POGA
CONSULTING
ENGINEERS

Unit C2, Nutgrove Office Park,
Rathfarnham, Dublin 14, D14CR20
T. 01 2051101 E. info@poga.ie W. poga.ie

Engineering Planning Report

Further Information

Whitechurch Road – Rathfarnham, County Dublin

Further Information

Whitechurch Road – Rathfarnham, County Dublin

August 2022

Notice

This document and its contents have been prepared and are intended solely for the commissioning client and the project named above.

POGA Consulting Engineers assumes no responsibility to any other party in respect of or arising out of or in connection with this document and / or its contents.

Document History

JOB NUMBER: 21029			DOCUMENT REF: 21029-EPR-FI-R0.docx			
R0	Further Information Issue	NM	PM	PM	PM	18/08/2022
Revision	Purpose Description	Originated	Checked	Reviewed	Authorised	Date

TABLE OF CONTENTS: **PAGE:**

1.0 INTRODUCTION

In response to a request of Further Information (FI) by South Dublin County Council (SDCC) for the Planning Application (Ref: SD22A/0039) we enclosed our Further Information Submission in relation to items: 3, 5 (a) (b) & (c) and 6.

This report should be read in conjunction with POGA Consulting Engineers drawings and all other Consultants' reports and drawings.

2.0 RESPONSE TO FURTHER INFORMATION REQUEST

Item 3

"The Planning Authority is concerned that as a result of the proposed development the strip of land to the east with surface water infrastructure would be further isolated and access to it restricted (when required for maintenance). The applicant is requested to consider this strip of land (and the piped stream) in the overall development. It is requested that the nature of this infrastructure, whether it is only a piped stream, is confirmed. The site boundary (red line) should be extended to include this strip of land. The applicant should consider whether appropriate landscaping could be provided along this strip of land (in line with ecological surveys). Dedicated access to this strip of land from the subject site should be provided. An appropriate setback distance of structures from any pipe should be provided. The separation distance of the proposed bicycle store and House No. 8 in particular from the eastern boundary should be reviewed in relation to this."

Response and Reference

Noted. We have investigated the drainage in the existing strip of land to the East of the subject site and found that there is a ø375mm surface water pipe which flows northwards along the boundary of the Loreto Hockey Club and into the Beaufort Downs housing estate. We have liaised with Padraig Slyne and Gabrielle McGee (SDCC Drainage Department) and Colm Harte (SDCC Area Inspector) about this matter. We have met Colm Harte on site to show a SDCC representative the original position of the pipe and to document the agreed move.

It was agreed to locally move the existing pipe eastwards away from the boundary to achieve the required minimum 3m offset from House 8 and the bike shed building. Please refer to drainage drawing 21029-102 which shows the updated position of the surface water pipe.

Item 5 (a)

"The issue of surface water attenuation has been raised as a significant concern for the Public Realm Section. A revised proposal is requested that includes further provision of additional natural above ground SuDS features to reduce or remove the need for an attenuation tank within the development. Further consideration of the breakdown in provision of open space, the location and size of attenuation tank proposed, and the incorporation of additional SuDS measures needs to be carried out. The response should include revised layout and drawings and avoid the use of underground tanks within open space areas where possible. The applicant is referred to the recently published SDCC SuDS Design Guide for further information and guidance. Examples of above ground SuDS to consider include; Green roofs, Swales, Tree pits Permeable Paving, Rain gardens, Channel rills, Water butts, Grasscrete"

Response and Reference

Noted. We have liaised with Mr Brian Harkin, Senior Executive Engineer at SDCC Water Services and agreed on a surface water drainage philosophy. We have added additional SuDS features as requested, these include; permeable paving at the driveways with infiltration

trenches at the base, a raingarden planter at the rear of each dwelling to store and treat the run off from 50% of the roofs, swales and infiltration trenches to drain sections of the road, and a 200mm deep overground detention basin to store the attenuated storm water flows generated by the 1 in 100 year storm event.

As requested by SDCC we have reduced the size of the underground attenuation storage system. However, due to the volume of water storage required in the 1 in 100 year storm event (211m^3 refer to Appendix A), it is not possible to remove the attenuation storage requirement completely. However, in order to reduce the attenuation storage under the public open space, we have allowed for the storage volumes from the SuDS features to be taken away from the overall storage requirements. This leaves the required attenuation capacity at 76m^3, we have designed the underground attenuation storage to store 55m^3 of run off up to the 1 in 30 year storm. The overground detention basin will be engaged with surface water run off event in exceeds the 1 in 30 year storm event.

Please refer to drawing 21029-102 for the drainage layout and to 21029-105 for surface water/SuDS features details.

Item 5 (b)

"The applicant is requested to submit a drawing and report to show what SuDS are proposed for the development. Show in m3 what surface water attenuation capacity proposed SuDS systems have."

Response and Reference

Please refer to Appendix A which shows a full break down of the SuDS treatment philosophy with the attenuation capacity provided for each system. Drawings 21029-102 & 105 also show the attenuation storage capacity provided.

Item 5 (c)

"A comprehensive SuDS Management Plan is requested to demonstrate that the proposed SuDS features have reduced the rate of run off into the existing surface water drainage network. A maintenance plan shall also be included as a demonstration of how the system will function following implementation. In addition, the applicant should demonstrate how the proposed natural SUDS features will be incorporated and work within the drainage design for the proposed development."

Response and Reference

Please refer to Appendix D which includes the SuDS Management Plan as requested by SDCC.

