

 ATRIO ARCHITECTURE LTD Windsor House St Andrews Road Henley-on-Thames	Project Bowsey Cottage, Canhurst Ln, Knowl Hill, RG10 9XT				Job Ref. 00423	
	Section				Sheet no./rev. 1	
	Calc. by AA	Date 13/04/2026	Chk'd by AA	Date	App'd by	Date

Introduction

ATRIO ARCHITECTURE LTD was instructed to prepare a Soakaway Design (in accordance with BRE Digest 365) by Mr F. Doka for the proposed development at Bowsey Cottage, Canhurst Ln, Knowl Hill. An infiltration test was carried out in accordance with BRE 365 on 02/10/2025 by client's contractor. Two trial pits with dimensions 1m x 1m x 1m were excavated as shown on the location plan below. The data from the infiltration test were used to determine the Soil Infiltration Rate and ultimately design the Soakaway.

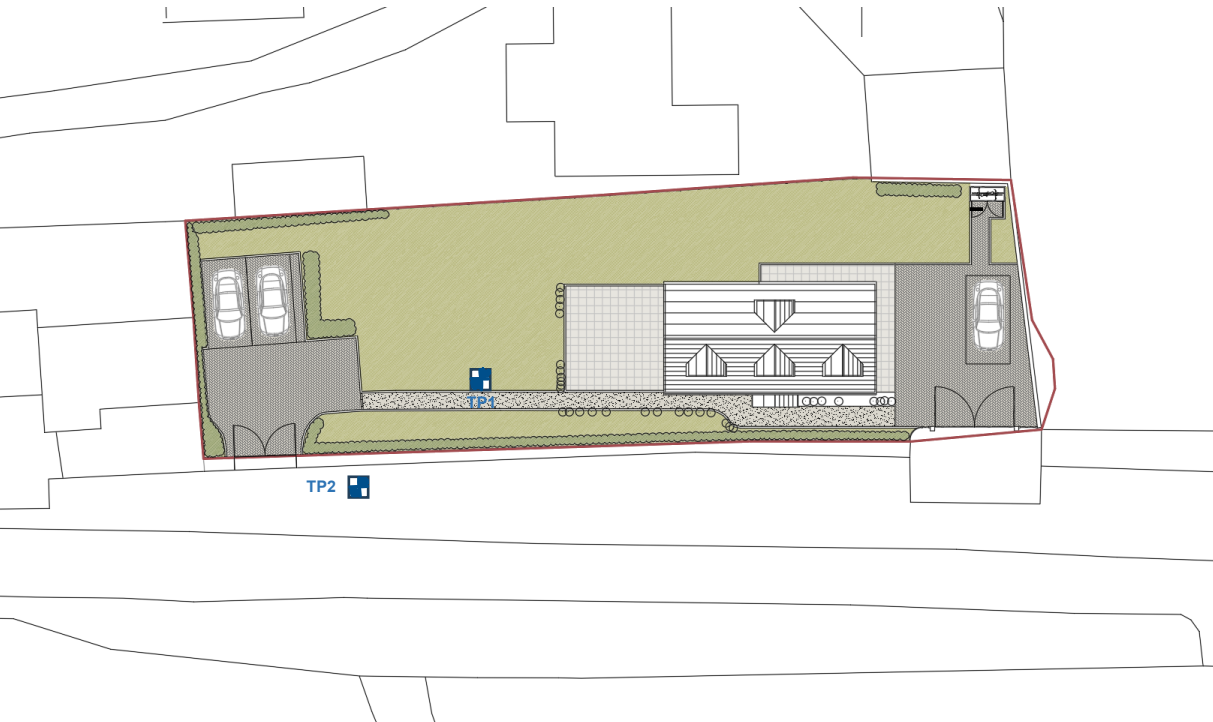


Figure 1 - Trial Pit Location Plan

SK1 - SOAKAWAY DESIGN (BRE DIGEST 365)

SOAKAWAY DESIGN

In accordance with BRE Digest 365 - Soakaway design

Tedds calculation version 2.0.04

Design rainfall intensity

Location of catchment area;	Oxford
Impermeable area drained to the system;	A = 103.0 m²
Return period;	Period = 100 yr
Ratio 60 min to 2 day rainfall of 5 yr return period;	r = 0.420
5-year return period rainfall of 60 minutes duration;	M5_60min = 20.0 mm
Increase of rainfall intensity due to global warming;	pclimate = 40 %

