CS CONSULTING

GROUP

DUBLIN | LONDON | LIMERICK

Engineering Services Report

The Arboury

Belgard Road, Tallaght, Dublin 24

Client: Landmarque Belgard Development Company Limited

Job No. L088

May 2022

CS CONSULTING

GROUP

CS CONSULTING
GROUP

ENGINEERING SERVICES REPORT

THE ARBOURY, BELGARD ROAD, TALLAGHT, DUBLIN 24

CONTENTS

CS CONSULTING
GROUP

File Location: j:\l_jobs\job-l088\b_documents\l088-csc-zz-xx-rp-c-0003 engineering services report.docx

BS 1192 FIELD	**L088-CSC-ZZ-XX-RP-C-0003 Engineering Services Report**

Job Ref.	Author	Reviewed By	Authorised By	Issue Date	Rev. No.
L088	MT	DB	PS	01.02.2021	P1
L088	MT	DB	PS	30.03.2021	P2
L088	MT	DB	PS	07.04.2021	P3
L088	MT	DB	PS	27.04.2021	P4
L088	MT	DB	PS	28.04.2021	P5
L088	MT	DB	PS	01.10.2021	P6
L088	MT	DB	PS	25.02.2022	P7
L088	MT	DB	PS	27.04.2022	P8
L088	MT	DB	PS	12.05.2022	P9
L088	MT	DB	PS	16.05.2022	P10

CS CONSULTING
GROUP

1.0 INTRODUCTION

Cronin & Sutton Consulting Engineers (CS Consulting) have been commissioned by Landmarque Belgard Development Company Limited to prepare an Engineering Services Report to accompany an SHD planning application for a residential development located on the site of the ABB Building on Belgard Road, Tallaght, Dublin 24.

The report assesses the proposed development under the following headings:

- Foul Drainage Infrastructure
- Stormwater Drainage Infrastructure
- Potable Water Infrastructure

In preparing this report, CS Consulting has made reference to the following:

- South Dublin Development Plan 2016-2022
- Regional Code of Practice for Drainage Works
- The Greater Dublin Strategic Drainage Study
- Irish Water code of Practice for Water
- Irish Water Code of Practice for Wastewater
- Local Authority Drainage Records

The Engineering Services Report is to be read in conjunction with the engineering drawings and documents submitted by CS Consulting and with the various additional information submitted by the other members of the design team, as part of the planning submission.

2.0 SITE LOCATION AND PROPOSED DEVELOPMENT

2.1 Site Location

The site of c.0.898 ha is located at the former ABB Site, Belgard Road, Tallaght, Dublin 24, D24 KD78. The site is bound by Belgard Road (R113) to the east, Belgard Square North to the North and Belgard Square East to the west and Clarity House to the south.

Figure 1 – Site Location
(map data: EPA, NTA, OSM Contributors)

The development is bound by the primary route of Belgard Road and the secondary routes of Belgard Square North & East with active frontage opening onto this route. The physical boundary to the south has a wall separating the site from an adjacent property along which the LAP seeks to introduce a tertiary route which is a publicly accessible pedestrian and cycle route.

The site is situated at the Northeast corner of the LAP town centre zoned land; therefore is considered a gateway site leading from Belgard Road and Belgard Road North into Tallaght centre.

The location of the proposed development site is shown in Figure 1 above; which also shows the indicative extents of the development site. The site is withing walking distance to the Square shopping centre (250m), the Tallaght University Hospital (400m), TUD Tallaght Campus (50m) and the Luas stop in the town centre (500m)

The site is within 2.5 km of the M50 to the East. The surrounding road network is shown in more detail in Figure 2 below.

Figure 2 – Site Environs
(map data: EPA, NTA, OSM Contributors)

2.2 Existing Land Use

The site currently contains a light industrial/office building which is occupied by ABB Limited. It also contains a storage yard with the remaining portion of the site used for carparking. The topography of the site is flat with only localized falls for drainage purposes.

