

STRATEGIC PLANNING

DRAFT **Randwick** **Development** **Control Plan** **B8 Water** **management**

D05248153

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Prepared by	JB	September 2025	
Coordinator Review	DA	September 2025	
Manager Review	Stella Agagiotis	October 2025	

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1. Introduction

This Section of the Randwick Development Control Plan (DCP) 2013 contains objectives and controls for development in relation to stormwater management, groundwater and flooding, with an overall focus on the implementation of Water Sensitive Urban Design (WSUD).

WSUD is the sustainable management of water in urban areas through intelligent and integrated design. It seeks to ensure that development is designed, constructed and maintained to minimise impacts on the natural water cycle.

It includes a wide range of technologies to reduce potable water consumption and reduce the pollution from stormwater ending up in local waterways. These can include rainwater tanks, gross pollutant traps, on site stormwater retention and reuse, landscaped swales, and infiltration systems.

This section of the DCP should be read in conjunction with:

- Part A – Introduction
- Part B3 – Sustainability
- Randwick Private Stormwater Code
- Randwick Flooding Advice and Flood Related Development Controls Policy
- Any other Part of the DCP which may apply.

2. Stormwater management

Randwick Local Environmental Plan (LEP) 2012 includes provisions for stormwater management which aim to minimise the impact of urban stormwater on land in Randwick City, including adjoining downstream properties, native bushland, waterways and receiving waters.

This section supports these LEP provisions and contains specific requirements for developments in relation to managing the quality and quantity of stormwater impacting on Randwick City and surrounding catchments, waterways and coastlines.

Other sections in this DCP also contain related requirements for water permeable surfaces in deep soil and landscaped open space. Refer to the sections on specific development types for further details.

2.1. Water quality

Explanation

Water bodies and coastlines in urban areas often suffer from decreased water quality resulting from stormwater run-off from roads and impermeable surfaces. This run-off collects sediments, oils, chemicals and other pollutants, and adversely impacts on the biodiversity and recreational amenity of waterways and coastlines.

Management of stormwater quality is particularly important for larger developments with open areas of hardstand or car parking space that have higher potential to collect and direct sediments and pollutants into the stormwater system.

Objectives

1. To prevent the transportation of pollutants and sediments from a site by stormwater runoff
2. To ensure that stormwater runoff is of suitable quality to protect the recreational amenity of water bodies and coastlines; aquatic ecosystems and downstream receiving waters
3. To prevent pollution spills or contaminants from leaving a site via the stormwater network.

Controls

- a) All development proposing open car parking or hard stand areas exceeding 200m², or incorporating new roads shall capture sediments and pollutants from the site and must provide a:
 - i. Minimum of one pollutant trap located between the last downstream stormwater pit and prior to discharge from the site
 - ii. System of WSUD treatments such as vegetated swales, bio-retention systems and buffer strips to achieve the same performance as the pollutant trap(s)
 - iii. Design report with a Development Application (DA) from a suitably qualified environmental consultant demonstrating how sediments and pollutants will be captured.
- b) All other residential and non-residential development must consider the use of WSUD technologies to improve the quality of stormwater run-off from a site prior to entering the drainage system, nearby catchments or waterways.

2.2. Stormwater management systems

Explanation

Council requires that most areas in the Local Government Area (LGA) provide on-site stormwater detention and/or infiltration for new developments.

On-site Stormwater Detention (OSD) systems temporarily store excess stormwater on a site and act to reduce the peak flow rate of stormwater discharged from a site into Council's drainage system. OSD systems can prevent overloading infrastructure and reduces the risk of downstream flooding effects.

Infiltration systems are utilised to manage and absorb stormwater runoff through infiltration into the soil. They are designed to offset the impacts of development and reduce the amount of water being discharged from a site via stormwater runoff.

