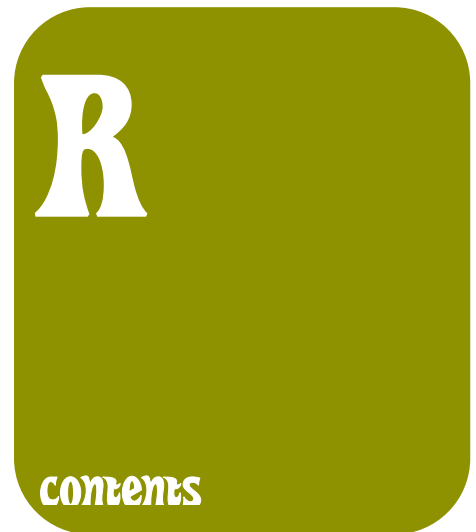
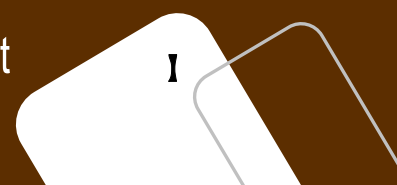


WATER SENSITIVE URBAN DESIGN AND INTEGRATED WATER CYCLE MANAGEMENT



1.0	INTRODUCTION	1
1.1	Aims of this Part	1
1.2	Objectives of this Part	1
1.3	Relationship to other documents	2
1.4	Definitions for this Part	2
2.0	APPLICATION OF THIS PART	3
2.1	Development to which this Part applies	3
2.2	Integrated development	4
2.3	Specialist advice	4
3.0	APPLICATION REQUIREMENTS	5
3.1	Strategies, assessments and/or plans to be Submitted	5
3.2	Matters for consideration	5
4.0	DEVELOPMENT CONTROLS	7
4.1	General	7
4.2	Waterfront lands	7
4.3	Water conservation	9
4.4	Stormwater (water quality and waterway stability)	10
4.5	Stormwater (detention)	11
4.6	Stormwater (erosion, sediment and pollution control)	11
4.7	Groundwater	12
APPENDIX 1	DEFINITIONS FOR THIS PART	14
APPENDIX 2	STRATEGIES, ASSESSMENTS AND/OR PLANS TO BE SUBMITTED WITH A DEVELOPMENT APPLICATION	19
APPENDIX 3	PLANS TO BE SUBMITTED PRIOR TO AND AFTER RELEASE OF THE CONSTRUCTION CERTIFICATE	25



FIGURES AND TABLES

Figure 1	Development to which this Part applies	3
Table 1	Strategies, assessments and/or plans to be submitted	6
Table 2	Plans to be submitted prior to release of the construction certificate	6
Table 3	Required percentage reductions in post development annual average loads of pollutants	10
Table 4	Sections and information to be included in the Integrated Water Cycle Management Strategy	18
Table 5	Sections and information to be included in the Integrated Water Cycle Management Report	20

Amendments to Part R ~ Water Sensitive Urban Design and Integrated Water Cycle Management

(as of DD/MM/YYYY)

Amendment No.	Location	DESCRIPTION	Adoption Date	Enforcement Date

1.0 INTRODUCTION

Water sensitive urban design and integrated water cycle management are processes or practices used to control the natural cyclical process whereby atmospheric water falls as rain and infiltrates to groundwater or runs off as stormwater to receiving waters and is then evaporated back into the atmosphere. At various stages of the process, water may also be released into the atmosphere (transpired) by living things or infiltrate to groundwater.

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INTRODUCTION

1.1 OBJECTIVES OF THIS PART

The objectives of this Part are to:

- (a) Provide direction and advice to applicants in order to facilitate water sensitive urban design and integrated water cycle management within the Development Application process; and
- (b) Provide design principles that will help assist in the development to meet the aims of this Part of the DCP.
- (c) Provide objectives, targets and controls (where appropriate) for the management of waterfront lands, water use, stormwater (including water quality, waterway stability, detention and erosion and sediment control) and groundwater.

1.2 AIMS OF THIS PART

The aims of this Part are to:

- (a) Protect and enhance natural watercourses and their associated ecosystems and ecological processes;
- (b) Maintain, protect and/or rehabilitate modified watercourses and their associated ecosystems and ecological processes towards a natural state;
- (c) Minimise potable water demand and wastewater generation;
- (d) Match the post development runoff to the pre development or natural water runoff regime as closely as possible;
- (e) Mitigate the impacts of development on water quality and quantity;
- (f) Mitigate the impacts of development on groundwater, particularly in saline groundwater environments;
- (g) Ensure any changes to the existing groundwater regime do not adversely impact upon adjoining properties;
- (h) Integrate water cycle management measures into the landscape and urban design to maximise amenity;
- (i) Minimise the potential impacts of development and other associated activities on the aesthetic, recreational and ecological values of receiving waters;
- (j) Minimise soil erosion and sedimentation resulting from site disturbing activities; and
- (k) Ensure the principles of ecologically sustainable development are applied in consideration of economic, social and environmental values in water cycle management.

1.3 RELATIONSHIP TO OTHER DOCUMENTS

This DCP Part is to be read in conjunction with the NSW Growth Centres DCP 2010, Blacktown Council's Engineering Guide for Development, Blacktown Council's Works Specification – Civil, the Upper Parramatta River Catchment Trust Manual (version 3), Blacktown Local Environment Plan and any other relevant policies, handbooks, guides or other documents released from time to time by Blacktown City Council that relate to water sensitive urban design and integrated water cycle management.

1.4 DEFINITIONS FOR THIS PART

Definitions for this Part are found in Appendix 1.

2.0 APPLICATION OF THIS PART

2.1 Development to which this Part applies

Is the proposed development occurring within 40 metres of a watercourse? → Yes → **Section 4.2 Waterfront Lands**

Is the proposed development:

- A Torrens title or Community Association subdivision creating 5 or more additional lots, or a subdivision of land greater than 1,500 square metres irrespective of how many Torrens title or Community Association allotments are created?
- A consolidation of lots that, after consolidation, involves an area greater than 1,500 square metres and upon which development occurs?
- An industrial, commercial or residential development, alteration or an addition to development, where the impervious area of any additional roads, driveways, vehicle parking areas, vehicle manoeuvring areas, loading areas or storage areas either individually or in total exceeds 150 square metres? This includes the construction or designation of car parking spaces, whether the spaces be covered or uncovered, basement or elevated type car parking spaces or car parking spaces that are remote to the dwelling which they serve.

Yes → **Section 4.3 Water Conservation**
Section 4.4 Stormwater (water quality and waterway stability)
Section 4.5 Stormwater (detention)

Is the proposed development:

- A dual occupancy development or development creating a larger number of dwellings than a dual occupancy?
- A commercial or industrial area outside the Parramatta River Catchment boundary where development will result in a total impervious area equal to or greater than 500 square metres regardless of the pre-existing impervious area?
- Within the Parramatta River Catchment boundary where all development shall be subject to the controls of the Upper Parramatta River Catchment Trust Manual (version 3)?

