

Project East Grinstead Care Home				Job no. 11089	
Calcs for Access Way Soakaway				Start page no./Revision SA 1	
Calcs by ANR	Calcs date 02/09/2025	Checked by N	Checked date 01/09/2025	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	London
Impermeable area drained to the system	A = <b>90.0</b> m <sup>2</sup>
Return period	Period = <b>10</b> yr
Ratio 60 min to 2 day rainfall of 5 yr return period	r = <b>0.250</b>
5-year return period rainfall of 60 minutes duration	M5_60min = <b>14.0</b> mm
Increase of rainfall intensity due to global warming	p <sub>climate</sub> = <b>10</b> %

#### Soakaway details

Soakaway type	Concentric ring
Depth of pit (below incoming invert)	d = <b>2023</b> mm
Width of pit (square excavation assumed)	w = <b>1000</b> mm
Internal diameter of concrete ring	D <sub>ring</sub> = <b>3000</b> mm
Thickness of concrete ring walls	T <sub>ring</sub> = <b>80</b> mm
Percentage free volume	V <sub>free</sub> = <b>35</b> %
Soil infiltration rate	f = <b>5.05</b> × 10 <sup>-6</sup> m/s
Wetted area of pit 50% full	a <sub>s50</sub> = 2 × w × d = <b>4045196</b> mm <sup>2</sup>

#### Table equations

Inflow (cl.3.3.1)	I = M10 × A
Outflow (cl.3.3.2)	O = a <sub>s50</sub> × f × D
Storage (cl.3.3.3)	S = I - O

Duration, D (min)	Growth factor Z1	M5 rainfalls (mm)	Growth factor Z2	10 year rainfall, M10 (mm)	Inflow (m <sup>3</sup> )	Outflow (m <sup>3</sup> )	Storage required (m <sup>3</sup> )
5	0.32;	4.9;	1.19;	5.8;	0.52;	0.01;	0.52
10	0.47;	7.2;	1.20;	8.6;	0.78;	0.01;	0.77
15	0.57;	8.7;	1.21;	10.6;	0.95;	0.02;	0.93
30	0.75;	11.6;	1.23;	14.2;	1.28;	0.04;	1.24
60	1.00;	15.4;	1.24;	19.1;	1.72;	0.07;	1.65
120	1.29;	19.9;	1.24;	24.6;	2.22;	0.15;	2.07
240	1.69;	26.0;	1.24;	32.1;	2.89;	0.29;	2.60
360	1.96;	30.2;	1.22;	36.8;	3.31;	0.44;	2.87
600	2.35;	36.1;	1.20;	43.4;	3.91;	0.74;	3.17
1440	3.27;	50.3;	1.17;	58.8;	5.30;	1.77;	3.53

Required storage volume S<sub>req</sub> = **3.53** m<sup>3</sup>

Soakaway storage volume S<sub>act</sub> = π × (D<sub>ring</sub><sup>2</sup> / 4) × d + (d × w<sup>2</sup> - (π × ((D<sub>ring</sub> + 2 × T<sub>ring</sub>)<sup>2</sup> / 4) × d)) × V<sub>free</sub> = **9.45** m<sup>3</sup>

**PASS - Soakaway storage volume**

Time for emptying soakaway to half volume t<sub>s50</sub> = S<sub>req</sub> × 0.5 / (a<sub>s50</sub> × f) = 24hr

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