Note

OSD and infiltration systems are generally required for most residential and non-residential development in specified locations within the Randwick LGA. For further details on the design and application of on-site detention/infiltration systems and applicable locations, refer to Council's Private Stormwater Code.

Objectives

1. To control the release of private stormwater into Council's drainage system to maintain its capacity and prevent flooding
2. To require the use of on-site detention systems and, where practical, encourage the use of stormwater infiltration in lieu of on-site detention.

Controls

- a) On-site detention and infiltration systems must be designed and constructed to comply with the requirements and specifications outlined in Council's Private Stormwater Code
- b) Where appropriate, infiltration systems are encouraged for all types of development to reduce discharged stormwater from a site
- c) Development applications for new development and alterations and additions which involve changes to stormwater drainage must include concept drainage plans with sufficient information to enable Council Officer's to determine suitable drainage conditions
- d) Should constraints restrict stormwater discharge by gravity to Council's drainage system and ground conditions preclude the construction of an infiltration pit, applicants should attempt to obtain a private drainage easement to dispose of stormwater to Councils drainage system. Where a private drainage easement cannot be obtained, Council may consider the use of pumps and/or a charged system.

2.3. Construction water management

Explanation

Discharging site stormwater, groundwater or seepage water from a building site can introduce excess sediments and harmful pollutants into Council's stormwater drainage system and downstream receiving waters. Construction sites are required to manage erosion of sediment and stormwater run-off during construction. Council will include Conditions of Consent describing requirements during construction.

Objective

1. To manage and protect the drainage system, downstream receiving waters and the surrounding environment from harmful contaminants from construction sites.

Controls

- a) All DAs involving excavation or other site disturbance must submit a Soil and Erosion Management Plan demonstrating how sediment and contaminants from construction shall be contained and managed
- b) Separate approval will be required from Council for any proposals to discharge stormwater, seepage water or groundwater from a construction site into Council's stormwater drainage system. Council may require water quality testing of the discharged water by a suitably qualified environmental consultant.

2.4. Stormwater infrastructure

Explanation

This sub-section applies to all development in proximity to public stormwater infrastructure or inter-allotment drainage, and all development proposing new connections to Council's drainage system.

Definitions

Public stormwater infrastructure is the system of drainage pipes and pits owned by Council or another public authority.

Inter-allotment drainage lines carry stormwater from more than one lot across private property before connecting to the public stormwater system.

Objectives

1. To ensure stormwater infrastructure is designed and constructed to an acceptable standard
2. To prevent adverse impacts of development on the performance, serviceability and integrity of publicly owned stormwater systems and inter-allotment drainage lines
3. To ensure that private stormwater systems discharge to the public stormwater system in an acceptable manner.

Controls

- a) The design and installation of stormwater infrastructure must be in accordance with Randwick City Council's Private Stormwater Code
- b) New structures must not be constructed on or above public stormwater infrastructure or inter-allotment drainage
- c) Redevelopment of existing structures above public stormwater infrastructure or inter allotment drainage may occur only where:
 - i. Relocation of the existing stormwater conduit or structure is not feasible
 - ii. The conduit is reconstructed to meet relevant standards
 - iii. The conduit is upgraded to ensure structural soundness and serviceability for the life of the structure and the life of the conduit.
- d) A drainage easement may be required for development impacting existing Council stormwater infrastructure or an inter-allotment drainage line
- e) Separate written approval from Council will be required for all drainage and infrastructure works located externally from a site within a road reserve/public place
- f) Separate approval must be obtained from a relevant authority if an applicant wishes to discharge stormwater to a system not owned by Council.

3. Groundwater

Several areas within Randwick City are underlain by the Botany Sands Aquifer. The level of the aquifer can vary with seasonal conditions, and in some areas is quite close to the surface. As a consequence, some developments in locations above the aquifer may be impacted by the groundwater system. Excavation of sites that receive groundwater inflows or seepage are an aquifer interference activity and are subject to the Water Management Act 2000 and the NSW Aquifer Interference Policy.

