

"Briarfield", Ancton Lane, Middleton-on-Sea, PO22 6NL -- Planning Reference M/141/21/HH

The Design Parameters for the Proposed Geocellular Structure Soakaway Installation S/A#1, located in the rear garden, are as follows :-

The Soil Infiltration Rate for the Sides is 1.211 E-05 metres / second and the Soil Infiltration Rate for the Base is 1.211 E-05 metres / second.

The Installation consists of a GeoCellular Structure of 6.00 metres Long by 2.50 metres Wide and 0.40 metres in Depth.

With a Cover Depth of 0.50 metres.

Percentage Void Space of 95%.

Impermeable Area specified as 99 square metres.

Using a Safety Factor of 1.5 for the Volumetric Runoff Coefficient $C_v=1.0$

The Design adopts a Factored Soil Infiltration Rate for the Sides of 6.055 E-06 metres / second.

And a Factored Soil Infiltration Rate for the Base of 6.055 E-06 metres / second.

Both the Side Area and the Base Area are Included in the Calculations.

The Rainfall Ratio for the Location is $r=0.36$

Rainfall Base Rate M5-60min the 5 Year Return Period Rainfall of 60 minutes Duration is 19.0mm.

Lowest Incoming Pipe Invert Height is 236mm above the Installation Base.

All Levels are referenced to 'Above Ordinance Datum' (AOD)

The Highest Recorded Groundwater at the Location of the Proposed Soakaway is 3.822 metres at a depth of 1.148 metres Below Ground Level (BGL)

The Ground Level at the Location of the Proposed Soakaway is 4.970 metres.

The Soffit Level of the Proposed Soakaway is 4.470 metres.

The Invert Level of the Lowest Incoming Pipe on the Proposed Soakaway is 4.306 metres

The Base Level of the Proposed Soakaway is 4.070 metres

The Base of the Soakaway Structure is 0.248 metres above the Highest Recorded Groundwater at the location of the Soakaway. This meets Building Regulations.

The Design Summary for the Proposed Geocellular Structure Soakaway Installation S/A #1 is as follows :-

For a 10 Year Return Storm Includes a 40% Increase for Climate Change.

The Design requires storage of 2.98 cubic metres out of 3.36 cubic metres available.

Therefore Storage is Passed with a Critical Storm occurring at 2 hours.

And the Half Drain Time is OK within the Allowable 24 hours Period at 3.06 hours.

For a 100 Year Return Storm Includes a 40% Increase for Climate Change.

The Design requires storage of 5.62 cubic metres out of 5.70 cubic metres available.

Therefore Storage is Passed with a Critical Storm occurring at 4 hours.

And the Half Drain Time is OK within the Allowable 24 hours Period at 5.27 hours.

10 Year Return Storm Includes a 40% Increase for Climate Change.

Storm Duration	Factor Z1-5	M5 Return Rainfall	Factor Z2-10	M10 Return Rainfall	Inflow Cu Metres	Outflow Cu Metres	Internal Water Level	Required Storage	Soakaway Status
5 minutes	0.360	6.80	1.190	11.40	1.128	0.041	76	1.087	-OK-
10 minutes	0.510	9.70	1.220	16.60	1.639	0.082	109	1.556	-OK-
15 minutes	0.620	11.80	1.220	20.10	1.992	0.124	131	1.868	-OK-
30 minutes	0.790	15.00	1.240	26.10	2.580	0.247	164	2.333	-OK-
1 hour	1.000	19.00	1.250	33.20	3.292	0.494	196	2.797	-OK-
2 hours	1.216	23.10	1.240	40.10	3.971	0.989	209	2.982	-OK-
3 hours	1.364	25.90	1.240	45.00	4.454	1.483	209	2.971	-OK-
4 hours	1.495	28.40	1.220	48.50	4.803	1.977	198	2.826	-OK-
5 hours	1.593	30.30	1.220	51.70	5.118	2.471	186	2.647	-OK-
6 hours	1.670	31.70	1.220	54.20	5.365	2.966	168	2.400	-OK-
7 hours	1.745	33.20	1.203	55.80	5.528	3.460	145	2.068	-OK-
8 hours	1.805	34.30	1.203	57.80	5.718	3.954	124	1.764	-OK-
9 hours	1.863	35.40	1.203	59.60	5.902	4.448	102	1.454	-OK-
10 hours	1.915	36.40	1.203	61.30	6.067	4.943	79	1.124	-OK-
11 hours	1.960	37.20	1.203	62.70	6.209	5.437	54	0.772	-OK-
12 hours	2.005	38.10	1.190	63.50	6.283	5.931	25	0.352	-OK-
14 hours	2.085	39.60	1.190	66.00	6.534	6.920	empty	none	-OK-
16 hours	2.155	40.90	1.190	68.20	6.753	7.908	empty	none	-OK-
18 hours	2.225	42.30	1.190	70.40	6.973	8.897	empty	none	-OK-
20 hours	2.295	43.60	1.180	72.00	7.132	9.885	empty	none	-OK-
22 hours	2.360	44.80	1.180	74.10	7.333	10.874	empty	none	-OK-
24 hours	2.430	46.20	1.180	76.30	7.551	11.862	empty	none	-OK-

Effective Volume of the Geocellular Structure Soakaway Installation for an M10 Return Period is 3.36 cubic metres.

