



LOHAN & DONNELLY
Consulting Engineers

13 Gardiner Place, Mountjoy Square, Dublin 1. T: 01 8787770
W: www.lohan-donnelly.com E: info@lohan-donnelly.com

Project Title: Submission for Churchfields Phase 2B,
Mulhuddart, Dublin 15.

Report Title: Report on Proposed Drainage & Civil
Works for Part 8 Submission

Project Ref: 19126

Client: Fingal County Council

Revision:	Status:	Author:	Date:	Approved By:	Date:
Rev.P1	Issued for Part 8 Submission	POC	25-10-2019		

Table of Contents

1.0 Introduction.....	1
2.0 Surface Water Drainage.....	1
2.1 Existing Surface Water Drainage.....	1
2.2 Proposed Surface Water Drainage	1
2.2.1 SUDS Arrangements.....	1
2.2.2 Surface water Attenuation.....	1
2.2.3 Surface Water Sewer Design	2
2.2.4 Surface Water Outfall	3
2.2.5 Surface Water Quality.....	3
3.0 Foul Water Drainage.....	3
3.1 Existing Foul Water Drainage Arrangements	3
3.2 Proposed Foul Water Drainage Arrangements	4
3.2.1 Foul Water Sewer Design:.....	4
4.0 Watermain.....	4
4.1 Existing Watermain Arrangement.....	4
4.2 Proposed Watermain Arrangement	4
5.0 Site Civil Works & Traffic Management.....	5

1.0 Introduction

Lohan & Donnelly have been commissioned by Fingal County Council to prepare drainage and civil design drawings to support a part 8 submission for a proposed residential development at Churchfields Phase 2B, Mulhuddart, Dublin 15.

The scope of works is the construction of 70 No. residential dwellings. The existing site is currently a greenfield site which is located next to Avondale Park, Mulhuddart, Dublin 15.

2.0 Surface Water Drainage

2.1 Existing Surface Water Drainage

The existing site is currently a greenfield site. There is an existing residential development to the east of the site and to the northeast of the site there is a greenfield site which is currently being developed to residential units.

The site to the east is semi-private and has an attenuation tank to cater for the developments surface water. The site to the northeast a Fingal County Council development and is using stormtech chambers to attenuate its surface water.

There is no known public surface water sewer near the site for which a connection via gravity can be achieved.

2.2 Proposed Surface Water Drainage

2.2.1 SUDS Arrangements

From a previous site investigation, the site is deemed not suitable for infiltration. Therefore, traditional soakaways and infiltration trenches are not suitable for the site. It is therefore proposed to attenuate all surface water from the developments hard standing areas.

2.2.2 Surface water Attenuation

Under the sustainable urban drainage systems (SUDS) as specified in GSDSDS volume 2, the surface water systems are designed for the 1 in 100 year storm event and includes for 20% increase in rainfall intensity to cater for climate change. The surface water is to be stored on site in attenuation tanks. The outflow from these attenuation tanks flows through a hydro-brake, which is set at the agricultural limit for the site (2 l/s/ha). The site has a total area of 2.85 hectares resulting in a controlled flow rate of 5.7 l/s from the hydro-brake. The attenuated surface water will then discharge to the Pinkeen River via a new 225mm surface water pipe.

Considering the site is not suitable for infiltration, the storage volume required has been sized taking into account that there is no infiltration through the ground. The total hardstanding area accounted for (including permeable paving) is 11,758m². As shown in figure 1 this results in a required attenuation volume of 720.4m³ for the 100 year storm event with a factor of 20% taken into account for climate change.

StormTech SC-3500 chambers will be provided for stormwater attenuation. The StormTech SC-3500 chambers are the preferred option for attenuation storage due to the high void ratio of the tanks. The chambers and stone fill surround provides over 60% voids ratio. Traditional stone fill only provides 30% voids ratio. Considering the attenuation volume/area required is 720.4m³, stormtech chambers are preferred as the volume of stone fill at 30% voids ratio would be greater than the area designated to attenuation. Even if the stone fill were to only account for the 1 in 30 year storm event the volume/area of stone fill required would be greater than the area designated to attenuation.

