

Stormwater soakpit: design to NZBC E1/VM1:1992

Dynamic Drainage & Excavation Ltd

Client Name:

HOMES BY PARKLANE

Site address:

24 WESTMOOR BOULEVARD ROLLESTON

Site location (NZMG):

mN mE

Local Authority:

SELWYN DISTRICT COUNCIL

Servicing 6 Downpipes & Driveway

Date:

22-Jun-23

Designer:

Grant Wooster

INPUT

Catchment area, Ac

(ha)

Ac (TOTAL) =

0.0332 ha

roof (non-absorbent)

234.8 m²

paved surfaces (asphalt / concrete)

96.9 m²

other

m²

Run-off co-efficient, C

(unitless)

C (TOTAL) =

0.89

Rainfall Intensity, I

(mm/hr)

10 yr / 10 minute

I₁₀₋₁₀

mm/hr

DESIGN: 10 yr / 60 minute

I₁₀₋₆₀

43.61 mm/hr

OUTPUT

Run-off, Rc

(flow discharged from catchment in 1 hr)

12.8 m³

Soakage volume, Vsoak

(disposed of by way of soakage in 1 hour)

3.3 m³

Storage volume, Vstor

(required storage to prevent overflow)

9.5 m³

Depth of groundwater

(max. depth of soakpit)

m

Design soakage rate, Sr

(mm/hr)

- from field test results (refer to separate worksheet)

500 mm/hr

System selected:

(a) Rock-filled soak pit

Y (Y/N)

Min. Volume required (total)

25.0 m³

Overall dimensions (m)

3.3 m wide by

2.0 m long

Base area of soakpit, Asp

6.6 (m²) by

3.8 m deep

Total design volume (actual)

25.0 m³

(Check if > 25.0 => OK ?)

(b) Chamber soak pit

N (Y/N)

No. of chambers

0 Diameter of chamber

0 mm

Base area of soakpit, Asp

0.00 (m²) by

0.0 m deep

Total design volume (actual)

N/A m³

(Check if > 9.5 => OK ?)

DESIGN SUMMARY:

Course soakage test in gravel medium 3.8m depths showed high percolation rates, to the extent that water wouldn't pond and a standard percolation test couldn't be carried out. Therefore a max of 500mm/hr has been used in calculations for soakage rate.

The SDC Engineering Code of Practise, Part 5 Stormwater has been used to select the rainfall data. This is summarised : Rolleston scaling factor: 1.03 * Rolleston. Additional scaling : + 16% for climate change. Design rainfall depth for site (2% AEP, 1 hr): 1.03*36.5 mm/hr* 1.16 = 43.61mm/hr

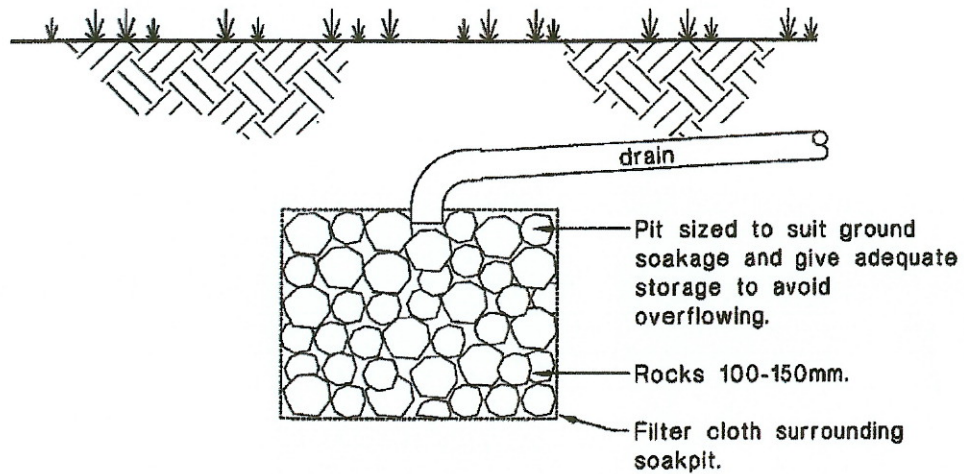
HIRDS V4 Depth-Duration-Frequency Results
 Sitename: 24 WESTMOOR BOULEVARD, ROLLESTON
 Coordinate system: WGS84