Yes → **Section 4.5 Stormwater (detention)**

Does the proposed development include any activity that involves the disturbance of the soil surface, or the cut or placement of fill or storage of materials on any allotment (this includes agricultural and land management practices). For rural allotments greater than 1 hectare that are fully vegetated, is the proposed development greater than 150 square metres or located within 50 metres of a watercourse?

Yes → **Section 4.6 Stormwater (Erosion, Sediment and Pollution Control)**

Is the proposed development including any edge or part of the development located:

- More than 50 metres from a watercourse and have a cut and fill over the existing (predevelopment) surface which is greater than or equal to 1.5 metres?
- Equal to or less than 50 metres from a watercourse and have a cut and fill over the existing (predevelopment) surface which is greater than or equal to 1 metre?

Yes → **Section 4.7 Groundwater**

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APPLICATION OF THIS PART

Figure 1 Development to which this Part applies

2.2 Integrated Development

In accordance with Section 91 of the *Environment Planning and Assessment Act 1979* certain approvals, permits or licences are required from the NSW State Government in order for development to be carried out. An activity approval under the *Water Management Act 2000* is required for all development on Waterfront Lands and potentially approval under the *Fisheries Management Act 1994*. The requirements for approvals, permits or licensing may change if legislation is amended, repealed or superseded. Advice from the appropriate NSW State Government agency should be sought prior to any detailed planning.

2.3 Specialist Advice

Specialist advice shall be sought when conducting assessments or developing strategies in relation to this Part:

- (a) The applicant must have regard to the size and complexity of the development when selecting consultants;
- (b) The applicant must employ the services of appropriately qualified and experienced practitioners acceptable to Blacktown City Council to conduct any assessments or develop any strategies;
- (c) Where Section 4.3 Water Conservation controls apply, a practitioner shall be employed that has relevant tertiary qualifications and technical knowledge with a minimum of five (5) years demonstrated experience in the field of water conservation management;
- (d) Where Section 4.4 Stormwater (water quality and waterway stability) controls apply, a practitioner shall be employed that has relevant tertiary qualifications, technical knowledge and a minimum of five (5) years demonstrated experience in the field of stormwater (water quality and waterway stability) including water sensitive urban design (WSUD). If the required controls include wetlands, vegetation or rehabilitation of a watercourse a practitioner shall be employed that has relevant tertiary qualifications and technical knowledge with a minimum of five (5) years demonstrated experience in the field of ecology and bush rehabilitation;
- (e) Where Section 4.5 Stormwater (detention) controls apply, a practitioner shall be employed that meets the requirements of Blacktown Council's Engineering Guide for Development;
- (f) Where Section 4.6 Stormwater (erosion, sediment and pollution control) controls apply, a practitioner shall be employed that has demonstrated experience and technical knowledge in erosion and sediment control; and
- (g) Where Section 4.7 Groundwater controls apply, a practitioner shall be employed that has relevant tertiary qualifications, technical knowledge and a minimum of five (5) years demonstrated experience in the geotechnical or hydrogeological field.

3.0 APPLICATION REQUIREMENTS

3.1 STRATEGIES, ASSESSMENTS AND/OR PLANS TO BE SUBMITTED

The strategies, assessments and/or plans that are required to be conducted and submitted are summarised in Tables 1, 2 and 3 below.

Table 1 Strategies, assessments and/or plans to be submitted with a Development Application

Document	Applies to	Reference
Integrated Water Cycle Management Strategy	All development to which this Part applies and is located outside the North West Growth Centre boundary.	Appendix 2
Integrated Water Cycle Management Report	All development to which this Part applies and is located within the North West Growth Centre boundary.	Appendix 2
Drainage Plan	All development where the stormwater controls (water quality and waterway stability, detention and groundwater) apply.	Appendix 2
Groundwater Assessment and Management Plan	All development where the groundwater controls apply.	Appendix 2

Table 2 Plans to be submitted prior to release of the construction certificate

Document	Applies to	Reference
Erosion and Sediment Control Plan	All development where the erosion and sediment controls apply.	Appendix 3

Table 3 Plans to be submitted after the release of the construction certificate

Document	Applies to	Reference
Works as Executed Plans	All development where the stormwater controls (water quality and waterway stability, detention and groundwater) apply.	Appendix 3

All electronic files associated with or included as part of any of the documents listed in Table 1 and 2 must be submitted with the document.

3.2 MATTERS FOR CONSIDERATION

The following matters are to be taken into consideration during the preparation of all Development Applications to which this Part applies:

- (a) **Roads.** Consider the location of the road, placement and incorporation of measures within and around roads, verges and footpaths and ease of maintenance particularly having regard to traffic and flooding requirements;
- (b) **Safety.** Consider public safety and the safety of operation and maintenance personnel as well as occupational health and safety considerations;
- (c) **Operation and maintenance.** Consider maintenance and monitoring regimes and whole of lifecycle costing for the management of any proposed measures; and



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- (d) **Flooding.** Consider the impact of flooding on the integrated water cycle management measures having regard to safety; access and ability to deliver the intended objective for which the measures are designed (for example water quality improvement).

4.0 CONTROLS

4.1 General

- (a) For all development to which this Part applies and that are located outside the North West Growth Centre boundary, an **Integrated Water Cycle Management Strategy** that meets Council’s application requirements must be prepared in accordance with Appendix 2 of this Part and submitted as part of any Development Application.
- (b) For all development to which this Part applies and that are located within the North West Growth Centre boundary, an **Integrated Water Cycle Management Report** that meet Council’s application requirements must be prepared in accordance with Appendix 2 of this Part and submitted as part of any Development Application.
- (c) All aspects of any development works must comply with:
 - i. Blacktown City Council’s Engineering Guide for Development; and
 - ii. Blacktown City Council’s Works Specification – Civil.
- (d) Prior to the issue of any Subdivision Certificate, Occupation Certificate or upon completion of works, all relevant Certificates and Plans must be lodged in accordance with Blacktown City Council’s Engineering Guide for Development.
- (e) For all development to which this Part applies, a Drainage Plan that meets Council’s Development Application requirements must be prepared in accordance with Appendix 2 of this Part and submitted as part of any Development Application.
- (f) For all development to which this Part applies a Works as Executed (WAE) Plan must be prepared in accordance with Appendix 3 of this Part and submitted in accordance with the application requirements after the release of the Construction Certificate if requested by Council.

