



HORIZONTAL SOAKAWAY CALCULATIONS CIRIA C753 - EQ 25.4 - using FEH 22 rainfall data - v2

PROJECT TITLE: No 8A The Lodge Warninglid

JOB No: 25065A

SOAKAWAY NO.: SA1 LOCATION: Side Garden

DATE: Jun-26

1. FEH Rainfall data		2. Design Inflow		3. Test rate calculations		4. Design Outflow results	
Event:	100 year	Roof (m ²):	113	Test pit L:	2.50	a ₅₀ (sq.m):	2.66
CC %	1.45	Yard (m ²):		Test pit W:	1.50	t _{p75-25} :	315.5
Index:	10	Workshop (m ²):	24	Test pit D:	1.00	Tot vol.:	2.4938
Urban Creep (%)	10	Total Area (sq.m):	151	Free vol (%):	100	a _{p50} (sq.m):	6.410
				Effective depth:	0.665	V _{p75-25} :	1.2469
				d ₂₅ - d ₇₅ depth:	0.804	f (m/s):	1.028E-05

5. Infiltration system data					6. Infiltration coefficient (q) (m/h)		7. FOS
Length (m):	5.000	Width (m):	4.00	q value (m/h):	0.0185	Rate (q) provided by SL:	2.0
Estimated depth (d):	0.800	Inlet IL:	7.350	Calculated base:	6.585	Calculated Soil Rate (f):	0.036993
Porosity n %:	96	diam inlet:	0.000	Top of s/away:	7.385		

Summary of designer's sizes for chosen D min duration for 100 year storm

L	W	d	A _b	A _d	P	R	n
5.00	4.00	0.800	20	151	18.00	7.54	0.96

Soakaway calculations are based on BRE 365 infiltration results and the calculated method shown in CIRIA document C697 & C753 and uses FEH 22 rainfall data. The rainfall depths are factored by the climate change growth factor chosen. The porosity rate is further factored for safety to suit risk from long term siting. Always refer to the project construction detail sheets 200 or 201 for the soakaway or permeable pavement make-up and the main general arrangement (GA) showing the size, levels and position of the soakaway.

Calculations used are derived from CIRIA document C753 - SUDS manual Eq 25.4

D (Hrs)	mm	i (m/h)	h _{max}
0.25	26.25	0.1523	0.2939
0.50	35.13	0.1019	0.3902
1.00	44.84	0.0650	0.4911
2.00	53.42	0.0387	0.5694
4.00	62.58	0.0227	0.6352
6.00	68.01	0.0164	0.6584
10.00	74.89	0.0109	0.6597
24.00	87.04	0.0053	0.5282
36.00	93.57	0.0038	0.3713
48.00	98.97	0.0030	0.2016
60.00	103.86	0.0025	0.0260
72.00	108.40	0.0022	-0.1535
84.00	112.69	0.0019	-0.3359
96.00	116.82	0.0018	-0.5201

$$h_{max} = \frac{D(Ri - q)}{n}$$

where:

h_{max} = maximum head of water above base of infiltration component

R = ratio of the drained area to the infiltration area, $R = \frac{A_D}{A_b}$

q = infiltration coefficient, from percolation test (m/h), adjusted by the appropriate factor of safety

i, D = intensity and duration of rainfall events with the required return period at the site location (m/h, h)

A_b = base area of infiltration system (m²)

A_D = area to be drained (m²)

n = porosity of fill material (voids volume/total volume)

This may be obtained from laboratory tests, or else the guide values provided in the following table may be used. If a value of porosity greater than 0.3 is used, the material delivered to site should be tested to ensure that it meets the design requirement.

Material	Porosity, n
geocellular systems	0.9-0.95
uniform gravel	0.3-0.4
graded sand or gravel	0.2-0.3

MAX HEIGHT (H_{max}): 0.6597

MAX VOL (cu.m): 12.67

Half drain time to empty

H_{max}: 0.660

R:

7.54

Time to empty (hrs): 17.12

$$\frac{n h_{max}}{2q}$$

Recalculated q (m/h): q OK

Equivalent f rate: n/a

EMPTY TIME IS SATISFACTORY