3.0 PROJECT DESCRIPTION

The site of c.0.898 ha is located at the former ABB Site, Belgard Road, Tallaght, Dublin 24, D24 KD78. The site is bound by Belgard Road (R113) to the east, Belgard Square North to the North and Belgard Square East to the west and Clarity House to the south.

The proposed development will consist of:

1. Demolition of all existing structures on site (with a combined gross floor area of c. 3625 sqm)

2. The construction of a mixed-use residential development set out in 3 No. blocks including a podium over a basement, ranging in height from 2 to 13 storeys (with core access above to roof terrace), comprising:

- 334 no. residential units of which 118 No. will be Build to Rent (BTR) residential units, with associated amenities and facilities across the development,
- 4 No. retail/café/restaurant units and 3 no. commercial spaces associated with the 3 no. live-work units (723 sqm combined),
- Childcare facility (144 sq.m.),
- 670 No. bicycle parking spaces including 186 visitor spaces; 117 car parking spaces (including 6 disabled spaces) are provided at ground floor and basement level.
- The overall development has a Gross Floor Area of 29,784 sq.m.
- Two (2) podium residential courtyards and three (3) public accessible pocket parks, two (2) to the North & one (1) to the South.

- Linear Park (as a provision of the Tallaght Town Centre LAP) providing safe public pedestrian and cycling access between Belgard Rd and Belgard Square East

3. Of the total 334 residential units proposed, unit types comprise:

Block A (Build-to-Rent)

- 91 no. 1 bed units
- 1 no. 2 bed 3 person units
- 26 no. 2 bed 4 person units

Blocks B & C

- 2 no. live-work studio units
- 102 no. 1-bed units
- 12 no. 2-bed 3 person units
- 88 no. 2-bed 4 person units including 5 no. duplex units
- 1 no. 2-bed 4 person live-work unit
- 11 no. 3-bed units

4. All associated works, plant, services, utilities, PV panels and site hoarding during construction

4.0 FOUL DRAINAGE

4.1 Existing Foul Drainage Infrastructure

Further to a review of the Irish Water drainage records for the area suggests that there is an existing 225mm diameter gravity foul sewer traversing the Belgard Square Road, flowing down the Belgard Square East Road (towards the N81).

See Appendix A for Irish Water drainage records.

The proposed development shall be serviced by a new drainage system with separate sewers and manholes for both foul and storm water within the sites boundary.

The proposed foul network has been designed in accordance with *Irish Water Codes of Practice for Waste Water,* the *Building Regulations & the Regional Code of Practice for Drainage Works, Version 6.*

4.2 Proposed Foul Drainage Arrangements

The proposed development is to consist of 334 No. residential units and 423m^2 of commercial space and 144m^2 of creche space.

Based on the Irish Water guidelines, the foul effluent generated shall be:

- For the residential units:
    - 446l/day per unit (based on 2.7 persons per unit x 150 l/person/day, including a 10% increase factor)
    - 446l/day/apt x 334 units = 148,964 l/day = 148.96 m^3/day
    - 1.72 l/sec Average Flow (1 DWF)
    - 10.34 l/sec Peak Flow (6 DWF)

- For the commercial units:
    - 60l/day per person (Based on Irish Water Code of Practice 1 person per 7.5m2 of the retail units)
    - 867m^2 / 7.5m2/person = 115.6
    - 115.6 x 60 l/day/person = 6,936 l/day = 6.94 m^3/day
    - 0.080 l/sec Average Flow (1 DWF)
    - 0.48 l/sec Peak Flow (6 DWF)

All foul effluent generated from the proposed development shall be collected in 150mm diameter pipe, provision for a pumping station should be made subject to a survey of the existing levels to ensure a new connection to the existing 225mm diameter foul sewer running adjacent to the Belgard Square East Road can be made.

The drainage network for the development shall be in accordance with Part H of the Building Regulations and to the requirements and specifications of Irish Water.