4.2 WATERFRONT LANDS

- (a) For all development to which this Part applies that is located outside the North West Growth Centre boundary, watercourses must be classified according to the requirements of the *Water Management Act 2000* must be defined according to their category and/or order as classified under the Strahler system of ordering watercourses and based on current 1:25 000 topographic maps blue lines. The relevant NSW State Government agency shall be consulted to determine the appropriate classification.
- (b) For all development to which this Part applies that is located within the North West Growth Centre boundary, the deemed watercourse classifications shall be in accordance with the Waterfront Lands Strategy developed for that Development Application.
- (c) For all development to which this Part applies that is located within the North West Growth Centre boundary, items (j) to (r) below must be in accordance with the Waterfront Lands Strategy developed for that Development Application.
- (d) Category 1 watercourses or watercourses with an order of greater than 3 (in general) must have a 40 metre wide core riparian zone on either side of the watercourse as measured from the top of each of the highest banks. A 10 metre vegetated buffer must also be provided that extends from the edge of the core riparian zone.

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CONTROLS

- (e) Category 2 watercourses, watercourses with a stream order of 2 or watercourse with a stream order of 1 with a permanent flow (in general) must have a 20 metre wide core riparian zone on either side of the watercourse as measured from the top of each of the highest banks. A 10 metre vegetated buffer must also be provided that extends from the edge of the core riparian zone.
- (f) Category 3 watercourses or watercourses with a stream order of 1 (in general) must have a 10 metre wide core riparian zone on either side of the watercourse as measured from the top of each of the highest banks. No vegetated buffer is required.
- (g) The core riparian zone, vegetated buffer and any additional lands required to maintain riparian function and its integrity, form the riparian lands.
- (h) Core riparian zones must be maintained, restored or rehabilitated to the full extent of the core riparian zone using locally endemic and indigenous species and include full structural floristics of the endemic vegetation community such as canopy, understorey and groundcover species.
- (i) The vegetated buffer must be maintained, restored or rehabilitated to the full extent of the vegetated buffer using locally endemic and indigenous species and include full structural floristics of the endemic vegetation community such as canopy, understorey and groundcover species.
- (j) Applicants must provide for the appropriate re-use of top soil from the development within the development site that contains known or potential seedbank.
- (k) Services such as sewer, electricity, gas, communication must be located outside the core riparian zone. Where services must traverse the core riparian zone the installation process should be limited to non destructive techniques such as direct drilling or boring and be designed to minimise the impact of maintenance or repair work. It must also be demonstrated that there will be minimal impact on the riparian function and the integrity of the riparian lands is maintained.
- (l) Transport infrastructure such as roads and railways must be located outside the core riparian zone. Where transport infrastructure must traverse the core riparian zone the design shall be at right angles to the creek to minimise the area of disturbance. It must also be demonstrated that there will be minimal impact on the riparian function and the integrity of the riparian lands is maintained.
- (m) Works such as environmental protection works and essential drainage from urban development and crossings may be located in the core riparian zone and vegetated buffer however, it must be demonstrated that there will be minimal impact on the riparian function and the integrity of the riparian lands is maintained.
- (n) Any activities or other land uses associated with lands classified under the *Local Government Act 1993* as a park or sportsground are not permitted in the core riparian zone or vegetated buffer. This includes a range of leisure, recreation or sporting activities and includes facilities such as amenities blocks and car parks. Pathways and cycleways or pervious recreational areas that do not support formal organised activities are excluded from this clause.
- (o) Pathways, cycleways and pervious recreational areas that do not support formal organised activities are permitted in the vegetated buffer, however they cannot exceed a combined total of 40 per cent of the area of the vegetated buffer. In general, pathways, cycleways and pervious recreational areas are not permitted in the core riparian zone except where an opportunity presents for the community to connect with and explore the watercourse in a strategic location. It must also be demonstrated that there will be minimal impact on the riparian function and the integrity of the riparian lands is maintained.
- (p) Crossings or other activities shall have regard to the requirements for fish passage particularly in regard to minimum structures for fish passage in accordance with relevant NSW State Government requirements.

- (q) Integrated water cycle management measures are not permitted in the core riparian zone however, they are permitted in the vegetated buffer provided that the measure is fully vegetated. Measures which are not fully vegetated must be located outside the vegetated buffer. It must also be demonstrated that there will be minimal impact on the riparian function and that the integrity of the riparian lands is maintained.
- (r) Bushfire asset protection zones (APZs) are not permitted within the core riparian zone or vegetated buffer and should be incorporated into the development footprint.
- (s) Subdivisions (via perimeter roads) and new developments should front onto riparian land. That is the road should be placed between the riparian land and the housing lots forming a perimeter to the development separating the development from the riparian lands. This also enables the road to form part of any required APZ.
- (t) Rehabilitation or revegetation of the core riparian zone or vegetated buffer must not increase the impacts of flooding to the proposed or upstream development. This must be demonstrated through flood modelling. This clause however shall not be used to prevent the restoration or rehabilitation of the core riparian zone or vegetated buffer in accordance with other clauses in this Part.

4.3 Water conservation

- (a) New residential dwellings, including residential components within a mixed use building and serviced apartments intended to, or capable of being strata titled, are to demonstrate compliance with State Environmental Planning Policy – Building Sustainability Index (BASIX).
- (b) Buildings that are not affected by BASIX that are installing any water use fittings must demonstrate compliance with the minimum standards defined by the Water Efficiency Labelling and Standards (WELS) Scheme. Minimum WELS ratings are:
 - i. 4 star dual-flush toilets;
 - ii. 3 star showerheads;
 - iii. 4 star taps (for all taps other than bath outlets and garden taps);
 - iv. 3 star urinals; and
 - v. Water efficient washing machines and dishwashers are to be specified and used wherever possible.
- (c) In industrial and commercial developments dual reticulation for non potable uses such as toilet flushing, laundry, irrigation and cooling towers must be installed.
- (d) Dual reticulation must be provided for future recycled water delivery, however, this must only supplement any stormwater harvesting and reuse schemes.
- (e) The percentage of proposed roof area directed to a rainwater tank must be maximised to increase the effectiveness and reliability of the reuse system.
- (f) Industrial and commercial developments must install rainwater tanks to meet a minimum of 80 per cent of their non potable water demand for outdoor use, toilets, laundry or hot water, unless physically impossible.
- (g) Where cooling towers are used they are:
 - i. To be connected to a conductivity meter to ensure optimum circulation before discharge;
 - ii. To include a water meter connected to a building energy and water metering system to monitor water usage; and
 - iii. To employ alternative water sources for cooling towers where practical.
- (h) Water use within public open space (for uses such as irrigation, pools, water features) must be supplied from non potable sources such as recycled water, roof water, harvested stormwater or other non

licenced water sources to meet a minimum of 80 per cent of the demand and treated to NSW State Government and Commonwealth Government standards.

4.4 STORMWATER (WATER QUALITY AND WATERWAY STABILITY)

- (a) Developments shall adopt a decentralised approach to water quality and waterway stability that is more attuned to the natural hydrological and ecological processes of the surrounding environment and includes on-site collection, treatment and utilisation of water flows as part of an integrated treatment train that is provided either in addition to, or in lieu of, conventional stormwater treatment measures.
- (b) All commercial, industrial, high and medium density, residential flat, integrated housing and housing for aged or disabled developments must provide for all stormwater treatment measures to be contained on lot or under a community association title unless otherwise agreed to by Council, prior to development approval being granted.
- (c) There shall be a minimum percentage reduction of the post development average annual load of pollutants in accordance with Table 4.

