

WYCA SuDS Guidance



Introduction

As part of the government's continuing commitment to protect people and property from flood risk, the Department for Communities and Local Government and the Department for Environment, Food and Rural Affairs recently published a proposal to strengthening existing planning policy to secure sustainable drainage systems.

To this effect, they expect local planning policies and decisions on planning applications relating to major development; 10 dwellings or more, or equivalent non-residential or mixed development as set out in Article 2(1) of the Town and Country Planning (Development Management Procedure (England) Order 2010) - to ensure that sustainable drainage systems for the management of run-off are put in place, unless demonstrated to be inappropriate.

Under these arrangements, in considering planning applications, local planning authorities should consult the relevant lead local flood authority on the management of surface water; satisfy themselves that the proposed minimum standards of operation are appropriate and ensure through the use of planning conditions or planning obligations that there are clear arrangements in place for ongoing maintenance over the lifetime of the development. The sustainable drainage system should be designed to ensure that the maintenance and operation requirements are economically proportionate.

To protect the public whilst avoiding excessive burdens on business, this policy will apply to all developments of 10 homes or more and to major commercial development. The government will keep this under review, and consider the need to make adjustments where necessary. However, the current requirement in national policy that all new developments should give priority to the use of sustainable drainage systems will continue to apply.

The purpose of this document is to provide developers with a brief introduction to sustainable drainage systems and techniques, and to provide guidance on the information that should be included with a planning application in order to promote the use of sustainable drainage systems in new developments.

The vision of the West Yorkshire Combined Authority (WYCA) Flood Risk Partnership

The Flood and Water Management Act 2010 states that "Sustainable drainage means managing rainwater (including snow and other precipitation) with the aim of (a) reducing damage from flooding, (b) improving water quality, (c) protecting and improving the environment, (d) protecting health and safety, and (e) ensuring the stability and durability of drainage systems".

The vision for the West Yorkshire Combined Authority is to develop **Flood Risk and Sustainable Drainage Guidance** to deliver the aspirations of partner organisations to:

- Promote delivery of **high performance sustainable drainage proposals that remain effective for the lifetime of the development**, with such proposals considered from the outset by developers, consultees and approval bodies
- **Encourage sustainable development** that is commensurate with the existing level of risk and that will be resilient to the predicted impacts of climate change
- **Encourage the use of sustainable techniques** that have a benefit to the environment, including improvement to amenity and biodiversity, and the quality of runoff entering the drainage network and watercourses
- Ensure that the **current and future level of flood risk is not increased**, and, where possible is decreased, to people, property and infrastructure through the implementation of the new development
- Support an **efficient and effective planning application process** that enables developers to demonstrate that their proposals comply with flood risk policy, guidance and standards

The above will be tested by Lead Local Flood Authorities through the Statutory Consultee role that they will fulfil after 15th April 2015. The developer will still need to consult with the Environment Agency, Yorkshire Water Services Ltd and other risk management authorities as per the development control processes set

Sustainable Drainage Systems

Surface water drainage systems developed to maintain a sustainable development are collectively known as sustainable drainage systems, often abbreviated to SuDs, SuDS or SUDS. These systems replicate as closely as possible the existing, natural drainage situation. They are designed both to reduce the environmental risks resulting from urban runoff and to contribute wherever possible to environmental enhancement.

SuDS objectives can be shown as a three-way concept (See figure 1) where the ideal solution minimises the impacts from the development on the quantity and quality of the runoff, and maximises amenity and biodiversity opportunities.

