

NOTE: This Chapter should not be read in isolation. You may need to consider other chapters of this DCP when preparing your application.



CHAPTER G2: SUSTAINABLE STORMWATER MANAGEMENT AND EROSION/SEDIMENT CONTROL

Chapter G2: Sustainable Stormwater Management and Erosion/Sediment Control

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Amendment history

Version Number	Date Adopted by Council	Commencement Date	Amendment Type
1	14 October 2014	22 October 2014	New
2	23 June 2015	1 July 2015	Amendment
3	20 January 2020	12 February 2020	Amendment

1 Purpose

The purpose of this Chapter is to:

- Give applicants guidance about how to implement sustainable **stormwater** management in the **development** application process.
- Provide design principles for **stormwater** management that assist **development**.
- Outline controls for the management of **stormwater** (including water quality, **waterway** stability, **detention**, erosion and sediment control).

Advisory Note: In addition to the provisions outlined in this Chapter, you must refer to the supporting documents:

- Supporting Document 1: Sustainable Stormwater Technical Guidelines.
- Supporting Document 2: Planning for Erosion and Sediment Control on Single Residential Allotments Guideline (Landcom 2004).

2 Application

This Chapter applies to all **development** in the Shoalhaven Local Government Area. Different sections of the Chapter will apply depending on the **scale**, location and type of the **development**.

Note: In Shoalhaven, State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011 applies to land at Kangaroo Valley and parts of the Sassafras Area.

3 Context

Stormwater is a generic term for rainfall that is concentrated after it runs off all urban surfaces such as roofs, pavements, carparks, **roads**, gardens and vegetated open space and includes water in **stormwater** pipes and channels. **Stormwater** represents a significant proportion of the natural water cycle.

To some degree, all **development** has an impact on the behaviour of **stormwater** through the addition of **impervious** surfaces, diversions and **drainage** and through changes to water quality. Sustainable **stormwater** management is the application of controls on **stormwater** to mitigate, manage and control changes to the natural water cycle, to protect environmental values and to protect human life and assets.

4 Objectives

The **objectives** are to:

- i. Manage **stormwater** flow paths and systems to ensure the safety of people and property.

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- ii. Protect and enhance natural **watercourses** and their associated ecosystems and ecological processes.
- iii. Maintain, protect and/or rehabilitate modified **watercourses** and their associated ecosystems and ecological processes towards a natural state.
- iv. Mitigate the impacts of **development** on water quality and quantity.
- v. Encourage the reuse of **stormwater**.
- vi. Integrate water cycle management measures into the landscape and urban design to maximise amenity.
- vii. Minimise soil erosion and sedimentation resulting from site disturbing activities.
- viii. Minimise the potential impacts of **development** and other associated activities on the aesthetic, recreational, cultural and ecological values of receiving water.
- ix. Ensure the principles of **ecologically sustainable development** are applied in consideration of economic, social and environmental values in water cycle management.
- x. Ensure **stormwater** systems and infrastructure are designed, installed and maintained so as not to increase the **risk** to life or safety or people.
- xi. Provide Green and Golden Bell Frog friendly **stormwater detention** ponds in areas where Green and Golden Bell Frog are present.
- xii. Ensure **stormwater** systems and infrastructure are appropriately designed and installed to minimise the ongoing maintenance costs as much as possible.

5 Controls

5.1 Stormwater

5.1.1 Minor and Major Systems Design

Performance Criteria	Acceptable Solutions
<p>P1 Minor and major drainage systems are appropriately designed to:</p> <ul style="list-style-type: none"> Not increase the risk to life or safety of persons during a storm event. <p>Note: Refer to Supporting Document 1: Sustainable Stormwater Technical Guidelines.</p> <ul style="list-style-type: none"> Manage stormwater discharge from the development or work to safely convey stormwater flows. Discharge runoff from the development without adverse 	<p><i>General</i></p> <p>A1.1 Runoff from impervious areas must not be concentrated or directed onto neighbouring properties.</p> <p><i>Minor System Drainage</i></p> <p>A1.2 For residential and rural residential areas, drainage must be designed to cater for a 5 year Average Recurrence Interval (ARI) event.</p> <p>A1.3 For mixed residential/commercial, commercial and industrial development, the drainage must be</p>

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impacts on existing infrastructure and neighbouring properties.

