



Building over or adjacent to our stormwater assets

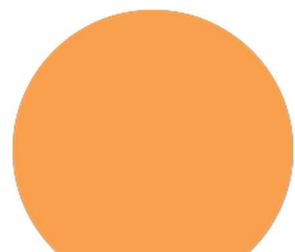
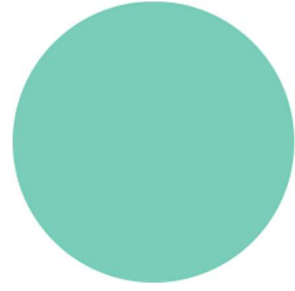
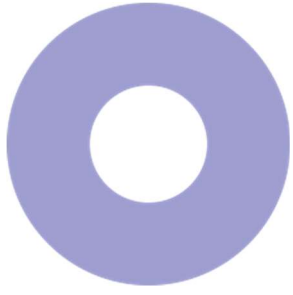




Table of contents

1 Overview	2
2 Introduction	3
3 Building over stormwater assets	3
3.1 Deviation or reconstruction not required	3
3.2 Deviation or reconstruction required	4
4 Building adjacent to stormwater assets	5
5 Asset protection requirements	6
5.1 Structural independence	6
5.2 Building over clearance	7
5.3 Building adjacent clearance	8
6 Report requirements	8
6.1 Services protection report	8
6.2 Flood impact assessment report	9
6.3 Dilapidation survey report	9
6.4 Stormwater deviation report	9
7 Definitions	10
8 Appendix 1 – Flood impact assessment	11
8.1 Consideration of flood risk	11
9 Appendix 2 – Rationale	12
9.1 Open channels	13
9.2 Enclosed assets	13

Table of figures

Figure 1. Zone of influence	6
Figure 2. Building over clearance requirements	7
Figure 3. Build adjacent clearance requirements	8
Figure 4. Open channel drainage capacity	Error! Bookmark not defined.
Figure 5. Enclosed asset drainage capacity	13



1 Overview

What

This guide explains our requirements for building structures other than bridges near our stormwater assets. 'Building structures' includes all associated earthworks and excavations before construction.

If you want to build a bridge over a Sydney Water open stormwater channel, you must instead refer to the [Building bridges over Sydney Water open stormwater channels](#) and [Building over or adjacent to Sydney Water's stormwater assets](#) policies.

Who

This guide applies to owners and developers who want to build over or adjacent to our stormwater assets.

Why

Building over or too close to stormwater assets interferes with our ability to maintain and reconstruct these assets. We require clearances between stormwater assets and other structures to inspect, maintain and reconstruct the stormwater asset when required.

We need you to follow these guidelines to:

- ensure we can provide ongoing local drainage and broader flood mitigation services to our customers
- enable urban development by providing timely information, advice and responses to enquiries and applications
- manage risks associated with building over and adjacent to stormwater assets
- protect the interests of customers by ensuring that proposals do not:
 - increase flood risk
 - have adverse flood impacts
 - increase costs to maintain and replace stormwater assets.



2 Introduction

Building a structure over or adjacent to our stormwater assets can make flooding worse and increase our costs to manage our assets. We aim to keep these structures to a minimum to ensure the community's safety and avoid passing increased costs to customers.

If a stormwater asset is located within 10 meters of your site, you'll need to get your building plans approved through a Water Servicing Coordinator (WSC). We must approve your building plans before you start earthworks, excavation or construction.

3 Building over stormwater assets

We'll only consider proposals to build structures over our stormwater assets when all the following apply:

- The proposed structure will be outside any easement or land owned by us.
- An existing building is located over the asset.
- Building over the asset is the only feasible solution for reasonable development of the property.

If your proposal meets all of these conditions, we'll assess whether you need to deviate or reconstruct the asset. Deviation or reconstruction is required if:



- the remaining life of the asset is less than the expected life of the proposed structure
- the proposed structure will intersect the asset
- the type of asset is not suitable for building over.

