PGN

Sustainable Urban Drainage Systems (SUDS)

Adopted
Planning Guidance Note

November 2003

Bournemouth
Borough
Council

Sustainable Urban Drainage Systems (SUDS)
Planning Guidance Note (PGN)

Contents

1. Introduction

1.1

The following guidance was adopted by the Council on 25th November 2003 after public consultation. Details relating to the consultation process and responses are available on request.

Purpose of the PGN

1.2

The purpose of this Planning Guidance Note (PGN) is to set out the Council's commitment to securing the use of sustainable urban drainage systems (SUDS) as part of development within the Borough. Use of SUDS contributes towards the Government and Bournemouth Council's aim of seeking to achieve sustainable development.

1.3

Policies 3.22, 3.24 and 3.27 of the Bournemouth District Wide Local Plan are relevant to this PGN and have been cited in part 2. The aim of this PGN is to reflect up to date Government policy and provide a best practice framework for those carrying out development in Bournemouth.

1.4

This PGN will explain what SUDS are, why using SUDS is important, how they fit into the planning system, outline some examples of SUDS and note where to find further information.

What are SUDS?

1.5

SUDS are physical structures built to receive surface water run off and provide a drainage system that:

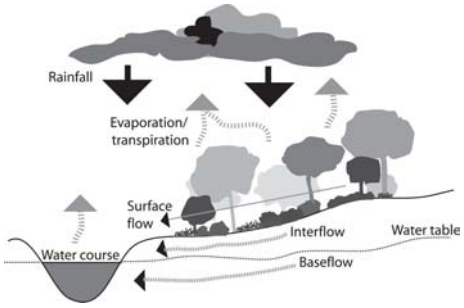
- Deals with run off as close to source as possible
- Seeks to mimic natural drainage
- Minimises pollution and flood risk resulting from new development, and
- Provides an alternative to conventional drainage systems.

What's wrong with traditional systems?

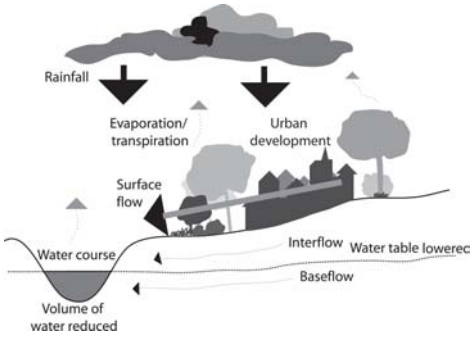
1.6

Traditional systems move rainwater as rapidly as possible from where it falls to a point of discharge e.g. watercourse. This causes a number of problems;

- Increased flooding
- Poor water quality as run off can contain a variety of pollutants
- Less infiltration to ground leading to poor groundwater recharge
- Poor biodiversity and amenity of urban watercourse, many of which are hidden underground.



Natural Hydrological cycle (no development)



Hydrological cycle after development

Why using SUDS is important

1.7

All developments must carefully consider appropriate sustainable surface water drainage options. Careful design of drainage systems and/or the provision of treatment facilities prior to discharge will assist in reducing the environmental impact of new development. These range of techniques are known as SUDS. They can be successfully applied to most development and can even be fitted to existing development.

Benefits of SUDS

1.8

There are considerable environmental and economic benefits to inclusion of SUDS techniques in a development.

These can include:

- Reduced cost by not constructing expensive underground structures
- Reduced cost from simpler maintenance
- Increased amenity and education value
- Improved visual and environmental quality of development and therefore increased economic value
- Increased biodiversity
- Reduced pollution
- Recharging of groundwater
- Reduced flood risk

1.9

SUDS can be applied to large or small developments due to the variety of techniques available. Use of SUDS on a series of smaller sites can have a significant cumulative effect on minimising harm to water quality and flood risk in an area.

2. Planning Background

Government guidance

2.1

Planning Guidance in the form of PPG 25 - Development and Flood Risk, acknowledges the impact of development on surface water flow and the fact that its disposal is a material planning consideration,
"All built development tends to extend the area of impermeable ground, from which water runs off rather than percolating into the ground. This can increase both the total and the peak flow from built-up areas, resulting in increased flows downstream and thus increasing the risk of flooding".
(para 40)

2.2

PPG 25 also notes the role of SUDS in addressing this impact,
"...there has been growing interest in the use of "soft" sustainable drainage systems to mimic natural drainage. As well as reducing total and peak flows of run-off, these systems can contribute substantially to good design in improving the amenity and wildlife interest of developments, as well as encouraging natural groundwater recharge."(para. 41).

2.3

Appendix E of PPG 25 gives detailed guidance on the role of SUDS.

