	DOCUMENT LEAD SHEET	

ENGINEERING SUBMISSION

PROJECT: COOKSTOWN CROSS, FOURTH AVENUE, COOKSTOWN INDUSTRIAL ESTATE

REPORT TITLE: ENGINEERING SERVICES REPORT

STATUS: PLANNING PERMISSION

CLIENT: STEELWORKS PROPERTY DEVELOPMENTS LTD

ARCHITECT: C+W O'BRIEN ARCHITECTS

gdcl CONSULTING ENGINEERS

Ireland Office:
Scope House
Whitehall Road
Dublin 12K8PP

UK Office:
75 Shelton St
Covent Garden
London WC2H 9JQ

Where this document has been revised it is recorded as indicated below. Please replace all superseded pages of this document with current version.

Rev	Date	Description	By	Checked	Approvals	
P1	20 Nov 18	Pre-Planning Application	PTC	GD		
P2	30 Apr 19	Pre-Planning Meeting (ABP)	PTC	GD		
P3	22 Aug 19	Issued to Irish Water	PTC	GD		
P4	24 Sep 19	Planning Submission to ABP	PTC	GD		
P5	01 Oct 20	Planning Submission to ABP	PTC	GD		

☑ Entire Document Issued this Revision

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1.0 INTRODUCTION

This report relates to the proposed mixed-use retail and residential development at the intersection of Fourth Avenue and Cookstown Road, Cookstown Industrial Estate, Dublin 24. The proposed development comprises a site, located immediately to the east of the southern arm of the Cookstown Road/Fourth Avenue roundabout.

The proposed site has an area of circa 1.1ha, of which approximately 0.35ha is comprising of the existing junction redevelopment, and is located at Units 66 & 67 Fourth Avenue, at the junction with Cookstown Road. The approximately 220m east of the Tallaght Hospital.

Refer to **Figure 1** below for a site location map.

Figure 1 – Site Location Map

The site slopes from north to south and is bounded to the north by Fourth Avenue, to the east by Cookstown Road, and to the south and west by industrial units. The site is situated within an industrial area and is immediately surrounded predominantly by warehouses and industrial units with both sites currently consisting of a warehouse with surface parking.

The site is located within the South Dublin County Council Development Plan 2016 - 2022 boundary with the zoning objective identified as REGEN-'To facilitate enterprise and/or residential-led regeneration'.

The proposed development consists of a mix of commercial units, a childcare facility, a gym, with 252 multi-level apartment units with an under-croft level for parking at surface level, surface water attenuation, water boosting and other plant and storage rooms.

The proposed development site has a vehicular entry point to the proposed under-croft parking facility via the Cookstown Road and a shared, bollard-controlled access via Fourth Avenue. There are planned road improvements by SDCC to construct a North-South Link Road connecting Cookstown Industrial Estate Road and through to Belgard Square North and to upgrade the Fourth Avenue/Cookstown Road junction as part of this submission.

The aim of this report is to provide information on the calculations, estimates and assumptions used to design the foul drains, surface water drains, SuDS systems, surface water attenuation and water supply for the proposed development.

Foul and surface water systems for the site will be separate and are designed in accordance with the requirements of South Dublin County Council, the recommendations of the Greater Dublin Strategic Drainage Study (GDSDS), the Building Regulations and the recommendations of the DOE Recommendations for Site development works for Housing areas. In addition, surface water has been designed with reference to the 'The Planning System and Flood Risk Management Guidelines', the Greater Dublin Regional Code of Practice for drainage works and Irish Water Standards Details for water and wastewater.

2.0 SURFACE WATER ATTENUATION

Surface water attenuation system will be provided using an off-line Stormtech SC740 attenuation system. The attenuation facility will be located within the under-croft footprint, below the parking area of the proposed development.

Surface water discharge from the site will be controlled using a hydrobrake at the outlet from the attenuation system. The total volume of the attenuation system is 470m^3

The hydraulic modelling software system 'WinDes' was used to calculate the attenuation volumes required. Maximum rainfall data from Extreme Rainfall Return Period values produced by Met Eireann (Rainfall Return Periods Table website) was used to input into WinDes to determine maximum flood volume. For Cookstown (708365, 728000 ITM):

SAAR = 782mm
Ratio M560/M52d = 0.27
M560 = 18.6mm

As per current practice a 10% increase to rainfall figures within Windes was applied to allow for climate change.

Runoff from roads and footpaths was assumed to be 80% impermeable. Runoff from traditional roofs areas was assumed to be 100% impermeable. Runoff from green roofs are assumed to be 70% as at least 30% of the rainfall during an extreme event would be stored in the green roof/permeable pavement and only 70% of total rainfall will discharge to the site attenuation system during the duration of an extreme rainfall event.

The individual catchment characteristics are as follows: -

Catchment Characteristics			
Cookstown Phase 2	Area (m^2)	Runoff Coeff.	Effective Area (m^2)
Roofs - Type 1 (Draining to gullies)	2,060	1.00	2060.0
Roofs - Type 2 (Draining to SUDS features)	-	0.70	0.0
Roofs - Type 3 (Draining to Back Gardens)	-	0.00	0.0
Green Roofs	1,365	0.70	955.5
Green Roof over Basements/Podiums	785	0.70	549.5
Roads and Footpaths - Type 1 (Draining to gullies)	1,730	0.80	1384.0
Roads and Footpaths - Type 2 (Draining to Suds features)	-	0.70	0.0
Permeable Paving	-	0.50	0.0
Paved areas over Undercrofts/Podiums	670	1.00	670.0
Verges	890	0.15	133.5
Parks	-	0.15	0.0
Public Open Space	-	0.05	0.0

Effective Catchment Area (Impermeable)	0.575	Hectares
Effective Catchment Runoff Coefficient	0.77	

The Greater Dublin Strategic drainage Study (GDSDS) recommends that surface water runoff from new developments is limited to 2l/s/ha or Qbar (calculated using the UK IH124 equation). As the development catchment area is approximately 0.75ha, this results in a Qbar value of 1.6 l/s, see appendix for calculation.

It should be noted that the existing development is a brownfield site which currently does not provide any attenuation measures, therefore this reduction in flow would result in a significant benefit to the downstream system capacity.

A calculation sheet has been appended to this report which shows how the attenuation volume and discharge rate were calculated.

3.0 INTERCEPTION STORAGE

It is current good practice in sustainable surface water drainage design that no run-off should directly pass to a receiving surface water system for rainfall depths of 5mm, therefore interception/infiltration storage should be provided at source where practicable. The volume of infiltration required is based on 5mm of rainfall depth from 80% of the runoff from impermeable areas and is calculated as follows:

Interception storage required **= 7500m^2 x 0.8 x 0.005 = 30m^3**

Interception storage will be provided within the green roof on the apartment building roofs and podium slab. The green roof and permeable pavement will have a substrate/subbase depth of 100mm with a void ratio of 35%.

Interception storage provided **= 2150m^2 x 0.1 x 0.35 = 75m^3**

The benefit of providing interception storage is that it allows some form of storage for small rainfall events which results in water evaporation and adsorption in small quantities, therefore there will be less run-off from the system in small rainfall events thus mimicking the natural response for the catchment. Also, the 150mm deep stone at the base of the geocellular attenuation facility will reduce the amount of run-off from the site as well as slowing down the rate of runoff.

4.0 TREATMENT VOLUME

It is also current good practice in sustainable surface water drainage design that a "treatment volume" is provided in order to prevent any pollutants or sediments discharging into river systems, additionally a 'treatment train' stormwater runoff management system should be applied. According to CIRIA document C697 the following treatment train approach is necessary:

Roofs – 1 Treatment method
Paved Areas excluding Roads - 1 Treatment method
Roads - 2 Treatment Methods

The volume of treatment required is based on 15mm of rainfall depth from 80% of the runoff from impermeable areas and is calculated as follows:

Treatment storage required **= 7500m^2 x 0.8 x 0.015 = 90m^3**

As all runoff is routed through the petrol interceptor and silt trap manhole as part of the offline attenuation system this will provide treatment storage in the system. Furthermore, the green roofs will provide additional treatment storage.

5.0 SUDS FEATURES

The SuDS strategy adopted by South Dublin County Council aims to provide an effective system to mitigate the adverse effects of urban stormwater runoff on the environment by reducing runoff rates, volumes and frequency, reducing pollutant concentrations in stormwater, contributing to amenity, aesthetics and biodiversity enhancement where possible. In addition, SuDS features aim to replicate the natural characteristics of rainfall runoff for any site by providing control of run-off at source.

In terms of compliance with the principles outlined in the GDSDS (Greater Dublin Strategic Drainage Study) Regional Drainage Policies Volume 2 New Development and Sustainable Drainage Systems (SuDS), the introduction proposed extensive green roof system would provide ecological, aesthetic and amenity benefits and intercept and retain rainfall, at source, reducing the volume of runoff and attenuating peak flows.

Green Roof: Green roofs provide ecological, aesthetic and amenity benefits and intercept and retain rainfall, at source, reducing the volume of runoff and attenuating peak flows. Green roofs absorb most of the rainfall that they receive during ordinary events although they will only contribute to attenuation of flows for larger events. Additionally, green roofs treat surface water through removal of atmospherically deposited urban pollutants. A typical extensive green roof will comprise a plant layer, extensive substrate layer (typically 100mm deep), laid on a filter layer, water retention and drainage layer, protection layer and a separation layer.

Figure 2 –Typical Extensive Green Roof

Petrol Interceptor: A proprietary oil/water separator which prevents hazardous chemical and petroleum products from entering watercourses and public sewers. This is proposed at the outfall from the site.