Some of our assets are in tunnels. Depending on the type of tunnel and its depth beneath your proposed works, building over tunnels may be acceptable with special conditions

3.1 Deviation or reconstruction not required

If we've determined that deviation or reconstruction is not required, your water servicing coordinator (WSC) will need to:

- submit a services protection report prepared by an accredited provider or a registered surveyor
- submit a pre-construction CCTV or dilapidation survey report for our stormwater asset, prepared by an accredited provider
- submit a flood impact assessment report
- submit building plans and structural details for approval, with clearances between the building structures, footings, piers and our assets clearly marked. These plans must clearly certify that the building design will meet our asset protection requirements (refer to Section 4).



We must approve your submitted plans before any further work can begin. Your WSC will then need to:

- supervise construction following the approved building plans
- submit the project completion package to us. This includes:
 - work-as-constructed drawings
 - post-construction CCTV or dilapidation survey report for our stormwater asset, prepared by an accredited provider.

3.2 Deviation or reconstruction required

If we've determined that deviation or reconstruction is required, your WSC must first explore options to deviate the stormwater asset around the proposed structure and present these in a stormwater deviation report (refer to Section 5).

After reviewing the stormwater deviation report, we'll determine whether the asset must be deviated around the proposed structure or reconstructed to permit building over the asset.

You can select your own designer and constructor; however, we must also approve your selection.

Design stage

Your WSC will need to engage a suitably qualified and experienced designer to design the new stormwater asset and submit to us:

- full stormwater design drawings
- a services protection report for the new asset location prepared by an accredited provider or a registered surveyor
- a pre-construction CCTV or dilapidation survey report for our stormwater asset, prepared by an accredited provider
- a pre-construction dilapidation survey report for structures within 10 metres of the proposed works, prepared by an accredited provider
- a flood impact assessment report
- building plans and structural details for approval, with clearances between the building structures, footings, piers and our assets clearly marked. These plans must clearly certify that the building design will meet our asset protection requirements (refer to Section 4).

Only when we've approved your submitted plans can any further work commence.

Tender stage

Your WSC will then seek and obtain three written quotes from qualified and experienced contractors. The quote must show a breakdown schedule per unit for professional services, delivery and contingency.

You must recommend a preferred constructor and seek our approval before any further work may commence.



Construction stage

Your WSC must then:

- supervise construction as per the approved building plans
- submit the project completion package including:
 - work-as-constructed drawings
 - a post-construction CCTV or dilapidation survey report for our stormwater asset, prepared by an accredited provider
 - a post-construction dilapidation survey report for structures within 10 metres of the proposed works, prepared by an accredited provider.

4 Building adjacent to stormwater assets

We'll only consider proposals to build adjacent to our stormwater assets if the structure is outside any easement or land owned by us.

Your WSC must submit to us:

- a services protection report prepared by an accredited provider or a registered surveyor
- a pre-construction CCTV or dilapidation survey report for our stormwater asset, prepared by an accredited provider
- a flood impact assessment report
- building plans and structural details for approval, with clearances between the building structures, footings, piers and our assets clearly marked. These plans must clearly certify that the building design will meet our asset protection requirements (refer to Section 4).

Only when we've approved your submitted plans can any further work commence. Your WSC will then be required to:

- supervise construction as per the approved building plans
- submit the project completion package including:
 - Work-as-constructed drawings
 - a post-construction CCTV or dilapidation survey report for our stormwater asset, prepared by an accredited provider.

5 Asset protection requirements

We require clearances between stormwater assets and other structures so we can inspect, maintain and rebuild the asset when required.

5.1 Structural independence

You'll need to ensure the continued structural integrity and independence of both the building and the stormwater asset. Foundations must be designed and certified by a structural engineer to meet the following requirements:

- No loads are to be transferred from the structure to the stormwater asset.
- The structure must be fully supported in the event of structural failure and collapse of the stormwater asset.
- Foundations must extend to at least one metre below the zone of influence of the stormwater asset, since asset failure during a storm may cause substantial erosion.
- Any piers are to be bored, not driven.

