street 1 street tree per 10 linear metres of existing street frontage of that development All new off-street[2] car parks accessible to the public to provide at	Developer submits plans, linear quantity of new street frontage and numbers of street trees Developer submits plans, with numbers of car spaces and	

			least 1 tree per 6 vehicle spaces	trees in car parks	

ISSUES WITH NO ESSENTIAL REQUIREMENT

N0.& ISSUE	PRE-APPLICATION SUSTAINABILITY CHECKLIST	
	QUESTION	**ANSWER**
2.1 Water Consumption	What measures will be taken to maximise water efficiency in buildings?	
3.1 Natural Daylight	How have Developers maximised the potential for natural daylight in their buildings?	
3.3 CO2 Reduction (Improved Energy Efficiency)	What percentage improvement on the maximum carbon emissions allowable under Building Regulations is proposed for the new buildings in this development?	
3.4 CO2 Exterior Lighting	Q.EBC E4a: What measures are proposed to minimise the carbon emissions from external space and security lighting and which Code credits is the development designed to achieve? Q. EBC E4b: How will the development minimise light pollution from external lights?	
3.7 Natural Ventilation	How will buildings be ventilated?	
4.1 Construction Waste	What measures will be taken to minimise construction waste?	
4.2 Construction Materials	How many Code or BREEAM Materials credits will the development aim to achieve?	
4.3 Waste Recycling	What measures will be taken to best facilitate waste recycling from the finished development?	
5.1 Green Infrastructure	What elements of green infrastructure are proposed with the development and how will they be managed?	
6.1 Biodiversity	How many Code FSH or BREEAM Ecology credits is the development designed to achieve for each building type?	
6.2 Noise	What measures is the developer proposing to quantify and, where necessary mitigate, the noise impact on the development's occupants?	
6.5 Pollution	What measures will be taken to minimise the pollution impacts of road pollution on the development (if in an air quality management area) and of nitrogen oxides and materials with high Global Warming Potential on the wider environment?	
7.1 Construction Site Impacts	What measures will be taken to minimise the site impacts during	

	construction?	
7.2 Building User Guides	What provision will be made for building or home user guides?	
7.3 Considerate Constructors Scheme	What level of certification for the Considerate Constructors Scheme (or equivalent) is the development aiming to achieve?	
8.1 Major Developments	What further sustainable measures are being proposed if the development is above 50 000 sq m of floor space?	

APPENDIX 6:
VIABILITY OF ESSENTIAL REQUIREMENTS

Thresholds:

The cost of assessment for a single plot under the Code for Sustainable Homes (including a 2 stage assessment process and audit) is in the order of £1000.The cost per unit decreases with the number of units in a development. For this reason a threshold of 10 dwellings or more has been imposed to allow the industry to become accustomed to providing assessments for 'major' developments to begin with.

However, in the year 2006/7 30% of all new residential development completed in the borough of Eastleigh was for 10 dwellings or below (234 out of 781).This is a very significant proportion of the total therefore the requirement for Code FSH certification should ultimately equally apply to all residential development. For this reason the residential threshold is removed from January 2011.

It is also recognised that smaller multi and non-residential buildings may typically find both compliance more difficult and the cost of employing a BREEAM assessor proportionately more expensive. For this reason a threshold of 1000 sq metres of floorspace was chosen to exclude the smallest developments to begin with.

Following the establishment of an assessment process for these developments during 2009 and 2010, the threshold will be reduced to 500 sq m from January 2011.

GENERAL SUSTAINABLE DEVELOPMENT

ESD 1 Minimum Code For Sustainable Homes and BREEAM Requirements (see p 7-9 in Appendix 1)

The Council requires all residential development of 10 dwellings or more to:

- Achieve Level 3 of the Code up to the end of 2010*

The Council requires all residential development to:

-
- Achieve Level 3 of the Code from January 2011 up to the end of 2011*
  Achieve Level 4 of the Code from January 2012*
  Achieve Level 5 of the Code from January 2014*
- Achieve Level 6 of the Code
  from January 2016*

The Council requires all non-residential and multi-residential development above 1000 sq m of external floor space to:

- Achieve BREEAM level "very good" up to the end of 2010*

The Council requires all non-residential and multi-residential development above 500 sq m of external floor space to:

- Achieve BREEAM level 'very good' from January 2011 up to the end of 2011*

- Achieve BREEAM level 'excellent' from January 2012*

*At the time planning application is submitted

Residential:
Code Level 3:
The extra cost for achieving the Code FSH Level 3 above the minimum requirement (2006 building regulations) was estimated to add typically from 4% to 8% to the construction cost *(Sweett, 2006 and DCLG, 2008)*. The majority of this additional cost is associated with carbon saving measures and where lower cost approaches are viable (e.g. wind turbines or site wide CHP) costs are reduced considerably.

Although the cost is likely to be greater for single dwellings the Government intends strengthening building regulations in the near future which will require all dwellings nationwide to comply with this level of emissions reduction as a minimum requirement. *"The aim is*

to set the improvement factor for 2010 to achieve a 25 per cent improvement over the 2006 standard for gas heated dwellings" (DCLG, 2007).

This is exactly the energy efficiency target necessary for Code FSH Level 3 compliance.

Code Level 4:

In 2007 Additional costs were estimated as between 7% - 12% depending on the house type and location. With developers and manufacturers aware that all new homes will need to achieve 'zero carbon' status by 2016 it is expected that the costs of the relevant technologies will reduce by 2012 through both innovation and economies of scale.

Code level 5:

The increased water efficiency measures required to meet the mandatory standard of less than 80 litres per person per day will require either rainwater harvesting or greywater recycling. One of these two options are already required in Essential Requirement EBC W1 (or the third option of a green roof) therefore the extra cost of this can often be discounted.

Code Level 6:

Costs become substantial for all homes, reflecting the high performance standards involved. From 2016 all homes will need to be 'zero carbon' (as prescribed by a further strengthening of building regulations) so the major costs associated with this can be discounted when Code Level 6 (which also requires 'zero carbon' emissions) is an essential requirement in 2016.

