

Drainage – Soakaway to BRE 365 (2016)Location: **Tyncoedcae Farm, Swansea Road, Merthyr Tydfil**

Return period 1 in (yr) 10

Site area A= 292 sq.m

To calculate inflow volume:

From Fig 1 Ratio r = 0.2 mm

M5-D = 20 mm

Storm Duration	D (mins)	10	30	60	240	360	600	1440
From Table 1	Z1 =	0.49	0.77	1	1.57	1.78	2.12	2.84
	M5-D =	9.8	15.4	20	31.4	35.6	42.4	56.8
From Table 2	Z2 =	1.22	1.24	1.24	1.22	1.2	1.19	1.17
	M10-D =	11.96	19.1	24.8	38.31	42.72	50.46	66.46
Inflow volume	I = (cu.m)	3.49	5.58	7.24	11.19	12.47	14.73	19.41

Soil Infiltration Tests

	Depth h	Length l	Width w	
Size of Trench (m)	1	2	0.4	
Assume depth to pipe invert =	0.1 (m)			
Effective depth (m)	0.9			
Volume Overall =	0.72			
therefore Vp75-25 =	0.36 cu.m			
Filter surface area Ap50 =	2.96 sq.m			
Test Number	1	2	3	
Time (mins) Tp75-25	682	721	743	
Soil Infiltration rate F = x10 ⁶	2.97218	2.81141	2.72817	m/sec
use minimum F Fmin =	2.72817			

Soakaway Design

Soakaway Design		Depth h	Length l	Width w	Void ratio =			
Size of Pit	(m)	0.4	58	1	0.3			
Effective depth	(m)	0.4	Effective storage = 6.96 cu.m					
Internal surface area	(sq.m)	23.6 excludes base area						
Storm Duration	D (mins)	10	30	60	240	360	600	1440
Inflow volume	I = (cu.m)	3.49	5.58	7.24	11.19	12.47	14.73	19.41
Outflow from pit	O (cu.m)	0.04	0.12	0.23	0.93	1.39	2.32	5.56
Storage volume	S (cu.m)	3.45	5.46	7.01	10.26	11.08	12.42	13.84

Storage volume as calculated is less than effective storage volume.

For 1in 100 plus 30%

Storm Duration	D (mins)	10	30	60	240	360	600	1440
From Table 1	Z1 =	0.49	0.77	1	1.57	1.78	2.12	2.84
	M5-D =	9.8	15.4	20	31.4	35.6	42.4	56.8
From Table 2	Z2 =	1.92	1.98	2.03	1.95	1.91	1.89	1.17
	M100-D =	18.82	30.49	40.6	61.23	68	80.14	66.46
Inflow volume	I = (cu.m)	5.49	8.9	11.86	17.88	19.85	23.4	19.41
for climate change	Add 30%	7.14	11.57	15.41	23.24	25.81	30.42	25.23

Soakaway Design for 1in 100

Soakaway Design	for 1in 100	Depth h	Length l	Width w	Void ratio =	Using		
Size of Pit	(m)	0.4	58	1	0.85	Soakaway crates		
Effective depth	(m)	0.4	Effective storage = 19.72 cu.m					
Internal surface area	(sq.m)	23.6 excludes base area						
Storm Duration	D (mins)	10	30	60	240	360	600	1440
Inflow volume +30%	I = (cu.m)	7.14	11.57	15.41	23.24	25.81	30.42	25.23
Outflow from pit	O (cu.m)	0.04	0.12	0.23	0.93	1.39	2.32	5.56
Storage volume	S (cu.m)	7.1	11.46	15.18	22.32	24.42	28.1	19.66

Swale Storage above ground

Depth (m)	Length (m)	Width at base	width at top
0.4	58	1.4	2
Added Vol=	39.44		
Total Storage	46.4		

Check drain down to half storage

Ts50 =	S x 0.5/ (as50 x f)	153141.95 secs	42.54 hrs
F =	2.72817 X 10^6		1.77 days
as50=	23.6		