

## Overview

### What

This guide explains what you need to do when building an on-site stormwater detention (OSD) system on your property.

### Who

This guide is for land owners, builders and developers who design and build an OSD system connecting to a Sydney Water or City of Sydney Local Government Area (LGA) stormwater asset.

### Why

This guide sets out our requirements for an OSD system. It helps us:

- support urban development
- protect the community by ensuring development activities do not increase flood risks
- ensure OSD systems are maintained correctly and regularly

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## 1. Introduction

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Changes in land use for urban development generally increase stormwater run-off. Building hard surfaces such as pavements, roofs and site drainage increase the volume and speed of stormwater run-off. They also reduce the capacity of stormwater to soak into the ground.

As the capacity of existing stormwater drainage systems is limited, if you're building or developing a new property you may need to provide on-site stormwater detention (OSD) systems to ensure that stormwater run-off does not increase flooding downstream of your development.

On-site stormwater detention provides temporary storage of stormwater run-off. This means the run-off rate and volume can be controlled to ensure the receiving system is not overloaded. The required size of storage and rate of discharge vary depending on the location, size and subsequent impact of your development.

This guide specifically addresses the requirements for Sydney Water, and is supplementary to any council guidelines. Please check with your local council for their requirements. Unless otherwise agreed, the owner or developer will be responsible for all costs associated with meeting our requirements.

## 2. When does my property need an on-site stormwater detention (OSD) system?

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### Which properties need an OSD system?

If you're connecting to or developing a property that connects to a Sydney Water or City of Sydney LGA stormwater asset, you may need to install an OSD system. Properties that must have a system include (but are not limited to):

- all commercial, industrial and special use (eg community, education, recreational) buildings or structures
- town houses, villas, home units or other strata subdivisions
  - These may use a single OSD system for the total site area as long as it's located on common property and the body corporate is responsible for maintenance.
- dual occupancy lots
  - Each lot within the dual occupancy must have its own OSD system. Each individual lot owner is responsible for maintenance.
- sealed sporting facilities (eg tennis, basketball courts)

### Which properties don't need an OSD system?

You may be exempt from requiring an OSD system if:

- you are building a single residential dwelling
- the original total site area is under 250 m<sup>2</sup>
- the development site is at the lower section of the catchment
- you are refurbishing an existing building and maintain the existing drainage system

## 3. What are the design requirements?

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### Design certification

Designs of the OSD system must be prepared by an appropriately qualified professional. The design must follow and meet:

- requirements in this guideline
- requirements in the *On-site stormwater detention policy*
- current best practice/principles outlined in the *Australian Rainfall and Run-off (1987)* guideline.

The design must also be certified by a chartered civil engineer stating that it has been prepared accordingly.

### Design calculations

Your OSD system must be able to:

- store the run-off caused by a storm event up to 100 year ARI for the site
- control the rate of discharge to ensure downstream stormwater assets can handle the extra run-off.

To achieve this, the OSD system must be designed to meet two key requirements:

- **Permissible Site Discharge (PSD)**

PSD is the maximum rate of discharge for the total site that the existing downstream stormwater system can handle.

- **Site Storage Requirement (SSR)**

SSR is the minimum storage volume that is needed to temporarily store and offset the excess stormwater run-off due to the development.

To determine your PSD and SSR, email the Land and Waterways team at [stormwater@sydneywater.com.au](mailto:stormwater@sydneywater.com.au) with the following information about your site:

- development address
- total site area (m<sup>2</sup>)
- existing pre-development impervious area (m<sup>2</sup>)
- proposed post-development impervious area (m<sup>2</sup>).

We will then calculate and inform you of the PSD and SSR for your site.

### Design specifications

#### Site run-off collection

The total flow from the site (from OSD storage and free run-off) cannot exceed the calculated PSD.

The development's drainage system must be able to transport all run-off from a 100 year ARI storm event to the OSD storage. If this is not practical, (eg topography limitations), we may allow up to 10% of your site area to drain externally either to the street or other stormwater system (eg council).

Surface inlets must have suitable grates to stop debris from entering the OSD system. This minimises blockages that may slow the steady discharge of run-off and potentially cause flooding.