BREEAM 'very good'

A recent study (*DfES*) estimates an extra cost of £19/ sq m for 'very good' compliance. Achieving credits typically, but not necessarily, results in higher capital costs. The expectation is that reduced operational costs will offset these costs in the long run, but this is not always true. Some sustainable solutions, such as micro wind turbines, result in both high capital and operational costs. Other sustainable options incur little or no cost. The BREEAM system is more flexible than the Code FSH with limited mandatory requirements especially at the lower levels so there is more scope for designing for BREEAM compliance in the most cost effective way.

BREEAM 'excellent'

- The DfES study estimated an extra cost of £ 60/ sq m for 'excellent' compliance in schools. Capital costs for achieving 'excellent' compliance are currently relatively high but should be lower by 2012 due to technological innovation and economies of scale. Building regulations will have also been updated which will make the additional cost of BREEAM compliance less than it would be today.

BREEAM 'outstanding'

The new top standard (since 2008) is 'outstanding'. Given the incremental increase in the 'excellent' standard as the BREEAM assessments get reviewed periodically, it is considered unreasonable to require an 'outstanding' standard for the forseeable future.

From *Putting a Price on Sustainable Schools, (2008)*
(Anna Surgenor (BRE) & Ian Butterss (Faithful+Gould)):

Primary school
Depending on the location, a *BREEAM Schools* rating and low/zero carbon can be achieved for an additional capital cost of:
1.8–3.0% for 'Very good',
5.9–9.85% for 'Excellent',
2.1–9.8% for low- or zero-carbon.

Secondary school
Depending on the location, a *BREEAM Schools* rating and low/zero carbon can be achieved for an additional capital cost of:
0.8–2.7% for 'Very good',
3.9–4.4% for 'Excellent',
2.7–15.3% for low- or zero-carbon.

WATER

ESD 2 Rainwater Harvesting and Greywater Recycling (see p 15-20 in Appendix 1)

The Council requires either:

all residential **flatted** development (of 10 dwellings or more)
and
all non-residential and multi-residential development (over 1000 sq m of external floor space) to:

Submit details of the rainwater harvesting and/or grey water recycling systems supplying all WC flushing and other appropriate uses for that development

OR

Compliance with Essential Requirement ESD 7 (Green Roofs)

OR

A combination of both

From January 2011 when a planning application is submitted the thresholds for this essential requirement will change to all flatted residential development (1 unit and above)

and to non-residential and multi-residential development above 500 sq m of external floor space.

The DCLG study *(DCLG, July 2008)* estimates that grey water reccling or rainwater harvesting (providing 30% reuse) would cost an extra £2650 or £800 for each house or flat respectively. Because the cost for houses is relatively high they have been excluded from this essential requirement. In addition there is the option of providing a green roof (as per essential requirement EBC GI1) instead of these water-saving systems for flats or non-residential buildings.
It should be noted that the implementation of these systems will gain both Code FSH and BREEAM credits which will allow savings in other areas of the development's design or specification.

ESD 3 External Water Consumption (see p 21-23 in Appendix 1)

The Council requires all buildings in residential development of 10 dwellings or more to achieve the credit awarded for **Wat 2** in the Code for Sustainable Homes.

From January 2011, when a planning application is submitted the threshold for this essential requirement will change to all residential development (1 unit and above).

Residential:
The compliance with Wat 2 is relatively low cost. For houses this could consist of providing a water butt. For apartment blocks economies of scale make collective rain water collection relatively cheap. In cases where rain water or greywater recycling systems are to be provided the additional cost implications of supplying outside taps with water safe to use from such systems will therefore be neglible.
Non-Residential and Multi-Residential:
These are at present exempt from this requirement

ESD 4 Reducing Surface Water Runoff (see p 24-28 in Appendix 1)

The Council requires all residential development of 10 dwellings or more and
all non-residential and multi-residential development (over 1000 sq m of external floor space) to :

- show that run-off rates and annual volumes of run-off post development will be no greater than the previous conditions for the site.
- show that all roofs and hard surfaces are drained by sustainable drainage systems
- provide a drainage report for the whole site.

From January 2011 when a planning application is submitted the thresholds for this essential requirement will change to all residential development (1 unit and above) and to non-residential and multi-residential development above 500 sq m of external floor space.

All development:

All developments will need to employ systems to attenuate peak surface runoff from all new roofs and hard surfaces. As greenfield development is by its nature cheaper to develop, the extra cost of this requirement should be easier to bear for all development types. Brownfield development will find it easier to match the existing runoff rates as stated in the first part of this Essential Requirement. Brownfield development with existing soakaways or other SUDS will also reduce the costs of this Essential Requirement.

Essential Requirements for reducing water consumption and encouraging rainwater harvesting in EBC W1, above and for the establishment of green roofs in EBC GI1 (below) all contribute to the need to establish roof systems that collect or attenuate rain water as required in this Essential Requirement.

Many of the ground level systems can be relatively inexpensive and, where space permits, they can double as important open space/landscape features (e.g. swales and ponds). Many cost effective porous or permeable alternatives to tarmac for paths and car parks exist to comply with the hard surface attenuation requirement.

The Flood Risk Assessment (FRA) in the vast majority of cases (i.e. in flood risk zone 1) will simply notify the Council of the current situation and of any proposed changes to surface water drainage arrangements. In flood risk zones 2 and 3 a FRA will already be required by the Environment Agency.

It should be noted that the implementation of these systems will gain the 2 Code FSH credits which will allow savings in other areas of a residential development's design or specification.

ENERGY / CO_2

ESD 5 Passive Solar Heat Gain (see p 35-39 in Appendix 1)

The Council requires all new buildings in residential development of 10 dwellings or more and all non-residential and multi-residential development (over 1000 sq m of external floor space) to:

make full use of potential passive solar heat gain through orientation, building design and landscape design (while avoiding excessive summer heat gain and glare) within a framework of good urban design unless there are particular site or building use factors which make it unfeasible

This should be clearly demonstrated in the Design and Access Statement

From January 2011 when a planning application is submitted the thresholds for this essential requirement will change to all residential development (1 unit and above) and to non-residential and multi-residential development above 500 sq m of external floor space.

Many efficiency improvements can be made, reducing the winter heating requirement, at no or negligible extra cost by implementing good design principles.

