

Drainage – Soakaway to BRE 365 (2016)

Location: **Tyncoedcae Farm, Swansea Road, Merthyr Tydfil**
 Return period 1 in (yr) 10
 Site area A= 350 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 =	11.956	19.096	24.8	38.308	42.72	50.456	66.456
Inflow volume	I = (cu.m)	4.1846	6.6836	8.68	13.4078	14.952	17.6596	23.2596

Soil Infiltration Tests

	Depth h	Length l	Width w	
Size of Trench (m)	0.4	2	1	
Assume depth to pipe invert =	0.1 (m)			
Effective depth (m)	0.3			
Volume	Overall =			
therefore	Vp75-25 =	0.3 cu.m		
Filter surface area	Ap50 =	2.9 sq.m		
Test Number	1	2	3	
Time (mins)	Tp75-25	682	721	743
Soil Infiltration rate	F = x10 ⁶	2.52806	2.39131	2.32051
use minimum F	Fmin =	2.32051		m/sec

Soakaway Design

Size of Pit	(m)	0.5	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)	4.1846	6.6836	8.68	13.4078	14.952	17.6596	23.2596
Outflow from pit	O (cu.m)	0.032858403	0.098575208	0.197150415	0.788601661	1.182902492	1.971504154	4.731609969
Storage volume	S (cu.m)	4.151741597	6.585024792	8.482849585	12.61919834	13.76909751	15.68809585	18.52799003

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 =	1.22	1.24	1.24	1.22	1.2	1.19	1.17
	M100-D =	11.956	19.096	24.8	38.308	42.72	50.456	66.456
Inflow volume	I = (cu.m)	4.1846	6.6836	8.68	13.4078	14.952	17.6596	23.2596
for climate change	Add 30%	5.43998	8.68868	11.284	17.43014	19.4376	22.95748	30.23748
Outflow from pit		0.032858403	0.098575208	0.197150415	0.788601661	1.182902492	1.971504154	4.731609969

Storage Volume REQ.	5.407121597	8.590104792	11.08684959	16.64153834	18.25469751	20.98597585	25.50587003
Storage Volume Act.	1.552878403	-1.630104792	-4.126849585	-9.681538339	-11.29469751	-14.02597585	-18.54587003
Combined storage capacity minus 1:100 + 30% CC	40.96002	37.80989521	35.31315042	28.96986	26.9624	25.41402415	20.89412997

Swale Storage				
Depth (m)	Length (m)	Width at base (m), width at top		
	0.4	58	1.4	2
Swale Vol=	39.44			
Total Storage of soakaway and swale			46.4	