Item 6

"The applicant is requested to submit a report and drawing to clearly show the location of proposed site on an OPW CFRAM Flood map. This will identify the location of site relative to adjacent flood zones if any and determine if any flood risks arise. If there is a risk of flooding such as a 1 in 1,000 year flood risk outline in a report and drawing what flood mitigation

measure are proposed for the development. Outline in report what if any flood risk there is for property upstream and downstream of proposed development due to same. Prior to the submission of revised documents the applicant might contact water services of South Dublin County Council to discuss same."

Response and Reference

Noted, please refer to Appendix C which shows the site boundary in red imposed on the RPS flood map. RPS Consulting Engineers produced this map as part of the Dodder Catchment Flood Risk Assessment and Management Study. The map identifies areas of predicted flooding along the Owendoher and Whitechurch streams, water levels for the 10, 100 & 1,000 year storm events are provided at various node points. Node points WS-3202 & WS-3204 are located along the Whitechurch Stream directly across the street from the subject site, the highest recorded flood levels at these points are; 52.02m (1:100 year event) and 52.30m (1:1000 year event). The lowest finished floor level at the subject site, 53.275m, is 1.2m above the 1:100 event and over 975mm above the 1:1000 event.

POGa CONSULTING ENGINEERS

APPENDICES

APPENDIX A

Surface Water Storage Provision

The storage requirements were designed according to Drainage Design Process Flow Charts provided in the GDSDS document.

- Required interception volume provided by the filter drains was calculated for a rainfall depth of 5mm and assuming 80% runoff from paved surfaces and 0% from pervious surfaces.
- Required treatment volume for the overlying swales was estimated for a rainfall depth of 15mm and assuming 80% runoff from paved surfaces and 0% from pervious surfaces.
- Storage volume in the attenuation system has been calculated using the 1, 30, and 100-year storm events +20% climate change, with no surface flooding taking place in the 100-year storm event.

STORAGE REQUIREMENTS			
Subject site information			
Site Area			0.58 Ha
PIMP Factor			0.46
Total Impermeable area			0.27 Ha
Criteria 1 - River Water Quality Protection			
Interception volume (5mm of rainfall)			$11m^3$
Treatment volume (15mm of rainfall with interception volume deducted)			$22m^3$
Total (Sum of interception and treatment Volume)			**$33m^3$**
Criteria 2 - River Regime Protection			
Attenuation Volumes			
1 Year Storm			$75m^3$
30-year storm			$166m^3$
100-year storm			$211m^3$
Criteria 3 - Level of Service for the Site			
All house levels are set 500mm above top water level of attenuation system			
Criteria 4 - River Flood Protection			
Long term storage is not provided. Outflow limited to Qbar.			
STORAGE PROVISION			
SUDS techniques	**Interception**	**Treatment**	**Attenuation**
Swales	(LxDxW) (62x0.2x1.0) $12.4m^3$	-	-
Filter Drains	(LxDxWxVoids) (62x0.9x0.75x0.4) $16.7m^3$	-	-
Rain Garden Planters	[(VolumexVoids)xNumber)] [2.5x1.5x0.9x0.4)x22] $30m^3$	-	-
Permeable paving (Treatment)	-	[Area x DepthxVoids] [540x0.35x0.4] $76m^3$	-
Underground Storage (30 Year)	-	-	$55m^3$
Detention Basin			$24m^3$
Sub Total	**$59.1m^3$**	**$76m^3$**	**$79m^3$**
Total			**214.1 m^3**
Compliance	**135.1>33 = ok**	**214>211 = ok**	

