

# R-Codes – Stormwater Management

## (draft) Local Planning Policy

VERSION 1

June 2018

town planning services

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town planning services

## 1.0 CITATION

This is a local planning policy prepared under the *Planning and Development (Local Planning Schemes) Regulations 2015* and the City of Greater Geraldton Local Planning Scheme No. 1 ('the Scheme'). It may be cited as the *Stormwater Management local planning policy*.

The local government may prepare a local planning policy in respect of any matter related to the planning and development of the Scheme area. In making a determination under the Scheme the local government must have regard to each relevant local planning policy to the extent that the policy is consistent with the Scheme.

## 2.0 BACKGROUND

*State Planning Policy 3.1 – Residential Design Codes (the R-Codes)* includes provisions for decision-makers to prepare local planning policies to alter certain development standards of the R-Codes where a specific local need arises. The R-Codes also acknowledge that applications with proposals which do not satisfy the deemed-to-comply provisions of the R-Codes may need to rely more specifically on local housing requirements and design objectives.

This policy provides local housing objectives and varies relevant deemed-to-comply provisions of the R-Codes to assist in their implementation. It should be read in conjunction with the R-Codes.

Stormwater management is an integral part of building construction and all development is required to have water draining from roofs, driveways, communal streets and other impermeable surfaces directed to an approved stormwater disposal system.

The National Construction Code (NCC) requires that surface water resulting from a 1 in 20 year Average Recurrence Interval (ARI) rainfall event be disposed of in a way that avoids the likelihood of damage or nuisance to any other property. The NCC also requires that a 1 in 100 year ARI event not enter into a building. This is generally achieved by ensuring the dwelling is elevated above the surrounding ground and that landscaping, driveways, paving and the like are graded such that water does not flood or pond against the dwelling.

Additionally the City of Greater Geraldton *Animals, Environment and Nuisance Local Law 2014* (Part 4, Division 4 – Stormwater management) requires the owner or occupier of a lot to ensure that all stormwater received by any building, house, or other structure or any paved or sealed or other surfaced areas including any vehicle access ways on the lot is contained within the lot and is not permitted to discharge onto or run-off onto adjacent land so as to cause a nuisance, or cause damage to any structures situated on adjacent land.

### 3.0 OBJECTIVES

- a) To alter the deemed-to-comply provisions of the R-Codes for *Design Principle 5.3.9 and 6.3.8 – Stormwater management*.
- b) To ensure that sufficient information is provided with a development application (or a building permit where development approval may not be required) so that the local government can assess the means by which stormwater will be appropriately managed.
- c) To specify the minimum standards for the effective retention of stormwater on-site for all types of development.

### 4.0 POLICY MEASURES

#### 4.1 Residential Development

- 4.1.1 The deemed-to-comply provisions for Part 5.3.9, C9 and Part 6.3.8, C8 of the R-Codes states that:

*All water draining from roofs, driveways, communal streets and other impermeable surfaces shall be directed to garden areas, sumps or rainwater tanks within the development site where climatic and soil conditions allow for the effective retention of stormwater on-site.*

- 4.1.2 It is important to note that the above clause does not just apply to a residence but to all roof areas which includes sheds, carports, patios and the like. Therefore applications for any impermeable roofed structure are required to demonstrate compliance with the deemed-to-comply provisions.

- 4.1.3 In addition to the deemed-to-comply provision (clause 4.1.1 above), the local government will allow stormwater to drain from driveways directly to the road carriageway provided:

- a) The maximum area is 36m<sup>2</sup> (generally a double width garage driveway setback 6m from the property boundary); and
- b) The drainage is only for the stormwater that falls directly onto the driveway (i.e. no stormwater from roofs, other impermeable surfaces or other driveways is directed onto the driveway).



Examples of downpipes that do not comply with clause 4.1.3

- 4.1.4 The amount of storage to be provided for stormwater retention is calculated for the 1 in 1 year ARI rainfall event for 1 hour duration, which is equivalent to 17mm of rainfall intensity as follows:

$$\text{Volume of storage required (m}^3\text{)} = \frac{\text{Total impermeable surface area (m}^2\text{)} \times 0.9}{\text{Soil Factor}}$$

60 for mostly sandy soils (A class sites)\* or  
50 for slightly clay or silty soils (S or M class sites)\*

\* For H1, H2 or E class sites (in accordance with soil types as per AS 2870) a detailed stormwater disposal method will need to be provided.