Cellular Attenuation System (Stormtech): A proprietary modular block or arch structure with a maintenance/inspection tunnel for providing underground surface water attenuation storage and can infiltrate runoff to the ground where the subgrade is suitable. The attenuation facility will be located within the under-croft footprint, below the parking area of the proposed development.

6.0 SURFACE WATER DRAINAGE SYSTEM

Surface water throughout the site will collected by a green roof system with addition roof and podium slab gullies draining via downpipes and pipe slung to the underside of the ground floor slab before discharging into the attenuation facility.

Flows from the attenuation facility will be throttled at greenfield runoff rates before discharging into the existing 450 diameter surface water sewer in running in an easterly direction on Fourth Avenue, to the north of the site.

Surface water drains were designed using the Rational Method to size the pipes for a 1-year storm event. The following parameters applied:

Return period 1 year
Time of entry 4 minutes
Pipe Ks 0.6mm (concrete)
Minimum velocity 0.75 m/s
Maximum velocity 3.0 m/s

The peak surface flow from the proposed development is 1.6l/s. The foul outfall pipe from the development would comprise a 225mm diameter pipe at a gradient of not flatter than 1 in 150. This pipe at full capacity of the sewer is estimated at 37.2l/s.

7.0 FOUL DRAINAGE

There is an existing 225mm diameter foul sewer in running in a northerly direction on the Cookstown Road, to the east of the site. Proposed foul drainage will discharge to this foul sewer.

Foul sewage within the site will be drained by a separate system via 150mm and 225mm diameter pipes. Where applicable, foul flows from the development would be slung under the podium slab and would connect to the proposed gravity sewers.

Foul sewers have been designed in accordance with the Building Regulations and in accordance with the EPA Treatment Systems for Small Communities, Business, Leisure and Hotel, DOE 'Recommendations for Site Development Works' and the recommendations of the 'Greater Dublin Strategic Drainage Study' (GDSDS) and Irish Water requirements.

The following design criteria have been applied in the design of foul sewers:

(i) Pipe Ks 0.6 mm (uPVC)
(ii) Minimum velocity 0.75 m/s (self-cleansing velocity)
(iii) Maximum velocity 3 m/s
(v) Minimum gradients:

No. of Connections	Minimum Pipe Gradient
1	100mm dia. @ 1:60 or self-cleansing gradient
2-8	150mm dia. @ 1:80 or self-cleansing gradient
>8	Min 150mm dia.; 1: DN or self-cleansing gradient

The peak flow from the proposed development is estimated at 5.65l/s. The foul outfall pipe from the development would comprise a 225mm diameter pipe at a gradient of not flatter than 1 in 180. This pipe at full capacity of the sewer is estimated at 37.21l/s.

Sewers and drains shall be laid to comply with the requirements of the Building Regulations 1997 in accordance with the recommendations contained in the Technical Guidance Documents, Section H (revised 2005) and Irish Water.

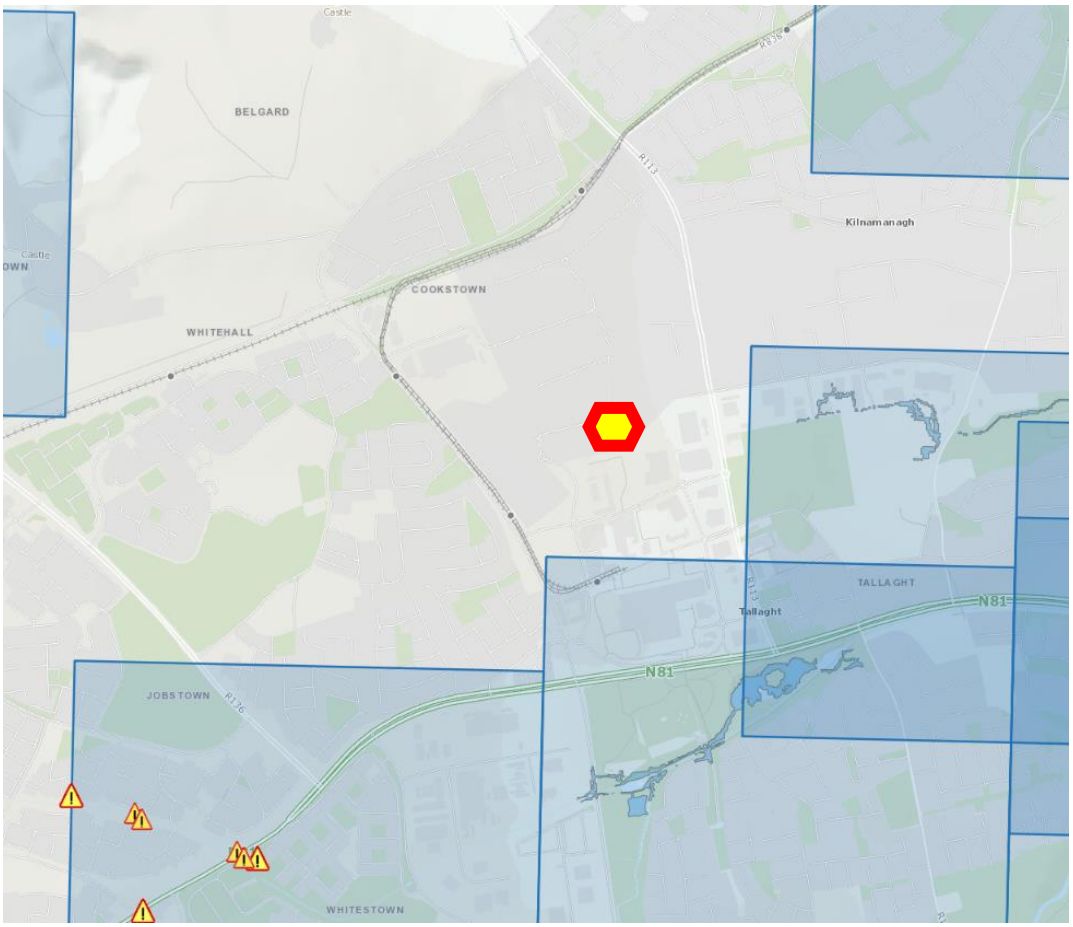
A calculation sheet has been appended to this report which indicates the peak foul flows.

8.0 FLOOD RISK

The subject site is located more than 1.1km from the Whitestown Stream, Additionally, the site is also located more than 12km from the coast and is therefore not prone to coastal flooding.

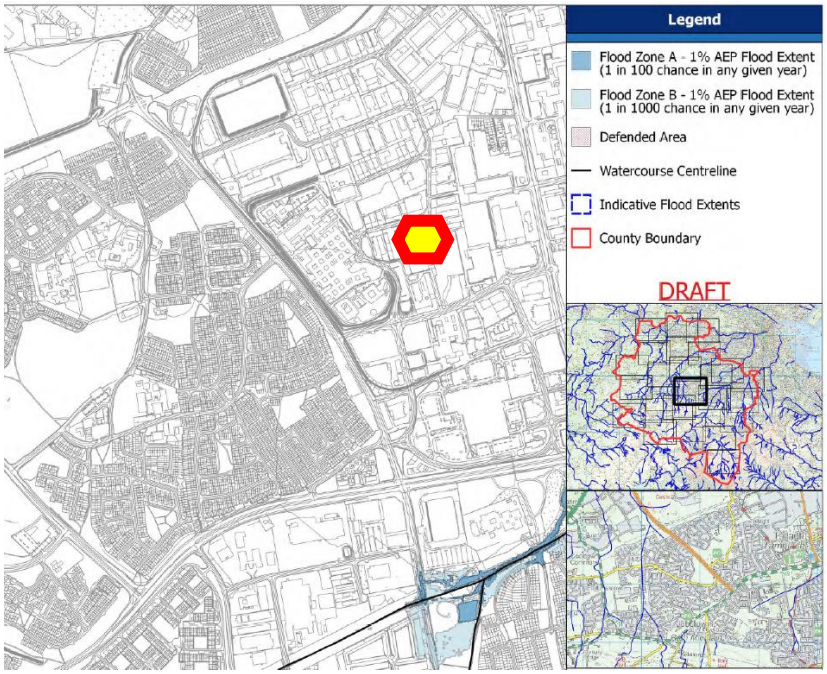
The ECFRAMS Flood Study Mapping indicates outside of the 0.1% Fluvial AEP Event and the site is therefore deemed to be within **Flood Zone C**, i.e. outside the 1000-year flood events. It is therefore not necessary to carry out a Site-Specific Flood Risk Assessment.

The sequential approach recommended by *"The Planning System and Flood Risk Management Guidelines for Planning Authorities"* has been complied with for the subject site as it is within Flood Zone C.



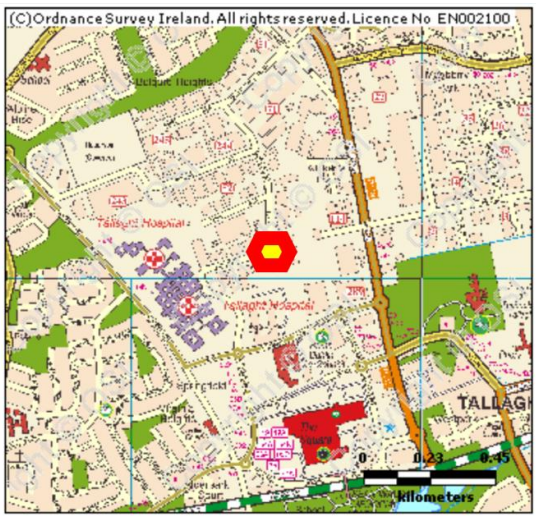
Floodinfo.ie showing OPW Flood Mapping

The Strategic Flood Risk Assessment for South Dublin County Council Development Plan 2016-2022 Fluvial Flood Zone Mapping was consulted and indicated that there was no risk of Fluvial Flooding.