Structure Plan Policy

2.4

Implementation Policy E of the Bournemouth, Dorset and Poole Structure Plan (CSP28) also refers to the issue of drainage stating that development should **"...be satisfactorily serviced in terms of water supply, drainage, sewerage, energy supplies".**

Local Plan Policy

2.5

Policies 3.22, 3.24 and 3.27 of the Bournemouth District Wide Local Plan state,

Policy 3.22 - Development which would pose unacceptable risks to the quality and quantity of the water environment both groundwater and surface water, will not be permited unless suitable mitigation measures agreed by the L.P.A. are utilised to reduce the risk to an acceptable level.

Policy 3.24 - Developments which will generate additional foul, combined and/or surface water drainage will only be permitted where arrangements are made for their satisfactory disposal.

Policy 3.27 - Postive surface water drainage systems, separate from foul drainage systems, will be required for new development unless it is demonstrated that soakaway disposal will be satisfactory under all seasonable conditions.

Cliff stability

2.6

Although the aim of this PGN is to secure and promote use of SUDS as part of new development, there are areas of Bournemouth where the use of SUDS may not be appropriate. One such area is in close proximity to the cliff top. Here, cliff stability must be maintained and it is likely to be more appropriate to use the local

piped drainage system to dispose of surface water for new development. This cliff top location however, does not preclude the use of measures to recycle water or reduce runoff at source e.g use of water butts and green roofs (roofs incorporating vegetation).

2.7

The issue of cliff stability is covered in Policy 3.25 of the Bournemouth District Wide Local Plan, which states that,

Policy 3.25 - Proposals for development or redevelopment within 200 metres of cliffs and chines, or in proximity to steep embankments, will incorporate the measures necessary to demonstrate that such development will have no adverse effect upon existing cliffs, chines or steep embankments. Proposals for major developments in these areas will be required to submit a development impact assessment to show the proposal will have no adverse effect on land stability.

2.8

Developers are advised that they will be required to comply with the requirements of Planning Policy Guidance Note (PPG) 14: Development on Unstable Land, Annexe 1 and 2 for sites close to the cliff top.

3. Building Regulations

3.1

Incorporation of SUDS has been reinforced as part of the development process by changes to Building Regulations. These came into effect from 1st April 2002. Revisions to Part H of the Building Regulations 2000 now require that, in order of priority, rainwater run-off should discharge into one of the following:

a) an adequate soakaway or some other adequate infiltration system; or where that is not reasonably practicable;

b) a watercourse; or where that is not reasonably practicable;

c) a sewer

4. Examples of SUDS

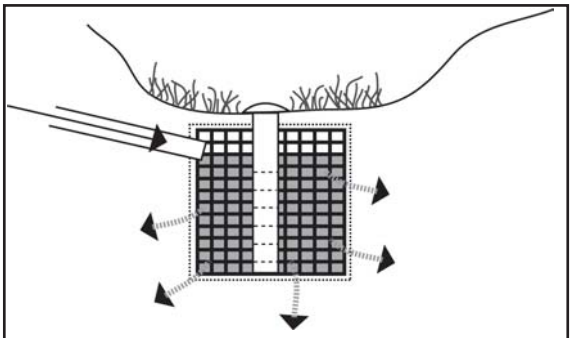
4.1

This section illustrates and gives examples of SUDS. Of the examples given below, large ponds and wetlands are generally more appropriate for larger sites in excess of 5ha. Infiltration trenches, swales and porous pavements are suitable for both large and small sites. Many large sites will incorporate a mix of different mechanisms. References for obtaining more detailed information can be found in section 7 of this guidance note.

Soakaways

4.2

Although soakaways have been traditionally used in more remote locations away from public sewers or where sewers have reached capacity, they may be used as an alternative to connection to the piped system. They are used to dispose of storm water and are typically circular pits with a honeycomb arrangement of bricks to allow water to permeate through them into the ground.

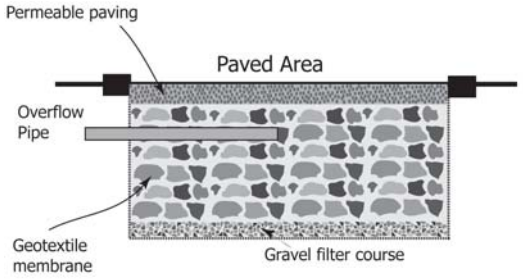


Soakaway
An underground chamber lined with a porous membrane and used to store surface water, and then allow its gradual infiltration into the surrounding soil.

Permeable Surfacing

4.3

This encourages surface water to permeate into the ground. Materials such as porous concrete blocks, crushed stone/gravel or porous asphalt can be used. Depending on the ground conditions, the water may infiltrate directly into the subsoil, or be stored in an underground reservoir (e.g a crushed stone layer) before slowly soaking into the ground. If necessary, an overflow can keep the pavement free of water in all conditions. Pollutant removal occurs either within the surfacing material itself, or by the filtering action of the reservoir or subsoil.