- Ensure continuity of **overland flow paths** where possible.
- Ensure **stormwater** systems are designed in accordance with industry standards.

designed to cater for a 10 year ARI event.

- A1.4 Kerb and gutters are required where soil permeability is not sufficient to allow natural **infiltration** of **stormwater runoff** without causing adverse impacts onsite or to neighbouring properties.
- A1.5 **Runoff** from roofs and other **impervious** areas shall be directed to an existing or proposed **stormwater** system when it can be proven to **Council's** satisfaction that the design capacity of the system is not exceeded.
- A1.6 Where onsite **infiltration** / absorption is proposed for **stormwater** disposal, supporting **geotechnical reports** are submitted with a **development** application to assess the suitability of the proposal.

Note: The geotechnical report shall also identify the depth to groundwater and measured on-site infiltration rate.

Where onsite infiltration is proposed for stormwater disposal, the applicant must demonstrate that this will not occur in areas with known soil or groundwater contamination.

- A1.7 **Stormwater** inlet structures must be designed with a blockage factor provision in accordance with the latest version of the Australian Rainfall and Runoff (ARR) guidelines.

Major System Drainage

- A1.8 Major system **drainage** must be designed for a 100 year ARI event.
- A1.9 Trunk **stormwater** systems (e.g. open channels, large conduits and **overland flow paths**) are designed for storms up to 100 year ARI event.
- A1.10 The following **overland flow paths** shall be utilised as major system flow routes:
- **Roadways** including **footpath**.
 - Pathways.
 - Parkland or open space.

Note: Overland flow paths on private land within subdivisions will not be supported.

- A1.11 Flow paths must be designed to ensure a velocity depth product of less than $0.3\text{m}^2/\text{s}$ for a 100 year ARI storm event.
- A1.12 The continuity of overland flow paths must not be obstructed by fences, walls, footpaths and the like.

Note: For example, where a roadway acting as an overland flow path discharges stormwater to a pathway, park, stormwater reserve, etc., the footpath must have a reverse crossfall to facilitate the overland flow.

5.1.2 Disposal of Stormwater from Development Sites

The specific objectives are to:

- i. Ensure the protection of public health, surrounding land and the natural environment including soils, ground water and surface waters.
- ii. Encourage harvesting of rainwater and the incorporation of pervious areas.
- iii. Ensure stormwater is controlled in a way that minimises nuisance to adjoining properties.
- iv. Set a minimum standard for the collection and management of stormwater on sites.

Performance Criteria	Acceptable Solutions
<p>P2 Stormwater is appropriately accommodated in the design including:</p> <ul style="list-style-type: none"> Stormwater from roofed areas is collected, stored and/ or conveyed to appropriate discharge points or disposal areas. Paved/impervious areas associated with buildings and driveways are graded and drained to prevent the discharge of surface water onto adjoining land. Permeable areas are utilised to reduce stormwater runoff. 	<p>A2.1 Roof water is to be collected by gutter and downpipe systems, or other equivalent means, and conveyed to an approved discharge point in accordance with the requirements of Part 3.1.2 of the Building Code of Australia and AS 3500.3. This could be:</p> <ol style="list-style-type: none"> a) A gutter or table drain in a road reserve, or b) A stormwater easement or easement to drain water, or c) A charged line system where (a) and (b) above are not available and the development site will have no more than two dwellings. Where a charged line system is proposed, the following must be included with the development application:

- Acknowledgement from adjoining property owners indicating a refusal to grant a drainage easement. The acknowledgement must indicate that a reasonable amount of compensation has been offered for the proposed drainage easement and that the advantages of creating as easement were explained.
- Demonstrate a minimum of 1.8m of fall between the roof gutters and the front boundary of the site.
- Demonstrate fall from the front boundary to the kerb line.
- Detailed design, inclusive of site plan and longitudinal section including all calculations, levels and further details of pits, gutters and maintenance facilities as required, or

d) A disposal/absorption trench, where (a), (b) or (c) above are not available, and soil conditions are suitable, or

Note: Supporting **geotechnical reports** are to be provided with a **development** application.

e) A water tank/on-site **detention** system with an overflow connected to a disposal method in (a), (b), (c) or (d), above.

