

2.25

GENERIC PROVISIONS STORMWATER MANAGEMENT







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Part 2 Generic Provisions

2.25 Stormwater Management

This section relates to stormwater drainage for all development types.

The flow of stormwater from developments needs to be managed so as to negate or reduce to an acceptable frequency the possibility of flooding buildings and/or the danger to life at any location, through the storage of stormwater where appropriate in developments and the control of major development drainage systems.

This section of the DCP should be read in conjunction with the Marrickville Council Stormwater and On-site Detention Guidelines (The Guidelines) and Sections 2.17 (Water Sensitive Urban Design) and 2.22 (Flood Management) of this DCP. Applicants are also advised to refer to AS/NZS 3500.3.2:1998 Stormwater drainage – acceptable solutions.

2.25.1 Objectives

- 01** To protect the urban environment from the effects of otherwise uncontrolled surface stormwater flows resulting from infrequent (and lesser) storm events.
- 02** To minimise or negate disruption and/or danger to both pedestrian and vehicular traffic that may be caused by otherwise uncontrolled surface stormwater flows resulting from frequent storm events.
- 03** To protect the quality of receiving waters, adjacent and downstream land-use and the rights of adjacent and downstream landowners.

2.25.2 Application of Controls

| CODE REQUIREMENT | LANDUSE | | | | |
|------------------------------|--|--|--------------|---|----------------------------|
| | Attached Dwellings, Dwelling Houses, Secondary Dwellings and Semi-Detached Dwellings | Multi-Dwelling Housing, Residential Buildings and Shop Housing | Flat and Top | Commercial, Industrial, Institutional (Community facilities, educational establishments, hospitals etc) | Drainage Works Only Paving |
| On Site Detention | Yes (3, 6) | Yes | | Yes | No (1) |
| <u>On Site Retention</u> | <u>Yes (3, 8)</u> | <u>Yes (3, 8)</u> | | <u>Yes (3, 8)</u> | <u>No</u> |
| Gravity Pipe System Required | Yes (4) | Yes | | Yes | Yes |
| Pump System Permitted | No (4) | No | | No | No |

| Drainage Easement over downstream property (2) | If site doesn't drain to street (4) | If site doesn't drain to street | If site doesn't drain to street | (1) | (1) |
|--|-------------------------------------|---------------------------------|---------------------------------|-----|-----|
| Qualified Engineer required to prepare drainage design | Yes (3, 6) | Yes | Yes | Yes | (1) |
| Sediment Control Plan Required | Yes (1) | Yes(7) | Yes(7) | Yes | Yes |
| Positive Covenant Required (i.e. Section 88E (3) Instrument) | No (5) | Yes | Yes | No | No |

1. Depends on the details of the development.
2. Alternatively, the applicant may construct a pipeline within the road reserve until a connection point with Council's system is reached that allows gravity drainage.
3. Except for cases where increased roof and paved areas are less than 40m².
4. Except where genuine attempts to acquire an easement at reasonable costs have failed. Documentary evidence of those attempts will be required.
5. Unless in a landscaped area.
6. Where OSD is required and the increased roof and paved areas is less than 80m² Council's standard OSD design from Supplement 6 of The Guidelines can be adopted.
7. Sediment Control Plans are to be prepared by an Engineer.
- 7-8. On Site Retention can offset or replace On Site Detention in circumstances described in C5 below.

2.25.3 Controls

2.25.3.1 Stormwater Drainage Concept Plans (SDCP)

- C1** A Stormwater Drainage Concept Plan (SDCP) must be submitted with any Development Application, demonstrating the feasibility of the proposed drainage systems within the site and connection to Council's system. The SDCP must include existing and proposed ground and floor levels, show surface flow path treatment, any easements required, on-site detention storages as well as details and sizes of internal piped systems. All levels shown on the SDCP must be to Australian Height Datum (AHD). Detailed design plans and calculations will be required to be submitted before the issue of a Construction Certificate.
- C2** Where easements are necessary over any adjoining or downstream property to achieve gravity drainage, a written agreement from the adjoining owners is to be submitted with the SDCP.

2.25.3.2 Adverse impact and controlling site runoff

- C3** Development activities must not cause an adverse impact on adjoining or any other properties. This includes preserving surface flow paths and not increasing water levels.