ESD 6 Carbon Dioxide (CO_2)Reduction (Small Scale zero/low carbon technologies) (see p 47-51 in Appendix 1)

The Council requires all buildings in new residential development of 10 dwellings or more to achieve*:

- **Up to the end of 2011** at least one Code **Ene 7** credit (10% carbon dioxide emissions reductions via local low/zero carbon energy)
- from January **2012** two Code **Ene 7** credits (15% carbon dioxide emissions reductions via local low/zero carbon energy)

The Council requires all new non-residential and multi-residential development (over 1000 sqm of external floorspace) to achieve*:

- at least two BREEAM **Ene 5** credits (10% carbon dioxide emissions reductions via local low/zero carbon energy)
- from January **2012** all three BREEAM **Ene 5** credits (15% carbon dioxide emissions reductions via local low/zero carbon energy)

Fro m January 2011 when a planning application is submitted the thresholds for this essential requirement will change to all residential development (1 unit and above) and to non-residential and multi-residential development above 500 sq m of external floor space.

*For all developments where it can be proved to the satisfaction of the Council that the full percentage requirement cannot be met on site or local to the site for reasons of technical non feasibility, a contribution to the Council's 'CarbonFREE' fund may be negotiated for the shortfall based on a figure equal to the most expensive zero carbon technology (likely to be photovoltaic panels).

All development:

The cost of meeting this Essential Requirement will also help meet the energy credits needed for Essential Requirement EBC G1 above. Government grants are available for most zero or low carbon technologies. An advance to 15 % is thought appropriate as technological innovation and the establishment of a mass market is expected to reduce the cost of these technologies. Other Local Planning Authorities (LPAs) across the country have opted for a figure of 20% or higher for certain types of development. To date, at least half of LPAs in England already have or are planning similar policies to this essential requirement.

This essential requirement is based on the percentage reduction of the carbon dioxide emissions from buildings after energy efficiencies have been factored in so the greater the efficiency improvements achieved in ESD 1 (above) the smaller the absolute requirement for carbon emissions reduction in ESD 6.

Residential:
The cost will vary according to the nature of the site and the type of dwelling. Single dwellings will tend to be more expensive, although roof-mounted solar water heating is suitable in most situations and is relatively low in cost compared with, for instance PV cells.

Non-Residential and Multi-Residential:
Economies of scale will make this Essential Requirement easier to achieve than many forms of residential development.

GREEN INFRASTRUCTURE

ESD 7 Green Roofs (see p 94-100 in Appendix 1)

The Council requires either:

Green Roofs on at least 80%[1] of the area of :

all flatted residential development roofs(of 10 dwellings or more)
and
all non-residential and multi-residential development roofs (over 1000 sqm of external floorspace),

provided they are compatible with the Council's design objectives.

OR

Compliance with Essential requirement ESD 2 (Rainwater harvesting/ grey water recycling)

OR

A combination of both

From January 2011 when a planning application is submitted the thresholds for this essential requirement will change to all flatted residential development (1 unit and above) and to non-residential and multi-residential development above 500 sq m of external floor space.
1. Unless it can be shown that this requirement is constrained by light wells or essential plant

All development:

Extensive green roofs (e.g. sedum) do not need a significant amount of substrate nor major engineering improvements to the design of the roof. For these reasons they are relatively cheap (typical extra capital costs range from £40-£55 per sq m). They can also be almost maintenance free.

More intensive roofs (used by people and often with larger plants) are more expensive (An indicative cost is £140 per sq m inclusive of waterproofing and insulation) although they do have the potential for more economic value (as private or communal gardens for instance). When the whole life costs of the green roof are assessed they are often more cost effective than non-green roof options. (see study for: *Living Roofs and Walls*, Technical Report: Supporting London Plan Policy, **Mayor of London**, February 2008, section 4.5)

APPENDIX 6: VIABILITY of ESSENTIAL REQUIREMENTS

BENEFIT	CODE FSH / BREEAM credits	FINANCIAL SAVINGS
Storm water attenuation	Sur 1/Pol7	Reduced need for drainage and storm water attenuation at ground level
Rainwater harvesting	Wat 1/Wat 1 and some BREEAM Wat 5	Reduced use of metered mains water
Native planting	Eco2 & Eco 4/LE 4 & LE 5	Save need for ground level ecological planting
Thermal insulation	Ene 1/Ene 1	Reduced energy bills
Private/communal space	Hea 2	More efficient use of land/ extra facilities
Protection of roof	N/A	Double lifespan of roof

Notwithstanding all of the above, the initial capital costs can be significant which is why this essential requirement is waived if all the units within the building comply with essential requirement W1 above (rainwater harvesting/ grey water recycling).
Although green roofs provide all the same benefits for houses, including on pitched roofs, their unit cost is greater. For this reason this essential requirement only applies to flats and non-residential development which is more cost effective.

A minimum of only 80% roof coverage is required, allowing for other facilities or sky lights on the roof.

ESD 8 Trees (see p 101-103 in Appendix 1)

The Council requires in all residential developments of 10 dwellings or more

- all new streets created for residential development to provide at least **1 street tree[1] per 30 linear metres of street**
- All new off-street[2] car parks to provide at least **1 tree[1] per 6 vehicle spaces**
- All **new private back gardens** to retain existing trees or (if no existing trees to retain) receive **at least 1 newly planted tree**

and

in multi-residential and non-residential development of at least 1000 sq m of external floor space :

- All new off-street[2] car parks accessible to the public to provide at least **1 tree[1] per 6 vehicle spaces**

1 and the appropriate maintenance cost to Hampshire County Council for each tree where these are in areas adopted by the Highway Authority.
2 these include rear court parking and other surface communal car parking areas.
NB the selection, planting location and specification to be in accordance with the forthcoming Eastleigh Borough SPD: Design (expected 2009) and the HCC Manual for Streets (2008)

From January 2011 when a planning application is submitted the thresholds for this essential requirement will change to all residential development (1 unit and above) and to non-residential and multi-residential development above 500 sq m of external floor space.

