7.06 Stormwater

Amendment history

Version Number	Date Adopted by Council	Commencement Date	Amendment Type
1	15/11/2011	15/06/2012	New
2	28/05/2013	10/06/2013	Amended
3	27/09/2016	24/10/2016	Amended
4	14/03/2017	03/04/2017	Amended

Savings provisions

Any development application lodged but not determined prior to this section coming into effect will be determined taking into consideration the provisions of this section.

Land to which this section applies

This section applies to all land to which the Newcastle Local Environmental Plan 2012 applies.

Development (type/s) to which this section applies

This control applies to all development which this DCP applies.

Applicable environmental planning instruments

The provisions of the following listed environmental planning instrument/s and legislation also apply to development applications to which this section applies:

- Newcastle Local Environmental Plan 2012
- State Environmental Planning Policy (Exempt and Complying Development Codes) 2008
- State Environmental Planning Policy (Building Sustainability Index: BASIX 2004)
- *Water Management Act 2000*

In the event of any inconsistency between this section and the above listed environmental planning instruments and legislation, the environmental planning instrument and legislation will prevail to the extent of the inconsistency.

Note 1: Additional environmental planning instruments may also apply in addition to those listed above.

Note 2: The *Environmental Planning and Assessment Act 1979* enables an environmental planning instrument to exclude or modify the application of this DCP in whole or part.

Related sections

The following sections of this DCP **may** also apply to development to which this section applies:

- Section 3.01 Subdivision
- Section 7.07 Water Efficiency
- Section 7.02 Landscape, Open Space and Visual Amenity

Associated technical manual/s

- Stormwater and Water Efficiency for Development Technical Manual, Newcastle City Council (check Council website for current version)

Additional information

Significant references

- *AS/NZS 3500 Plumbing and Drainage 2013*
- *AS/NZS 3725 Design for installation of buried concrete pipes*
- *AS/NZS 4058 Precast concrete pipes (pressure and non-pressure)*
- *Australian Rainfall and Runoff, 1987, Engineers Australia*
- *Australian Runoff Quality: A Guide to Water Sensitive Urban Design, 2006, Engineers Australia*
- *Draft NSW MUSIC Modelling Guidelines (BMT WBM, 2010)*
- *Adoption Guidelines for Stormwater Biofiltration Systems (Appendix C), 2015, CRC for Water Sensitive Cities*
- *Managing Urban Stormwater: Soils and Construction Volume 1, 4th Edition March 2004, Landcom*
- *Standard Drawings, Newcastle City Council*
- *Water sensitive design solutions for catchments above wetlands by Hunter and Central Coast Regional Environmental Management Authority*
- *Water Sensitive Urban Design Technical Design Guidelines for South East Queensland (South East Queensland Healthy Waterways Partnership, 2006)*
- *Bioretention Technical Design Guidelines (Water by Design, 2014), http://healthywaterways.org/resources/documents/*

Other references:

- *A Sustainable Urban Water Cycle Policy for Newcastle, 2004, Newcastle City Council*
- *Australian Guidelines for Urban Stormwater Management, 2000, ANZECC*
- *Construction and Establishment Guidelines: Swales, Bioretention Systems and Wetlands Version 1.1 (South East Queensland Healthy Waterways Partnership, 2010) http://waterbydesign.com.au/ceguide/*
- *Guidelines for riparian corridors on waterfront land, Department of Primary Industries, Office of Water*
- Hunter Water Corporation website http://www.hunterwater.com.au/
- *Australian Guidelines for Water Recycling: Stormwater Harvesting and Reuse 2009 (Natural Resource Management Ministerial Council)*
- *Newcastle City-wide Floodplain Risk Management Study and Plan, Final Report, June 2012, Newcastle City Council*
- *Newcastle Flood Policy: A Technical Manual 2003, Newcastle City Council*
- *Newcastle Stormwater Management Plan, 2004, Newcastle City Council*
- *Urban Stormwater and the Ecology of Streams, 2004, CRC for Freshwater Ecology*

- *Water Sensitive Urban Design Book (Landcom)*
  - Book 1: Policy
  - Book 2: Planning and Management
- *Interim Reference Guideline, Concept Design Guidelines for WSUD (SMCMA, 2011), WSUD.org*

Definitions

A word or expression used in this development control plan has the same meaning as it has in Newcastle Local Environmental Plan 2012, unless it is otherwise defined in this development control plan.

Other words and expressions referred to within this section are defined within Part 9.00 - Glossary of this plan, and include:

Absorption trench - a trench excavated into the ground for the purpose of storing an initial volume of rainfall before that water seeps into the soil in which the trench is excavated.