A2.2 Surface water from paved areas including driveways is to be directed to an approved discharge point (see **A2.1**) that minimises impact on adjoining land.

Note:

- The method selected for the discharge point in **A2.1** and **A2.2** above will be assessed against the suitability and hydraulic capability including pipe size and/or soil type.
- Pervious/ **permeable paving** should be considered for infrequently trafficked areas on private land.
- Pervious/ **permeable paving** and pavements on public roads will not be supported.

- A2.3 Where the area of **buildings**, pavement and other **impervious** areas exceeds 65% of the **site area**, the proposal is to include details of the methods to be used to harvest rainwater and minimise increased **runoff** to surrounding land and public **stormwater** infrastructure. The details are to include assessment of **pre-development** and **post development stormwater** flows.

Note: The calculation of the 65% area may include reasonable assumption of future paved areas such as driveways not shown on plans at **development** application stage.

5.1.3 Climate Change Controls

Performance Criteria	Acceptable Solutions
P3 Major system design must consider the impact of changes to rainfall intensity due to climate change.	A3.1 Climate change impacts, such as changes to rainfall intensity, shall be considered in system design as per relevant policies and/or Australian Rainfall and Runoff Guidelines.
P4 Where relevant, major and minor system design must consider the impact of sea level rise.	A4.1 Sea level rise shall be considered in system design as per relevant policies and/or Australian Rainfall and Runoff Guidelines.

5.1.4 Onsite Stormwater Detention

Onsite **stormwater detention** may be required for all **development** **except** for:

- (a) Alterations, additions, ancillary structures and second **storey** additions in areas within the 5-year ARI **flood** extents as identified in a **flood** study or **floodplain risk management study** adopted by **Council** where:
 - (i) The addition is less than 10% of the existing **development** footprint; and
 - (ii) The overall site **impervious** areas are less than 50% of the site.
- (b) Change of use where no increase in **impervious** area is proposed;
- (c) New **developments** in subdivisions where onsite **stormwater detention** has already been provided for the entire subdivision and it has sufficient capacity for the additional **development**.

Performance Criteria	Acceptable Solutions												
<p>P5 The use of onsite stormwater detention is appropriate for the needs of the development and is designed to ensure:</p> <ul style="list-style-type: none"> • Post development peak flow matches pre-development peak flow as closely as possible. • Safe onsite stormwater detention measures. • That the development does not place an unacceptable financial burden on landowners or the community. • Compliance with industry standards. 	<p>A5.1 Onsite stormwater detention is to be sized to match pre-development peak flow rates for the 5, 20 and 100-year ARI rain events for the site.</p> <p>A5.2 For development other than subdivision, pre and post-development peak flow calculations must be based on the:</p> <ul style="list-style-type: none"> • Impervious percentages in Table 1, or • Actual impervious surface area as detailed on development plans, whichever is greater. <p>A5.3 For subdivisions, pre and post-development peak flow calculations must be based on the impervious percentages in Table 1.</p>												
	<p>Note: Lots within subdivisions containing existing dwellings/buildings must be considered.</p>												
	<p>Table 1: Pre and post development peak flow percentages</p>												
	<table> <tr> <th>Area impervious</th><th>Percentage</th></tr> <tr> <td>Open space</td><td>25%</td></tr> <tr> <td>Low and medium density residential</td><td>80%</td></tr> <tr> <td>Industrial areas</td><td>80%</td></tr> <tr> <td>Commercial areas</td><td>90%</td></tr> <tr> <td>Half width road reserve</td><td>95%</td></tr> </table>	Area impervious	Percentage	Open space	25%	Low and medium density residential	80%	Industrial areas	80%	Commercial areas	90%	Half width road reserve	95%
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	<p>A5.4 Onsite stormwater detention design must consider downstream boundary conditions for the 100-year ARI level of the receiving water.</p>												
	<p>A5.5 Detention storage must be located at a level above the 5-year ARI flood level.</p>												
	<p>A5.6 If onsite stormwater detention is provided in landscaped areas, the desirable maximum depth of ponding under design conditions is 300mm.</p>												

A5.7 Despite **A5.6**, the desirable maximum depth of ponding under design conditions can be increased to 1200mm provided that:

- Site slopes of the basin are 1:6 or shallower (less than 1:6); or
- The provided storage is fenced off.