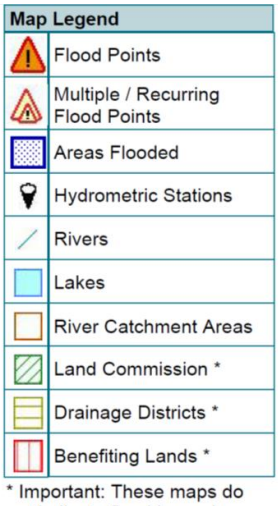


South Dublin County Council Development Plan 2016-2022 Fluvial Flood Zone Map 15 Extract

The Office for Public Works (OPW) historical flood maps were consulted with regards to recorded flood events in the vicinity of the subject site. A map showing historical flood events within 2.5km of the subject site was generated. There were no recorded flood events within the immediate vicinity of the subject site, and it is therefore considered that there is a low likelihood of flooding from surrounding areas.



Map Scale 1:18,843



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Floodmaps.ie showing no historical flooding event with 2.5km of site

9.0 WATER SUPPLY

The development will be serviced by a proposed 150mm diameter watermain which connects to the existing 150mm diameter watermain located at the eastern boundary of the proposed development**.**

These proposed watermains in turn will connect to a water booster and balancing system to be located in the plant room located on the ground floor/under-croft area of the proposed development. This booster system will store and pump potable water to all apartments and commercial units within the development. In addition to the watermain, a new fire-main will be provided within the carparking area of the development, below the podium slab. The external areas of the development will be served by existing fire hydrants together with additional hydrants to be located on the new 150mm diameter watermains.

A bulk water meter will be provided at the connection to the site from the existing watermain. This electromagnetic flow meter will include a remote telemetry unit and associated mini kiosk, to the requirements of SDCC Water Management Section and Irish Water.

The supply arrangements will be carried out to the requirements of Irish Water. The Peak Hour Water demand for the proposed development is estimated at 5.4l/s.

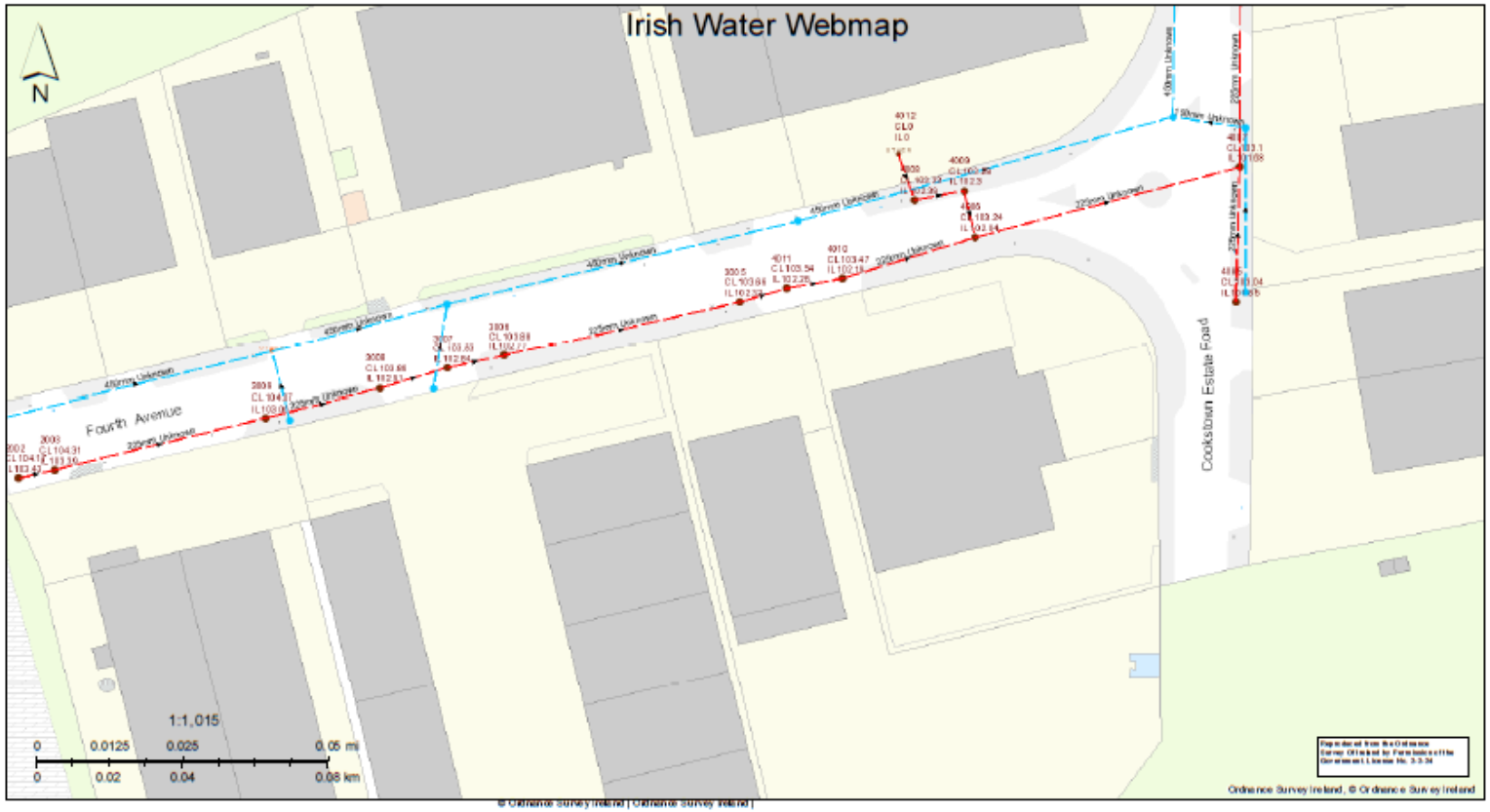
Refer to appendices for watermain and water supply calculations.

10.0 ACCESS

Vehicular access to the undercroft car park area would be via a new access road tied in to the Cookstown Road, at the southeast corner of the site. A shared, bollard-controlled access via Fourth Avenue will also be provided.

APPENDIX A

Water Services Records



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June 28, 2016

Legend

- Surface
- Surface
- Surface
- Surface
- Cascade
- Catchpit
- Hatchbox

Irish Water gives this information as to the position of its underground network as a general guide only on the strict understanding that it is based on the best available information provided by each Local Authority in Ireland. It should not be relied upon in the event of excavations or other works being carried out in the vicinity of the network. The onus is on the parties carrying out the works to ensure the exact location of the network is identified prior to mechanical works being carried out. Service pipes are not generally shown but their presence should be anticipated. © Irish Water

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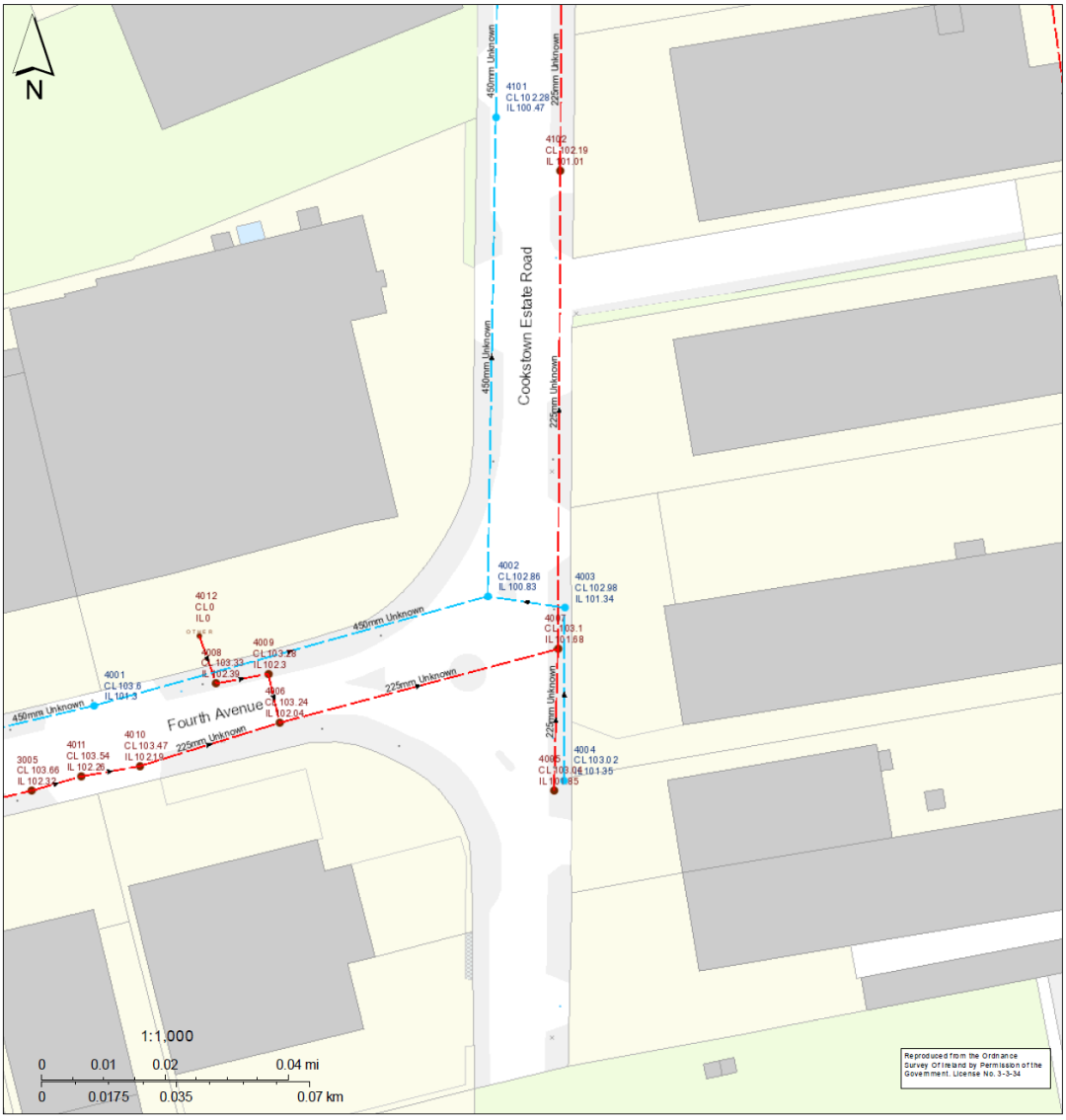
Irish Water Webmap



