G.R Merchant Ltd	Plot 3 Soakaway 1 (2 No)			
			Revision	
	Job No:		Page:	C/01
Section: Belmont - Sutton St James	Prepared By:	SLB	Date:	28/01/2026

ALTERNATIVE SOAKAWAY SIZES			
	trench soakaways		
width of trench *[mm]*:	450	600	900
required trench length *[m]*:	8.47	6.74	4.77
	ring soakaways		
diameter of ring *[mm]*:	1050	1350	1500
required pit diameter *[m]*:	1.77	1.75	1.74

** Based on effective depth and number of pits as in Soakaway Data table*

SUMMARY OF CALCULATIONS		
critical design rainfall duration 't_{crit}' =	120	*min*
required storage volume 'V_{req}' =	4.70	m^3
provided storage volume 'V_{prov}' =	7.16	m^3
utilisation factor =	**0.66**	***.OK***
required time to discharge 50% 't_{50}' =	6.18	*hours*
utilisation factor =	**0.26**	***.OK***

GENERAL DATA	
site location:	**England and Wales**
soakaway type:	**geocellular units**
impermeable area drained to soakaway 'A' *[m^2]* =	**94**
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:	**30%**

SOAKAWAY DATA	
soakaway width 'W' [m] =	**1.80**
soakaway length 'L' [m] =	**3.60**
total depth from ground level 'D_b' *[m]* =	**1.80**
depth to drain invert level 'D_d' *[m]* =	**0.50**
soakaway effective depth 'D_{eff}' *[m]* =	1.30
free volume in infill aggregate *[%]* =	**85**

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] =	1.80
storage volume between 75-25% 'V_p' [m^3] =	0.22
time for water to fall from 75-25% 't_p' [min] =	111.39
soil infiltration rate 'f' [m/s] =	1.80E-05

SOAKAGE TRIAL PIT DATA	
soakage trial pit width 'W_t' *[m]* =	**0.60**
soakage trial pit length 'L_t' *[m]* =	**1.20**
total depth from ground level 'D_{tb}' *[m]* =	**1.00**
depth to pipe invert level 'D_{tp}' *[m]* =	**0.40**
soakage trial pit effective depth 'D_{teff}' *[m]* =	0.60
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 Z2	M10-D rainfalls *[mm]*	M10-D inflow *[m^3]*	M50-D Z2	M50-D rainfalls *[mm]*	M50-D inflow *[m^3]*	M100-D Z2	M100-D rainfalls *[mm]*	M100-D inflow *[m^3]*	outflow from soakaway *[m^3]*	required storage *[m^3]*
5	0.39	7.80	1.21	12.24	1.15	1.61	16.33	1.53	1.86	18.83	1.77	0.05	1.72
10	0.54	10.80	1.22	17.17	1.61	1.66	23.28	2.19	1.92	27.00	2.54	0.10	2.44
15	0.65	13.00	1.23	20.82	1.96	1.68	28.39	2.67	1.96	33.09	3.11	0.14	2.97
30	0.82	16.40	1.24	26.44	2.49	1.71	36.42	3.42	2.00	42.67	4.01	0.29	3.72
60	1.00	20.00	1.24	32.24	3.03	1.73	44.98	4.23	2.03	52.78	4.96	0.58	4.38
120	1.19	23.80	1.24	38.37	3.61	1.72	53.29	5.01	2.01	62.34	5.86	1.16	**4.70**
240	1.38	27.60	1.23	44.12	4.15	1.71	61.34	5.77	1.99	71.37	6.71	2.32	4.39
360	1.51	30.20	1.22	47.87	4.50	1.70	66.69	6.27	1.97	77.28	7.26	3.48	3.79
600	1.68	33.60	1.21	52.82	4.96	1.68	73.31	6.89	1.94	84.79	7.97	5.79	2.18
1440	2.03	40.60	1.19	62.74	5.90	1.64	86.37	8.12	1.89	99.50	9.35	13.91	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	15	30	45	60	90	120	150	180	210									
	depth to water *[m]* =	0.00	0.40	0.57	0.71	0.79	0.85	0.89	0.93	0.97	1.00									
Soakage Trial 2	time *[min]* =	0	15	30	45	60	90	120	150	180	210									
	depth to water *[m]* =	0.00	0.38	0.56	0.69	0.78	0.83	0.87	0.91	0.95	0.98									
Soakage Trial 3	time *[min]* =	0	15	30	45	60	90	120	150	180	210									
	depth to water *[m]* =	0.00	0.35	0.54	0.68	0.73	0.79	0.82	0.86	0.90	0.94									