

Land Adjacent to "Chandos", Elm Grove, Bognor Regis, PO21 2SW Planning Reference BR/302/19/PL

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 3.304E-6 metres / second.

Soil Infiltration Rate for the Base is 3.304E-6 metres / second.

The Installation consists of a GeoCellular Structure of 4.00 metres Long by 3.00 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 49 square metres.

Using a Safety Factor of 2.0

The Design adopts a Factored Soil Infiltration Rate for the Sides of 1.652E-6 metres / second.

And a Factored Soil Infiltration Rate for the Base of 1.652E-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 5.072 metres at a depth of 0.910 metres Below Ground Level (BGL)

The Ground Level at the Location of the Proposed Soakaway is 5.982 metres

The Soffit Level of the Proposed Soakaway is 5.582 metres

The Invert Level of the Lowest Incoming Pipe on the Proposed Soakaway is 5.482 metres

The Base Level of the Proposed Soakaway is 5.182 metres

The Base of the Soakaway Structure is 0.110 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 2.17 cubic metres out of 3.42 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 13.66 hours.

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

The Design requires storage of 3.96 cubic metres out of 4.56 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 23.08 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	0.558	0.007	48	0.551	-OK-
10 minutes	0.510	9.70	1.220	16.60	0.811	0.014	70	0.797	-OK-
15 minutes	0.620	11.80	1.220	20.10	0.986	0.021	85	0.965	-OK-
30 minutes	0.790	15.00	1.240	26.10	1.277	0.042	108	1.235	-OK-
1 hour	1.000	19.00	1.250	33.20	1.629	0.084	136	1.545	-OK-
2 hours	1.216	23.10	1.240	40.10	1.965	0.168	158	1.798	-OK-
3 hours	1.364	25.90	1.240	45.00	2.205	0.252	171	1.953	-OK-
4 hours	1.495	28.40	1.220	48.50	2.377	0.335	179	2.042	-OK-
5 hours	1.593	30.30	1.220	51.70	2.533	0.419	185	2.114	-OK-
6 hours	1.670	31.70	1.220	54.20	2.656	0.503	189	2.152	-OK-
7 hours	1.745	33.20	1.203	55.80	2.736	0.587	189	2.149	-OK-
8 hours	1.805	34.30	1.203	57.80	2.830	0.671	189	2.159	-OK-
9 hours	1.863	35.40	1.203	59.60	2.921	0.755	190	2.166	-OK-
10 hours	1.915	36.40	1.203	61.30	3.003	0.839	190	2.164	-OK-
11 hours	1.960	37.20	1.203	62.70	3.073	0.922	189	2.151	-OK-
12 hours	2.005	38.10	1.190	63.50	3.110	1.006	185	2.104	-OK-
14 hours	2.085	39.60	1.190	66.00	3.234	1.174	181	2.060	-OK-
16 hours	2.155	40.90	1.190	68.20	3.343	1.342	176	2.001	-OK-
18 hours	2.225	42.30	1.190	70.40	3.451	1.509	170	1.942	-OK-
20 hours	2.295	43.60	1.180	72.00	3.530	1.677	163	1.853	-OK-
22 hours	2.360	44.80	1.180	74.10	3.630	1.845	157	1.785	-OK-
24 hours	2.430	46.20	1.180	76.30	3.737	2.013	151	1.725	-OK-

Effective Volume of the Geocellular Structure Soakaway Installation for an M10 Return Period is 3.42 cubic metres.

Maximum Available (Effective) Outflow Surface Area at M10 Return is 14.10 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 9 hours

With a Maximum Internal Structure Critical Water Level of 190mm.

Requiring a Maximum (Critical) Storage Capacity of 2.17 cubic metres.

The Outflow Surface Area for the Critical Storm Duration for the M10 Return is 13.33 square metres referenced to the Critical Water Level.

Half Drain Time for a 10 Year Return Critical Storm is 13.66 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	0.840	0.007	73	0.833	-OK-
10 minutes	0.510	9.70	1.910	25.90	1.270	0.015	110	1.255	-OK-
15 minutes	0.620	11.80	1.910	31.50	1.543	0.022	133	1.521	-OK-
30 minutes	0.790	15.00	1.990	41.80	2.049	0.044	176	2.005	-OK-
1 hour	1.000	19.00	2.030	54.00	2.646	0.088	224	2.558	-OK-
2 hours	1.216	23.10	2.010	65.00	3.186	0.176	264	3.010	-OK-
3 hours	1.364	25.90	2.010	72.90	3.573	0.264	290	3.309	-OK-
4 hours	1.495	28.40	1.970	78.30	3.839	0.352	306	3.487	-OK-
5 hours	1.593	30.30	1.970	83.50	4.090	0.440	320	3.650	-OK-
6 hours	1.670	31.70	1.970	87.50	4.288	0.528	330	3.760	-OK-
7 hours	1.745	33.20	1.930	89.60	4.390	0.616	331	3.774	-OK-
8 hours	1.805	34.30	1.930	92.70	4.541	0.704	337	3.836	-OK-
9 hours	1.863	35.40	1.930	95.60	4.686	0.792	342	3.894	-OK-
10 hours	1.915	36.40	1.930	98.30	4.817	0.880	345	3.937	-OK-
11 hours	1.960	37.20	1.930	100.60	4.931	0.968	348	3.962	-OK-
12 hours	2.005	38.10	1.890	100.80	4.939	1.056	341	3.883	-OK-
14 hours	2.085	39.60	1.890	104.80	5.136	1.232	342	3.904	-OK-
16 hours	2.155	40.90	1.890	108.30	5.309	1.408	342	3.900	-OK-
18 hours	2.225	42.30	1.890	111.90	5.481	1.584	342	3.897	-OK-
20 hours	2.295	43.60	1.855	113.20	5.549	1.760	332	3.788	-OK-
22 hours	2.360	44.80	1.855	116.40	5.706	1.936	331	3.770	-OK-
24 hours	2.430	46.20	1.855	119.90	5.875	2.112	330	3.763	-OK-

Effective Volume of the Geocellular Structure Soakaway Installation for an M100 Return Period is 4.56 cubic metres.

Maximum Available (Effective) Outflow Surface Area at M100 Return is 14.80 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 11 hours

With a Maximum Internal Structure Critical Water Level of 348mm.

Requiring a Maximum (Critical) Storage Capacity of 3.96 cubic metres.

The Outflow Surface Area for the Critical Storm Duration for the M100 Return is 14.43 square metres referenced to the Critical Water Level.

Half Drain Time for a 100 Year Return Critical Storm is 23.08 hours.

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