July 6, 2016

.egend

- Surface
- Surface
- Surface
- Surface
- Cascade
- Catchpit
- Hatchbox
- Lamphole
- Standard
- Other; Unknown
- Gully
- Standard

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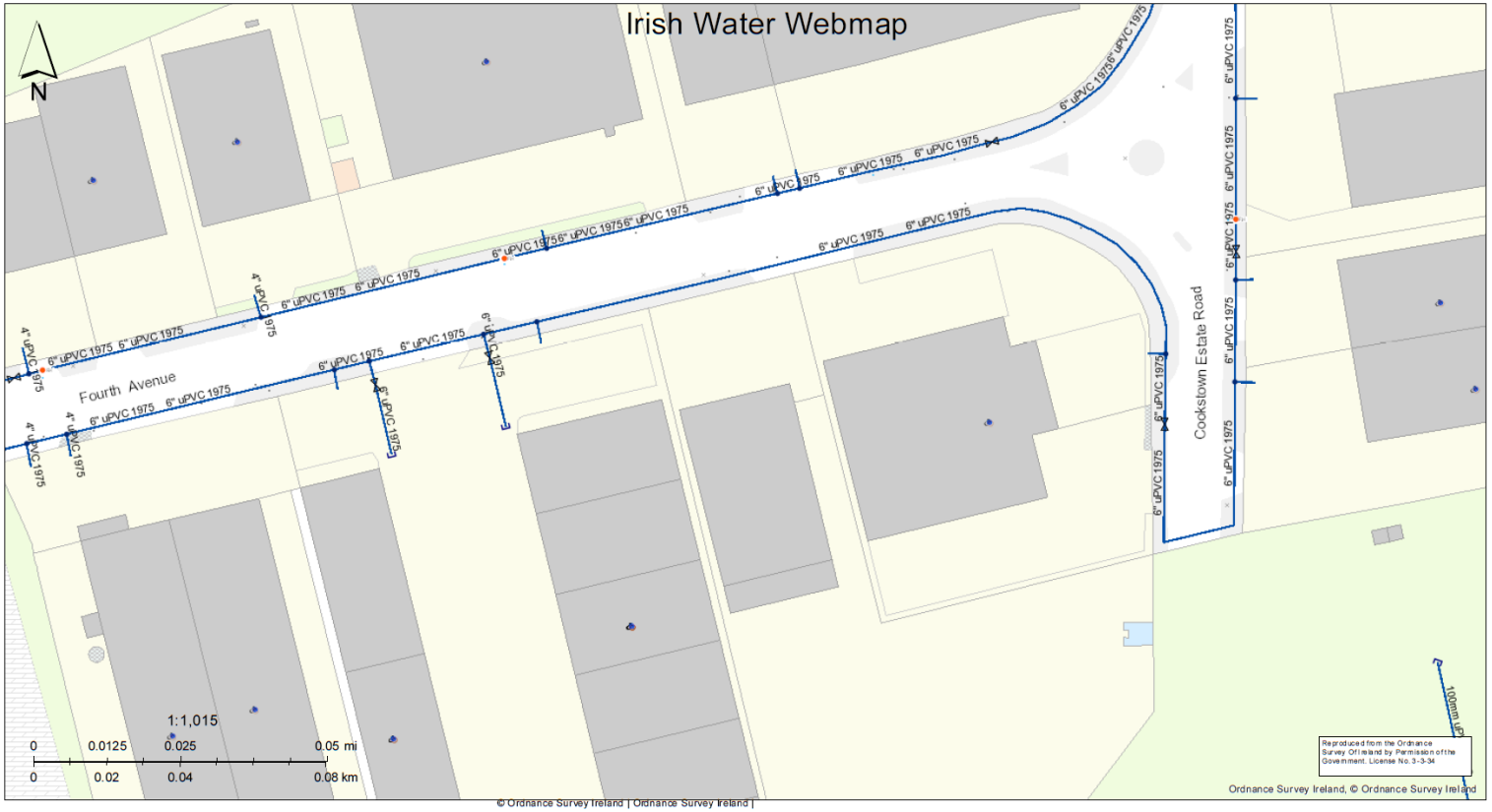

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une 28, 2016

egend

- Non-return
- Hydro
- Orifice Plate
- PRV
- PSV
- Other
- Open

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APPENDIX B

Surface Water Attenuation Calculations

Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 308460, Northing: 228650,

	Interval		Years											
DURATION	6months,	1year,	2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	150,	200,	250,	500,
5 mins	2.5,	3.8,	4.4,	5.5,	6.2,	6.7,	8.6,	10.8,	12.3,	14.4,	16.3,	17.8,	20.2,	22.0,	23.6,	N/A ,
10 mins	3.5,	5.2,	6.2,	7.6,	8.6,	9.4,	12.0,	15.1,	17.1,	20.1,	22.7,	24.8,	28.1,	30.7,	32.8,	N/A ,
15 mins	4.2,	6.2,	7.3,	9.0,	10.1,	11.1,	14.1,	17.7,	20.2,	23.6,	26.8,	29.2,	33.1,	36.1,	38.6,	N/A ,
30 mins	5.5,	8.0,	9.4,	11.6,	13.0,	14.2,	18.0,	22.5,	25.5,	29.8,	33.6,	36.7,	41.4,	45.0,	48.1,	N/A ,
1 hours	7.2,	10.5,	12.2,	14.9,	16.8,	18.2,	23.0,	28.6,	32.3,	37.5,	42.3,	46.0,	51.7,	56.2,	60.0,	N/A ,
2 hours	9.5,	13.6,	15.9,	19.3,	21.6,	23.4,	29.4,	36.3,	40.8,	47.3,	53.1,	57.7,	64.7,	70.2,	74.7,	N/A ,
3 hours	11.1,	15.9,	18.5,	22.4,	25.0,	27.1,	33.9,	41.7,	46.9,	54.2,	60.8,	65.9,	73.7,	79.9,	85.0,	N/A ,
4 hours	12.5,	17.7,	20.6,	24.9,	27.8,	30.1,	37.5,	46.0,	51.7,	59.7,	66.8,	72.3,	80.9,	87.6,	93.1,	N/A ,
6 hours	14.6,	20.7,	23.9,	28.9,	32.2,	34.8,	43.3,	52.9,	59.3,	68.3,	76.4,	82.6,	92.2,	99.7,	105.9,	N/A ,
9 hours	17.1,	24.1,	27.9,	33.5,	37.3,	40.3,	49.9,	60.9,	68.1,	78.3,	87.3,	94.3,	105.1,	113.5,	120.5,	N/A ,
12 hours	19.2,	26.9,	31.1,	37.2,	41.4,	44.7,	55.3,	67.2,	75.1,	86.2,	96.0,	103.6,	115.3,	124.4,	132.0,	N/A ,
18 hours	22.5,	31.4,	36.2,	43.2,	48.0,	51.7,	63.7,	77.3,	86.2,	98.7,	109.7,	118.3,	131.5,	141.7,	150.1,	N/A ,
24 hours	25.2,	35.1,	40.3,	48.1,	53.3,	57.4,	70.5,	85.3,	95.0,	108.6,	120.7,	130.0,	144.3,	155.3,	164.4,	196.3,
2 days	31.8,	43.0,	48.8,	57.4,	63.2,	67.6,	81.7,	97.3,	107.4,	121.5,	133.8,	143.2,	157.6,	168.7,	177.8,	209.2,
3 days	37.1,	49.4,	55.7,	65.0,	71.1,	75.8,	90.7,	107.1,	117.7,	132.2,	144.9,	154.5,	169.2,	180.4,	189.6,	221.3,
4 days	41.7,	54.9,	61.7,	71.5,	78.0,	82.9,	98.6,	115.6,	126.6,	141.6,	154.6,	164.5,	179.5,	190.9,	200.3,	232.3,
6 days	49.9,	64.6,	72.1,	82.9,	90.0,	95.3,	112.2,	130.4,	142.0,	157.8,	171.5,	181.8,	197.4,	209.2,	218.9,	251.7,
8 days	57.1,	73.2,	81.3,	92.9,	100.4,	106.1,	124.1,	143.3,	155.4,	171.9,	186.1,	196.9,	213.0,	225.2,	235.1,	268.8,
10 days	63.7,	80.9,	89.6,	101.9,	109.9,	115.9,	134.7,	154.8,	167.5,	184.6,	199.3,	210.4,	227.0,	239.6,	249.8,	284.2,
12 days	69.9,	88.2,	97.3,	110.3,	118.6,	124.9,	144.6,	165.5,	178.6,	196.3,	211.5,	222.9,	240.0,	252.8,	263.3,	298.4,
16 days	81.4,	101.6,	111.5,	125.6,	134.7,	141.5,	162.6,	184.9,	198.9,	217.6,	233.6,	245.6,	263.4,	276.8,	287.7,	324.2,
20 days	92.0,	113.9,	124.6,	139.7,	149.3,	156.6,	179.0,	202.5,	217.2,	236.8,	253.5,	266.0,	284.6,	298.5,	309.7,	347.4,
25 days	104.5,	128.2,	139.8,	156.0,	166.3,	174.1,	197.9,	222.8,	238.2,	258.9,	276.3,	289.4,	308.7,	323.2,	334.9,	373.9,

