

# Appendix E: Use of SuDS and sustainable development

## Advice on the use of SuDS and sustainable development

As development increases, so too does the volume of rainwater falling on impermeable surfaces. These surfaces prevent stormwater from draining naturally through the ground to local rivers and streams. In order to compensate for this and to prevent localised flooding, traditional drainage systems aim to convey this water to local watercourses as quickly as possible.

This practice is becoming increasingly undesirable, as it can increase the chance of localised flooding further downstream and leads to increased pollution in the watercourse from pollutants such as oil and litter which are present on the developed surfaces.

In order to relieve the demand on public water supplies and wastewater collection and treatment facilities, it is also becoming desirable to make better use of wastewater and surface water on site, by collecting and re-using it where possible.

This section introduces a number of water management methods which may possibly be used to achieve effective drainage and water usage whilst considering the present and future environmental impact. The main aims of these schemes are:

- To keep water on site for longer;
- To prevent pollution;
- To allow the storage and use of the water.

Support for the SuDS approach to managing surface water run-off is set out in paragraph 22 of Planning Policy Statement 1 (PPS1): Delivering Sustainable Development and in more detail in Planning Policy Statement 25: Development and Flood Risk, Annex F. Paragraph F8 of the Annex notes that "LPAs should ensure that their policies and decisions on applications support and complement Building Regulations on sustainable rainwater drainage".

Approved Document Part H of the Building Regulations 2000 establishes a hierarchy for surface water disposal, which encourages a SuDS approach. Under Approved Document Part H the first option for surface water disposal should be the use of SuDS, which encourage infiltration e.g. soakaways or infiltration trenches. Where the intention is to dispose to soakaway, these should be shown to work through an appropriate assessment carried out under BRE Digest 365.

### *SuDS (Sustainable Drainage Systems)*

SuDS is the collective term for a number of drainage methods which can be used in various combinations to provide an effective but sustainable drainage system in place of, or in conjunction with, a traditional drainage system.

SuDS schemes aim to improve on traditional drainage methods by attempting to replicate natural land drainage systems and processes. These schemes reduce the risk of flooding, by more effectively managing the flow rates of surface water to watercourses.

Through natural processes, they also reduce the amount of pollution transmitted to watercourses, stabilising or improving water quality. In addition to this, SuDS schemes can actively enhance the developed environment by improving landscaping, wildlife habitats, and community facilities.

The four general methods included in SuDS (Excluding Reduction of flow) are as follows:-

#### **(i) Filter strips and swales**

A swale is a shallow channel whereas a filter strip is a gently sloping piece of ground. Both are grass covered areas designed to drain water from surrounding impermeable surfaces.

**(ii) Filter drains and permeable surfaces**

Both of these use a volume of permeable material below the ground to store surface water for a period of time. Water enters storage via a permeable surface such as grass, gravel, or porous paving. This method is particularly useful to drastically reduce the impermeable area of features such as car parks and paths.

**(iii) Infiltration devices**

These are features such as trenches, usually filled with stone and usually dry, which are designed to encourage the infiltration of surface water into the ground.

**(iv) Basins and ponds**

Both of these types of feature are designed to store water during periods of peak rainfall and discharge it during drier periods. Basins include flood plains and detention basins, which are dry under dry weather conditions. Ponds contain water during dry weather, and include features such as balancing ponds, lagoons, retention ponds, and wetlands. These can be enhanced functionally and aesthetically by the introduction of vegetation to the area.

**Rainwater Reclamation**

Rainwater can be collected from roof guttering and permeable paving. It is possible to utilise this water for a range of applications such as toilet flushing, watering of plants, and washing of cars. A certain amount of treatment such as filtration or disinfection may be necessary before re-use, dependant on the proposed use.

**Grey Water Reclamation (Not a Sustainable Drainage technique in relation to surface water)**

Grey water refers to water which originates from the water supplier but has been used in a wash basin, bath or shower. It does not include water from toilets, clothes washing, and dish washing.

It is possible to collect this water and re-use it in applications such as toilet flushing in order to reduce the unnecessary use of higher quality water and to reduce the volume of water discharged to the sewer network. A certain amount of treatment such as filtration and disinfection is necessary before it can be re-used, dependant on the proposed use and level of contamination.

**Benefits**

The environmental benefits of Sustainable Water Management have already been introduced, these primarily being:

- Limiting the output of wastewater and stormwater from a development to reduce flood risk;
- Improving the quality of the stormwater reaching watercourses;
- Providing an amenity.

There is also the opportunity of a cost benefit when implementing these schemes, through the possibility of lower construction costs.

**Points to Consider**

SuDS should be considered as early in the development process as possible, preferably at pre-application stage. Not all methods will be suitable or necessary for all developments. Many factors, such as available space or ground conditions, will influence the choice of methods for a particular development.

Adoption (transfer of responsibility of completed SuDS system – see below) issues can often be a barrier to SuDS schemes and it is essential that consultation with the relevant authorities is undertaken at an early stage.

With all of the methods described above there is a requirement for scheduled maintenance if the schemes are to function correctly. It is important to remember that the incorrect functioning of a scheme could have a severe environmental impact, such as increased levels of pollution in watercourses or localised flooding. Incorrect functioning of rainwater or grey water reclamation schemes could be a danger to public health.

For more information on SuDS and water reclamation schemes, the following websites may be of use:-

- [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk) (Business > Business sectors > Construction > Sustainable Drainage Systems)
- [www.ciria.org/suds](http://www.ciria.org/suds)

#### *Adoption of SuDS*

SuDS are usually provided by the developer in compliance with a planning consent condition, imposed by the LPA (usually in consultation with the Environment Agency and/or Severn Trent Water or Yorkshire Water) where they are considered necessary to attenuate the additional runoff from a development before it is discharged to the receiving watercourse or sewer.

In many cases, especially that of residential development, the developer intends to sell the development to prospective purchasers of the houses, industrial units etc and does not wish to have any interest or involvement in the development thereafter.

However, for SuDS to provide consistent and effective long-term attenuation of runoff from the development they have to be maintained in an efficient condition for the life of the development. This may involve the control of weed growth in ponds and lagoons, the frequent removal of debris, both natural and man-made, from watercourses and weed screens, the clearance of blockages, sometimes at short notice, from pipes and culverts, the repair of malicious damage and vandalism, mowing grass in filter strips, swales, dry ponds etc. A routine inspection regime is, of course, essential to ensure that any such problems are identified and dealt with in a timely manner.

This raises the question of the responsibility for the maintenance of SuDS, which may be of particular relevance where the development (e.g. a housing estate) ultimately becomes the property of numerous private individuals. Even where the outflow from a lagoon or retention pond discharges to a public sewer, it is usually found that the water company owning that sewer will be unwilling to accept responsibility for the lagoon. Similarly, even where the receiving watercourse is a Main River, the Environment Agency is unlikely to accept responsibility for any SuDS discharging to that watercourse.

*In practice, unless the SuDS in question are to be effectively abandoned at the outset, its maintenance often inevitably devolves onto the LPA in the absence of any other appropriate body. The LPA should, therefore, be prepared for the necessity of accepting de-facto responsibility for many SuDS and should therefore be aware of the need for financial or other provision to be made at planning stage for the long term maintenance of those installations.*