Figure 3.2 Treatment Train Calculations

POGA CONSULTING ENGINEERS

APPENDIX B

Rainfall Data

Raingarden Planter Size

Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 314287, Northing: 228180,

	Interval		Years												
DURATION	6months,	1year,	2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	150,	200,	250,	500,
5 mins	2.6,	3.9,	4.6,	5.6,	6.3,	6.9,	8.8,	11.0,	12.5,	14.7,	16.6,	18.1,	20.5,	22.4,	23.9,	N/A ,
10 mins	3.7,	5.4,	6.4,	7.8,	8.8,	9.6,	12.3,	15.4,	17.5,	20.5,	23.2,	25.3,	28.6,	31.2,	33.3,	N/A ,
15 mins	4.3,	6.3,	7.5,	9.2,	10.4,	11.3,	14.5,	18.1,	20.6,	24.1,	27.2,	29.7,	33.6,	36.7,	39.2,	N/A ,
30 mins	5.7,	8.3,	9.7,	11.9,	13.3,	14.5,	18.3,	22.8,	25.7,	30.0,	33.8,	36.8,	41.4,	45.0,	48.0,	N/A ,
1 hours	7.5,	10.8,	12.6,	15.3,	17.1,	18.5,	23.2,	28.6,	32.2,	37.3,	41.9,	45.4,	50.9,	55.2,	58.8,	N/A ,
2 hours	10.0,	14.1,	16.3,	19.7,	21.9,	23.7,	29.5,	36.0,	40.4,	46.5,	51.9,	56.2,	62.7,	67.8,	72.0,	N/A ,
3 hours	11.7,	16.5,	19.0,	22.8,	25.4,	27.3,	33.8,	41.2,	46.0,	52.9,	58.9,	63.6,	70.8,	76.4,	81.1,	N/A ,
4 hours	13.2,	18.4,	21.2,	25.3,	28.1,	30.3,	37.3,	45.3,	50.6,	57.9,	64.4,	69.5,	77.2,	83.2,	88.2,	N/A ,
6 hours	15.5,	21.5,	24.6,	29.3,	32.5,	35.0,	42.9,	51.8,	57.7,	65.8,	73.1,	78.6,	87.2,	93.8,	99.3,	N/A ,
9 hours	18.2,	25.1,	28.7,	34.0,	37.6,	40.4,	49.3,	59.3,	65.8,	74.8,	82.9,	89.0,	98.5,	105.7,	111.8,	N/A ,
12 hours	20.5,	28.0,	31.9,	37.8,	41.7,	44.7,	54.4,	65.2,	72.2,	82.0,	90.6,	97.2,	107.3,	115.1,	121.6,	N/A ,
18 hours	24.1,	32.7,	37.2,	43.8,	48.2,	51.6,	62.5,	74.5,	82.4,	93.2,	102.7,	110.1,	121.2,	129.8,	136.8,	N/A ,
24 hours	27.1,	36.5,	41.4,	48.6,	53.4,	57.1,	68.9,	82.0,	90.4,	102.1,	112.3,	120.2,	132.1,	141.3,	148.8,	174.9,
2 days	33.7,	44.5,	50.0,	58.1,	63.4,	67.4,	80.3,	94.3,	103.3,	115.6,	126.4,	134.5,	146.9,	156.4,	164.1,	190.6,
3 days	39.1,	50.9,	57.0,	65.7,	71.4,	75.8,	89.5,	104.4,	113.9,	126.8,	138.1,	146.6,	159.4,	169.2,	177.2,	204.4,
4 days	43.8,	56.6,	63.1,	72.4,	78.4,	83.0,	97.6,	113.2,	123.1,	136.6,	148.3,	157.1,	170.4,	180.5,	188.7,	216.7,
6 days	52.1,	66.4,	73.6,	83.9,	90.6,	95.7,	111.5,	128.4,	139.1,	153.6,	166.1,	175.5,	189.6,	200.2,	208.9,	238.2,
8 days	59.4,	75.1,	82.9,	94.0,	101.3,	106.7,	123.7,	141.7,	153.1,	168.4,	181.5,	191.4,	206.2,	217.4,	226.4,	257.0,
10 days	66.1,	83.0,	91.3,	103.2,	110.9,	116.7,	134.7,	153.7,	165.7,	181.8,	195.5,	205.8,	221.3,	232.9,	242.3,	274.0,
12 days	72.3,	90.3,	99.2,	111.8,	119.9,	126.0,	144.9,	164.8,	177.3,	194.1,	208.4,	219.1,	235.1,	247.1,	256.9,	289.6,
16 days	83.9,	103.9,	113.7,	127.5,	136.4,	143.0,	163.6,	185.1,	198.5,	216.5,	231.8,	243.3,	260.3,	273.1,	283.4,	318.0,
20 days	94.7,	116.4,	127.0,	141.9,	151.4,	158.6,	180.6,	203.5,	217.8,	236.9,	253.1,	265.2,	283.1,	296.5,	307.4,	343.6,
25 days	107.3,	130.9,	142.5,	158.6,	168.9,	176.6,	200.2,	224.8,	240.0,	260.3,	277.5,	290.3,	309.3,	323.4,	334.9,	372.9,