Table 4 Required percentage reductions in post development average annual loads of pollutants

Pollutant	% post development average annual load reduction
Gross Pollutants	90
Total Suspended Solids	85
Total Phosphorous	65
Total Nitrogen	45
Total Hydrocarbons	90

- (d) The post development duration of stream forming flows shall be no greater than 3.5 times the pre developed duration of stream forming flows with a stretch target of 1.
- (e) Any modelling conducted must be in accordance with the Blacktown City Council Modelling Guidelines.
- (f) Any changes in flow rate and flow duration within the receiving watercourses as a result of the development shall be limited as far as practicable. Natural flow paths, discharge point and runoff volumes from the site should also be retained and maintained as far as practicable.
- (g) Impervious areas that are directly connected to the stormwater system shall be minimised. Runoff from impervious areas such as roofs, driveways and rainwater tank overflows shall be directed onto grassed and other landscaped areas designed to accept such flows.
- (h) Any proposed stormwater treatment measures must be located to minimise the potential resuspension of pollutants and damage to the vegetation.
- (i) Where practicable, trunk drainage is to be provided as a natural stable channel and form part of the Integrated Water Cycle Management Strategy and must not be considered as a treatment measure in its own right for water quality.
- (j) Any stormwater treatment measures must be integrated into the urban design and landscaped areas.
- (k) Any stormwater treatment measures must be located, and configured, to maximise the impervious area that is treated.
- (l) Where kerbside stormwater treatment measures (excluding hard engineering treatments such as gross pollutant traps) are proposed, the footway must be extended to the additional width of the measure. That is the prescribed footway width is not to include the width of the measure and the road reserve must be widened to cater for the measure.

- (m) The pollution retention efficiency of structural stormwater treatment measures must be maintained up to the design discharge and must not decrease with the build up of materials.
- (n) Structural stormwater treatment measures must not allow the release of any previously trapped material in the event of a stormwater discharge and be designed to prevent or manage any additional surcharge from any inlet or manhole.
- (o) Structural stormwater treatment measures must be able to bypass flows in excess of the design discharge with negligible afflux resulting from overtopping or blockage of the device.
- (p) Stormwater treatment measures must consider mosquito control in their design.
- (q) Stormwater treatment measures must be located outside of the core riparian zone on waterfront lands. No adverse impact from discharges into the bushland must occur.
- (r) All stormwater treatment measures, such as gross pollutant traps, must be located in an area which is easily accessible (e.g. road side), and have wet weather access.
- (s) All filter media used in stormwater treatment measures must meet the current specifications of the Bioretention Filter Media Guidelines produced by the Facility for Advancing Water Filtration or demonstrated equivalent and verified by a soil laboratory registered by the National Association of Testing Authorities.
- (t) All stormwater treatment measures excluding gross pollutant traps located in areas where there is a shallow saline water table must be designed and constructed with impermeable liners to prevent infiltration and potential resulting rise in the watertable.
- (u) All vegetated stormwater treatment measures must consider monitoring points in their design.
- (v) Construction of the stormwater treatment measures must be completed once 90 per cent of the catchment is developed to ensure the treatment measure is not commissioned until the majority of catchment infrastructure is completed and landform stabilised. If the development is to be staged, sacrificial zones must be included in the design and rectified upon completion of development within the catchment.

4.5 STORMWATER (RETENTION)

- (a) The post development peak flows must be treated in accordance with Blacktown City Council Engineering Guide for Development.
- (b) Within the Parramatta River Catchment boundary all development shall be subject to the controls of the Upper Parramatta River Catchment Trust Manual (version 3).

4.6 STORMWATER (EROSION, SEDIMENT AND POLLUTION CONTROL)

- (a) An Erosion and Sediment Control Plan that meets Council's Development Application requirements must be prepared in accordance with Appendix 3 of this Part and submitted and approved by the certifying authority prior to the issuing of a Construction Certificate.

4.7 GROUNDWATER

- (a) A Groundwater Assessment and Management Plan that meets Council's Development Application requirements must be conducted and prepared in accordance with Appendix 2 of this Part and submitted as part of any Development Application.
- (b) Any dewatering activities may require concurrence from the NSW State Government Approval Body. The NSW State Government must be consulted if dewatering is proposed prior to lodgement of the Development Application.
- (c) The applicant must demonstrate that there will be no adverse impact on surrounding or adjacent properties, infrastructure or groundwater dependant ecosystems:
 - i. As a result of changes in the behaviour of groundwater created by the method of construction chosen; or
 - ii. From changes to the behaviour of groundwater of the surrounding area, created by the nature of the constructed form and groundwater management system used.
- (d) Where there is the potential for a damming effect on groundwater to be created by several consecutive below-ground structures:
 - i. The cumulative impact will require groundwater modelling to demonstrate no adverse impact on the surrounding properties or infrastructure. The extent of the modelling must consider the potential for future development to extend the damming effect and must, as a minimum extend between street blocks; or
 - ii. Where below ground structures are in close proximity to each other (typically less than 3 metres) there shall be no allowance provided for natural flow of groundwater through these narrow corridors. Provision must be made for these flows to be included in the design of perimeter or through drainage.
- (e) Where an impediment to the natural flow paths is created as a result of the nature of the construction methods utilised or the bulk of the below-ground structure, artificial drains may be utilised. These systems may only be utilised where it can be demonstrated that the natural groundwater flow regime is restored both up-gradient and down-gradient of the site, without any adverse effects on surrounding property or infrastructure.
- (f) Any groundwater management systems proposed shall have a minimum design life of 50 years.
- (g) Where construction is to occur on a hillside, details of the method of construction for any development proposal involving construction of permanent structures below the water table, other than pile or footing installation must be provided. The details provided must be sufficient to demonstrate compliance with the following:
 - i. All components of the structure including subsoil drainage must be located entirely within the property boundary; and
 - ii. Disposal of collected sub soil water must be achieved through a gravity drainage system.
- (h) Where Blacktown City Council's existing stormwater drainage network does not extend to the development site, the existing system will be required to be extended to the site frontage, unless alternative means of connection are provided.
- (i) The groundwater regime is to be maintained as close as possible to the pre-development condition during construction and operational phases of any development.
- (j) Construction techniques, where possible, shall eliminate the need for dewatering.
- (k) All groundwater management activities including monitoring must be conducted in accordance with the Groundwater Assessment and Management Plan and as agreed to by Council

- (l) For all development involving construction into perched aquifers in porous or fractured rock aquifers such as shale areas, construction techniques that eliminate the need for pumping shall be employed.
- (m) Groundwater management systems shall be designed so that they are easily maintained. A positive covenant and restriction may be required to ensure the continued functioning and maintenance of the approved groundwater system.

