Ministerial Building Standard MBS 009

On-site retention of stormwater

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Government of South Australia

KNet #14057406

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Department Planning Transport and Infrastructure

1. SCOPE AND APPLICATION

1.1 This Standard is published as a Ministerial Building Standard that forms part of the Building Rules under section **80** of the *Planning, Development and Infrastructure Act 2016* (the Act).

1.2 This Standard sets out cost-effective technical solutions for *stormwater retention* systems for retaining some *surface water* runoff on-site.

1.3 The provisions of this standard apply to Class 1 and 2 dwellings, and Class 10a buildings associated with Class 1 and 2 buildings (as defined by the *Building Code*), where the relevant authority has directed that on-site *stormwater retention* devices must be incorporated as part of the stormwater drainage system.

1.4 The deemed-to-satisfy provisions of this Standard do not address the design and installation of non-*required* retention devices.

2. PERFORMANCE REQUIREMENTS

2.1 In addition to performance requirements **P2.2.1(a)** and **P2.2.1(c)** of Volume Two of the National Construction Code for Class 1 buildings and associated Class 10a buildings, *surface water* runoff from a storm having an average recurrence interval of 1 in 5 years must be retained on site.

2.2 In addition to performance requirements **FP1.1** and **FP1.3** of Volume One of the National Construction Code for Class 2 buildings and associated Class 10a buildings, *surface water* runoff from a storm having an average recurrence interval of 1 in 5 years must be retained on site.

3. DEEMED TO SATISFY PROVISIONS

3.1 Acceptable on-site stormwater retention devices

3.1.1 Where the relevant authority has directed that on-site *stormwater retention* must be provided and incorporated as part of the stormwater drainage system to satisfy performance requirement **2.1 or 2.2** as relevant, the retention can be achieved on suitable soil types (refer **3.3**) by the installation of one or more appropriate on-site retention devices, acceptable forms of which are either soakage trenches or soakage wells, sized in accordance with the relevant tables provided in this Standard.

3.2 Selection of appropriate design table and % of run-off to be retained

3.2.1 Selection of the appropriate table for the sizing of a retention device for a particular site must be as directed by the relevant authority. The relevant authority must also determine the percentage of roof runoff to be retained on-site by the retention device/s.

3.3 Site restrictions on the use of on-site retention of stormwater

3.3.1 The use of on-site retention devices is restricted to soil types classified as Class A and S or Class M, where the characteristic surface movement, (y_s value) is equal to or less than 25mm, as defined in Australian Standard *AS 2870 – Residential slabs and footings*, and where the following conditions exist:

(a) the slope of the natural ground does not exceed 1 in 10;

(b) the depth to rock is 1.2m or greater; and

(c) the ground-water table is permanently below 1.5m from the natural ground surface or the final ground surface, whichever is the lowest.

3.3.2 The use of on-site retention devices is not recommended on sites that have deep moisture changes such as those classified as M-D, H1-D, H2-D, E-D sites, nor Class P sites as defined in Australian Standard *AS 2870 – Residential slabs and footings.* Their use is also not suitable for sites where the slope of the land is more than 1 in 10.

