

Urban water management

Alternative technology for stormwater management

New guidelines available from the Water Research Commission (WRC) provides assistance for the development of sustainable drainage systems.

Background

Stormwater management in the urban areas of South Africa has, and continues to predominantly focus on collecting runoff and channelling it to the nearest watercourse. This means that stormwater drainage currently prioritises quantity (flow) management with little or no emphasis on the preservation of the environment. The result has been a significant impact on the environment through resulting erosion, siltation and pollution. An alternative approach is to consider stormwater as part of the urban water cycle, a strategy increasingly known as water sensitive urban design (WSUD), with the stormwater management component known as sustainable drainage systems (SuDS).

This study had three aims:

- To identify and develop new and appropriate, practical and affordable alternative stormwater management technologies for South Africa in line with WSUD principles;
- To evaluate the identified technology options in terms of their ability to improve stormwater management in urban areas, i.e. reduce the impacts on receiving watercourses resulting from increased velocities and volumes of runoff and the deterioration of runoff quality;
- To develop practical and user-friendly guidelines for the implementation of WSUD for both retrofit and greenfield scenarios in both the economic and sub-economic sectors of South African society.

Methodology

An extensive search was undertaken to uncover all that had been published on sustainable drainage systems since 2000. The information obtained, which included books, journal papers, conference proceedings, reports and manuals, was used to compile a 405-page bibliography. The bibliography was, in turn, used to compile a summary literature review as well as the guidelines.

South African case studies

At the start of the research, a number of exploratory field trips were undertaken to assess what had been planned and implemented in South Africa with respect to SuDS. Although the case studies were limited to only three provinces (Western Cape, Gauteng, and KwaZulu-Natal), these three provinces account for about half the population and the majority of the economic activity of South Africa. They also experience different climatic conditions from each other that roughly represent much of the country.

The identified case studies were then monitored over a two-year period. The eight most promising case studies were selected for further study and reporting. The wetlands and associated SuDS at Century City, in Cape Town, were studied in particular detail.

Development of the guidelines

In the course of the search for source material, 27 SuDS design manuals from Australia, the UK and the USA were reviewed. The South African SuDS Guidelines were then compiled by summarising the key material from these manuals in such a way as to be relevant to all professionals working with stormwater – and not just engineers.

The guidelines are not intended to be a design manual, but a way of highlighting potential opportunities for better stormwater management. Among others, the guideline covers design criteria and methods, SuDS options, source controls, local controls, and regional controls. In addition, a website has been developed which could be expanded in time to cover issues associated with WSUD: www.wsud.co.za

Further reading:

To order the report, *Alternative technology for stormwater management: The South African guidelines for sustainable drainage systems (Report No. TT 558/13)* contact Publications at Tel: (012) 330-0340, Email: orders@wrc.org.za or Visit: www.wrc.org.za to download a free copy.