Stormwater Soakaway Report

Site address

Collins Avenue, Bohernabreena, Tallaght, Dublin 24

Date

18 / 2 / 2022

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1.0 INTRODUCTION

An on-site stormwater disposal system is required to accommodate the storm water run-off from a proposed 40m² of hardstand area at a development on Collins Avenue, Bohernabreena, Tallaght, Dublin 24. Testing has been carried out at the proposed soakaway location and a suitable soakaway system designed. Soakaway testing and design was carried out in accordance with BRE Digest 365.

2.0 FIELDWORK

A pit (SA1) was excavated at the proposed soakaway location to assess the ground conditions. The pit revealed a layer of slightly gravelly clay from ground level to 0.1m, which overlies a stratum of brown slightly gravelly silt/clay from 0.1m to 0.8m. A stratum of very gravelly sandy silt/clay with cobbles is present from 0.8m to the termination depth of 1.6m. No groundwater was encountered.

Testing was carried out in accordance with BRE Digest 365. The pit was saturated, then refilled with water. The drop in water level was recorded at regular intervals throughout the test.

From the test results, an f-value was calculated. This is the volume of water dispersed through unit area of soil per unit time.

In this case $f = 1.2077 \times 10^{-4}$ m/s

3.0 DESIGN

A soakaway is designed to accommodate the immediate run-off from a hardstand area following a period of rainfall and provide soakage into the surrounding soil, at such a rate, that sufficient storage is made available to accommodate the run-off from the next period of rainfall.

Using the f-value calculated from the test carried out in SA1, a stone filled trench soakaway has been designed for this site. The trench will be 2m long, 1.5m wide and 1.6m deep in total. The invert level of the intake pipe must be no more than 0.8m below ground level giving an effective soakaway depth of 0.8m. The trench must be filled using a gravel with minimum 30% voids. The trench should be lined with a geotextile to prevent the gravel becoming clogged with soil over time.

4.0 RECOMMENDATIONS

A stone filled trench soakaway has been designed for this site. The trench will be a minimum of 2m x 1.5m x 1.6m deep with a maximum intake pipe invert level of 0.8m giving an effective depth of 0.8m.

The soakaway should be built as close as possible to the location of the soakaway test (SA1). Observations should be made during construction to ensure that the stratum exposed are consistent with those observed in the test pit.

The gravel used in the trench should provide a minimum 30% free volume.

In accordance with BRE Digest 365, no storm water soakaway should be built within 5m of structural foundations.

APPENDIX 1
Soakaway Designs

Soakaway Design

Pit Details

| From	To	Description
0.00	0.10	Slightly gravelly CLAY
0.10	0.80	Brown slightly gravelly SILT/CLAY
0.80	1.60	Very gravelly sandy SILT/CLAY with cobbles

Groundwater Observations	None encountered

Site Data

Area of Site to be Served by Soakaway	40.00	m^2
Depth to Top of Permeable Stratum	0.80	m
Depth to Bottom of Permeable Stratum	1.60	m
Invert Level of Intake Pipe	0.80	m
Total depth of Soakaway (below ground level)	1.60	m
Effective depth of Soakaway	0.80	m
Infiltration Rate	0.000120773	m/s
Rainfall Return Period	50	years
Proposed Length of Soakaway	2.00	m
Proposed Width of Soakaway	1.50	m
Percentage Free Space in Gravel Pack	30	%
Total Storage Available in Gravel Filled Trench	0.72	m3

Soakaway Design Calculations (BRE Digest 365)

Duration (min)	Rainfall (mm)	Inflow (m^3)	Outflow (m^3)	Storage Req (m^3)	Storage Avail (m^3)	Drain Time (Hours)		Result
1	3.3	0.132	0.020	0.112	0.720	✓	0.0	✓
2	5.8	0.232	0.041	0.191	0.720	✓	0.1	✓
5	10.5	0.42	0.101	0.319	0.720	✓	0.1	✓
10	15.5	0.62	0.203	0.417	0.720	✓	0.2	✓
15	19.9	0.796	0.304	0.492	0.720	✓	0.2	✓
30	26	1.04	0.609	0.431	0.720	✓	0.2	✓
60	32	1.28	1.217	0.063	0.720	✓	0.0	✓
120	38	1.52	2.435	-0.915	0.720	✓	-0.4	✓
240	46	1.84	4.870	-3.030	0.720	✓	-1.2	✓
360	54	2.16	7.304	-5.144	0.720	✓	-2.1	✓
720	67	2.68	14.609	-11.929	0.720	✓	-4.9	✓
1440	79	3.16	29.217	-26.057	0.720	✓	-10.7	✓
2880	92	3.68	58.435	-54.755	0.720	✓	-22.5	✓
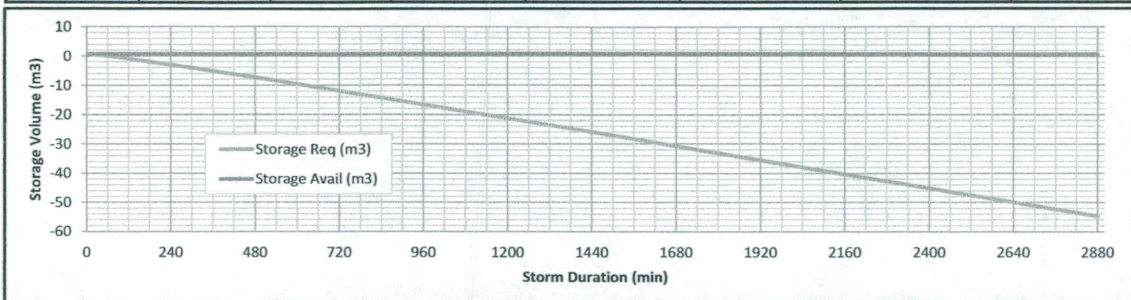
Conclusion

Based on these calculations, a 2m long, 1.5m wide, 1.6m deep, stone-filled trench
has the capability to accomodate the stormwater run-off from a hardstand area of 40 square metres. Care should be
taken during construction to ensure the ground conditions exposed remain similar to those observed at the trial pit. The gravel
used in the trench should have a minimum free volume of 30% and should be separated from the surrounding soil using a
permeable geo-textile membrane (to avoid soil clogging up the gravel over time)

APPENDIX 2
  Site Map

SEE DRG. NO. 17. 11. 21.

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