Zone of influence

The zone of influence is the area above and beside an asset where loads will have an impact on the stormwater asset.

The gradient of the zone of influence begins at the minimum horizontal clearance from the stormwater asset and extends upwards to the ground surface at an angle of 45 degrees (regardless of soil conditions).

Figure 1 shows the zone of influence based on our clearance requirements.

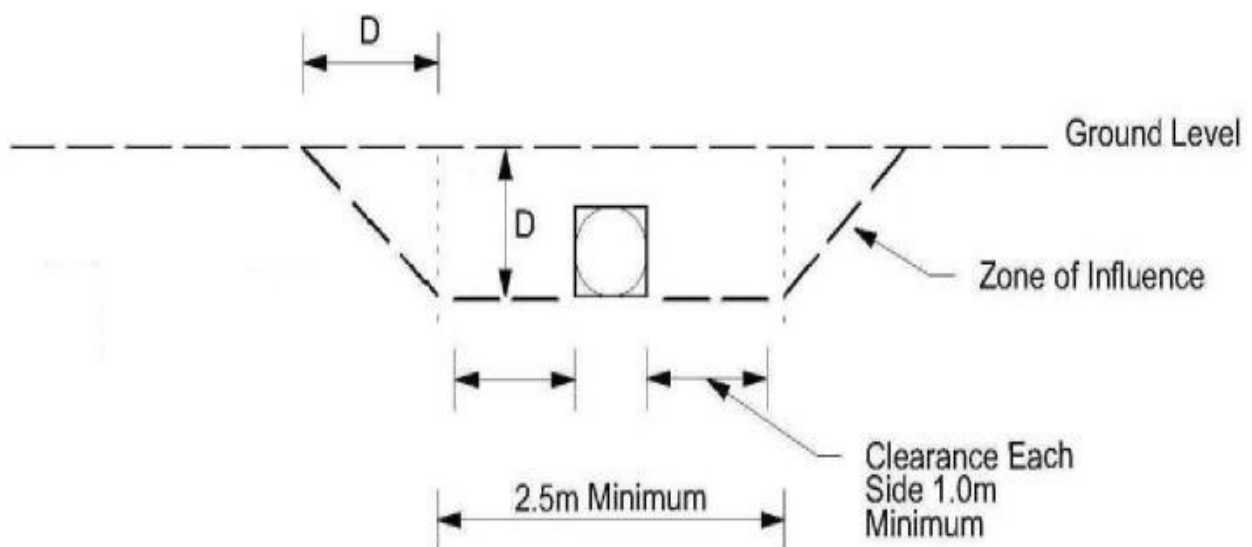


Figure 1. Zone of influence

5.2 Building over clearance

Our clearance requirements for **building over** stormwater assets are:

- one metre from the outside edges of the asset to the adjacent structure.
- 0.6 metres from the outside edge of the asset to the overlying structure.

Figure 2 shows the clearance requirements for building over our stormwater asset.

