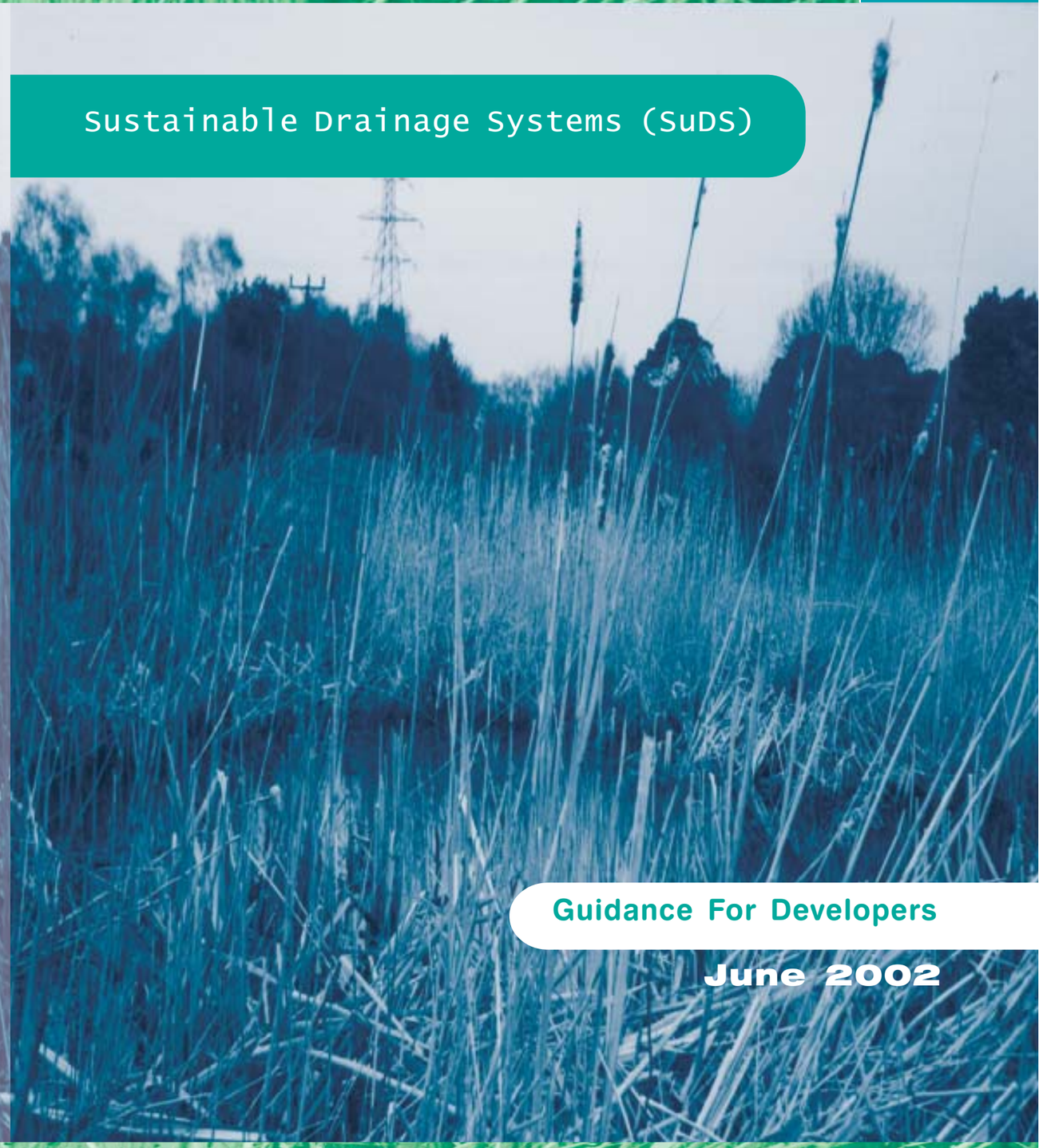
Supplementary Planning Guidance

BOROUGH OF POOLE

Sustainable Drainage Systems (SuDS)



Guidance For Developers

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Contacts:

At The Borough of Poole

Strategic Planning Services
Civic Centre
Poole BH12 2BH
b.richardson@poole.gov.uk
Tel: 01202 633298

Planning Design and Control
Tel: 01202 633321

Leisure Services
s.terry@poole.gov.uk **Tel: 01202 261354**

The Environment Agency

Rivers House
Sunrise Business Park
Higher Shaftsbury
Blandford
Dorset DT11 8ST
www.environment-agency.gov.uk
Tel: 01258 455998

Note: This document was issued for consultation between 12th March 2002 to 26th April 2002. Responses to these representations are detailed in 'Sustainable Urban Drainage Systems - Summary of Public Consultation Responses and Changes to Draft Guidance (May 2002). These responses helped to inform the final version of this Supplementary Planning Guidance which was adopted on 5th June 2002. This document includes a full summary of the consultation process and is available from Strategic Planning Services (see above).