All development:

- The cost of a garden tree starts at £50-£100 and increases depending on its size.
- In new streets the cost of a new vandal-proof tree (including root barriers or deflectors and construction) is typically £1200. A development of moderate density with terraces of town houses might typically have a ratio of 8-12 houses per street tree. Lower density development of semi-detached or detached houses might have 1-4 dwellings per street tree and high density schemes with apartments could have a ratio of 20-40 dwellings per street tree. Even with the worst case scenario (detached houses with large gardens) a figure of £1200 would be a very small fraction of the build cost of the house and street. In higher density schemes the relative cost of street trees would be even less significant.
- The HCC maintenance bond currently costs £400 per street tree in the adopted Highway. Trees in non-adopted car parks will also require some maintenance expenditure.
- There are financial benefits from an increase in property values in streets with generous street trees but this is difficult to quantify. One American study showed a property increase of up to 15%:

http://www.cfr.washington.edu/research.envmind/Policy/Hedonics.pdf

REFERENCES

Sweett, Cyril February 2007
A Cost Review of the Code for Sustainable Homes Report for **English Partnerships and the Housing Corporation**

DCLG, July 2008
The Cost Analysis of the Code for Sustainable Homes

DCLG July 2007
Building Regulations Energy efficiency requirements for new dwellings: A forward look at what standards may be in 2010 and 2013

DfES
Schools for the Future: Cost of BREEAM Compliance in Schools

APPENDIX 7
MODEL SUSTAINABILITY STATEMENT (RESIDENTIAL) (Illustration but not necessarily best practice)

N0.& ISSUE	PRE-APPLICATION SUSTAINABILITY CHECKLIST	
	QUESTION	**ANSWER**
ISSUE REQUIRING CODE FOR SUSTAINABLE HOMES CERTIFICATES		
ESD 1 General Sustainability	What level of the Code For Sustainable Homes will the residential; development be designed to achieve?	All dwellings will achieve Code level 3. Code level 4 will be attempted where feasible
ISSUES REQUIRING SPECIFIC CODE FOR SUSTAINABLE HOMES CREDITS		
ESD 3 External Water Consumption	How will the development's landscape area be watered?	All houses will have water butts which drain to the surface water drainage system when overflowing. The flats will have a water collection system with water stored under the green roof to irrigate the communal gardens
ESD 6 CO2 Reduction (Small Scale Zero/Low Carbon Technologies)	By what percentage will carbon emissions from buildings in this development be reduced by means of on-site zero or low carbon energy generation?	A target of 15% with a minimum of 10% for all dwelling types will be set using a range of technologies. Solar water heating panels will be used on all house roofs. A water source heat pump will be used for flats next to the lake. Connection to adjacent Biomass CHP/District Heating scheme for the remaining flats or stand alone biomass district heating scheme to be installed for flatted areas.
ISSUES REQUIRING OTHER COMPLIANCE CHECKS		
ESD 2	What % of the development's	At present, none of the flats will have either

Rainwater & Greywater *(FLATS ONLY)*	predicted water needs will be served by rainwater harvesting and/or grey water recycling?	rainwater or grey water systems (green roofs instead)
ESD 4 Surface Water Runoff	What Sustainable Drainage Systems will be employed to attenuate storm water runoff from the development's roof areas and areas of hard standing?	Green roofs for flats; Hard surfaces to drain to central lake or where levels prevent this to soakaways or ditches; all highways to oversized surface water sewers
ESD 5 Passive Solar Heat Gain	How have Developers maximised the potential for passive solar heat gain in their buildings?	The majority of living spaces to face within 30 degrees of south except where site borders railway and where flats overlook central green space to the west.
ESD 7 Green Roofs *(FLATS ONLY)*	What percentage of the development's total roof area will consist of green roofs?	All the flats to have green roofs. Probably more than 80% coverage.
ESD 8 Trees	How many trees will be provided in every 30 linear metres of new street and in all communal car parks?	At least the minimum number of trees to be provided as per requirements in *ESD 8*

ISSUES WITH NO ESSENTIAL REQUIREMENT

N0.& ISSUE	**PRE-APPLICATION SUSTAINABILITY CHECKLIST**	
	QUESTION	**ANSWER**
2.1 Water Consumption	What measures will be taken to maximise water efficiency in buildings?	At least the minimum measures required under Code level 3 will be implemented. All efficient appliances and fittings.
3.1 Natural Daylight	How have Developers maximised the potential for natural daylight in their buildings?	The Code credits in this area will be sought for all dwelling types where possible.
3.3 CO2 Reduction (Improved Energy Efficiency)	What percentage improvement on the maximum carbon emissions allowable under Building Regulations is proposed for the new buildings in this development?	At least the minimum measures required under Code level 3 will be implemented through high insulation and air tightness levels
3.4 CO2 Exterior Lighting	Q.EBC E4a: What measures are proposed to minimise the carbon emissions from external space and security lighting and which Code credits is the development designed to achieve? Q. EBC E4b: How will the development minimise light pollution from external lights?	The Code credits in this area will be sought for all dwelling types where possible. External lights which minimise light pollution will be selected powered by solar pv cells where possible
3.6 Zero Carbon Residential Developments	What percentage of buildings in this development will be designed to emit net zero carbon emissions annually?	None at this stage although one experimental house may be considered.
3.7 Natural Ventilation	How will buildings be ventilated?	All openable windows. Flats dual aspect allowing through ventilation
3.8 Drying	What facilities for non-mechanical clothes drying will residents have?	Drying lines for all private gardens. Bathroom lines over baths in flats

APPENDIX 7: Model Sustainability Statement (Residential)

