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	Section SOAKAWAY				Sheet no./rev. 1	
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SOAKAWAY DESIGN (BRE DIGEST 365/SUDS)

SOAKAWAY DESIGN

In accordance with BRE Digest 365 - Soakaway design

Tedds calculation version 2.0.03

Design rainfall intensity

Location of catchment area; Brighton; Imp area drained to soakaway; $A = 50.0 \text{ m}^2$
 Return period; Period = 100 yr; Ratio r ; $r = 0.350$
 5-yr rtn period rainfall 60 min; $M5_{60\text{min}} = 20.0 \text{ mm}$; Increase for global warming; $P_{\text{climate}} = 0 \%$

Soakaway details

Soakaway type; Concentric ring; Pit depth (below incom invert); $d = 1000 \text{ mm}$
 Pit width (square excavation); $w = 2600 \text{ mm}$; Internal dia of concrete ring; $D_{\text{ring}} = 1200 \text{ mm}$
 Thickness of conc ring walls; $T_{\text{ring}} = 90 \text{ mm}$; Percentage free volume; $V_{\text{free}} = 30 \%$

Soil infiltration rate (BRE digest 365)

Length of trial pit; $l_{\text{trial}} = 1000 \text{ mm}$; Width of trial pit; $b_{\text{trial}} = 400 \text{ mm}$
 Depth of trial pit (below invert); $d_{\text{trial}} = 900 \text{ mm}$; Free volume (if fill used); $V_{\text{trial}} = 100 \%$
 75% depth of pit; $d_{75} = 675.00 \text{ mm}$; 50% depth of pit; $d_{50} = 450.00 \text{ mm}$
 25% depth of pit; $d_{25} = 225.00 \text{ mm}$; Test 1 - 75% to 25% depth; $T1 = 140 \text{ min}$
 Test 2 - 75% to 25% depth; $T2 = 140 \text{ min}$; Test 3 - 75% to 25% depth; $T3 = 140 \text{ min}$
 Longest test time; $t_g = 140 \text{ min}$; Storage volume 75% to 25%; $V_{g75,25} = 0.18 \text{ m}^3$
 Internal surface area to 50%; $a_{p50} = 1.66 \text{ m}^2$; Surface area to 50% depth; $A_{s50} = 1.260 \text{ m}^2$
 Soil infiltration rate; $f = 12.9 \times 10^{-6} \text{ m/s}$
 Wetted area of pit 50% full; $a_{s50} = 5200000 \text{ mm}^2$

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 (m ³)	Outflow (m ³)	Storage required (m ³)
5;	0.36;	7.1;	1.84;	13.1;	0.66;	0.02;	0.64
10;	0.51;	10.1;	1.91;	19.4;	0.97;	0.04;	0.93
15;	0.62;	12.3;	1.95;	24.0;	1.20;	0.06;	1.14
30;	0.79;	15.7;	2.00;	31.4;	1.57;	0.12;	1.45
60;	1.00;	20.0;	2.03;	40.6;	2.03;	0.24;	1.79
120;	1.22;	24.5;	2.01;	48.2;	2.46;	0.48;	1.98
240;	1.50;	29.9;	1.97;	59.0;	2.95;	0.97;	1.98
360;	1.69;	33.8;	1.94;	65.6;	3.28;	1.45;	1.83
600;	1.95;	38.9;	1.90;	73.9;	3.70;	2.42;	1.28
1440;	2.48;	49.6;	1.81;	89.9;	4.50;	5.80;	0.00

Required storage volume; $S_{\text{req}} = 1.98 \text{ m}^3$; Soakaway storage volume; $S_{\text{act}} = 2.71 \text{ m}^3$

PASS - Soakaway storage volume

Time to empty half soakaway; $t_{s50} = 4 \text{ hr } 5 \text{ min } 49 \text{ s}$

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