Soakaway / infiltration trench details

Soakaway type;	Rectangular
Minimum depth of pit (below incoming invert);	d = 1000 mm
Width of pit;	w = 3600 mm

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Length of pit; $I = 2400 \text{ mm}$
Percentage free volume; $V_{\text{free}} = 95 \%$

Soil infiltration rate (BRE digest 365)

Length of trial pit; $I_{\text{trial}} = 1000 \text{ mm}$
Width of trial pit; $b_{\text{trial}} = 1000 \text{ mm}$
Depth of trial pit (below invert); $d_{\text{trial}} = 1000 \text{ mm}$
Free volume (if fill used); $V_{\text{trial}} = 100 \%$;
75% depth of pit; $d_{75} = (d_{\text{trial}} \times 0.75) = 750.00 \text{ mm}$
50% depth of pit; $d_{50} = (d_{\text{trial}} \times 0.50) = 500.00 \text{ mm}$
25% depth of pit; $d_{25} = (d_{\text{trial}} \times 0.25) = 250.00 \text{ mm}$
Test 1 - time to fall from 75% depth to 25% depth; $T_1 = 223 \text{ min}$
Test 2 - time to fall from 75% depth to 25% depth; $T_2 = 305 \text{ min}$
Test 3 - time to fall from 75% depth to 25% depth; $T_3 = 312 \text{ min}$
Longest time to fall from 75% depth to 25% depth; $t_g = \max(T_1, T_2, T_3) = 312 \text{ min}$
Storage volume from 75% to 25% depth; $V_{p75_25} = (I_{\text{trial}} \times b_{\text{trial}} \times (d_{75} - d_{25})) \times V_{\text{trial}} = 0.50 \text{ m}^3$
Internal surface area to 50% depth; $a_{p50} = ((I_{\text{trial}} \times b_{\text{trial}}) + (I_{\text{trial}} + b_{\text{trial}}) \times 2 \times d_{50}) = 3.00 \text{ m}^2$
Surface area of soakaway to 50% storage depth; $A_{s50} = 2 \times (I_{\text{trial}} + b_{\text{trial}}) \times d_{\text{trial}} / 2 = 2.000 \text{ m}^2$
Soil infiltration rate; $f = V_{p75_25} / (a_{p50} \times t_g) = 8.90 \times 10^{-6} \text{ m/s}$
Wetted area of pit 50% full; $a_{s50} = I \times d + w \times d = 6000000 \text{ mm}^2$

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 (m³)	Outflow (m³)	Storage required (m³)
5;	0.38;	10.6;	1.92;	20.4;	2.10;	0.02;	2.09
10;	0.53;	14.8;	1.99;	29.5;	3.04;	0.03;	3.01
15;	0.64;	17.9;	2.01;	36.1;	3.72;	0.05;	3.67
30;	0.81;	22.7;	2.02;	45.8;	4.72;	0.10;	4.62
60;	1.00;	28.0;	1.99;	55.6;	5.73;	0.19;	5.54
120;	1.20;	33.6;	1.94;	65.2;	6.72;	0.38;	6.33
240;	1.42;	39.8;	1.89;	75.2;	7.75;	0.77;	6.98
360;	1.57;	44.0;	1.86;	81.7;	8.41;	1.15;	7.26
600;	1.74;	48.7;	1.82;	88.7;	9.13;	1.92;	7.21
1440;	2.16;	60.5;	1.74;	105.2;	10.83;	4.62;	6.22

Required storage volume; $S_{\text{req}} = 7.26 \text{ m}^3$
Soakaway storage volume; $S_{\text{act}} = I \times d \times w \times V_{\text{free}} = 8.21 \text{ m}^3$

PASS - Soakaway storage volume

Time for emptying soakaway to half volume; $t_{s50} = S_{\text{req}} \times 0.5 / (a_{s50} \times f) = 18\text{hr } 52\text{min } 34\text{s}$
PASS - Soakaway discharge time less than or equal to 24 hours

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