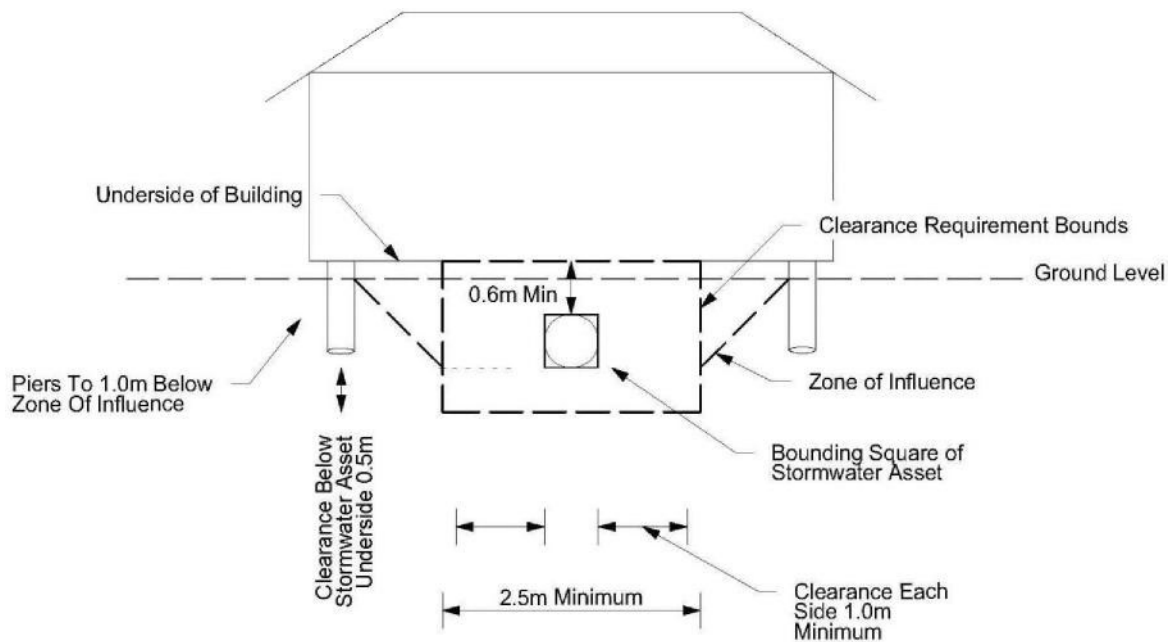


Figure 2. Building over clearance requirements

5.3 Building adjacent clearance

Our clearance requirements for **building adjacent** to stormwater assets are:

- one metre from the outside edges of the asset to the adjacent structure.
- No structure above the asset.

Figure 3 shows the clearance requirements when building adjacent to our stormwater asset.

