

Sustainable Drainage News



The bi-annual bulletin of news and development in sustainable drainage systems

Issue 4 – July 2003

This is the fourth bi-annual newsletter about sustainable drainage systems (SUDS). The newsletter aims to communicate the latest innovations in SUDS practices and encourage their widespread incorporation in developments.

This newsletter discusses the ways in which SUDS can contribute to quality of life and outlines some of the research being undertaken by the Environment Agency, research organisations and academia.

The Bourne Stream Partnership – using the SUDS approach to improve the local environment

The Bourne stream on the south coast of England rises on Canford Heath and flows 9 km south to join the sea at Bournemouth. It forms an important green corridor for local people and wildlife in a highly developed area.

It is a typical urban stream, suffering from large variations in flow and diffuse pollution, particularly in the summer. Heavy rainfall can cause a "first flush" of pollutants, resulting in poor water quality and contributing to failures of the Bathing Water Directive's more stringent guideline bacterial standards in the local bathing waters.

To address these issues and improve the stream for the local community and wildlife a local partnership was formed in 2000. The Partnership aims to improve access to the stream and promote sustainable development in the catchment, which will improve local environmental quality. The SUDS approach has been at the core of the Partnership's thinking. Working with the local community, the Partnership is starting to deliver its objectives through a number of sub-projects (See table overleaf).

The stream flows through both Poole and Bournemouth areas. Planners in both councils have been briefed on the benefits of SUDS in reducing peak flows and improving water quality and are now seeking opportunities to implement SUDS in the catchment.

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Coots on the wetland at DEX, Scotland. Courtesy Black and Veatch

Quality of life Improve access to the stream	Greenlink	Greenway – develop and build a walk/cycle route through the valley
Sustainable development Promote SUDS with LAs and developers	Environment Agency	SUDS Workshop for Poole and Bournemouth Planners in March 2002. Subsequently Borough of Poole adopted supplementary planning guidance promoting the use of SUDS
	Bournemouth & West Hampshire Water Company	Using water wisely – promotion of water saving measures with local residents
Environmental quality Improve stream and bathing water quality Improve habitat for wildlife	EA/Borough of Poole/English Nature	Habitat enhancement work at various locations along the stream designed to reduce flows and improve water and habitat quality
	Wessex Water Plc	Operation Streamclean – identify misconnections from foul to surface water drainage systems

Aims and sub-projects of the Bourne Stream Partnership

An Environment Agency national R&D project is providing some support for the Partnership, including the identification of suitable sites in the catchment for building in-stream features that will improve the habitat, slow water flow and improve its quality. These measures are also being used to educate a wide audience in the benefits of using these techniques to enhance water and habitat quality. The R&D project will also help the Partnership consider SUDS options, such as swales and porous pavements away from the stream in existing developed areas, and their potential impact on flow patterns and water quality.

Neil Smith, Environment Agency



Retrofit SUDS site in the State of Maryland, USA. Courtesy of Sustainable Drainage Associates.

Valuing the benefits of SUDS

As SUDS are increasingly being incorporated into developments across the UK, there is a growing interest in their cost-effectiveness.

Proposed schemes should ideally present a cost-effective solution (meeting the design objectives for the lowest cost, while providing a benefit - cost ratio well above unity). Costs should not only include expenditure associated with implementation, but also the costs of ongoing operation and maintenance activities. Capital and ongoing costs can be estimated based on current design guidance, but bringing an understanding of long-term benefits into the decision-making process is a new challenge.

A study being undertaken by HR Wallingford for the DTI (in association with industry partners and the Environment Agency) is addressing the whole-life costs of SUDS. The study is undertaking educational campaigns and research into public perception of SUDS, and will provide guidance on the potential ecological benefits of the systems.

Reductions in flood risk and increases in property prices next to SUDS sites are examples of measurable economic benefits. However, there are other less tangible benefits, such as enhancements to recreational and ecological value and improvements to receiving surface water quality. Such benefits can now be quantified using environmental valuation techniques such as contingent valuation and choice modelling. These questionnaire survey techniques elicit information on the value individuals place on particular environmental attributes or proposed improvements.

ODDS & SUDS

CIRIA is developing exciting urban drainage proposals for information go to: www.ciria.org/suds/suds_project.htm

Benefit transfer approaches are also becoming better established and more widely accepted. These take values calculated using more complex techniques for similar change elsewhere and use them to establish cost-effective ball-park values for other environmental impacts. Appropriate adjustments need to be applied to account for each site's individual characteristics. The Foundation for Water Research and the Environment Agency have produced manuals that advise how to apply benefit transfers to changes in surface water quality and river flows/volumes.

Studies undertaken by JacobsGIBB for the Environment Agency have determined recreational values and non-use values associated with improving freshwater fish stocks and water levels in rivers, providing robust values that can be applied to parallel situations, using benefit transfer techniques.

Similar approaches can be used to help bring the wider benefits of SUDS into a framework for future sustainable decision-making.