3.3.3 On-site retention devices must not be installed in fill (refer **Figures 3.1(a)** and **3.1(b)**).

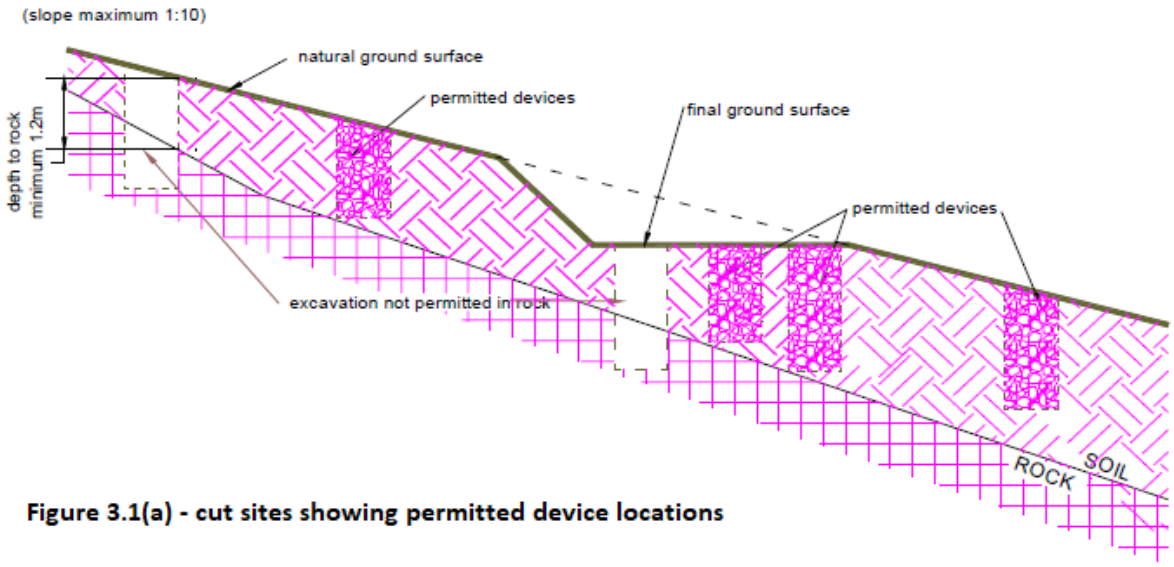

Figure 3.1(a) - cut sites showing permitted device locations

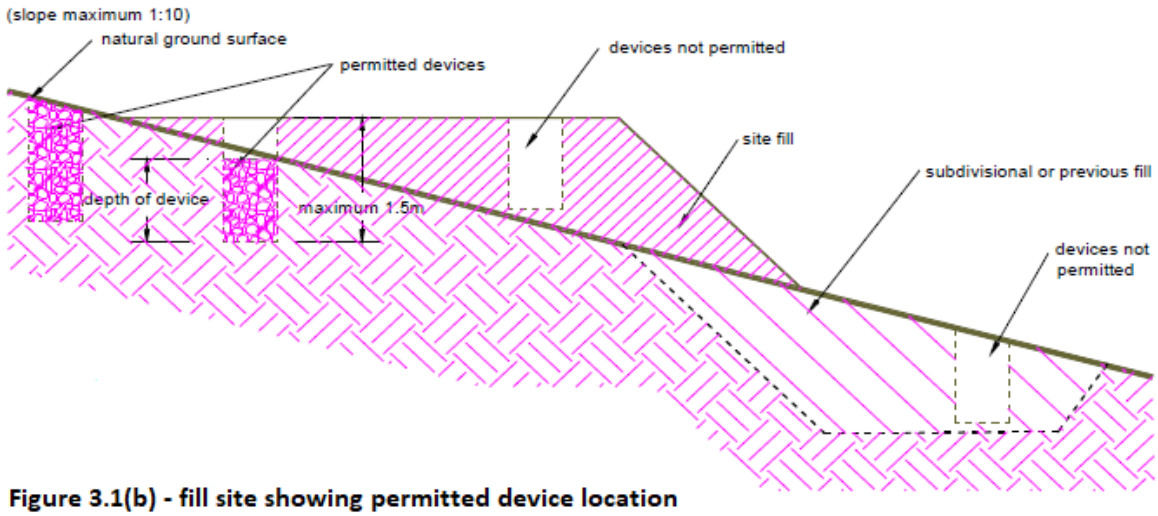

Figure 3.1(b) - fill site showing permitted device location

Note: Figures 3.1(a) and 3.1(b) are not to scale

3.4 Soakage trenches

3.4.1 Where the relevant authority responsible for issuing development approval has identified that on-site stormwater retention is necessary as part of the stormwater drainage system to avoid stormwater damaging or creating a nuisance to other property, soakage trenches constructed in accordance with **3.4.3** and **Figure 3.4** can be used in conjunction with the stormwater provisions in the Building Code to satisfy performance requirement **2.1** and **2.2**.

3.4.2 Where soakage trenches are to be used to achieve on-site retention of surface stormwater run-off for a particular storm event, the sizing of the device/s must be in accordance with the relevant design criteria applicable to the site as set out in **tables 3.1**, **3.2** or **3.3** herein. The total required length may be achieved by the installation of a single trench or multiple trenches and interpolation of the tables is permitted.

Note that numbers greater than 10 have been rounded to the nearest whole number for simplicity. Refer to the Appendices for worked examples showing how to apply the tables to the design of a soakage device.

Table 3.1 - Total required length of soakage trench (metres)
ARI = 1 in 5 year, 30 minute storm event

Trench dimensions (metres)		**Soil Type**	**Catchment Area** (m^2)									
			20	***40***	***60***	***80***	***100***	***120***	***140***	***160***	***180***	***200***
			Total required length of soakage trench (metres)									
width	**0.3**	A/S	4.3	8.6	13	17	22	26	30	35	39	43
depth	0.5	M-D	5.8	12	18	23	29	35	41	47	53	58
width	**0.3**	A/S	2.4	4.8	7.2	9.6	12	14	17	19	22	24
depth	1	M-D	3.0	6.0	9.0	12	15	18	21	24	27	30
width	**0.3**	A/S	2.0	4.0	6.1	8.1	10	12	14	16	18	20
depth	1.2	M-D	2.5	5.0	7.6	10	13	15	18	20	23	25
width	**0.6**	A/S	2.3	4.6	6.9	9.2	12	14	16	18	21	23
depth	0.5	M-D	3.0	5.9	8.9	12	15	18	21	24	27	30
width	**0.6**	A/S	1.2	2.5	3.8	5.1	6.4	7.7	9.0	10	12	13
depth	1	M-D	1.5	3.1	4.6	6.1	7.7	9.2	11	12	14	15
width	**0.6**	A/S	1.1	2.1	3.2	4.3	5.4	6.5	7.6	8.7	9.8	11
depth	1.2	M-D	1.3	2.6	3.8	5.1	6.4	7.7	9.0	10	12	13
width	**0.9**	A/S	1.5	3.1	4.7	6.2	7.8	9.4	11	13	14	16
depth	0.5	M-D	2.0	4.0	6.0	8.0	10	12	14	16	18	20
width	**0.9**	A/S	0.8	1.7	2.6	3.5	4.4	5.2	6.1	7.0	7.9	8.8
depth	1	M-D	1.0	2.0	3.1	4.1	5.1	6.2	7.2	8.2	9.3	10
width	**0.9**	A/S	0.7	1.5	2.2	3.0	3.7	4.5	5.2	6.0	6.7	7.5
depth	1.2	M-D	0.9	1.7	2.6	3.4	4.3	5.2	6.0	6.9	7.8	8.6