Annual exceedance probability (AEP) - is the probability that a flood event being equalled or exceeded within a period of one year

Bioretention rain garden (or biobasin) - is a vegetated bed of filter media for the purpose of capturing stormwater runoff for water quality treatment through the filtration of sediment and biological uptake of nutrients.

Bioretention swales (or bioswales) - are deliberately formed surface depressions for the conveyance of stormwater runoff that include a vegetated infiltration trench within the channel invert for the purpose of water quality treatment through the filtration of sediment and biological uptake of nutrients.

Broad Scale Development - Includes all development types other than dual occupancy and single dwelling houses

Coastal Wetland - The wetlands identified in the Coastal Management SEPP, previously known as SEPP 14 wetlands

Discharge Control - a device that stores water and limits the rate of discharge from the development site.

Dispersion trench - a 600mm x 600mm trench, 1m long for every 25m^2 of catchment draining to it (regardless of whether or not a discharge control is used) excavated into the ground for the purpose of dispersing overflows and discharges from stormwater systems. Dispersion trenches are only for single dwellings that drain to the rear.

Drainage - means any activity that intentionally alters the hydrological regime of any locality by facilitating the removal of surface or ground water. It may include the construction, deepening, extending, opening, installation or laying of any canal, drain or pipe, either on the land or in such a manner as to encourage drainage of adjoining land.

Easement - a legal right held by an owner of land or public authority in respect of another land parcel. Easements are commonly created to enable access across other properties, such as for drainage, pipelines, footways, etc.

Erosion and Sediment Control Plan - a plan lodged with a development application that illustrates how erosion and sediment control will be managed during the construction phase of the development.

Exceedances per Year (EY) - term used for events more frequent than 50% AEP. For example, 2 EY is equivalent to a design event with a 6 month recurrence interval when there is no seasonality in flood occurrence'

Gravel filled absorption trench - an absorption trench filled with gravel so as to achieve a minimum 30% void ratio and allowing the surface of the trench to be treated and used similarly to the surrounding surface.

Impervious area – an area of impermeable surface (excluding pools and porous paving).

Impermeable surface - a surface that does not allow rainwater to infiltrate to the soil, such as buildings (roofs), roads, parking areas and courtyards.

Infiltration - the practice of discharging stormwater or drainage water to the ground.

Infiltration trench - a trench excavated into the soil for the purpose of dispersing all stormwater up to the 5% AEP event. Infiltration trenches will vary in volume depending on the permeability of the parent soil and should be designed by a qualified Civil Engineer based on soil permeability testing.

Large Scale Development - development sites that are larger than 5,000m^2.

Major drainage system - the part of the public drainage system that carries relatively large flows. It consists of the system of streams, floodways, stormwater channels, retarding basins and street pavements. It is generally designed to protect people and indoor property from the effects of a flood with an annual exceedance probability (AEP) of 1%.

Minor drainage system - the part of the public drainage system that carries relatively minor flows. It consists of the system of kerbs, gutters, roadside channels, swales, sumps and underground pipes. It is generally designed to control flows which occur frequently, typically with an annual exceedance probability (AEP) of 10%.

On-site stormwater detention (OSD) - a stormwater management practice that limits the rate of discharge from a site using outlet restriction devices. Stormwater flows in excess of the capacity of the outflow control device is temporarily stored either in tanks or surface depressions until the storm event recedes. Stormwater flows are therefore released at a controlled rate into the public drainage system.

On-site stormwater retention - stormwater management practices where on-site stormwater runoff is actually captured and retained within the site for re-use or infiltration and is not released to the downstream drainage system.

Overflow disposal - the disposal of flows that occur when the capacity of the site discharge controls is reached and such overflow.

Permeable surface - a surface treatment that allows rain water to infiltrate to the soil, such as grass, landscaping, gravel, porus pavement and coarse sand.

Permissible site discharge (PSD) - the maximum rate at which stormwater is permitted to be discharged from a given site area.

Porous Paving - paving that maintains a high degree of permeability to allow rainfall to infiltrate the substrate and not produce runoff in common rainfall events.

Public drainage system - a drainage system owned and operated by the Council or the Hunter Water Corporation.

Rainwater tank - has the same meaning as in the Newcastle Local Environmental Plan 2012.

Note: The Newcastle Local Environmental Plan 2012 defines a rainwater tank as a tank designed for the storage of rainwater gathered on the land on which the tank is situated.