4.1 Construction Waste	What measures will be taken to minimise construction waste?	SWMP will be required. Code Was 2 credit will be sought.
4.2 Construction Materials	How many Code or BREEAM Materials credits will the development aim to achieve?	The development will attempt to achieve the majority of the (14) available Code materials credits. All timber to be from certified sustainable sources.
4.3 Waste Recycling	What measures will be taken to best facilitate waste recycling from the finished development?	This has not been decided. Will consult with Council waste and recycling officers.
4.4 Composting	What provision is being made to encourage composting in the residential development?	As per 4.3.
5.1 Green Infrastructure	What elements of green infrastructure are proposed with the development and how will they be managed?	New central green space with lake proposed. Part of green area planted with some fruit and nut trees as informal communal food sources The site will link to adjacent established park
6.1 Biodiversity	How many Code FSH or BREEAM Ecology credits is the development designed to achieve for each building type?	The maximum possible credits will be attempted. Advice from Council's Biodiversity Officer will be sought for planting native species that are also resilient to inevitable climate change.
6.2 Noise	What measures is the developer proposing to quantify and, where necessary mitigate, the noise impact on the development's occupants?	At least building regulations standards
6.3 Private Space	What provision for private or shared space will be made for the development?	All houses to have private rear gardens. All flats to have generous balconies. Ground floor flats to have private gardens. Some flats to have communal gardens. Potential for a communal garden on roof of one block of flats will be investigated
6.4 Lifetime Homes	Is the residential development being designed to comply with all of the Lifetime Homes standards?	All social housing to be lifetime homes compliant.
6.5 Pollution	What measures will be taken to minimise the pollution impacts of road pollution on the development (if in an air quality management area) and of nitrogen oxides and materials with high Global Warming Potential on the wider environment?	If Code credits can be achieved here they will be. No living rooms facing busy road on edge of site.
7.1 Construction Site Impacts	What measures will be taken to minimise the site impacts during construction?	The Code credit Man 3 will be pursued for most if not all dwelling types
7.2 Building User Guides	What provision will be made for building or home user guides?	All dwellings to receive building user guides as per Code credit Man 1
7.3 Considerate Constructors Scheme	What level of certification for the Considerate Constructors Scheme (or equivalent) is the development aiming to achieve?	The available Code man 2 credit will be sought for the whole site.
8.1 Major Developments	What further sustainable measures are being proposed if the development is above 500	Not applicable.

	dwellings in size?	

APPENDIX 8: MODEL PLANNING CONDITION

Pre-commencement

1. Prior to the commencement of the development hereby approved (or in accordance with a timetable to be agreed in writing with the Local Planning Authority), a Code for Sustainable Homes/BREEAM interim stage certificate and report highlighting how all of the essential requirements of the Eastleigh Borough Council adopted Supplementary Planning Document 'Environmentally Sustainable Development' are to be met shall be submitted to and approved in writing by the Local Planning Authority.
   Reason: To ensure the development meets the requirements of the adopted Supplementary Planning Document 'Environmentally Sustainable Development'.

Post Construction

2. Prior to the occupation of buildings within the development hereby approved, a Code for Sustainable Home/BREEAM final stage certificate and report highlighting how all of the essential requirements of the Eastleigh Borough Council adopted Supplementary Planning Document 'Environmentally Sustainable Development' have been met shall be submitted to and approved in writing by the Local Planning Authority.
   Reason: To ensure the development meets the requirements of the adopted Supplementary Planning Document 'Environmentally Sustainable Development'.

Supplementary Planning Document

Environmentally Sustainable Development

Adoption Statement
March 25, 2009

On March 5 2009 Eastleigh Borough Council adopted a Supplementary Planning Document entitled **Environmentally Sustainable Development**.

Any person with sufficient interest in the decision to adopt this SPD may apply to the High Court for permission to apply for judicial review of the decision. Any such application must be made promptly and in any event not later than 3 months after the date on which the SPD was adopted.

EASTLEIGH BOROUGH COUNCIL

Environmentally Sustainable Development SPD (adopted March 5 2009)

WRITTEN CONSULTATION RESPONSES

SEERA (Greg Pitt)

COMMENT	CHANGE TO DOCUMENT	REASONS
Need to justify with local evidence higher standards than national (as per revised SE Plan) for major devs.	Yes	Agreed. More local evidence provided in Appendix 3
Too long. Make more references to nationally available guidance	Yes	Main document separated from guidance (now in Appendix 1) making it much shorter and user-friendly
Suggested revising structure: Sustainable dev issues and evidence Policy context in 1 section Requirements, delivery mechanisms and good practice	Yes	Some of these suggestions used
S 4.3 Put 10% renewables and zero carbon sections together	No	Two different objectives. Zero carbon is not mandatory while 10% CO2 reduction through low/zero carbon energy is.
SEERA agree low/zero C energy should be on site.	No	Agreed.

Quayside Architects (Neil Holmes)

COMMENT	CHANGE TO DOCUMENT	REASONS
Too long and 'unnecessary'	Yes and no	Structure changed so working part shorter but disagree unnecessary
The small no of new dwellings in the borough each year make the requirements for them to be more sustainable too insignificant in national and global terms to merit this initiative.	No	The principle of making new development more sustainable is agreed by nearly all sectors of this debate. Greater sustainable performance in other areas (existing buildings, transport etc) are also necessary but we should not be allowing new development that will need to be expensively retrofitted to meet high sustainable standards in the near future.
No justification to go beyond building	No	Building regulations are a

regulations and planning authorities do not have the expertise		*minimum* standard only. We are building up our expertise in this area. The SPD is designed to reduce the burden on DC.
Unnecessary to require a minimum standard before consent. Unnecessary burden and will hamper design.	No	Consent is granted but subject to the condition that the development accords with the SPD
BRE quasi commercial. Requirement for minimum Code/BREEAM standard unreasonable.	No	BRE status as agents for government-owned Code for Sustainable Homes and as owners of BREEAM is appropriate. National standards being adopted by many other local authorities.
Need for developers to employ an assessor unreasonable burden	Yes and no	Change threshold for first 2 years of 10 dwellings or more and for 1000 sq m of non-residential floor space makes assessment cost relatively low. This will be reviewed in 2 years time.
Code itself disliked. Lifetime Homes concept flawed.	No	Code is imperfect but is a very useful tool. Gov. likely to make Lifetime Homes compulsory for all homes within a few years anyway. (already for all social housing)
Most efficient use of land will conflict with maximising passive solar gain. SuDS conflicts with best use of land.	Yes	Wording in essential requirement modified to reflect these qualifications
Green roof % unreasonable burden.	Yes	Green roofs only to apply to flats and non-residential buildings and may be waived if grey water or rainwater systems used to supply WCs or other appropriate uses.
Council's Carbon tax additional unwarranted tax on development.	No	This is only employed as a substitute for on site/local green energy if it can be proved this is technically unfeasible in full
Applying the document to single dwellings unreasonable restriction on land owners.	Yes	Threshold of 10 or more dwellings at least for first 2 years.
Southern Water (David Sims)		
COMMENT	**CHANGE TO DOCUMENT**	**REASONS**
Southern Water supports the use of	No	Agreed

