

**Woodsyde Developments Ltd**

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**Land Adjacent The Cottage,
Garth**

Revision

Job No: 1

Page: 1.00

Section: **Single Dwelling**Prepared By: **KG**Date: **01/08/2022****SUMMARY OF CALCULATIONS**

critical design rainfall duration 't _{crit} ' =	30	min
required storage volume 'V _{req} ' =	3.35	m ³
provided storage volume 'V _{prov} ' =	3.42	m ³
utilisation factor =	0.98	.OK
required time to discharge 50% 't ₅₀ ' =	0.50	hours
utilisation factor =	0.02	.OK

GENERAL DATA

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

impermeable area drained to soakaway 'A' [m²] = **110**
60 min rainfall depth of 5 year return period 'R' [mm] = **20**
M5-60 to M5-2d rainfall ratio 'r' = **0.50**
allowance for climate change: **40%**

SOAKAWAY DATA

soakaway width 'W' [m] = **1.50**
soakaway length 'L' [m] = **9.50**

total depth from ground level 'D_b' [m] = **1.40**
depth to drain invert level 'D_d' [m] = **0.60**
soakaway effective depth 'D_{eff}' [m] = 0.80
free volume in infill aggregate [%] = **30**

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base: **30%**
available on-site infiltration test results: ☒ Yes ☐ No
use soakage trial pit table below
internal surface area of trial pit 'a_{p50}' [m²] = 2.08
storage volume between 75-25% 'V_p' [m³] = 0.24
time for water to fall from 75-25% 't_p' [min] = 26.27
soil infiltration rate 'f' [m/s] = 7.25E-05

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' [m] = **0.50**
soakage trial pit length 'L_t' [m] = **1.70**
total depth from ground level 'D_{tb}' [m] = **1.88**
depth to pipe invert level 'D_{tp}' [m] = **1.32**
soakage trial pit effective depth 'D_{teff}' [m] = 0.56
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]	M10-D			M50-D			M100-D			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	0.39	7.80	1.21	13.18	1.45	1.61	17.59	1.93	1.86	20.28	2.23	0.28	1.95
10	0.54	10.80	1.22	18.49	2.03	1.66	25.07	2.76	1.92	29.07	3.20	0.57	2.63
15	0.65	13.00	1.23	22.42	2.47	1.68	30.58	3.36	1.96	35.64	3.92	0.85	3.07
30	0.82	16.40	1.24	28.47	3.13	1.71	39.22	4.31	2.00	45.95	5.05	1.71	3.35
60	1.00	20.00	1.24	34.72	3.82	1.73	48.44	5.33	2.03	56.84	6.25	3.41	2.84
120	1.19	23.80	1.24	41.32	4.54	1.72	57.39	6.31	2.01	67.13	7.38	6.83	0.56
240	1.38	27.60	1.23	47.51	5.23	1.71	66.06	7.27	1.99	76.86	8.45	13.66	0.00
360	1.51	30.20	1.22	51.56	5.67	1.70	71.83	7.90	1.97	83.22	9.15	20.48	0.00
600	1.68	33.60	1.21	56.88	6.26	1.68	78.95	8.68	1.94	91.31	10.04	34.14	0.00
1440	2.03	40.60	1.19	67.57	7.43	1.64	93.01	10.23	1.89	107.15	11.79	81.94	0.00

** Z2 is growth factor from M5 rainfalls***SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS**

water level measurement N ^o :		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	3	6	10	13	15	18	23	25	30	32	36	40	43	46	50	53	57	60
	depth to water [m] =	1.37	1.45	1.52	1.59	1.62	1.65	1.68	1.71	1.73	1.75	1.76	1.78	1.79	1.80	1.81	1.82	1.82	1.83	1.85
Soakage Trial 2	time [min] =	0	3	5	24	31	45	54	58	65	72	78	82							
	depth to water [m] =	1.42	1.47	1.51	1.72	1.75	1.80	1.82	1.83	1.84	1.85	1.86	1.87							
Soakage Trial 3	time [min] =	0	3	4	11	16	21	27	34	38	44	62	73	78	82	86	92			
	depth to water [m] =	1.32	1.39	1.43	1.55	1.62	1.67	1.73	1.76	1.78	1.80	1.83	1.85	1.85	1.86	1.87	1.88			