## OSD storage type

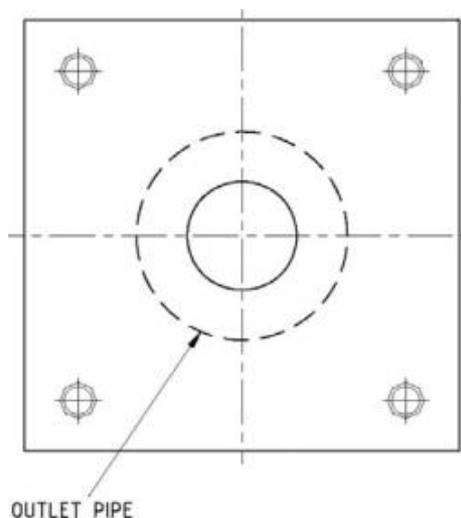
The OSD system must store all the run-off for a storm event (up to 100 year ARI), that is, the **calculated SSR**. The storage type can either be below ground, above ground, or a combination. Our requirements vary depending on the storage type:

Below ground storage	Above ground storage
<ul style="list-style-type: none"> <li>• Access must conform to the current Confined Spaces regulation.</li> <li>• You must install step irons if the fall is 1200 mm or more.</li> <li>• Where there is a risk of gas build up or hydrostatic pressure, you must install a release valve.</li> </ul>	<ul style="list-style-type: none"> <li>• Maximum depth of the above ground storage must not be over 300 mm at full capacity.</li> <li>• Minimum surface slope is 1.5%.</li> <li>• The maximum water level of the OSD storage at capacity must be at least:                             <ul style="list-style-type: none"> <li>○ 300 mm below all habitable floor levels on site</li> <li>○ 150 mm below pedestrian entry/exit facilities.</li> </ul> </li> </ul>

## Orifice plate and discharge rate

The orifice plate controls the discharge rate from the OSD storage. The OSD storage discharge rate (plus any free run-off) must be less than the **calculated PSD** for the site.

The orifice plate must be a minimum 200 mm x 200 mm flat stainless steel plate and 3mm thick. The orifice diameter must not be less than 40 mm.



## 4. What are my responsibilities?

You must regularly maintain your OSD system to prevent potential problems. This helps ensure that if there's a storm, the OSD system functions as designed.

If your OSD system discharges directly into a Sydney Water owned drainage system, you must enter into a formal agreement with us which sets out your ongoing OSD maintenance responsibilities.

You will need to register this agreement on the property title so the information is stored on the title of the land and not lost over time as properties change ownership.

We will provide you with a standard proforma for the solicitor.

The agreement will set out:

- that the property owner / strata will regularly maintain and repair the OSD system at their expense
- that the property owner / strata will not fill or modify the OSD system (to prevent changes to the original approved design)
- a dispute resolution process.

If the OSD system discharges directly into a drainage system that is not owned by Sydney Water, you may be required to enter into an agreement with your local council. Please contact your local council for further information.

## **5. How do I get approval?**

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### **Design approval**

Before you can begin construction you must submit to us:

- certification of design by a chartered civil engineer, verifying that it has been designed to meet the calculated PSD and SSR
- a plan and elevation of OSD system with all dimensions
- the location of OSD storage in relation to overall development and site drainage
- a detailed design of orifice including
  - all dimensions
  - maximum storage discharge rate specifications
  - the percentage (if any) of the site area that will drain to the street or other stormwater system

### **Post construction**

After construction of the OSD system is complete, you must submit to us:

- Work-As-Executed (WAE) plans prepared and signed by a registered surveyor
- Certificates of Hydraulic Compliance that :
  - confirm the system has been constructed and will function as designed
  - identify any variations from the approved design, and state that these variations will not affect the performance of the OSD system

To avoid delays in certification, we encourage developers and builders to have the OSD designer supervise and certify the construction of these systems.

## 6. Definitions

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Term	Definition
Average Recurrence Interval (ARI)	The average or expected value of the periods between exceedances of a given rainfall total accumulated over a given duration. It is implicit in this definition that the periods between exceedances are generally random.
Impervious area	Surfaces that are covered and prevent stormwater run-off from infiltrating the soil eg asphalt, concrete, pavers, rooftops
Orifice plate	A structure which controls the rate of discharge from the OSD storage.
Permissible Site Discharge (PSD)	The maximum rate of discharge for the total site
Site Storage Requirement (SSR)	The minimum storage volume needed to temporarily store and off-set the excess stormwater run-off caused by development
Australian Rainfall and Run-off (ARR) guideline	A national guideline for the estimation of design flood characteristics in Australia. Published by Engineers Australia.