

#2 Tudor Cottages, Tudor Drive, Westergate, PO20 3YT Planning Reference AL/77/19/HH

The Design Parameters for the Proposed Geocellular Structure Soakaway S/A#1, are as follows :-

The Soil Infiltration Rate for the Sides is $2.767\text{E-}3$ metres / second; and the Soil Infiltration Rate for the Base is $2.767\text{E-}3$ metres / second.

The Installation consists of a GeoCellular Structure of 3.50 metres Long by 1.00 metre Wide and 0.40 metres in Depth.

With a Cover Depth of 0.587 metres.

Percentage Void Space of 95%.

Impermeable Area specified as 92.4 square metres.

Using a Safety Factor of 8.0

The Design adopts a Factored Soil Infiltration Rate for the Sides of $3.459\text{E-}4$ metres / second.

And a Factored Soil Infiltration Rate for the Base of $3.459\text{E-}4$ metres / second.

The Rainfall Ratio for the Location is $r=0.34$

Rainfall Base Rate M5-60min the 5 Year Return Period Rainfall of 60 minutes Duration is 19.2mm.

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 9.561 metres at a depth of 1.050 metres Below Ground Level (BGL)

The GroundLevel at the Location of the Proposed Soakaway is 10.611 metres

The Soffit Level of the Proposed Soakaway is 10.024 metres

The Invert Level of the Lowest Incoming Pipe on the Proposed Soakaway is 9.924 metres

The Base Level of the Proposed Soakaway is 9.624 metres

The Base of the Soakaway Structure is 0.063 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 0.54 cubic metres out of 1.00 cubic metres available.

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

And the Half Drain Time is OK within the Allowable 24 hours Period at 0.05 hours.

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

The Design requires storage of 1.29 cubic metres out of 1.33 cubic metres available.

Therefore Storage is Passed with a Critical Storm occurring at 10 minutes.

And the Half Drain Time is OK within the Allowable 24 hours Period at 0.10 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	0.353	6.80	1.190	11.30	1.043	0.503	162	0.540	-OK-
10 minutes	0.503	9.70	1.220	16.50	1.524	1.006	156	0.518	-OK-
15 minutes	0.613	11.80	1.220	20.10	1.857	1.510	105	0.348	-OK-
30 minutes	0.783	15.00	1.240	26.10	2.411	3.019	empty	none	-OK-
1 hour	1.000	19.20	1.250	33.60	3.105	6.039	empty	none	-OK-
2 hours	1.225	23.50	1.240	40.80	3.773	12.078	empty	none	-OK-
3 hours	1.382	26.50	1.240	46.10	4.256	18.117	empty	none	-OK-
4 hours	1.518	29.10	1.220	49.80	4.600	24.156	empty	none	-OK-
5 hours	1.624	31.20	1.220	53.30	4.921	30.195	empty	none	-OK-
6 hours	1.713	32.90	1.203	55.40	5.118	36.234	empty	none	-OK-
7 hours	1.795	34.50	1.203	58.00	5.363	42.273	empty	none	-OK-
8 hours	1.865	35.80	1.203	60.30	5.572	48.312	empty	none	-OK-
9 hours	1.928	37.00	1.203	62.30	5.761	54.351	empty	none	-OK-
10 hours	1.985	38.10	1.190	63.50	5.867	60.390	empty	none	-OK-
11 hours	2.037	39.10	1.190	65.20	6.021	66.429	empty	none	-OK-
12 hours	2.085	40.00	1.190	66.70	6.162	72.468	empty	none	-OK-
14 hours	2.174	41.70	1.190	69.50	6.426	84.546	empty	none	-OK-
16 hours	2.251	43.20	1.180	71.40	6.597	96.624	empty	none	-OK-
18 hours	2.328	44.70	1.180	73.80	6.823	108.702	empty	none	-OK-
20 hours	2.405	46.20	1.180	76.30	7.049	120.780	empty	none	-OK-
22 hours	2.480	47.60	1.170	78.00	7.207	132.858	empty	none	-OK-
24 hours	2.557	49.10	1.170	80.40	7.430	144.935	empty	none	-OK-

Effective Volume of the Geocellular Structure Soakaway Installation for an M10 Return Period is 1.00 cubic metres.

Maximum Available (Effective) Outflow Surface Area at M10 Return is 4.85 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 5 minutes

With a Maximum Internal Structure Critical Water Level of 162mm.

Requiring a Maximum (Critical) Storage Capacity of 0.54 cubic metres.

The Outflow Surface Area for the Critical Storm Duration for the M10 Return is 4.23 square metres referenced to the Critical Water Level.

Half Drain Time for a 10 Year Return Critical Storm is 0.05 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	0.353	6.80	1.790	17.00	1.569	0.550	307	1.019	-OK-
10 minutes	0.503	9.70	1.910	25.80	2.386	1.100	387	1.286	-OK-
15 minutes	0.613	11.80	1.910	31.50	2.908	1.650	378	1.258	-OK-
30 minutes	0.783	15.00	1.990	41.90	3.870	3.300	172	0.570	-OK-
1 hour	1.000	19.20	2.030	54.60	5.042	6.599	empty	none	-OK-
2 hours	1.225	23.50	2.010	66.20	6.116	13.199	empty	none	-OK-
3 hours	1.382	26.50	2.010	74.70	6.899	19.798	empty	none	-OK-
4 hours	1.518	29.10	1.970	80.40	7.427	26.397	empty	none	-OK-
5 hours	1.624	31.20	1.970	86.00	7.946	32.996	empty	none	-OK-
6 hours	1.713	32.90	1.930	88.90	8.211	39.596	empty	none	-OK-
7 hours	1.795	34.50	1.930	93.10	8.604	46.195	empty	none	-OK-
8 hours	1.865	35.80	1.930	96.80	8.940	52.794	empty	none	-OK-
9 hours	1.928	37.00	1.930	100.00	9.242	59.394	empty	none	-OK-
10 hours	1.985	38.10	1.890	100.80	9.318	65.993	empty	none	-OK-
11 hours	2.037	39.10	1.890	103.50	9.562	72.592	empty	none	-OK-
12 hours	2.085	40.00	1.890	105.90	9.787	79.192	empty	none	-OK-
14 hours	2.174	41.70	1.890	110.40	10.205	92.390	empty	none	-OK-
16 hours	2.251	43.20	1.855	112.20	10.371	105.589	empty	none	-OK-
18 hours	2.328	44.70	1.855	116.10	10.726	118.787	empty	none	-OK-
20 hours	2.405	46.20	1.855	119.90	11.081	131.986	empty	none	-OK-
22 hours	2.480	47.60	1.815	121.00	11.180	145.184	empty	none	-OK-
24 hours	2.557	49.10	1.815	124.70	11.527	158.383	empty	none	-OK-

Effective Volume of the Geocellular Structure Soakaway Installation for an M100 Return Period is 1.33 cubic metres.

Maximum Available (Effective) Outflow Surface Area at M100 Return is 5.30 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 minutes

With a Maximum Internal Structure Critical Water Level of 387mm.

Requiring a Maximum (Critical) Storage Capacity of 1.29 cubic metres.

The Outflow Surface Area for the Critical Storm Duration for the M100 Return is 5.24 square metres referenced to the Critical Water Level.

Half Drain Time for a 100 Year Return Critical Storm is 0.10 hours.

* * * END of REPORT * * *