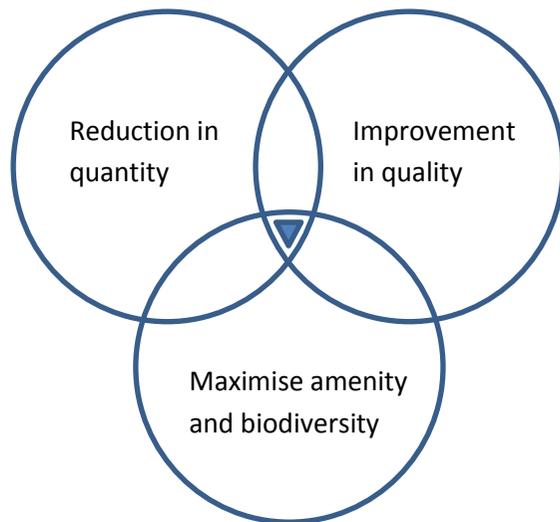


Figure 1 Sustainable drainage objectives (CIRIA C697)

More information can be found in the CIRIA SuDS Manual (C697) and the other references listed at the end of this document.

The SuDS Management Train

In order to mimic the natural situation of the site as successfully as possible, a “management train” is adopted. It uses a series of drainage techniques to reduce pollution, flow rates and volumes. The hierarchy of techniques within this management train should be considered as follows:

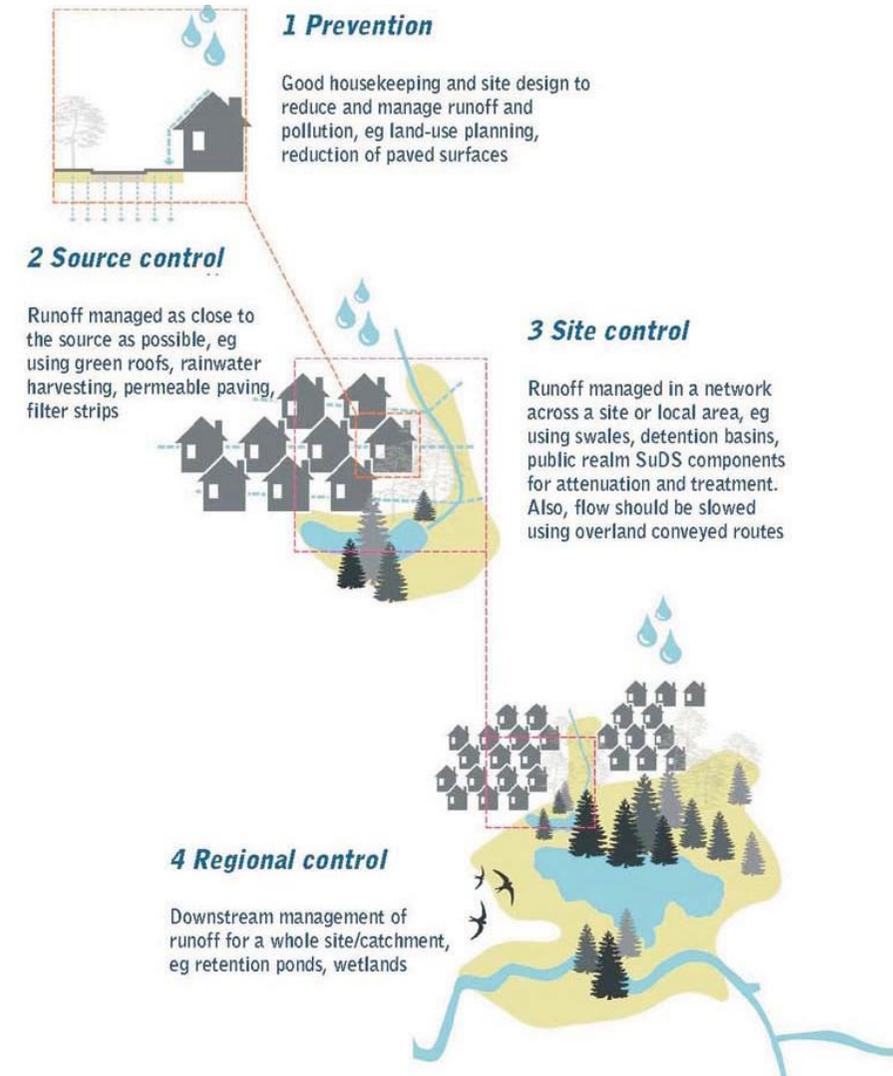


Figure 2 SuDS Management Train (CIRIA 2010)

Expected Levels of Treatment

In terms of water quality improvement, the number of techniques required in a SuDS management train is proportional to the level of risk to the environment of pollution reaching a receiving water body. Where there is less risk, fewer levels of treatment are required.