A5.8 For subdivisions, onsite **stormwater detention** shall be:

- Designed at the subdivision stage.
- Constructed at the individual **dwelling** stage where OSD is proposed to be provided on each **lot**.
- Constructed at the subdivision stage where OSD is proposed to be provided through dedicated **detention** storage.

Note: OSD should be kept to a minimum when proposed on **public land** and the application must clearly demonstrate that the system is cost effective and well designed in terms of maintenance and safety.

A5.9 50% of any **retention** volume can contribute towards the onsite **stormwater detention** volume required for the **development**, where continual reuse of the **retention** volume can be demonstrated.

5.2 Stormwater Quality and Waterway Protection

This Section aims to encourage an approach to **stormwater** management that considers the natural hydrological and ecological processes of the surrounding environment. This may include onsite collection and reuse of water flows as part of an integrated treatment train provided in addition to conventional **stormwater** treatment measures.

5.2.1 Erosion and Sediment Control

The specific objective is to:

- i. Prevent litter and sediment from **building** sites entering **waterways**.

Mandatory Controls

- 1 An **erosion and sediment control plan** or **soil and water management plan** must be prepared in accordance with the following for any **development** that involves the disturbance of the soils surface, or the placement of materials that may erode, or cause erosion:
 - Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom 2004) (Blue Book Vol. 1)
 - Managing Urban Stormwater: Soils and Construction Volume 2 (DECCW, 2008) (Blue Book Vol. 2) and,
 - Supporting Document 2: Planning for Erosion and Sediment Control on Single Residential Allotments Guideline (Landcom 2004).

Note:

- Where there is an inconsistency between these documents, the 'Blue Book' will prevail.
- The above standards are minimum requirements. Additional works may be required depending upon exposed area and prevailing weather conditions. Refer to Supporting Document 1: Sustainable Stormwater Technical Guidelines.
- The erosion and sediment control measures are to be retained until the disturbed areas are revegetated. Refer to Supporting Document 2: Planning for Erosion and Sediment Control on Single Residential Allotments Guideline.
- Hay bales are not to be used as sediment control devices.

General Controls

Performance Criteria	Acceptable Solutions
<p>P6 The development or work will not:</p> <ul style="list-style-type: none"> • Cause erosion and/or siltation. • Have an adverse impact on receiving waterways from increased concentrations and loads of sediment. 	<p>A6.1 Where vegetation exists on the site, buffer zones of vegetation shall be retained along the boundaries of the site where practicable, particularly those adjacent to creeks and street gutters.</p> <p>A6.2 Sediment and erosion control measures shall not adversely impact on stormwater management measures of the site or any existing public drainage structures or systems.</p> <div style="background-color: #f0f0f0; padding: 10px; margin-top: 10px;"> <p>Note: Activities that have the potential to pollute must comply with standards of the <i>Environmental Operation Act 1997</i>.</p> </div>

5.2.2 Stormwater Retention and Reuse

This section applies to all **development** that is not subject to BASIX.

Note: BASIX applies to certain residential **development**. Refer to State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004 for more information.

Performance Criteria	Acceptable Solutions												
P7 The development provides adequate retention storage where there is an increase in impervious surface area.	<p>A7.1 The volume of retention storage provided is to be equal to or greater than:</p> <p>[storage depth at Table 2] X [increase in impervious surfaces compared to pre-development]</p> <p>Note: Refer to Supporting Document 1: Sustainable Stormwater Technical Guidelines for more information.</p>												
<p>Table 2: Retention storage depth</p> <table> <tr> <th>Development type</th><th>Storage depth</th></tr> <tr> <td>Alterations, additions, ancillary structures and second storey additions</td><td>10mm</td></tr> <tr> <td>Dwelling houses and dual occupancy</td><td>10mm</td></tr> <tr> <td>Medium Density</td><td>9mm</td></tr> <tr> <td>High Density</td><td>8mm</td></tr> <tr> <td>Industrial</td><td>6mm</td></tr> </table>		Development type	Storage depth	Alterations, additions, ancillary structures and second storey additions	10mm	Dwelling houses and dual occupancy	10mm	Medium Density	9mm	High Density	8mm	Industrial	6mm
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High Density	8mm												
Industrial	6mm												
P8 The reuse of stormwater is optimised to provide an alternative water supply.	<p>A8.1 Residential development shall install rainwater tanks to meet a portion of supply such as outdoor use, toilets, laundry.</p> <p>A8.2 Any overflow from rainwater tanks shall be directed into an existing stormwater system where possible, alternatively the overflow will be managed so that it does not cause nuisance to neighbouring properties.</p>												