Riparian Zone - is an area of river or creek bank that supports, or has at one time supported a unique ecosystem pertaining to the river microenvironment. Generally, a width of 40m is considered to be the minimum viable riparian zone.

Runoff - the portion of rainfall that flows across the ground surface as water.

Site drainage line - a piped drain that conveys stormwater from a development site to the public drainage system.

Single Dwelling Houses - a dwelling house on a block of land with no other dwellings.

Small Scale Development - development sites that are smaller than 5,000m^2.

Soil and Water Management Plan - a plan lodged with a development application that illustrates how stormwater, runoff and soils will be managed on the site. The plan should demonstrate the feasibility of both the proposed stormwater management system, including water quality, conveyance and discharge controls. The plan should also demonstrate any proposed pre, during and post construction phase measures for the management of all site water including ground and surface waters. This will include proposed erosion, sediment and water quality control measures and dewatering controls as required. The plan should be supported by preliminary hydrological calculations and other information in the accompanying Statement of Environmental Effects.

Stormwater - the runoff from rainfall events.

Stormwater harvesting - the collection, storage and use of stormwater for domestic, industrial, irrigation or other purposes.

Stormwater Management Plan - a plan lodged with a development application that details the proposed use of structural infrastructure and treatment techniques to both improve stormwater quality and mitigate excessive flows and may include dewatering controls as required.

Stormwater surface flowpath - land that carries concentrated surface flow during a rainfall event, the width, shape and gradient of which is designed to cater for the flow produced by a 1% annual exceedance probability (AEP) rainfall event. Includes a flowpath from the spillway of an on-site detention system.

Swale - a deliberately formed surface depression for the storage or conveyance of stormwater runoff. Swales can be lined with rock, turf or other vegetation.

Waterfront land - has the same meaning as in the *Water Management Act 2000*.

Note: The definition of waterfront land in the *Water Management Act 2000* is:

(a) the bed of any river, together with any land lying between the bed of the river and a line drawn parallel to, and the prescribed distance inland of, the highest bank of the river, or

(a1) the bed of any lake, together with any land lying between the bed of the lake and a line drawn parallel to, and the prescribed distance inland of, the shore of the lake, or

(a2) the bed of an estuary, together with any land lying between the bed of the estuary and a line drawn parallel to, and the prescribed distance inland of, the mean high water mark of the estuary, or

(b) if the regulations so provide, the bed of the coastal waters of the State, and any land lying between the shoreline of the coastal waters and a line drawn parallel to, and the prescribed distance inland of, the mean high water mark of the coastal waters,

where the prescribed distance is 40m or (if the regulations prescribed a lesser distance, either generally or in relation to a particular location or class of locations) that lesser distance. Land that falls into two or more of the categories referred to in paragraphs (a), (a1) and (a2) may be waterfront land by virtue of any of the paragraphs relevant to that land.

Water cycle management plan – a plan that identifies additional opportunities to minimise reticulated mains water use. The plan should detail the whole of the water cycle and any public health issues. It may also include consideration of the storage and use of grey water and the installation of water efficient appliances.

Water sensitive urban design - planning and design of the urban and built form with the incorporation of the total water cycle and recognition of conservation principles and reuse.

Aims of this section

1. To outline Council's requirement for stormwater management for development.

2. To adopt a whole of water cycle approach to development.

3. To ensure an appropriate quality and quantity of water enters waterways.

Note: Specialist advice

Applicants are encouraged to employ the services of an appropriately qualified and experienced professional, such as a Stormwater/Environmental Engineer or Hydrologist, to assist them with the development of appropriate plans and documents to meet the requirements of this DCP. Discharge controls should be considered and incorporated into development as early as possible to ensure a holistic, integrated and economical design. When considering engaging a specialist, applicants should have regard to the size and complexity of the proposed development.

7.06.01 Plan requirements

Objectives

1. Outline the stormwater documents that are required to be submitted with a development application.

2. Ensure appropriate plans and documents are provided to Council to adequately assess water management in proposed developments.

Controls

The following controls apply to all development to which this section applies

1. For the purpose of this section, the following documents are submitted with a development application for the development type listed in Table 1.