the Code for Sustainable Homes for residential proposals and the BREEAM assessment for non residential proposals.		
Southern Water supports the council's requirement for development to achieve specific standards, as detailed in requirement W1, provided it can be enforced through development control.	No	Agreed
Efficient use of water is important at a time when the demand for water is rising both as a result of population growth and increased per capita consumption. Southern Water promotes efficient use of water as part of a twin-track approach of managing demand for water as well as providing additional resources. This strategy has been developed in collaboration with the Environment Agency and helps to minimise the volume of water abstracted from the environment.	No	Agreed
SW supports requirement W4 which will ensure that run-off rates and annual volumes of run-off post development will be no greater than the previous conditions for the site.	No	Agreed (Now essential requirement ESD 4)
Test Valley BC (Karen Eastley)		
COMMENT	**CHANGE TO DOCUMENT**	**REASONS**
The Council supports the aim of the document to improve the environmental sustainability of development within Eastleigh Borough Council and the application of BREEAM and Code for Sustainable Homes standards as discussed as part of PUSH. The Test Valley Core Strategy Pre-Submission (Draft) includes a policy requiring the same standards as included in Essential Requirement G1.	No	Agreed
The document provides a wealth of information on a number of issues and the summary of essential requirements towards the beginning of the document is considered to be useful.	No	Agreed
Similarly the compliance check details and case studies are deemed to be beneficial, especially if examples can be provided from the locality.	No	Agreed
The appropriateness and enforceability of some of the general requirements is queried, for example in relation to GI3 on trees – a more	Yes	This essential requirement has been modified and is now less prescriptive. (Now ESD

flexible approach may be required when taking account of other material considerations.		8)
The discussion of the viability of the essential requirements is also deemed to be beneficial.	No	Agreed
Terence O'Rourke on behalf of the **North Hedge End Developer Consortium** (Jacqueline Mulliner)		
COMMENT	**CHANGE TO DOCUMENT**	**REASONS**
concerned that many of the requirements of the draft SPD are unworkable, will render important development schemes unviable, and therefore undermine the deliverability of the RSS and Core Strategy.	Yes and No	The SPD requirements are workable. Only 8 of the original 17 essential requirements remain in the final draft
Our client considers that the document needs substantial revision and re-consultation.	Yes and No	Significant revisons have been made but re-consultation not necessary
Given the scale of the SDA our clients would welcome an opportunity to discuss these matters further with you.	N/A	Not related to document as such
In principle, the SPD goes well beyond the Government's sustainability requirements	No	The Government accepts that development can be more sustainable than building regulations which are the absolute minimum
Eastleigh Borough Council has provided no evidence to demonstrate that a more onerous approach is necessary to meeting the sustainability objectives of the RSS/Core Strategy; acceptable (particularly in terms of viability), or appropriate to the Borough in terms of natural resources and design. It is unjustified and inappropriate for the SPD to introduce more onerous requirements without a robust evidence base.	Yes	Much more local evidence included in Appendix 3
Furthermore, Policy CC4 requires such a departure to be demonstrated through a DPD not an SPD.	No	This is considered to be a wrong interpretation of the regulations. SPD is the right vehicle for this practical interpretation of policy
Unflexible as sometimes targets impossible.	No	None of the targets are impossible.
The SPD should provide clear guidance regarding the role of suitable planning conditions and/or planning obligations.	Yes and No	Model planning conditions now included in Appendix 8. Planning obligations issue seen as not appropriate to this document.
The relationship of the draft SPD, and the associated draft	No	EIA is not in any way connected with this SPD.

sustainability appraisal, to the mandatory requirements of environmental impact assessment (for qualifying applications) needs clarification.		Separate issue.
The SPD fails to clarify how measures identified will be enforced.	No	Compliance checks are spelled out in the main document
Throughout Chapter 3 'Essential Requirements', the SPD seeks to apply a number of targets 'at the time detailed planning permission is granted'. However, the application of targets is an important consideration in any viability appraisal. Consequently it is important that these do not change significantly during the course of determination. Reference to submission of the application would be more appropriate and reference to outline applications needs to be carefully considered.	Yes	The key date now is the submission of the planning application.
The council's requirements in respect of issues such as tree provision (EBC GI3 Trees) are particularly onerous. Factors like providing trees on land outside the site boundary and external to the applicant's ownership could ransom a development. This approach is unacceptable. Equally, trees dying and trees being removed by subsequent residents cannot be accounted for in enforcing the SPD requirements.	Yes	This essential requirement has been modified and is now less prescriptive. (Now ESD 8). Trees dying in new streets, gardens or car parks would need to be replaced as part of any establishment maintenance period in the normal way.
Hampshire County Council Andrew Herring, Spatial Strategy		
COMMENT	**CHANGE TO DOCUMENT**	**REASONS**
The Sustainable Development SPD Guidance 2008 referred to throughout the document is draft guidance and has yet to be agreed by the Partnership for Urban South Hampshire (PUSH). As this is ongoing work it would be premature to rely on this guidance as a key source. The County Council therefore reserves its position until such time as the document is formally agreed by PUSH. However, Eastleigh Borough Council may wish to consider the following comments :	No	PUSH document will provided some more detailed guidance. We are authoring the PUSH document here at EBC therefore we have every confidence that it will be relevant.
Too long?	Yes	Structure changed so working part shorter
The draft SPD should be clearer on	Yes	No distinction as the key

