

City of Stirling On Site Stormwater Drainage Criteria

This information has been provided to aid private property owners who wish to develop or subdivide, with managing stormwater runoff within their property.

The City of Stirling requires all rainfall falling within lot boundaries to be contained on site, by means of soakwells or other City of Stirling approved alternatives, including holding tanks or infiltration basins. The proposed method shall require approval in writing by the City.

The following criteria are to be used as a guide for private lot stormwater disposal for developments or smaller subdivisions.

For larger developments and multi lot subdivisions, the developer should consult current publications provided by the WAPC or a relevant statutory authority.

Stormwater disposal details shall be provided to the City's Development Services Business Unit at the development approval stage. The minimum on-site stormwater storage and level of detail required shall be dependent on the criteria shown in the table below:

CRITERIA	YES/NO
Are the historical maximum groundwater levels within 1.2m of the existing surface level at the development site?	
Is the development within an area of moderate to high risk of acid sulfate soils?	
Is the development on a current or previously listed contaminated site or known to be at risk of having been contaminated?	
Is the development in an area known to have peaty soils?	
Is the development within the catchment area of a sensitive waterway?	
Is the development proposing to have below ground level or basement carpark?	
Is the development proposing to have more than 90% of the site impervious?	
Will the development be more than 2 storeys in height?	
Has the City previously requested a Drainage Management Plan?	

If you answered **YES** to any of the above criteria, then you will be required to submit a drainage management plan (DMP) with your development application. If you are unsure if any of the above questions relate to your development, more information can be found on the links at the end of this document. If you answered **NO** to all the above criteria, you may skip to *Minimum Requirements for On Site Drainage*. **The City may still request a drainage management plan be submitted due to special circumstances not foreseen or stated above.**

Drainage Management Plan (DMP)

A drainage management plan is a document which accompanies your development application. It shall clearly demonstrate appropriate strategies to manage stormwater issues which may be encountered when developing/subdividing your land.

Depending on the size and complexity of the development, these documents shall include but not be limited to the following information:

- Existing site survey levels/contours.

- Proposed lot levels and layout (including catchment areas).
- Proposed stormwater drainage layout and storage volumes.
- Stormwater storage volume calculations with justification.
- Geotechnical report (including soil type, potential and/or encountered cap rock within the development, site measured and estimated infiltration rate, measured distance to groundwater and predicted distance to maximum groundwater levels, potential contaminants and/or acid sulfate soil).

The onsite retention storage volume is to be designed to cater for a 1 in 20 ARI (5% AEP) critical storm.

In the case that the stormwater system for a 1 in 20 ARI (5% AEP) would overflow and runoff from the site could not be safely stored within its boundaries or have a safe overland path where it would not enter other private properties, the development shall be designed to cater for the 1 in 100 ARI (1% AEP) critical storm.

Minimum Requirements for On Site Drainage

If you answered **NO** to all the above criteria, your development application will require as a minimum a site plan showing the following details:

- Existing ground levels or contours in AHD.
- Proposed levels of paved or concrete areas.
- Details of roof and pavement drainage disposal.
- Size, depth, locations and combined storage volume of all stormwater disposal structures.
- Stormwater runoff path and catchment area of each individual soakwell.

The site is to be designed to cater for a 1 in 1 ARI (1 EY) 60 minute event (equivalent to 15mm of rainfall across the entire site) as a minimum, although more is encouraged.

The following formula shall be used to determine the volume capacities required:

$$\text{Impervious Area (m}^2\text{)} \times 0.015\text{m} = \text{Capacity Required m}^3$$

Private Lot Connections to the City's Drainage System

No private lot connections to the City's stormwater system shall be permitted unless the applicant has provided sufficient evidence that on-site stormwater drainage by infiltration will be adversely affected by a high groundwater table. The granting of a private connection is subject to sufficient surplus capacity existing in the City's system and shall be prior to the issue of a development or subdivision approval. For more details, refer to *Requirements for Private Connections to the City's Drainage System Policy* on the link provided at the end of this document.

