

 ADS Structural Ltd 107 Mere Grange Business Park St Helens WA9 5 GG	Project Shwabe Street, Middleton				Job no.	
	Calcs for 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 = 145.0 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} = 30 %**

Soakaway / infiltration trench details

Soakaway type **Rectangular**
 Minimum depth of pit (below incoming invert) **d = 1500 mm**
 Width of pit **w = 5683 mm**
 Length of pit **l = 2400 mm**
 Percentage free volume **V_{free} = 30 %**
 Soil infiltration rate **f = 33.0×10⁻⁶ m/s**
 Wetted area of pit 50% full **a_{s50} = l × d + w × d = 12125017 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;	9.3;	1.89;	17.6;	2.54;	0.12;	2.42
10	0.51;	13.2;	1.96;	25.8;	3.75;	0.24;	3.51
15	0.62;	16.0;	2.00;	32.0;	4.65;	0.36;	4.29
30	0.79;	20.5;	2.03;	41.5;	6.02;	0.72;	5.29
60	1.00;	26.0;	2.00;	52.1;	7.55;	1.44;	6.11
120	1.22;	31.8;	1.96;	62.2;	9.02;	2.88;	6.14
240	1.50;	38.9;	1.90;	73.9;	10.71;	5.76;	4.95
360	1.69;	43.9;	1.86;	81.7;	11.84;	8.64;	3.20
600	1.95;	50.6;	1.81;	91.4;	13.25;	14.40;	0.00
1440	2.48;	64.5;	1.71;	110.4;	16.00;	34.57;	0.00

Required storage volume **S_{req} = 6.14 m³**

Soakaway storage volume **S_{act} = l × d × w × V_{free} = 6.14 m³**

PASS - Soakaway storage volume

Time for emptying soakaway to half volume **t_{s50} = S_{req} × 0.5 / (a_{s50} × f) = 2hr 7min 53s**

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