Table 1: Documents which are required to be submitted with a development application

Development type	Required documents	Modelling
1. Development proposals that are the scale of a dual occupancy or smaller (see note 2)	• Stormwater management plan • Erosion and sediment control plan	Not required
2. Development proposals that: • Incorporate 20 or more dwellings; or • Accommodate 50 or more employees or clients, or • Involves the use of more than 1 hectare of land for commercial, industrial or special use purposes.	• Water cycle management plan • Soil and water management plan • Broad scale development assessment checklist for water sensitive urban design (see Note 2)	For large scale development hydrological and hydraulic modelling assessment is required in accordance with Section 7.06.02 of this DCP and the Stormwater and Water Efficiency for Development Technical Manual. Modelling shall be in accordance with Newcastle MUSIC link.
3. All other development	• Stormwater management plan • Erosion and sediment control plan • Broad scale development assessment checklist for water sensitive urban design (see Note 2)	For large scale development hydrological and hydraulic modelling assessment is required in accordance with Section 7.06.02 of this DCP and the Stormwater and Water Efficiency for Development Technical Manual. Modelling shall be in accordance with Newcastle MUSIC-link.

Note 1: Plans submitted to Council should be drawn in accordance with the requirements in Council's checklists for development applications.

Note 2: The broad scale development assessment checklist for water sensitive urban design can be found in the Stormwater and Water Efficiency for Development Technical Manual. This is generally only required for development of a scale greater than dual occupancies in size. However site circumstances may require a checklist to be submitted after lodgement.

Note 3: Definitions of each of the plans in Table 1 is provided in the definitions section at the start of this section and in Section 9.00 Glossary of this DCP.

7.06.02 All Development

Objectives

1. Ensure stormwater is controlled in a way that minimises nuisance to adjoining properties.

2. Match post development runoff to the pre development or natural water runoff regime as closely as possible.

3. Minimise soil erosion and sedimentation from site disturbance.

4. Prevent pollutants such as litter, sediment, nutrients and oils from entering waterways.

5. Minimise the potential impacts of development and other associated activities on the aesthetics, recreational and ecological values of receiving waters.

6. Ensure appropriate easements are provided over drainage systems on private properties.

7. Ensure easements are unimpeded by development for maintenance purposes.

8. Protect natural watercourses and their associated ecosystems and ecological processes.

9. Incorporate water sensitive urban design elements into the landscape in a manner that provides multiple benefits including: water quality protection; stormwater retention and detention as well as ecological enhancement.

10. Provide objectives, targets and controls (where appropriate) for the management of waterfront lands, water use, stormwater and groundwater.

11. Ensure stormwater infrastructure is identified on site and can be appropriately maintained.

12. To clearly define the stormwater disposal requirements for development located in coastal wetland catchments and minmise the impacts of stormwater run-off on coastal wetlands

Controls

<u>The following controls apply to all development to which this section applies</u>

1. The water cycle management plan or stormwater management plan (whichever is submitted with the development application) includes the following items:

    (i) the location of all buildings, driveways and impervious surfaces

(ii) the location of any watercourses or bushland passing through or adjacent to the property

(iii) any overland flowpaths which drain through the property or adjacent to the property

(iv) the location, size and depth of easements or drainage pipelines

(v) the discharge point of the site into the public drainage system.

(vi) cross section and long sections of major drainage structures.

The water cycle management plan or stormwater management plan shows the appropriate design elements to achieve compliance with the requirements set out in the following subclauses relating to:

(a) Stormwater collection

i) surface levels are to be graded such that sites are generally free draining with sufficient overflow capacity to ensure that waters do not enter buildings when underground drainage systems are beyond their capacity

ii) drainage pits are to be installed so that nuisance water does not collect at low points

iii) gutters, down pipes and pits are to be connected to the stormwater management system for the site.

Note: Australian Standard 3500.3 sets appropriate standards for stormwater collection and is to be followed when constructing new development. Part 3 of the Stormwater and Water Efficiency for Development Technical Manual provides more guidance on stormwater collection and should also be considered.

(b) Flooding and runoff regimes

i) Development is to be designed so that runoff from low intensity, common rainfall is equivalent to the runoff from a natural catchment. This can be achieved by intercepting and storing 12mm of rainfall from a minimum of 90% of the impervious area of the site.

ii) Runoff generated by more intense rainfall needs to be managed so that downstream drainage systems are not compromised beyond their design criteria. In general runoff from the development up to and including the 5% AEP shall be collected and drained underground. Public drainage (minor system) has a design capacity of the 10% AEP and connections from private development shall be made subject to the 10% AEP hydraulic grade line of the public drainage being lower than the property drainage system.

iii) Runoff from the development up to the 1% AEP shall be drained to the major drainage system in a manner that poses nil adverse impact to neighbouring property.

iv) Development is to be designed so that peak runoff from the site for all events is not greater than the 'natural' drainage conditions of the site.