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

Qbar Calculation
Using IOH Report 124 for Sites < 25 km²

Catchment Name
Cookstown Phase 2

[1] $Q_{bar} = 0.00108 * (AREA)^{0.89}(SAAR)^{1.17}(SOIL)^{2.17}$

Estimation of QBAR from IOH Report 124 for catchments less than 25 km² using the 3 variable equation

AREA =	0.75	Ha	Overall Catchment Area (Hectares) For catchments < 50 hectares in area, flow rates are linearly interpolated for smaller areas.
AREA =	0.008	km^2	Area of the Catchment (km^2)
SAAR =	782	mm	Standard Annual Average Rainfall (mm)
SOIL =	0.30		
$M5_{60}$	18.6	mm	
$M5_{2day}$	67.6	mm	

Soil Type Expressed as a Percentage	Soil 1	Soil 2	Soil 3	Soil 4	Soil 5
	0	100	0	0	0
SOIL Value	0.15	0.30	0.40	0.45	0.50

Ratio $M5_{60}/M5_{2d}$ **0.275**

Soil index value (SPR) calculated from Flood Studies Report Vol V Fig I 4.18(1) - The Classification of Soils from Winter Rainfall Acceptance Rate .

Flood Return Event	[5]Growth Factor	Permitted Flow (l/s)
1	0.85	1.3
QBAR	1	1.6
10	1.67	2.6
30	2.1	3.3
50	2.33	3.6
100	2.6	4.0
200	2.85	4.4
1000	3.5	5.4

[4]QBar from Site with Factorial Error Allowance

r^2 =	0.847
n =	71
fse =	1.651

Q'_{bar} = 2.57 l/s

(With Allowance for the standard factorial error)

Pro-rata based on 50 Ha Site area to calculate Qbar

Q_{bar} =	0.00004	cumecs/Ha
Q_{bar} =	2.1	l/s/Ha

$Q_{bar[rural]}$ = 1.6 l/s

Catchment Characteristics

Cookstown Phase 2	Area (m^2)	Runoff Coeff.	Effective Area (m^2)
Roofs - Type 1 (Draining to gullies)	2,060	1.00	2060.0
Roofs - Type 2 (Draining to SUDS features)	-	0.70	0.0
Roofs - Type 3 (Draining to Back Gardens)	-	0.00	0.0
Green Roofs	1,365	0.70	955.5
Green Roof over Basements/Podiums	785	0.70	549.5
Roads and Footpaths - Type 1 (Draining to gullies)	1,730	0.80	1384.0
Roads and Footpaths - Type 2 (Draining to Suds features)	-	0.70	0.0
Permeable Paving	-	0.50	0.0
Paved areas over Undercrofts/Podiums	670	1.00	670.0
Verges	890	0.15	133.5
Parks	-	0.15	0.0
Public Open Space	-	0.05	0.0

Effective Catchment Area (Impermeable) **0.575** Hectares

Effective Catchment Runoff Coefficient **0.77**

Date 20/08/2020 08:44	Designed by
File COOKSTOWN PHASE 2 SITE	Checked by
Innovyze	Source Control 2018.1

Summary of Results for 100 year Return Period (+10%)

Half Drain Time : 2069 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	102.197	0.257	0.2	1.3	1.5	95.0	O K
30 min Summer	102.291	0.351	0.2	1.3	1.5	129.9	O K
60 min Summer	102.391	0.451	0.2	1.3	1.5	166.6	O K
120 min Summer	102.499	0.559	0.2	1.3	1.5	206.5	O K
180 min Summer	102.565	0.625	0.2	1.3	1.5	231.1	O K
240 min Summer	102.613	0.673	0.2	1.3	1.5	248.7	O K
360 min Summer	102.679	0.739	0.2	1.4	1.6	273.3	O K
480 min Summer	102.724	0.784	0.2	1.4	1.6	289.9	O K
600 min Summer	102.757	0.817	0.2	1.4	1.6	301.8	O K
720 min Summer	102.780	0.840	0.2	1.5	1.6	310.6	O K
960 min Summer	102.811	0.871	0.2	1.5	1.7	322.0	O K
1440 min Summer	102.834	0.894	0.2	1.5	1.7	330.3	O K
2160 min Summer	102.830	0.890	0.2	1.5	1.7	328.9	O K
2880 min Summer	102.819	0.879	0.2	1.5	1.7	324.8	O K
4320 min Summer	102.796	0.856	0.2	1.5	1.6	316.4	O K
5760 min Summer	102.769	0.829	0.2	1.4	1.6	306.6	O K
7200 min Summer	102.740	0.800	0.2	1.4	1.6	295.6	O K
8640 min Summer	102.709	0.769	0.2	1.4	1.6	284.1	O K
10080 min Summer	102.677	0.737	0.2	1.4	1.6	272.4	O K
15 min Winter	102.228	0.288	0.2	1.3	1.5	106.6	O K
30 min Winter	102.335	0.395	0.2	1.3	1.5	145.8	O K
60 min Winter	102.446	0.506	0.2	1.3	1.5	187.2	O K
120 min Winter	102.569	0.629	0.2	1.3	1.5	232.5	O K
180 min Winter	102.645	0.705	0.2	1.4	1.5	260.7	O K
240 min Winter	102.701	0.761	0.2	1.4	1.6	281.1	O K
360 min Winter	102.779	0.839	0.2	1.5	1.6	310.0	O K
480 min Winter	102.833	0.893	0.2	1.5	1.7	329.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	89.558	0.0	96.4	19
30 min Summer	61.519	0.0	125.6	34
60 min Summer	39.838	0.0	171.6	64
120 min Summer	25.136	0.0	216.6	124
180 min Summer	19.065	0.0	243.6	184
240 min Summer	15.631	0.0	244.8	242
360 min Summer	11.789	0.0	245.5	362
480 min Summer	9.639	0.0	246.7	482
600 min Summer	8.242	0.0	248.4	602
720 min Summer	7.251	0.0	250.6	722
960 min Summer	5.923	0.0	256.4	962
1440 min Summer	4.451	0.0	263.0	1440
2160 min Summer	3.338	0.0	508.2	1816
2880 min Summer	2.719	0.0	502.0	2216
4320 min Summer	2.035	0.0	482.0	3024
5760 min Summer	1.655	0.0	685.4	3864
7200 min Summer	1.411	0.0	729.9	4680
8640 min Summer	1.238	0.0	768.7	5528
10080 min Summer	1.108	0.0	803.1	6352
15 min Winter	89.558	0.0	108.0	19
30 min Winter	61.519	0.0	123.8	34
60 min Winter	39.838	0.0	192.2	64
120 min Winter	25.136	0.0	242.6	122
180 min Winter	19.065	0.0	245.3	180
240 min Winter	15.631	0.0	246.0	240
360 min Winter	11.789	0.0	248.5	358
480 min Winter	9.639	0.0	252.0	474

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Summary of Results for 100 year Return Period (+10%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
600 min Winter	102.872	0.932	0.2	1.5	1.7	344.6	O K
720 min Winter	102.903	0.963	0.2	1.5	1.7	355.8	O K
960 min Winter	102.945	1.005	0.2	1.6	1.7	371.4	O K
1440 min Winter	102.986	1.046	0.2	1.6	1.8	386.4	O K
2160 min Winter	102.992	1.052	0.2	1.6	1.8	388.7	O K
2880 min Winter	102.976	1.036	0.2	1.6	1.8	383.0	O K
4320 min Winter	102.936	0.996	0.2	1.6	1.7	368.2	O K
5760 min Winter	102.892	0.952	0.2	1.5	1.7	351.9	O K
7200 min Winter	102.843	0.903	0.2	1.5	1.7	333.6	O K
8640 min Winter	102.791	0.851	0.2	1.5	1.6	314.4	O K
10080 min Winter	102.739	0.799	0.2	1.4	1.6	295.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	8.242	0.0	256.7	590
720 min Winter	7.251	0.0	261.3	708
960 min Winter	5.923	0.0	267.7	934
1440 min Winter	4.451	0.0	273.3	1384
2160 min Winter	3.338	0.0	519.9	2012
2880 min Winter	2.719	0.0	517.6	2304
4320 min Winter	2.035	0.0	510.8	3240
5760 min Winter	1.655	0.0	767.5	4152
7200 min Winter	1.411	0.0	817.3	5048
8640 min Winter	1.238	0.0	860.9	5968
10080 min Winter	1.108	0.0	869.7	6856