**The ratio of the volume of storage (m<sup>3</sup>) to the impermeable surface area (m<sup>2</sup>) equates to:**

- 1m<sup>3</sup> of storage volume for every 67m<sup>2</sup> of impervious area for sandy soils.
- 1m<sup>3</sup> of storage volume for every 56m<sup>2</sup> of impervious area for slightly clay or silty soils.

- 4.1.5 In addition to the above 1 in 1 year ARI event, consideration will also need to be given for higher intensity rainfall events and how stormwater will be directed away from your residence and also directed so as not to discharge or runoff onto adjacent land in accordance with the City of Greater Geraldton *Animals, Environment and Nuisance Local Law 2014* (Part 4, Division 4 – Stormwater management).

- 4.1.6 Depressed garden or landscaped areas should be a minimum of 1m away from a boundary fence. They should have a low point 100mm below the adjacent areas to provide storage capacity.

- 4.1.7 In order to demonstrate that the development meets the deemed-to-comply provisions of the R-Codes the following information is required (with either the development application or the building permit):

- a) Site classification of the property (in accordance with soil types as per AS 2870);
- b) Area of impermeable surfaces (such as roofs and paved areas);
- c) Depressed garden areas proposed (if any) for stormwater retention with levels;
- d) Calculations showing the amount stormwater required to be contained; and
- e) Storage size of garden areas, soakwells or rainwater tanks to accommodate the above calculation.

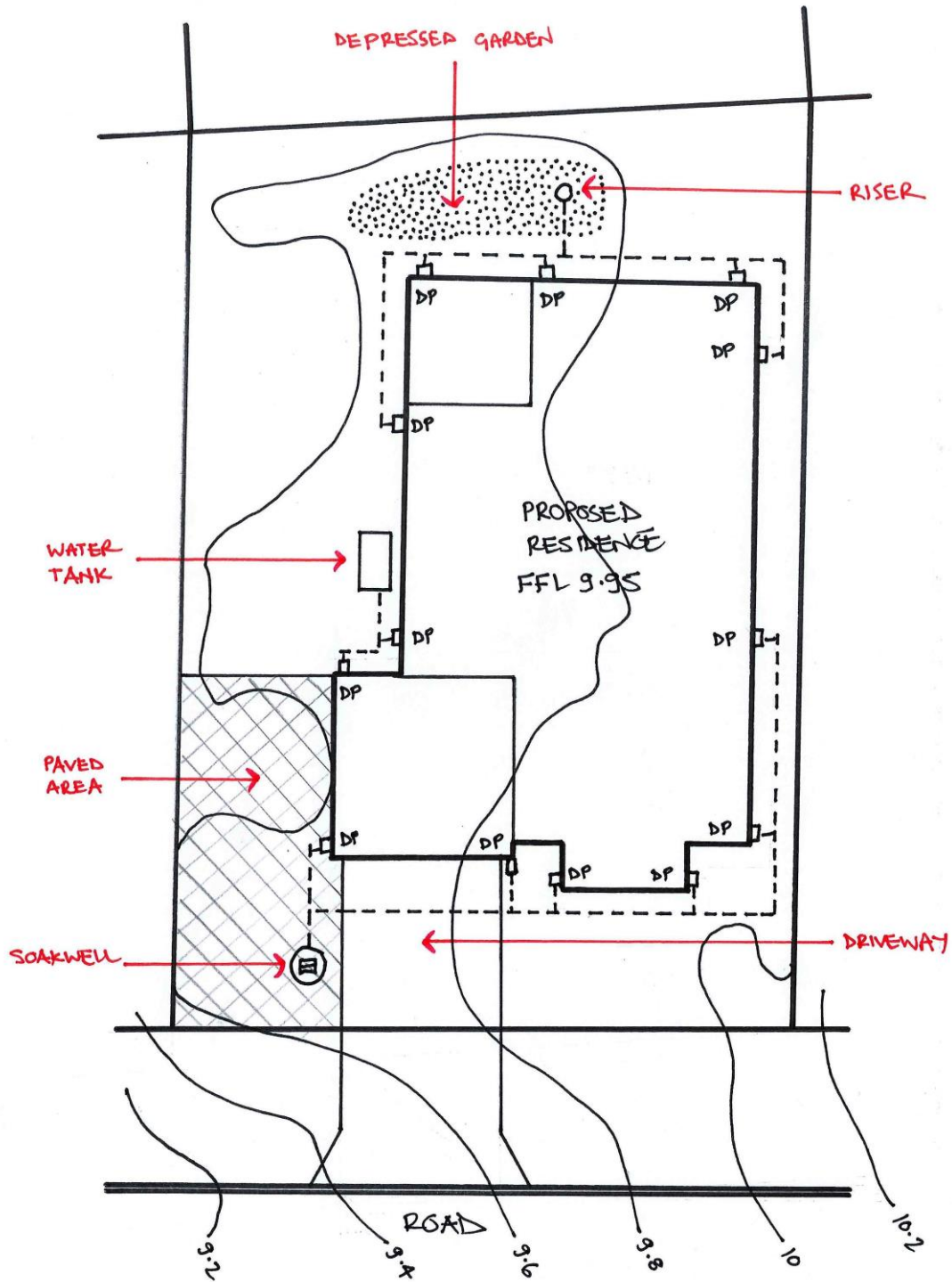
- 4.1.8 A combination of rainwater tanks, soakwells, depressed gardens or other forms Water Sensitive Urban Design (WSUD) solutions are encouraged and the design should allow for an overflow pathway directing higher rainfall intensity events away from the residence and neighbouring properties and ensuring water does not pond against fences or buildings.