Table 3.2 - Total required length of soakage trench (metres)
ARI = 1 in 5 year, 1 hour storm event

Trench Dimensions (metres)		**Soil Type**	**Catchment area** (m²)									
			20	***40***	***60***	***80***	***100***	***120***	***140***	***160***	***180***	***200***
			Total required length of soakage trench (metres)									
width	**0.3**	A/S	4.3	9.4	14	19	24	28	33	38	43	47
depth	0.5	M-D	7.2	14	22	29	36	43	50	58	65	72
width	**0.3**	A/S	2.6	5.3	8.0	11	13	16	19	22	24	27
depth	1	M-D	3.8	7.6	11	15	19	23	27	30	34	38
width	**0.3**	A/S	2.2	4.5	6.8	9.1	11	14	16	18	21	23
depth	1.2	M-D	3.2	6.3	9.5	13	16	19	22	25	29	32
width	**0.6**	A/S	2.5	5.0	7.6	10	13	15	18	20	23	25
depth	0.5	M-D	3.7	7.4	11	15	19	22	26	30	33	37
width	**0.6**	A/S	1.4	2.9	4.4	5.8	7.3	8.8	10	12	13	15
depth	1	M-D	1.9	3.9	5.9	7.8	9.8	12	14	16	18	20
width	**0.6**	A/S	1.2	2.5	3.7	5.0	6.3	7.5	8.8	10	11	13
depth	1.2	M-D	1.6	3.3	4.9	6.6	8.2	9.9	12	13	15	17
width	**0.9**	A/S	1.7	3.4	5.2	6.9	8.6	10	12	14	16	17
depth	0.5	M-D	2.5	5.0	7.5	10	13	15	18	20	22	25
width	**0.9**	A/S	1.0	2.0	3.0	4.0	5.0	6.0	7.1	8.1	9.1	10
depth	1	M-D	1.3	2.6	3.9	5.3	6.6	7.9	9.2	11	12	13
width	**0.9**	A/S	0.8	1.7	2.6	3.4	4.3	5.2	6.1	6.9	7.8	8.7
depth	1.2	M-D	1.1	2.2	3.3	4.4	5.5	6.6	7.7	8.9	10	11

Table 3.3 - Total required length of trench (metres)
ARI = 1 in 5 year, 2 hour storm event

Trench Dimensions (metres)		**Soil Type**	**Catchment area** (m²)									
			20	***40***	***60***	***80***	***100***	***120***	***140***	***160***	***180***	***200***
			Total required length of soakage trench (metres)									
width	**0.3**	A/S	4.6	9.2	14	19	23	28	32	37	42	46
depth	0.5	M-D	8.1	16	24	33	41	49	57	65	73	81
width	**0.3**	A/S	2.6	5.3	7.9	11	13	16	19	21	24	27
depth	1	M-D	4.4	8.7	13	18	22	26	31	35	40	44
width	**0.3**	A/S	2.2	4.5	6.8	9.1	11	14	16	18	21	23
depth	1.2	M-D	3.7	7.4	11	15	19	22	26	30	33	37
width	**0.6**	A/S	2.5	5.0	7.6	10	13	15	18	20	23	25
depth	0.5	M-D	4.3	8.5	13	17	21	26	30	34	39	43
width	**0.6**	A/S	1.5	3.0	4.5	6.1	7.6	9.2	11	12	14	15
depth	1	M-D	2.3	4.6	7.0	9.3	12	14	16	19	21	23
width	**0.6**	A/S	1.2	2.6	3.9	5.2	6.6	7.9	9.2	11	12	13
depth	1.2	M-D	1.9	3.9	5.9	7.9	9.8	12	14	16	18	20
width	**0.9**	A/S	1.7	3.5	5.2	7.0	8.8	11	12	14	16	18
depth	0.5	M-D	2.9	5.8	8.7	12	15	17	20	23	26	29
width	**0.9**	A/S	1.0	2.1	3.1	4.2	5.3	6.4	7.5	8.6	9.6	11
depth	1	M-D	1.5	3.1	4.7	6.3	7.9	9.5	11	13	14	16
width	**0.9**	A/S	0.8	1.8	2.7	3.7	4.6	5.5	6.5	7.4	8.3	9.3
depth	1.2	M-D	1.3	2.7	4.0	5.3	6.7	8.0	9.4	11	12	13

3.4.3 Soakage trenches must be constructed in accordance with the following-

(a) the top of the soakage device must be not less than 300mm below the finished ground surface;

(b) the distance from the finished ground surface to the base of the trench must not be more than 1.5m;

(c) retention trenches must be orientated parallel to the contour lines of the natural ground surface of the area in which the trench is to be located;

(d) the soakage trench must be filled with single size aggregate with a minimum particle size of 20mm and maximum size of 75mm;

(e) the geo-textile fabric must completely encapsulate the aggregate backfilled trench;

(f) the trench must be fitted with an inspection point to enable maintenance and cleaning;

(g) all pipework must be a minimum of 90mm diameter Class 6 UPVC; and

(h) cover to pipework must be-

(i) under soil – 100mm; or

(ii) under paved or concrete areas – 50mm; or

(iii) under areas subject to light vehicular traffic-

(A) reinforced concrete – 75mm; or

(B) paved – 100mm.

