vkhp-consulting civil and structural	Project	Baker's Lane, Chartham, CT4 7QB	Job no.	301817
	Calcs for	Soakaway - Plot 17	Start page no./Revision	1
	Calcs by MW	Calcs date 22/05/2018	Checked by PB	Checked date	Approved by	Approved date

SOAKAWAY DESIGN

In accordance with BRE Digest 365 - Soakaway design

Tedds calculation version 2.0.03

Design rainfall intensity

Location of catchment area	Other
Impermeable area drained to the system	A = **141.0** m^2
Return period	Period = **100** yr
Ratio 60 min to 2 day rainfall of 5 yr return period	r = **0.450**
5-year return period rainfall of 60 minutes duration	$M5\_60min$ = **20.0** mm
Increase of rainfall intensity due to global warming	$p_{climate}$ = **40** %

Soakaway / infiltration trench details

Soakaway type	Rectangular
Minimum depth of pit (below incoming invert)	d = **800** mm
Width of pit	w = **2664** mm
Length of pit	l = **2000** mm
Percentage free volume	V_{free} = **95** %
Soil infiltration rate	f = **370.**$\times$10^{-6} m/s
Wetted area of pit 50% full	a_{s50} = $l \times d + w \times d$ = **3730908** mm^2

Table equations

Inflow (cl.3.3.1)	$I = M100 \times A$
Outflow (cl.3.3.2)	$O = a_{s50} \times f \times D$
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	0.39;	10.9;	1.92;	21.0;	2.96;	0.41;	2.55
10	0.54;	15.1;	1.99;	30.1;	4.24;	0.83;	3.42
15	0.65;	18.2;	2.02;	36.7;	5.17;	1.24;	3.93
30	0.82;	23.0;	2.02;	46.3;	6.53;	2.48;	4.05
60	1.00;	28.0;	1.99;	55.6;	7.84;	4.97;	2.87
120	1.19;	33.3;	1.94;	64.8;	9.13;	9.94;	0.00
240	1.38;	38.6;	1.90;	73.5;	10.36;	19.88;	0.00
360	1.51;	42.3;	1.87;	79.1;	11.16;	29.82;	0.00
600	1.68;	47.0;	1.83;	86.3;	12.16;	49.70;	0.00
1440	2.03;	56.8;	1.76;	100.2;	14.13;	119.27;	0.00

Required storage volume	S_{req} = **4.05** m^3
Soakaway storage volume	S_{act} = $l \times d \times w \times V_{free}$ = **4.05** m^3

PASS - Soakaway storage volume

Time for emptying soakaway to half volume	t_{s50} = $S_{req} \times 0.5 / (a_{s50} \times f)$ = 24min 27s

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