Porous paving
Stores water and attentuates runoff
Filters runoff water
Allows water to slowly infiltrate to groundwater
Only occasionally overflows to water course

Gravel Drive
Example of permeable surfacing encouraging surface water to permeate into the ground.

Swales and Basins

4.4

Swales are dry channels or ditches and basins are dry "ponds". Both can vary in size. They can be created as features within the landscaped areas of the site, or they can be incorporated into ornamental, amenity and screen planted areas where they would be maintained as part of a normal maintenance contract. They provide temporary storage for storm water, reduce peak flows to receiving waters, facilitate the filtration of pollutants and microbial decomposition as well as facilitating water infiltration directly into the ground.

4.5

Swales and basins are often installed as part of a drainage network connecting to a pond or wetland prior to discharge to a natural watercourse. They may be installed alongside roads to replace conventional kerbs, therefore saving construction and maintenance costs.

Ponds and Wetlands

4.6

These can be particularly beneficial during time of storm due to their capacity to hold large amounts of water and therefore reduce flood risk. They are most widely used on larger sites.

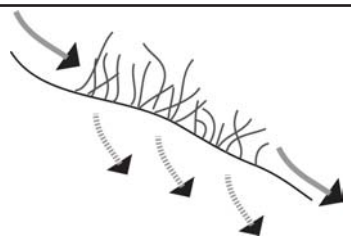
4.7

Ponds and wetlands also help with grit removal. Algae and plants in wetlands can significantly assist with filtering and nutrient removal. The ponds and wetlands can be fed by swales, filter drains or piped systems. Use of inlet/outlet sumps assist in reducing sedimentation and reeds planted at these points will cleanse water as it enters and leaves the pond.

Infiltration trenches and filter drains

4.8

Infiltration trenches are stone filled reservoirs to which stormwater runoff is diverted and from which the water gradually infiltrates into the ground. Filter strips, gullies or sump pits can be incorporated at inflow points to remove excess solids. This lengthens the life of the trench.



Filter Strips
An area of gentle sloping, vegetated land through which surface water run-off is directed.

4.9

Filter drains are similar to infiltration trenches but have a perforated pipe running through them. They are widely used by highway authorities for draining roads and help to slow down runoff water on route towards the receiving watercourse. They allow storage, filtering and filtration of water before the discharge point.
Pollutant removal is by absorption, filtering and microbial decomposition in the surrounding soil.

Choosing the right SUDS

4.10

The choice of SUDS will depend on a number of factors:

- ❑ The pollutants present in runoff (in part dependent on type of development)
- ❑ The size of and drainage strategy for the catchment area
- ❑ The hydrology of the area and infiltration rate of the soil

4.11

Large sites may incorporate a mix of different techniques. SUDS can be incorporated into areas where there is clay subsoil or there is a fairly steep gradient. Soil permeability can have a significant effect on the selection of SUDS techniques. Infiltration techniques for example may not be effective if the infiltration rate is below 10mm/hr for the upper soil layers. Swales and ponds, working by a combination of filtration and infiltration, are more tolerant of poor soils. In highly permeable soils wet ponds need to be lined.

5. SUDS and Bournemouth

Bournemouth Hospital
Example of SUDS pond

5.1

There are examples of sites in Bournemouth where SUDS have been used. The first SUDS pond, for example, was constructed as part of the Bournemouth hospital site and accommodates surface water discharge from the paved areas of the hospital. The result is that there is little surface water discharge into the Castle Lane sewers that flow into the River Stour.

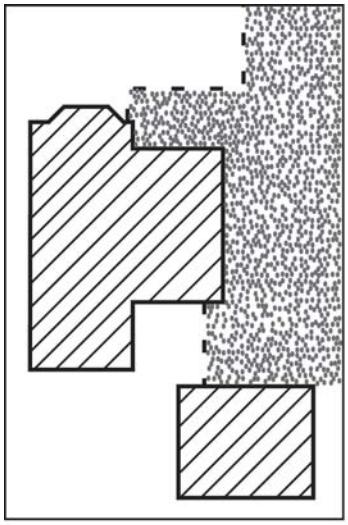
Bourne Stream
SUDS promoted through the Bourne Stream Partnership

5.2

Bournemouth Borough Council, along with the Borough of Poole, the Environment Agency, English Nature, Wessex Water, the Bournemouth & West Hampshire Water Company, Bournemouth University, the Dorset Coast Forum, the Dorset Wildlife Trust and Green Link contributes to the work of the Bourne Stream Partnership. One of the aims of this Partnership is to promote use of SUDS for new and existing developments. This is to improve surface water quality, to reduce the risk of down stream flooding and avoid bacterial contamination of the watercourse and bathing area around Bournemouth Pier.