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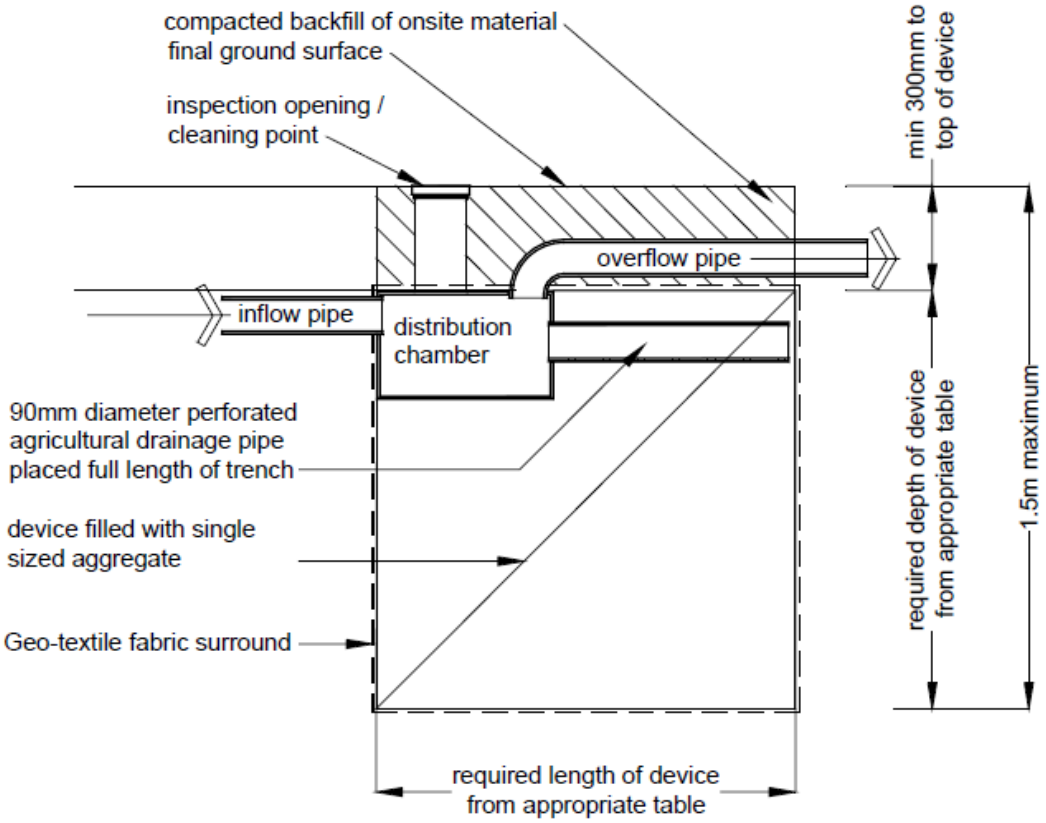


Figure 3.4 - soakage trench
Note: Figure 3.4 not to scale

3.5 Soakage wells

3.5.1 Where the relevant authority has identified that on-site stormwater retention is necessary as part of the stormwater drainage system to avoid stormwater damaging or creating a nuisance to other property, soakage wells constructed in accordance with **3.5.3** and **Figure 3.5** can be used in conjunction with the stormwater provisions in the Building Code to satisfy performance requirements **2.1** and **2.2**.

3.5.2 Where soakage wells are selected to achieve on-site retention of surface stormwater run-off, sizing of the device/s must be in accordance with the relevant design criteria applicable to the site as set out in **tables 3.4**, **3.5** or **3.6** herein. Total required depths more than 1.2m are to be achieved by the installation of multiple wells. Interpolation of the tables is permitted.

Note that numbers greater than 10 have been rounded to the nearest whole number for simplicity.
Refer to the Appendices for worked examples showing how to apply the tables to the design of a soakage device.