APPENDIX 1 DEFINITIONS

Activity means any development on land and may include, but is not limited to any one of the following:

- (a) The erection of a building.
- (b) The carrying out of work in, on, over or under land.
- (c) The use of land or of a building or work.
- (d) The subdivision of land whether involving earthworks or not.
- (e) Any soil disturbing activity in or on a public place or on lands owned by Blacktown City Council which may or may not be the subject of an approval.
- (f) Any act, matter or thing for which provision may be made under Section 26 of the *Environmental Planning and Assessment Act 1979* and which is prescribed for the purposes of this definition but does not include act, matter or thing referred to in Section 26 of the *Environmental Planning and Assessment Act 1979* for which development consent is required or which is prohibited under an environmental planning instrument.

Annual Exceedence Probability (AEP) means the chance of a flood of a given or larger size occurring in any one year, usually expressed as a percentage. For example, if a peak flood discharge of greater than or equal to 500 cubic metres per second has an AEP of 5 per cent, it means that there is a 5 per cent chance (that is one-in-20 chance) of a peak flood discharge of greater than or equal to 500 cubic metres per second or larger occurring in any one year (see average recurrence interval).

Aquifer means a body of saturate rock or soil containing a system of interconnected voids from which significant (economic) quantities of groundwater may be extracted.

Australian Height Datum (AHD) is a common national level corresponding approximately to mean sea level.

Average Recurrence Interval (ARI) means the long-term, average number of years, between the occurrences of a flood as big as or larger than, the selected event. For example, floods with a discharge equal to, or greater than, the 20 year ARI flood event will occur on average once every 20 years. ARI is another way of expressing the likelihood of occurrence of a flood event.

Bioretention Filter Media Guidelines refers to the document dated March 2008 2005 by Facility for Advancing Water Biofiltration (FAWB) and entitled Bioretention Filter Media Guidelines (version 2.01) as amended or superseded.

Building means any part of a building, and also includes any structure or part of a structure (including any temporary structure or part of a temporary structure), but does not include a moveable dwelling or associated structure or part of a manufactured home, moveable dwelling or associated structure.

Commercial development means any activity or development that is undertaken with a view to making a commercial gain or profit.

Conventional stormwater treatment measures means addressing the impacts of urban development on local watercourses in a manner that takes an end of pipe approach. Conventional stormwater treatment measures includes for example proprietary gross pollutant devices and regional wetlands.

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INTEGRATED WATER
CYCLE MANAGEMENTAPPENDIX 1
DEFINITIONS

Cooling towers means heat removal devices used to transfer process waste heat to the atmosphere by evaporating water to remove process heat and cool the working fluid to near the wet-bulb air temperature or by relying solely on air to cool the working fluid to near the dry-bulb air temperature. Common applications include cooling the circulating water used in oil refineries, chemical plants, power plants and building cooling.

Core riparian zone means the land contained within and adjacent to the channel or stream. The width of the zone from the banks of the stream is determined by assessing the importance and riparian functionality of the watercourse, merits of the site and long-term use of the land. The width of the zone is based on watercourse order, however the final width is determined in consultation with the NSW State Government after a merit based assessment of the site and consideration of any impacts proposed. The width of the zone is measured from the top of the highest bank on both sides of the watercourse.

Detention means the temporary storage of stormwater generated within an allotment to restrict the discharge leaving the site to a predetermined rate to prevent an increase in flooding downstream both in the local drainage system immediately downstream of the site and along the creeks and watercourses further downstream.

Dewatering means the removal of water from solid material or soil by a solid-liquid separation process. This is often done during the site development phase of a major construction project due to a high water table and may involve the use of pumps.

Downpipes means narrow channels, or troughs that form part of the gutter and collect and divert rainwater shed by the roof. In many buildings, the purpose of this diversion is to prevent water from falling off the roof edges. This uncontrolled water can cause structural damage to the outside walls and/or the foundation of a building over time.

Drainage means the natural or artificial movement of surface and sub-surface water from a given area.

Drainage Plan means a plan as described in Appendix 2 of this Part.

Dual reticulation means the delivery of the supply of water from two different sources using separate pipes for example when recycled water (sewage or stormwater) is used for non potable purposes such as irrigation and toilet flushing and drinking water is used for potable purposes such as drinking and cooking are delivered through separate water networks.

Ecologically Sustainable Development has the same meaning as the definition in the *Local Government Act 1993*.

Engineering Guide for Development refers to the current version at the time of submission of the Development Application developed by Blacktown City Council and entitled Engineering Guide for development as amended or superseded.

Erosion means the process by which the detachment, entrainment, suspension and transport of soil occurs by wind, water or gravitational effects. Erosion leads to sedimentation.

Erosion and Sediment Control Plan means a plan as described Appendix 3 of this Part.

Flow path means the route which water draining from an area will take.

Flow rate means the volume of fluid, in this instance water, that which passes through a given point per unit of time.

Flow duration means the time period over which flows occur.

Groundwater means water contained within the voids and spaces in rocks or soils.

Groundwater management system means the processes or practices used to control groundwater.

Groundwater Assessment and Management and Plan means an assessment and plan as described in Appendix 2 of this Part.

Gross pollutant means contaminants equal to or greater than 5 millimetres in diameter that when introduced into an environment cause instability, disorder, harm or discomfort to the physical systems or living organisms. This may include for example trash, litter and vegetation.

Hydrogeology means the branch of geology that deals with the distribution and movement of groundwater (commonly in aquifers).

Hydrogeologist or Geohydrologist means a person that studies or works in the area of hydrogeology. Often referred to as a hydrologist or engineer applying themselves to geology (geohydrology), or a geologist applying themselves to hydrology (hydrogeology).

Hydrological modelling means the computer based conceptual representation of parts of the hydrologic cycle and is primarily used for hydrologic prediction and for understanding hydrologic processes.

Hydrology means the movement, distribution, and quality of water throughout the Earth, and thus addresses both the hydrologic cycle and water resources.

Impervious areas means areas which have no or very limited ability to transmit fluids from the surface through to the subsurface. Impervious areas occur where the soil surface is sealed eliminating rainwater infiltration and natural groundwater recharge. They consist mainly of artificial structures such as pavements, rooftops, sidewalks, roads, and parking lots covered by materials such as asphalt, concrete, brick, and stone. Soils compacted by urban development are also highly impervious.

Integrated treatment train means measures which are organized or structured so that the individual measures are not designed and constructed in isolation but rather as part of an overall strategy that relies on several individual parts to achieve the full effect.

Integrated water cycle management means the processes or practices used to control the natural cyclical process whereby atmospheric water falls as rain and infiltrates to groundwater or runs off as stormwater to receiving waters and is then evaporated back into the atmosphere. At various stages of the process, water may also be released into the atmosphere (transpired) by living things.