(c) Storage

i) General

For sites of less than 50% impervious area, development shall provide 12mm of storage to meet the peak runoff requirements. Where the proposed development covers 100% of the site area, the interception and storage of 25mm of rainfall will achieve the peak runoff requirement. The rainfall depth storage can be linearly interpolated between 12mm and 25mm for sites between 50% and 100% of the impervious area of the site. Where there is a change in the impervious area of an existing site, the entire site is to be considered as pre developed or in a natural condition in regard to impervious areas for design purposes. The recommended storage provisions to satisfy the storage requirements are shown diagrammatically in **Figure 1**. Examples of suitable site storage provisions, for some standard sized sites with particular impervious area coverage are shown in **Table 2**.

Figure 1: Impervious area to storage requirement relationship

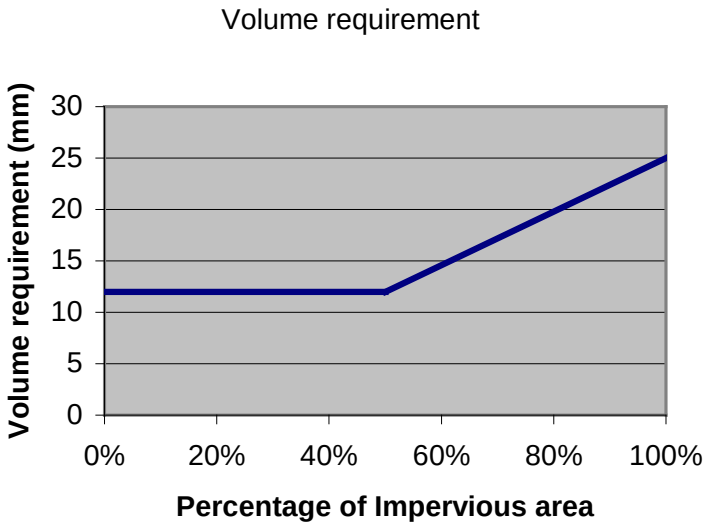

Table 2: Minimum storage requirements

		Impervious Area									
		100m²	250m²	300m²	350m²	500m²	600m²	750m²	1000m²	1500m²	2000m²
Site Area	100m²	2.5									
	250m²	1.2	6.3m³								
	500m²	1.2	3.1m³	4.4m³	6.0m³	12.5m³					
	600m²	1.2	3.1m³	3.6m³	5.0m³	10.3m³	15.0m³				
	750m²	1.2	3.1m³	3.6m³	4.2m³	8.2m³	11.9m³	18.8m³			
	1000m²	1.2	3.1m³	3.6m³	4.2m³	6.0m³	8.8m³	13.9m³	25.0m³		
	1500m²	1.2	3.1m³	3.6m³	4.2m³	6.0m³	7.2m³	9.0m³	16.3m³	37.5m³	
	2000m²	1.2	3.1m³	3.6m³	4.2m³	6.0m³	7.2m³	9.0m³	12.0m³	27.8m³	50.0m³

Storage requirements (cubic metres). Note 1 cubic metre = 1,000L

Note 1: Porous paving is not included in the impervious area calculation.

Note:2: Where a rainwater tank volume is less than the required storage the shortfall shall be provided in other site discharge controls for sites greater than 600m^2

For a single dwelling house, a rainwater tank with a minimum capacity of 4,000L is required in order to reduce mains water demand and to assist in minimising stormwater discharge from the site. In some cases BASIX will require a larger tank that will further reduce mains water demand.

The roof area directed to a rainwater tank should be maximised, to both increase the effectiveness and reliability of the reuse system, and reduce the degree of stormwater treatment required for those areas not draining to the rainwater tank.

Rainwater tanks are not required for additions to existing houses, however, where rainwater tanks are provided, the volume of the tank can be used to offset any additional discharge control storage that is required.

All rainwater tanks must be fitted with a first flush device to prevent contaminates fouling water and to prolong the life of the tank.

For large scale development it will be necessary to undertake a more rigorous hydrologic and hydraulic assessment to demonstrate that the flooding and runoff regimes are being satisfied in accordance with Council's requirements and the Stormwater and Water Efficiency for Development Technical Manual.

ii) Coastal wetland catchments

Note: Refer to Appendix 2 of the Stormwater & Water Efficiency for Development Technical Manual for coastal wetland catchments.

To meet the hydrology objectives for development draining to coastal wetlands a deemed to comply solution has been developed where specific rainwater tank configurations are required. The tank sizes shall be adopted for all small scale development and can be used as a guide for large scale development.

