Water sensitive urban design

Water sensitive urban design (WSUD) is a way of planning our cities to minimise water runoff and ensure any runoff causes the least amount of damage. It is also about wise use of that water to improve our urban environment.

Cities alter the way water flows through the natural environment. Buildings, roads and other impervious surfaces prevent rainwater soaking into the soil, forcing it into stormwater drains and other watercourses.

In Canberra, stormwater has been channeled into concrete stormwater drains or channels that feed into our urban waterway. The result has been increased flash flooding, sometimes leading to erosion of watercourses and damage to vegetation along the waterways. The stormwater has passed into our lakes and rivers, taking with it sediments, hydrocarbons, nutrients and gross pollutants such as litter.

WSUD is an approach to integrating the urban water cycle into urban planning and design to mitigate the impacts on waterways and to make best use of stormwater by mimicking natural water cycle processes.

The key principles of WSUD are:

- *to reduce the demand for potable (fit for drinking) water by using alternative sources of water such as rainwater and treated wastewater and encouraging water efficient appliances*
- *to minimise the generation of wastewater and to treat wastewater to a suitable standard for re-use and/or release to receiving waters*
- *to treat urban stormwater to a quality where it can be reused and/or discharged to surface waters*
- *to use stormwater in the urban landscape to improve the visual and recreational amenity of developments.*

The Canberra connection

As Australia's largest inland city, and the largest urban area in the Murray–Darling Basin, Canberra has a proud heritage in high quality water management for both the city and the region.

Water management in the construction of the city continues to be refined. In the 1980s, highly engineered urban waterways began to change to include more natural features, recognising the merits of natural processes in water quality management. In the 1990s the emphasis shifted to place responsibility for water management as close to the source as possible (i.e. on block) instead of on the broader catchment or sub-catchment. The severe drought in the early 2000s placed a focus on potable (drinking water) security.

The Territory and WSUD

WSUD guidelines were first released in 2007. In 2009 they were given further effect by being included in the Territory Plan as the Waterways: Water Sensitive Urban Design Code (the WSUD Code). The WSUD Code aimed to encourage a reduction in mains water use and improve stormwater quality and quantity.

The guidelines aimed for a 40% reduction in water usage in new developments and refurbishments/extensions compared with pre-2003 levels.

Current WSUD measures include a number of different ways to improve water management, for example:

- sediment control/water quality management in new estates, including ponds and wetlands, swales, rain gardens and stormwater harvesting
- permeable pavements
- retrofitted wetlands (with associated reticulation for reuse of harvested water), such as the Dickson Wetlands
- stormwater detention systems at commercial and industrial sites and multi-unit developments.

In individual homes, the installation of rainwater tanks and water saving appliances and fittings are examples of WSUD. While there has been limited take-up of water sensitive landscaping, some single, multi-unit and commercial developments have incorporated some elements into their garden design.

ACT Government WSUD Review

In July 2013, the ACT Government commenced a review of WSUD and the 40% reduction target. The ACT Government Water Sensitive Urban Design Review Report, released in August 2014, recommends significantly expanding the current measures to achieve the targets, and providing maximum flexibility to developers in how they implement WSUD to help them lower development costs. The recommendations in the report are a first step process in moving forward with WSUD.

The report reiterates the importance of WSUD in our environment to manage our urban water cycle, encourages discussion and refined whole-of-government coordination to achieve better outcomes and reduced costs, and to address implementation of report recommendations.

For more information

Water sensitive urban design: review report
Web: www.environment.act.gov.au

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ACT Government
Environment and Planning

AUGUST 2014

ACT Government WSUD Review

The ACT Government has reviewed the implementation of water sensitive urban design (WSUD) regulations in light of the current context and changing environment.

The regulations, included in the Territory Plan and other ACT Government policies and design standards, aimed to reduce water use by 40% in new developments and refurbishments/extensions compared with pre-2003 levels.

The ACT Government Water Sensitive Urban Design Review Report, released in August 2014, reiterates the importance of WSUD in our environment to manage our urban water cycle, encourages whole-of-government coordination to achieve better on-ground outcomes and reduced costs, and addresses implementation of report recommendations.

Major recommendations include significantly expanding the current measures to achieve the targets, and providing maximum flexibility to developers in how they implement WSUD, which will help them lower development costs.

The ACT Government has supported the findings and recommendations of the review. The report's recommendations are a first step process in moving forward with WSUD.