The stormtech SC-3500 chambers shown on drawings 19126_C01 and 19126_C03 provides a storage volume of 733.1 m³. This storage volume allows for the 100 year storm event, and includes a factor of 20% for the effects of climate change.

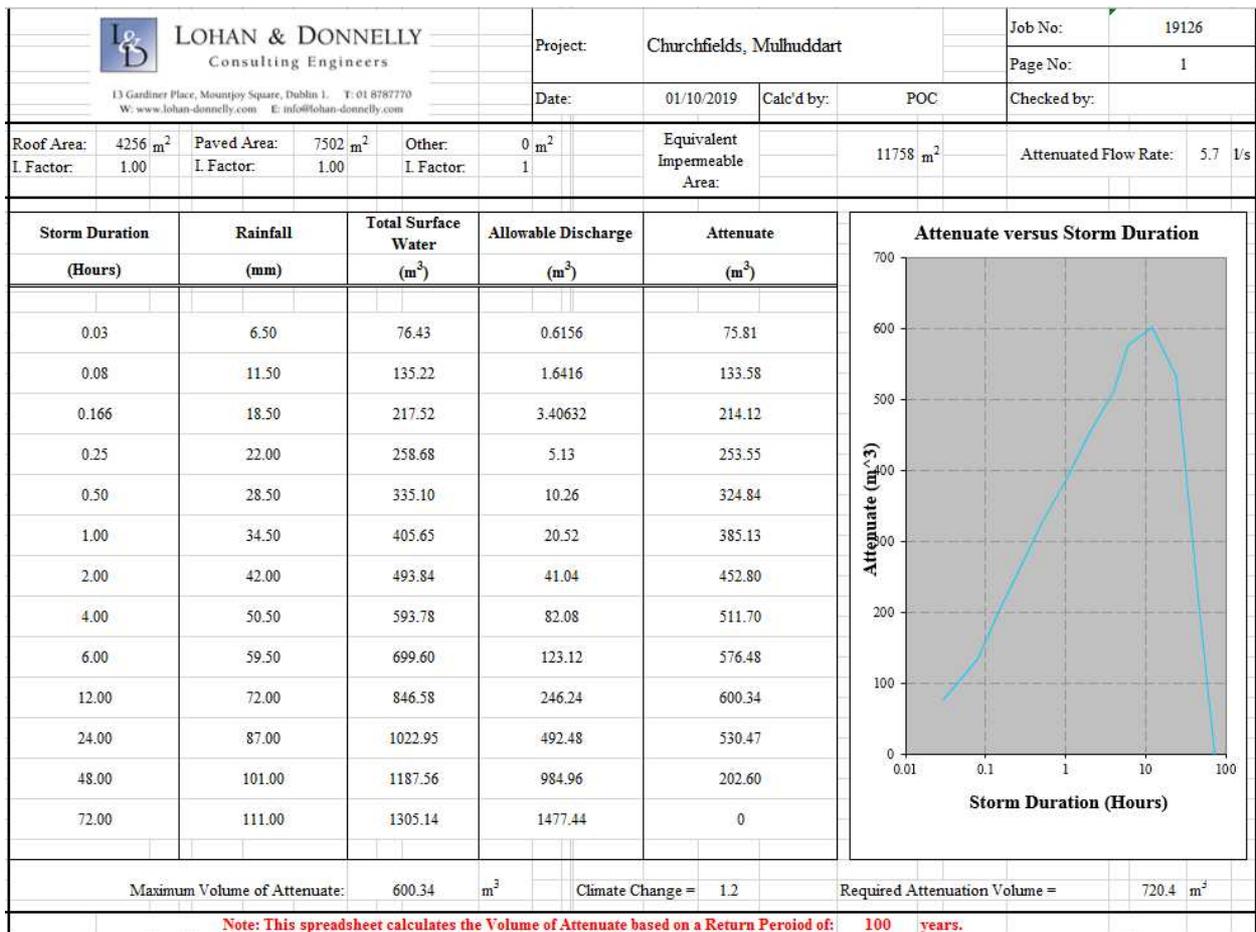


Figure 1: Stormwater Attenuation Calculation

2.2.3 Surface Water Sewer Design

All sewers are designed in accordance with BS 752: 2008 and Building Regulations TGD Part H. All drainage works shall be in accordance with the requirements of Fingal County Council. Surface water sewers have been designed using the modified rational method for a 2-year return period as shown in Figure 2 below.

LOHAN & DONNELLY Consulting Engineers		Project: Churchfields, Mulhuddart										Job No: 19126			
13 Gardiner Place, Mountjoy Square, Dublin 1. T: 01 8787770 W: www.lohan-donnelly.com E: info@lohan-donnelly.com		Date: 22/10/2019										Page No: 2			
		Calc'd by: POC										Checked by:			
Remarks	From	To	Area (m ²)	Previous Area (m ²)	Total Area (m ²)	Length of Pipe (m)	Gradien t	Size (mm)	Velocit y (m/s)	Capacity (l/s)	Time of Entry (min)	Time of Flow (min)	Time of Concentration (min)	Rainfall Intensity (mm/hr)	Total Run- Off (l/s)
	MH S01	MH S02	976.5	0.0	976.5	41.70	1: 200	225	0.87	34.4	4.00	0.80	4.80	64.50	17.50
	MH S02	MH S03	134.3	976.5	1110.9	18.40	1: 200	225	0.87	34.4	4.00	0.35	4.40	66.80	20.61
	MH S03	MH S04	225.0	1110.9	1335.9	15.40	1: 200	225	0.87	34.4	4.00	0.30	4.30	67.30	24.97
	MH S04	MH S06	1841.0	1335.9	3176.9	47.60	1: 200	400	1.27	159.5	4.00	0.62	4.60	65.50	57.80
	MH S06	MH S09	3081.0	3176.9	6257.9	36.70	1: 200	400	1.27	159.5	4.00	0.48	4.50	66.30	115.25