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Innovyze | Source Control 2018.1

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	18.600	Shortest Storm (mins)	15
Ratio R	0.270	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+10

Time Area Diagram

Total Area (ha) 0.575

Time (mins) From:	To:	Area (ha)
0	4	0.575

Time Area Diagram

Total Area (ha) 0.000

Time (mins) From:	To:	Area (ha)
0	4	0.000

Date 20/08/2020 08:44	Designed by
File COOKSTOWN PHASE 2 SITE	Checked by
Innovyze	Source Control 2018.1

Model Details

Storage is Offline Cover Level (m) 103.600 Dividing Weir Level (m) 101.940

Cellular Storage Structure

Invert Level (m) 101.940 Safety Factor 1.0
Infiltration Coefficient Base (m/hr) 0.00100 Porosity 0.66
Infiltration Coefficient Side (m/hr) 0.00100

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	560.0	560.0	1.100	560.0	664.3	1.200	0.0	664.3

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0057-1600-1190-1600	Sump Available	Yes
Design Head (m)	1.190	Diameter (mm)	57
Design Flow (l/s)	1.6	Invert Level (m)	101.810
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	75
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.190	1.6	Kick-Flo®	0.511	1.1
Flush-Flo™	0.251	1.3	Mean Flow over Head Range	-	1.3

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.2	0.800	1.3	2.000	2.0	4.000	2.8	7.000	3.6
0.200	1.3	1.000	1.5	2.200	2.1	4.500	2.9	7.500	3.7
0.300	1.3	1.200	1.6	2.400	2.2	5.000	3.1	8.000	3.8
0.400	1.3	1.400	1.7	2.600	2.3	5.500	3.2	8.500	4.0
0.500	1.1	1.600	1.8	3.000	2.4	6.000	3.4	9.000	4.1
0.600	1.2	1.800	1.9	3.500	2.6	6.500	3.5	9.500	4.2

STORMTECH Stormwater Management System Design Tool

ver: Jun14

PROJECT REF:	Cookstown Phase 2
LOCATION:	Site A
DATE:	12/08/2020
CREATED BY:	Peter Clarke

Instructions:
- Fill in blue highlighted cells
- Set width to maximum allowance
- Adjust site parameters and system dimension until volume achieved
- For Rectangular systems only, for irregular shape dig contact Microstrain

SYSTEM PARAMETERS

Required Total Storage	470	m^3
Stormtech chamber model	SC740	
Number of Isolator Rows for TSS Removal	1	

SITE PARAMETERS

Maximum Width at Excavation Base	27.91	m	
Stone Porosity	40%		
Excavation Batter Angle (degrees)	60	°	*Minimum Requirement*
Stone Below Chambers	0.15	m	*0.15*
Stone Above Chambers	0.15	m	*0.15*
Additional Storage. E.g manholes, pipe	0	m^3	

CALCULATED CHAMBER SYSTEM DIMENSIONS

	Calculated	Adopted	
Number of Rows	19		ea
Number of units per Row	11		ea
Number of SC740 Chambers	209		ea
Number of SC740 Endcaps	38		ea
System Installed Storage Depth (effective storage depth)	1.060		m
Tank overall installed Width at base	27.91	27.91	m
Tank overall installed Length at Base	24.57	24.57	m
Total Effective System Storage	**470.2**	**470.2**	m^3

STORMTECH SYSTEM DETAIL

StormTech Chamber Model	SC740	
Unit Width	1.295	m
Unit Length	2.17	m
Unit Height	0.76	m
Min Cover Over System	0.3	m
Max Cover Over Chamber	2.4	m
Internal Storage Vol. (Chamber only)	1.3	m^3

STONE AND EXCAVATION DETAIL

Volume of Dig for System	762	
Area of Dig at Base of System	686	m^2
Area of Dig at Top of System	751	m^2
Void Ratio	62%	
Stone Requirement - tonne	799	tonne

StormTech®
Detention • Retention • Recharge
Subsurface Stormwater Management™

APPENDIX C

Foul Sewer Loading Calculations

PROJECT TITLE: Cookstown Phase 2 **JOB REFERENCE:** 1606

SUBJECT
Wastewater Load for Irish Water

gdcl CONSULTING ENGINEERS

DRAWING NO. 1605-C-100 **CALCULATIONS BY** **CHECKED BY** **DATE**

POST DEVELOPMENT DEMAND

Wastewater flow per head[1]	150	litres	Unit Consumption Allowance[3]	10	%
Average Occupancy Ratio[2]	2.7	person/3 bed unit	DWF Peak Factor[4]	6	

Residential Unit Type	4 Bed	3 Bed (4p)	2 Bed (3p)	1 Bed	Studio
Average Occupancy(persons)	5	4	3	1	1
Number of Units	0	6	100	96	50
Average Occupancy[4] (PE)	0	24	300	96	50

Residential Dry Weather Flow(DWF) Volume[5] 77,550 litres

Commercial Unit Type	Shopping	Commercial	Pub/ Restaurant	Leisure/ Gym	Medical/ Care Home	Creche
Average Occupancy (per m2)	18	25	5	5	20	20
Area(m2)	0	144	95	125	0	275
Average Occupancy[5] (PE)	0	6	19	25	0	14
Average Usage(litres per person/day)[9]	25	100	60	50	350	60
Daily Usage(/)	0	576	1140	1250	0	825

Commercial Dry Weather Flow(DWF) Volume[5] 3,874 litres

WASTEWATER LOADING SUMMARY

	Residential	Commercial	Total
Average Daily Discharge	0.90 l/s	0.04 l/s	0.94 l/s
Peak Discharge[6]	5.39 l/s	0.27 l/s	5.65 l/s

ORGANIC LOADING

EPA Wastewater Parameters Loading Concentrations		Residential Organic Loading		Commercial Organic Loading		Total Organic Loading	
Average Concentration[7]	Max Concentration[8]	Average Conc[7]	Max Conc[8]	Average Conc[7]	Max Conc[8]	Average Conc[7]	Max Conc[8]
BOD(mg/l)		BOD(kg/day)		BOD(kg/day)		BOD(kg/day)	
168.0	422.0	13.03	32.73	0.65	1.63	13.68	34.36
SS (mg/l)		SS (kg/day)		SS (kg/day)		SS (kg/day)	
163.0	435.0	12.64	33.73	0.63	1.68	13.27	35.42
N (mg/l)		N (kg/day)		N (kg/day)		N (kg/day)	
40.6	78.6	3.15	6.10	0.16	0.30	3.31	6.40
P (mg/l)		P (kg/day)		P (kg/day)		P (kg/day)	
7.1	15.5	0.55	1.20	0.03	0.06	0.58	1.26

Notes:

1. Waste Water flow - 150 l/head as per Irish Water Code of Practice - (3.6)
2. Average Occupancy ratio of 2.7 persons per dwelling from Irish Water Code of Practice - (3.6)
3. 10% Unit Consumption Allowance as per Irish Water Code of Practice - (3.6.3)
4. DWF Peak Factor is 6 as per Irish Water Code of Practice - (3.6)
5. Dry Weather Flow = No. of Residential Units X Average Occupancy Ratio X Waste Water Flow X UCA[3]
6. Peak Discharge = Average Daily Discharge X DWF Peak Factor
7. The average concentrations of wastewater parameters taken from EPA "Wastewater Treatment Manuals, Treatment Systems for Small Communities, Business, Leisure Centres and Hotels".
8. Assumed Maximum concentration is equal to the average concentration plus 2 times the standard deviation (for the 95%ile) taken from EPA "Wastewater Treatment Manuals, Treatment Systems for Small Communities, Business, Leisure Centres and Hotels".

APPENDIX D

Water Demand Calculations

PROJECT TITLE: Cookstown Phase 2 **JOB REFERENCE:** 1606

SUBJECT
Water Demand for Irish Water

gdcl CONSULTING ENGINEERS

DRAWING NO. 1606-C-100 **CALCULATIONS BY** **CHECKED BY** **DATE**

POST DEVELOPMENT DEMAND

Per-Capita Consumption[1]	150	litres/person/day
Average Occupancy Ratio[2]	2.7	person/3 bed unit

Residential Unit Type	4 Bed	3 Bed (4p)	2 Bed (3p)	1 Bed	Studio
Average Occupancy(persons)	5	4	3	1	1
Number of Units	0	6	100	96	50
Average Occupancy[a] (PE)	0	24	300	96	50

Average Residential Demand[6] 70,500 l/day

Commercial Unit Type	Shopping	Commercial	Pub/ Restaurant	Leisure/ Gym	Medical/ Care Home	Creche
Average Occupancy (per m2)	18	25	5	5	20	20
Area(m2)	0	144	95	125	0	275
Average Occupancy[5] (PE)	0	6	19	25	0	14
Average Usage(litres per person/day)	25	100	60	50	350	60
Daily Usage(/)	0	576	1140	1250	0	825

Average Commercial Demand[b] 3,791 l/day

Average Day/Week Demand Factor[3]	1.25
Peak Demand Factor[4]	5

WATER DEMAND SUMMARY

	Residential	Commercial	Total
Average Daily Demand	0.82 l/s	0.04 l/s	0.86 l/s
Average Day/Peak Week Demand[7]	1.02 l/s	0.05 l/s	1.07 l/s
Peak Hour Water Demand[8]	5.100 l/s	0.274 l/s	5.374 l/s

Notes:

1. Per-Capita Consumption 150l/person/day as per Irish Water Code of Practice - (3.7.2)
2. Average Occupancy ratio of 2.7 persons per dwelling from Irish Water Code of Practice - (3.7.2)
3. Average Day/Week Demand Factor is 1.25 as per Irish Water Code of Practice - (3.7.2)
4. Peak Demand Factor is 5 as per Irish Water Code of Practice - (3.7.2)
5. Average Occupancy(or PE-Population Equivalent) = No. of Residential Units X Average Occupancy Ratio
6. Average Domestic Demand = Average Occupancy X Per-Capita Consumption
7. Average Day/Peak Week Demand = Average Daily Domestic Demand X Average Day/Week Demand Factor
8. Peak Hour Water Demand = Average Occupancy X Per-Capita Consumption X Average Day/Week Demand Factor X Peak Demand Factor

APPENDIX E

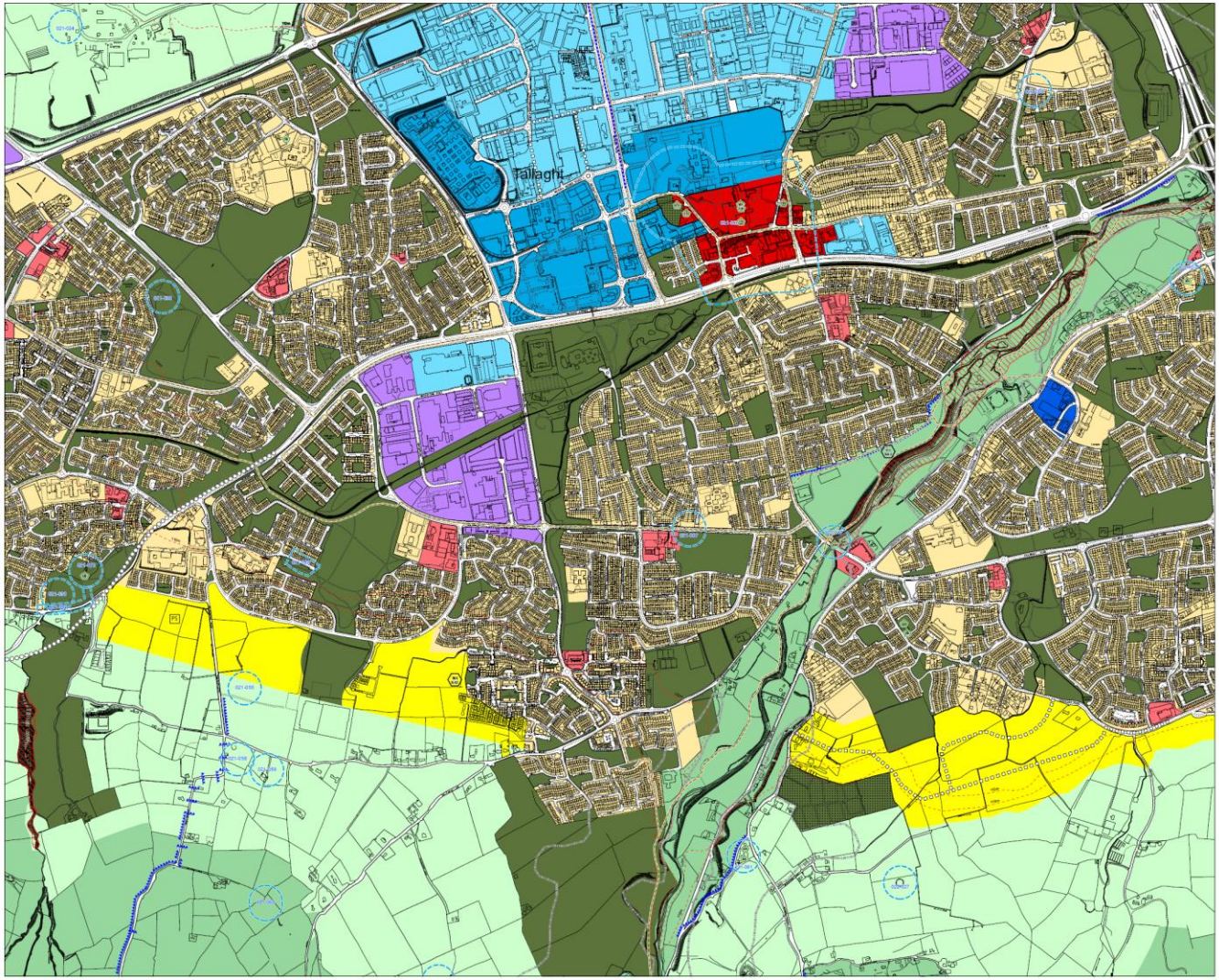
South Dublin County Council Development Plan 2016 - 2022 Zoning Objectives - Map 9

South Dublin County Council

Development Plan 2016 - 2022

Map includes Variations 1 & 2

Map 9



South Dublin County Council
Development Plan
2016 – 2022

Use Zoning Objectives

- To protect and/or improve residential amenity
- To provide for new residential communities in accordance with approved area plans
- To provide for strategic development in accordance with approved planning schemes
- To facilitate enterprise and/or residential-led regeneration
- To protect, improve and provide for the future development of Town Centres
- To protect, improve and provide for the future development of a Major Retail Centre
- To protect, improve and provide for the future development of District Centres
- To protect, improve and provide for the future development of Village Centres
- To protect, improve and provide for the future development of Local Centres
- To provide for and consolidate retail warehousing
- To provide for enterprise and employment related uses
- To preserve and provide for open space and recreational amenities
- To protect and enhance the outstanding natural character and amenity of the Liffey Valley, Dodder Valley and Dublin Mountains areas
- To protect and improve rural amenity and to provide for the development of agriculture

Specific Objectives:

- Proposed Post Primary School
- Proposed Primary School
- Seveso Sites
- Specific Local Objectives (See Written Statement for Details)
- To provide for Traveller Accomodation Sites to be Selected
- To provide for Traveller Accommodation
- To protect and / or provide for a Burial Ground
- Contour Lines
- SDZ Planning Scheme Boundaries
- County Boundary

Transport

- Junction Proposals
- Road Proposals - Long Term
- Road Proposals - 6 Year
- Long Term High Capacity Public Transport (RPA Preferred Route)
- NTA Greater Dublin Cycle Network Plan
- Proposed Local Cycle / Pedestrian Link

Conservation

- To Preserve Prospects
- Tree Preservation Order (See Written Statement For Details)
- Record of Protected Structures (See Written Statement for Details)
- Record of Monuments and Places (See Written Statement for Details) (For Areas of Archaeological Potential see Index Map)
- Protect and Preserve Significant Views
- Geological Sites for Protection
- Bohernabreena Reservoir Catchment
- Architectural Conservation Areas (ACA)
- Proposed Natural Heritage Areas (pNHA)
- Special Protection Areas (SPA)
- Liffey Valley Special Area Amenity Order 1990 (SAAO)
- Special Area of Conservation (SAC)

Note:
See index map for details of approach areas and height control zones for Casement Aerodrome, Baldonnell and Backweston Aerodrome, Backweston Park.

The lines of the Transport Proposals shown on this map are diagrammatic only and are subject to change during the detailed design process

