

"Ross Cottage" Eastergate Lane, Walberton, Arundel BN18 0BA Planning Reference WA/78/20/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 1.889E-5 metres / second and the Soil Infiltration Rate for the Base is 1.889E-5 metres / second.

The Installation consists of a GeoCellular Structure of 7.00 metres Long by 3.50 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 151.6 square metres.

Using a Safety Factor of 3.0

The Design adopts a Factored Soil Infiltration Rate for the Sides of 6.297E-6 metres / second.

And a Factored Soil Infiltration Rate for the Base of 6.297E-6 metres / second.

Both the Side Areas 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 300mm 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 11.851 metres at a depth of 0.995 metres Below Ground Level (BGL)

The Ground Level at the Location of the Proposed Soakaway is 12.846 metres.

The Soffit Level of the Proposed Soakaway is 12.346 metres.

The Invert Level of the Lowest Incoming Pipe on the Proposed Soakaway is 12.246 metres

The Base Level of the Proposed Soakaway is 11.946 metres

The Base of the Soakaway Structure is 0.095 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 4.94 cubic metres out of 6.98 cubic metres available.

Therefore Storage is Passed with a Critical Storm occurring at 3 hours.

And the Half Drain Time is OK within the Allowable 24 hours Period at 4.08 hours.

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

The Design requires storage of 9.40 cubic metres out of 9.31 cubic metres available.

Storage is Passed (with a pipe of length 12.5 metres fully surcharged) with a Critical Storm occurring at 5 hours.

And the Half Drain Time is OK within the Allowable 24 hours Period at 7.22 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	1.728	0.052	72	1.675	-OK-
10 minutes	0.510	9.70	1.220	16.60	2.509	0.104	103	2.405	-OK-
15 minutes	0.620	11.80	1.220	20.10	3.050	0.157	124	2.894	-OK-
30 minutes	0.790	15.00	1.240	26.10	3.950	0.313	156	3.637	-OK-
1 hour	1.000	19.00	1.250	33.20	5.041	0.627	190	4.414	-OK-
2 hours	1.216	23.10	1.240	40.10	6.080	1.254	207	4.827	-OK-
3 hours	1.364	25.90	1.240	45.00	6.821	1.880	212	4.940	-OK-
4 hours	1.495	28.40	1.220	48.50	7.355	2.507	208	4.848	-OK-
5 hours	1.593	30.30	1.220	51.70	7.837	3.134	202	4.703	-OK-
6 hours	1.670	31.70	1.220	54.20	8.216	3.761	191	4.455	-OK-
7 hours	1.745	33.20	1.203	55.80	8.465	4.387	175	4.078	-OK-
8 hours	1.805	34.30	1.203	57.80	8.756	5.014	161	3.742	-OK-
9 hours	1.863	35.40	1.203	59.60	9.038	5.641	146	3.397	-OK-
10 hours	1.915	36.40	1.203	61.30	9.290	6.268	130	3.022	-OK-
11 hours	1.960	37.20	1.203	62.70	9.508	6.894	112	2.614	-OK-
12 hours	2.005	38.10	1.190	63.50	9.621	7.521	90	2.100	-OK-
14 hours	2.085	39.60	1.190	66.00	10.005	8.775	53	1.231	-OK-
16 hours	2.155	40.90	1.190	68.20	10.341	10.028	13	0.313	-OK-
18 hours	2.225	42.30	1.190	70.40	10.677	11.282	empty	none	-OK-
20 hours	2.295	43.60	1.180	72.00	10.921	12.535	empty	none	-OK-
22 hours	2.360	44.80	1.180	74.10	11.230	13.789	empty	none	-OK-
24 hours	2.430	46.20	1.180	76.30	11.563	15.042	empty	none	-OK-

Effective Volume of the Geocellular Structure Soakaway Installation for an M10 Return Period is 6.98 cubic metres.

Maximum Available (Effective) Outflow Surface Area at M10 Return is 27.65 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 300mm.

For a 10 Year Return Period the Critical Storm occurs at 3 hours.

With a Maximum Internal Structure Critical Water Level of 212mm.

Requiring a Maximum (Critical) Storage Capacity of 4.94 cubic metres.

The Outflow Surface Area for the Critical Storm Duration for the M10 Return is 26.73 square metres referenced to the Critical Water Level.

Half Drain Time for a 10 Year Return Critical Storm is 4.08 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	2.599	0.054	109	2.544	-OK-
10 minutes	0.510	9.70	1.910	25.90	3.928	0.108	164	3.820	-OK-
15 minutes	0.620	11.80	1.910	31.50	4.775	0.163	198	4.613	-OK-
30 minutes	0.790	15.00	1.990	41.80	6.340	0.325	258	6.014	-OK-
1 hour	1.000	19.00	2.030	54.00	8.186	0.651	324	7.536	-OK-
2 hours	1.216	23.10	2.010	65.00	9.856	1.301	368	8.555	-OK-
3 hours	1.364	25.90	2.010	72.90	11.056	1.952	391	9.104	-OK-
4 hours	1.495	28.40	1.970	78.30	11.876	2.602	398	9.274	-OK-
5 hours	1.593	30.30	1.970	83.50	12.655	3.253	404	9.402	Flood
6 hours	1.670	31.70	1.970	87.50	13.267	3.903	402	9.363	Flood
7 hours	1.745	33.20	1.930	89.60	13.581	4.554	388	9.027	-OK-
8 hours	1.805	34.30	1.930	92.70	14.048	5.205	380	8.843	-OK-
9 hours	1.863	35.40	1.930	95.60	14.499	5.855	371	8.644	-OK-
10 hours	1.915	36.40	1.930	98.30	14.904	6.506	361	8.398	-OK-
11 hours	1.960	37.20	1.930	100.60	15.254	7.156	348	8.098	-OK-
12 hours	2.005	38.10	1.890	100.80	15.281	7.807	321	7.474	-OK-
14 hours	2.085	39.60	1.890	104.80	15.891	9.108	291	6.783	-OK-
16 hours	2.155	40.90	1.890	108.30	16.424	10.409	258	6.015	-OK-
18 hours	2.225	42.30	1.890	111.90	16.958	11.710	225	5.248	-OK-
20 hours	2.295	43.60	1.855	113.20	17.168	13.011	179	4.156	-OK-
22 hours	2.360	44.80	1.855	116.40	17.654	14.313	144	3.341	-OK-
24 hours	2.430	46.20	1.855	119.90	18.177	15.614	110	2.564	-OK-

Effective Volume of the Geocellular Structure Soakaway Installation for an M100 Return Period is 9.31 cubic metres.

Maximum Available (Effective) Outflow Surface Area at M100 Return is 28.70 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 5 hours.

With a Maximum Internal Structure Critical Water Level of 404mm.

The excess volume of water not contained in the Geocellular Structure of 4mm in height is 98 litres.

This will easily be accommodated within 12.5 metres of fully surcharged pipework underground and will not result in a Flooding Event Above Ground Level.

Requiring a Maximum (Critical) Storage Capacity of 9.40 cubic metres.

The Outflow Surface Area for the Critical Storm Duration for the M100 Return is 28.74 square metres referenced to the Critical Water Level.

Half Drain Time for a 100 Year Return Critical Storm is 7.22 hours.