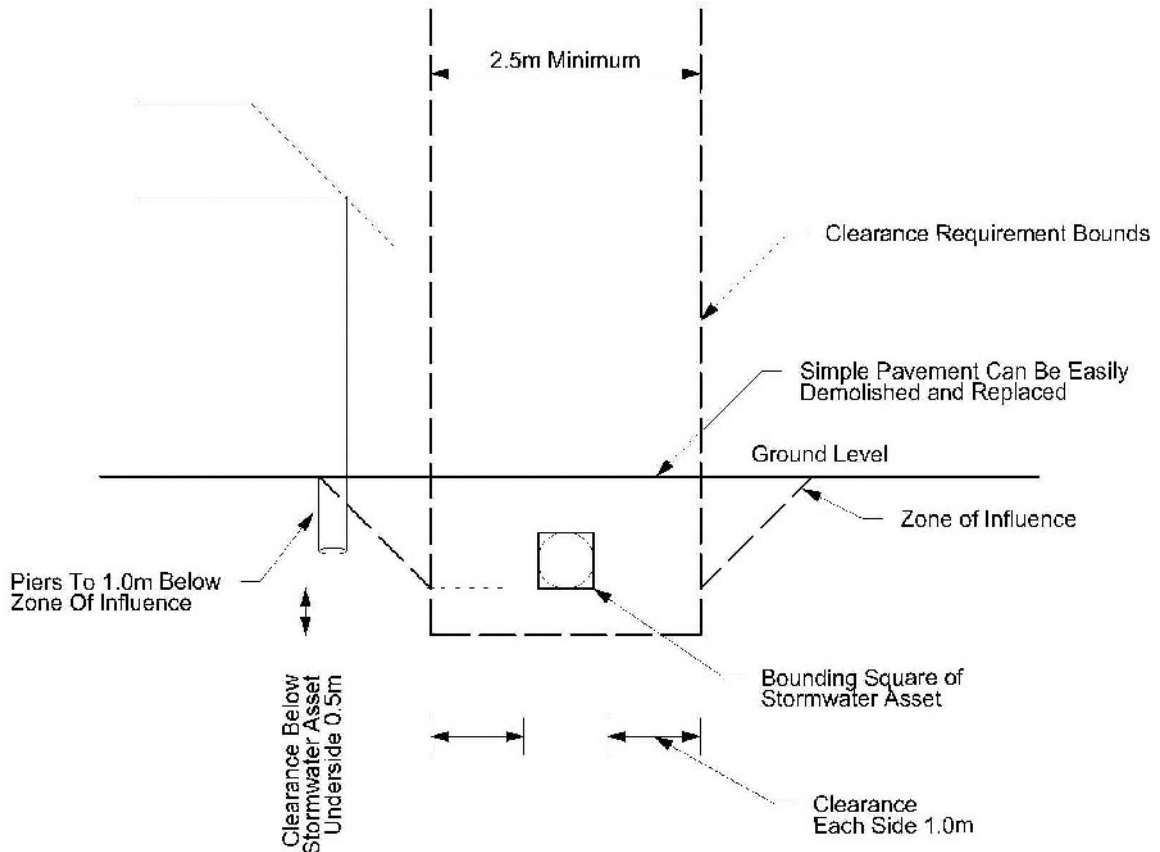


Figure 3. Build adjacent clearance requirements



6 Report requirements

Depending on your proposal, you may be required to submit the following reports.

6.1 Services protection report

As part of the development, the asset must be accurately located to design the appropriate asset protection.

The report will accurately locate the size, alignment and depth of all our assets in the vicinity (that is, water, sewer and stormwater) and within the zone of influence of the existing or proposed stormwater asset. This area may include the subject property, adjoining properties and dedicated road reserve (including footpath area).



You must include a dilapidation survey of the asset's condition. We'll provide you with a recent condition assessment from our scheduled inspection program if this is available.

6.2 Flood impact assessment report

Flood risks should be managed by using the land in a way that is compatible with the flood hazard and at a level of risk acceptable to the community. Controlling and managing land use is the most effective way to manage the consequences of floods and minimise flood risks. This approach to managing flood risk is in line with the NSW Government's *Flood-prone land policy*, included in the *Floodplain development manual*, Department of Infrastructure, Planning and Natural Resources, Sydney, 2005.

A flood impact assessment report must:

- have been completed within the last two years
- be based on a current flood model
- identify flood hazards
- demonstrate there are no potential adverse flood impacts due to the development
- evaluate the impacts of flooding on the proposed development.

For details of minimum requirements refer to *Appendix 1 – Flood impact assessment*.

6.3 Dilapidation survey report

This report protects both the applicant and us from claims that damage has occurred during construction. A dilapidation survey report is a condition inspection and report, with video or photographs of assets and structures nearby that may be affected by the approved works.

You must provide a pre-construction dilapidation survey report before any work begins, and a post-construction dilapidation survey report after work is complete. This will identify any changes that have occurred during the works.

6.4 Stormwater deviation report

Structures over stormwater assets interfere with our ability to maintain and reconstruct these assets. To avoid increased public costs to maintain and reconstruct assets, we may require the asset to be deviated around the proposed structure when possible. If this is the case, you'll need to prepare a stormwater deviation report. This report needs to:

- consider options to deviate our stormwater asset around your proposed structure
- examine the feasibility of constructing a new stormwater asset, including any changes to the slope of the stormwater asset and considering all existing services and structures within the deviation route
- include cost estimates for each deviation option
- include cost estimates for the 'base case' of reconstructing the asset in its existing location
- have been completed within the last two years.