the different information requirements between Full and Outline planning applications.		trigger is the submission of a planning application (outline or full)
It would also be useful to include a section on Transport and Access. This could be placed under Section 4 "Sustainable Development".	No	Not within the scope of this document and will be addressed in the forthcoming LDF
(details of what might be included followed)		
Essential Requirement EBC W2 - Water Recycling The greywater recycling diagram on page 31 suggests that greywater can be used within the home. However, in the County Council's experience, where greywater is stored for any length of time within the home, it begins to smell. Therefore, one of the best uses for greywater is for garden irrigation. In blocks of flats there is a general antagonism to the use of greywater and the public is sometimes unhappy with the thought that their toilet is being flushed by someone else's bathwater. This view is difficult to justify in a rational way, nevertheless it does exist, and shouldn't be dismissed lightly.	Yes	Grey water is now one of three options (with rain water and green roofs) and only applies to flats and non-residential buildings. The smell/public health issue can be addressed with appropriate design and management safeguards.
Essential Requirement EBC G11 - Green Infrastructure This policy requires applicants to provide information in the form of drawings plans and written descriptions on the extent of the Green Infrastructure to be provided. This is to form part of the Design and Access Statement and should include the location, extent and description of the green infrastructure to be provided on site and offsite as well as details of future management arrangements.	Yes	No longer considered necessary as an essential requirement.
Planning Policies usually require development proposals to achieve specific targets or standards, failure to do so can result in a refusal of planning permission. EBC G11 is not specific and merely advises on the type of information that applicants should provide in their accompanying documentation - as such it should not be a policy in its own right but is best included in some form of advice to applicants. There appears to be an overlap between the Green Infrastructure requirements in the draft SPD and the Open Space requirements which are referred to in Appendix 1 (p.155). It might be helpful if these were incorporated into one section of the document for	Yes	No longer considered necessary as an essential requirement.

the ease and convenience of applicants.		
Essential Requirement EBC G12 - Green Roofs All policies need to be practical and achievable. While the desire to encourage green roofs is laudable, the expectation that volume house builders will be prepared to provide such a large percentage within their developments, or that the general public will want to buy them, may be open to question. The Draft SPD offers some examples of green roofs but it would be pre-emptive to think that these offer a practical way forward at the scale suggested in this policy. The cost and maintenance implications for standard residential dwellings are unknown – certainly consultations should be undertaken with the house building industry before such a policy is introduced. This prescriptive policy should therefore be deleted, although this would not preclude green roofs being encouraged within the general text.	Yes	Green roofs only to apply to flats and non-residential buildings and may be waived if grey water or rainwater systems used to supply WCs or other appropriate uses. Where green roofs apply minimum 80% cover unless essential plant or light wells make this impractical.
Persimmon Homes (South Coast) Ltd (essentially the same letter as North Hedge End Developer Consortium above)		
Bryan Jezeph Consultancy Ltd		
COMMENT	**CHANGE TO DOCUMENT**	**REASONS**
EBC G1 It is unrealistic to expect an evaluation against the 'code' at this stage. It is entirely wasteful to do so, if the purpose of the application is to establish whether development is or is not acceptable.	No	Conditions at outline or full application stage reasonable as design information is or will become available before the development is built.
The requirement to provide this data adds another (significant) cost and obstacle to achieving development	Yes	Thresholds increased to 10 dwellings/ 1000 sq m so relatively low cost.
EBC W1 For speculative development, it is impractical to know at the outline stage what fittings/appliances may be designed in or out of the final buildings.	No	At the earliest application stage the requirement is for an estimate of how a certain level of sustainable achievement (certificate) can be reached. Not necessarily all the details needed but intentions will suffice
Planning Implications – Page 28 This ignores the potential land use and design implications of requiring storage tanks and rainwater harvesting, which may collectively need substantial land to accommodate, and subsequently	No	This is unlikely to have significant planning implications in most cases.

require (vehicular) access for maintenance.		
EBC W2 Planning Applications - P.33 This ignores the potential difficulties of the siting tanks, especially in higher density developments where gardens may subsequently be land locked, potentially preventing future maintenance. Will the Council accept storage tanks in publicly 'adopted' areas?	No	Not clear what the problem is here.
EBC W4 This is impractical to achieve at outline planning stage where no details of sizes of buildings, siting etc are included. It is unreasonable to require this level of information (in detail) at outline stage.	No	All details don't need to be provided at outline stage. Details supplied before building commences or otherwise agreed.
EBC E1 EBC E2 The draft SPD indicates that there are no Planning Implications, which is surprising as this standard is affected by both orientation and the layout of individual buildings, and by the separation between buildings. These factors must impact on how sites are laid out.	No	Passive Solar Design just one factor in assessment of proposals
EBC E3 Most of the energy efficiency measures on p.58 are unknown until the details of design are considered. It is therefore impracticable to achieve these at outline stage, eg to consider heat sources, insulation, appliances and lighting prior to designing the layout and design of buildings.	No	Not all details need at this stage, an estimate only. Full details needed before building commencement or otherwise agreed.
EBC E5 It is impracticable to incorporate this level of detail at the outline stage. The requirement for developers to pay into a carbon fund is one sided and does not indicate what the Council will do in return, or the timescales for this. The Council should produce a rolling 5 year plan of projects to be funded, and then be able to indicate (annually) when moneys received will be committed to new infrastructure or carbon reducing projects. There should also be information about when larger projects such as district heating schemes will be operational, so that	No	In most cases this will not apply as usually quite feasible to provide 10% CO2 reduction via onsite or local low/zero carbon energy. When it does apply EBC 'Carbon Free' fund will be reasonable and well targeted at e.g. insulating existing properties.

developers contributing can pre-plan when they can 'tap in' to these resources.		
(page 71) When evaluating 'zero carbon', account should be taken of the carbon cost of commissioning and decommissioning some systems. eg the energy used in concrete production, or in photovoltaic production, or in different forms of insulation. Some materials may help to save energy, but never 'pay back' the energy used in their production.	No	This is largely an urban myth as exposed by a parliamentary report on the whole life costs of such technologies.
EBC MW1 Supported	N/A	This essential requirement has now been omitted.
MW3 Effective recycling depends in part on the range of materials that will be collected by the Local Authority. The Council should commit itself to providing and retaining a (weekly) collection service for paper, card, glass, all food cans, all plastics, green garden waste, and any other products that can reasonably be recycled.	N/A	This essential requirement has now been omitted.
EBC GI 1 It is common practice for developers to contribute to open space off site and this is generally encouraged. However, many Councils are unable to say 'where' money will be spent at the time of receiving such contributions. Consequently, the requirement to specify these details in a design and access Statement is unrealistic; unless the Council first commits itself to which public space improvements/new provision will be funded and carried out in any particular year.	Yes	This essential requirement has now been omitted as unnecessary
EBC GI 2 Further consideration should be given to the thresholds and percentages. The possibility of a scheme for 10 dwellings providing one dwelling with a green roof is unlikely to be acceptable in design and maintenance terms. Equally, designing dwellings with 10% of their roof 'green' is unlikely to be effective. Such requirements may be especially onerous on affordable housing schemes. Will RSL's accept	Yes	Green roofs now an option (together with rain/grey water systems) and does not apply to houses.