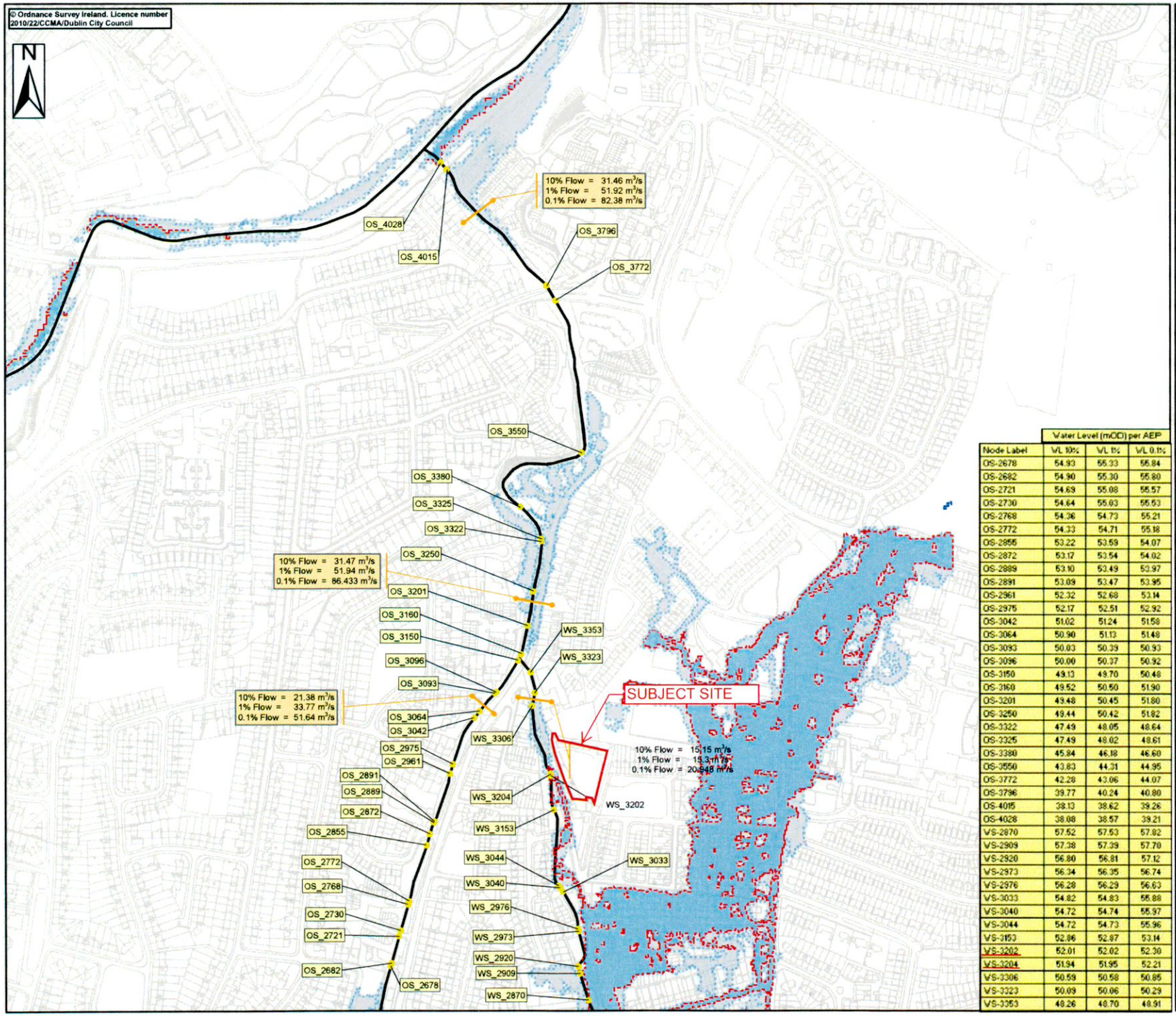
NOTES:
N/A Data not available
These values are derived from a Depth Duration Frequency (DDF) Model
For details refer to:
'Fitzgerald D. L. (2007), Estimates of Point Rainfall Frequencies, Technical Note No. 61, Met Eireann, Dublin',
Available for download at www.met.ie/climate/dataproducts/Estimation-of-Point-Rainfall-Frequencies_TN61.pdf

M10 120 = 29.5
Roof Area = $43m^2$
Req Vol = $29.5x10^{-3}x43$
Req Vol = $1.27m^3$
Voids = 40%
Req Vol Soil = $(1.27/0.40) = 3.17m^3$
Planter Vol = $2.5x1.5x0.9 = 3.4m^3$

POGA CONSULTING ENGINEERS

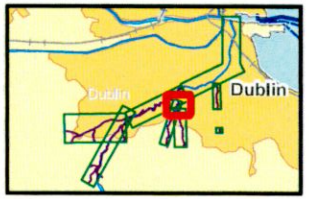
APPENDIX C

CFRAMS Flood Mapping



	Water Level (mOD) per AEP		
Node Label	WL 10%	WL 1%	WL 0.1%
OS-2678	54.93	55.33	55.84
OS-2682	54.90	55.30	55.80
OS-2721	54.69	55.08	55.57
OS-2730	54.64	55.03	55.53
OS-2768	54.36	54.73	55.21
OS-2772	54.33	54.71	55.18
OS-2855	53.22	53.59	54.07
OS-2872	53.17	53.54	54.02
OS-2889	53.10	53.49	53.97
OS-2891	53.09	53.47	53.95
OS-2961	52.32	52.68	53.14
OS-2975	52.17	52.51	52.92
OS-3042	51.02	51.24	51.58
OS-3064	50.90	51.13	51.48
OS-3093	50.03	50.39	50.93
OS-3096	50.00	50.37	50.92
OS-3150	49.13	49.70	50.48
OS-3160	49.52	50.50	51.90
OS-3201	49.48	50.45	51.80
OS-3250	49.44	50.42	51.82
OS-3322	47.49	48.05	48.64
OS-3325	47.49	48.02	48.61
OS-3380	45.84	46.18	46.60
OS-3550	43.83	44.31	44.95
OS-3772	42.28	43.06	44.07
OS-3796	39.77	40.24	40.80
OS-4015	38.13	38.62	39.26
OS-4028	38.08	38.57	39.21
WS-2870	57.52	57.53	57.92
WS-2909	57.38	57.39	57.70
WS-2920	56.80	56.81	57.12
WS-2973	56.34	56.35	56.74
WS-2976	56.28	56.29	56.63
WS-3033	54.82	54.83	55.88
WS-3040	54.72	54.74	55.97
WS-3044	54.72	54.73	55.96
WS-3153	52.86	52.87	53.14
WS-3202	52.01	52.02	52.30
WS-3204	51.94	51.95	52.21
WS-3306	50.59	50.58	50.85
WS-3323	50.09	50.06	50.29
WS-3353	48.26	48.70	48.91

Location Plan:



Legend:

- 10 % AEP Flood Extent (1 in 10 chance in any given year)
- 1 % AEP Flood Extent (1 in 100 chance in any given year)
- 0.1 % AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- High Confidence (<20m) (10% AEP)
- Medium Confidence (<40m) (10% AEP)
- Low Confidence (>40m) (10% and 0.1% AEP)
- High Confidence (<20m) (1% AEP)
- Medium Confidence (<40m) (1% AEP)
- Low Confidence (>40m) (1% AEP)
- River Centreline
- Node Point
- OS_2975 — Node Label (refer to table)
- Flow reporting location
- 10% Flow = 1.29 / 1% Flow = 1.55 / 0.1% Flow = 2.17 — Peak flow during design flood extent

USER NOTE:

USERS OF THESE MAPS SHOULD REFER TO THE DETAILED DESCRIPTION OF THEIR DERIVATION, LIMITATIONS IN ACCURACY AND GUIDANCE AND CONDITIONS OF USE PROVIDED AT THE FRONT OF THIS BOUND VOLUME. IF THIS MAP DOES NOT FORM PART OF BOUND VOLUME, IT SHOULD NOT BE USED FOR ANY PURPOSE.

