



SUDS Advice Note



Brownfield Sites

Suds Advice Note – Brownfield Sites

Sustainable Urban Drainage Systems are an important component of sustainable development and are now regarded as normal practice for all new developments, including those on brownfield sites.

Key Points:

- Use of SUDS on brownfield sites is as relevant as it is for greenfield sites;
- 40% of all sites incorporating SUDS in Scotland are on brownfield sites;
- The approach to the use of SUDS on brownfield sites must be integrated at an early stage with the restoration design;
- If a site is affected by contamination, SUDS must not mobilise contaminants or act as a preferential flow path to convey such contaminants - SUDS design can be adapted to ensure that this does not occur;
- SUDS techniques can also be adapted to deal with lack of space and poor soil infiltration;
- Brownfield sites often have a high wildlife habitat value – SUDS provide an opportunity to maintain or even enhance biodiversity.

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Existing Advice

General advice on SUDS design and implementation is provided in the CIRIA publication 'Sustainable Urban Drainage Systems – design manual for Scotland and Northern Ireland' (C521). Many of the SUDS techniques described in the manual are just as relevant for brownfield sites; a fact not always appreciated. This guidance note aims to provide extra information with regard to the implementation of SUDS in brownfield sites, and should be used in conjunction with the manual. In addition, a considerable amount of guidance on best practice relating to the assessment and development of brownfield sites, some of which may be affected by contamination, is now available as a result of recent legislation and government policy initiatives. This Advice Note does not seek to repeat or summarise existing guidance, but instead sets out a framework to link into other guidance. Reference is made to a number of other relevant documents which are detailed on the back page.



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Scope of this Advice Note

For the purposes of this note, a brownfield site is defined as a site which has been previously developed. This may include sites affected by contamination and statutory contaminated land identified under Part IIA of the Environmental Protection Act 1990 ("land where significant harm has been identified or there is significant probability of significant harm, pollution of controlled waters or significant possibility of pollution of controlled waters")

Increasing Use of Brownfield Sites

Current Scottish Executive planning policy generally promotes the use of brownfield sites in preference to greenfield land. With the continuing pressure for urban development, it is likely that the requirement to utilise brownfield sites will continue to increase in importance.

SUDS in Brownfield Sites

SUDS are now commonplace in Scotland, but there is a common perception that they are unsuitable for brownfield sites. This perception is unfounded provided that any issues associated with land contamination are addressed during SUDS design. This is backed up by an extensive survey of SUDS in Scotland (SNIFFER 2002) which has found that 40% of sites which incorporate SUDS were in fact brownfield sites. Therefore SUDS should still be used in brownfield sites, although it is recognised that the selection of SUDS techniques will be governed by the 'suitable for use' principle of re-development. SUDS offer a variety of techniques which can be selected to suit the particular needs or requirements of a site.

In many cases, the use of SUDS in brownfield sites is actually of greater relevance, due to existing environmental pressures. Brownfield sites are often located where existing watercourses are already polluted by urban drainage and where flooding is exacerbated by urbanisation. SUDS will ensure that pollution and flood risk are not increased by the new development and can help reduce these risks where appropriate. Where sites are served by an existing combined system the incorporation of a SUDS and the reduction in storm run-off may well reduce discharges of untreated sewage from storm overflows in the downstream drainage system.

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Biodiversity

Brownfield sites are increasingly found to provide important niche habitats for flora and fauna in decline elsewhere due to the pressures of intensive agriculture and urbanisation. SUDS features such as ponds and wetlands offer a means of safeguarding and enhancing the biodiversity of sites being redeveloped. The site characterisation process may benefit from a Phase 1 habitat survey, carried out in consultation with Scottish Natural Heritage (SNH) to assess potential ecological impact and the scope for mitigation offered by SUDS features. Detailed SUDS design may thereafter be carried out in conjunction with more detailed habitat survey and impact assessment as appropriate.



