WATER SENSITIVE URBAN DESIGN

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Clean stormwater helps keep our creeks, rivers and lakes, beaches and oceans healthy. Keeping our stormwater clean also provides us with new opportunities for stormwater harvesting and reuse. This helps us to protect our precious water reserves.

What is water sensitive urban design?

Water sensitive urban design (WSUD) is an environmentally preferable alternative to traditional urban drainage systems.

Conventional drain networks carry rainfall away from urban areas as fast as possible, directly to the nearest waterway without treatment. Its main purpose is to prevent urban flooding, because most urbanised areas have up to 90 per cent water-resistant surfaces and rain simply runs off and pools at the lowest point. Along the way it picks up many types of pollution that can harm our waterways.

WSUD aims to provide drainage systems that provide water-quality treatment as well as flood management and to reduce the pollution carried to our waterways.

The key principles of WSUD include:

- minimising water resistant areas
- recharging natural groundwater aquifers (where appropriate) by increasing the amount of rain absorbed into the ground
- encouraging onsite reuse of rain
- encouraging onsite treatment to improve water quality and remove pollution
- using temporary rainfall storage (retarding basins/wetlands) to reduce the load on our drains.

Where can it be used?

WSUD measures have mostly been demonstrated in residential areas around Melbourne, generally in new subdivisions.

However, the Victorian Government has funded a number of projects incorporating WSUD features into roadways (Kingston City Council) and mixed-use areas (such as Docklands in central Melbourne, City of Knox and Yarra City Council). Melbourne Water and VicRoads have also developed WSUD projects in a range of areas.

Not all areas are suitable for WSUD, particularly those with high groundwater tables or very steep slopes.

What are the advantages and challenges of water sensitive design?

WSUD still protects urban areas from flooding during heavy rains. At the same time, it can help improve the health of our waterways by:

- protecting environmental values
- supporting wildlife habitats
- filtering pollution out of stormwater, including litter, dirt, heavy metals, hydrocarbons (oil and grease), and grass and leaves
- helping us to view stormwater as an asset and a resource
- improving the visual appearance (amenity) of an area.

WSUD also provides economic and social benefits, including:

- lower capital cost and construction costs
- reducing the cost of treatment of polluted water
- increasing the value of new subdivisions by improving appearance and the amount of public open space
- a more natural appearance to our neighbourhoods.

What elements can be included in water sensitive urban design?

- A multipurpose corridor that forms the basis of your water treatment system, which may also include water features, habitat protection, visually aesthetic features and recreational space.
- Grass swale – a shallow, grassed or planted open channel beside a roadway or footpath that absorbs water and filters out polluted sediment and some heavy metals and hydrocarbons.
- Bioretention system/infiltration trench –an open channel filled with soils and planted with species that soak up water quickly, filtering out some pollution and slowing the flow of water to the nearest waterway.
- Filtration and retention basins – ponds that slow the progress of water from street to waterway, absorbing some back into the ground and preventing flooding in the waterway without flooding the street. Filtration basins also filter out polluted soil.
- Water-sensitive housing layout – which preserves natural drainage lines and builds around open-space corridors.
- Stormwater from houses directed into a local stormwater treatment feature.
- Reduced paving – shorter driveways, footpaths on one side of the street (with a swale on the other).
- Porous paving – for use in footpaths, carparks and some roads.
- Water-sensitive roads – reduced impervious surfaces and one-way crossfalls (a single slope, so only one side of the road needs a gutter), 'slotted gutters' that enable rain to drain to a swale or bioretention system from several points, instead of one concentrated flow.
- Carparks with one-way crossfalls and 'slotted gutters' that enable rain to drain to a swale or bioretention system from several points.
- Onsite harvesting and reuse, or onsite detention basins for large commercial or industrial sites.

Some tips for implementing water sensitive urban design

- The most obvious time to incorporate WSUD is when a new building, subdivision or public open space area is being planned.
- Plan early.
- Seek out developers/councils who have experience with WSUD and learn from their experiences.
- Provide appropriate education to local residents (for example: don't park on swales), industry, council maintenance staff and other stakeholders about what the features are and how they should be protected.

Where in Victoria can I see WSUD in action?

The Victorian Government has funded a range of WSUD projects throughout Victoria, including a major residential development at Kialla Lakes (City of Greater Shepparton) and WSUD roads in the City of Kingston.

Melbourne Water and VicUrban have also piloted a range of sites, including Lynbrook estate in south-eastern Melbourne, Cairnlea and Epping North.

For more information about WSUD:

- Clear Water information exchange: www.clearwater.asn.au/infoexchange.cfm
- Melbourne Water's stormwater pages: www.stormwater.melbournewater.com.au (click on the link to WSUD)
- *Urban Stormwater Best Practice Environmental Management Guidelines*; (1999) CSIRO Publishing, Melbourne.

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