	MH S09	MH S11	839.6	6257.9	7097.6	30.50	1: 200	400	1.27	159.5	4.00	0.40	4.40	66.80	131.70
	MH S09	MH S10	581.2	6257.9	6839.1	33.88	1: 200	400	1.27	159.5	4.00	0.44	4.40	66.80	126.90
	MH S12	MH S13	1748.6	0.0	1748.6	56.59	1: 200	225	0.87	34.4	4.00	1.09	5.10	63.00	30.60
	MH S14	MH S15	1030.8	0.0	1030.8	75.40	1: 200	225	0.87	34.4	4.00	1.45	5.50	61.00	17.47
	MH S15	MH S16	247.8	1030.8	1278.5	13.40	1: 200	225	0.87	34.4	4.00	0.26	4.30	67.30	23.90
	MH S16	MH S17	1045.3	1278.5	2323.8	53.50	1: 200	300	1.05	74.1	4.00	0.85	4.90	64.00	41.31
Note: This spreadsheet calculates the flow in pipes based on the Modified Rational Method and a Return Period of:													2	years.	

Figure 2: Surface Water Sewer Design

2.2.4 Surface Water Outfall

New surface manhole (MH S22) contains a hydro-brake to limit the flow to 5.7 l/s. Refer to drawing 19126_C01 for the outfall manhole location.

2.2.5 Surface Water Quality

As the site is not deemed suitable for infiltration, there is no way of using green infrastructure to treat surface water of hydrocarbons. Section 16.5 of Cirea report 753 (the SuDs manual) states; unless infiltration is allowed, filter drains will not provide sufficient reduction in contaminant loads to surface water via volumetric run off. Therefore hydrocarbons are to be removed via a petrol interceptor. After the surface water passes through the hydro-brake, surface water in turn flows through a petrol interceptor which will remove oils before the surface water discharges to the Pinkeen River. Drawing 19126_C01 indicates the location of the petrol interceptor.