Note: Refer to Supporting Document 1: Sustainable Stormwater Technical Guidelines.

- A8.3 Stormwater use within public open space (e.g. irrigation, street cleaning, public amenities) is encouraged.

5.2.3 Small/medium Scale Development – Site Discharge Index

This Section applies to small/medium scale development, but not in relation to alterations, additions, ancillary structures and second storey additions where:

- The addition is less than 10% of the existing development footprint; and
- The overall site impervious areas are less than 50% of the site.

Note: Refer to Section 6.1 of this Chapter for guidance as to whether, for the purposes of stormwater management, the proposed development is a small/medium scale development.

Performance Criteria	Acceptable Solutions
P9 Site discharge has a minimal impact on receiving waterways and stormwater systems.	<p>A9.1 Development shall be designed to achieve a site discharge index that does not exceed 0.1.</p> <p>Note: Refer to Supporting Document 1: Sustainable Stormwater Technical Guidelines for more information.</p> <p>A9.2 For car parks exceeding a trafficable impervious area of 300m² and/or 10 parking spaces, stormwater treatment measures are required to achieve an 80% reduction in Total Suspended Solids unless stormwater runoff is discharged to a treatment device elsewhere within the development.</p>

5.2.4 Large Scale Development

This section applies to large scale development.

Note: Refer to Section 6.1 of this Chapter for guidance as to whether, for the purposes of stormwater management, the proposed development is a large scale development.

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Performance Criteria	Acceptable Solutions
<p>P10 Large scale development mitigates adverse impacts by:</p> <ul style="list-style-type: none"> Minimising post development pollutant loads to not unduly impact on the quality of receiving waterways. Protecting stream stability and habitats through retention, infiltration and detention to limit post development flows. 	<p>A10.1 For development within Sydney's drinking water supply catchments, a neutral or beneficial effect must be demonstrated in accordance with the State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011.</p> <p>A10.2 For development outside Sydney's drinking water supply catchments, pollutant load reduction must be a minimum reduction of the post development average annual load of pollutants in accordance with Table 3, <u>and</u> the following as relevant:</p> <ul style="list-style-type: none"> For greenfield sites or sites draining to a natural stream of 3rd order or lower, the 1.5 year ARI pre-development peak discharge must be maintained; and For development discharging to a natural stream, the post development duration of stream forming flows must be no greater than a stream erosion index of 2; and For development discharging to a tidal area or natural watercourse, outlets must be designed to limit erosion and sedimentation at the discharge point; and For development discharging to St Georges Basin, Swan Lake, Lake Conjola, Burrill Lake, Lake Tabourie, Willinga Lake and Wollumboola Lake, a higher Total Phosphorus reduction target of 65% must be achieved; and For development discharging into an area of significant biodiversity value, the post-development residual pollutant concentrations must not exceed the ecological trigger values listed in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality; and

- Uncoated metal (i.e. copper etc) roofs, facades and/or downpipes are will not be supported due to heavy metal concentrations in stormwater runoff from these surfaces being harmful to receiving waterways.

Note:

- Water quality modelling is to demonstrate reductions in pollutant loads. The reduction targets must be achieved within the site boundary of the proposed development.
- Refer to Supporting Document 1: Sustainable Stormwater Technical Guidelines.
- The Model for Urban Stormwater Improvement Conceptualisation (MUSIC) modelling program, or an equivalent as approved by Council, is appropriate to model (simulate) pollutant loads. The MUSIC model must be submitted with the Development Application.
- Applicants are encouraged to discuss the proposed stormwater quality strategy for large scale developments with Council by arranging a pre-lodgement meeting with Council's Development Advisory Unit (DAU).