Client:

Project:

DODDER CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT STUDY

Map:

PRESENT DAY OWENDOHER & WHITECHURCH

Map Type: FLOOD EXTENT
Source: FLUVIAL FLOODING
Map Area: URBAN AREA
Scenario: CURRENT

Drawn By : A.A.B **Date :** 26 November 2010
Checked By : A.J. **Date :** 26 November 2010
Approved By : A.G.B **Date :** 26 November 2010

Figure No. :

OSWS/EXT/UA/CURS/103

Map Series : Page 3 of 3

Drawing Scale : 1: 5,000 **Plot Scale :** 1:1 @ A3

0 0.1 0.2
Kilometers

RPS Consulting Engineers
ELMWOOD HOUSE
74 BOUCHER ROAD
BELFAST BT12 6RZ
TEL : 028 9066 7914
FAX : 028 9066 8286
www.rpsgroup.com/Ireland

POGa CONSULTING ENGINEERS

APPENDIX D

SuDS Management Plan

SuDS Management Plan

1.0 INTRODUCTION

Sustainable Drainage Systems (SuDS) is a series of management practices and control structures that aim to mimic natural drainage. SUDS reduces flood risk, improves water quality and provides amenity through the use of permeable paving, swales, green roofs, infiltration trenches, rain water harvesting, detention basins, ponds and wetlands. SUDS can achieve multiple objectives such as removing pollutants from urban run-off at source, controlling surface water run-off from developments and ensuring flood risk does not increase further downstream. Furthermore, SUDS offers the opportunity to combine water management with green space, which can increase amenity and biodiversity.

The three main aims of using SuDS techniques are:

- To infiltrate the surface water into the ground through development of porous pavements such as permeable paving, swales, infiltration trenches and detention basins.
- The holding of water in storage areas through the construction of green roofs, rainwater harvesting, detention basins, ponds, and wetlands.
- The general slow-down of the movement of water.

This report should be read in conjunction with POGA Consulting Engineers drawings and all other Consultants' reports and drawings.

Note that this document is live and is subject to change over time. The Maintenance Plan is to be reviewed and updated whenever maintenance contracts are renewed.

2.0 SuDS Techniques

In accordance with the SuDS philosophy it is proposed to provide five surface water treatment features at the subject site, these include; permeable paving, infiltration trenches, swales, rain garden planters, and a detention basin. The techniques chosen help maintain the run off quantity and quality by means of infiltration and treatment. The SuDS techniques also limit the discharge of run off at the outfall into the Whitechurch Stream.

2.1 Suds Techniques:

- Permeable Paving - Permeable paved areas are located at the driveway of each dwelling. It is proposed to drain the surface water run-off from the front area of roof through the permeable paving and into an infiltration trench located at the base. The inspection chambers located along the infiltration trench, these act as an access point for maintenance.
- Swale & Infiltration Trench – The swale an infiltration trench are located along the edge of the open space at the centre of the site. It is proposed to drain the road & hardstanding areas into the swale and infiltration trench. The stone gravel in the trench treats the run off before it connects back into the main drainage network. The inspection chambers located along the swale acting as an access point for maintenance.
- Rain Garden Planters – It is proposed to store the surface water run-off from the rear area of roofs in a rain garden planter system. The planters are designed to add an attractive colour feature to each garden, improve the bio diversity, and help with the pollination of plants. Each planter will act as an attenuation during storm events but will also have weep holes acting as a form of overflow.
- Detention Basin – There is a 200mm deep detention basin at the centre of the open space designed to store the surplus storm water volume in extreme storm events (1:30 years or greater). The banks of the basin are sloped at 1:3 to allow for gardening and maintenance.

Please refer to Figure 2.1 which shows the locations of each SuDS feature and the areas where maintenance access is possible.

