

## **irishsuds.com - New SuDS Website for Ireland**

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Dublin is one of Europe's vibrant and dynamic cities. The city has outgrown the old sewerage infrastructure serving it. Dublin's rapid growth in the 1990s resulted in pressure on its infrastructure. In particular the sewerage system, parts of which were built over a century ago, never envisaged the city the size it is today.

Dublin's problems are similar to those of many other cities. In being located on a river estuary, the drainage system is generally dendritic with the treatment works at the seaward end of the city. Most developments that take place are by definition further inland, requiring all the additional sewage to pass through the existing trunk sewer system. The result of this is that both pollution of the rivers and flooding at an increasing number of locations occurs at more frequent intervals.

The Greater Dublin Strategic Drainage Study (GDSDS) was completed in 2005 and involved the seven Local Authorities of the Greater Dublin Area. The study carried out an in depth assessment of the Dublin's drainage system extending out to the north, south and west to take account of all potential development that might affect the city and its environs up to the year 2030. In addition to the extensive analysis of the drainage systems and the data collection that was carried out, the output also provided five policy documents. One of these was an Environmental Policy, a second dealt with drainage of New Developments and a third on Climate Change. These three documents focused on the design approach and criteria for new drainage. The objective of these three policy documents was to ensure that any future development did not continue the trend towards increasing flooding in the city and pollution of the rivers.

Drainage design in the past has been extremely simple using a rational method to size pipes to ensure that surface water is removed as quickly as possible to ensure flooding does not take place. Unfortunately this philosophy is flawed as, in transferring the surface water downstream, it provides the potential for flooding of other areas subject to the capacity further down the system. In addition the pollution in the wash-off from the urban environment is conveyed into the natural environment.

To provide an alternative method of drainage which does not have these failings therefore requires a completely new approach. "Best Management Practices" (BMPs) is a commonly used term throughout the world that refers to this new approach to drainage. For some reason this term is not used in UK and Ireland, possibly because the term "drainage" is not included. In the UK and Ireland this practice is referred to as Sustainable Drainage Systems (SuDS).

SuDS can best be summarised as offering a "total" solution to rainwater management while traditional drainage can be considered as only providing a "collection and disposal" approach. The diagram (Figure 1), where SuDS integrates both quality and

in quantity of runoff with increase in amenity and biodiversity, is traditionally used to show the holistic nature of SuDS addressing rainwater management as a whole and seeing it as an opportunity rather than a threat to be removed and to utilise the benefits of rainwater for man and the environment as effectively as possible. In addition the diagram (Figure 2) indicates the need to consider the management of stormwater as a process through the system as it passes downstream. The philosophy of SuDS is to try and replicate the natural drainage that would have occurred prior to development.

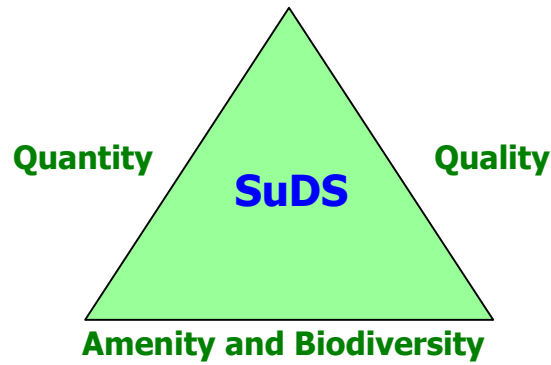


Figure 1 SuDS TRIANGLE (courtesy of CIRIA)