A Pre-Connection Enquiry for 389 Residential Units and 1,500m^2 of Retail Units (over and above what is proposed by the development) was submitted to Irish Water on the 24/08/2020 for a 150mm diameter water connection and the Client has received a response which requires further discussion with Irish Water prior to lodgment of the Stage 3 SHD application documentation. It is to be noted that these figures applied as part of the pre-connection enquiry are more than the 334 units now currently proposed.

The confirmation of feasibility letter was issued by Irish Water after an extensive period of modelling on the capacity of their network in the area and noted the below in the response. The Developer comments are noted in red below.

1. Irish Water can facilitate the connection subject to the development adhering to strict flow management. This is to ensure no further detriment in the downstream network resulting from the new connections to the existing sewer. The flow control and storage measures will be installed, owned, operated and managed by the developer locally on the private side, and will be required until Irish Water have increased capacity in the downstream network. Providing this arrangement can be facilitated and managed on the private network, your connection can be facilitated subject to a Connection Agreement with Irish Water. The period of time for operating and maintaining flow control measures are subject to the delivery of the public network upgrade and will be a condition of any potential connection. The capital upgrade project is currently at preliminary design stage.
    a. *The Developer team notes the requirement for flow management until such point that Irish Water complete capital upgrades to the public sewer network. The absence of guidance of what extent of flow management is required from Irish Water, the Developer team undertakes to liaise with Irish Water in advance of submitting the Stage 3 application to An Bord Pleanala to receive a "statement of design acceptance". The purpose of this discussions with Irish Water is to agree a proposed interim solution to be implemented at the development prior to Irish Water completing the capital upgrade works. These interim measures may include a temporary foul water storage tank, hydraulic restriction via pipe sizes, etc or some combination.*

2. In addition to the above removing any existing misconnections or installing dedicated separate storm water systems will be required to preserve the existing capacity for foul only flows.

   a. *The Developer team undertakes to investigate all misconnections currently existing on site and decommission same during construction works. The proposed surface water strategy for the site will install a dedicated separate storm water system.*

3. Local Network upgrades or extensions required to connect to strategic infrastructure and point of connection will be assessed at connection application stage.
   a. *The Developer team undertakes to discuss this item with Irish Water at Connection Application stage.*

Please refer to Appendix B for a copy of the confirmation of feasibility from Irish Water.

Further discussions took place with Irish Water in advance of submission of this planning application and the statement of design acceptance has been received and appended to this report.

5.0 STORMWATER DRAINAGE

5.1 Existing Stormwater Drainage Infrastructure

Following receipt of the drainage records (see Appendix A) there is an existing 225mm stormwater line running along the eastern boundary of the development site on Belgard Road.

There is also a stormwater line running along the northern and western boundaries of the site, the diameter of which is unknown.

5.2 Proposed Stormwater Drainage Arrangements

In accordance with the requirements of SDCC Drainage Division, all new developments are to incorporate the principles of Sustainable Urban Drainage Systems, (SuDS). The SuDS principles require a two-fold approach to address storm water management on new developments.

The first aspect is to reduce any post development run-off to pre-development discharge rates. The development is to retain storm water volumes predicted to be experienced during extreme rainfall events. This is defined as the volume of storm water generated during a 1 in 100-year storm event increased for predicted climate change factors.

To ensure an accurate calculation of the required attenuation for the site Met Eireann was contacted to provide:

a) The SAAR (Standard Annual Average Rainfall) for the area: 825mm
b) The sliding duration table for the site indicating the 1:100-year rainwater intensities to be used.

Based on the above criteria, the development shall require 1139 m^3, this is based on effective permeable area of 0.813 has, soil type 2, and a SAAR of 825mm. The site area is 0.898ha. GDSDS recommend maximum Qbar of

2l/s/ha (subject to a minimum of 2l/s for operation/maintenance reasons. Therefore, the total outflow is limited to 2l/s for the development. See calculations in Appendix C

The restricted flow from the development site shall then discharge to the existing 225mm stormwater network along the eastern boundary. The last public manhole and network to the existing boundary sewer is to be constructed in accordance with the Local Authority's requirements.