Maximum Available (Effective) Outflow Surface Area at M10 Return is 17.01 square metres referenced to the Invert of the lowest incoming pipe.

Maximum Allowable Pre-Flood Water Level for 10 Year Return (Lowest Pipe Invert Level for Building Control) is 236mm.

For a 10 Year Return Period the Critical Storm occurs at 2 hours.

With a Maximum Internal Structure Critical Water Level of 209mm.

Requiring a Maximum (Critical) Storage Capacity of 2.98 cubic metres.

The Outflow Surface Area for the Critical Storm Duration for the M10 Return is 16.78 square metres referenced to the Critical Water Level.

Half Drain Time for a 10 Year Return Critical Storm is 3.06 hours.

100 Year Return Storm Includes a 40% Increase for Climate Change.

Storm	Factor	M5 Return	Factor	M100 Return	Inflow	Outflow	Internal	Required	Soakaway
Duration	Z1-5	Rainfall	Z2-100	Rainfall	Cu Metres	Cu Metres	Water Level	Storage	Status
5 minutes	0.360	6.80	1.790	17.10	1.697	0.045	116	1.652	-OK-
10 minutes	0.510	9.70	1.910	25.90	2.565	0.089	174	2.476	-OK-
15 minutes	0.620	11.80	1.910	31.50	3.118	0.134	209	2.985	-OK-
30 minutes	0.790	15.00	1.990	41.80	4.140	0.267	272	3.873	-OK-
1 hour	1.000	19.00	2.030	54.00	5.346	0.535	338	4.811	-OK-
2 hours	1.216	23.10	2.010	65.00	6.436	1.070	377	5.367	-OK-
3 hours	1.364	25.90	2.010	72.90	7.220	1.604	394	5.616	-OK-
4 hours	1.495	28.40	1.970	78.30	7.756	2.139	394	5.617	-OK-
5 hours	1.593	30.30	1.970	83.50	8.264	2.674	392	5.590	-OK-
6 hours	1.670	31.70	1.970	87.50	8.664	3.209	383	5.455	-OK-
7 hours	1.745	33.20	1.930	89.60	8.869	3.743	360	5.125	-OK-
8 hours	1.805	34.30	1.930	92.70	9.174	4.278	344	4.896	-OK-
9 hours	1.863	35.40	1.930	95.60	9.469	4.813	327	4.656	-OK-
10 hours	1.915	36.40	1.930	98.30	9.733	5.348	308	4.385	-OK-
11 hours	1.960	37.20	1.930	100.60	9.962	5.883	286	4.079	-OK-
12 hours	2.005	38.10	1.890	100.80	9.979	6.417	250	3.562	-OK-
14 hours	2.085	39.60	1.890	104.80	10.377	7.487	203	2.890	-OK-
16 hours	2.155	40.90	1.890	108.30	10.726	8.556	152	2.169	-OK-
18 hours	2.225	42.30	1.890	111.90	11.074	9.626	102	1.448	-OK-
20 hours	2.295	43.60	1.855	113.20	11.211	10.696	36	0.515	-OK-
22 hours	2.360	44.80	1.855	116.40	11.528	11.765	empty	none	-OK-
24 hours	2.430	46.20	1.855	119.90	11.870	12.835	empty	none	-OK-

Effective Volume of the Geocellular Structure Soakaway Installation for an M100 Return Period is 5.70 cubic metres.

Maximum Available (Effective) Outflow Surface Area at M100 Return is 18.40 square metres referenced to the top of the GeoCell Installation.

Maximum Allowable Pre-Flood Water Level for 100 Year Return (Soakaway Height) is 400mm.

For a 100 Year Return Period the Critical Storm occurs at 4 hours.

With a Maximum Internal Structure Critical Water Level of 394mm.

Requiring a Maximum (Critical) Storage Capacity of 5.62 cubic metres.

The Outflow Surface Area for the Critical Storm Duration for the M100 Return is 1835 square metres referenced to the Critical Water Level.

Half Drain Time for a 100 Year Return Critical Storm is 5.27 hours.

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