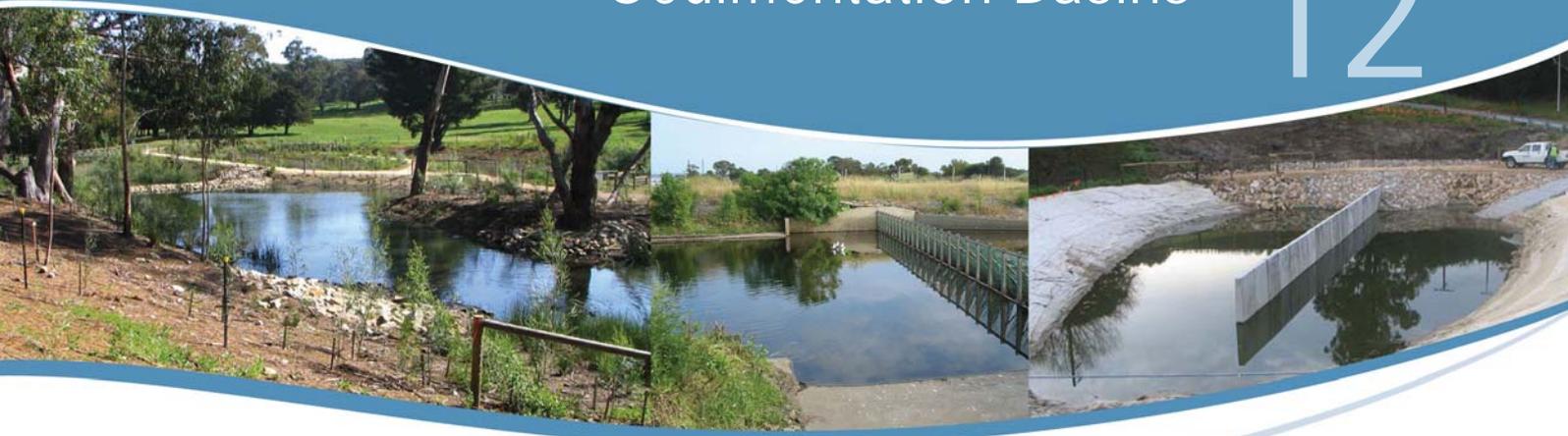


Summary Sheet

Sedimentation Basins 12



Sedimentation basins (otherwise known as sediment basins) are stormwater detention systems that promote settling of sediments through the reduction of flow velocities and temporary detention.

Sedimentation basins are typically installed as part of an overall stormwater management system to remove coarse sediments and regulate flows.

The removal of coarse sediment generally ensures that the vegetation downstream is not smothered by sediment and allows downstream treatment systems to target finer particulates, nutrients and other pollutants. A sedimentation basin also regulates or controls flows and thus protects downstream vegetation against scour during high flows.

Sedimentation basins are generally included as the first treatment step in constructed wetland systems (i.e. the inlet zone) prior to the heavily vegetated macrophyte zone. Sedimentation basins are deeper than macrophyte zones and are vegetated only around the water's edge and bank.

What is Water Sensitive Urban Design?

Water Sensitive Urban Design (WSUD) is an approach to urban planning and design that integrates the management of the total water cycle into the urban development process. It includes:

- Integrated management of groundwater, surface runoff (including stormwater), drinking water and wastewater to protect water related environmental, recreational and cultural values;
- Storage, treatment and beneficial use of runoff;
- Treatment and reuse of wastewater;
- Using vegetation for treatment purposes, water efficient landscaping and enhancing biodiversity; and
- Utilising water saving measures within and outside domestic, commercial, industrial and institutional premises to minimise requirements for drinking and non-drinking water supplies.

There are many different WSUD measures which together form a 'tool kit' from which individual measures can be selected to form a specific response suiting the characteristics of each development (or redevelopment).

Those measures are described in detail in the WSUD Technical Manual, which can be found online at www.planning.sa.gov.au/go/wsud

Sedimentation basins are one such measure.

Application and Scale

Sedimentation basins can take various forms (at a range of scales) and can be used as permanent systems integrated into an urban design or can be used as a temporary measure to control sediment discharge during construction.

Design Considerations

The key design considerations for sedimentation basins include:

- The role the sedimentation basin plays in the treatment train and the surrounding landscape. This determines the target sediment size for settling, and aesthetic and recreational objectives to be met;
- The required water retention capabilities of the base material (i.e. designs typically include a clay base overlain with hard rock);
- Vegetation and landscaping to provide scour and erosion protection and to limit public access where necessary;
- Plant species selection and planting plan to prevent cover of open water zones and enable maintenance access while achieving landscape objectives;
- Maintenance access and frequency to enable sufficient sediment storage capacity and access for sediment removal and drying;
- Identification of land and asset ownership to ensure that maintenance and management responsibilities are clearly understood; and
- Understanding of and compliance with the relevant legislative requirements.



Design Process

Key steps in the design process include:

- Complete site and catchment analysis and identify any site constraints;
- Establish design objectives and targets;
- Consult with local council and other relevant authorities;
- Complete concept design (including target sediment size, design flows, size and shape of basin, storage volume and cross sections);
- Obtain approvals, if required;
- Complete detailed design (including design of hydraulic structures i.e. inlet, outlet and high flow bypass);
- Complete vegetation specification and plan vegetation procurement;
- Develop maintenance plan and assign responsibilities;
- Specify construction tolerances to ensure appropriate hydraulic function.

Legislative Requirements and Approvals

A thorough investigation of required permits and approvals should be undertaken as part of the conceptual design. This can be assisted through discussions with your local council. A proposed system needs to meet the requirements of the following legislation:

- *Development Act 1993*;
- *Environment Protection Act 1993*;
- *Public and Environmental Health Act 1987*; and
- *Natural Resources Management Act 2004*.

Maintenance Requirements

A maintenance plan and associated inspection forms should be developed as part of the design process. Typical maintenance of sedimentation basins will include:

- Routine inspection of the sedimentation basin to identify depth of sediment accumulation, damage to vegetation, scouring or litter and debris build up (after first three significant storm events and then at least every three months);
- Routine inspection of inlet and outlet points to identify any areas of scour, litter build up and blockages;
- Removal of litter and debris and management of invasive weeds (both terrestrial and aquatic); and
- Periodic (usually every five years) draining and desilting, which will require excavation and dewatering of accumulated sediment (and disposal to an approved location).

Further Information

While there is a large range of useful resources and further information available on sedimentation basins, in the first instance it is suggested that people read Chapter 12 of the *Water Sensitive Urban Design in Greater Adelaide Technical Manual*. Further information is available at www.planning.sa.gov.au/go/wsud

Other Summary Sheets

Other Water Sensitive Urban Design Summary Sheets for the Greater Adelaide Region are available in this series. To download the summary sheets, visit www.planning.sa.gov.au/go/wsud

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