7 Definitions

Term	Meaning
Accredited provider	<p>A private company accredited by Sydney Water to do work on Sydney Water assets.</p> <p>Lists of accredited providers for different functions are available on our website, under:</p> <p><i>Sydney Water > Plumbing building & developing > Building > Providers or Sydney Water > Plumbing building & developing > Developing > Providers</i></p>
Build adjacent clearance requirements	<p>The amount of space required around the stormwater asset for adjacent structures, being one metre horizontally from the outside edges of the asset.</p> <p>Refer to Figure 3</p>
Build over clearance requirements	<p>The amount of space required around the stormwater asset for overlying structures, being one metre horizontally and 0.6 metres vertically from the outside edges of the asset.</p> <p>Refer to Figure 2</p>
Expected life	<p>The total lifespan expected for an asset, based on a structural assessment of the asset's condition.</p>
Overland flow paths	<p>Land that carries surface stormwater flows when the volume of stormwater either exceeds that of the stormwater assets, or the flows cannot enter the assets due to topography or asset configuration.</p>
Reasonable development	<p>A development that:</p> <ul style="list-style-type: none">• complies with the relevant planning controls (eg Local Environment Plan, Development Control Plan, State Environmental Planning Policy)• is approved by both the relevant consent authority (eg council) and Sydney Water's stormwater planning and assessment• accounts for the physical limitations on the design due to environmental, health and safety risks (this type of development may not necessarily maximise the financial potential of the land).
Remaining life	<p>The expected life of a stormwater asset, minus its consumed life.</p>
Stormwater assets	<p>Includes open and covered channels, oviforms, pipes and box culverts, constructed from a variety of materials.</p>

Water servicing coordinator (WSC)

A private company contracted to Sydney Water that is the point of contact between customers and Sydney Water. They provide advice, project management and Quality Assurance in relation to the construction and protection of Sydney Water assets.

A list of WSCs is available on our website, under:

Sydney Water > Plumbing building & developing > Building > Providers
or *Sydney Water > Plumbing building & developing > Developing > Providers*

Zone of influence

The area around an asset (both at ground level and below the ground) that may impact an asset.

Refer to Section 4

8 Appendix 1 – Flood impact assessment

Most developments in a floodplain modify existing flood behaviour. This may adversely impact the surrounding environment, including existing properties and assets. The proposed development itself is also exposed to flood risk, including risk to life and property. We may require a flood Impact assessment report when a development is proposed in the floodplain adjacent to or over one of its assets.

It's worth noting that both open channel and piped/enclosed systems have associated floodplains. A brief description of the typical flooding scenario for both these cases is presented in Appendix 2 – Rationale.



Refer to the most current version of the NSW Government's *Floodplain development manual* to guide the assessment and management of flood risks.

8.1 Consideration of flood risk

All development proposing to build over or adjacent to our stormwater assets should consider the assessment and management of flood risk. Where local council guidelines on flooding are available, you should consider these while preparing your flood impact assessment report.

In the absence of any guidelines, your flood impact assessment report must meet the following requirements as a minimum:

- Consider the Impact of debris blockage in the stormwater asset when deriving the design flood events.
- Determine the flood planning level by adding 500 mm freeboard to the peak 100-year Average Recurrence Interval (ARI) flood level.
- Habitable floor levels to be at the flood planning level.
- You may consider floor levels for carport/parking space/garage at a reduced freeboard, provided you can demonstrate an acceptable level of risk for safety and property damage.

- 
- 
- Points of entry to any below ground or basement area must be at the probable maximum flood (PMF) level or the flood planning level, whichever is higher. You must address evacuation issues in the event of basement flooding.
 - Various land uses within the development should be consistent with the flood hydraulic hazard, as defined in the NSW Government's *Floodplain development manual*.
 - Ensure the structural integrity of the development by considering the floodwater flow velocity for the 100-year ARI or the PMF event, depending on the risk level. You must also consider the impact of floating debris.
 - Provide flood-proofing strategies for various services including electrical equipment, wiring, fuel lines and other services proposed to be connected to the development. Consider placing these services above the PMF level.
 - Identify appropriate storage places above the PMF level for any hazardous material in the development.
 - If the development proposal would significantly increase the number of occupants at the site, you must include a flood emergency response plan. This plan must address evacuation issues associated with any basement levels/car parks.