This sub-section applies to all development proposing basement construction or other forms of excavation that may interact with the groundwater table.

Note

For further information on requirements applying to commercial, residential and mixed-use developments that incorporate basement levels and excavation, refer to the Department of Planning and Environment 2022 guidelines - Minimum requirements for building site groundwater investigations and reporting (nsw.gov.au)

3.1. Site investigations

Explanation

It is important to establish the potential for a development to be impacted by groundwater or interfere with groundwater flows early in the design process. Appropriate site investigations need to be undertaken that inform the design and construction of the development.

Objectives

1. To appropriately characterise the existing groundwater regime and ensure appropriate site investigations are undertaken to identify the potential for a development to be affected by groundwater or interfere with groundwater flow
2. To minimise impacts of construction activity and completed development on the groundwater regime
3. To meet regulatory obligations under the Water Management Act 2000, water sharing plans and the NSW Aquifer Interference Policy.

Controls

- a) All development proposals incorporating a basement level and excavation are required to undertake a preliminary geotechnical investigation to establish whether the development may be affected by groundwater
- b) Any development that may temporarily or permanently interfere with groundwater flows must submit a Hydrogeological report in conjunction with a Geotechnical report
- c) This investigation must be undertaken by a suitably qualified geotechnical or hydrogeological engineer, and shall be submitted with the DA.

3.2. Basement design and construction

Explanation

Basements that may intersect the water table must be designed and constructed to preclude the need for dewatering after construction, while also avoiding unreasonable adverse effects on groundwater flows and quality, and on neighbouring properties.

This sub-section sets out requirements for documentation to be included with DAs. Council will also include conditions of development consent requiring design details and certification of the suitability of the basement design prior to approval to commence works on site, and certification upon completion that the works have been implemented in accordance with the approved documentation.

Objectives

1. To ensure that basement design and construction does not create unreasonable impacts to neighbouring properties, groundwater conditions or the structural integrity of the development
2. To prevent permanent dewatering of groundwater in basements following construction
3. To maintain the natural flow paths of groundwater around development and implement groundwater management systems if required.

Controls

- a) A letter or report prepared by a suitably qualified engineer experienced in the design of structures below a water table, shall be submitted with a DA, confirming that the proposed basement will be designed and constructed in a manner that is suitable for the site conditions
- b) The report must include confirmation that the basement will:
 - i. Be designed and certified by a suitably qualified and experienced engineer
 - ii. Preclude the need for dewatering after construction
 - iii. Be suitably water-proofed and tanked in all areas where groundwater may impact on the development
 - iv. Include groundwater management systems if needed to maintain natural flow paths of groundwater around the development.

3.3. Groundwater during construction

Explanation

Where a development intersects the groundwater table, temporary pumping (dewatering) may be required to allow construction to proceed. Dewatering is the process of removing groundwater from an aquifer to lower the water table below the lowest level of the excavation. This allows construction to proceed safely by limiting the potential for excavation instability and water-logged ground conditions.

Development proposals involving dewatering are referred for assessment, review and approval from WaterNSW. If approval is granted, they will issue general terms of approval which will be incorporated into any development consent issued by Council. It is also necessary to obtain a water access license from WaterNSW after a development consent is issued, to permit the extraction of water from a groundwater source.

Note that WaterNSW will not endorse continuous extraction of groundwater. Temporary dewatering may be approved by WaterNSW provided the design of basement areas precludes the need for dewatering after construction.

Council will also include conditions of development consent relating to excavation, shoring, piling, dewatering and other construction activities relating to basements affected by groundwater, including requirements for information/certification to be provided prior to approval to commence construction works.

Objectives

1. To ensure that construction activities do not adversely impact on groundwater conditions or neighbouring properties.
2. To identify requirements for development proposals that may require temporary de-watering during construction.

