

SUMMARY OF CALCULATIONS

critical design rainfall duration 't _{crit} '	=	60	min
required storage volume 'V _{req} '	=	5.02	m ³
provided storage volume 'V _{prov} '	=	9.60	m ³
utilisation factor	=	0.52	.OK
required time to discharge 50% 't ₅₀ '	=	2.86	hours
utilisation factor	=	0.12	.OK

GENERAL DATA

site location: **England and Wales**
soakaway type: **infilled pit or trench**

impermeable area drained to soakaway 'A' [m²] = **150**
60 min rainfall depth of 5 year return period 'R' [mm] = **20**
M5-60 to M5-2d rainfall ratio 'r' = **0.35**
allowance for climate change: **10%**

SOAKAWAY DATA

soakaway width 'W' [m] = **2.50**
soakaway length 'L' [m] = **6.00**

total depth from ground level 'D_b' [m] = **3.00**
depth to drain invert level 'D_d' [m] = **1.40**
soakaway effective depth 'D_{eff}' [m] = **1.60**
free volume in infill aggregate [%] = **40**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base: **No**
available on-site infiltration test results: ☒ Yes ☐ No
use soakage trial pit table below
internal surface area of trial pit 'a_{p50}' [m²] = 2.92
storage volume between 75-25% 'V_p' [m³] = 0.36
time for water to fall from 75-25% 't_p' [min] = 60.00
soil infiltration rate 'f' [m/s] = 3.42E-05

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' [m] = **1.00**
soakage trial pit length 'L_t' [m] = **1.80**
total depth from ground level 'D_{tb}' [m] = **1.60**
depth to pipe invert level 'D_{tp}' [m] = **1.20**
soakage trial pit effective depth 'D_{teff}' [m] = **0.40**
free volume in infill aggregate [%] = **100**

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration [min]	rainfall factor Z1	M5-D rainfalls [mm]	M100-D			ignore			ignore			outflow from soakaway [m ³]	required storage [m ³]
			Z2	rainfalls [mm]	inflow [m ³]	Z2	rainfalls [mm]	inflow [m ³]	Z2	rainfalls [mm]	inflow [m ³]		
5	0.36	7.13	1.84	14.45	2.17							0.14	2.03
10	0.51	10.13	1.91	21.31	3.20							0.28	2.92
15	0.62	12.33	1.95	26.42	3.96							0.42	3.54
30	0.79	15.73	2.00	34.54	5.18							0.84	4.34
60	1.00	20.00	2.03	44.66	6.70							1.68	5.02
120	1.22	24.47	2.01	54.15	8.12							3.35	4.77
240	1.50	29.93	1.97	64.88	9.73							6.71	3.03
360	1.69	33.80	1.94	72.11	10.82							10.06	0.76
600	1.95	38.93	1.90	81.31	12.20							16.77	0.00
1440	2.48	49.60	1.81	98.93	14.84							40.24	0.00

* Z2 is a growth factor from M5 rainfalls

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

water level measurement N°:		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time [min] =	0	15	30	45	60	75	90	105	115										
	depth to water [m] =	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60										
Soakage Trial 2	time [min] =	0	15	30	45	60	75	90	105	115										
	depth to water [m] =	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60										
Soakage Trial 3	time [min] =	0	15	30	45	60	75	90	105	120										
	depth to water [m] =	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60										