

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 #2, located in the Front 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 2.50 metres Long by 2.00 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 24.5 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 289mm 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 9.299 metres at a depth of 0.852 metres Below Ground Level (BGL)

The Ground Level at the Location of the Proposed Soakaway is 10.151 metres

The Soffit Level of the Proposed Soakaway is 9.751 metres

The Invert Level of the Lowest Incoming Pipe on the Proposed Soakaway is 9.640 metres

The Base Level of the Proposed Soakaway is 9.351 metres

The Base of the Soakaway Structure is 0.052 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 #2 is as follows :-

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

The Design requires storage of 0.93 cubic metres out of 1.37 cubic metres available.

Therefore Storage is Passed with a Critical Storm occurring at 5 hours.

And the Half Drain Time is OK within the Allowable 24 hours Period at 7.45 hours.

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

The Design requires storage of 1.71 cubic metres out of 1.90 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 12.15 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	0.279	0.006	58	0.274	-OK-
10 minutes	0.510	9.70	1.220	16.60	0.405	0.011	83	0.394	-OK-
15 minutes	0.620	11.80	1.220	20.10	0.493	0.017	100	0.476	-OK-
30 minutes	0.790	15.00	1.240	26.10	0.638	0.033	127	0.605	-OK-
1 hour	1.000	19.00	1.250	33.20	0.815	0.067	157	0.748	-OK-
2 hours	1.216	23.10	1.240	40.10	0.983	0.134	179	0.849	-OK-
3 hours	1.364	25.90	1.240	45.00	1.102	0.201	190	0.901	-OK-
4 hours	1.495	28.40	1.220	48.50	1.189	0.268	194	0.921	-OK-
5 hours	1.593	30.30	1.220	51.70	1.267	0.335	196	0.932	-OK-
6 hours	1.670	31.70	1.220	54.20	1.328	0.402	195	0.926	-OK-
7 hours	1.745	33.20	1.203	55.80	1.368	0.469	189	0.899	-OK-
8 hours	1.805	34.30	1.203	57.80	1.415	0.536	185	0.879	-OK-
9 hours	1.863	35.40	1.203	59.60	1.461	0.603	181	0.858	-OK-
10 hours	1.915	36.40	1.203	61.30	1.501	0.670	175	0.832	-OK-
11 hours	1.960	37.20	1.203	62.70	1.537	0.737	168	0.800	-OK-
12 hours	2.005	38.10	1.190	63.50	1.555	0.804	158	0.751	-OK-
14 hours	2.085	39.60	1.190	66.00	1.617	0.938	143	0.679	-OK-
16 hours	2.155	40.90	1.190	68.20	1.671	1.072	126	0.600	-OK-
18 hours	2.225	42.30	1.190	70.40	1.726	1.206	109	0.520	-OK-
20 hours	2.295	43.60	1.180	72.00	1.765	1.340	90	0.425	-OK-
22 hours	2.360	44.80	1.180	74.10	1.815	1.474	72	0.341	-OK-
24 hours	2.430	46.20	1.180	76.30	1.869	1.608	55	0.261	-OK-

Effective Volume of the Geocellular Structure Soakaway Installation for an M10 Return Period is 1.37 cubic metres.

Maximum Available (Effective) Outflow Surface Area at M10 Return is 6.30 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 289mm.

For a 10 Year Return Period the Critical Storm occurs at 5 hours

With a Maximum Internal Structure Critical Water Level of 196mm.

Requiring a Maximum (Critical) Storage Capacity of 0.93 cubic metres.

The Outflow Surface Area for the Critical Storm Duration for the M10 Return is 5.88 square metres referenced to the Critical Water Level.

Half Drain Time for a 10 Year Return Critical Storm is 7.45 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	0.420	0.006	87	0.414	-OK-
10 minutes	0.510	9.70	1.910	25.90	0.635	0.012	131	0.623	-OK-
15 minutes	0.620	11.80	1.910	31.50	0.772	0.018	159	0.754	-OK-
30 minutes	0.790	15.00	1.990	41.80	1.025	0.036	208	0.988	-OK-
1 hour	1.000	19.00	2.030	54.00	1.323	0.072	263	1.251	-OK-
2 hours	1.216	23.10	2.010	65.00	1.593	0.145	305	1.448	-OK-
3 hours	1.364	25.90	2.010	72.90	1.787	0.217	330	1.570	-OK-
4 hours	1.495	28.40	1.970	78.30	1.919	0.289	343	1.630	-OK-
5 hours	1.593	30.30	1.970	83.50	2.045	0.361	354	1.684	-OK-
6 hours	1.670	31.70	1.970	87.50	2.144	0.434	360	1.710	-OK-
7 hours	1.745	33.20	1.930	89.60	2.195	0.506	356	1.689	-OK-
8 hours	1.805	34.30	1.930	92.70	2.270	0.578	356	1.692	-OK-
9 hours	1.863	35.40	1.930	95.60	2.343	0.651	356	1.693	-OK-
10 hours	1.915	36.40	1.930	98.30	2.409	0.723	355	1.686	-OK-
11 hours	1.960	37.20	1.930	100.60	2.465	0.795	352	1.670	-OK-
12 hours	2.005	38.10	1.890	100.80	2.470	0.867	337	1.602	-OK-
14 hours	2.085	39.60	1.890	104.80	2.568	1.012	328	1.556	-OK-
16 hours	2.155	40.90	1.890	108.30	2.654	1.157	315	1.498	-OK-
18 hours	2.225	42.30	1.890	111.90	2.741	1.301	303	1.439	-OK-
20 hours	2.295	43.60	1.855	113.20	2.774	1.446	280	1.329	-OK-
22 hours	2.360	44.80	1.855	116.40	2.853	1.590	266	1.263	-OK-
24 hours	2.430	46.20	1.855	119.90	2.938	1.735	253	1.203	-OK-

Effective Volume of the Geocellular Structure Soakaway Installation for an M100 Return Period is 1.90 cubic metres.

Maximum Available (Effective) Outflow Surface Area at M100 Return is 6.80 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 6 hours

With a Maximum Internal Structure Critical Water Level of 360mm.

Requiring a Maximum (Critical) Storage Capacity of 1.71 cubic metres.

The Outflow Surface Area for the Critical Storm Duration for the M100 Return is 6.62 square metres referenced to the Critical Water Level.

Half Drain Time for a 100 Year Return Critical Storm is 12.15 hours.

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