Acknowledgement is given to the Environment Agency, South Gloucestershire Council and Wessex Water for their help in preparing this document.

SuDS & The Development Process

Advice is given in **PPG 25 (Development and Flood Risk),** paragraph 42, that Local Planning Authorities should work closely with the Environment Agency, sewerage undertakers and prospective developers to enable surface water run-off to be controlled as near to source as possible by the encouragement of sustainable drainage systems (SuDS). Policy NE31 of the Poole Local Plan (First Alteration – Revised Deposit Plan November 2001) encourages the incorporation of SuDS in all new development where ground conditions allow….

NE31 Water Services

In considering development prposals, regard will be had to:

1) The adequacy of existing water supplies, drainage, disposal arrangements, sewerage and sewage treatment facilities: and

2) The need for surface water drainage systems, separate from all foul drainage systems: and

3) The use of sustainable drainage systems where ground conditions are appropriate.

Planning permission will not be granted for any proposal which, as a consequence of inadequate provision for water services or surface water drainage and disposal, would pollute the water environment.

This Note on SuDS has been approved by the Council as Supplementary Planning Guidance. It provides guidance to support Policy NE31 on potential circumstances where SuDS may be incorporated into new development.

The Council will expect that, as far as possible and where ground conditions allow, all development proposals will incorporate the drainage principles set out here.

The need for planning guidance on SuDS has been further re-inforced by changes to the **Building Regulations** which took 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.

These changes to the building regulations mean that consideration of drainage techniques from the outset of the development process is critical. As with other key considerations in the planning process, such as transport, landscape, heritage and nature conservation, Sustainable Drainage needs to be considered early on in the site evaluation and planning process, as well as at the detailed design stage. The incorporation of SuDS may have implications for the design and layout of development.

The SuDS techniques set out in this Guidance Note are tried and tested in many parts of the country. They are cost-effective, and can be applied to a wide range of schemes from small developments through to major residential, leisure and commercial or industrial operations with large areas of hardstanding and roof. They can, in some instances, also be successfully retrofitted to existing developments.

The Council will make use of planning conditions and/or obligations to secure the implementation of sustainable drainage. Staff (through consultation with the Environment Agency where necessary) will be available to discuss these matters with applicants at any stage.

1 Surface Water Runoff –The Problem

1.1 Development can have significant effects on our water resources:

- Piping water, rather than letting it soak into the soil as it used to do before development took place, reduces the amount of water getting into the groundwater, which can cause low flows in streams and rivers
- Surface water runoff can contain a wide range of contaminants such as oil, organic matter and toxic metals. When these get into rivers and streams water quality goes down, which affects amenity and wildlife.
- Increased runoff as a result of more extensive hard paving and roofing can increase the risk of flooding downstream, as well as give sudden rises of water levels and flow rates as the water is discharged into watercourses.

2 Enivironmental & Economics Benefits Of SuDS

2.1 Sustainable Drainage Systems are a new look at how to dispose of surface water runoff using a range of different but straightforward techniques. **They differ from traditional engineered systems in that they are designed to deal with runoff as close to source as possible.**

2.2 Sustainable Drainage Systems **minimise the quantity of water** that has to be disposed of from any development and hence helps to reduce flood risk. SuDS also **improve the quality** of the discharge. Minimising the quantity and improving the quality of water:

- minimises pollution discharged into watercourses
- reduces the quantity of water discharged to sewer or outfall
- while increasing the amount of water infiltrating into the ground, and aquifers
- SuDS can, at the same time, benefit nature conservation, landscape and amenity.

