



SUSTAINABLE URBAN DRAINAGE SYSTEMS

The permanent water may be visually more attractive, although elevated nutrient concentrations may result in algal blooms. To be successful as an amenity, a retention pond should have a catchment of at least 5 hectares and/or a reliable source of baseflow. Inlet and outlet sumps will, as for detention basins, enhance performance by trapping sediment and preventing clogging of the outlet. Removal of collected sediment from the inlet sump may be needed, although typically this is not required at a frequency greater than once every seven years.

Ponds can be fed by a swale system, a filter drain network or a conventional surface water system. The last option will result in much larger peak flows reaching the pond and consequently require a bigger area. A typical retention pond will have at least 20 days retention time, to permit biological degradation of pollutants. For industrial sites, a pond provides a final opportunity to catch oils and chemicals from accidental spillages around the estate.

WETLANDS

These are a further enhancement of retention ponds, and incorporate shallow areas planted with marsh or wetland vegetation. These provide a much greater degree of filtering and removal of nutrients by algae and, to a lesser extent, by incorporation into plant material. Inlet and outlet sumps, as with detention basins and retention ponds, will enhance performance and might be considered almost obligatory since excessive sediment can quickly overwhelm the shallow area.

Only specially constructed wetlands should be used to treat surface water. It is not normally an acceptable practice to lead surface water into an existing, natural, wetland area.

In many developed countries constructed wetlands have been proven to be effective, providing moderate to high levels of pollutant removal throughout the year. Design of constructed wetlands by specialist consultants will maximise their performance and longevity. A review of constructed wetlands was published by CIRIA in 1997 (11).



This wetland serves an industrial estate in Livingston. It acts as both a water treatment facility and provides wildlife interest.

SUDS AS AMENITIES



SUDS such as ponds and wetlands provide additional green areas and interesting water features within the urban environment, useful for urban recreation and pollution tolerant wildlife. They can provide a network of varied habitats threading through the urban environment.

Water features can be incorporated into both rural and urban settings to improve amenity value.

Roof water from the site flows to this attractive water feature at the Wheatley Service Area on the M40.



This newly constructed pond forms part of the treatment system for a major site in Southern England, which will provide a haven for local wildlife as the plants become established.



CONCLUSION

The traditional approach to draining developed areas is having a damaging impact on our environment and is not sustainable. Sustainable Urban Drainage Systems offer a wide range of techniques which can be adopted for most new and redeveloped sites to give a reduced environmental impact from surface water drainage. To implement SUDS techniques effectively, developers need to consider their use at the earliest possible stage, as this may influence decisions on

land purchase and the overall layout of the development. They should consult with planning authorities, the Agencies and sewerage undertakers at the earliest stage of the development process. Widespread adoption of these techniques in new developments would see a long-term improvement in the quality of our urban rivers, contributing to a more varied and attractive urban environment built on a sustainable basis.





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References 4-7, 9 and 11 are available from CIRIA, the Construction Industry Research and Information Association, 6, Storey's Gate, London SW1P 3AU (Tel 0171 222 8891)

Further information and examples of sustainable urban drainage will be found in the following:

Urban drainage - the natural way. Hydro Research and Development, Clevedon, BS21 7RD, UK (Tel. 01275 878371)

Scope for control of urban runoff. CIRIA report 124. 1992. ISBN 0 86017 346 1

Standing Conference on Stormwater Source Control. School of the Built Environment, Coventry University, Coventry, UK (Tel 01203 631313)
and on SEPA's web site, www.sepa.org.uk

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