Rainfall depths (mm) :: RCP8.5 for the period 2081-2100														
ARI	AEP	10m	20m	30m	1h	2h	6h	12h	24h	48h	72h	96h	120h	
1.58	0.633	5.27	6.99	8.38	11.7	16.2	27	36.4	48.1	60.9	68.3	73.4	77.2	
2	0.5	6.03	7.97	9.54	13.2	18.4	30.4	41	53.6	67.8	76.1	81.7	85.6	
5	0.2	8.88	11.6	13.8	19	26.1	42.6	56.8	73.5	92	103	110	115	
10	0.1	11.3	14.6	17.3	23.6	32.3	52.2	69.2	88.9	111	123	131	137	
20	0.05	13.9	18	21.3	28.8	39.2	62.7	82.4	105	130	144	153	159	
30	0.033	15.7	20.2	23.8	32.1	43.5	69.2	90.5	115	142	157	166	173	
40	0.025	17	21.8	25.6	34.5	46.6	74	96.6	122	150	166	176	183	
50	0.02	18.1	23.1	27.2	36.5	49.2	77.8	101	128	157	173	184	190	
60	0.017	18.9	24.2	28.4	38.1	51.3	81	105	133	163	180	190	196	
80	0.013	20.4	26.1	30.5	40.8	54.8	86.1	112	141	172	189	199	207	
100	0.01	21.6	27.5	32.2	42.9	57.6	90.3	117	147	179	196	207	214	
250	0.004	26.8	33.9	39.5	52.2	69.4	107	138	172	208	227	239	246	

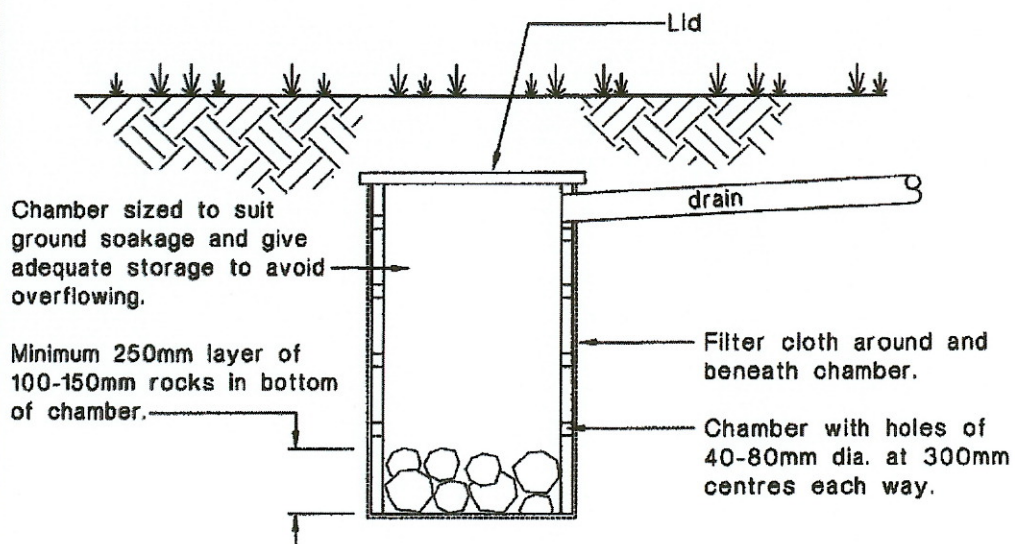
Table 1 Scale factors for each township within the Selwyn District

Township	Rainfall Gauge	Scale Factor
Arthurs Pass	Arthurs Pass	1.00
Burnham	Christchurch Aero	1.06
Castle Hill	Cheeseman	1.02
Coalgate	Whitecliffs	0.91
Darfield	Ridgens Road	1.20
Doyleston	Christchurch Aero	1.01
Dunsandel	Ridgens Road	1.05
Glentunnel	Whitecliffs	0.92
Hororata	Ridgens Road	1.06
Kirwee	Christchurch Aero	1.06
Lake Coleridge	Highpeak Station	0.72
Leeston	Christchurch Aero	1.01
Lincoln	Christchurch Aero	0.96
Lower Selwyn Huts	Christchurch Aero	0.98
Motukarara	Christchurch Aero	1.01
Prebbleton	Christchurch Aero	1.03
Rolleston	Christchurch Aero	1.03
Sheffield	Whitecliffs	1.00
Southbridge	Christchurch Aero	0.98
Springfield	13 Mile Bush	0.83
Springston	Christchurch Aero	0.99
Tai Tapu	Christchurch Aero	0.98
Templeton	Christchurch Aero	1.02
Terrace Downs	Highpeak Station	1.01
Upper Selwyn Huts	Christchurch Aero	0.96
Waddington	Whitecliffs	1.00
West Melton	Christchurch Aero	1.03
Whitecliffs	Whitecliffs	1.00
Windwhistle	Highpeak Station	0.92

Figure 13. Soak Pit for Surface Water Disposal
Paragraph 9.0.4



(a) Rock soak pit



(b) Chamber soak pit