

#48 the Meadows, Walberton, BN18 0PB Planning Reference WA/39/18/PL

The Design Parameters for the Proposed Geocellular Structure Soakaway Installation S/A #1, located in the rear garden of #48, are as follows :-

The Soil Infiltration Rate for the Sides is 6.122E-6 metres / second.
The Soil Infiltration Rate for the Base is 6.122E-6 metres / second.
The Installation consists of a GeoCellular Structure of 3.00 metres Long by 3.00 metres Wide and 0.80 metres in Depth.
With a Cover Depth of 0.50 metres.
Percentage Void Space of 95%.
Impermeable Area specified as 80 square metres.
Using a Safety Factor of 2.0
The Design adopts a Factored Soil Infiltration Rate for the Sides of 3.061E-6 metres / second.
And a Factored Soil Infiltration Rate for the Base of 3.061E-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 644mm 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 12.275 metres at a depth of 2.391 metres Below Ground Level (BGL)
The Ground Level at the Location of the Proposed Soakaway is 14.706 metres
The Soffit Level of the Proposed Soakaway is 14.206 metres
The Invert Level of the Lowest Incoming Pipe on the Proposed Soakaway is 14.050 metres
The Base Level of the Proposed Soakaway is 13.406 metres
The Base of the Soakaway Structure is 1.091 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 3.49 cubic metres out of 5.51 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 13.84 hours.

For a 30 Year Return Storm Includes a 40% Increase for Climate Change.
The Design requires storage of 4.53 cubic metres out of 6.84 cubic metres available.
Therefore Storage is Passed with a Critical Storm occurring at 10 hours.
And the Half Drain Time is OK within the Allowable 24 hours Period at 16.88 hours.

For a 100 Year Return Storm Includes a 40% Increase for Climate Change.
The Design requires storage of 6.38 cubic metres out of 6.84 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 21.47 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	0.912	0.012	105	0.900	-OK-
10 minutes	0.510	9.70	1.220	16.60	1.324	0.024	152	1.300	-OK-
15 minutes	0.620	11.80	1.220	20.10	1.610	0.035	184	1.574	-OK-
30 minutes	0.790	15.00	1.240	26.10	2.085	0.071	236	2.014	-OK-
1 hour	1.000	19.00	1.250	33.20	2.660	0.142	295	2.518	-OK-
2 hours	1.216	23.10	1.240	40.10	3.209	0.284	342	2.925	-OK-
3 hours	1.364	25.90	1.240	45.00	3.599	0.425	371	3.174	-OK-
4 hours	1.495	28.40	1.220	48.50	3.881	0.567	388	3.314	-OK-
5 hours	1.593	30.30	1.220	51.70	4.136	0.709	401	3.427	-OK-
6 hours	1.670	31.70	1.220	54.20	4.336	0.851	408	3.485	-OK-
7 hours	1.745	33.20	1.203	55.80	4.467	0.992	406	3.475	-OK-
8 hours	1.805	34.30	1.203	57.80	4.621	1.134	408	3.487	-OK-
9 hours	1.863	35.40	1.203	59.60	4.769	1.276	409	3.493	-OK-
10 hours	1.915	36.40	1.203	61.30	4.902	1.418	408	3.485	-OK-
11 hours	1.960	37.20	1.203	62.70	5.018	1.559	404	3.458	-OK-
12 hours	2.005	38.10	1.190	63.50	5.077	1.701	395	3.376	-OK-
14 hours	2.085	39.60	1.190	66.00	5.280	1.985	385	3.295	-OK-
16 hours	2.155	40.90	1.190	68.20	5.457	2.268	373	3.189	-OK-
18 hours	2.225	42.30	1.190	70.40	5.634	2.552	361	3.083	-OK-
20 hours	2.295	43.60	1.180	72.00	5.763	2.835	342	2.928	-OK-
22 hours	2.360	44.80	1.180	74.10	5.926	3.119	328	2.807	-OK-
24 hours	2.430	46.20	1.180	76.30	6.102	3.402	316	2.700	-OK-

Effective Volume of the Geocellular Structure Soakaway Installation for an M10 Return Period is 5.51 cubic metres.