- C4** Site discharges will need to be restricted to pre-development discharges using On-site Stormwater Detention (OSD) and On Site Retention (OSR).:-

2.25.3.3 *On-site detention (OSD) and on-site retention (OSR) of stormwater*

OSD or OSR of stormwater is required to limit discharges from developments to pre-development conditions. Council's OSD and OSR requirements have been formulated to ensure there is ~~no increase~~ a reduction in discharges adjacent to the site or elsewhere in the catchment for virtually all rainfall events through to 100 years ARI. ~~For developments greater than 1000m² in site area, allowable discharges will be limited to the equivalent fully pervious discharges for the site area.~~

- C5** OSD will be required for all developments except for:
- Extensions (~~alterations and additions~~) where the proposed extended roof or paved area are less than 40m².
 - ~~Sites that discharge directly to the Cooks River or into a major Sydney Water Corporation controlled trunk drainage system~~
 - ~~For single dwelling developments, where a maximum of two residential dwellings are being created (including secondary dwellings, alterations and additions, dual occupancies, attached and semi-detached), on-site retention (OSR) may be used in lieu of OSD. The following requirements are applicable:~~
 - ~~The OSR system must adhere to the following:~~

| <u>Lot size (sqm)</u> | <u>OSR tank size per lot (strata or torrens title) (Litres)</u> |
|---|---|
| <u>Greater than 200</u> | <u>Minimum 5,000</u> |
| <u>Less than 200 but greater than 100</u> | <u>Minimum 4,000</u> |
| <u>Less than 100</u> | <u>Minimum 3,000</u> |

- ~~The OSR must provide water to all new and/or upgraded toilet cisterns, laundry washing machine connections, external taps and irrigation systems. Standard labelling shall be displayed at such outlets.~~
- ~~OSR is not required as per the same exclusions applying to OSD under C5 i and ii above.~~
- ~~For other developments excluded by the above, OSR may be used to offset the calculated OSD storage volume at a rate of 1m³, for every 2.5m³ of OSR storage provided (up to a maximum OSD offset of 10m³).~~

- C6** All OSD systems will require full hydraulic design in accordance with the details in Supplement 2 of The Guidelines, except for single residential dwellings where:
- The building works are an extension of an existing house/garage, and

- ii. The total proposed extended roof and paved area is less than 80m².

In those exceptions the OSD required can be constructed in accordance with Council's default design (refer to The Guidelines) without requiring a full design.

- C7** The Stormwater Drainage Concept Plan (SDCP) is to outline the OSD and/or OSR proposed. A detailed design will be required before the issue of a Construction Certificate.
- C8** Storage outflows are to be controlled to ensure the full range of ARI protection occurs. This will require the OSD to incorporate a range of storage-discharge values for various ARI's.
- C9** Storages should not be located in overland flow paths which convey catchment flows through the site. Storages are to be in common areas (rather than privately controlled areas such as courtyards) for developments with multiple dwellings or units.

2.25.3.4 *Surface flow paths*

- C10** Surface flow paths are an integral part of the drainage system. They are to be preserved, or alternatives provided, wherever they pass through or affect the development site. Site discharges are not to be concentrated to a degree greater than that which naturally occurs.
- C11** Redirection of flows including to other sub catchments is not permitted unless appropriate counter measures are undertaken.
- C12** Flows to the receiving system or sub-catchment are not to be increased.
- C13** Flow paths are to be retained within easements.

2.25.3.5 *Gravity drainage*

- C14** All stormwater drainage connecting to Council's drainage systems is to be by gravity means. Mechanical means (i.e. pumps) for disposal of stormwater runoff will generally not be permitted (refer to checklist in 2.25.2). Subsoil and basement seepage systems where separate from the stormwater drainage may be exempted from this requirement.
- C15** The acquisition of an easement over any intervening downstream properties (at the developer's cost) will normally be required for sites that do not drain to:
 - i. the street,
 - ii. Council land containing a drainage line, or
 - iii. an existing council pipeline within the development site.

C16 Written consent for the piping and acquisition of an easement is to be obtained from adjoining owners and provided to Council with the development application. In such cases a transfer granting easement or a linen plan and Section 88B (of the Conveyancing Act 1919) instrument must be registered with NSW Government Land and Property Information prior to the operation of any consent. Any portion of the proposed addition below the flood standard level must be built from flood compatible materials.

C17C16 Exception to acquiring an easement may be given at the discretion of Council's Director, Planning and Environmental Services for sites that do not drain to the street, only where extensions to an existing residential building or replacement of an existing dwelling is proposed, and genuine attempts at acquiring a downstream easement have failed. Written



documentation of those attempts, including reasonable financial consideration, must be included in any application for exception. If an exception is granted a pump/sump system may be provided.

- G18C17** For minor extensions (i.e. less than 25m²) to existing single residential dwellings, connections may be made direct to the existing site drainage system where one exists.

2.25.3.6 Relationship to other properties

- G19C18** Where surface runoff from adjoining properties flows onto the development site, such flows are to be catered for within the development. Obstructions that cause damming and backwater effects on upstream properties will not be permitted. Similarly, surface runoff from the site that is conveyed through the site is not to be concentrated onto downstream properties, or diverted from existing discharge points unless into Council's drainage system. Diverting flows from one catchment to another will not normally be permitted.