Where a private connection into the City's stormwater drainage system is deemed not possible, the City shall retain the right to refuse such requests and amended development or subdivision plans shall be required.

Alteration or Relocation of an Existing City of Stirling Stormwater Drainage Asset

Under certain circumstances, it may be favourable to alter or relocate a City of Stirling stormwater drainage asset to facilitate a development/subdivision. Where such requests arise, the City's

Development Services Business Unit shall seek advice and approval from the Engineering Services Business Unit prior to the issue of a development or subdivision approval.

Where the City has granted approval for an alteration or relocation of a stormwater drainage asset or where works are required within the road reserve boundary, inspection fees and bonds shall be applicable and be paid in full to the City prior to commencement of construction.

Where alteration or relocation of the City's stormwater drainage assets is deemed not possible, the City shall retain the right to refuse such requests and amended development or subdivision plans shall be required.

Stormwater Drainage Easements within Private Lots

Where an alteration or relocation of a City stormwater drainage asset falls within a private property with an existing easement, an amendment to the easement as specified by the Engineering Services Business Unit shall be granted in favour of the City, where the existing easement is deemed insufficient to protect the City's assets, prior to the issue of a development or subdivision approval.

Where an easement does not already exist on a private property where a City of Stirling stormwater drainage asset is located, an easement shall be granted in favour of the City as specified by the Engineering Services Business Unit prior to the issue of a development or subdivision approval.

For information relating to construction within private property in the vicinity of or adjacent to an easement, please refer to the *Easement Building Criteria Detail ESD-DR-01* on the City's website.

Where alteration or relocation of the City's stormwater drainage assets is deemed not possible, the City shall retain the right to refuse such requests and amended development or subdivision plans shall be required.

General Information

- Soakwells and other underground stormwater systems should be located away from adjacent structures or property boundaries by at least 1m from edge to edge or follow manufacturer's specifications (whichever is greater), unless otherwise specified by a qualified practising structural engineer that neither the structure nor stormwater system shall be adversely affected.
- All stormwater disposal structures shall be of a type and standard approved in writing by the City of Stirling.
- All downpipes shall discharge to grated inlets prior to entering below ground stormwater infiltration systems.
- All drainage structures located within or under driveways/carports/garages shall be designed to be trafficable and shall be provided with an approved base to prevent any subsidence of well liners.
- In addition to the above criteria, the City encourages the use of rainwater harvesting tanks for grey water or irrigation, water wise native gardens, permeable paving and other approved stormwater disposal techniques.
- The minimum allowable size for a soakwell for roof water disposal is 900mm diameter x 600mm deep.
- Runoff from roof areas shall be stored and infiltrated separately to runoff from other impervious areas including carparks.

- All underground storage and infiltration systems shall be provided with City of Stirling approved maintenance access openings (maintenance of these systems shall remain the responsibility of the property owner/manager).

Soakwell Sizes and Capacities

Diameter (mm)	Depth (mm)	Capacity (m ³)
900	600	0.38
900	900	0.57
900	1200	0.76
1050	600	0.54
1050	1200	1.09
1200	600	0.68
1200	900	1.02
1200	1200	1.36
1200	1500	1.70
1500	600	1.06
1500	1200	2.10
1500	1500	2.65
1800	600	1.53
1800	900	2.29
1800	1200	3.05
1800	1800	4.58

Reference Documents

Department of Water and Environmental Regulation Perth Groundwater Maps
<https://maps.water.wa.gov.au/Groundwater/>

Department of Water and Environmental Regulation Acid Sulfate Soil Risk Maps
<https://catalogue.data.wa.gov.au/dataset/acid-sulphate-soil-risk-map-swan-coastal-plain-dwer-055>

Department of Water and Environmental Regulation Contaminated Sites
<https://dow.maps.arcgis.com/apps/webappviewer/index.html?id=c2ecb74291ae4da2ac32c441819c6d47>

City of Stirling Private Connection Policy Document
<https://www.stirling.wa.gov.au/your-city/documents-and-publications/your-city/about-council/governance-and-transparency/policies/requirements-for-private-connections-to-the-city-s>