

SOAKAWAY DESIGN

In accordance with BRE Digest 365 - Soakaway design

Tedds calculation version 2.0.05

Design rainfall intensity

Location of catchment area Manchester
Impermeable area drained to the system $A = 1840.0 \text{ m}^2$
Return period Period = 30 yr
Ratio 60 min to 2 day rainfall of 5 yr return period $r = 0.360$
5-year return period rainfall of 60 minutes duration $M5_{60\text{min}} = 19.0 \text{ mm}$
Increase of rainfall intensity due to global warming $p_{\text{climate}} = 0 \%$

Soakaway / infiltration trench details

Soakaway type Rectangular
Minimum depth of pit (below incoming invert) $d = 3204 \text{ mm}$
Width of pit $w = 9000 \text{ mm}$
Length of pit $l = 9000 \text{ mm}$
Percentage free volume $V_{\text{free}} = 30 \%$
Soil infiltration rate $f = 10.0 \times 10^{-6} \text{ m/s}$
Wetted area of pit 50% full $a_{s50} = l \times d + w \times d = 57678821 \text{ mm}^2$

Table equations

Inflow (cl.3.3.1) $I = M30 \times A$
Outflow (cl.3.3.2) $O = a_{s50} \times f \times D$
Storage (cl.3.3.3) $S = I - O$

Duration, D (min)	Growth factor Z1	M5 rainfalls (mm)	Growth factor Z2	30 year rainfall, M30 (mm)	Inflow (m ³)	Outflow (m ³)	Storage required (m ³)
5	0.36;	6.8;	1.45;	9.9;	18.25;	0.17;	18.08
10	0.51;	9.7;	1.49;	14.4;	26.50;	0.35;	26.15
15	0.62;	11.8;	1.50;	17.7;	32.58;	0.52;	32.06
30	0.79;	15.0;	1.53;	22.9;	42.17;	1.04;	41.13
60	1.00;	19.0;	1.54;	29.3;	53.84;	2.08;	51.76
120	1.22;	23.2;	1.54;	35.6;	65.55;	4.15;	61.40
240	1.48;	28.1;	1.52;	42.8;	78.69;	8.31;	70.38
360	1.67;	31.7;	1.51;	47.8;	87.88;	12.46;	75.42
600	1.90;	36.1;	1.48;	53.6;	98.63;	20.76;	77.87
1440	2.42;	46.0;	1.44;	66.2;	121.72;	49.83;	71.89

Required storage volume $S_{\text{req}} = 77.87 \text{ m}^3$

Soakaway storage volume $S_{\text{act}} = l \times d \times w \times V_{\text{free}} = 77.87 \text{ m}^3$

PASS - Soakaway storage volume

Time for emptying soakaway to half volume $t_{s50} = S_{\text{req}} \times 0.5 / (a_{s50} \times f) = 18\text{hr } 45\text{min } 4\text{s}$

PASS - Soakaway discharge time less than or equal to 24 hours