Integrated Water Cycle Management Strategy means a Strategy as described in Appendix 2 of this Part.

Integrated Water Cycle Management Report means a Report as described in Appendix 2 of this Part.

Natural channel design means the design of channels with attributes and similarities of natural channels that may once have existed on site including a meandering line with pool and riffle zones created using natural materials and vegetation.

North West Growth Centre boundary means land that has been identified in accordance with the *State Environmental Planning Policy (Sydney Region Growth Centres) 2006*.

Perched aquifer means an aquifer in which infiltrating water remains separated from an underlying main body of groundwater, with an unsaturated zone existing between the two.

Public open space means land zoned as 6(a) and coloured green with black edging in the *Blacktown Local Environment Plan 1988*.

Rainwater tank means a reservoir or container that is used to collect and store (harvest) rain that runs off roofs via gutters and downpipes.

Receiving watercourses means any watercourse to which water is delivered from an area. The method of delivery may include, for example, subsoil drainage, local overland flow paths, pipes or other watercourses.

Dwelling has the same meaning as the definition in the *Blacktown Local Environment Plan 1988*.

Responsible person(s) means the person with suitable qualifications, experience or ability to correctly install and adequately maintain erosion and sediment control measures.

Secondary containment area means any area used to contain liquids in the event that the primary container (liquid storage container) or transfer mechanism fails or liquids otherwise leaks or spills. Secondary containment can include: following:

- (a) bunds which are raised, impermeable barriers forming the perimeter of secondary containment areas (for example, walls, speed humps, guttering, curbing, flexible rubber barriers).
- (b) encasement, for example storage containers with integral secondary containment.
- (c) grading of sealed surface areas to form a contained area, either as part of a building or an external structure.

Sediment means material of varying size, both mineral and organic, that is being, or has been moved from its site of origin by the action of wind, water or gravity and comes to rest.

Sedimentation means the deposition of sediment, usually in locations such as a channel, along a fence line, in an area of low slope, depression, watercourse or sediment trap.

Soil means a natural material consisting of layers, amalgamates or individual particles or mineral and/or organic constituents, or variable thickness, that differs from its parent material in morphological, physical, chemical and mineralogical properties and biological characteristics.

Stormwater means rainwater plus anything the rain carries along with it. In urban areas this includes the rain that falls on the roof of houses, or collects on paved areas such as driveways, roads and footpaths and is carried away through a system of pipes that is separate to the sewerage system.

Stormwater harvesting and reuse schemes means a process of collection, treatment, storage and use of stormwater.

Stormwater management means the processes or practices used to control stormwater.

Stormwater treatment measure means both hard and soft engineering practices that treat and improve the quality and quantity of stormwater.

Stream forming flow is defined as the following percentage of the 2 year ARI flow rate estimated for the catchment under natural conditions:

- (a) 10 per cent for cohesion less (for example sandy) bed and banks.
- (b) **25 per cent for moderately cohesive bed and banks. Main one to be used in Blacktown LGA due to dispersive clay soils.**
- (c) 50 per cent for cohesive (for example stiff clay) bed and banks.

Subsoil drainage means drainage in the layer of soil directly under the topsoil on the surface of the ground.

Subsoil water means water that is located in the layer of soil under the topsoil that forms the surface of the ground. The subsoil may include substances such as clay that has only been partially broken down by air, sunlight, water.

Total Nitrogen is the sum of the nitrogen present in all nitrogen-containing components in the water column including large and small phytoplankton and zooplankton, suspended microphytobenthos, dissolved inorganic nitrogen (nitrate and ammonia), dissolved organic nitrogen, labile detritus (both at the Redfield ratio and the Atkinson ratio) and refractory detritus. Total nitrogen concentration is determined by a balance between inputs (diffuse catchment loads, point source loads) and loss terms (export from the site to a watercourse and within the sediments).

Total Phosphorous is the sum of the phosphorus present in all phosphorus-containing components in the water column including large and small phytoplankton and zooplankton, suspended microphytobenthos, dissolved inorganic phosphorus (both absorbed and desorbed), dissolved organic phosphorus, labile detritus (both at the Redfield ratio and the Atkinson ratio) and refractory detritus. Total phosphorus concentration is determined by a balance between inputs (diffuse catchment loads and point source loads) and loss terms (export from the site to a watercourse and within the sediments).

Total Suspended Solids is a measure of the mass of fine inorganic particles suspended in the water.

Treatable flow rate means the minimum flow that a stormwater treatment measure must be capable of treating without bypass.

Trunk drainage means drainage systems where the catchment area exceeds 15 hectares.

Watercourse has the same meaning as 'river' under the *Water Management Act 2000* as amended or superseded.

Waterfront land has the same meaning as the *Water Management Act 2000* as amended or superseded.

Water Sensitive Urban Design (WSUD) means the process of addressing the impacts of urban development on local watercourses in a manner that seeks to integrate the sustainable management of the urban water cycle into the planning and design of the built form in urban environments. WSUD includes on-site collection, treatment and utilisation of stormwater flows as part of an integrated 'treatment train' that may be applied in addition to, or in lieu of, conventional stormwater and that can supplement water supply measures. WSUD can include:

- (a) Reuse of rainwater, stormwater or treated effluent for toilet flushing, washing machines, garden watering, car washing or industrial purposes;
- (b) Specially designed landscaping and other treatment systems for conveying and treating stormwater runoff including the use of wetlands, grass swales and bioretention systems; and
- (c) Protection and restoration of stream and riparian corridors for their environmental, recreational and cultural values.

Water table means the top level of water stored underground; the surface of groundwater in the soil.

Waterway stability refers to the ability of a watercourse to withstand erosive forces.

Works as Executed Plan means a plan as described in Appendix 3 of this Part.

Works Specification – Civil refers to the document dated February 2005 by Blacktown City Council and entitled Works Specification – Civil as amended or superseded.

APPENDIX 2 STRATEGIES, ASSESSMENTS AND/OR PLANS TO BE SUBMITTED WITH A DEVELOPMENT APPLICATION

Plans and/or strategies required to be submitted include:

- (a) Integrated Water Cycle Management Strategy;
- (b) Integrated Water Cycle Management Report;
- (c) Drainage Plan; and
- (d) Groundwater Assessment and Management Plan.

Integrated Water Cycle Management Strategy

Any **Integrated Water Cycle Management Strategy** that is prepared must be written in the form of a report and include the relevant sections and information as stated in Table 5. Applicants should consult with Council officers to discuss the criteria of the Strategy prior to its development.

The objective of the Strategy is to:

- (a) Assess the water cycle of the site and identify mitigation/conservation/management measures for waterfront lands, water conservation, stormwater (water quality and waterway stability, detention and erosion, sediment and pollution control) and groundwater (whichever applies) to ensure the development meets the development controls.