Summary of issues

The review considered 16 issues that were grouped into four themes.

1. Current application of WSUD compared to a changing environment

The review looked at current WSUD regulations in the ACT across various instruments. It provided an analysis of their application and what could be changed to adapt to a changing environment.

Issue 1 – Currency of the WSUD General Code and promoting innovation

Issue 2 – Design standards for urban infrastructure

Issue 3 – Application of the Water Use and Catchment Code

Issue 4 – Estate Development Plan Guidelines

Issue 5 – Expanding the range of acceptable on-site options for stormwater retention and detention

Issue 6 – The relationship of WSUD and climate change, including stormwater and flood management

Issue 7 – Green infrastructure strategy

Issue 8 – Urban renewal and residential intensification

2. Housing affordability

An extensive literature review was conducted on the impacts of WSUD on the cost of housing, but could not find any substantial evidence to show that implementing WSUD in developments impacted on affordability.

Issue 9 – WSUD and housing affordability

3. Coordination and compliance of WSUD in the building and development phase

The review looked at the coordination and compliance between different ACT Government directorates and with developers and the building industry. It identified that internal administrative processes relating to WSUD and development need significant improvement. Improving WSUD administrative processes has benefits for the government and the community.

Issue 10 – Selection of the most appropriate stormwater treatment measures

Issue 11 – Lack of in-house stormwater modeling skills and capacity

Issue 12 – Water quality monitoring data to provide feedback loop for future designs, maintenance planning and operation of WSUD measures

Issue 13 – Soil stabilisation techniques in developments

Issue 14 – Handover and responsibility of erosion and sediment control mechanisms

Issue 15 – Regulation and compliance on erosion and sedimentation

4. Sustainable maintenance of WSUD assets

The review explored the various funding and maintenance arrangements of public WSUD infrastructure in other jurisdictions and the current constraints facing asset managers of WSUD infrastructure.

Issue 16 – Funding inadequate for maintenance for WSUD assets and hence their performance targets cannot be met.

Summary of recommendations

Review recommendations and actions were grouped into priority projects. The priority projects consider the information addressed by analysis of the issues and the recommendations in section 6 of the review report.

Priority Project 1: Code restructure and revision

Environment and Planning Directorate (EPD) leads a revision of the water sensitive urban design provisions in the Territory Plan, supported by a practice guideline to provide for greater clarity and consistency in interpretation as well as to promote innovation and increase flexibility in meeting WSUD targets.

This responds to issues 1,3,4,5,6 and 8

Priority Project 2: Alternative management and funding models

EPD, Territory and Municipal Services Directorate (TAMS), Chief Ministers, Treasury and Economic Development Directorate (CMTEDD) work together to investigate alternative management and funding models for sustainable maintenance of WSUD assets, informed by cost-benefit analysis.

This responds to issue 16.

Priority Project 3: Housing affordability

The ACT Government will encourage WSUD approaches that maximise cost efficiency at the appropriate level (e.g. on-site versus sub-catchment) to minimise impacts on housing affordability in the ACT, as well as the maintenance burden.

This responds to issue 9.

Priority Project 4: Green infrastructure strategy

EPD, subject to available funding, lead development of a green infrastructure strategy for the ACT as a means of realising the social, economic and environmental values of our green assets including the integration of WSUD assets.

This responds to issues 6 and 7.

Priority Project 5: Design standards

TAMS, subject to available resources, continue its review of design standards for urban WSUD and related infrastructure.

This responds to issue 2.

Priority Project 6: Modelling and monitoring

EPD leads the development of a water quality and flows modelling and monitoring program, focusing on understanding the performance of WSUD assets against modelled results and building internal capacity within the ACT Government in modelling and monitoring.

This responds to issues 11 and 12.

Priority Project 7: Erosion and sediment control

EPD, through the ACT Environment Protection Authority, review the Environment Protection Guidelines for Construction and Land Development in the ACT (2011) and continue to work with the construction industry to improve their performance in erosion and sediment control during the building construction phase. EPD also investigate building certifiers to ensure compliance with site management requirements, including erosion and sediment control.

This responds to issue 15.

Priority Project 8: WSUD asset management transfer

EDD leads the development of a guideline in consultation with TAMS to inform the effective transfer of government owned WSUD infrastructure from construction to management.

This responds to issues 10, 13 and 14.

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