The level of environmental risk depends on the potential amount of pollution that could be conveyed by the surface water runoff and the sensitivity of the receiving waters. In most circumstances the number of techniques required in a management train would be as follows:

Risk	Levels of treatment	Typical locations
Low	1	Small residential developments
Medium	2	Most new residential and small retail developments
High	3	Major retail and industrial developments; Motorways and major roads

Table 1 Levels of treatment

For particularly sensitive receiving waters, greater numbers of techniques could be required to provide the desired level of protection.

Surface Water Disposal Hierarchy

Part H of the Building Regulations requires the selection of receptor for the disposal of surface water drainage from a development site to be in accordance with the following hierarchy:

- 1) Disposal to ground via infiltration, and where this is not practicable,
- 2) Disposal to a watercourse, and where this is not practicable,
- 3) Disposal to a surface water sewer or highway drain, and where this is not practicable,
- 4) Disposal to a combined sewer.

SuDS Techniques

Source Control

SuDS Technique	Description and Key Design Points	CIRIA SuDS Manual Reference (For details and design guidance)
<p data-bbox="280 387 427 416">Green Roofs</p> 	<p data-bbox="640 467 1585 603">Green roofs comprise a multi-layered system that covers the roof of a building or podium structure with vegetation cover/landscaping/permeable car parking, over a drainage layer. They are designed to intercept and retain precipitation, reducing the volume of runoff and attenuating peak flows.</p>	<p data-bbox="1798 520 1939 549">Chapter 6.4</p>
<p data-bbox="293 743 414 772">Soakaway</p> 	<p data-bbox="640 850 1581 954">Square or circular excavations, filled with aggregate or lined with brickwork, or pre-cast storage structures surrounded by granular backfill, designed to store runoff until it infiltrates into the surrounding soil.</p>	<p data-bbox="1798 887 1939 916">Chapter 6.5</p>
<p data-bbox="286 1123 421 1152">Filter Strips</p> 	<p data-bbox="640 1217 1563 1353">Filter strips are vegetated strips of land designed to accept runoff as overland sheet flow from upstream development, provide a degree of filtration and retention by the vegetation and soil, and convey excess runoff onwards to more suitable storage/infiltration techniques</p>	<p data-bbox="1809 1270 1928 1299">Chapter 8</p>

Water Butts / Rainwater Harvesting



Rainwater harvesting is the process of collecting and using rainwater that would otherwise have gone into the drainage system or been lost through evaporation.

Chapter 6.6 & 6.7

Permeable Paving



Permeable or pervious pavements provide a pavement suitable for pedestrian and/or vehicular traffic, while allowing rainwater to infiltrate through the surface and into the underlying layers. The water is temporarily stored before infiltration to the ground, reuse, or discharge to a watercourse or other drainage system.