5.3

Development in Bournemouth is increasingly relying on brownfield sites (previously developed land) to accommodate development and provide the 12,400 dwellings required by the Structure Plan. If development relies solely on connection to a fixed capacity pipe system it may give rise to capacity problems for the future. Conversion of properties to flats can result in a larger proportion of the site being given over to hardsurfacing for car parking causing increased runoff and pollution. Infill development using gardens increases the building footprint on the site, which also increases water run-off. Incorporation of SUDS will therefore become increasingly important in Bournemouth. Examples of development have been included in this PGN, which illustrate the increased site coverage (building footprint and hardsurfacing) arising from new build and conversion.



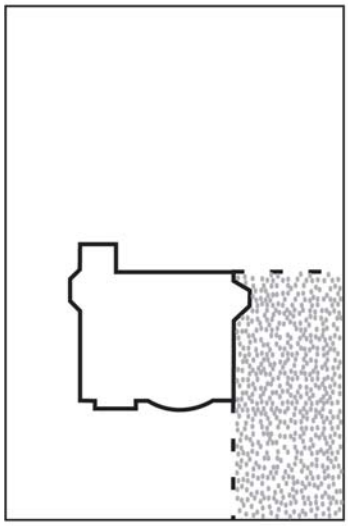
New Build
(Private garden to 1 house and garage)

New buildings (32% of site)

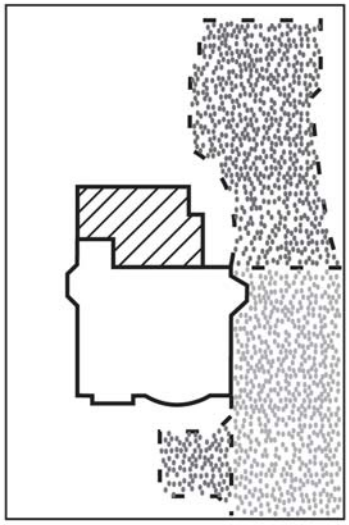
New Hard surfacing (14% of site)

Total area of site covered by new development = 46%

Flat Conversion
(1 house extended + converted to 6 flats with car parking)



Site as 1 house



Site as 6 flats

Extension (5% of site)

New hard surfacing (20% of site)

Existing hard surfacing

Total area of site covered by new development = 25%

Residential Development
Illustration of increased site coverage arising from new development

6. SUDS and Planning

6.1

It is important that developers establish the soil conditions and hydrology of the site (storm water run-off, water table height, water quality) and consider appropriate SUDS at an early stage in the site evaluation and design process. This will ensure that the best drainage solution for a particular site is found and incorporated into the layout, development costs and timetable for implementation.

6.2

This Council will expect planning applications to demonstrate how SUDS will be incorporated into development proposals and for detailed design information to be submitted at an appropriate stage. Responsibility for the adoption and future maintenance of SUDS should also be considered at the design stage and made clear as part of the planning application submission. It is important, for example, to incorporate utility vehicle and maintenance access into landscaping schemes. It may also be appropriate to link SUDS on new development sites to existing green space and amenity areas. Early consultation with the Council is advised.

6.3

The Council will make use of planning conditions or legal agreements to secure implementation of SUDS where appropriate.

7. More Information

7.1

Contacts -

Planning Policy
Local Plans Team:
Tel. 01202 451446
Email: planning@bournemouth.gov.uk

Planning Control
East Team:
Tel. 01202 451327/454729
Email:
planning.control.east@bournemouth.gov.uk

West Team:
Tel. 01202 451328/451329
Email:
planning.control.west@bournemouth.gov.uk

Technical Services
Group Manager:
Tel. 01202 451377

Parks & Countryside incl. BEAT
(Bournemouth Environmental Advisory Team)
Countryside Policy Officer:
Tel. 01202 454699

Environment Agency
Planning Liaison:
Tel. 01258 456080

7.2

Relevant documents -
The following are available from Planning & Development Services or from the Environment Agency

"Sustainable Urban Drainage Systems: An Introduction"
(SEPA, E. Agency and Environment and Heritage Service")

" Sustainable Drainage Systems (SUDS): A guide for Developers"
(E. Agency)

7.3

Useful websites -
Environment Agency:
www.environment-agency.gov.uk

Office of the Deputy Prime Minister: www.odpm.gov.uk
(for PPG 14 and PPG25 and Part H of Building Regulations)

Construction Industry Research and Information Association (CIRIA): www.ciria.org/suds
(for details on techniques and case studies)

Greenlink:
www.greenlink.co.uk/stream.htm
(for information on Bourne Stream Partnership)

UK SUDS Database:
www.suds-sites.net
(for national database of sites)

7.4

Acknowledgements -
Acknowledgement is given to the Environment Agency for their help in preparing this document.