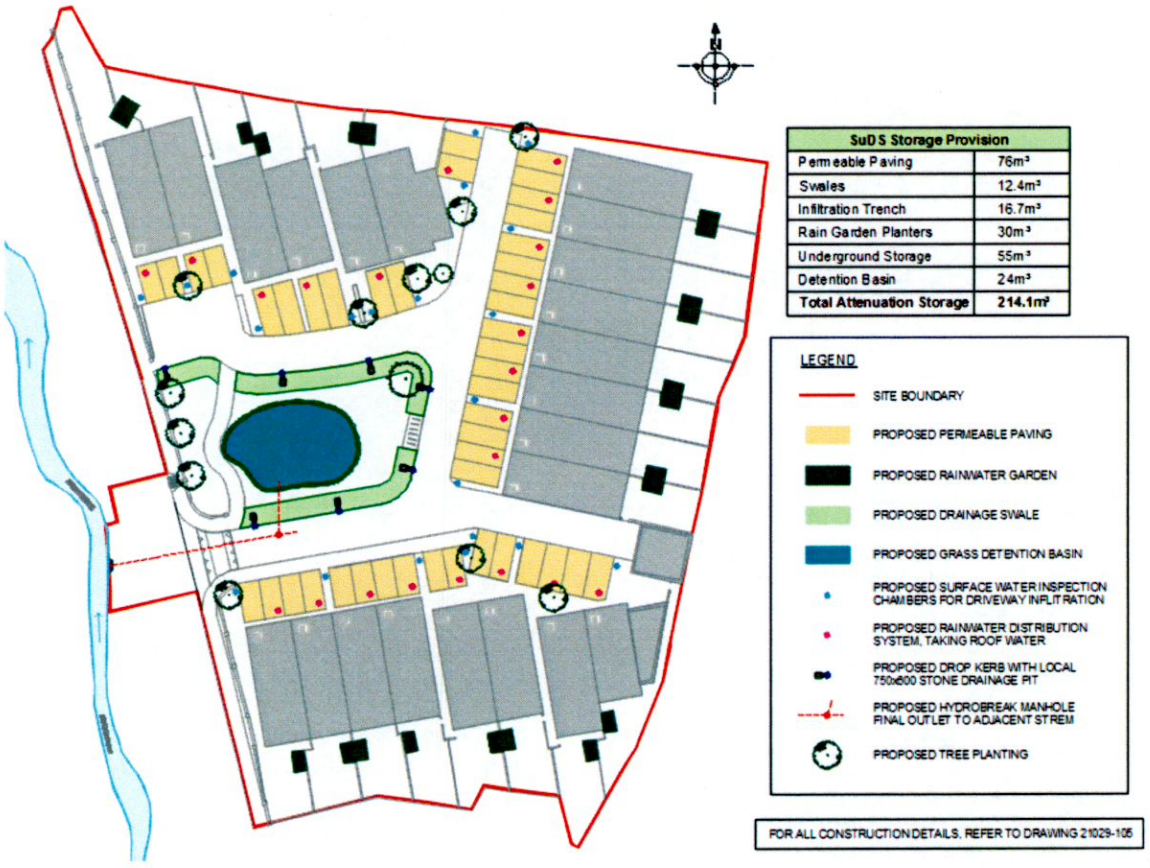


Figure 2.1 SuDS feature and the areas where maintenance access is possible.

2.2 Maintenance

The SuDS features will require maintenance over time to ensure they are functioning properly. If regular scheduled maintenance is not carried out, a site can change over time, evolving into an urban wasteland. Please refer to Figure 2.2, which details the maintenance schedule for the subject site. The O&M manual for maintaining the Stormtech attenuation system is attached in Addendum 1

The maintenance procedures for the site can be split into two groups; regular and occasional maintenance.

Regular Maintenance		
Type	Activity	Frequency
Litter	Pick up all litter and debris in SuDS landscaped areas (and all site). Remove from site.	1 visit monthly
Grass	Mow all grass verges, paths and open space areas at 35050mm. 75mm max. Leave cuttings in situ.	1 visit monthly (More visits required during growing season)
Detention Basin	Mow all dry swales and detention basin to allow flow channels. Cut to 100-150mm max. Cut swales and basin areas annually. First and last cuts to be gathered.	6 visits per year
Weeding	Wildflower areas to be strimmed to 100mm. Weeding of invasive species to be done annually.	1 visit annually
Pervious Surfaces	Sweep all permeable paved areas.	1 visit annually
Oil Removal/ Filters	Inspect all filters and inspection chambers monthly. Remove any debris from around aprons.	1 visit monthly
Occasional Maintenance		
Type	Activity	Frequency
Permeable Paving	Sweep and suction brush all permeable surfaces.	1 visit monthly
Flow Controls	Annual inspection of control chambers. Remove silt and check the free flow.	1 visit annually
Detention Basin	Remove sediment from basin using hand tools. Sediment removal can damage the surrounding vegetation. Contractor to re-establish if required.	1 visit annually
Silt	Inspect swales, infiltration trenches and inspection chambers. Excavate silt.	1 visit annually

Figure 2.2 Maintenance schedule for the subject site

2.2.1 Regular Maintenance

Regular maintenance of the SuDS features comprises:

- Inspections and reporting – These will help achieve optimum performance of the features, establish the ongoing hydraulic performance of the systems, and allow for the identification of any potential performance failures.
- Litter and Debris removal – These are an integral part of SuDS maintenance. In order to reduce the risk of inlet and outlet blockages, retain amenity value and to minimise pollution risks.

- Grass cutting – The grass cutting regime is specific for each area to maximise the performance of SuDS. For example allowing the grass to grow in areas enhances the water quality. Short grass around the detention basin is not suitable. This can lead to nuisance wildlife
- Weed and Invasive Plant Control – The spread of alien or invasive species needs to be halted, by either manual weeding or mowing.
- Shrub management – Shrubs require weeding at their bases, especially during years one and two to ensure they retain enough water for growth.
- Pervious surfaces – Sweeping pervious surfaces on a regular basis is a requirement on this site. This will help maintain their infiltration capacity. Sweeping and cleaning may only be required once a year.
- Oil removal & cleaning/replacing filters – The oil removal and cleaning of the filters for the attenuation tank and the flow control device should be as per the manufacturer's guidelines.

2.2.2 Occasional Maintenance

The main occasional maintenance activity is sediment removal. This activity will help ensure the long term performance of the SuDS features. Sediment removal is required at:

- Detention Basin
- Infiltration trenches at the driveways and under the swale

For this small site it is recommended that hand tools are used to remove the sediment to avoid damaging the SuDS feature and reduce disturbance the surrounding soil. Proprietary systems such as suction tankers may be used to remove the sediment also.