Refer to drawing 19126_C01_Rev.P1 for surface water plan, drawing 19126_C03_Rev.P1 for surface water sections and drawing 19126_C04_Rev.P1 for manhole details.

3.0 Foul Water Drainage

3.1 Existing Foul Water Drainage Arrangements

There is an existing 750Ø foul sewer pipe that runs from the south-west of the site to the south-east. There is also an existing 225Ø foul sewer pipe that runs adjacent to the site in Avondale Park.

3.2 Proposed Foul Water Drainage Arrangements

3.2.1 Foul Water Sewer Design:

It is proposed to provide a 225mm diameter foul sewer to serve the new development. The foul water from the dwellings will fall by gravity to outfall manholes and from the outfall manhole the foul water pipe will saddle connect into the existing 750Ø foul sewer pipe located on the south of the site. Due to the location Blocks No. 2, 3, 5 & 6 foul water will fall by gravity and saddle into the existing 225Ø foul water sewer located at Avondale Park Road to the east of the site.

Foul water pipe sizing is derived from wastewater loadings of 200 l/person/day. The proposed development consists of 70 dwellings, which generates a dry weather flow (1DWF) of 0.594 l/s with a 6DWF of 3.57 l/s, suggesting a 225Ø pipe at a gradient of 1/150 with a capacity of 39.7 l/s is sufficient to ensure blockages do not occur in the foul water pipe and has enough capacity allowance for future connections into the foul water sewer to the north-west of the site.

Refer to drawing 19126_C02_ Rev.P1 for foul sewer plan and drawing 19126_C04_ Rev.P1 for manhole details.

4.0 Watermain

4.1 Existing Watermain Arrangement

There is an existing 150Ø watermain running adjacent to the site along Avondale Park.

4.2 Proposed Watermain Arrangement

It is proposed to provide a new 150mm diameter HDPE watermain to serve the new development. The 150mm diameter HDPE will ultimately connect into the existing 150mm diameter watermain on Avondale Park as shown on drawing 19126_C05_Rev 0. An approved Bulk Watermeter will be installed at locations where the new 150mm diameter HDPE connects into existing 150mm diameter watermain on Avondale Park. 5 No. hydrants are to be installed on the line to cover all dwellings within a 46m radius.

Refer to drawing 19126_C05_Rev.P1 for proposed watermain plan and drawing 19126_C06_Rev.P1 for watermain details.

5.0 Site Civil Works & Traffic Management

Refer to drawing 19126_C07_Rev.P1 for civil structural works plan and road details.

Refer to drawing 19126_C08_Rev.P1 for traffic management plan & sight lines.

We trust that this is in order, but should you have any queries on the foregoing, please do not hesitate to contact the undersigned.

Signed 
Mr. Peter O Connor

Date: 25th October 2019

For Lohan & Donnelly Civil & Structural Consulting Engineers

Enclosed:

Issue Sheet - 1 Copy

Site Plan – Surface Water Drainage Plan (19126_C01_Rev.P1) – 1 Copy

Site Plan – Foul Sewer Drainage Plan (19126_C02_Rev.P1) - 1 Copy

Surface Water – Sections (19126_C03_Rev.P1) - 1 Copy

Manhole Details – Manhole Type A, B & C (19126_C04_Rev.P1) - 1 Copy

Site Plan – Watermain Plan (19126_C05_Rev.P1) - 1 Copy

Watermain – Sections & Details (19126_C06_Rev.P1) - 1 Copy

Site Plan – Civil Structural Works (19126_C07_Rev.P1) - 1 Copy

Site Plan – Traffic Management & Sight Lines (19126_C08_Rev.P1) - 1 Copy

19126_SUD's Selection Rationale - 1 Copy