Below Ground Solutions Ltd
Unit C The Orchards, Taunton, Somerset TA2 8QN
www.belowgroundsolutions.co.uk
Tel: 08708630123

The Haven, Mamesbury
SN16 9NT

		Revision	
Job No:	**22668**	Page:	**C/01**
Section:	**Single drive per property Trial Pitt 2**	Prepared By:	**LW**	Date:	**06/04/2024**

ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]* :	**450**	**600**	**900**
required trench length *[m]* :	2.74	2.17	1.52
	ring soakaways		
diameter of ring *[mm]* :	1050	1350	1500
required pit diameter *[m]* :	1.22	1.20	1.19

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

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	60	*min*
required storage volume 'V_{req}' =	0.70	m^3
provided storage volume 'V_{prov}' =	0.73	m^3
utilisation factor =	**0.95**	***.OK***
required time to discharge 50% 't_{50}' =	1.13	*hours*
utilisation factor =	**0.05**	***.OK***

GENERAL DATA

site location: **England and Wales**
soakaway type: **geocellular units**

impermeable area drained to soakaway 'A' *[m^2]* = **18**
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] = **1.20**
soakaway length 'L' [m] = **1.20**

total depth from ground level 'D_b' *[m]* = **0.80**
depth to drain invert level 'D_d' *[m]* = **0.20**
soakaway effective depth 'D_{eff}' *[m]* = 0.60
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] = 0.48
storage volume between 75-25% 'V_p' [m^3] = 0.03
time for water to fall from 75-25% 't_p' [min] = 23.00
soil infiltration rate 'f' [m/s] = 4.83E-05

SOAKAGE TRIAL PIT DATA

soakage trial pit width 'W_t' *[m]* = **0.40**
soakage trial pit length 'L_t' *[m]* = **0.40**
total depth from ground level 'D_{tb}' *[m]* = **0.60**
depth to pipe invert level 'D_{tp}' *[m]* = **0.20**
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]*	**M1-D** Z2	**M1-D** rainfalls *[mm]*	**M1-D** inflow *[m^3]*	**M10-D** Z2	**M10-D** rainfalls *[mm]*	**M10-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	0.61	6.71	0.12	1.21	13.18	0.24	1.86	20.28	0.37	0.03	0.34
10	0.54	10.80	0.61	9.25	0.17	1.22	18.49	0.33	1.92	29.07	0.52	0.05	0.47
15	0.65	13.00	0.62	11.21	0.20	1.23	22.42	0.40	1.96	35.64	0.64	0.08	0.56
30	0.82	16.40	0.63	14.36	0.26	1.24	28.47	0.51	2.00	45.95	0.83	0.16	0.66
60	1.00	20.00	0.64	17.92	0.32	1.24	34.72	0.62	2.03	56.84	1.02	0.33	**0.70**
120	1.19	23.80	0.66	21.83	0.39	1.24	41.32	0.74	2.01	67.13	1.21	0.65	0.56
240	1.38	27.60	0.67	25.90	0.47	1.23	47.51	0.86	1.99	76.86	1.38	1.30	0.08
360	1.51	30.20	0.68	28.77	0.52	1.22	51.56	0.93	1.97	83.22	1.50	1.95	0.00
600	1.68	33.60	0.69	32.33	0.58	1.21	56.88	1.02	1.94	91.31	1.64	3.26	0.00
1440	2.03	40.60	0.70	39.86	0.72	1.19	67.57	1.22	1.89	107.15	1.93	7.81	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**	**2**	**4**	**6**	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**32**	**34**	
	depth to water *[m]* =	**0.00**	**0.05**	**0.07**	**0.10**	**0.15**	**0.17**	**0.20**	**0.25**	**0.30**	**0.35**	**0.40**	**0.45**	**0.47**	**0.50**	**0.52**	**0.55**	**0.57**	**0.60**	
Soakage Trial 2	time *[min]* =	**0**	**5**	**7**	**10**	**15**	**20**	**25**	**27**	**30**	**35**	**40**	**45**	**47**	**50**	**55**	**53**	**57**	**60**	
	depth to water *[m]* =	**0.00**	**0.05**	**0.10**	**0.15**	**0.20**	**0.25**	**0.27**	**0.30**	**0.32**	**0.35**	**0.40**	**0.42**	**0.45**	**0.50**	**0.52**	**0.55**	**0.57**	**0.60**	
Soakage Trial 3	time *[min]* =	**0**	**5**	**15**	**25**	**30**	**35**	**40**	**45**	**55**	**60**	**65**	**68**	**70**	**75**	**80**	**85**	**90**	**95**	
	depth to water *[m]* =	**0.00**	**0.05**	**0.07**	**0.10**	**0.15**	**0.17**	**0.20**	**0.25**	**0.30**	**0.35**	**0.40**	**0.45**	**0.47**	**0.50**	**0.52**	**0.55**	**0.57**	**0.60**	