Rainwater tanks to be configured such that:

- all roofs greater than 10m^2 drain to a rainwater tank
- 100% of the roof area drains to the rainwater tank
- only roof areas are connected to the tank
- 50% of the rainwater tank is to be provided as air space. The top half of the rainwater tank is to drain to a small 5mm weep hole. The weep hole is to be located at the mid-point of the tank and is to drain to the overflow pipe for the rainwater tank.

The size of the tank is based on the roof area. Refer to **Table 3** below for details.

Table 3 Coastal Wetland Rainwater Tank Size (Deemed to comply)

Roof Area (m^2)	Total Tank Size Required (kL)	Leaky tank volume (kL)
10-50	2	1
51-100	4	2
101-150	6	3
151-300	10	5
301-500	20	10
>500	Min: Roof Area x 0.04	50% of Tank Volume

Note: Where a large scale storage solution, such as on-site detention is provided as part of the subdivision, individual tank storage volumes may be reduced by a commensurate amount.

(d) Storage drawdown

i) General

In order to provide sufficient capacity to accommodate subsequent rainfall events, the stored water must be drawn down at a minimum rate of 2mm of rainfall per day (0.023L per second per 1000m^2 contributing catchment). In general, this can be achieved by using the water internally in the development by connection to toilet cisterns and washing machine taps, or by disposing to groundwater. While the stored water can be used for garden irrigation, there are few additional benefits to stormwater management due to the intermittent nature of garden watering (especially during rain). Notwithstanding the above, use of stored water for garden irrigation is encouraged.

Alternatively, the stored water may be released back to the catchment. In order to ensure flows do not form erosive velocities downstream, the maximum discharge rate must not exceed 2mm of rainfall per hour (0.5L per second per 1000m^2 contributing catchment).

ii) Coastal wetlands catchments

Note: Refer to Appendix 2 of the Stormwater & Water Efficiency for Development Technical Manual for Coastal wetland catchments.

The rainwater tanks must be plumbed into the following non potable uses with a separate pipe connection to that of the potable water supply:

- irrigation
- outside taps
- all toilets
- washing machine taps and all laundry basin taps
- hot water service

Stored water shall not be released back to coastal wetlands catchments.

(e) Site discharge controls

i) General

The above requirement relating to storage and drawdown can be achieved by installing 'site discharge controls'. Selection of appropriate 'site discharge controls' will largely depend on the constraints and opportunities presented by the site and are a matter for the applicant to integrate with the development proposal.

Alterations and additions within the existing building footprint, such as building a second floor, do not require additional discharge controls. The requirement to manage runoff regimes does not apply for additions less than $50m^2$ or 20% of the existing ground floor area (whichever is greater), up to a maximum addition of $150m^2$. For additions larger than $50m^2$, additional discharge controls are required at a rate of $1.8m^3$ for every $100m^2$ of additional impervious area.

Additional discharge controls may be selected from a combination of one or more of the following measures:

- rainwater tanks
- absorption trenches
- on-site retention
- swales
- bioretention rain gardens or biobasins
- bioretention swales or bioswales
- porous paving (this is not a discharge control but it reduces the overall impervious area on a site)
- Sand filters with basins (not recommended for single dwelling houses)
- Constructed wetlands (not recommended for small scale development)
- Sediment basins (not recommended for small scale development)

Details for certain 'site discharge controls' can be found in Part 4 of the 'Stormwater and Water Efficiency for Development Technical Manual'.

Site discharge controls are to be designed and installed for each impervious segment of a site's catchment and include appropriate storage and water quality devices for that segment.

ii) Coastal wetland catchments

Note: Refer to Appendix 2 of the Stormwater & Water Efficiency for Development Technical Manual for coastal wetland catchments.

In order to meet the hydrology objectives in Table 4, site discharge controls are required for the following:

- Rainwater tanks only for single dwelling houses having a lot area of less than 600m$^{2.}$
- For other small scale development either bioretention systems or on-site retention systems with sandfilter in addition to the rainwater tanks.
- For large scale development a site specific solution is to be prepared. Rainwater tanks are to be provided at a lot scale and additional site discharge controls are required in other areas. All controls shall be located within the site boundary of the development.

Details for certain site discharge controls can be found in Part 4 of the Stormwater and Water Efficiency for Development Technical Manual.