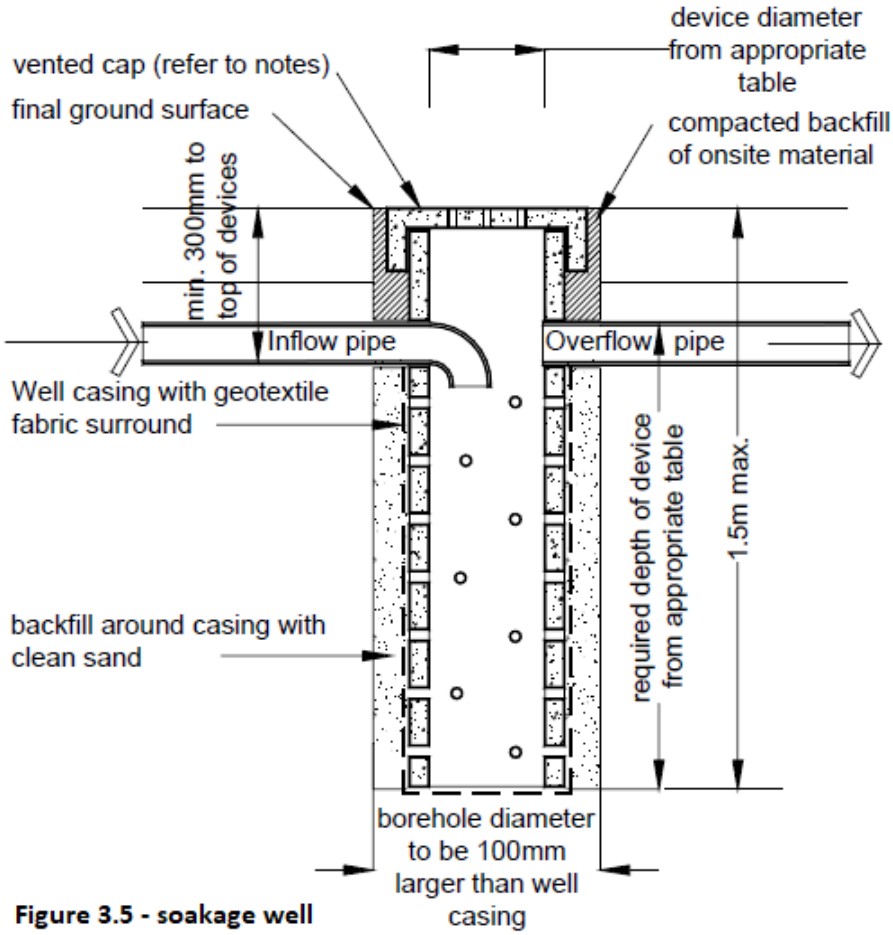


Figure 3.5 - soakage well

Note: Figure 3.5 is not to scale

Table 3.4 - Total required depth of well (metres)
ARI = 1 in 5 year, 30 minute storm event

Well diameter (metres)	**Soil Type**	**Catchment Area** (m²)									
		20	***40***	***60***	***80***	***100***	***120***	***140***	***160***	***180***	***200***
		Total required depth of well (metres)									
0.1	A/S	17	*	*	*	*	*	*	*	*	*
	M-D	33	*	*	*	*	*	*	*	*	*
0.2	A/S	5.6	11	17	23	*	*	*	*	*	*
	M-D	9.2	18	*	*	*	*	*	*	*	*
0.3	A/S	2.8	5.6	8.5	11	14	17	*	*	*	*
	M-D	4.2	7.2	13	17	*	*	*	*	*	*
0.6	A/S	0.8	1.7	2.6	3.4	4.3	5.2	6.1	6.9	7.8	8.7
	M-D	1.1	2.2	3.3	4.4	5.5	6.6	7.7	8.8	9.9	11
0.9	A/S	*	0.8	1.2	1.6	2.0	2.5	2.9	3.3	3.7	4.2
	M-D	*	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.4	4.9
1.2	A/S	*	*	0.7	0.9	1.2	1.4	1.7	1.9	2.2	2.4
	M-D	*	0.6	0.8	1.1	1.4	1.7	2.0	2.2	2.5	2.8
1.5	A/S	*	*	*	0.6	0.7	0.9	1.1	1.2	1.4	1.6
	M-D	*	*	*	0.7	0.9	1.1	1.3	1.4	1.6	1.8

** well configuration not recommended*

Table 3.5 - Total required depth of well (metres)
ARI = 1 in 5 year, 1 hour storm event

Well diameter (metres)	**Soil Type**	**Catchment Area** (m²)									
		20	***40***	***60***	***80***	***100***	***120***	***140***	***160***	***180***	***200***
		Total required depth of well (metres)									
0.1	A/S	20	*	*	*	*	*	*	*	*	*
	M-D	35	*	*	*	*	*	*	*	*	*
0.2	A/S	6.5	13	*	*	*	*	*	*	*	*
	M-D	10	20	*	*	*	*	*	*	*	*
0.3	A/S	3.3	6.6	10	13	17	*	*	*	*	*
	M-D	4.7	9.5	14	19	*	*	*	*	*	*
0.6	A/S	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10
	M-D	1.3	2.5	3.8	5.1	6.3	7.6	8.9	10	11	13
0.9	A/S	*	0.9	1.4	1.9	2.4	2.9	3.3	3.8	4.3	4.8
	M-D	0.6	1.1	1.7	2.3	2.9	3.5	4.0	4.6	5.2	5.8
1.2	A/S	*	0.5	0.8	1.1	1.4	1.7	1.9	2.2	2.5	2.8
	M-D	*	0.6	1.0	1.3	1.6	2.0	2.3	2.6	2.9	3.3
1.5	A/S	*	*	0.5	0.7	0.9	1.1	1.3	1.4	1.6	1.8
	M-D	*	*	0.6	0.8	1.0	1.3	1.5	1.7	1.9	2.1

** well configuration not recommended*

Table 3.6 - Total required depth of well (metres)
ARI = 1 in 5 year, 2 hour storm event

