

"Pandora" Bilsham Road, Yapton, ARUNDEL BN18 0JU -- Planning Reference Y/66/21/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 $3.310E-5$ metres / second.
The Soil Infiltration Rate for the Base is $3.310E-5$ metres / second.
The Installation consists of a GeoCellular Structure of 3.00 metres Long by 3.00 metres Wide and 0.40 metres in Depth.
With a Cover Depth of 0.60 metres.
Percentage Void Space of 95%.
Impermeable Area specified as 71 square metres.
Using a Safety Factor of 2.0
The Design adopts a Factored Soil Infiltration Rate for the Sides of $1.655E-5$ metres / second.
And a Factored Soil Infiltration Rate for the Base of $1.655E-5$ 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 270mm 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 4.468 metres at a depth of 1.334 metres Below Ground Level (BGL)
The Ground Level at the Location of the Proposed Soakaway is 5.802 metres.
The Soffit Level of the Proposed Soakaway is 5.202 metres.
The Invert Level of the Lowest Incoming Pipe on the Proposed Soakaway is 5.072 metres
The Base Level of the Proposed Soakaway is 4.802 metres
The Base of the Soakaway Structure is 0.334 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 1.73 cubic metres out of 2.31 cubic metres available.
Therefore Storage is Passed with a Critical Storm occurring at 1 hour.
And the Half Drain Time is OK within the Allowable 24 hours Period at 1.42 hours.

For a 100 Year Return Storm Includes a 40% Increase for Climate Change.
The Design requires storage of 3.26 cubic metres out of 3.42 cubic metres available.
Therefore Storage is Passed with a Critical Storm occurring at 2 hours.
And the Half Drain Time is OK within the Allowable 24 hours Period at 2.42 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	0.809	0.053	88	0.756	-OK-
10 minutes	0.510	9.70	1.220	16.60	1.175	0.105	125	1.070	-OK-
15 minutes	0.620	11.80	1.220	20.10	1.429	0.158	149	1.270	-OK-
30 minutes	0.790	15.00	1.240	26.10	1.850	0.316	179	1.534	-OK-
1 hour	1.000	19.00	1.250	33.20	2.361	0.633	202	1.728	-OK-
2 hours	1.216	23.10	1.240	40.10	2.848	1.265	185	1.582	-OK-
3 hours	1.364	25.90	1.240	45.00	3.194	1.898	152	1.296	-OK-
4 hours	1.495	28.40	1.220	48.50	3.445	2.531	107	0.914	-OK-
5 hours	1.593	30.30	1.220	51.70	3.670	3.164	59	0.507	-OK-
6 hours	1.670	31.70	1.220	54.20	3.848	3.796	6	0.051	-OK-
7 hours	1.745	33.20	1.203	55.80	3.965	4.429	empty	none	-OK-
8 hours	1.805	34.30	1.203	57.80	4.101	5.062	empty	none	-OK-
9 hours	1.863	35.40	1.203	59.60	4.233	5.695	empty	none	-OK-
10 hours	1.915	36.40	1.203	61.30	4.351	6.327	empty	none	-OK-
11 hours	1.960	37.20	1.203	62.70	4.453	6.960	empty	none	-OK-
12 hours	2.005	38.10	1.190	63.50	4.506	7.593	empty	none	-OK-
14 hours	2.085	39.60	1.190	66.00	4.686	8.858	empty	none	-OK-
16 hours	2.155	40.90	1.190	68.20	4.843	10.124	empty	none	-OK-
18 hours	2.225	42.30	1.190	70.40	5.001	11.389	empty	none	-OK-
20 hours	2.295	43.60	1.180	72.00	5.115	12.655	empty	none	-OK-
22 hours	2.360	44.80	1.180	74.10	5.259	13.920	empty	none	-OK-
24 hours	2.430	46.20	1.180	76.30	5.415	15.186	empty	none	-OK-

Effective Volume of the Geocellular Structure Soakaway Installation for an M10 Return Period is 2.31 cubic metres.

Maximum Available (Effective) Outflow Surface Area at M10 Return is 10.62 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 270mm.

For a 10 Year Return Period the Critical Storm occurs at 1 hour.

With a Maximum Internal Structure Critical Water Level of 202mm.

Requiring a Maximum (Critical) Storage Capacity of 1.73 cubic metres.

The Outflow Surface Area for the Critical Storm Duration for the M10 Return is 10.21 square metres referenced to the Critical Water Level.

Half Drain Time for a 10 Year Return Critical Storm is 1.42 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	1.217	0.057	136	1.160	-OK-
10 minutes	0.510	9.70	1.910	25.90	1.840	0.113	202	1.726	-OK-
15 minutes	0.620	11.80	1.910	31.50	2.236	0.170	242	2.067	-OK-
30 minutes	0.790	15.00	1.990	41.80	2.969	0.340	308	2.629	-OK-
1 hour	1.000	19.00	2.030	54.00	3.834	0.679	369	3.155	-OK-
2 hours	1.216	23.10	2.010	65.00	4.616	1.358	381	3.258	-OK-
3 hours	1.364	25.90	2.010	72.90	5.178	2.038	367	3.140	-OK-
4 hours	1.495	28.40	1.970	78.30	5.562	2.717	333	2.845	-OK-
5 hours	1.593	30.30	1.970	83.50	5.927	3.396	296	2.531	-OK-
6 hours	1.670	31.70	1.970	87.50	6.213	4.075	250	2.138	-OK-
7 hours	1.745	33.20	1.930	89.60	6.361	4.754	188	1.606	-OK-
8 hours	1.805	34.30	1.930	92.70	6.579	5.434	134	1.146	-OK-
9 hours	1.863	35.40	1.930	95.60	6.791	6.113	79	0.678	-OK-
10 hours	1.915	36.40	1.930	98.30	6.980	6.792	22	0.188	-OK-
11 hours	1.960	37.20	1.930	100.60	7.144	7.471	empty	none	-OK-
12 hours	2.005	38.10	1.890	100.80	7.157	8.151	empty	none	-OK-
14 hours	2.085	39.60	1.890	104.80	7.442	9.509	empty	none	-OK-
16 hours	2.155	40.90	1.890	108.30	7.692	10.867	empty	none	-OK-
18 hours	2.225	42.30	1.890	111.90	7.942	12.226	empty	none	-OK-
20 hours	2.295	43.60	1.855	113.20	8.040	13.584	empty	none	-OK-
22 hours	2.360	44.80	1.855	116.40	8.268	14.943	empty	none	-OK-
24 hours	2.430	46.20	1.855	119.90	8.513	16.301	empty	none	-OK-

Effective Volume of the Geocellular Structure Soakaway Installation for an M100 Return Period is 3.42 cubic metres.

Maximum Available (Effective) Outflow Surface Area at M100 Return is 11.40 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 2 hours.

With a Maximum Internal Structure Critical Water Level of 381mm.

Requiring a Maximum (Critical) Storage Capacity of 3.26 cubic metres.

The Outflow Surface Area for the Critical Storm Duration for the M100 Return is 11.29 square metres referenced to the Critical Water Level.

Half Drain Time for a 100 Year Return Critical Storm is 2.42 hours.

* * * END of REPORT * * *