(f) Water Quality and Quantity Targets

i) All development covered by this section of the DCP is to achieve the targets set out in **Table 4**. These targets relate to post-construction. The site discharge controls in Part 4 of the 'Stormwater and Water Efficiency for Development Technical Manual' have been designed with inbuilt mechanisms to filter pollutants. Where one or more of the prescribed site discharge controls are applied according to the technical manual, the pollutant load in stormwater runoff is reduced and is deemed to comply to the pollutant targets.

Table 4: Water quality and water quantity targets

Total Suspended Solids	85% reduction in the average annual load of Total Suspended Solids.
Total Nitrogen	45% reduction in the average annual load of Total Nitrogen.
Phosphorous	65% reduction in the average annual load of Total Phosphorus.
Gross Pollutants	90% reduction in the average annual load of Gross Pollutants (>5mm).
Hydrocarbons	100% removal.
Stream Flows	The Stream Erosion Index (SEI) is to be no greater than 2, where the SEI is expressed as the ratio of 'post development flow exceeding the stream forming flow' to 'pre development flow exceeding the stream forming flow'.
[1]Hydrology Objectives for developments in coastal wetland catchments	The post development 7 day flooding hydrology (high flow) is to match the pre development 7 day flooding hydrology (high flow) up to the 80th percentile The post development 30 day drying hydrology (low flow) is to match the pre development 30 day drying hydrology (low flow) up to the 80th percentile

Note 1: Refer to the Stormwater and Water Efficiency for Development Technical Manual for further information on hydrology targets for development in coastal wetland catchments. A map of the coastal wetlands catchment area is shown in Appendix 2.

Note 2: Refer to the Stormwater and Water Efficiency for Development Technical Manual for further information on water quality and water quantity.

The reduction in loads is relative to the stormwater pollution loads expected from conventional urban development without stormwater treatment measures. The stream forming flow is defined as 50% of the 2-year flow rate estimated for the catchment under natural conditions.

For developments larger than 5,000m^2, or development which will become a Council asset, it will be necessary to undertake a more rigorous modelling assessment to demonstrate that the pollutant (water quality and water quantity) reduction targets in **Table 4** will be met.

ii) Gross Pollutant Traps. The objective of Gross Pollutant Traps (GPT's) is to remove contaminants such as sediment, oil and other pollutants before it discharges into the receiving system. GPTs must be installed for the following developments:

- residential developments with more than four dwellings
- all commercial developments that may involve the use, storage or transportation of contaminants
- commercial developments on allotments greater than 2,000m^2
- all industrial developments
- upstream of all bioretention devices.

(g) Overflow disposal

The objective of overflow disposal is to ensure that development is designed so that overflows do not adversely affect neighbouring properties by way of intensification, concentration or inappropriate disposal across property boundaries. This can be achieved by securing appropriate easements over downstream properties or discharging overflows directly to the street system where feasible. Overflows from paved areas adjacent to the property boundary are to be directed by a kerb or formed gutter to drain away from neighbouring properties.

A dwelling house that drains to the rear of the property is not required to obtain an easement over downstream lands. Dispersion trenches may be used where an easement cannot be obtained for single dwelling houses only.

Note: Part 5 of the Stormwater and Water Efficiency for Development Technical Manual provides more advice on the disposal of overflows.

(h) Existing drainage systems

Where a drainage system serving other lands is located on the development site, that system is to be protected by an easement in favour of the beneficiary of the drainage system in order to permit the continued use of the drain. At the same time, a drainage easement gives the beneficiary the right to maintain the pipes contained in the easement. Where necessary, upstream lots are to be given a legal right to drain through a development site.

New buildings are not to be constructed over or compromise the integrity of drainage lines or easements including those originating from outside the site.

Where an existing drainage line runs under a proposed building, the drainage line and any associated easement is to be diverted around the building. Redundant easements are to be extinguished and new easements are to be created. Where an existing drainage system across the site is retained, access to the existing system is not to be affected by the proposed development. The development is to be designed so as not to degrade the structural integrity of the system.

Note: Extinguishing or creating an easement will need to be carried out in accordance with the *Conveyancing Act 1919*.

Pollution reduction devices are to be retrofitted to existing development where practical. Preliminary advice should be sought from Council should the applicant believe such measures are impractical.

(i) Installation and maintenance requirements

i) Erosion and sediment controls are to be installed prior to the commencement of work, maintained throughout the course of the work and are not to be removed until the site is stable with all bare areas supporting an established vegetative cover.

ii) All drainage elements and water saving fixtures and appliances nominated in the application or required by conditions of consent are to be installed and operational prior to the issue of the occupation certificate for the new building. Drainage elements and water saving fixtures and appliances must be appropriately maintained throughout the life of the building.