2.3 The use of SuDS may result in savings (both economic and social) by, for example:

- avoiding or reducing the need for constructing surface water sewers
- avoiding the need for requisitioning surface water sewers
- avoiding the need for pipe connections to distant outfalls
- may avoid the costs involved in routing pipes across land owned by others (ransom strips)
- reducing the ecomonic and social cost of flooding
- limiting the risk of sewage discharge during exceptional high rainfall reduces risk to human health

2.4 SuDS can be effectively designed to work with retained natural features such as ditches or ponds, and to form an integral part of hard and soft landscaped areas. In this way they can help to produce an attractive scheme which improves urban

3 Suitability Of SuDS In Poole

Soil Permeability and Hydrology

3.1 Ground conditions in Poole generally favour sustainable drainage techniques, since the predominant soil type is based on sand. There are, however, areas that will not be suitable for SuDS. These include areas of clay, some of which are highly impermeable and localities near to (within 400 metres) cliff edges at Canford Cliffs. There are also quite large areas of tipped ground, which may vary in character.

3.2 Soil permeability can have a significant effect on the selection of SuDS techniques. Infiltration techniques may not be effective if the infiltration rate is less than 10mm/hour for the upper soil layers. Swales and ponds, working by a combination of filtration and infiltration are more tolerant of such soils. In highly permeable soils wet ponds need to be lined.

3.3 Where ground conditions are not suitable for infiltration to ground, attenuation of surface water run-off should be considered.

3.4 It is important that developers establish the soil conditions and hydrology of their site at an early stage in the site planning process. The results of these investigations should be provided to the Borough Council with the planning application as background to the drainage system proposals .

Urban Planning Considerations

3.5 Promotion of sustainable development lies at the heart of the Poole Local Plan. Key issues which emerge include making best use of urban land, promoting new development that is integrated with existing and planned transport, and supporting good access to local services.

3.6 Through the Local Plan and masterplanning process, the Council is promoting the redevelopment of many central 'brownfield sites' in the town (mainly within the central area). In order to reduce the need to travel and achieve efficient use of land, much new development in Poole (up to 2011 and beyond) will be mixed use and at generally higher density than has historically been the case.

3.7 On brownfield sites where higher density development is likely to be pursued by the Council, some SuDS techniques may be inappropriate. For example, the Former Power Station Site (Hamworthy) may, when developed, incorporate much greater emphasis on grey water recycling. Alternatively the Borough of Poole has incorporated Ponds and Wetlands as an approach to land drainage and pollution control for the Bourne Steam.

On some sites that are bounded by areas of recognised nature conservation interest, such as a Site of Special Scientific Interest, SuDS techniques involving a significant land take may also be appropriate to serve as a buffer.

4.1 **Integrated SuDS drainage.** This section briefly lists different SuDS techniques. For each site a careful selection of which ones are most suitable, and the provision of overall integrated drainage proposals is essential.

4.2 **Soakaways.** These are used to dispose of stormwater from buildings and paved areas. They are typically circular pits with a 'honeycomb' arrangement of bricks which allow water to permeate through them and efficiently infiltrate into adjacent soil. Soakaways have traditionally been used for buildings that are remote from public sewers or where sewers have reached or are close to capacity. Poole's largely sand based soil allows for easy incorporation of soakaways into residential and other land uses in most cases. It is is likely that soakaway designs will be considered appropriate in many new developments (even where conveniently located to existing sewers). Part 'H' of the building Regulations 2000 (revised) provides siting criteria and further information on design can be found in CIRIA Report 156 - Infiltration drainage - Manual of good practice.'

4.3 **Porous pavements.** Encouraging water to permeate in through porous pavements (especially parking areas) by using e.g. permeable (no fines) concrete blocks, crushed stone or gravel, or porous asphalt can reduce the need for surface-water drains and off-site sewers greatly.

Depending on the ground conditions the water may be arranged to:

- infiltrate directly into the subsoil
- or be stored in an underground reservoir (such as a crushed stone layer or proprietary draintank) before soaking slowly into the ground

If necessary an overflow to a sump or basin can be included to ensure that the pavement is kept clear of water in all conditions.