Chapter 12

Site Control

SuDS Technique	Description and Key Design Points	CIRIA SuDS Manual Reference (For details and design guidance)
<p data-bbox="309 300 394 327">Swales</p> 	<p data-bbox="636 376 1543 547">Swales are linear vegetated drainage features in which surface water can be stored or conveyed. They can be designed to allow infiltration, where appropriate. They should promote low flow velocities to allow much of the suspended particulate load in the stormwater runoff to settle out, providing effective pollutant removal.</p>	<p data-bbox="1800 448 1935 475">Chapter 10</p>
<p data-bbox="248 687 454 715">Detention Basins</p> 	<p data-bbox="636 788 1538 922">Detention basins are surface storage basins or facilities that provide flow control through attenuation of stormwater runoff. They also facilitate some settling of particulate pollutants. Detention basins are normally dry and in certain situations the land may also function as a recreational facility.</p>	<p data-bbox="1800 841 1935 868">Chapter 16</p>
<p data-bbox="248 1086 454 1114">Infiltration Basins</p> 	<p data-bbox="636 1233 1512 1294">Infiltration basins are vegetated depressions designed to store runoff and infiltrate it gradually into the ground.</p>	<p data-bbox="1800 1249 1935 1276">Chapter 15</p>

Regional Control

SuDS Technique	Description and Key Design Points	CIRIA SuDS Manual Reference (For details and design guidance)
<p data-bbox="250 300 452 331">Retention ponds</p> 	<p data-bbox="636 450 1559 549">Ponds can provide both stormwater attenuation and treatment. They are designed to support emergent and submerged aquatic vegetation along their shoreline. Runoff from each rain event is detained and treated in the pool.</p>	<p data-bbox="1800 485 1935 517">Chapter 17</p>
<p data-bbox="295 756 407 788">Wetlands</p> 	<p data-bbox="636 868 1581 1043">Wetlands provide both stormwater attenuation and treatment. They comprise shallow ponds and marshy areas, covered almost entirely in aquatic vegetation. Wetlands detain flows for an extended period to allow sediments to settle, and to remove contaminants by facilitating adhesion to vegetation and aerobic decomposition. They also provide significant ecological benefits.</p>	<p data-bbox="1800 938 1935 970">Chapter 18</p>

Photographs – www.susdrain.org

Information requirements for your application

Whilst there are several types of planning applications, the three main categories are discussed below.

Pre planning application

Pre planning applications are submitted very early in the design process, and are to seek information with regard to local requirements. Early consultation with the lead local flood authority is an important step towards achieving a sustainable design that is appropriate for the development.

Outline Planning application

Outline planning applications seek to establish whether a development is acceptable in terms of scale and nature of development. Fewer details are required for the submission however once outline permission has been granted, you will need approval of the details (reserved matters or conditions) before work on site can start.

Full planning application/ Reserved matters

Full planning is a detailed submission of all information required for a development to be accepted.

Reserved matters is submitted within 3 years following a previous outline planning application and includes all the information that was excluded previously.

If you are in any doubt of which planning application is required, you should contact your Local Planning Authority in the first instance.

Planning Matrix

Key questions:

- Have you assessed what SuDS will be included?
- Have you allowed space for green SuDS?
- Have you considered how the drainage system will be maintained?

Pre-planning application

Statutory consultee information requirements		Information to be provided by developers for pre-planning application (Requirements draw on readily available information)
Site location and LLFA(s) involved	Site location	Plan or description
	Grid reference and post code	For centre of site
	LLFA(s) involved	Identified through initial discussions with planning officers
Existing Site Characteristics	How the site currently drains	Marked up topographical survey plan showing existing impermeable areas and existing drainage infrastructure
	Location of nearest watercourse (open and culverted)	OS map or similar/contact LLFA to check drainage register
	Location of nearest public sewer (surface water and/or combined)	Water authority asset records
	Location of nearest highway drain	Contact LLFA to check drainage register
	Sources of flood risk already present on the site	Risk of flooding on site obtained from the EA's flood risk maps and LLFA's historical records
	Sources of flood risk already present near the site	Risk of flooding near the site obtained from the EA's flood risk maps and LLFA's historical records
	Existing topography	Topographical survey plan of existing site
	Underlying geology and infiltration rate	Description of underlying geology from Soils map.
	Groundwater level and aquifer protection	Information from British Geological Survey maps and Environment Agency Groundwater Source Protection Zone maps
	Existing use of site (with regard to potential contaminants)	Description of current and previous site uses.
	Existing predevelopment runoff rate	Existing impermeable areas quantified on OS map or topographical survey. Estimate of existing runoff rate.