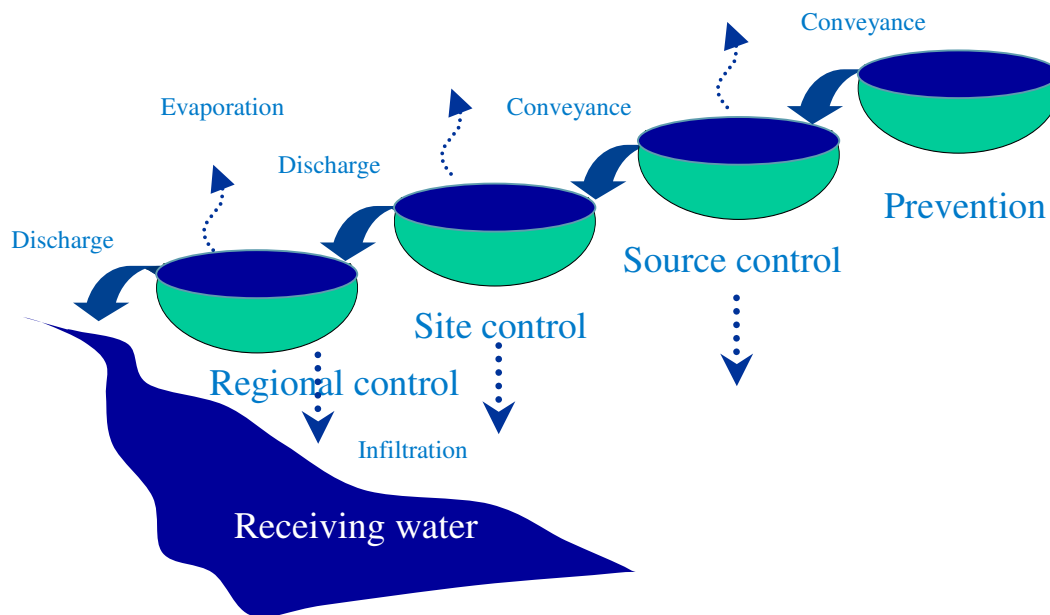


Figure 2 SuDS STORMWATER TRAIN (courtesy of CIRIA)

SuDS are the antithesis of standard piped drainage in every way. This means they pose a massive challenge to the water industry and the community. If they are to be implemented properly it requires consideration of the **institutional** framework

required, awareness and understanding by **society** at large, and skills development to ensure **technical** competence of engineers. The following summarises the completely different approach provided by SuDS.

**Conveyance V Storage** – SuDS are volumetrically based systems while pipes are aimed at maximising conveyance.

**Source control** – SuDS aim to address rainfall runoff at source as much as possible rather than removing it as quickly as possible.

**Pollution** – SuDS provide treatment processes to retain and breakdown pollutants while piped systems transport the pollution downstream.

**Design (hydraulic and treatment)** – there are an infinite number of ways in addressing stormwater using SuDS (combination of components, shapes and sizes) whereas pipe design is a standard simple procedure understood by all drainage engineers.

**Design criteria** - new and more complex criteria have to be considered.

**Institutionally** – where pipes can be easily defined in terms of ownership, most SuDS components are not easily categorised. For instance permeable pavements are both road structures as well as stormwater management facilities. Ownership is currently the biggest impediment in the take up of SuDS.

**Health and safety risks** – risks associated with pipe based systems are limited to operators and well understood by the water industry, while SuDS often provide open water systems which introduce new liabilities with respect to the public as well as water industry operators.

**Ecology** – ecology is not an issue for pipe based drainage systems, while SuDS emphasises the need to maximise biodiversity as well as amenity. This introduces additional responsibilities and skills needed by the owners of SuDS.

**Maintenance** – as with ecology, the management of these systems requires new skills and techniques. Limited experience in their management means that costs are less certain. In addition different designs of the same type of SuDS can result in very different costs.

**SuDS drainage records** – possibly one of the most difficult issues in the long term is the fact that all SuDS systems need recording, both those in private ownership as well as those in the public domain. This is because any change in any part of the system will have an influence on the performance of the drainage system downstream. This is particularly important as a significant proportion of the total drainage system performance could well be dependent on drainage that is privately owned.

**Management** - the implications of having a large proportion of the drainage infrastructure in private ownership has major implications in terms of managing the risk associated with the possible changes made by homeowners and ensuring that the drainage provision capability is not significantly reduced.

It can therefore be seen that SuDS poses a massive challenge for the water industry to move away from traditional drainage systems. To do this not only requires the use of new drainage techniques, it also requires the development of new criteria and new analytical methods of design. The GDSDS policy document on New Development, together with recommendations in the Climate Change policy statement, provides a totally new approach to drainage design to be used in the Greater Dublin Area. It should be noted that this design approach and the use of SuDS is now mandatory in the Greater Dublin Area for all new drainage and this has been the case since 2006. In other parts of Ireland it is being applied on an ad hoc basis. However some Local

Authorities, outside the Greater Dublin Area, are proposing to incorporate the mandatory use of SuDS in their Development Plans.

The problem now facing Dublin City Council and the other six local authorities is getting across the message of this new approach and encouraging the development of the appropriate skills in the industry to ensure the use of good drainage practice.

