CONSULTING ENGINEERS

Engineering Report

At

50 Crannagh Road, Rathfarnham

26a Maywood Lawn,
Raheny, Dublin 5
e-mail: ross.somers@gmail.com
t: +353 87 9017325

Document Control

Revision	Date	Prepared
R0 (1st issue)	15-11-2022	RS

Table of Contents

1.0 Introduction

RS Consulting Engineers were requested to prepare a civil engineering part of an additional information request form South Dublin County Council for the proposed works at No. 50 Crannagh Road, Rathfarnham.

This report addresses the following items:

- Proposed wastewater drainage system
- Proposed surface water system
- Proposed water connection

2.0 Proposed wastewater drainage system

The new waste water from the extension will drain into the existing private shared sewer that is located at the rear of the property.

3.0 Proposed surface water system

Proposed surface water system was designed for 100 year return period plus 20% increase in rainfall depth for climate change.

SUDS is a fundamental change in the overall approach to drainage design with the primary aim of replicating the natural processes. This involves incorporating source control techniques which endeavour to mimic the natural movement of storm water from a development, reducing flood risk downstream, enhancing water quality and provide an improved environment.

In aiming to achieve this, it was intended that the following system would be adopted as part of the scheme:

- Soakpit

For details, please refer to drawing no. 22-270-001.

All proposed works will be carried out in accordance with South Dublin County Council Drainage Department, Greater Dublin Regional Code of Practice for Drainage Works and Building Regulations requirements.

Please refer to Appendix for soakpit calculations and Appendix B for the results and photographs of the site infiltration test.

4.0 Water Connection

The existing water connection will remain unchanged.

Appendix A: Soak pit calculation

Soakaway A Design

Assumed values for a rectangular soakaway

length (L) =	4 m	Note: Plan area of 16m²
depth (D)=	4 m	
width (W) =	W m	

Calculate the design width of the soakaway (W):

Accumulative impermeable area (A) = 71 m^2

Inflow (I) = The inflow from the impermeable area drained to the soakaway
I = A x R ,where
A = Accumulative impermeable area
R = The total rainfall in a design storm for a specific duration

Outflow (O) = The outflow infiltrating into the soil during rainfall
$O = a_{s50} \times f \times d$,where
a_{s50} = The internal surface area of the Soakaway to 50% effective depth :this excludes the base
f = The soil infiltration rate determined in a trial pit
d = The storm duration

a_{s50} = 2 x (L + W) x (D /2)
= 16 + 4 W

f = 5.14E-07 m/s

Assume Granular material having 30% free volume shall be used to fill the soakaway

Storage (S) = 30% of the effective volume of soakaway, and

Storage (S) = The required storage in the soakaway
S = I - O

10 year storm

Duration minutes	Rainfall mm	Inflow m^3	Outflow m^3	Storage m^3	W m
15	11.9	0.8449	0.00 + 0.00 W	4.8 W	0.176
30	15.5	1.1005	0.00 + 0.00 W	4.8 W	0.229
60	20	1.42	0.01 + 0.00 W	4.8 W	0.294
120	24.4	1.7324	0.01 + 0.01 W	4.8 W	0.358
240	30.9	2.1939	0.03 + 0.01 W	4.8 W	**0.450**
360	36.6	2.5986	0.04 + 0.02 W	4.8 W	0.531
720	45.7	3.2447	0.08 + 0.03 W	4.8 W	0.655
1440	55.1	3.9121	0.16 + 0.07 W	4.8 W	0.771
2880	65.8	4.6718	0.32 + 0.13 W	4.8 W	0.882

Therefore construct a plan area of 16m² x 0.45 m thick

Appendix B: Infiltration Test

Infiltration Test

Trial Pit Dimensions:

Length =	1 m
Width =	1 m
Depth =	1 m
Effective Depth =	0.4 m

Volume Outflowing between 75% and 25% effective depth:

V_{p75} = 0.2 m^3

Mean Surface Area through which outflow occurs:
(pit sides to 50% effective depth and pit base)

a_{p50} = 1.8 m^2

Time for outflow between 75% and 25% effective depth:

t_{p75-25} = 3600 minutes

Soil infiltration rate:

f = 5.14403E-07