Well diameter (metres)	**Soil Type**	**Catchment Area** (m²)									
		20	***40***	***60***	***80***	***100***	***120***	***140***	***160***	***180***	***200***
		Total required depth of well (metres)									
0.1	A/S	16	*	*	*	*	*	*	*	*	*
	M-D	36	*	*	*	*	*	*	*	*	*
0.2	A/S	6.0	12	18	*	*	*	*	*	*	*
	M-D	11	22	*	*	*	*	*	*	*	*
0.3	A/S	3.2	6.4	9.6	13	16	*	*	*	*	*
	M-D	5.4	11	16	*	*	*	*	*	*	*
0.6	A/S	1.0	2.0	3.1	4.1	5.2	6.2	7.3	8.3	9.3	10
	M-D	1.5	3.0	4.5	6.0	7.6	9.1	11	12	14	15
0.9	A/S	*	*	*	*	*	*	*	*	*	5.2
	M-D	0.7	1.4	2.1	2.8	3.5	4.2	4.9	5.6	6.3	7.0
1.2	A/S	*	0.5	0.9	1.2	1.5	1.8	2.1	2.4	2.8	3.1
	M-D	*	0.8	1.2	1.6	2.0	2.4	2.8	3.2	3.6	4.1
1.5	A/S	*	*	0.5	0.8	1.0	1.2	1.4	1.6	1.8	2.0
	M-D	*	0.5	0.8	1.0	1.3	1.6	1.8	2.1	2.4	2.6

** well configuration not recommended*

3.5.3 Soakage wells must be constructed in accordance with the following-

(a) the top of the perforated section of well casing must be not less than 300mm below the finished ground surface;

(b) the distance from the finished ground surface to the base of the well must not be more than 1.5m (*refer to notes re depth limitations*);

(c) perforations to the concrete or uPVC casing must not be less than 5% of the surface area of the casing and must be uniformly distributed;

(d) all pipework must be a minimum of 90mm diameter;

(e) the well must not be filled with aggregate;

(f) the well must be capped for safety reasons;

(g) the cap must be vented to the final ground surface;

(h) the cap must be easily identifiable and accessible for cleaning purposes; and

(i) cover to pipework must be-

  (i) under soil – 100mm;

  (ii) under paved or concrete areas – 50mm; or

  (iii) under areas subject to light vehicular traffic-

    (A) reinforced concrete – 75mm; or

    (B) paved – 100mm.

3.6 Setback distances

3.6.1 Retention devices shall be located a minimum of 3m from all property boundaries, (excluding front boundaries and/or reserves) and 3m from footings of all structures located on the allotment.

3.6.2 A minimum clear spacing of 1m between the sides of the retention device and any service trench is *required*.

3.7 Distances between devices

3.7.1 Where two or more retention devices are installed, the clear distance between the edges of the devices must be 1.5 times the depth of the deepest device.

3.8 Overflow device

3.8.1 All on-site retention devices must be fitted with an overflow device at the inlet end of the device.

3.9 Overflows

3.9.1 Overflows must be disposed of to the street water table or other public infrastructure designed to accept stormwater in accordance with the requirements of the relevant authority.

3.9.2 Surface stormwater run-off discharging from overflows must be disposed of in a way that avoids the likelihood of damage or nuisance to other property.

3.10 Filtration device

3.10.1 A device for the filtration of the surface stormwater run-off must be located between the gutter and the inlet pipe of the retention device.

3.10.2 Filtration devices must be identifiable, accessible and cleanable.

3.11 Gutters and pipework

3.11.1 All associated gutters and pipework required to direct the surface stormwater run-off to the device, and pipework from the device to the off-site stormwater disposal system must be designed and installed in accordance with-

(a) Australian Standard *AS/NZS 3500.3 Plumbing and drainage – Stormwater drainage*; or

(b) for Class 1 buildings - the acceptable construction practice in Part 3.5.3 of Volume Two of the National Construction Code.

APPENDIX A

A1 INTERPRETATION

Average recurrence interval (ARI) applied to rainfall, means the expected or average interval between exceedances for a 5 minute duration rainfall intensity.

Building Code has the same meaning as defined in section 3 of the *Planning, Development and Infrastructure Act 2016*.

Catchment area means the proportion of the surface catchment area, expressed in square metres, that the relevant authority requires stormwater run-off from, to be retained.

Final ground surface means the ground surface from which the device is installed.

Natural ground surface means the ground surface prior to human intervention.

Over-flow device means a device used with the on-site stormwater retention system to divert overflow away from structures and buildings in the event of a blockage of the system or run-off exceeding the system's capacity.

Professional engineer has the same meaning as the *Building Code*.

Relevant authority for the purposes of this Standard means the council or the State Planning Commission.

Required means required by this Standard.

Roof catchment area means the total area, expressed in square metres, of the roof measured on the horizontal (no allowance for slope or vertical surfaces) and is to include the roof area of any fully or partly covered carport, portico, verandah, balcony, porch or similar structure attached to the building.

Soakage trench means a retention device, installed horizontally.

Soakage well means a retention device installed vertically.

Stormwater retention means the practice of inhibiting the release of stormwater run-off into the existing infrastructure through the installation of on-site soakage devices that retain surface stormwater run-off on-site. The run-off is absorbed into, and percolates through, the surrounding soil strata.

