

 ADS Structural Ltd 107 Mere Grange Business Park St Helens WA9 5 GG	Project Mount Cottage				Job no.	
	Calcs for AQUA CELL SOAK-A-WAY				Start page no./Revision 1	
	Calcs by SWH	Calcs date	Checked by	Checked date	Approved by	Approved date

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 = 234.0 m²**
 Return period **Period = 100 yr**
 Ratio 60 min to 2 day rainfall of 5 yr return period **r = 0.350**
 5-year return period rainfall of 60 minutes duration **M5_60min = 20.0 mm**
 Increase of rainfall intensity due to global warming **p_{climate} = 45 %**

Soakaway / infiltration trench details

Soakaway type **Rectangular**
 Minimum depth of pit (below incoming invert) **d = 1500 mm**
 Width of pit **w = 7019 mm**
 Length of pit **l = 2400 mm**
 Percentage free volume **V_{free} = 50 %**
 Soil infiltration rate **f = 33.0 × 10⁻⁶ m/s**
 Wetted area of pit 50% full **a_{s50} = l × d + w × d = 14127932 mm²**

Table equations

Inflow (cl.3.3.1) **I = M100 × A**
 Outflow (cl.3.3.2) **O = a_{s50} × f × D**
 Storage (cl.3.3.3) **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;	10.3;	1.92;	19.8;	4.64;	0.14;	4.50
10	0.51;	14.7;	1.99;	29.2;	6.83;	0.28;	6.55
15	0.62;	17.9;	2.01;	36.0;	8.42;	0.42;	8.00
30	0.79;	22.8;	2.02;	46.1;	10.78;	0.84;	9.94
60	1.00;	29.0;	1.98;	57.4;	13.42;	1.68;	11.74
120	1.22;	35.5;	1.93;	68.3;	15.99;	3.36;	12.63
240	1.50;	43.4;	1.86;	80.9;	18.92;	6.71;	12.21
360	1.69;	49.0;	1.82;	89.1;	20.85;	10.07;	10.78
600	1.95;	56.5;	1.77;	99.7;	23.33;	16.78;	6.55
1440	2.48;	71.9;	1.66;	119.5;	27.95;	40.28;	0.00

Required storage volume **S_{req} = 12.63 m³**

Soakaway storage volume **S_{act} = l × d × w × V_{free} = 12.63 m³**

PASS - Soakaway storage volume

Time for emptying soakaway to half volume **t_{s50} = S_{req} × 0.5 / (a_{s50} × f) = 3hr 45min 46s**

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