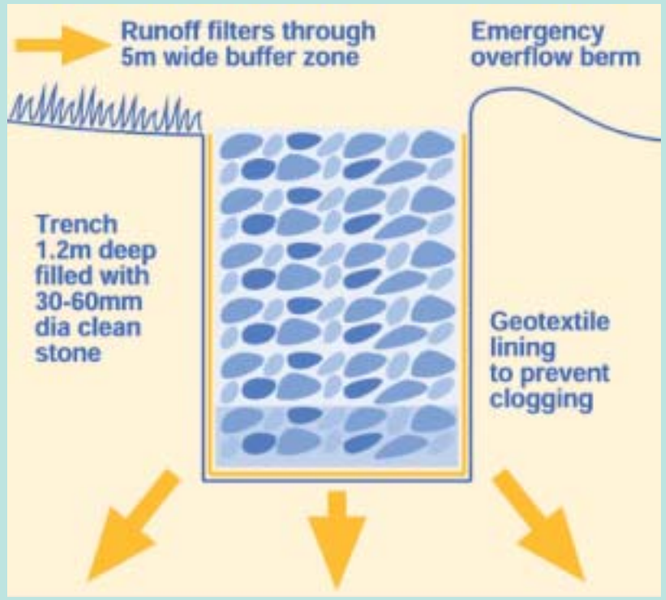
Pollutant removal occurs either within the surfacing material itself, or by the filtering action of the reservoir or subsoil.

Porous Paving Details.

Above - Porous blocks laid on a bed of ground and crushed stone. Underlying materials provide useful storage volume for peak storm events.

4.4 **Swales and basins.** These are dry channels and 'ponds' of all sizes which provide temporary storage for storm water, reduce peak flows to receiving waters, and help to filter out pollutants, as well as aiding water infiltration directly into the ground.

Swales and basins are often installed as part of a drainage network connecting to a pond or wetland which then discharges to a natural watercourse. They may be installed alongside roads to replace conventional kerbs, which saves construction and maintenance costs. They can be created as features within the landscaped areas of the site, or they can be incorporated into ornamental, amenity or screen-planted areas.

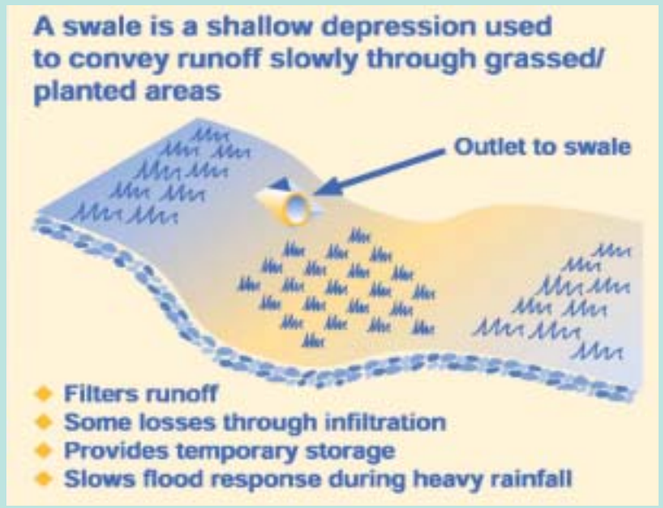


4.5 **Filter Drains.** Filter Drains are a major SuDS technique, already widely used by Highway Authorities for draining roads. They are stone-filled trenches with a perforated pipe running through them. For road drainage, they can be used without road-edge kerbs, or with off-let kerbs connecting directly to the filter drain.

These drains slow down water movement, and provide some filtration and infiltration of water. Pollutant removal is by adsorption, filtering and microbial decomposition in the surrounding soil.

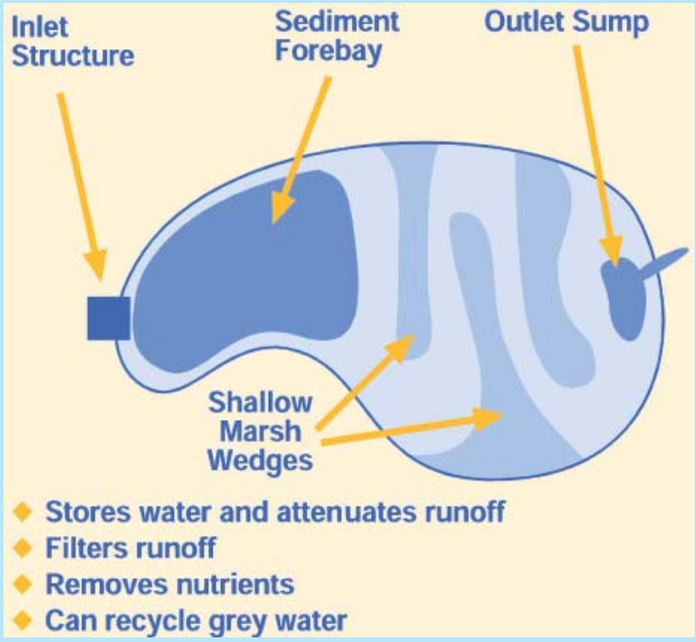
4.6 **Infiltration trenches & basins** are similar to Filter drains. They are stone-filled trenches or reservoir areas but without the piping. Stormwater runoff is routed into them and then gradually infiltrates into the ground. Filter strips, gullies or sump pits can be incorporated at inflow points to remove excessive solids. This helps the trenches last as long as possible.