APPENDIX B

B1 WORKED EXAMPLES – Using soakage trenches

B1.1 A single unit development having a total roof catchment area of 160m² is located on an allotment with Class A soil. The relevant authority has specified the following design parameters:

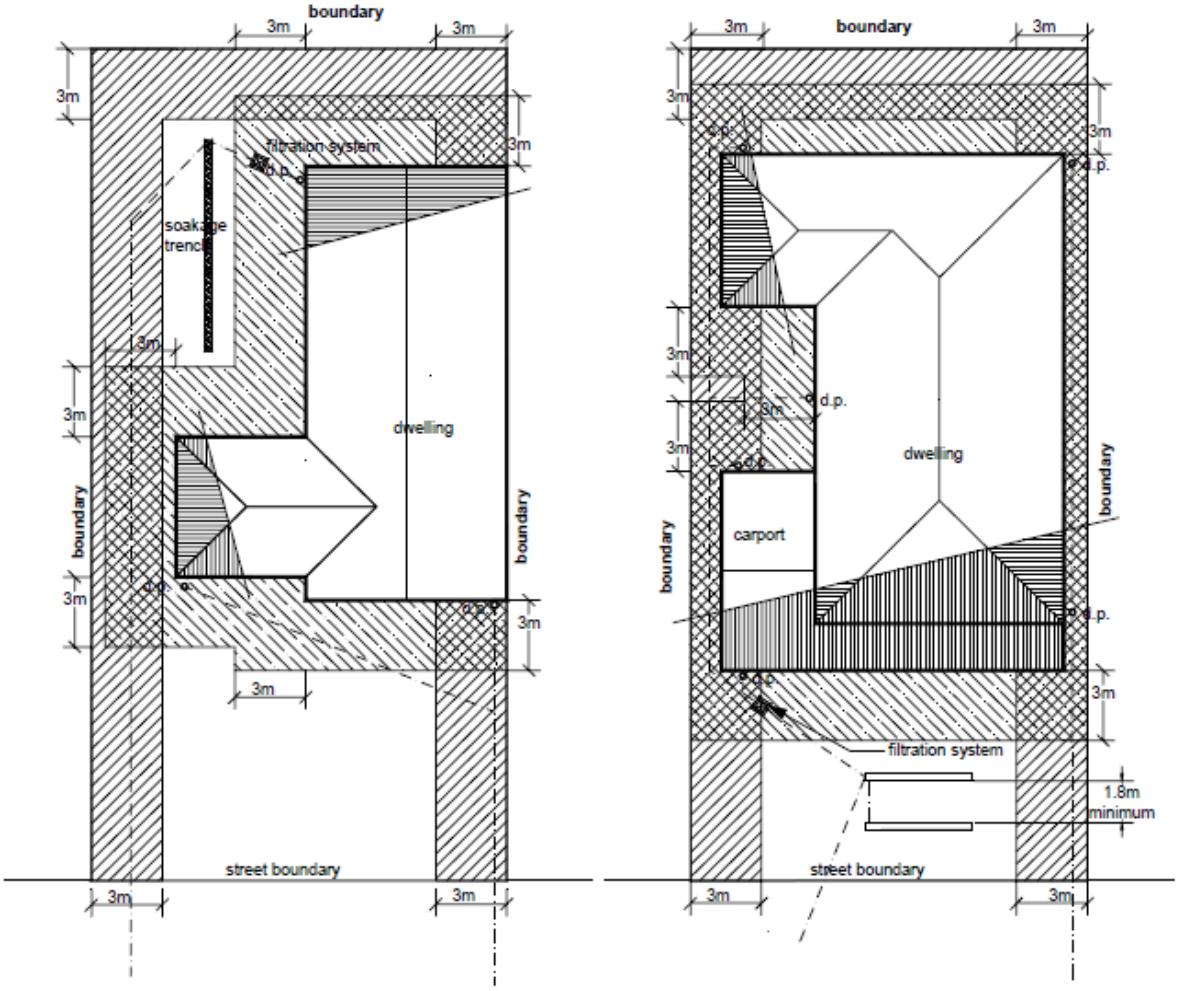
ARI	=	*1 in 5*
Storm event	=	*1 hour*
Roof run-off to be retained	=	*50% of the total roof catchment area*.*

* The percentage of runoff to be retained on-site is determined by the relevant authority responsible for local stormwater management.

The design parameters specified necessitate the use of **Table 3.2**. By determining the catchment area required to be retained, an appropriately sized device can be selected for the configuration of the allotment.

Catchment area	=	*80sqm (50% of 160sqm)*
Selected device	=	*one 0.3m wide by 1.2m deep by 9.1m long trench or two 0.3m wide by 1.2m deep by 4.55m long trenches.*

Refer to **Figure B1** for examples of how soakage trenches can be used to provide the required stormwater retention on-site.



