

#16 Arundel Way, Elmer Sands, Middleton-on-Sea, PO22 6JH Planning Reference M/55/20/HH

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

Soil Infiltration Rate for the Sides is 3.155E-6 metres / second, and the Soil Infiltration Rate for the Base is 3.155E-6 metres / second.

The Installation consists of a GeoCellular Structure of 7.50 metres Long by 3.50 metres Wide and 0.333 metres in Depth.

With a Cover Depth of 0.40 metres.

Percentage Void Space of 95%.

Impermeable Area specified as 97 square metres.

Using a Safety Factor of 2.0

The Design adopts a Factored Soil Infiltration Rate for the Sides of 1.578E-6 metres / second.

And a Factored Soil Infiltration Rate for the Base of 1.578E-6 metres / second.

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 233mm above the Installation Base.

The Base Area of the Installation is Included in the calculation.

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

The Highest Recorded Groundwater at the Location of the Proposed Soakaway is 3.559 metres at a depth of 0.773 metres Below Ground Level (BGL)

The Ground Level at the Location of the Proposed Soakaway is 4.332 metres

The Soffit Level of the Proposed Soakaway is 3.932 metres

The Invert Level of the Lowest Incoming Pipe on the Proposed Soakaway is 3.832 metres

The Base Level of the Proposed Soakaway is 3.599 metres

The Base of the Soakaway Structure is 0.040 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 4.31 cubic metres out of 5.81 cubic metres available.

Therefore Storage is Passed with a Critical Storm occurring at 9 hours.

And the Half Drain Time is OK within the Allowable 24 hours Period at 13.48 hours.

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

The Design requires storage of 7.89 cubic metres out of 8.30 cubic metres available.

Therefore Storage is Passed with a Critical Storm occurring at 11 hours.

And the Half Drain Time is OK within the Allowable 24 hours Period at 23.37 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	1.105	0.014	44	1.092	-OK-
10 minutes	0.510	9.70	1.220	16.60	1.605	0.027	63	1.578	-OK-
15 minutes	0.620	11.80	1.220	20.10	1.952	0.041	77	1.911	-OK-
30 minutes	0.790	15.00	1.240	26.10	2.528	0.082	98	2.446	-OK-
1 hour	1.000	19.00	1.250	33.20	3.225	0.164	123	3.062	-OK-
2 hours	1.216	23.10	1.240	40.10	3.891	0.327	143	3.563	-OK-
3 hours	1.364	25.90	1.240	45.00	4.364	0.491	155	3.873	-OK-
4 hours	1.495	28.40	1.220	48.50	4.706	0.655	162	4.052	-OK-
5 hours	1.593	30.30	1.220	51.70	5.015	0.818	168	4.196	-OK-
6 hours	1.670	31.70	1.220	54.20	5.257	0.982	171	4.275	-OK-
7 hours	1.745	33.20	1.203	55.80	5.416	1.145	171	4.271	-OK-
8 hours	1.805	34.30	1.203	57.80	5.603	1.309	172	4.294	-OK-
9 hours	1.863	35.40	1.203	59.60	5.783	1.473	173	4.310	-OK-
10 hours	1.915	36.40	1.203	61.30	5.944	1.636	173	4.308	-OK-
11 hours	1.960	37.20	1.203	62.70	6.084	1.800	172	4.284	-OK-
12 hours	2.005	38.10	1.190	63.50	6.156	1.964	168	4.193	-OK-
14 hours	2.085	39.60	1.190	66.00	6.402	2.291	165	4.111	-OK-
16 hours	2.155	40.90	1.190	68.20	6.617	2.618	160	3.999	-OK-
18 hours	2.225	42.30	1.190	70.40	6.832	2.945	156	3.886	-OK-
20 hours	2.295	43.60	1.180	72.00	6.987	3.273	149	3.715	-OK-
22 hours	2.360	44.80	1.180	74.10	7.185	3.600	144	3.586	-OK-
24 hours	2.430	46.20	1.180	76.30	7.398	3.927	139	3.471	-OK-

Effective Volume of the Geocellular Structure Soakaway Installation for an M10 Return Period is 5.81 cubic metres.

Maximum Available (Effective) Outflow Surface Area at M10 Return is 28.81 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 233mm.

For a 10 Year Return Period the Critical Storm occurs at 9 hours

With a Maximum Internal Structure Critical Water Level of 173mm.

Requiring a Maximum (Critical) Storage Capacity of 4.31 cubic metres.

The Outflow Surface Area for the Critical Storm Duration for the M10 Return is 28.15 square metres referenced to the Critical Water Level.

Half Drain Time for a 10 Year Return Critical Storm is 13.48 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	1.663	0.014	66	1.649	-OK-
10 minutes	0.510	9.70	1.910	25.90	2.513	0.028	100	2.485	-OK-
15 minutes	0.620	11.80	1.910	31.50	3.055	0.042	121	3.013	-OK-
30 minutes	0.790	15.00	1.990	41.80	4.056	0.085	159	3.971	-OK-
1 hour	1.000	19.00	2.030	54.00	5.238	0.170	203	5.068	-OK-
2 hours	1.216	23.10	2.010	65.00	6.306	0.340	239	5.967	-OK-
3 hours	1.364	25.90	2.010	72.90	7.074	0.510	263	6.564	-OK-
4 hours	1.495	28.40	1.970	78.30	7.599	0.680	277	6.920	-OK-
5 hours	1.593	30.30	1.970	83.50	8.097	0.849	291	7.248	-OK-
6 hours	1.670	31.70	1.970	87.50	8.489	1.019	300	7.469	-OK-
7 hours	1.745	33.20	1.930	89.60	8.690	1.189	301	7.501	-OK-
8 hours	1.805	34.30	1.930	92.70	8.989	1.359	306	7.630	-OK-
9 hours	1.863	35.40	1.930	95.60	9.277	1.529	311	7.748	-OK-
10 hours	1.915	36.40	1.930	98.30	9.536	1.699	314	7.838	-OK-
11 hours	1.960	37.20	1.930	100.60	9.760	1.869	316	7.892	-OK-
12 hours	2.005	38.10	1.890	100.80	9.778	2.039	310	7.739	-OK-
14 hours	2.085	39.60	1.890	104.80	10.168	2.378	312	7.789	-OK-
16 hours	2.155	40.90	1.890	108.30	10.509	2.718	312	7.791	-OK-
18 hours	2.225	42.30	1.890	111.90	10.850	3.058	312	7.793	-OK-
20 hours	2.295	43.60	1.855	113.20	10.984	3.398	304	7.587	-OK-
22 hours	2.360	44.80	1.855	116.40	11.296	3.737	303	7.558	-OK-
24 hours	2.430	46.20	1.855	119.90	11.631	4.077	303	7.554	-OK-

Effective Volume of the Geocellular Structure Soakaway Installation for an M100 Return Period is 8.30 cubic metres.

Maximum Available (Effective) Outflow Surface Area at M100 Return is 29.91 square metres referenced to the top of the GeoCell Installation.

Maximum Allowable Pre-Flood Water Level for 100 Year Return (Soakaway Height) is 333mm.

For a 100 Year Return Period the Critical Storm occurs at 11 hours

With a Maximum Internal Structure Critical Water Level of 316mm.

Requiring a Maximum (Critical) Storage Capacity of 7.89 cubic metres.

The Outflow Surface Area for the Critical Storm Duration for the M100 Return is 29.73 square metres referenced to the Critical Water Level.

Half Drain Time for a 100 Year Return Critical Storm is 23.37 hours.

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