Table 3: Pollutant load reduction

Pollutant	Post development average annual load reduction
Gross pollutants	<p>End of stormwater network solution is to achieve the following:</p> <ul style="list-style-type: none"> • Litter: Retention of litter greater than 40mm for flows up to the 4 exceedances per year (EY) event (3-month ARI peak flow).

	<ul style="list-style-type: none"> Coarse sediment: Retention of sediment coarser than 0.125mm for flows up to the 4EY peak flow.
Total suspended solids	80%
Total phosphorus	45%
Total nitrogen	45%

5.2.5 Design and Maintenance of Stormwater Treatment Measures

This section sets out controls for large **scale development** that requires **stormwater** treatment measures.

Note: Refer to **Section 6.1** of this Chapter for guidance as to whether, for the purposes of **stormwater** management, the proposed **development** is a large **scale development**.

Performance Criteria	Acceptable Solutions
<p>P11 Stormwater treatment measures for large scale development are appropriately designed and are able to be maintained appropriately to ensure their optimal efficiency including:</p> <ul style="list-style-type: none"> Protection of permanent stormwater treatment against siltation/ sedimentation and clogging during construction. Not unduly increasing health and safety risks. Not unduly increasing maintenance requirements of stormwater infrastructure by Council. Design in accordance with best industry practices. Ensuring the ongoing reduction of stormwater pollutants. 	<p>A11.1 Where practicable, trunk drainage is to be provided as a naturally vegetated stable channel.</p> <p>A11.2 Where practicable due to adequate catchment area, constructed wetlands are preferred over the use of bio-retention basins and water quality ponds. The preference between a water quality pond and bioretention device will depend on site specific constraints.</p> <p>Note: Incorporation of OSD into constructed wetlands and water quality ponds is encouraged provided this would not damage vegetation.</p> <p>A11.3 An Operation and Maintenance Plan shall be submitted to Council for all stormwater treatment measures proposed, whether the asset is to remain in private ownership or to be handed over to Council.</p>

A11.4 System design shall allow for maintenance (i.e. access and room to operate safely) at all times.

A11.5 **Stormwater** treatment measures must not be connected until the majority of catchment infrastructure is completed and landforms stabilised with impervious or fully established grassed surfaces. Bioretention devices and constructed wetlands must be established offline from inflows until they are fully established.

A11.6 Where the **development** is staged, sacrificial zones must be included in the design of the **stormwater** treatment measures. Sacrificial zones are to be rectified upon completion of **development** at the developers cost.

A11.7 Structural **stormwater** treatment measures must be able to bypass flows in excess of the design discharge with negligible afflux resulting from over topping or blockage of the device.

A11.8 Trash racks are generally preferred over proprietary gross pollutant traps (GPTs) by **Council**. In some circumstances **Council** may consider proprietary GPT devices where it can be demonstrated that

- The device can achieve the desired treatment performance; and
- The maintenance costs are less than that of an equivalent conventional device; and
- No specialist equipment is required to carry out maintenance activities; and
- Major consumable parts e.g. filters and cartridges are not required to be purchased by **Council** on a regular basis.

Where a proprietary GPT is supported by **Council**, the developer must provide documentation from the supplier providing evidence that the proposed device has been

appropriately sized for the contributing catchment.

Note: Pit litter baskets are not supported by Council.

A11.9 In the event of a **stormwater** discharge, **stormwater** treatment **structures** must not allow the release of any previously trapped material.

A11.10 **Stormwater** treatment measures must consider mosquito control in the design, including:

- Permanent water ponding;
- Water depth;
- Exposure to sunlight and wind; and
- Proximity to residential **development**.

Note: Expert advice may be required to support the **development** application.

A11.11 All filter media used in bioretention **stormwater** treatment measures must meet the current specifications for Filter Media in Adoption Guidelines for Stormwater Biofiltration Systems or a demonstrated and approved equivalent and be verified by a soil laboratory registered by the National Association of Testing Authorities.