4.7 **Ponds and wetlands.** Where there is space to include ponds and small wetland areas sustainable drainage from filter drains, piped systems, or swales can be fed into them.



This can help greatly in dealing with water during storm conditions, reducing the risk of flooding. Such areas also help with solids removal significantly, and the algae and plants of wetlands can provide a particularly good level of filtering and nutrient removal. Larger ponds and wetlands have the potential to recycle 'grey water'.

The use of inlet/outlet sumps will help reduce sedimentation.



Right - Pond and wetland recreation off Ringwood Road. SuDS techniques implemented through the Bourne Stream Partnership. (Partnership includes the Borough of Poole and the Environment Agency).

5 During Construction

5.1 The early implementation of appropriate SuDS techniques can prevent the pollution of watercourses during construction.

6 Choosing The Right SuDS Techiques

6.1 The choice of appropriate techniques will depend on a number of factors:

- the pollutants present in runoff
- the presence of contaminated land
- the size of the catchment area
- the drainage strategy for the catchment area
- the hydrology of the area and its soil infiltration rate
- the presence of Groundwater Source Protection Zones

6.2 Large-scale ponds and wetlands are generally more appropriate for larger sites, above 5.0ha. Infiltration trenches, swales, filter strips and porous pavements are suitable for both large and small sites. Large sites will need to incorporate a mix of different mechanisms.

7 Avoiding Excessive Run Off In New Development

7.1 The positive benefits of incorporating SuDS into new development can be jeopardised through inappropriate building design. Developments that incorporate unnecessarily large areas of hard surfaces will generate excessive surface water-run off and should be avoided. Alternatively SuDS should not prevent the incorporation of rainwater collection systems as part of the overall system of managing water run off.

8 Implementation

8.1 Revisions to part 'H' of the Building Regulations and the Implementation of Policy NE31 have required a shift in practise to identifying drainage constraints and agreeing principals for securing construction and future maintenance of SuDS under planning conditions and/or planning obligations at the development control stage.

8.2 Considering the future maintenance of SuDS at the planning stage, particularly for larger housing developments, is necessary to ensure future residents are not at risk of having to maintain these features at their own expense.

8.3 It is recognised that large institutional or commercial developers will be able to ensure maintenance through their own management regimes. Some larger residential developers may wish to seek adoption of SuDS features by the Council. In these instances the Council is willing to consider adoption provided appropriate maintenance contributions are secured through planning obligations. Early discussion with the Council on this matter is crucial.

8.4 **Amenity Space.** Imaginative incorporation of SuDS as both on-site amenity / landscaped space and for drainage will be welcomed by the Council provided that considerable areas of amenity space are secured for access by future residents.

8.5 **Roads.** The Council is willing to adopt new highways which incorporate SuDS provided adequate design techniques are secured and appropriate contribution for future maintenance is made. Suitable designs may include swales, porous surfaces or kerbed roads with piped entries into swales.

9 Summary

9.1 The use of SuDS can bring substantial environmental and economic benefits. There is no single 'best fit' solution to the use of SuDS in new development, however, soil in Poole generally allows for most techniques to be applied. Developers are encouraged to consider their inclusion into schemes from the outset, including pre-application stage. Borough of Poole will actively support the incorporation of SuDS into new development.

Further Information

Publications:

- **"Sustainable Urban Drainage Systems - an Introduction", SEPA/ EA**
  Tel: 01454-624400.
  ISBN: 1-901322-12-8
- **Planning Policy Guidance Note 25 (Development and Flood Risk). July 2001**
  www.thestationeryoffice.com
  ISBN: 0-11-753611-3
- **Part 'H'. The Building Regulations 2002 Edition, April 2002, DTLR.**
  www.thestationeryoffice.com

CIRIA Reports:

- **156 - "Infiltration Drainage - Manual of good practice"**
- **C522 "Sustainable Urban Drainage Systems - a Design Manual…"**
  ISBN: 0- 86017-522-7
- **124 - "Scope for the Control of Urban Runoff"**

Other Contacts

- **Environment Agency web site:**
  www.environment-agency.gov.uk
- **Construction Industry Research Association**
  Tel: 020-7222-8891