Note that it is best to complete the occasional maintenance tasks at the detention basin and swale during the season between September-March. This will minimise the impact on the receiving water body. As the project develops over time, maintenance to the detention basin may be limited to September – October to protect wildlife breeding or hibernating.

Addendum 1

Isolator® Row Plus
O&M Manual

ADS StormTech™

The Isolator® Row Plus

Introduction

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The StormTech Isolator Row Plus is a technique to inexpensively enhance Total Suspended Solids (TSS) and Total Phosphorus (TP) removal with easy access for inspection and maintenance.

The Isolator Row Plus

The Isolator Row Plus is a row of StormTech chambers, either SC-160, SC-310, SC-310-3, SC-740, DC-780, MC-3500 or MC-7200 models, that is surrounded with filter fabric and connected to a closely located manhole for easy access. The fabric-wrapped chambers provide for sediment settling and filtration as stormwater rises in the Isolator Row Plus and passes through the filter fabric. The open bottom chambers and perforated sidewalls (SC-310, SC- 310-3 and SC-740 models) allow stormwater to flow both vertically and horizontally out of the chambers. Sediments are captured in the Isolator Row Plus protecting the adjacent stone and chambers storage areas from sediment accumulation.

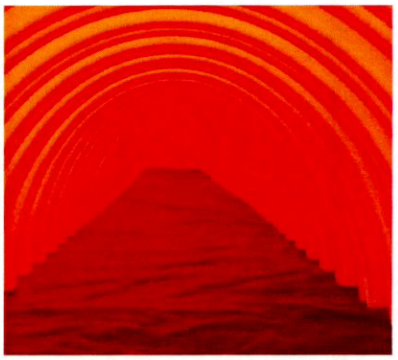
ADS geotextile fabric is placed between the stone and the Isolator Row Plus chambers. The woven geotextile provides a media for stormwater filtration, a durable surface for maintenance, prevents scour of the underlying stone and remains intact during high pressure jetting. A non-woven fabric is placed over the chambers to provide a filter media for flows passing through the chamber's sidewall. The non-woven fabric is not required over the SC-160, DC-780, MC-3500 or MC-7200 models as these chambers do not have perforated side walls.

The Isolator Row Plus is designed to capture the "first flush" runoff and offers the versatility to be sized on a volume basis or a flow-rate basis. An upstream manhole provides access to the Isolator Row Plus and includes a high/low concept such that stormwater flow rates or volumes that exceed the capacity of the Isolator Row Plus bypass through a manifold to the other chambers. This is achieved with an elevated bypass manifold or a high-flow weir. This creates a differential between the Isolator Row Plus row of chambers and the manifold to the rest of the system, thus allowing for settlement time in the Isolator Row Plus. After Stormwater flows through the Isolator Row Plus and into the rest of the chamber system it is either exfiltrated into the soils below or passed at a controlled rate through an outlet manifold and outlet control structure.

The Isolator Row FLAMP™ (patent pending) is a flared end ramp apparatus attached to the inlet pipe on the inside of the chamber end cap. The FLAMP provides a smooth transition from pipe invert to fabric bottom. It is configured to improve chamber function performance by enhancing outflow of solid debris that would otherwise collect at the chamber's end. It also serves to improve the fluid and solid flow into the access pipe during maintenance and cleaning and to guide cleaning and inspection equipment back into the inlet pipe when complete.

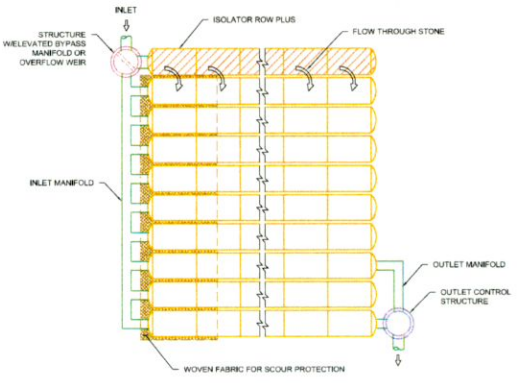
The Isolator Row Plus may be part of a treatment train system. The treatment train design and pretreatment device selection by the design engineer is often driven by regulatory requirements. Whether pretreatment is used or not, StormTech recommend using the Isolator Row Plus to minimize maintenance requirements and maintenance costs.

Note: *See the StormTech Design Manual for detailed information on designing inlets for a StormTech system, including the Isolator Row Plus.*



Looking down the Isolator Row PLUS from the manhole opening, ADS PLUS Fabric is shown between the chamber and stone base.

StormTech Isolator Row PLUS with Overflow Spillway (not to scale)



Isolator Row Plus Inspection/Maintenance

Inspection

The frequency of inspection and maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial, residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices.

At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row Plus should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

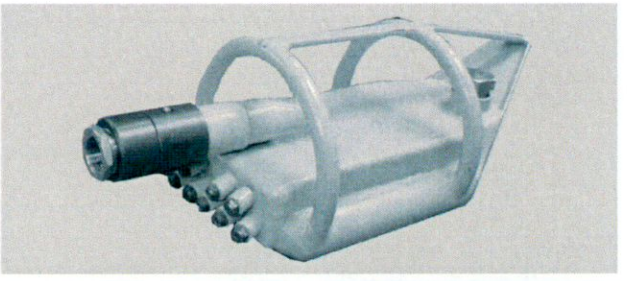
The Isolator Row Plus incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

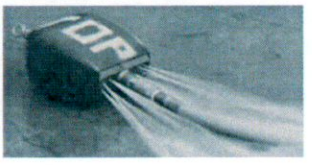
If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 3 inches throughout the length of the Isolator Row Plus, clean-out should be performed.