2.25.3.7 Easements

- G20C19** For sites that have existing Council pipelines through them that are not covered by an easement, or where an existing pipeline is not within the easement, Council will require the creation of an easement in favour of itself over the pipeline. The easement width is to be the pipe, box, or channel section width plus 1.5 metres, with an overall minimum width of 2.5 metres.
- G21C20** Site drainage systems will require inter-allotment easements over downstream properties where the drainage traverses any other private property to connect to Council's drainage system. Those easements are to be a minimum of 0.9 metres wide.

2.25.3.8 Flood study/drainage system analysis

- G22C21** In situations where flooding problems have occurred, or there is a risk of such occurrence and flood information is not available from Council, a flood study or drainage system analysis of the catchment containing the development site will be required. Where such a study is to be carried out, the calculation methods required to demonstrate satisfactory treatment of the development will generally need to be in accordance with current practice as outlined in Australian Rainfall & Runoff (1998), and subject to the satisfaction of Council's Director, Planning and Environmental Services.

2.25.3.9 Standards

- G23C22** Pipe systems draining the development site are to be designed to a minimum ARI standard shown in the table below, with suitable treatment of all surface flows to a 100 year ARI standard. All pipe and surface flows to the 100 year ARI standard are to be routed through any OSD /OSR required.
- G24C23** Developments with higher potential damage risks from surface flows will require higher design standards. Where surface flow paths are not available, the pipe standard will rise to 100 year ARI.
- G25C24** Where the site or buildings are at or below the level of a downstream road or embankment, Probable Maximum Flood events are to be considered. OSD will require all ARI's to be examined to ensure no

adverse effects for any size storm.

| PIPED SYSTEMS - ARI STANDARDS | |
|----------------------------------|----------------|
| Development Case | ARI |
| Residential Low & Medium Density | 10 years |
| Residential High Density | 20 years |
| Commercial/Industrial | 20 years |
| Heavy Industry | 50 years |
| Hospital & Emergency Services | 100 years |
| OSD Range | 2 to 100 years |

2.25.3.10 *Safety and considerations of failure*

C26C25 Open drainage system components are to be designed to meet relevant safety criteria. Storage basins are to have battered slopes for egress, maximum ponding depths, and appropriate signage and fencing. Specific reference is made to Figures G1 and G2, Appendix G of the Floodplain Development Manual 2001 for velocity and depth limits, and to Supplement 2 of The Guidelines for the design of OSD storages.

C27C26 The possibility of failure of components of the system must be considered, and provision made for the safe conveyance of flows should failure occur. For OSD basins emergency spillways must be provided. The potential for obstructions to overland flow paths is to be minimised.

2.25.3.11 *Visual impact*

C28C27 All drainage structures and measures are to be designed to be visually unobtrusive and sympathetic with the development. This requirement is necessary to ensure future occupants do not adjust or remove facilities for aesthetic reasons without understanding the functional impact of such actions.

2.25.3.12 *Restrictions as to user – positive covenants*

C29C28 The potential for modification or adjustment to OSD and OSR storages and/or surface flow paths through the property is significant enough to warrant extra protection. Future owners of properties also need to be aware of their presence and purpose. Consequently, a Restriction As To User - Positive Covenant may be required on the property title as part of the development.

C30C29 The restriction is created as a Positive Covenant using Form 55A for an Instrument Pursuant to Section 88E (3) of the Conveyancing Act, 1919. The Instrument is to ensure the continued functioning and maintenance of the items detailed in the consent condition.

C31C30 Positive Covenants for OSD and OSR will be required for all development types except for single residential dwellings.

2.25.3.13 *Structures over or near drainage lines and easements*

C32C31 New buildings and structures will not be permitted over drainage lines or within easements. Paving over any drainage line or easement is acceptable, but will require appropriate jointing at the easement boundary, and to be in a material approved by Council's Director, Planning and Environmental Services.



C33C32 Clearances to easement boundaries are required to prevent structural loads on drainage structures or encroachment within the angle of repose of the soil. Piering is an acceptable technique to achieve this.

C34C33 If there is an existing structure over the drainage line or easement within the site that is part of the application, then an access pit is required to be provided upstream and downstream of the structure.

2.25.3.14 Freeboard

C35C34 Freeboard for floor levels above top water level (TWL) of OSD storages is required for buildings near OSD storages, of at least 0.2 metres above the maximum spillway operating level for habitable areas.

C36C35 A building floor level freeboard of 0.3 metres to 0.5 metres will be required against channel or mainstream flows, or in areas where significant overland flow occurs. In all other circumstances a minimum freeboard of 0.3 metres is required above surrounding finished ground levels.