



LOCAL PLANNING POLICY NO. 14 - ON-SITE STORMWATER POLICY

1.0 OPERATION OF THIS PLANNING POLICY

This planning policy has been prepared in accordance with Part 2 of the Town Planning Amendment Regulations 1999.

2.0 PURPOSE OF THIS POLICY

The purpose of this policy is to:

1. Clearly outline the circumstances in which the Town will permit a connection to the Town's drainage system.
2. State the design standards that the Town will have regard to in assessing applications to connect to the drainage system; and
3. Outline the conditions that will be imposed on any approval to connect to the drainage system.

3.0 APPLICATION OF THE POLICY

This policy applies to any application for new development that proposes to connect to the Town's drainage system.

4.0 BACKGROUND

Urbanisation leads to changes in both the quantity and quality of water that is delivered to receiving waters. The built environment has many sources of pollutants that can contaminate stormwater as it passes through the catchment, including metals, oils, petrol, organic debris, litter, silt and dust, fertilisers, animal waste, pesticides and detergents.

Within the Town of Bassendean, there are areas which have soils that are largely clay in nature. As a result, stormwater runoff may pool on the surface of properties due to reduced capacity to infiltrate the soil. Traditionally, Council has permitted this stormwater to be discharge into the stormwater system via a silt trap and temporary on site storage system.

Increases in housing density and infill development have increased demand from developers to have private stormwater disposed via the Town's street drainage system. However, this system was designed several decades ago for road stormwater runoff only. Even with over capacity margins built into the system there is likely to be increasing pressure on the Town's drainage systems and its ability to effectively drain the area during storm events.

There is also concern about the quality of stormwater discharging into the drainage system and into water bodies, such as the Swan and Canning Rivers, particularly from industrial areas. Stormwater runoff from urban areas carries sediments and pollutants, such as nutrients and heavy metals from impervious surfaces. Unmanaged, the cumulative impact of these pollutants can result in considerable damage to the environment.

To address this issue, the Town of Bassendean proposes that all new drainage applications for connection and drainage to the Town's stormwater system be assessed against Sections 5 and 6 of this policy.

5.0 ASSESSMENT PROCEDURE

The Town will only permit applications to connect to the Town's stormwater system, in the following circumstances:

- a) all on-site stormwater retention options have been investigated and exhausted;
- b) only developments in areas where the natural soil is high in clay content, and deemed unsuitable for on-site disposal via infiltration, shall be considered for connection to the Council's stormwater system. This should be verified as part of the geotechnical investigation in addition to the site classification and it can be demonstrated by a qualified civil engineer to the Town's satisfaction that on site disposal is not feasible ;
- c) if connection to the Town's stormwater system is necessary in industrial areas, that the stormwater discharging from the area be independently tested, in accordance with the Unauthorised Discharge Regulations 2004 enacted under the *Environmental Protection Act 1986*.

6.0 Design Requirements

6.1 Off-Site Drainage System

For pre and post development discharge calculation, the required discharge design storm shall be the minor system design ARI (Average Recurrence Interval) of the municipal drainage system, to which the storage will be connected. This is the 1 in 5 year ARI. The design storm for calculating the total storage volume above and below ground and for overall design of the on-site detention facility shall be the 1 in 20 year ARI.

A standard pre-development runoff coefficient of $C=0.35$ applies over the whole of the development area. Considering the post-development site conditions, a respective runoff coefficient appropriate for the development over the whole of the lot area will have to be found and applied. The underlying factor for the specification of this runoff coefficient is that the post-development site discharge is reduced to pre-development levels and is estimated on the basis, that flow rates within the downstream stormwater drainage and conveyance system will not be increased. For calculation of the PSD, the roof-to-gutter time of concentration shall be taken as 9 minutes for residential areas and 5 minutes to on-site facilities for commercial and industrial sites. The designer will then have to determine the permissible site discharge value, e.g. by using the Rational Method combined with a Hydrograph Estimation Method, and a suitable outflow regulating device will have to be designed to meet this requirement. Alternatively, the attached standard design can be utilised in accordance with the site discharge values and subsequent site storage requirements to be determined

Required Storage Volume:

Given the aforementioned, a respective storage volume appropriate for the development and the layout of the lot area will have to be found. Regarding the respective design storm durations, typically the critical storm duration that produces the largest required storage volume is longer than the time of concentration used for peak flow estimation. Therefore, corresponding storage volumes must be determined for a range of storm durations to find the maximum storage required. This value will have to be logically comprehensible from the hydraulic calculations.

Depth of Underground Storage:

The base level of any underground storage system must be such that the flow stormwater into the Town's adjacent street stormwater system is possible. The applicant must be able demonstrate this as part of the design process.

Point of Discharge:

The point of discharge into the municipal drainage system will have to be determined through consultation with Council. In some cases, an extension of the municipal drainage system may be required at the developer's cost and to the specification and satisfaction of the Town of Bassendean.

Application Procedure

Applicants wishing to connect to the Town's drainage system are required to complete the modified COPAS equation for stormwater retention which is available on the Town's website, and an example of which is shown on Appendix 1.

The onus is on the property owner to fully design the internal stormwater system and submit a comprehensive stormwater drainage plan to Council, for approval by the Director Operational Services, prior to the commencement of works. All surveys for existing invert levels and pipe alignment etc are the responsibility of the owner to obtain. This design be carried out and certified by a consulting engineer. These plans and specifications for this system must be to the Town's satisfaction.

A comprehensive stormwater plan is to detail sizes and types of all materials, invert levels, pit levels – top and bottom, design return period, site retention capacity and outlet capacity for the design return period and grades of all pipes.