Controls

- a) All DA's involving excavations that may require temporary de-watering, shall include a Hydrogeological report prepared by a suitably qualified engineer experienced in the construction of structures below a water table. The report shall:
 - i. Outline the proposed method of construction and rate of dewatering
 - ii. Specify how groundwater drainage systems have been designed to transfer groundwater through or under the proposed development without a change in the range of the natural groundwater fluctuations
 - iii. Confirm that the basement can be feasibly constructed without causing unreasonable impacts to neighbouring properties and infrastructure.

4. Flooding

Explanation

Flooding in NSW is managed in accordance with the NSW Government's Flood Prone Land Policy and the principles of the Flood Risk Management Manual 2023, which aims to reduce the impact of flooding and flood liability on individual owners and occupiers of flood prone property, and to reduce private and public losses resulting from floods, utilising ecologically positive methods wherever possible.

Randwick City Council is in the process of undertaking flood studies and Floodplain Risk Management Studies and Plans (FRMSP) for its catchments to quantify flooding risks and potential measures in accordance with the NSW Government's Floodplain Development Manual.

This sub-section of the DCP supports Section 5.21 and 5.22 of the Randwick LEP 2012 and provides controls for development consistent with the NSW Government's Flood Prone Land Policy and the Flood Risk Management Manual.

Definitions

1% Annual Exceedance Probability (1% AEP) is a flood with a 1% (1:100) probability of occurring in any given year, formerly known as the 100-year ARI.

5% Annual Exceedance Probability (5% AEP) is a flood with a 5% (1:20) probability of occurring in any given year, formerly known as the 20-year ARI.

Flood Planning Level is the combination of the flood level from a defined flood event (i.e. 1% AEP) and freeboard selected for Flood Risk Management (FRM) purposes.

Flood Planning Area is the area of land below the Flood Planning Level.

Freeboard is a factor of safety typically used in relation to the setting of minimum floor levels or levee crest levels.

Overland Flow Path is the path of rain-induced surface run-off that is not part of a defined watercourse, including run-off in excess of the capacity of the underground drainage system.

Probable Maximum Flood (PMF) is the largest flood that could conceivably occur at a particular location.

This section applies to:

- Residential development on land below the 1% Annual Exceedance Probability (1% AEP) flood plus the required freeboard
- All other development on land below the Probable Maximum Flood (PMF) plus the required freeboard.

Applicants are encouraged to liaise with Council early in the design process to identify any applicable flooding implications.

Objectives

1. To control development at risk of flooding in accordance with the NSW Government's Flood Risk Management Manual, Flood Prone Land Policy and Council adopted flood studies and FRMSP.

2. To ensure that the economic and social costs which may arise from damage to property due to flooding is minimised and can be reasonably managed by the property owner and general community
3. To reduce the risk to human life and damage to property caused by flooding by controlling development on land impacted by potential floods
4. To ensure that development is appropriately sited and designed according to the site's sensitivity to flood risk.

4.1. Flood studies and plans

Objectives

1. To ensure that development addresses and is consistent with the requirements any relevant flood studies and FRMSP.

Controls

- a) DA's are to identify any flood related information including flood levels, locations of floodways or overland flow paths impacting the site
- b) Applications must comply with any catchment-specific controls in a Council adopted FRMSP in addition to the controls in this section
- c) A site-specific Flood Risk Management Report or Flood Study may be required to demonstrate that there is no adverse impact on flooding of a site if an FRMSP or flood study for the catchment has not been prepared.

Note

Refer to Council's website for the status of flood studies, and availability of information for different catchments - <https://www.randwick.nsw.gov.au/environment-and-sustainability/what-were-doing/managing-flooding>

Information including locations of floodways and flood levels are available from Council where a flood study for a particular catchment has been prepared.

Property specific information, where available, can be obtained from Council by completing a Flood Report Application Form.

A flood study may be prepared either by Council, or by the applicant in instances where Council requires the applicant to submit a flood study.

