

		Hazel Cottage, Church Lane Yapton West Sussex		Revision	A03
		Job No:		Page:	C/01
		Prepared By:	HN	Date:	28/04/2020
Section:	Soakway Size (BRE Digest 365)				

SUMMARY OF CALCULATIONS			
critical design rainfall duration 't _{crit} '	=	120	min
required storage volume 'V _{req} '	=	1.63	m ³
provided storage volume 'V _{prov} '	=	5.40	m ³
utilisation factor	=	0.30	.OK
required time to discharge 50% 't ₅₀ '	=	11.52	hours
utilisation factor	=	0.48	.OK

GENERAL DATA	
site location:	England and Wales
soakaway type:	geocellular units
impermeable area drained to soakaway 'A' [m ²]	50
60 min rainfall depth of 5 year return period 'R' [mm]	20
M5-60 to M5-2d rainfall ratio 'r'	0.40
allowance for climate change:	40%

SOAKAWAY DATA	
soakaway width 'W' [m]	3.00
soakaway length 'L' [m]	2.50
total depth from ground level 'D _b ' [m]	1.50
depth to drain invert level 'D _d ' [m]	0.70
soakaway effective depth 'D _{eff} ' [m]	0.80
free volume in infill aggregate [%]	90

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} ' [m ²]	3.08
storage volume between 75-25% 'V _p ' [m ³]	0.48
time for water to fall from 75-25% 't _p ' [min]	264.38
soil infiltration rate 'f' [m/s]	9.79E-06

SOAKAGE TRIAL PIT DATA	
soakage trial pit width 'W _t ' [m]	1.10
soakage trial pit length 'L _t ' [m]	1.10
total depth from ground level 'D _{tb} ' [m]	1.10
depth to pipe invert level 'D _{ip} ' [m]	0.25
soakage trial pit effective depth 'D _{teff} ' [m]	0.85
free volume in infill aggregate [%]	93
NOTE: faces of excavation assumed to be vertical	

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION													
rainfall duration [min]	rainfall factor Z1	M5-D rainfalls [mm]	M5-D			M5-D			M10-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	0.37	7.47	1.02	10.71	0.54	1.02	10.71	0.54	1.20	12.59	0.63	0.02	0.61
10	0.52	10.47	1.03	15.09	0.75	1.03	15.09	0.75	1.22	17.90	0.90	0.04	0.86
15	0.63	12.67	1.03	18.27	0.91	1.03	18.27	0.91	1.23	21.82	1.09	0.06	1.03
30	0.80	16.07	1.03	23.17	1.16	1.03	23.17	1.16	1.24	27.89	1.39	0.12	1.28
60	1.00	20.00	1.03	28.84	1.44	1.03	28.84	1.44	1.24	34.72	1.74	0.23	1.50
120	1.21	24.13	1.03	34.80	1.74	1.03	34.80	1.74	1.24	41.90	2.09	0.47	1.63
240	1.45	28.93	1.03	41.72	2.09	1.03	41.72	2.09	1.22	49.59	2.48	0.94	1.54
360	1.60	32.07	1.03	46.15	2.31	1.03	46.15	2.31	1.21	54.49	2.72	1.41	1.32
600	1.79	35.87	1.02	51.43	2.57	1.02	51.43	2.57	1.20	60.38	3.02	2.34	0.68
1440	2.24	44.80	1.02	63.97	3.20	1.02	63.97	3.20	1.18	74.03	3.70	5.62	0.00

* Z2 is 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	30	50	75	90	120	135	150	165	180	195	210	225	240	255	270	285	300	315
	depth to water [m] =	0.40	0.50	0.55	0.60	0.64	0.68	0.71	0.73	0.75	0.76	0.78	0.80	0.82	0.84	0.85	0.87	0.89	0.90	0.91
Soakage Trial 2	time [min] =																			
	depth to water [m] =																			
Soakage Trial 3	time [min] =																			
	depth to water [m] =																			