2. Structures are not to be located within a drainage easement or where there is no easement, within 1.5m of the centreline of a drainage pipe. Eave overhangs are permitted subject to at least 4.5m clearances to ground level. Footings for buildings should not be founded on material that is shallower than a line drawn at 45^{o} to the vertical from the bottom edge of the existing drainage system.

Note: The stormwater storage, infiltration or water quality system may need to be endorsed on any associated subdivision certificate for the development with a positive covenant. Council shall be nominated as the sole authority to modify, vary or release the covenant.

3. Maintenance manuals are to be provided for all devices in large scale development and selected devices for other types of development that include on-site retention, bioretention rain gardens, bioretention swales, porous paving and sand filters within basins. The manual is to address maintenance issues including routine monitoring and maintenance as well as any associated components (such as vegetation, subsurface drainage, filter material, flush outs, etc) of the system that could impact on device performance. Periodic monitoring and maintenance is to ensure the system functions as designed, and meets water quality and quantity targets as indicated in the DCP (see **Table 4**) over the life cycle of the device. The manual is to be kept onsite.

> Note: See the Stormwater and Water Efficiency for Development Technical Manual for a Maintenance Manual example.

4. Each on site stormwater management system shall be indicated on site by fixing a marker plate or sign in a prominent position. The marker plate or sign is to be provided in accordance with the Stormwater and Water Efficiency for Development Technical Manual.

5. First order streams within Newcastle LGA require assessment for their riparian corridor function and proposed development is designed to protect such first order streams and their contribution to reduction of stream erosion index (SEI).

6. Stormwater treatment measures are integrated into the urban design and landscaped areas.

7. Stormwater treatment measures are located, and configured, to maximise the impervious area that is treated. Devices are to be located within the property boundary.

8. Structural stormwater treatment measures must be able to bypass flows in excess of the design discharge with negligible concentrated flows resulting from overtopping or blockage of the device to protect property life and maximise infrastructure performance and useful life.

9. Water use within open spaces (for uses such as irrigation and water features) is supplied from non potable sources such as recycled water, roof water, harvested stormwater or other non licensed water sources to meet a minimum of 50% of the demand and treated to an appropriate standard in accordance with NSW State Government and Commonwealth Standards.

> Note: Development which discharges to natural waterways or is carried out on water front land is to meet the requirements of the *Water Management Act 2000* and the Department of Primary Industry Office of Water guidelines for riparian corridors on waterfront land.

7.06.03 Infrastructure

Objectives

1. To set a minimum standard for public assets that are to be dedicated to Council.

2. To ensure discharge controls can be easily maintained.

3. To set minimum standard for stormwater devices and riparian corridors that are to remain in private ownership.

4. To ensure maintenance is undertaken for private assets.

Controls

The following controls apply to development that creates a Council (public) stormwater asset

1. A maintenance plan is submitted to Council as part of the development application. The maintenance plan addresses the issues described in Part 4c of the Stormwater and Water Efficiency for Development Technical Manual.

2. All weather access is provided to site discharge controls for maintenance purposes.

3. Site discharge controls designed in accordance with the Stormwater and Water Efficiency for Development Technical Manual.

4. Devices are designed to be easily accessible and avoid the need for fencing.

5. Hydrologic and hydraulic assessment modelling is required to demonstrate that the flooding and runoff regimes are being satisfied in accordance with Council's requirements and the Stormwater and Water Efficiency for Development Technical Manual.

6. Discharge controls are to be considered and incorporated into a development as early as possible to ensure a holistic, integrated and economical design.

7. Devices are designed in accordance with the Newcastle City Council Standard Drawings.

8. All new subsurface drainage assets shall be inspected by CCTV following construction. CCTV footage and associated reports are to be provided to Council prior to asset hand-over in accordance with any consent conditions and Council specifications.

9. Works as executed plans are to be provided to Council prior to asset handover for all drainage assets in accordance with any consent conditions and Council specifications.

Note: Newcastle City Council Standard drawings can be found on Council's website.

The following controls apply to development that creates a shared private asset such as stormwater devices, discharge controls and riparian corridors

10. A maintenance plan is to be submitted to Council as part of the development application.

11. All weather access tracks are to be provided to private assets for maintenance purposes.

12. Where fencing is installed it shall not preclude access for maintenance.

13. All stormwater devices shall be designed and constructed to meet the water quality and quantity targets of this DCP.

14. All stormwater devices and riparian corridors shall observe any additional requirements of the NSW Office of Water.