Statutory consultee information requirements (continued)		Information to be provided by developers for pre-planning application (Requirements draw on readily available information)
Proposed Site Characteristics	Type of development	General description and early master planning
	Area of development	Total site area and estimate of percent impermeable
	Percentage increase or decrease in impermeable area from existing site	Indicative increase or decrease
	Proposed site layout and levels	Marked up OS map or preliminary master plan
	How any particular requirements addressing flood risk have been considered	Discussion with LLFA about potential requirements for floor levels, flood storage compensation, flood resilient construction etc.
	How any particular requirements addressing amenity and biodiversity have been considered	Discussion with LLFA about the potential for combining open space with SuDS to improve amenity and biodiversity on the site.
Information about how the site will be drained after development.	Options discounted as unfeasible SuDS options and why	Discussion with LLFA about feasible options to influence master planning, identifying further information to be obtained.
	How the site will be drained	Concept drainage layout plan with indicative sizes of critical infrastructure
	How the proposed drainage scheme will mimic natural drainage patterns	Discussion with LLFA about the selection of suitable SuDS methods to be included in the drainage scheme.
	Requirements requested by LLFA, Environment Agency, Water Authority and other risk management authorities	Evidence of initial consultations. Concept layout plans/sketches addressing the requirements.
	Agreed discharge rate and receptor (including location)	Discussion with LLFA to confirm the requirements. Preliminary calculations showing that the proposed design will achieve the agreed requirements.
	Identify maintenance requirements and responsible organisation	Initial discussion with LLFA regarding adoptability of various components, maintenance requirements of the various options and who will be responsible for the various maintenance activities.
Climate adaptation and resilience considerations.	How climate change has been considered	Discussion with LLFA to confirm the requirements
	How will exceedance events be controlled	Discussion with LLFA to confirm the requirements
	If future interventions are needed	Discussion with LLFA to confirm the requirements

Outline planning

Statutory consultee information requirements		Information to be provided by developers for outline planning application (Requirements draw on readily available information)
Site location and LLFA(s) involved	Site location	Site location plan
	Grid reference and post code	For centre of site
	LLFA(s) involved	Identified through initial discussions with planning officers
Existing Site Characteristics	How the site currently drains	Marked up topographical survey plan showing existing impermeable areas and existing drainage infrastructure
	Location of nearest watercourse (open and culverted)	OS map or similar/contact LLFA to check drainage register
	Location of nearest public sewer (surface water and/or combined)	Water authority asset records
	Location of nearest highway drain	Contact LLFA to check drainage register
	Sources of flood risk already present on the site	Risk of flooding on site obtained from the EA's flood risk maps and LLFA's historical records
	Sources of flood risk already present near the site	Risk of flooding near the site obtained from the EA's flood risk maps and LLFA's historical records
	Existing topography	Topographical survey plan of existing site
	Underlying geology and infiltration rate	Description of underlying geology from Soils map. Measured as part of site investigation (where it has been undertaken)
	Groundwater level and aquifer protection	Information from British Geological Survey maps and Environment Agency Groundwater Source Protection Zone maps. Measured as part of site investigation (where it has been undertaken).
	Existing use of site (with regard to potential contaminants)	Description of current and previous site uses. Relevant soil and groundwater contamination testing as part of site investigation (where it has been undertaken)
Existing predevelopment runoff rate	Existing impermeable areas quantified on OS map or topographical survey. Estimate of existing runoff rate.	
Proposed Site Characteristics	Type of development	Master plan layout
	Area of development	Proposed impermeable area at Master planning stage
	Percentage increase or decrease in impermeable area from existing site	Indicative increase or decrease
	Proposed site layout and levels	Master plan layout with indicative finished levels
	How any particular requirements addressing flood risk have been considered	Discussion with LLFA about potential requirements for floor levels, flood storage compensation, flood resilient construction etc.
	How any particular requirements addressing amenity and biodiversity have been considered	Potential areas for combining open space with SuDS to improve amenity and biodiversity on the site shown on the master plan layout.