OPTION 1 - Single Trench -
one trench @ 300mm wide
x 1.2m deep x 9.1m long

OPTION 2 - Multiple Trenches
two trenches @ 300mm wide
x 1.2m deep x 4.55m long

Minimum clear distance between sides of devices
= 1.5m deep x 1.2
= 1.8m

Notes

- Stormwater disposal including overflows as directed by the relevant authority
- Stormwater drainage system to AS/NZS 3500.3.2
- Construction of soakage trenches is not permitted in these zones

Figure B1 - Location of soakage trenches

Note: Figure B1 not to scale

B2 WORKED EXAMPLE – Using soakage wells

B2.1 A single unit development having a total roof catchment area of 200m² is located on an allotment with Class M-D (y_s<25mm) soil. The relevant authority has specified the following design parameters:

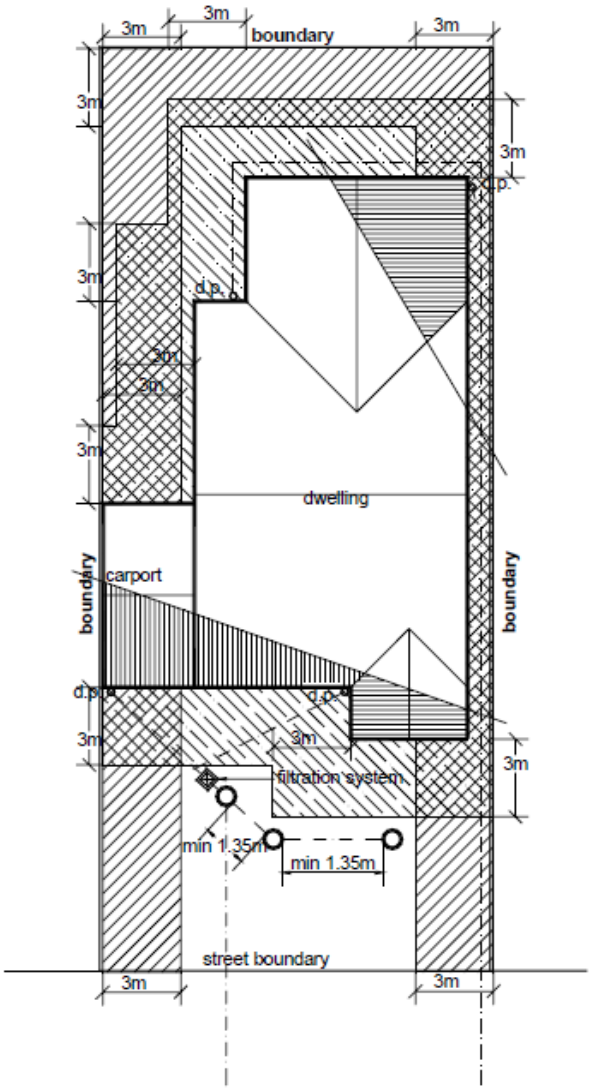
ARI	=	*1 in 5*
Storm Event	=	*30 minutes*
Run-off to be retained	=	*50% of the total roof catchment area**

* The percentage of runoff to be retained on-site is determined by the relevant authority responsible for local stormwater management.

The design parameters specified necessitate the use of **Table 3.4**. By determining the catchment area to be retained, an appropriately sized device can be selected for the configuration of the allotment.

Catchment area	=	*100sqm (50% of 200sqm)*
Selected devices	=	*0.9m diameter well with total depth of 2.5m*
	=	*multiple wells required – two at 0.8m deep plus one at 0.9m deep*

Refer to **Figure B2** for examples of how soakage wells can be used to provide the required stormwater retention on-site.



Multiple wells

three x 900mm diameter wells:
two @ 0.8m deep and one @ 0.9m deep = 2.5m in total

minimum clear distance between wells = 0.9 x 1.5m = 1.35m

Notes

- Stormwater disposal including overflows as directed by the relevant authority
- Stormwater drainage system to AS/NZS 3500.3.2
- Construction of soakage wells is not permitted in these zones

Figure B2 - Location of soakage wells
Note: Figure B2 not to scale

B3 NOTES

B3.1 Depth limitations

(a) The specification has limited the depth of soakage devices to 1.5m due to restrictions imposed on excavation depths greater than 1.5m by the Work, Health and Safety and Regulations 2012 and the likely impact of water on the soil/foundations at depths greater than 1.5m.

(b) The maximum depth of 1.5m used in the specification may be exceeded if-

(i) the allotment conditions (slope, depth to water table and rock) are confirmed in a report from a *professional engineer* as suitable and that existing and proposed building structures will not be adversely impacted by retaining runoff at the proposed depth; and

(ii) the additional requirements of the Work, Health and Safety Regulations are complied with.

B3.2 Maintenance

(a) In addition to the installation of filtration devices to the on-site stormwater retention system, retention trenches and wells should be inspected and cleaned on a regular basis.

(b) Overflow, discharge or bleed-off pipes from roof mounted appliances such as evaporative air conditioners, hot water services and solar heaters should not discharge onto the catchment area.

B3.3 Sizing tables

(a) The sizing tables were prepared by the Urban Water Resource Centre – University of South Australia incorporating the following design parameters:

(i) Rainfall intensities for a 1 in 5 year average recurrence interval:

30 minute storm duration = 33.4mm/hr

1 hour storm duration = 21.7mm/hr

2 hour storm duration = 14.0mm/hr

(ii) The hydraulic conductivity used to calculate the size of the soakage devices in Class A and S sites is 2.5×10^{-5} m/s (assumes a blockage of 50%).

(iii) The hydraulic conductivity used to calculate the size of the soakage devices in Class M-D sites is 5×10^{-6} m/s (assumes a blockage of 50%).

(iv) Infiltration rates under steady state flow were derived from the Darcy Law Equation, with a time step of 1 minute.