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D10 Stormwater Management Plan

What is a Stormwater and Siteworks Plan?

All applications must identify the method of stormwater disposal. When applying for Planning Consent a minimum level of information must be submitted with the application in accordance with Schedule 8 of the Planning, Development and Infrastructure Regulations 2017.

In addition to this additional information may be required to be submitted to demonstrate that the relevant Planning and Design Code (PDI Code) Assessment Provisions have also been met.

The following check list is provided to assist identify the additional information required.

- Pervious and impervious area identification
- Existing site and adjacent road levels
- Existing and proposed floor levels
- Proposed site levels
- Directions of flow
- Pollutant control devices
- All proposed drainage lines
- Pipe sizes
- Pipe gradients
- Pipe levels
- Collection points
- Discharge points
- Pits, sumps
- Soakage systems

Where no clear directive has been provided for the assessment provisions to be met Table 1: Requirements and Guidelines has been provided by Council to demonstrate compliance.

Table 1: Requirements and Guidelines

Requirements	Guidelines
1. No run-off shall be directed from the development site to adjacent properties.	Runoff from the whole site shall be directed to the street gutter via one or more of the following: • Gravity drains • Sealed pressure drains • Overflows from soakage pits • Overflows from detention/retention systems • Pump systems • Site-works grading • Overflow paths
2. The floor levels, site works and drainage system shall be designed to provide 1% AEP protection against inundation of buildings and any flood intolerant structures.	• This applies to a 1% AEP over the development site. • This is to be achieved by a combination of the above drainage systems and the setting of safe floor and site-works levels. • All finished floor levels (excluding under croft car park) shall be a minimum of 0.3m above the highest adjacent street top of kerb level. • It is required to be demonstrated that driveway profile(s) comply with the vehicle clearance and grade requirements of AS2890. The levels, distances, gradients and any required transitions for the entire driveway (from the roadway crossfall and including the footpath) are required to be specified. Any required alterations to a footpath are required to be detailed, must comply with AS1428 (limiting longitudinal gradient 1 in 14) and Council's requirement for a maximum crossfall of 2.5%. • Development is sited, designed and constructed to prevent the entry of floodwaters where the entry of flood waters is likely to result in undue damage to or compromise ongoing activities within buildings.

Requirements	Guidelines
3. Measures shall be incorporated within the site-works along the property boundary to contain gutter flows.	• Driveway and property levels along the property/road reserve boundary shall be specified at least 225mm above the adjacent street gutter levels (unless in a flood zone, refer to Development Information Guide D33 – Stormwater Inundation). • If the property falls away from the roadway or the floor levels are less than 0.3m above the highest adjacent street gutter level, measures are to be specified to form a continuous (including its driveway) barrier along or near the lot frontage at a minimum of 0.3m above adjacent street gutter levels.
4. Measures shall be incorporated in all development to ensure no stormwater borne pollutants (including litter, silt and any harmful substances) are discharged into Council's drainage system.	• For Residential development: by the provision of silt and litter traps. • For Commercial/Industrial development: Development likely to result in significant risk of export of litter, oil or grease includes stormwater management systems designed to minimise pollutants entering stormwater. Water discharged from a development site is of a physical, chemical and biological condition equivalent to or better than its pre-developed state. • Water Quality improvement devices must be sized to treat flows from a 20% AEP event.
5. Water Sensitive Urban Design (WSUD)	• Water Sensitive Urban Design (WSUD) techniques should be incorporated into development design. Permeable pavement, Retention systems, Drainage swales and Bio-filtration systems are common examples. • Battle-axe or Common driveways shall be constructed of a minimum 50% permeable or porous material.

Requirements	Guidelines
6. Soakage systems shall be safely located, shall provide effective detention and shall be environmentally appropriate.	Soakage systems: • Shall be located only class A and S sites OR alternatively borelog testing is required for council assessment to determine if the site soil conditions are sufficient for soakage system. • Shall be designed for a 1% AEP. • Shall not be located within 3m of any footing or property boundary and not be located on ground sloping more than 30 degrees. • Shall collect only roof and surface runoff from clean, non-vehicular areas and comply with EPA requirements. • For Detention purposes systems shall be demonstrated to be empty within 24 hours of a storm. • Shall incorporate an overflow for when/if the storage capacity is exceeded.
7. Pump System Design and pump system failure. When pump system failure may result in inundation of any building or adjacent property, measures shall be incorporated to minimise the risk of failure during a storm.	If failure of the pump system is likely to result in flooding of a building, under-croft or adjacent properties then the following shall apply: • Two pumps shall be provided, each capable of the design flow rate. • The pumps shall be configured to automatically alternate as the duty pump. • The system shall be configured to automatically revert to the alternate pump should the duty pump fail. • An Audible Alarm system must be provided • Either a back-up power supply or a safe power failure storage (below and/or above ground) with a volume equal to a 20% AEP, 4 hour duration storm run-off without pump operation and without flooding of buildings, under-crofts or any properties shall be provided.