Where there is an existing manhole, gully or side entry pit within the verge and within the extent of the frontage of the property, a connection from the silt pit may be made directly to that structure (provided levels are suitable). If there is no manhole, gully or side entry pit within the property frontage, and a stormwater pipe exists within the verge.

Where the Town has no drainage infrastructure accessible from the property the Town may extend the Town's network or provide an outlet structure on the kerb at the owners cost. Where an outlet structure is provided the stormwater exiting at the kerb will then flow down the road to the nearest road gully at the same cost.

The Town may construct a manhole over the pipe as per the sketch detailed on appendix 2. The property owner shall be responsible for all costs associated with the construction of the manhole.

Conditions to be imposed on approvals to connect to the Town's Drainage System

The owner of the land, will be required to place a notification under section 70A of the Transfer of Land Act. 1893 as amended, to be placed on the Certificate(s) of Title advising of the stormwater detention system installation, the restrictions, drainage limitations and the requirement for the current and future property owners to maintain the detention system in good working order.

All works associated with connecting the internal system to the street drainage system are to be carried out by the property owner.

Prior to backfilling of trenches, the works are to be inspected by the Engineering Officer. All pipes and connection points to pits are to be easily visible by the inspecting Council Officer.

A security deposit of \$750 is to be lodged with Council prior to the commencement of works within the road reserve. This deposit is fully refundable at the completion of the works, provided that the site has been left in a clean and tidy state to the standard which existed prior to works commencing. Council will retain part or all of the deposit held should reinstatement works not be to the satisfaction of the Director Operational Services.

The Director Operational Services reserves the right to vary the deposit in line with the extent of the proposed works.

A fee is payable for connection to the Town's drainage network where all stormwater is disposed of into the Town's drainage system. Details of the fee is included in the Town's Schedule of Fees and Charges.

Permits for connection to the drainage system will be valid for a period of 2 years. If the works are not undertaken in this time a new approval will be required.

Regular maintenance of an on-site detention system is required to keep the system fully functioning and is the responsibility of the property owner. The required maintenance schedule and drawings will identify the key components of the system, their locations and will provide a tool to ensure that ongoing maintenance is carried out as required, including cleaning of accumulated debris from screens and removal of sediment from the base of the pit or tank.

Applicants are advised:

In the event of a severe stormwater or flooding event, that the Town of Bassendean drainage system may not have sufficient capacity to manage the stormwater from the subject lot. It is therefore essential that property owners make necessary

enquires to obtain suitable and adequate private insurance coverage for such events.

It is an offence under the Environmental Protection Act 1986 (WA) to discharge contaminants or discharge waste that will cause harm to the environment. Applicants are responsible for ensuring that they do not allow any contaminants to enter the retention system as overflow discharged water from the subject lot will subsequently enter the Swan River.

The uncertain and often inexact nature of stormwater management and flood mitigation, together with the increased level of liability and litigious potential of flooding, can pose an increased and unknown level of risk to property owners. The Town of Bassendean, its employees, servants and agents, shall not be held responsible for any loss, damage or injury (fatal or otherwise), whether to property or person, howsoever suffered by the Applicant, unless such loss is shown to have occurred due to the direct negligence of the Town of Bassendean.

APPENDIX 1

Worked example

Lot area = 800m²

Total roof and paved area = 500m²

Natural surface level = 7.5

Council stormwater system invert level = 6.1

From spreadsheet:

	M	N	O	P	Q	R	S	T
1	MODIFIED COPAS EQUATION FOR STORMWATER RETENTION							
2	<i>Town of Bassendean</i>							
3								
4	Lot Area (ha)		= 0.08					
5	Roof & Paved Area (ha)		= 0.0500					
6	Time of Concentration (mins)		= 5					
7	Predevelopment Flow (l/s)		= 5.04					
8	Orifice diameter (mm)		= 66					
9								
10		1 in 2yr	1 in 5yr	1 in 10yr	1 in 20yr	1 in 50 yr	1 in 100yr	
11		cu.m	cu.m	cu.m	cu.m	cu.m	cu.m	
12								
13	Maximum Storage Requ	1.24	2.50	3.45	5.03	7.63	9.82	
14	T I M E							
15	<i>minutes /hours</i>							
16	5	5	0.94	1.80	2.47	3.44	4.94	6.23
17	6	6	1.07	2.05	2.81	3.88	5.54	6.95
18	10	10	1.24	2.50	3.45	4.81	6.88	8.73
19	20	20	0.52	2.10	3.29	5.03	7.63	9.82
20	30	30	-0.91	0.87	2.20	4.14	7.06	9.55
21	1	60	-6.66	-4.55	-3.00	-0.72	2.74	5.73
22	2	120	-20.37	-18.05	-16.25	-13.57	-9.60	-6.16
23	3	180	-35.26	-32.80	-30.90	-28.00	-23.61	-19.89
24	6	360	-82.43	-79.71	-77.60	-74.40	-69.28	-65.00
25	12	720	-181.09	-178.11	-175.71	-171.80	-165.81	-160.52
26	24	1440	-384.38	-381.09	-378.21	-373.50	-365.90	-359.35
27	48	2880	-799.49	-796.35	-793.09	-787.47	-777.73	-769.19
28	72	4320	-1218.99	-1216.94	-1213.88	-1208.00	-1197.82	-1188.06

Total storage volume = 5.03m³

Maximum tank depth = 7.5 – 6.1 = 1.4m

Use 1.2m dia x 1.2m deep tanks each with a volume of 1.36m³

Use 4 tanks (total volume) = 5.44m³

Outlet orifice diameter = 66mm (max)

Interactive Stormwater Retention Calculator (Modified COPASEQ5 Rev01.xls) can be found on the Town's website.

The Appendix 2 Standard Stormwater Connection Details is currently draft, the updated drawing will be provided shortly.