4.2. Flood effects

Objectives

1. To ensure that development, either individually or cumulatively, minimises adverse impacts on flooding, conveyance of floodwaters and floodplain storage volume
2. To ensure that floodways and overland flow paths are not obstructed by development.

Controls

- a) The development shall not increase flood effects elsewhere, having regard to loss of flood storage, changes in flood levels and velocities and the cumulative impact of multiple potential developments, for floods up to and including the 1% AEP flood
- b) Floodways and overland flow paths must not be obstructed or diverted onto adjoining properties
- c) Areas identified as flood storage areas must not be filled unless compensatory excavation is provided to ensure that there will be no net loss of floodplain storage volume below the 1% AEP flood.
- d)

4.3. Flood levels

Explanation

Floor levels refer to the minimum required building floor levels. For development such as basements, the floor level refers to the lowest level at each access point.

Objectives

1. To ensure that floor levels are set at an appropriate height to reduce the frequency of inundation of structures and floors to an acceptable probability.

Controls

- a) Building floor levels shall comply with Table 1 Floor levels for buildings, with the exceptions noted below
- b) A single (once only) addition at the existing lowest habitable floor level may be permitted after a flood study has been prepared. Such an addition will be limited to:
 - i. A maximum 10m² for existing single and dual occupancy dwellings
 - ii. Up to 10% of the existing Gross Floor Area (GFA) for all other development (note for large buildings, this increase may be limited to a lower amount)
- c) A certificate by a registered surveyor shall certify that the floor levels are not less than the required level
- d) Where the lowest habitable floor area is elevated more than 1.5m above ground level, a restriction is to be placed on the title of the land confirming that the sub-floor area is not to be enclosed.

Table 1 – Floor levels for buildings

Scenario	Floor level
Habitable floors – all development (excluding sensitive and hazardous development)	
Inundated by flooding	1% AEP + 0.5m freeboard
Inundated by overland flow path	Two times the depth of flow in the 1% AEP flood with a minimum of 0.3m above the surrounding surface
Habitable floors –sensitive and hazardous development	
Inundated by flooding	PMF + 0.5m freeboard
Inundated by overland flow path	Two times the depth of flow in the PMF with a minimum of 0.3m above the surrounding surface
Non-habitable floors – residential outbuildings (excluding garages) *	
Gross floor area less than or equal to 10 square metres	1% AEP but not less than 0.15m above surrounding ground level
Gross floor area greater than 10 square meters	The applicable habitable floor level
Industrial and commercial	
Located on flooding or overland flow path	1% AEP but not less than 0.15m above surrounding ground level
Material storage locations – all development	
Materials sensitive to flood damage, or which may cause pollution or be potentially hazardous during flooding	1% AEP + 0.5m freeboard

Note

***Non habitable floors** include areas such as laundries or sheds but exclude garages. All other floor spaces are habitable areas.

Industrial and commercial facilities include any business, office or retail premises or buildings of land used for industrial activities.

Sensitive and hazardous development includes caravan parks, correctional centres, eco-tourist facilities, educational establishments, emergency services facilities, group homes, hazardous industries, hazardous storage establishments, hospitals, information and education facilities, respite day care centres, seniors housing, sewerage systems and water supply systems.

Overland flow paths occur when:

- The maximum cross sectional depth flowing through and upstream of the site is less than 0.25m for the 1% AEP flood for other than critical facilities, or 0.25 for the PMF for sensitive and hazardous development
- Existing surface levels within the site are above the floor level requirements, at the nearest downstream trapped low points
- The flood study demonstrates that blockage to any upstream trapped low point does not increase the depth of flow to greater 0.25m.

Note

For more information on overland flow paths, contact Council's Development Engineering section.

4.4. Building components

Objective

1. To ensure that building components and materials used in development is compatible with flooding up to the applicable floor level.