Requirements	Guidelines
8. When a development property abuts a Council laneway, buildings shall be located safely and have safe floor levels to reduce flood risk from the laneway.	Where a building or structure is proposed at a location abutting a Council lane-way, the following additional minimum requirements apply: • Setback requirements must be as per the PDI Code Assessment Provisions. • Proposed floor levels shall comply with other applicable requirements and shall be a minimum of 0.20m above the highest adjacent laneway level, whichever is the highest. • No stormwater is permitted to discharge to a laneway.
9. All works necessary beyond the property boundaries shall be to Council's requirements and standard details.	All works (e.g. connections across Council's footpath, connection to Council's drains, new entranceways and removal and reinstatement of abandoned entranceways) shall be specified on the plan to meet Councils requirements and standard details.
10. Discharge rates	• The maximum discharge rate per development to council street water table is 10L/s. • All residential development is required to be discharge stormwater to the street water table. • Development with large pre development flows will be assessed on their own merits.
11. Basement Design	• The design must ensure the basement is tanked and is designed to withstand the hydrostatic pressures of a saturated soil. • The basement must be waterproofed and the design will demonstrate that no groundwater will be collected and then drained or pumped from the land.
12. Maintenance	It is the responsibility of the property owner to ensure all Stormwater Infrastructure within the development site shall be maintained, serviced, cleaned and sustained operational as required by the stormwater design.

What are the requirements for stormwater retention on site for development?

Rainwater retention tanks should be provided on all residential developments and must be designed to capture and re-use stormwater to maximise conversation of water resources. Retention tank sizes for new dwellings and additions are specified in the PDI Code. Where retention storage is not specified in the PDI Code calculations may be requested.

What minimum size rainwater tank do I require and does it need to be plumbed into my house?

Required retention tank sizes as per the PDI code are listed below in Figure 1.

Figure 1

Site Size (m^2)	Minimum Retention Volume (Litres)
<200	1000
200-400	2000
401	4000

- Retention tank storage must be connected to at least 60% of the roof area for a detached dwelling (not in a battle-axe arrangement), semi detached dwelling or row dwelling. In all other cases 80% of the roof area must be connected.

- Rainwater tank storage must be connected to either a toilet, laundry cold water outlets or hot water service for sites less than 200m^2. Rainwater tank storage must be connected to one toilet and either the laundry cold water outlets or hot water service for sites 200m^2 or greater.

The Floor Plan / Plan View must include:

- Roof layout showing catchment area and location of downpipes and water tanks.

- An overflow device must be fitted to the tank and to ensure water quality a mosquito proof, non-degradable screen must be attached.

Plumbing work must be done by a licensed plumber and comply with AS/NZS 3500:2003, the National Plumbing and Drainage Code and any SA variations published by SA Water. The technical requirements of rainwater tanks are contained in Section 14 of AS/NZS 3500:2003 and the SA Water variations.

What are the requirements for stormwater detention on site for development?

Rainwater detention tanks should be provided for all developments and must be designed to manage peak stormwater run-off flows and volume to ensure the carrying capacities of downstream systems are not overloaded. Detention tank sizes for certain new dwellings and additions are specified in the PDI Code and are listed below in Figure 2.

Figure 2

Site Size (m^2)	Minimum Detention Volume (Litres)	Orifice Size (mm)
<200	1000	20-25mm
200-400	Site Pervious: <30% 1000 :>30% N/A	20-25mm
401	Site Pervious <35% 1000 :>35% N/A	20-25mm

What are the requirements for stormwater detention on site for development when not listed in the PDI code?

Where detention tank storage requirements is not specified in the PDI code council still requires the discharge of stormwater from the site to Council's drainage system to be restricted. The objectives are to minimize flooding and the impact of increased runoff from infill development within catchments. Compliance with Council's requirements can require detailed engineering analysis and computations as listed below and hence a suitably experienced engineer should be engaged to undertake this analysis.

The following designs require stormwater detention computations in line with this development information guide:

- All underground detention tanks.
- All development with a pump system.
- All development with a soakage system.
- All residential development where stormwater discharge from the site needs to be managed to ensure the development does not increase the peak flows and the AEP is not specified in the PDI code.
- All commercial and industrial development where stormwater discharge from the site needs to be managed to ensure the development does not increase the peak flows and the AEP is not specified in the PDI code.

For this above identified development, the post development peak rate of runoff from the development site from the “design” storm must not exceed that from the pre development site from a 20% AEP storm.

Note:

- The critical storm duration must be identified.
- For residential development of less than 3 dwellings, the post development "design" storm is 20% Annual Exceedance Probability (AEP).
- For all other development including commercial and industrial the post development "design" storm is 1% AEP.
- Any required detention storage can be either above or below ground tanks, soakage systems or graded site areas or any combination.
- Any outflow restriction device shall be calculated and specified on the plan.
- Computations shall be provided to demonstrate compliance with the requirements.
- Impervious, detained and un-detained catchments shall be identified.
- Detention storages must be available at all times and must be demonstrated to be emptied within 24 hours of a storm.
- Retention storages for re-use or plumbing to a dwelling are not permitted for detention purposes. Detention tanks must be empty at the beginning of a rain event.

Further Information:

Department for Infrastructure and Transport
*Web: **http://www.dpti.sa.gov.au/***

Department for Environment and Water
*Web: **http://www.environment.sa.gov.au***

SA Water
*Web: **www.sawater.com.au***

EPA
*Web: **www.epa.sa.gov.au***