maintenance of such buildings?		
EBC G1 3 It is unlikely to be impracticable to provide street trees in many locations, for the reasons set out in the Planning Implications. I also question whether this is a reasonable requirement as the motive would appear to be to improve streets in the vicinity of new development, rather than to undertake works directly related to the development itself. Such planting could not, in my view, reasonably be conditioned for this reason. If this is to be regarded as Planning Gain, then there needs to be a suitable evaluation as to why such improvements are justified for each development. A blanket requirement as proposed is, I suggest, not supported by government advice. The requirement based on street frontages may be disproportionate to the amount of development, where many backland (PDL) schemes may have a very small frontage, whereas a single 'corner plot' may have a very large frontage.	Yes	This requirement has been modified to make it less prescriptive and onerous (now ESD 8)
Where street trees are provided, at such a high price to the development, will the highway authority then undertake that all Statutory Undertakers will make protection of trees a priority, so that trees planted at great cost will not be ripped up? It is common to see service trenches brush against street trees.	No	Fair point but beyond scope of this document. If trees in highway they will be maintained by HCC anyway.
Implementation Pages -141/142 -It is unclear at what stage 'stage two' operates but if this is still at outline stage, then the additional cost of £1700 for an assessment (P.167) adds substantially to a typical planning fee of just £335, just to see if the principle of development is acceptable. The SPD appears to discriminate by removing this requirement from smaller non residential development, (on grounds of cost – Appendix 4, page.167) but continues to target developers of small residential plots. As it is intended to require compliance by conditions, (at detailed stage) it appears irrational to require a full	Yes	This section significantly revised.

assessment at outline stage.		
Given that many developers approach council officers for advice prior to submitting the application, will the Council now offer pre-application advice on how to comply with the code as part of its own service, or simply point elsewhere ?	N/A	Some advice will be given but this is also partly the role of the guidance part of the document.
Generally There is concern that achieving 'The Code' requirements can only be achieved by appointing a licensed assessor, which may be costly at outline stage, where only the principle of development is at issue, unhelpful where there is minimal information available, and undermines the principle of applying for outline planning permission, simply to see if the principle of a land use is acceptable. Consequently, the checklists in Appendices 2 and 3 are impractical for most 'smaller' outline schemes. The additional costs of providing these assessments may discourage some potential developers/landowners from putting land forward for development, thereby reducing the supply of 'brownfield' sites and leading to more 'greenfield' (less sustainable) development.	No	Assessment (and certificate) not needed until just before commencement even if this is years after submission of outline planning application. Checklists are non-binding and require developer to start thinking about how the development can address these issues at earliest stage.
Various parts of the SPD refer to the additional costs of compliance with the code and Breeam being offset by the potential future (energy) savings to residents. This may be true, but the additional construction costs, and consequent sale costs may also prevent people from buying who do not have the extra moneys at the outset. It will push up the costs of all new housing, which is especially difficult in a 'credit crunch' and a recession.	Yes	Extra costs will have to be absorbed by land owners/developers and purchasers but there will be a premium on much more cost efficient buildings. Thresholds increased to help the smallest developments. For larger developments the unit cost will be smaller. All development will need to respond to tighter building regulations in future years anyway (2016 zero carbon homes mandatory).
Hedge End Town Council		
COMMENT	**CHANGE TO DOCUMENT**	**REASONS**
During the Committees' meeting of 22nd October members determined the following recommendation: *That they support the recommendations of Eastleigh Borough Council. Proposed The*	No	Agreed

Chairman, seconded Cllr. Keith Day and motion carried		
Barratt Homes (Steve Wilks)		
COMMENT	**CHANGE TO DOCUMENT**	**REASONS**
Concerned that requirements for both grey-water recycling and green roofs an unacceptable financial burden	Yes	Requirement has now been modified to one of three options (green roofs/ rainwater harvesting/grey water systems) and does not apply to houses.
Concern expressed that insistence on layouts maximising passive solar gain too prescriptive.	Yes	Essential requirement (now ESD 5) makes the original intention clearer that passive solar gain should be fully considered within the context of all other design constraints. The current problem is that very often developments make no effort to consider and exploit the free winter heat energy of passive solar gain.
Concern about requirement for 1 street tree per 7 linear metres	Yes	This has been changed in new streets to at least 1 tree every 30 linear metres
Concern about raised requirements for the larger (500 plus homes) developments	Yes	This essential requirement has been omitted
Higher standards not justified as new homes not a significant proportion of total housing stock	No	The principle of making new development more sustainable is agreed by nearly all sectors of this debate. Greater sustainable performance in other areas (existing buildings, transport etc) are also necessary but we should not be allowing new development that will need to be expensively retrofitted to meet high sustainable standards in the near future.
This approach attempts to cover up for DC lack of knowledge with tick sheets	No	Although it is agreed that we all need to raise our levels of expertise in this area it is not necessary or desirable for DC officers to become environmental building experts. The SPD is designed to place the largest burden of

		assessment on the trained independent assessors.
Will place large financial burden on developers affecting their ability to deliver housing numbers	Yes	Essential requirements have been reduced from 17 to 8 and thresholds have been raised for when the SPD applies. Only one out of the three options green roofs/ rainwater /grey water recycling now required and houses exempt. Code Level 3 for housing is not considered an uncommercial requirement (already mandatory for all social housing). Government research shows this adds typically from 4% to 8% to the construction cost. Many other local authorities are imposing similar requirements.