



Survey Site Solutions Ltd

Office: 01422 361900
Email: info@surveysitesolutionsltd.co.uk
Web: www.surveysitesolutionsltd.co.uk
Ground Floor, Calder House, The Wharf,
Sowerby Bridge, HX62AG



Oak Street, Littleborough

Section:	Proposed Soakaway	Job No:	1279	Page:	C/01
		Prepared By:	MH	Date:	17/09/2020

ALTERNATIVE SOAKAWAY SIZES			
	trench soakaways		
width of trench [mm]:	450	600	900
required trench length [m]:	12.28	9.85	7.04
	ring soakaways		
diameter of ring [mm]:	1050	1350	1500
required pit diameter [m]:	1.86	1.86	1.86

* 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} ' =	10.23	m ³
provided storage volume 'V _{prov} ' =	11.40	m ³
utilisation factor =	0.90	.OK
required time to discharge 50% 't ₅₀ ' =	6.16	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] =	180
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] =	2.50
soakaway length 'L' [m] =	3.00
total depth from ground level 'D _b ' [m] =	2.20
depth to drain invert level 'D _d ' [m] =	0.60
soakaway effective depth 'D _{eff} ' [m] =	1.60
free volume in infill aggregate [%] =	95

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] =	0.60
storage volume between 75-25% 'V _p ' [m ³] =	0.04
time for water to fall from 75-25% 't _p ' [min] =	43.00
soil infiltration rate 'f' [m/s] =	2.33E-05

SOAKAGE TRIAL PIT DATA	
soakage trial pit width 'W _t ' [m] =	0.60
soakage trial pit length 'L _t ' [m] =	0.60
total depth from ground level 'D _{tb} ' [m] =	1.20
depth to pipe invert level 'D _{tp} ' [m] =	1.00
soakage trial pit effective depth 'D _{teff} ' [m] =	0.20
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	0.39	7.80	1.86	20.28	3.65							0.08	3.57
10	0.54	10.80	1.92	29.07	5.23							0.15	5.08
15	0.65	13.00	1.96	35.64	6.41							0.23	6.18
30	0.82	16.40	2.00	45.95	8.27							0.46	7.81
60	1.00	20.00	2.03	56.84	10.23							0.93	9.31
120	1.19	23.80	2.01	67.13	12.08							1.85	10.23
240	1.38	27.60	1.99	76.86	13.84							3.70	10.13
360	1.51	30.20	1.97	83.22	14.98							5.55	9.43
600	1.68	33.60	1.94	91.31	16.44							9.25	7.19
1440	2.03	40.60	1.89	107.15	19.29							22.20	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
Soakage Trial 1	time [min] =	0	2	3	4	7	10	14	22	25	30	35	42	47	50	52		
	depth to water [m] =	1.00	1.02	1.03	1.05	1.06	1.07	1.09	1.10	1.11	1.12	1.13	1.14	1.15	1.18	1.20		
Soakage Trial 2	time [min] =	0	1	3	5	9	12	18	23	27	34	39	45	48	52	55		
	depth to water [m] =	1.00	1.02	1.03	1.06	1.07	1.08	1.09	1.10	1.11	1.12	1.13	1.14	1.16	1.18	1.20		
Soakage Trial 3	time [min] =	0	2	4	6	8	9	17	22	34	28	37	44	48	49	50		
	depth to water [m] =	1.00	1.02	1.03	1.04	1.06	1.08	1.09	1.10	1.11	1.12	1.13	1.15	1.17	1.19	1.20		