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INTEGRATED WATER CYCLE MANAGEMENT

APPENDIX 2 STRATEGIES, ASSESSMENTS AND/OR PLANS TO BE SUBMITTED WITH A DEVELOPMENT APPLICATION

Table 5 Sections and information to be included in the Integrated Water Cycle Management Strategy

Section	When to include section	Information to be provided
Background information	All development to which this Part of the DCP applies. See Section 2.1.	The name, qualifications and a brief outline of relevant experience of person(s) involved in the preparation of the Strategy.
		This section must summarise any background information available including previous and concurrent studies, mapping data, strategies or plans. Any relevant documents referenced in the Strategy must be attached as appendices.
Proposed development	All development to which this Part of the DCP applies. See Section 2.1.	This section must describe the proposed development including allotment boundaries, adjoining properties; proposed land use densities, population, infrastructure and development staging.
Objectives	All development to which this Part of the DCP applies. See Section 2.1.	This section must identify the development objectives that apply to the proposed development consistent with this Part.
Constraints and opportunities	All development to which this Part of the DCP applies. See Section 2.1.	This section must identify the constraints and opportunities presented by the allotment for which the Strategy is being prepared that have the potential to impact upon or enhance the integrated water cycle management.

Section	When to include section	Information to be provided
Waterfront Lands	All development to which the waterfront lands controls of this Part of the DCP applies. See Section 2.1.	This section must describe the existing conditions and identify the conservation/mitigation/management measures proposed to meet the relevant controls in Clause 4 of this Part.
Water conservation	All development to which the water conservation controls of this Part of the DCP applies. See Section 2.1.	<p>This section must include, or have included as an appendices any calculations and results of any modelling conducted and identify the size, location, indicative level, volume and configuration of any measures proposed.</p> <p>This section must include an assessment of all potential strategies that were considered. This section must include the impacts of vegetation and/or potential rehabilitation/restoration of core riparian zones and vegetated buffers in any flood modelling.</p>
Stormwater (water quality and waterway stability)	All development to which the stormwater (water quality and waterway stability) controls of this Part of the DCP applies. See Section 2.1.	
Stormwater (detention)	All development to which the stormwater (detention) controls of this Part of the DCP applies. See Section 2.1.	
Stormwater (erosion, sediment and pollution control)	All development to which the stormwater (erosion, sediment and pollution control) controls of this Part of the DCP applies. See Section 2.1.	
Groundwater	All development to which the groundwater controls of this Part of the DCP applies. See Section 2.1.	
Integration with urban design and the environment	All development to which this Part of the DCP applies. See Section 2.1.	This section must identify how the proposed mitigation/conservation/management measures will integrate with the existing and proposed urban design and the environment.
Assessment of potential strategies as an integrated system including costs	All development to which this Part of the DCP applies. See Section 2.1.	<p>This section must assess the proposed mitigation/conservation/management measures as an integrated system.</p> <p>This section must identify capital, operational and maintenance costs of the proposed mitigation/conservation/management measures. The cost estimates must include typical annual maintenance costs and corrective maintenance or renewal/adaptation costs (that is a whole of life cycle cost estimate).</p> <p>This section must identify and demonstrate how issues such as land take requirements, expected reliability, likely level of community acceptance and future management responsibilities have been considered and addressed.</p>
Maintenance and monitoring plan	All development to which this Part of the DCP applies. See Section 2.1.	This section must identify any inspection and maintenance requirements for the proposed mitigation/conservation/management measures to ensure the proposed measures remain effective. This must include the submission of an annual maintenance and monitoring report. Where vegetation is included in the proposed measures the monitoring and maintenance plan must include a harvesting schedule for example a macrophyte harvesting schedule for a wetland. This information must demonstrate that the measures are performing to the design criteria and any areas being rehabilitated are establishing and meeting the requirements for their enhancement.

Integrated Water Cycle Management Report

Any **Integrated Water Cycle Management Report** prepared must be a written report and include the relevant sections and information as stated in Table 6. Applicants should consult with Council officers to discuss the criteria of the Report prior to its development.

The objective of the Report is to:

- (a) Assess the water cycle of the site and identify mitigation/conservation/management measures for waterfront lands, water conservation, stormwater (water quality and waterway stability, detention and erosion, sediment and pollution control) and groundwater (whichever applies) to ensure the development meets the development controls in accordance with the Precinct wide Stormwater Strategy and Waterfront Lands Strategy prepared for the Precinct.

Table 6 Sections and information to be included in the Integrated Water Cycle Management Strategy

Section	When to include section	Information to be provided
Background information	All development to which this Part of the DCP applies. See Section 2.1.	The name, qualifications and a brief outline of relevant experience of person(s) involved in the preparation of the Strategy.
		This section must summarise the relationship of the report to any relevant Precinct wide strategies or plans.
Proposed development	All development to which this Part of the DCP applies. See Section 2.1.	This section must describe the proposed development including allotment boundaries, adjoining properties and reference any relevant information from Precinct wide strategies or plans.
Objectives	All development to which this Part of the DCP applies. See Section 2.1.	This section must identify the development objectives that apply to the proposed development consistent with this Part and any relevant Precinct wide strategies or plans.
Constraints and opportunities	All development to which this Part of the DCP applies. See Section 2.1.	This section must identify any additional constraints and opportunities presented by the allotment with the potential to impact upon or enhance the integrated water cycle management that may not have been addressed or addressed in appropriate detail in the relevant Precinct wide strategies or plans.
Waterfront Lands	All development to which the waterfront lands controls of this Part of the DCP applies. See Section 2.1.	This section must describe how the proposed development and the proposed conservation/mitigation/management measures meet the relevant requirements of the relevant Precinct wide strategies or plans. This section must include, or have included as an appendices any calculations and results of any modelling conducted and identify the size, location, indicative level, volume and configuration of any measures proposed. This section must include an assessment of all potential strategies that were considered if the measures proposed are inconsistent with the approach of the relevant Precinct wide strategy or plan. This must include the impacts of vegetation and/or potential rehabilitation/restoration of core riparian zones and vegetated buffers in any flood modelling.
Water conservation	All development to which the water conservation controls of this Part of the DCP applies. See Section 2.1.	
Stormwater (water quality and waterway stability)	All development to which the stormwater (water quality and waterway stability) controls of this Part of the DCP applies. See Section 2.1.	
Stormwater (detention)	All development to which the stormwater (detention) controls of this Part of the DCP applies. See Section 2.1.	
Stormwater (erosion, sediment and pollution control)	All development to which the stormwater (erosion, sediment and pollution control) controls of this Part of the DCP applies. See Section 2.1.	