Statutory consultee information requirements (continued)		Information to be provided by developers for outline planning application (Requirements draw on readily available information)
Information about how the site will be drained after development.	Options discounted as unfeasible SuDS options and why	Assessment of options based on available information, identifying further information to be obtained.
	How the site will be drained	Concept drainage layout plan with indicative sizes of drainage infrastructure
	How the proposed drainage scheme will mimic natural drainage patterns	Discussion with LLFA about the selection of suitable SuDS methods to be included in the drainage scheme.
	Requirements requested by the LLFA, Environment Agency, Water Authority and other risk management authorities	Evidence of initial consultations. Concept layout plans/sketches addressing the requirements.
	Agreed discharge rate and receptor (including location)	Preliminary calculations showing that the proposed design will achieve the agreed requirements.
	Identify maintenance requirements and responsible organisation	Initial discussion with LLFA regarding adoptability of various components, maintenance requirements of the various options and who will be responsible for the various maintenance activities.
Climate adaptation and resilience considerations.	How climate change has been considered	Evidence of inclusion in preliminary calculations
	How will exceedance events be controlled	Plan showing exceedance flow paths or relevant discussion in the concept drainage design report
	If future interventions are needed	Discussion with LLFA to confirm the requirements

Full planning application / Reserved matters

Statutory consultee information requirements		Information to be provided by developers for full planning and reserved matters applications (Requirements draw on information required to plan and design the development)
Site location and LLFA(s) involved	Site location	Site location plan
	Grid reference and post code	For centre of site
	LLFA(s) involved	Identified through initial discussions with planning officers
Existing Site Characteristics	How the site currently drains	Existing drainage layout plan, condition assessment of existing drainage assets to be retained
	Location of nearest watercourse (open and culverted)	Shown on proposed drainage layout plan if it will receive runoff from the site
	Location of nearest public sewer (surface water and/or combined)	Shown on proposed drainage layout plan if it will receive runoff from the site
	Location of nearest highway drain	Shown on proposed drainage layout plan if it will receive runoff from the site
	Sources of flood risk already present on the site	To be assessed in a Flood Risk Assessment
	Sources of flood risk already present near the site	To be assessed in a Flood Risk Assessment
	Existing topography	Topographical survey plan of existing site
	Underlying geology and infiltration rate	Results of a site geotechnical investigation. Infiltration rates to be tested in accordance with BRE 365 in areas of proposed soakaways or other infiltration SuDS methods.
	Groundwater level and aquifer protection	Information from Environment Agency Groundwater Source Protection Zone maps. At least three months of groundwater level monitoring as part of the site investigation.
Existing use of site (with regard to potential contaminants)	Relevant soil and groundwater contamination testing as part of site investigation	
Existing predevelopment runoff rate	Existing runoff rate calculations	
Proposed Site Characteristics	Type of development	Proposed site layout plans
	Area of development	Proposed impermeable area and allowance for potential future increases
	Percentage increase or decrease in impermeable area from existing site	Actual increase or decrease
	Proposed site layout and levels	Proposed layout and proposed finished surface levels
	How any particular requirements addressing flood risk have been considered	Proposed plans and details addressing relevant requirements
	How any particular requirements addressing amenity and biodiversity have been considered	Proposed plans and details of relevant SuDS features.