SCALE 1:5,000

0 75 150 300 450 600 metres

Land Use Planning and Transportation Department

Laura Leonard
BA MBA
A/Director

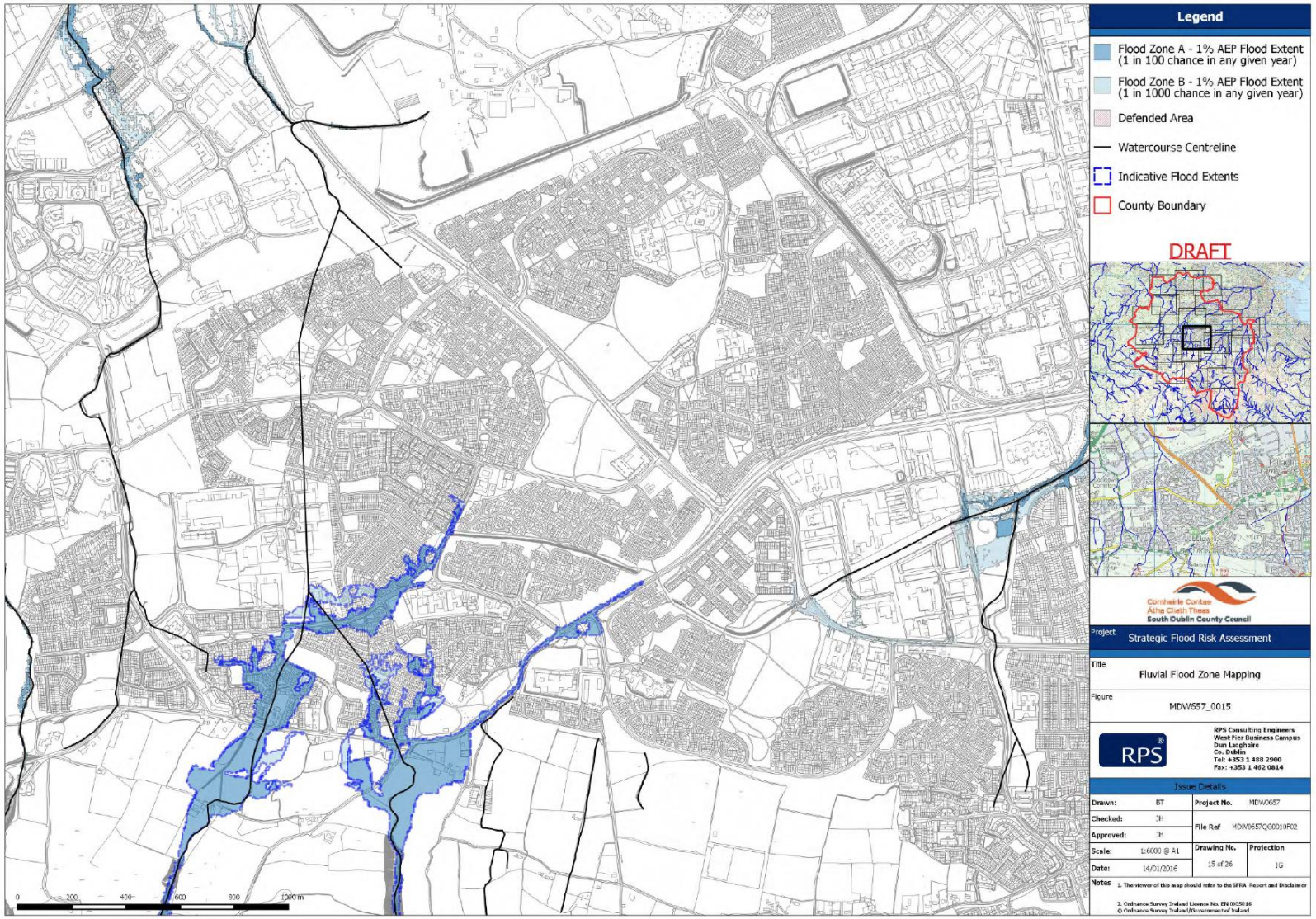
Brian Keaney
MIPI MRTPI
Senior Planner

9

APPENDIX F

South Dublin County Council Development Plan 2016 - 2022 Strategic Flood Risk Assessment

Fluvial Flood Zone Mapping - Map 15


Legend
Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
Defended Area
Watercourse Centreline
Indicative Flood Extents
County Boundary
DRAFT
0
200
400
600
800
1000 m
Comhairle Contae Átha Cliath Theas
South Dublin County Council
Project
Strategic Flood Risk Assessment
Title
Fluvial Flood Zone Mapping
Figure
MDW657_0015
RPS
RPS Consulting Engineers
West Pier Business Campus
Dun Laoghaire
Co. Dublin
Tel: +353 1 488 2900
Fax: +353 1 462 0814
Issue Details
Drawn: BT
Checked: JH
Approved: JH
Scale: 1:6000 @ A1
Date: 14/01/2016
Project No. MDW0657
File Ref MDW0657QG0010R02
Drawing No. 15 of 26
Projection IG
Notes 1. The viewer of this map should refer to the SFRA Report and Disclaimer
2. Ordnance Survey Ireland Licence No. EN 0050816
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APPENDIX G

Confirmation of Feasibility Letter from Irish Water

Steelworks Property Developments LTD, c/o Greg Daly
Scope House
Whitehall Road West
Perrystown
Dublin

Uisce Éireann
Bosca OP 6000
Baile Átha Cliath 1
Éire

Irish Water
PO Box 6000
Dublin 1
Ireland

T: +353 1 89 25000
F: +353 1 89 25001
www.water.ie

26 April 2019

Dear Sir/Madam,

Re: Customer Reference No 155089700 pre-connection enquiry - Subject to contract | Contract denied
[Connection for 474 no. domestic units, 392m2 retail unit, gym and creche]

Irish Water has reviewed your pre-connection enquiry in relation to water and wastewater connections at Fourth Avenue/Cookstown Cookstown Estate Road Junction Tallaght,Dublin 24. Based upon the details that you have provided with your pre-connection enquiry and on the capacity currently available in the network(s), as assessed by Irish Water, we wish to advise you that, subject to a valid connection agreement being put in place, your proposed connection to the Irish Water network(s) can be facilitated.

In the case of wastewater connections this assessment does not confirm that a gravity connection is achievable. Therefore a suitably sized pumping station may be required to be installed on your site. All infrastructure should be designed and installed in accordance with the Irish Water Code of Practice.

Water:
New connection to the existing network is feasible subject to network upgrade and network reconfiguration: 2 new cross-connections between existing adjacent 4''uPVC mains in Second Avenue in Cookstown Industrial Estate (please see attached layout map)
Please note that Irish Water can not guarantee a flow rate to meet fire flow requirements and in order to guarantee a flow to meet the Fire Authority requirements, you should provide adequate fire storage capacity within your development.
Wastewater:
New connection to the existing network is feasible subject to network extension.
The 600mm ID sewer on Airton Road will need to be extended to the intersection with Belgard Road. The 300mm ID sewer to the west of Belgard road will need to be diverted from the 450 mm sewer on Airton Road and connected to the extended section of 600 mm ID sewer on Airton Road.

Strategic Housing Development
Irish Water notes that the scale of this development dictates that it is subject to the Strategic Housing Development planning process. Therefore:
A. In advance of submitting your full application to An Bord Pleanala for assessment, you must have reviewed this development with Irish Water and received a Statement of Design Acceptance in relation to the layout of water and wastewater services.
B. You are advised that this correspondence does not constitute an offer in whole or in part to provide a connection to any Irish Water infrastructure and is provided subject to a connection agreement being signed and appropriate connection fee paid at a later date.
C. In advance of submitting this development to An Bord Pleanala for full assessment, the Developer is required to have entered into a Project Works Services Agreement to deliver infrastructure upgrades to facilitate the connection of the development to Irish Water infrastructure.

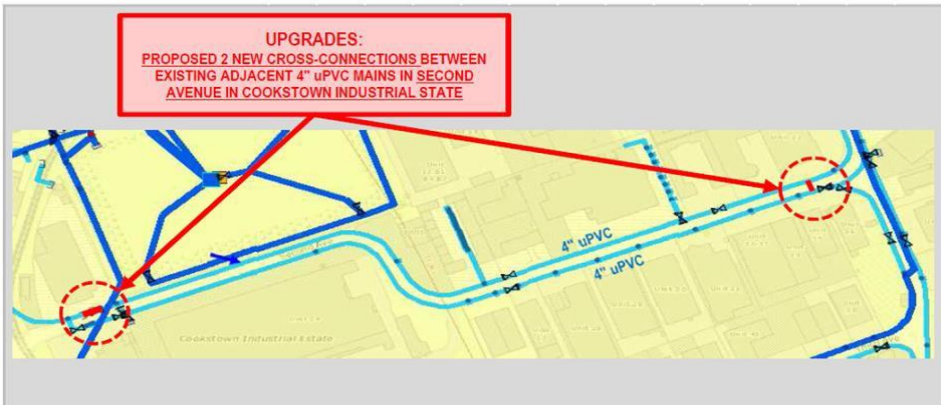
All infrastructure should be designed and installed in accordance with the Irish Water Codes of Practice and Standard Details.

A connection agreement can be applied for by completing the connection application form available at **www.water.ie/connections**. Irish Water's current charges for water and wastewater connections are set out in the Water Charges Plan as approved by the Commission for Regulation of Utilities.

If you have any further questions, please contact Marina Byrne from the design team on 018925991 or email mzbyrne@water.ie. For further information, visit **www.water.ie/connections**

Yours sincerely,

Maria O'Dwyer
Connections and Developer Services



APPENDIX H

Statement of Design Acceptance from Irish Water

Steelworks Property Development Ltd.
C/o Greg Daly,
GDCL Consulting Engineers,
Scope House,
Whitehall Road West,
Perrystown

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Irish Water
PO Box 448,
South City
Delivery Office,
Cork City.

www.water.ie

17 September 2019

Re: Design Submission for Fourth Avenue/Cookstown, Cookstown Estate Road Junction, Tallaght, Dublin 24 (the "Development")
(the "Design Submission") / Connection Reference No: 155089700

Dear Greg Daly,

Many thanks for your recent Design Submission.

We have reviewed your proposal for the connection(s) at the Development. Based on the information provided, which included the documents outlined in Appendix A to this letter, Irish Water has no objection to your proposals.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Irish Water infrastructure. Before you can connect to our network you must sign a connection agreement with Irish Water. This can be applied for by completing the connection application form at www.water.ie/connections. Irish Water's current charges for water and wastewater connections are set out in the Water Charges Plan as approved by the Commission for Regulation of Utilities (CRU)(https://www.cru.ie/document_group/irish-waters-water-charges-plan-2018/).

You the Customer (including any designers/contractors or other related parties appointed by you) is entirely responsible for the design and construction of all water and/or wastewater infrastructure within the Development which is necessary to facilitate connection(s) from the boundary of the Development to Irish Water's network(s) (the "**Self-Lay Works**"), as reflected in your Design Submission. Acceptance of the Design Submission by Irish Water does not, in any way, render Irish Water liable for any elements of the design and/or construction of the Self-Lay Works.

If you have any further questions, please contact your Irish Water representative:
Name: Marina Zivanovic Byrne
Phone: 01 89 25991
Email: mzbyrne@water.ie

Yours sincerely,

Maria O'Dwyer
Connections and Developer Services

Appendix A

Document Title & Revision

- [Site Services Layout] P1606-C-101-P3
- [Watermain Layout] P1606-C-102-P4
- [Foul Drainage Layout] P1606-C-110-P3

*For further information, visit **www.water.ie/connections***

Notwithstanding any matters listed above, the Customer (including any appointed designers/contractors, etc.) is entirely responsible for the design and construction of the Self-Lay Works. Acceptance of the Design Submission by Irish Water will not, in any way, render Irish Water liable for any elements of the design and/or construction of the Self-Lay Works.