A11.12 Design of **stormwater** treatment measures must be in accordance with Supporting Document 1: Sustainable Stormwater Technical Guidelines.

A11.13 **Development** adjacent to a **watercourse** or **stormwater** drain addresses environmental impact on the **waterbody**.

A11.14 Constructed wetlands and bio-retention basins must be located in a treatment train approach immediately downstream of a sediment basin/forebay that:

- Has been sized to capture approximately 75% of coarse sediment; and

- Is offline from the stormwater network to allow flows exceeding the capacity of the piped stormwater network to bypass the treatment devices.

The sediment basin/forebay can be either wet or dry. A trash rack can be incorporated into the sediment basin inlet structure provided the invert of the trash rack is above the permanent water level of the pond.

A11.15 Bioretention devices must be designed in accordance with the latest version of the Adoption Guidelines for Stormwater Biofiltration Systems (CRC for Water Sensitive Cities) and Facility for Advancing Water Biofiltration (FAWB) Guidelines.

Note: Where there is an inconsistency between these documents, the 'Adoption Guidelines for Stormwater Biofiltration Systems' Guidelines will prevail.

A11.16 Constructed wetlands must be designed in accordance with the latest version of the Melbourne Water Wetland Design Manual or a demonstrated and approved equivalent.

5.3 Waterfront Land

5.3.1 Development on Waterfront Land

This section applies to all waterfront land as defined by the *Water Management Act 2000*.

Note:

- **Watercourses** are defined according to:
 - Shoalhaven LEP 2014 Natural Resource Sensitivity – Water Map; or
 - Category 1 being the highest, most valuable, and category 3 being the lowest.
 - The *Water Management Act 2000*; or
 - The *Water Management Act 2000* uses a different method to order streams – the Strahler Method. This method ranks the stream based on the number of upstream tributaries draining to it at that point.
 - Where necessary, the relevant NSW State Government agency must be consulted to determine the appropriate classification.
- The category will define the **Core Riparian Zone** width which must be protected/rehabilitated and an adjoining vegetated buffer width.
- Any works within 40m of a **watercourse** is considered a controlled activity requiring approval through the issuing of a Controlled Activity Approval (CAA).

Performance Criteria	Acceptable Solutions
<p>P12 Buffers and setbacks to watercourses are appropriately provided through:</p> <ul style="list-style-type: none"> • Core riparian zones areas being established or maintained in accordance with the relevant guidelines. • Development or works on waterfront land complying with State Government legislation and guidelines. 	<p>A12.1 The minimum width of the core riparian zone is in accordance with Table 4 or as specified by the <i>Water Management Act 2000</i>.</p> <p>A12.2 The core riparian zone must be maintained, restored or rehabilitated using appropriate local species with a range of canopy, understorey and groundcover species to enable a healthy and diverse ecosystem.</p> <p>A12.3 Topsoil shall be reused from the development site where it contains known or potential seedbank on the development site.</p> <p>A12.4 Transport infrastructure and services (i.e. sewer, electricity, gas and communication) shall be located outside the core riparian zone.</p> <p>A12.5 Despite A12.4, where services must traverse the core riparian zone, the</p>

development application must demonstrate that there will be minimal impact on the function and integrity of the core riparian zone.

A12.6 Pathways, cycleways and pervious recreational areas shall be located outside the core riparian zone unless all of the following is satisfied:

- An opportunity exists for the community to connect with and explore the watercourse in a strategic location.
- There will be minimal impact on the riparian function.
- The integrity of the riparian land is maintained.

A12.7 Bushfire asset protection zones shall be located outside the core riparian zone or vegetated buffer and should be incorporated into the development footprint.

A12.8 Crossings of waterways or other activities must have regard to the minimum structure requirements for fish passage in accordance with relevant NSW state government requirements.

A12.9 Works carried out on waterfront land comply with the *Water Management Act 2000*.

Note: Refer to Supporting Document 1: Sustainable Stormwater Technical Guidelines and WaterNSW for information on:

- In-stream works.
- Laying pipes and cables in watercourses.
- Outlet structures.
- Riparian corridors.
- Vegetation Management Plans.
- Watercourse crossings.

