

 Sutcliffe Consultants Ltd 11 Crossbush Road Bognor Regis PO22 7LS	Project Grove House, Drygrounds Lane, Barnham				Job no. 1814	
	Calcs for Soakaway Design				Start page no./Revision 1	
	Calcs by AHS	Calcs date 23/05/2018	Checked by	Checked date	Approved by	Approved date

SOAKAWAY DESIGN

In accordance with BRE Digest 365 - Soakaway design

Tedds calculation version 2.0.00

Design rainfall intensity

Location of catchment area	Brighton	Imp area drained to soakaway	$A = 25.0 \text{ m}^2$
Return period	Period = 100 yr	Ratio r	$r = 0.400$
5-yr rtn period rainfall 60 min	M5_60min = 20.0 mm	Increase for global warming	$p_{\text{climate}} = 30 \%$

Soakaway / infiltration trench details

Soakaway type	Rectangular		
Depth of pit	$d = 400$ mm	Width of pit	$w = 2957$ mm
Length of pit	$l = 1000$ mm	Percentage free volume	$V_{\text{free}} = 95 \%$

Soil infiltration rate (BRE digest 365)

Length of trial pit	$l_{\text{trial}} = 300$ mm	Width of trial pit	$b_{\text{trial}} = 300$ mm
Depth of trial pit (below invert)	$d_{\text{trial}} = 300$ mm	Free volume (if fill used)	$V_{\text{trial}} = 100 \%$
75% depth of pit	$d_{75} = 225.00$ mm	50% depth of pit	$d_{50} = 150.00$ mm
25% depth of pit	$d_{25} = 75.00$ mm	Test 1 - 75% to 25% depth	$T1 = 22$ min
Test 2 - 75% to 25% depth	$T2 = 23$ min	Test 3 - 75% to 25% depth	$T3 = 23$ min
Longest test time	$t_{\text{lg}} = 23$ min	Storage volume 75% to 25%	$V_{p75_25} = 0.01 \text{ m}^3$
Internal surface area to 50%	$a_{p50} = 0.27 \text{ m}^2$	Surface area to 50% depth	$A_{s50} = 0.180 \text{ m}^2$
Soil infiltration rate	$f = 36.2 \times 10^{-6} \text{ m/s}$		
Wetted area of pit 50% full	$a_{s50} = 1582763 \text{ mm}^2$		

Table equations

Inflow	$I = M100 \times A$	Outflow	$O = a_{s50} \times f \times D$
Storage	$S = I - O$		

Duration, D (min)	Growth factor Z1	M5 rainfalls (mm)	Growth factor Z2	100 year rainfall, M100 (mm)	Inflow (m³)	Outflow (m³)	Storage required (m³)
5	0.37	9.7	1.90	18.5	0.46	0.02	0.44
10	0.52	13.6	1.97	26.8	0.67	0.03	0.63
15	0.63	16.5	2.00	33.0	0.82	0.05	0.77
30	0.80	20.9	2.03	42.3	1.06	0.10	0.95
60	1.00	26.0	2.00	52.1	1.30	0.21	1.09
120	1.21	31.4	1.96	61.5	1.54	0.41	1.12
240	1.45	37.6	1.91	71.8	1.80	0.83	0.97
360	1.60	41.7	1.88	78.2	1.96	1.24	0.72
600	1.79	46.6	1.84	85.7	2.14	2.06	0.08
1440	2.24	58.2	1.75	102.2	2.55	4.95	0.00

Required storage volume $S_{\text{req}} = 1.12 \text{ m}^3$ Soakaway storage volume $S_{\text{act}} = 1.12 \text{ m}^3$

PASS - Soakaway storage volume

Time to empty half soakaway $t_{s50} = 2\text{hr } 43\text{min } 17\text{s}$

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