James Spurgeon, JacobsGIBB Ltd
Bridget Woods Ballard, HR Wallingford Ltd

An AUDACIOUS project on urban drainage

Climate change is often seen as a threat. However, the need to manage extreme rainfall events in urban areas provides an opportunity to integrate the activities of highway authorities, land drainage authorities, planning authorities, water service providers and regulators to improve our urban environment. The management of climate change impacts can contribute to the development of sustainable communities, improving the environment and quality of life, as shown below:



Integration of climate change impacts

To generate optimum solutions, with contributions from the key stakeholders, new enhanced urban drainage models should be developed that can be adapted to meet changing environmental factors, such as groundwater levels, vegetation, changing design standards and rainfall. These models should be able to simulate the interactions between surface and pipe flows, and will be used alongside whole-life cost assessment of solutions within a risk-based approach.

AUDACIOUS (Adaptable urban drainage – addressing change in intensity, occurrence and uncertainty of stormwater), will provide new integrated procedures, computer models, and appropriate (targeted) guidance to help assess climate change impacts and the development of mitigating responses for construction and local drainage systems.

The results will be used to set out a clear picture for stakeholders of the extent of interactions between poor performance of existing drainage systems and the wider urban catchment due to climate change.

The development of guidance, in the form of a toolbox within AUDACIOUS, is only the start. This project, together with other urban flood management proposals within the EPSRC Infrastructure and environment programme, and the DEFRA / Environment Agency Joint R&D programme on flood and coastal defence, is designed to produce comprehensive guidance and new tools for all aspects of urban drainage.

John Blanksby, Pennine Water Group

Useful links and contacts

Listed below are websites, featuring SUDS work, which you may find useful:

- www.ciria.org/suds
- www.environment-agency.gov.uk
- www.boc.com/foundation
- www.epg-ltd.co.uk
- www.sepa.org.uk

CIRIA has published the following on SUDS:

- C521 Sustainable urban drainage systems – design manual for Scotland and Northern Ireland
- C522 Sustainable urban drainage systems – design manual for England and Wales
- C523 Sustainable urban drainage systems – best practice manual
- C582 Source control using constructed pervious surfaces

Framework for sustainable drainage systems (SUDS) in England and Wales: launch of consultation document

The National SUDS Working Group was established in 2001 to assist in removing the log-jam of national obstacles to SUDS. The group was formed from key government departments, the water industry, local and highway authorities, regulators, and the construction industry.

The work of the group has been encapsulated in the SUDS Framework, launched in May 2003 for its three-month consultation period; deadline for replies is 15 August 2003. The purpose of this Framework is to provide a set of core standards and agreements between those public organisations with statutory or regulatory responsibilities relating to SUDS, leading to a Code of Practice.

Electronic copies of the Framework consultation document may be viewed and downloaded from www.environment-agency.gov.uk Click on your environment; consultations; current consultations; Framework for Sustainable Drainage Systems (SUDS) in England and Wales.

Once all replies to the Framework consultation have been received, the former working group will become a steering group, and draft the SUDS Code of Practice. This will be a living document that is periodically updated. In the long-term we will need to consider producing a document equating to Sewers for adoption, perhaps entitled SUDS for adoption.

The Framework provides guidance on planning, regulation and consents, legal issues, and ownership and maintenance. It should be seen as complementary to the CIRIA SUDS manuals. Some key SUDS problems being tackled are:

- Water companies' legal right to adopt SUDS: this is clarified in the Framework at section 9.
- Guidance on SUDS maintenance: a draft model legal agreement is included in the Framework at Appendix A, and a draft ownership/maintenance matrix is included at Appendix B.
- Funding the service: draft procedures have been included in the Framework at Appendix A, based on the principle of using a Section 106 TCPA 1990 agreement.
- Need for a discharge consent, and a contaminated waste licence, for removal of dredged material from SUDS ponds: For guidance on the disposal of dredged material from some SUDS, the Framework outlines at Appendix E cases where the requirement for authorisation may be relaxed. An option is also suggested at section 8, for where an authorisation is not normally required, to allow removed sediment to be deposited on site within 10 metres of the edge of the structure; this bypasses the need to consider whether or not the sediment is contaminated.

- Nationally-agreed methodology for calculating greenfield runoff: A draft methodology is included at section 6.6.

Not all the answers have been provided; many of these lie with government, and in the autumn DEFRA will be considering introducing legislation.

Prosper Paul, Environment Agency

ODDS & SUDS

The Water Environment and Water Services (Scotland) Bill can be found at www.scottish.parliament.uk/S1/parl_bus/bills/b57bs1.pdf

Supporting dissemination of SUDS work....

This newsletter and CIRIA's SUDS website (www.ciria.org/suds) are the outputs of a project to promote good practice relating to SUDS. If you would like to sponsor the newsletter and website and participate in the project please contact CIRIA on 020 7828 4441.



Infiltration trench in Malmö, Sweden. Courtesy of C J Pratt.

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