A12.10 Stormwater disposal over/ across/ through public waterfront reserves should be avoided to prevent erosion and need for remedial actions.

Chapter G2: Sustainable Stormwater Management and Erosion/Sediment Control**Table 4: Watercourses and width of core riparian zone and vegetated buffer**

SLEP 2014 Watercourse Categories	Width of core riparian zone	Vegetated buffer width
Sensitive area (watercourse category 1) – Environmental Corridor	40m	10m
Sensitive area (watercourse category 2) – Terrestrial and Aquatic Habitat	20m	10m
Sensitive area (watercourse category 3) – Bank Stability and Water Quality	10m	Merit based

5.3.2 Coastal Areas

This section applies to all **development** discharging **stormwater** to coastal cliffs or coastal dunes.

Performance Criteria	Acceptable Solutions
P13 Stormwater discharge will not cause significant erosion of the cliff or dune face.	<p>A13.1 The quantity of stormwater discharged to the cliffs or dune face is limited by compliance with the provisions of this Chapter.</p> <p>A13.2 Stormwater is discharged to stable well vegetated areas and/or energy dissipation structures.</p> <p>A13.3 The design shall maximise the capture and discharge of roof and surface flow stormwater to the street, or if not away from the cliff line, by discharging to the bottom of the cliff.</p> <p>A13.4 Stormwater discharges must not be directed to the base of a dune or cliff where the cliff or dune is Crown land.</p>

6 Advisory Information

6.1 Is the Proposal Small/medium Scale or Large Scale Development?

Table 5 provides guidance as to whether, for the purposes of **stormwater** management, the proposed **development** is a small/medium **scale** or large **scale development**.

Table 5: Determining whether your development is small/medium scale or large-scale

Criteria	Determination	Scale and documentation required
Is the proposed development:	Yes to any of these questions	Large-scale development An integrated water cycle management strategy (IWCMS) must be submitted with the development application.
a) A Torrens or community title subdivision creating 10 or more additional lots? b) A subdivision of land greater than 3,500m ² irrespective of how many Torrens or community title allotments are created? c) An integrated housing subdivision? d) A development with a development footprint greater than 2,500m ² ? e) An industrial, commercial or residential development (including alterations and/or additions), where the new impervious area for the site exceeds 1,000m ² ?	No to all these questions	Small/medium scale development A stormwater management plan (SMP) must be submitted with the development application.

- Note:**
- In relation to d) above, **development** footprint includes any **structures** and **impervious** areas. It does not refer to the size of the land.
 - In relation to industrial, commercial or residential **development** at e) above, this includes the construction or designation of car **parking spaces**, whether the spaces are covered or uncovered, **basement** or elevated type car **parking spaces** or car **parking spaces** that are remote to the **development** which they serve.
 - An IWCMS must include a report and drawing demonstrating how the **development** meets the relevant **stormwater** controls.

6.2 Other legislation or policies you may need to check

Note: This section is not exclusive and you may be required to consider other legislation, policies and other documents with your application

Council Policies & Guidelines	<ul style="list-style-type: none"> • Engineering Design Specifications • Sustainable Stormwater Technical Guidelines (Supporting Document 1)
External Policies & Guidelines	<ul style="list-style-type: none"> • Adoption Guidelines for Stormwater Biofiltration Systems (CRC for Water Sensitive Cities) • Australian and New Zealand Guidelines for Fresh and Marine Water Quality • Australian Rainfall and Runoff Guidelines (2019) • Building Code of Australia • Facility for Advancing Water Biofiltration (FAWB) Guidelines • Guidelines for Filter Media in Biofiltration Systems (Version 3.01) (Facility for Advancing Water Filtration 2009) • Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom 2004) (Blue Book Vol. 1) • Managing Urban Stormwater: Soils and Construction Volume 2 (DECCW, 2008) (Blue Book Vol. 2) • Planning for Erosion and Sediment Control on Single Residential Allotments Guideline (Landcom 2004) (Supporting Document 2) • Wetland Design Manual (Melbourne Water)
Legislation	<ul style="list-style-type: none"> • Environmental Operation Act 1997 • Shoalhaven LEP 2014 • State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004 • State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011 • Water Management Act 2000