

Cox's Farm, Lake Lane, Barnham, PO22 0AJ Planning Reference BN/23/19/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 5.906E-6 metres / second and the Soil Infiltration Rate for the Base is 5.906E-6 metres / second.

The Installation consists of a GeoCellular Structure of 4.00 metres Long by 4.00 metres Wide and 0.40 metres in Depth.

With a Cover Depth of 0.40 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 2.953E-6 metres / second.

And a Factored Soil Infiltration Rate for the Base of 2.953E-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 300mm 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 9.347 metres at a depth of 0.899 metres Below Ground Level (BGL)

The Ground Level at the Location of the Proposed Soakaway is 10.246 metres

The Soffit Level of the Proposed Soakaway is 9.846 metres

The Invert Level of the Lowest Incoming Pipe on the Proposed Soakaway is 9.746 metres

The Base Level of the Proposed Soakaway is 9.446 metres

The Base of the Soakaway Structure is 0.099 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 3.16 cubic metres out of 4.56 cubic metres available.

Therefore Storage is Passed with a Critical Storm occurring at 6 hours.

And the Half Drain Time is OK within the Allowable 24 hours Period at 8.42 hours.

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

The Design requires storage of 5.82 cubic metres out of 6.08 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 14.37 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	0.912	0.016	59	0.895	-OK-
10 minutes	0.510	9.70	1.220	16.60	1.324	0.033	85	1.291	-OK-
15 minutes	0.620	11.80	1.220	20.10	1.610	0.049	103	1.561	-OK-
30 minutes	0.790	15.00	1.240	26.10	2.085	0.098	131	1.987	-OK-
1 hour	1.000	19.00	1.250	33.20	2.660	0.196	162	2.464	-OK-
2 hours	1.216	23.10	1.240	40.10	3.209	0.391	185	2.817	-OK-
3 hours	1.364	25.90	1.240	45.00	3.599	0.587	198	3.012	-OK-
4 hours	1.495	28.40	1.220	48.50	3.881	0.782	204	3.099	-OK-
5 hours	1.593	30.30	1.220	51.70	4.136	0.978	208	3.158	-OK-
6 hours	1.670	31.70	1.220	54.20	4.336	1.174	208	3.162	-OK-
7 hours	1.745	33.20	1.203	55.80	4.467	1.369	204	3.098	-OK-
8 hours	1.805	34.30	1.203	57.80	4.621	1.565	201	3.056	-OK-
9 hours	1.863	35.40	1.203	59.60	4.769	1.760	198	3.009	-OK-
10 hours	1.915	36.40	1.203	61.30	4.902	1.956	194	2.946	-OK-
11 hours	1.960	37.20	1.203	62.70	5.018	2.152	189	2.866	-OK-
12 hours	2.005	38.10	1.190	63.50	5.077	2.347	180	2.730	-OK-
14 hours	2.085	39.60	1.190	66.00	5.280	2.738	167	2.541	-OK-
16 hours	2.155	40.90	1.190	68.20	5.457	3.130	153	2.327	-OK-
18 hours	2.225	42.30	1.190	70.40	5.634	3.521	139	2.113	-OK-
20 hours	2.295	43.60	1.180	72.00	5.763	3.912	122	1.851	-OK-
22 hours	2.360	44.80	1.180	74.10	5.926	4.303	107	1.623	-OK-
24 hours	2.430	46.20	1.180	76.30	6.102	4.695	93	1.407	-OK-

Effective Volume of the Geocellular Structure Soakaway Installation for an M10 Return Period is 4.56 cubic metres.

Maximum Available (Effective) Outflow Surface Area at M10 Return is 18.40 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 6 hours

With a Maximum Internal Structure Critical Water Level of 208mm.

Requiring a Maximum (Critical) Storage Capacity of 3.16 cubic metres.

The Outflow Surface Area for the Critical Storm Duration for the M10 Return is 17.66 square metres referenced to the Critical Water Level.

Half Drain Time for a 10 Year Return Critical Storm is 8.42 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	1.371	0.017	89	1.354	-OK-
10 minutes	0.510	9.70	1.910	25.90	2.073	0.034	134	2.039	-OK-
15 minutes	0.620	11.80	1.910	31.50	2.520	0.051	162	2.469	-OK-
30 minutes	0.790	15.00	1.990	41.80	3.345	0.102	213	3.243	-OK-
1 hour	1.000	19.00	2.030	54.00	4.320	0.204	271	4.116	-OK-
2 hours	1.216	23.10	2.010	65.00	5.201	0.408	315	4.793	-OK-
3 hours	1.364	25.90	2.010	72.90	5.834	0.612	344	5.222	-OK-
4 hours	1.495	28.40	1.970	78.30	6.267	0.816	359	5.451	-OK-
5 hours	1.593	30.30	1.970	83.50	6.678	1.021	372	5.658	-OK-
6 hours	1.670	31.70	1.970	87.50	7.001	1.225	380	5.776	-OK-
7 hours	1.745	33.20	1.930	89.60	7.167	1.429	378	5.738	-OK-
8 hours	1.805	34.30	1.930	92.70	7.413	1.633	380	5.780	-OK-
9 hours	1.863	35.40	1.930	95.60	7.651	1.837	383	5.814	-OK-
10 hours	1.915	36.40	1.930	98.30	7.865	2.041	383	5.824	-OK-
11 hours	1.960	37.20	1.930	100.60	8.050	2.245	382	5.805	-OK-
12 hours	2.005	38.10	1.890	100.80	8.064	2.449	369	5.615	-OK-
14 hours	2.085	39.60	1.890	104.80	8.386	2.858	364	5.528	-OK-
16 hours	2.155	40.90	1.890	108.30	8.667	3.266	355	5.401	-OK-
18 hours	2.225	42.30	1.890	111.90	8.949	3.674	347	5.275	-OK-
20 hours	2.295	43.60	1.855	113.20	9.059	4.082	327	4.977	-OK-
22 hours	2.360	44.80	1.855	116.40	9.316	4.490	317	4.826	-OK-
24 hours	2.430	46.20	1.855	119.90	9.592	4.899	309	4.694	-OK-

Effective Volume of the Geocellular Structure Soakaway Installation for an M100 Return Period is 6.08 cubic metres.

Maximum Available (Effective) Outflow Surface Area at M100 Return is 19.20 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 10 hours

With a Maximum Internal Structure Critical Water Level of 383mm.

Requiring a Maximum (Critical) Storage Capacity of 5.82 cubic metres.

The Outflow Surface Area for the Critical Storm Duration for the M100 Return is 19.07 square metres referenced to the Critical Water Level.

Half Drain Time for a 100 Year Return Critical Storm is 14.37 hours.

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