Statutory consultee information requirements		Information to be provided by developers for full planning and reserved matters applications (Requirements draw on information required to plan and design the development)
Information about how the site will be drained after development.	Options discounted as unfeasible SuDS options and why	Final assessment of options
	How the site will be drained	Design drainage layout plan with sizing and details of critical infrastructure
	How the proposed drainage scheme will mimic natural drainage patterns	Discussion about the selection of suitable SuDS methods included in the drainage scheme.
	Requirements imposed by the Environment Agency	Proposed layout plans, details and calculations addressing the particular requirements
	Requirements imposed by the Water Authority	Proposed layout plans and details addressing the particular requirements
	Agreed discharge rate and receptor (including location)	Detailed calculations showing that the proposed design will achieve the agreed requirements
	Identify maintenance requirements and responsible organisation	Detailed maintenance management plan including responsible parties for the various activities.
Climate adaptation and resilience considerations.	How climate change has been considered	Evidence of inclusion in detailed calculations
	How will exceedance events be controlled	Plan showing exceedance flow paths
	If future interventions are needed	Timing and nature if interventions to be detailed in maintenance management plan including responsible parties for the various activities.

Useful References

Lead Local Flood Authority Websites:

www.Leeds.gov.uk/FloodRisk

Link to the Flood Risk Management section of the Leeds City Council website.

http://www.york.gov.uk/info/200378/flood_risk_management/169/flood_risk_management

Link to the Flood Risk Management section of the City of York Council website.

<http://www.kirklees.gov.uk/business/regeneration/majordevelopments.aspx>

Link to relevant documents on the Kirklees Council website.

<http://www.wakefield.gov.uk/residents/roads-and-transport/land-drainage-and-flooding>

Link to the Land Drainage and Flooding section of the Wakefield Council website.

Planning Policy and Sustainable Drainage:

<https://www.gov.uk/government/speeches/sustainable-drainage-systems>

This statement has similar weight to the National Planning Policy Framework and makes Sustainable Drainage Systems a material planning consideration and also places a presumption in favour of SuDS.

<https://www.gov.uk/government/publications/national-planning-policy-framework--2>

Link to the National Planning Policy Framework. See Section 10 (Meeting the challenge of climate change, flooding and coastal change) and Section 11 (Conserving and enhancing the natural environment), especially para 109, which encourages the use of 'green SuDS'.

<https://www.gov.uk/government/publications/sustainable-drainage-systems-non-statutory-technical-standards>

Non statutory Technical Standards for SuDS.

<http://planningguidance.planningportal.gov.uk/>

See Flood Risk and Coastal Change.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/296964/LIT_8496_5306da.pdf

Guidance to support the National Planning Policy Framework, September 2013, Environment Agency Standing Advice

SuDS Guidance and Design:

http://www.ciria.org/Resources/Free_publications/the_suds_manual.aspX

The CIRIA SuDS Manual (C697) provides a wealth of information about the benefits of SuDS, SuDS methodologies and general design guidance.

<http://www.susdrain.org/delivering-suds/using-suds/design-guidance/guidance-overview.html>

The SusDrain website provides a list of useful design references, as well a lot of other useful information about the design, implementation and maintenance of SuDS.

Useful references for obtaining information about your site:

<https://www.gov.uk/prepare-for-a-flood/find-out-if-youre-at-risk>

Environment Agency flood risk maps to identify whether a site is likely to be at risk from flooding from rivers and the sea, surface water or reservoirs.

<http://www.bgs.ac.uk/products/hydrogeology/groundwaterFlooding.html>

British Geological Survey mapping showing wider area within which groundwater levels are likely to be at or rise to levels close to the ground surface.

<http://apps.environment-agency.gov.uk/wiyby/37833.aspx>

Environment Agency mapping showing areas where groundwater sources are used for public water supply and are therefore risk of contamination from any activities that might cause pollution in the area.

<http://www.bgs.ac.uk/products/digitalmaps/digmapgb.html>

British Geological Survey mapping showing the underlying and superficial rock types.

<http://www.landis.org.uk/soilscapes/>

Mapping from Cranfield Soil and AgriFood Institute showing soil types.