Wetland constructed on Brownfield site

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Land Contamination

The restoration strategy and detailed design should be based on a site's characteristics as determined through site investigation and assessment. Planning Advice Note 33 offers a framework for a structured approach to land remediation through the planning process, and is complemented by a wide range of detailed guidance material from public bodies, CIRIA and professional bodies (further details can be found on the back page). In the case of land affected by contamination, risk assessment comprising analysis of pollutant linkages (source-pathway-receptor) is central to the design process. The potential risks of SUDS in sites which contain contamination are as follows:

- Mobilisation of contaminants – SUDS which use infiltration will not be suitable where infiltration is through land containing contaminants which are likely to be mobilised into surface water or groundwater. This can be overcome by restricting infiltration to areas which are not affected by contamination, or constructing SUDS with an impermeable base layer to separate the surface water drainage system from the contaminated area. SUDS which do not use infiltration are still effective at treating and attenuating surface water.
- Introduction of pathways – as with a traditional drainage system, the introduction of SUDS may provide a pathway along which contaminants in aqueous or non-aqueous liquid phase can migrate and enter groundwater or surface water. The likelihood of this should always be considered and the system and the system located to a different area or redesigned as required. It should be noted however that a traditional piped drainage system is also likely to act as a contaminant conduit in this way.

- The best practice approach is to build in consideration of SUDS from the outset
- Risk assessment should particularly consider the potential for SUDS to act as a pathway

It is therefore essential that the selection of the SUDS is considered at an early stage as the type of SUDS used will be informed by the nature and degree of contamination.

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Poor soil infiltration properties

As with greenfield sites, poor soil infiltration can be perceived as an obstacle to SUDS implementation (where contamination is not an issue). In certain cases the soil in brownfield sites has been impacted and may not be suitable for infiltration. However, as described above, most SUDS techniques do not require infiltration and can be designed accordingly, while still providing effective water treatment and attenuation.

To sum up:

- The use of SUDS is as applicable on brownfield sites as it is on greenfield sites;
- SUDS design should be considered at the earliest stages of restoration design;
- For contaminated land, SUDS design can be adapted to ensure that contaminants are not mobilised, and that pollution pathways are not created.



contaminated/derelict land

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Sources of further information

Brownfields - managing the development of previously developed land.
A Clients Guide, CIRIA/DTI

CLEA Guidelines - a series of reports (CLR 7-10) published by DEFRA/EA

Contaminated Land Provisions: Part IIA Environment Protection Act 1990,
An Overview of Part IIA for Appropriate Persons - Booklet published by SEPA
and COSLA

Contaminated Land (Scotland) Regulations 2000, SI No 178

Sustainable Urban Drainage Systems - Design Manual for Scotland
and Northern Ireland (C521), CIRIA

Habitat Survey: A technique for Environment audit, JNC Committee, 1993

How to Investigate Contaminated Land, Scottish Enterprise 1998

How to Approach Contaminated Land, Scottish Enterprise, 1998

National Vegetation Classification: British Plant Communities Volumes 1-5,
Cambridge University Press. handbook for Phase 1

PAN33 - Development of Contaminated Land, Scottish Executive

PAN61 - Planning and Sustainable Urban Drainage Systems, Scottish Executive

SEPA Policy 15 - Regulation of Urban Drainage (www.sepa.org.uk)

Scottish Vacant and Derelict Land Survey - Bulletin published by
Scottish Executive

SUDS in Scotland - The Scottish SUDS Database, SNIFFER 2002



This advice note is produced by SEPA on behalf of the Sustainable Urban Drainage Scottish Working Party (SUDSWP). SUDSWP was formed in 1997 to promote the implementation of SUDS in Scotland. It is a partnership of all the SUDS stakeholders in Scotland including Scottish Water, Local Authorities, the Scottish Executive, development interests, relevant professional institutions and SEPA. SUDSWP can be contacted via SEPA at the address below.



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