Section	When to include section	Information to be provided
Groundwater	All development to which the groundwater controls of this Part of the DCP applies. See Section 2.1.	<p>This section must describe how the proposed development and the proposed conservation/mitigation/management measures meet the relevant requirements of the relevant Precinct wide strategies or plans.</p> <p>This section must include an assessment of all potential strategies that were considered if the measures proposed are inconsistent with the approach of the relevant Precinct wide strategy or plan including potential impacts and how they integrate with other water cycle management measures.</p>
Integration with urban design and the environment	All development to which this Part of the DCP applies. See Section 2.1.	This section must describe how the proposed development and the proposed conservation/mitigation/management measures meet the relevant requirements of the relevant Precinct wide strategies or plans.
Assessment of potential strategies as an integrated system including costs	All development to which this Part of the DCP applies. See Section 2.1.	<p>This section must describe how the proposed development and the proposed conservation/mitigation/management measures meet the relevant requirements of the relevant Precinct wide strategies or plans.</p> <p>This section must identify capital, operational and maintenance costs of the proposed mitigation/conservation/management measures. The cost estimates must include typical annual maintenance costs and corrective maintenance or renewal/adaptation costs (that is a whole of life cycle cost estimate).</p> <p>If the measures proposed are inconsistent with the approach of the relevant Precinct wide strategy or plan, this section must also identify and demonstrate how issues such as land take requirements, expected reliability, likely level of community acceptance and future management responsibilities have been considered and addressed.</p>
Maintenance and monitoring plan	All development to which this Part of the DCP applies. See Section 2.1.	This section must identify any inspection and maintenance requirements for the proposed mitigation/conservation/management measures to ensure the proposed measures remain effective. This must include the submission of an annual maintenance and monitoring report. Where vegetation is included in the proposed measures the monitoring and maintenance plan must include a harvesting schedule for example a macrophyte harvesting schedule for a wetland. This information must demonstrate that the measures are performing to the design criteria and/or those areas being rehabilitated are establishing and meeting the requirements for their enhancement.

Drainage Plan

A **Drainage Plan** is a drawing that depicts the process of capture and conveyance of stormwater and must be prepared by a practitioner that fulfils the requirements of Blacktown City Council’s Engineering Guide for

Development for the preparation of such plans. The plan must provide enough detail for Council to determine that the proposal will function in accordance with the development controls of this Part, the relevant sections of Blacktown City Council's Engineering Guide for Development and Blacktown City Council's Works Specification – Civil as well as accepted engineering practices.

It is expected that the following information will be provided as a minimum:

- (a) Legal points of discharge;
- (b) Detention including all necessary levels, dimensions, volumes etc;
- (c) Easements;
- (d) Overland flow paths;
- (e) Trunk drainage;
- (f) Pipe sizes and levels of critical points;
- (g) Extent of works;
- (h) Interallotment drainage;
- (i) Subsoil drainage;
- (j) Pit design;
- (k) Constraints including ecological, archaeological and geotechnical;
- (l) Flood prone land;
- (m) Integrated water cycle management measures; and
- (n) Utilities.

The Drainage Plan must also demonstrate that any proposed measures will fit within the available space.

GROUNDWATER ASSESSMENT AND MANAGEMENT PLAN

A **Groundwater Assessment and Management Plan** is a written document that must be prepared by a practitioner with relevant tertiary qualifications, technical knowledge and a minimum of five (5) years demonstrated experience in the geotechnical or hydrogeological field and be prepared in accordance with the Sydney Coast Councils Group Groundwater Management Handbook 2006, subsequent updates or superseding documents.

The groundwater assessment must provide information on:

- (a) The local hydrology including depth to water table and an assessment of the recharge characteristics;
- (b) The presence of contaminated soil, surface water or groundwater including details of the contamination; and
- (c) An assessment of the potential for interaction with, or potential for impacts on groundwater.

If the groundwater assessment determines that there is potential for interaction with, or potential for impacts on groundwater, a management plan must be prepared and include/identify:

- (a) A summary of the findings of the groundwater assessment;
- (b) More detailed information on the local hydrogeology which was excluded from the groundwater assessment such as groundwater flow rates;
- (c) The ambient chemical characteristics of the groundwater;
- (d) The proximity of surrounding structures or buildings their footing systems and soil conditions;
- (e) The potential for settlement and water seepage;
- (f) Any temporary or permanent measures to be employed to manage groundwater interference, with sufficient detail and explanation to demonstrate that the measures will provide an acceptable level of performance;
- (g) The location and provide an assessment of risk to adjoining properties;
- (h) Options for the disposal of groundwater and stormwater;
- (i) How the existing groundwater regime will be maintained;
- (j) A monitoring program in accordance with any licensing requirements, or in the absence of licensing requirements as determined by Council;
- (k) An assessment of possible reasons for performance falling short of the required level and a contingency plan to deal with sub-standard performance and any unforeseen circumstances;
- (l) Documentation to satisfy requirements for any permits or licensing to be obtained from the NSW State Government; and
- (m) Any other features that will have an influence on the site or surrounding area.

In so far as the proposal includes any of these features and provide sufficient detail to demonstrate that the completed works will meet the requirements of the groundwater controls of this Part of the DCP.

The local hydrogeology will largely determine the options available for controls of the groundwater during construction and the long term. Regardless of the construction methodology it may be necessary to install monitoring devices so that fluctuations in water level can be monitored pre, during and post construction and remedial action undertaken if required.

It is important to note that the presence of contaminated soil, surface water or groundwater, whether generated from the allotment or beyond, will require remediation prior to construction commencing. The method and extent of remediation will depend on the nature and source of the contamination and whether it is moving within the groundwater system.

Additionally, in most cases the ambient chemical characteristics of groundwater are usually relatively benign and not likely to impact on the long term integrity of the structure. However, if there is the presence of highly corrosive groundwater the selective use of particular building materials that can withstand this corrosive attack may be required and should be incorporated into the report.

Major structures in close proximity to the development may also pose a constraint to the methods proposed to manage groundwater during construction.

APPENDIX 3 PLANS TO BE SUBMITTED PRIOR TO AND AFTER RELEASE OF THE CONSTRUCTION CERTIFICATE

Plans required to be submitted prior to the release of the construction certificate include:

- (a) Erosion and Sediment Control Plan.

Plans required to be submitted after the release of the construction certificate if requested by Council including:

- (b) Works as Executed Plans.

EROSION AND SEDIMENT CONTROL PLAN

An **Erosion and Sediment Control Plan** is a drawing and accompanying explanation that must be prepared by a person with suitable qualifications, experience or ability in the preparation of such plans and that has a demonstrated knowledge of soil and water management. The Plan must be prepared in accordance with the relevant section of Blacktown City Council’s Engineering Guide for Development and Blacktown City Council’s Works Specification – Civil.

WORKS AS EXECUTED PLAN

A **Works as Executed Plan** is a drawing that must be prepared by a by a practitioner that fulfils the requirements of the Engineering Guide for Development for the preparation of such plans. The Plan must be prepared in accordance with the relevant section Blacktown City Council’s Engineering Guide for Development.

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INTEGRATED WATER CYCLE MANAGEMENT

**APPENDIX 3
PLANS TO BE
SUBMITTED PRIOR TO
AND AFTER RELEASE OF
THE CONSTRUCTION
CERTIFICATE**