To this end Dublin City Council commissioned HR Wallingford to develop a web site to provide all the necessary information on SuDS and drainage design criteria and to make information as easily accessible as possible. In addition guidance on the application of the design criteria and two on-line tools are provided on the website free of charge. Using this website provides assistance on designing surface water drainage systems. Figure 3 shows the homepage of the website, suitably named [irishsuds.com](http://irishsuds.com).



**Figure 3** [irishsuds.com](http://irishsuds.com) Home Page

The first tool provides an indication of the storage volume requirements to implement the design criteria for any site of any size located anywhere in Ireland (including Northern Ireland). Figure 4 provides a picture of the data input page after selecting the location of the site on a map of Ireland. This tool only requires a name of the site, the size of the site and the proportion of the site that will have impermeable surfaces. This tool is therefore aimed at being able to be used by all parties involved in the process of development. This means that planners and developers can obtain a common understanding of the situation without having to spend time and money evaluating the site using consultants at the initial stage of assessing the drainage

requirements. This is a big cost saving as well as minimising the time required in putting forward planning applications for sites.

The screenshot shows the 'Irish SuDS: Guidance and Tools' website. The main heading is 'Stormwater Storage Assessment Tool'. On the left is a map of Ireland with a 'Go to a County' dropdown menu. The right side contains a form for site characteristics and a table of results.

Site characteristics	automatic values	editable values	unit
Area		1	ha
Proposed % of Impermeable Area (50-100%)		100	%
% of Impermeable Area Required Treatment		100	%
Soil Type (based on FSR)	4	4	
Hydrological Region	Dublin Region	Dublin Region	
Average Annual Rainfall	874	874	mm
M5-60 Rainfall Depth	17	17	mm
"r" Ratio M5-60/M5-2 day	0.3	0.3	
Climate Change Increase	1.1	1.1	%
<b>Discharge rate limits*</b>			
1:1 year	5 (5)	5 (5)	l/s
1:30 year	13 (6)	13 (6)	l/s
1:100 year	16 (6)	16 (6)	l/s
<b>Volumetric requirements*</b>			
treatment storage	120 (120)	120 (120)	m <sup>3</sup>
long term storage	201 (0)	201 (0)	m <sup>3</sup>
attenuation storage	247 (534)	247 (534)	m <sup>3</sup>
interception storage	40 (40)	40 (40)	m <sup>3</sup>

\* values in brackets are calculated for the case when long-term storage is not used

Buttons: Re-calculate, Report

**Figure 4** [irishsuds.com](http://irishsuds.com) Tool for Stormwater Storage Analysis

The second tool provides a report on the use of appropriate suds components for any particular site based upon information particular to that site. Information needed includes soil type, groundwater level, catchment size, the type of development and a number of other site characteristics. Figure 5 shows the data input requirements for this tool. The report produced allows both the developer and the planner and the design engineer to start from a common understanding of the set of SuDS units which are likely to be most appropriate for the site.


This website officially came online on the 1<sup>st</sup> of December 2007. The next phase in ensuring a rapid take-up of SuDS across the Dublin region, as well as encouraging its use across whole of Ireland, is providing training for both public authority staff as well as developers and their consultants. This is currently in development and it is anticipated that in 2008 a number of training courses on SuDS will be carried out in Dublin and in other regions.

Irish SuDS: Guidance and Tools


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Evaluate Your Site



Dublin City Council  
Comhairle Cathrach Bhaile Átha Cliath



Dublin Drainage  
A Strategic Study for Greater Dublin

This tool provides guidance on applicable use of SuDS which are specific to the site characteristics of the development. Fill out the form below and click on "Evaluate Site" to produce your report.

Site Name:

Site Development Includes: (Select at least one option)

- Residential (Low Density)
- Residential (High Density)
- Commercial
- Industrial

Drainage Ownership: (Select at least one option)

- Private
- Local Authority

Site Size:

Soil Type:

Land Use:

Location:

Other Characteristics: (Select any that apply)

- Contaminated Land
- Aquifer - High Vulnerability
- Water Considered to be Scarce

Ground Water:

[Click Here to Download the Extended SuDS Guidance \(pdf 600KB\)](#)

**Figure 5**     [irishsuds.com](http://irishsuds.com) Tool for Site Specific Guidance on the use of SuDS