- 4.1.9 In order to reduce the risk of water back flowing up into eaves the use of a stormwater grate is encouraged.





Stormwater Plan for an A Class site (example only and not to scale)



**Stormwater volume calculations:**

Roof area + 232m<sup>2</sup>    Paved area + 124m<sup>2</sup>    Driveway – 36m<sup>2</sup> (refer to clause 4.1.3)  
Total impermeable surface area: 320m<sup>2</sup> x 0.9 / 60  
Volume of storage required = 4.80m<sup>3</sup>

**Stormwater management systems:**

Soakwell (1500mm diameter x 1200mm depth)	2.12m <sup>3</sup>
Water tank (2,000 litres)	2m <sup>3</sup>
Depressed garden (24m <sup>2</sup> area x 0.05m average depth)	1.2m <sup>3</sup>
<u>Total volume of storage proposed:</u>	<u>5.32m<sup>3</sup></u>

## 4.2 Commercial and Industrial Development

- 4.2.1 All water draining from roofs, driveways, car parking areas, hardstand areas and other impermeable surfaces shall be retained on-site.
- 4.2.2 A combination of rainwater tanks, soakwells, storage pits, landscaped drainage basins / open swales or other forms WSUD solutions are encouraged. Fenced, open earth drainage sumps will only be approved if the proponent provides evidence to the satisfaction of the local government that all other WSUD disposal options are not viable for the site.
- 4.2.3 The amount of storage to be provided for stormwater retention is calculated for the 1 in 10 year ARI rainfall event for 1 hour duration, which is equivalent to 31mm of rainfall intensity as follows:

$$\text{Volume of storage required (m}^3\text{)} = \text{Total impermeable surface area (m}^2\text{)} \times 0.9 \times 0.031$$

- 4.2.4 In addition, the method to cater for a 1 in 100 year ARI rainfall event is to be demonstrated. This is most commonly achieved via an overland flow path.

## 4.3 Standard Soakwell Volumes

- 4.3.1 The table below shows standard soakwell sizes, stormwater storage capacity and the equivalent impermeable area for A, S and M class sites (in accordance with soil types as per AS 2870).

Soakwell Sizes and Storage Capacity			Equivalent Impermeable Area	
Diameter (mm)	Depth (mm)	Volume (m <sup>3</sup> )	Class A (Sandy Soil)	Class S & M (Clayey / Silty Soil)
600	600	0.17	11.4	9.5
900	600	0.38	25.5	21.3
900	900	0.57	38.2	31.9
1200	1200	1.36	91.1	76.2
1800	600	1.53	102.5	85.7
1500	1200	2.12	142.0	118.7
1500	1500	2.65	177.5	148.4
1800	1200	3.05	204.3	170.8
1800	1500	3.81	255.3	213.4
1800	1800	4.58	306.9	256.5

- 4.3.2 In accordance with the City of Greater Geraldton *Animals, Environment and Nuisance Local Law 2014* (Part 4, Division 4 – Stormwater management) soakwells (and other stormwater disposal systems) must be maintained in a good state of repair and free from obstruction.
- 4.3.3 In order to provide sufficient drainage area for soakwells to function effectively, they should be setback a minimum of 2m from footings and/or the property boundary.

## 5.0 DEFINITIONS

Refer to *State Planning Policy 3.1 – Residential Design Codes (the R-Codes)*.

**Impermeable Surface** the ground surface area that will impede the absorption of stormwater into the natural ground surface.