Controls

- a) All development shall utilise flood compatible building components below the floor levels identified in Table 1
- b) All structures shall be constructed to withstand the forces of floodwater, debris and buoyancy up to and including the floor levels identified in Table 1.

4.5. Driveway access and car parking

Objectives

1. To ensure car parking and site access is constructed to an acceptable flood standard
2. To require appropriate protection measures for warning and safe evacuation from basement car parking
3. To minimise the likelihood of cars or other objects becoming floating debris during a flood.

Controls

- a) Car parking floor levels shall comply with Table 2 – floor levels for car parking
- b) Locate vehicular access where the road level is greater than or equal to the required floor level for the car park. Where road access above the required floor level is not available, locate vehicular access at the highest feasible location
- c) The level of the driveway between the road and car park shall be no lower than 0.3m below the 1% AEP flood or such that the depth of inundation during the 1% AEP flood is not greater than the depth of flooding at either the car park or the road where the site is accessed
- d) Underground car parking accommodating more than three vehicles shall have warning systems signage and exits to ensure adequate warning and safe evacuation
- e) Barriers shall be provided to prevent floating vehicles leaving the site during the 1% AEP flood if the depth of flooding at the car space exceeds 0.3m
- f) Vehicle access to sensitive and hazardous development that have an emergency function must be achieved for floods up to the PMF.

Table 2 – Floor levels for car parking

Scenario	Floor Level
Above ground level open car parking, car ports and garages	
Open car parking spaces and car ports	5% AEP flood
Residential garages with up to two spaces	1% AEP but not less than 0.15m above surrounding ground level
Residential garages with more than two spaces	Applicable residential habitable floor level requirement (Table A)
Enclosed industrial/ commercial parking spaces	Applicable industrial/commercial floor level requirement (Table A)
Underground car park (where floor level is more than 0.8m below surrounding ground level)	
All driveways	1% AEP plus 0.3m freeboard at its highest point
All emergency exits	All underground garages and car parks to have emergency exits protected from inundation up to the 1% AEP flood plus 0.5m freeboard with a minimum of 0.2m freeboard from vehicle entry point.
All other openings inundated by flooding or local overland flow path	All openings to be sealed up to 1% AEP + 0.5m freeboard with a minimum of 0.3m above the surrounding ground level

4.6. Safety and evacuation

Objective

1. To ensure the structure and construction of development is compatible with flooding up to the applicable floor level
2. To ensure that building occupants are capable of seeking safe refuge during a flood event.

Controls

- a) Include a description of the safety and evacuation methodology with all DAs , including the:
 - i. Provision of reliable and safe egress for inhabitants from the lowest habitable floor level to a publicly accessible location above the PMF level
 - ii. Method of access for emergency personnel.

Note

For some developments a condition of consent may be imposed to require the placement of a Safety and Evacuation Plan for all building occupants in a visible location.

4.7. Management and design

Objectives

1. To ensure stored materials do not become hazardous during a flood.
2. To ensure land subdivisions have suitable potential to be developed in accordance with the flooding requirements of this DCP.
3. To ensure development does not increase erosion, siltation or destruction of natural or modified watercourses, wetlands or coastal areas.
4. To ensure fencing does not obstruct the flow of flood waters, become unsafe during times of flood or become moving debris.

Controls

- a) Land shall not be subdivided unless it is demonstrated that the newly created parcels of land can be developed in accordance with the flooding requirements of this DCP. Parcels created for the specific purpose of being transferred to Council ownership are exempt from this requirement.
- b) The development shall not cause or increase erosion, siltation or destruction of natural or modified watercourses, wetlands or coastal areas.
- c) Fencing within a floodway or overland flow path shall be of permeable open type design, and be constructed to withstand the forces of floodwaters or to collapse in a controlled manner.
- d) Any proposed storage area shall be constructed and located to prevent stored materials or goods becoming hazardous during a flood.

Definition

Permeable open type fences are fences with sufficient openings to allow the unobstructed flow of water.