Maximum Available (Effective) Outflow Surface Area at M10 Return is 12.86 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 644mm.

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

With a Maximum Internal Structure Critical Water Level of 409mm.

Requiring a Maximum (Critical) Storage Capacity of 3.49 cubic metres.

The Outflow Surface Area for the Critical Storm Duration for the M10 Return is 11.45 square metres referenced to the Critical Water Level.

Half Drain Time for a 10 Year Return Critical Storm is 13.84 hours.

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

Storm Duration	Factor Z1-5	M5 Return Rainfall	Factor Z2-100	M100 Return Rainfall	Inflow Cu Metres	Outflow Cu Metres	Internal Water Level	Required Storage	Soakaway Status
5 minutes	0.360	6.80	1.790	17.10	1.371	0.013	159	1.359	-OK-
10 minutes	0.510	9.70	1.910	25.90	2.073	0.025	239	2.048	-OK-
15 minutes	0.620	11.80	1.910	31.50	2.520	0.038	290	2.482	-OK-
30 minutes	0.790	15.00	1.990	41.80	3.345	0.076	382	3.269	-OK-
1 hour	1.000	19.00	2.030	54.00	4.320	0.152	487	4.168	-OK-
2 hours	1.216	23.10	2.010	65.00	5.201	0.304	573	4.897	-OK-
3 hours	1.364	25.90	2.010	72.90	5.834	0.456	629	5.378	-OK-
4 hours	1.495	28.40	1.970	78.30	6.267	0.608	662	5.659	-OK-
5 hours	1.593	30.30	1.970	83.50	6.678	0.760	692	5.918	-OK-
6 hours	1.670	31.70	1.970	87.50	7.001	0.912	712	6.088	-OK-
7 hours	1.745	33.20	1.930	89.60	7.167	1.064	714	6.102	-OK-
8 hours	1.805	34.30	1.930	92.70	7.413	1.217	725	6.197	-OK-
9 hours	1.863	35.40	1.930	95.60	7.651	1.369	735	6.283	-OK-
10 hours	1.915	36.40	1.930	98.30	7.865	1.521	742	6.344	-OK-
11 hours	1.960	37.20	1.930	100.60	8.050	1.673	746	6.377	-OK-
12 hours	2.005	38.10	1.890	100.80	8.064	1.825	730	6.239	-OK-
14 hours	2.085	39.60	1.890	104.80	8.386	2.129	732	6.257	-OK-
16 hours	2.155	40.90	1.890	108.30	8.667	2.433	729	6.234	-OK-
18 hours	2.225	42.30	1.890	111.90	8.949	2.737	726	6.212	-OK-
20 hours	2.295	43.60	1.855	113.20	9.059	3.041	704	6.018	-OK-
22 hours	2.360	44.80	1.855	116.40	9.316	3.346	698	5.970	-OK-
24 hours	2.430	46.20	1.855	119.90	9.592	3.650	695	5.943	-OK-

Effective Volume of the Geocellular Structure Soakaway Installation for an M100 Return Period is 6.84 cubic metres.

Maximum Available (Effective) Outflow Surface Area at M100 Return is 13.80 square metres referenced to the top of the GeoCell Installation.

Maximum Allowable Pre-Flood Water Level for 100 Year Return (Soakaway Height) is 800mm.

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

With a Maximum Internal Structure Critical Water Level of 746mm.

Requiring a Maximum (Critical) Storage Capacity of 6.38 cubic metres.

The Outflow Surface Area for the Critical Storm Duration for the M100 Return is 13.48 square metres referenced to the Critical Water Level.

Half Drain Time for a 100 Year Return Critical Storm is 21.47 hours.

* * * END of REPORT * * *