The report must also include:

- details of the proposed development, including a survey of the stormwater asset(s), the existing site and its surrounds.
- catchment definition and description of the existing stormwater drainage system.
- details of the existing flood behavior, including flood level, discharge and velocity for at least the 100-year ARI design flood. Depending on the nature of your development, you may need to include data for other design floods.
- Evacuation strategies in the event of 100-year ARI and the PMF event.

The required information for the flood impact assessment report may not be readily available and you may need to do appropriate flood modelling to prepare this report.

If you have any questions or would like further advice, please contact us at stormwater@sydneywater.com.au

9 Appendix 2 – Rationale

When the capacity of stormwater systems is not enough to contain storm flows, overland flows and localised flooding occur. Stormwater assets are usually located along the alignment of original watercourses (such as creeks or rivers). Building over open or enclosed stormwater assets is generally not permitted because of the adverse impacts on capacity and flow behavior that are usually associated with building across overland flow paths.

9.1 Open channels

When the capacity of an open stormwater channel is not enough to convey stormwater flows, the water level rises above the top of the banks. This 'overbank flow' substantially increases the total open stormwater capacity for only moderate increases in flow depth. Figure 4 depicts the drainage capacity of an open stormwater asset, consisting of the channel flows and the 'overbank flow'.

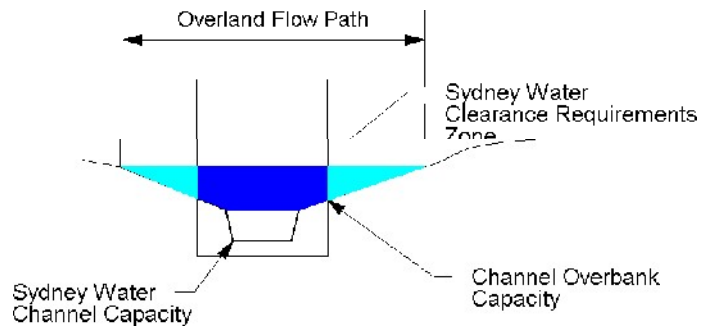


Figure 4. Open channel drainage capacity

9.2 Enclosed assets

In contrast, the capacity of the enclosed stormwater system usually can only increase marginally over the pipe or culvert, due to the asset being buried. Figure 5 depicts the drainage capacity of an enclosed stormwater asset, consisting of the minor flows within the pipe / culvert and the major flows overland.

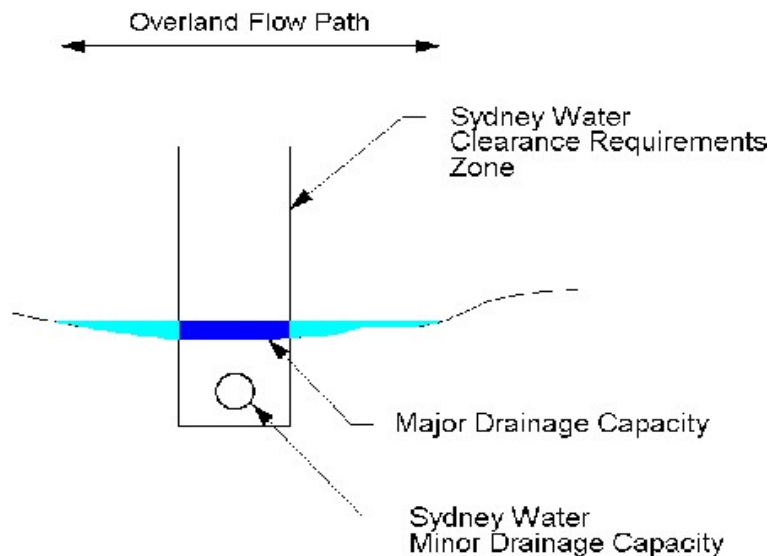


Figure 5. Enclosed asset drainage capacity