Maintenance

The Isolator Row Plus was designed to reduce the cost of periodic maintenance. By "isolating" sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entries.

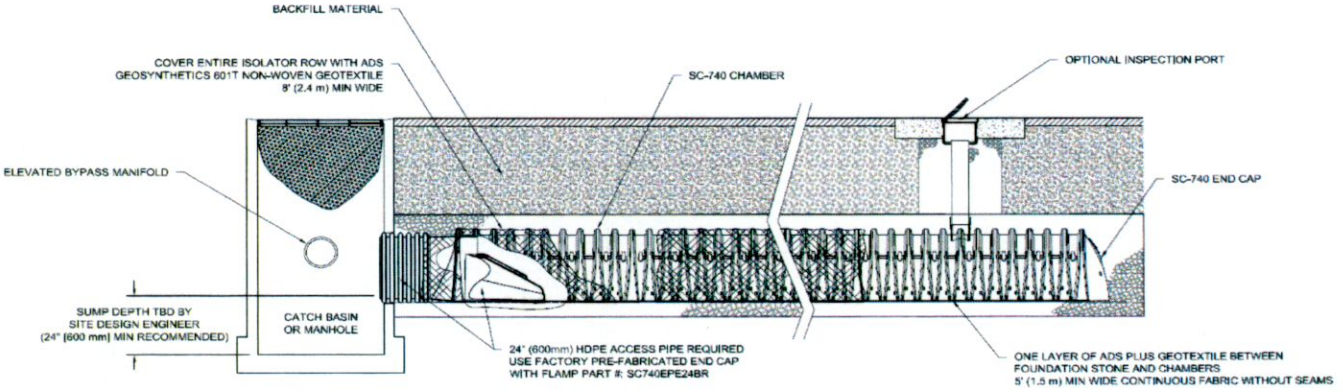
Maintenance is accomplished with the JetVac process. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row Plus while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45" are best. StormTech recommends a maximum nozzle pressure of 2000 psi be utilized during cleaning. JetVac reels can vary in length. For ease of maintenance, ADS recommends Isolator Row Plus lengths up to 200' (61 m). **The JetVac process shall only be performed on StormTech Isolator Row Plus that have ADS Plus Fabric (as specified by StormTech) over their angular base stone.**





StormTech Isolator Row PLUS (*not to scale*)

Note: *Non-woven fabric is only required over the inlet pipe connection into the end cap for SC-160LP, DC-780, MC-3500 and MC-7200 chamber models and is not required over the entire Isolator Row PLUS.*



Isolator Row Plus Step By Step Maintenance Procedures

Step 1

Inspect Isolator Row Plus for sediment.

A) Inspection ports (if present)

i. Remove lid from floor box frame

ii. Remove cap from inspection riser

iii. Using a flashlight and stadia rod,measure depth of sediment and record results on maintenance log.

iv. If sediment is at or above 3 inch depth, proceed to Step 2. If not, proceed to Step 3.

B) All Isolator Row Plus

i. Remove cover from manhole at upstream end of Isolator Row Plus

ii. Using a flashlight, inspect down Isolator Row Plus through outlet pipe

1. Mirrors on poles or cameras may be used to avoid a confined space entry
2. Follow OSHA regulations for confined space entry if entering manhole

iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches), proceed to Step 2.
If not, proceed to Step 3.

Step 2

Clean out Isolator Row Plus using the JetVac process.

A) A fixed floor cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable

B) Apply multiple passes of JetVac until backflush water is clean

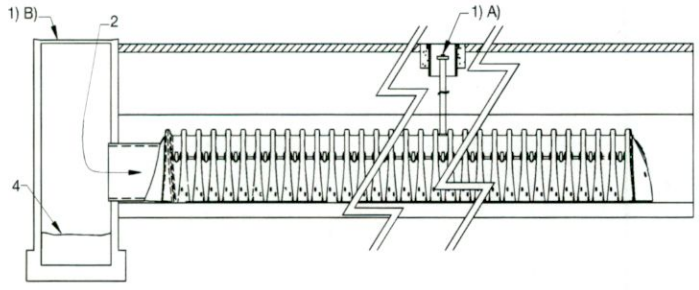
C) Vacuum manhole sump as required

Step 3

Replace all caps, lids and covers, record observations and actions.

Step 4

Inspect & clean catch basins and manholes upstream of the StormTech system.



Sample Maintenance Log

Date	Stadia Rod Readings		Sediment Depth (1)–(2)	Observations/Actions	Inspector
	Fixed point to chamber bottom (1)	Fixed point to top of sediment (2)			
3/15/11	6.3 ft	none		New installation. Fixed point is CI frame at grade	DJM
9/24/11		6.2	0.1 ft	Some grit felt	SM
6/20/13		5.8	0.5 ft	Mucky feel, debris visible in manhole and in Isolator Row PLUS, maintenance due	NV
7/7/13	6.3 ft		0	System jetted and vacuumed	DJM

adspipe.com
800-821-6710

ADS StormTech™