The second aspect is the policy of the Local Authority is to include Sustainable Urban Drainage Systems, SuDS, for all new applications, as such a range of SuDS devices are generally available but some not feasibility for smaller urban brownfield sites such as this such as below:

- Green/Blue roofs – Green roofs are provided to all roof surfaces as highlighted on C+WOB Architects roof drawing (see figure below)
- Swales – due to the urban brownfield nature of the site, swales are not possible
- Filter Drains/Channel rills – due to the urban brownfield nature of the site, swales are not possible
- Infiltration systems – based on recent experience in the area, it is known that the ground is not conducive to surface water disposal via infiltration
- Rain Gardens – numerous landscaping soft features are proposed throughout the development at ground level and terraces; refer to CAMEO Landscaping layout drawings
- Permeable Paving/Asphalt – The full site coverage of the podium structure, coupled with other soft landscaping areas makes permeable paving not possible
- Tree pits – numerous landscaping soft features are proposed throughout the development at ground level and terraces; refer to CAMEO Landscaping layout drawings

- Rainwater harvesting – rainwater harvesting is not proposed for the development.

SuDS proposals are as follows:

- SuDS and soft landscaping features within the landscaping at ground level

Figure 2 – SUDS and Soft Landscaping at Ground Level
(Image source: CAMEO & Partners drawing C0118 L 1000)

- Green roofs at roof level

Figure 3 – Green roofs at roof levels
(Image source: C+WOB Architects drawing PE1)9150-CWO-ZZ-13-DR-A-2113

- Attenuation tank with flow control device, sized to contain 1-in-100 ear storm event and increased by 20% for predicted climate change to limit the surface water discharge from the site during extreme rainfall events.

The attenuated surface water run off for the site is ultimately connected to the existing surface water sewer to the east of the development. This sewer then runs south to the Blessington Road. Once it hits the junction with Blessington Road, it travels east to Old Bawn Road where it discharges to the Whitestown Stream which is a tributary of the River Dodder. The Whitestown Stream joins the River Dodder just west of the M50 at Balrothery. The River Dodder then discharges to the River Liffey at Sir John Rogersons Quay and into Dublin Bay.

6.0 POTABLE WATER SUPPLY

6.1 Existing potable Water System

Records obtained from Irish Water indicate a watermains currently installed on the site to provide water for the existing structure on the site, with a connection to the public watermains on Belgard Road East at the Southwest corner of the site.

6.2 Proposed Potable Water System

It is proposed to make a new connection of the existing watermain on Belgard Square East, see drawing '*BR-CSC-ZZ-00-DR-C-0005 Proposed Watermain'*.

Based on the Irish Water Code of Practice for Water, the potable water requirements shall be:

- For the Residential Units:
    - 405 l/day per unit (based on 2.7 persons per unit x 150 l/person/day)
    - 405 l/day/apt x 334 units = 135,270 l/day = 135.3m^3/day
    - 1.56 l/sec Average Water Demand
    - 7.8 l/sec Peak Water Demand (5 times the average water demand).
- For the Retail Units:
    - Assuming 20 persons/retail unit x 60l/person/day
    - 1,200l/day over the total retail area of 867m^2
    - Assuming an 8hr working day.
    - 0.042 l/sec Average Water Demand
    - 0.21 l/sec Peak Water Demand (5 times the average water demand)

A Pre-Connection Enquiry for 389 number residential units and 1,500m^2 of retail units (over and above what is proposed by the development) was submitted to Irish Water on the 24/08/2020 and the Client has received a favorable response, confirming a connection was feasible to the existing network, stipulating specifically that the connection is made "The connection should be 150mm ID pipe connected to the existing 150mm uPVC main" as highlighted in the image below

Figure 4 – Proposed Watermain Connection Location
(image source: Irish Water Confirmation of Feasibility letter, dated 15/9/2021)

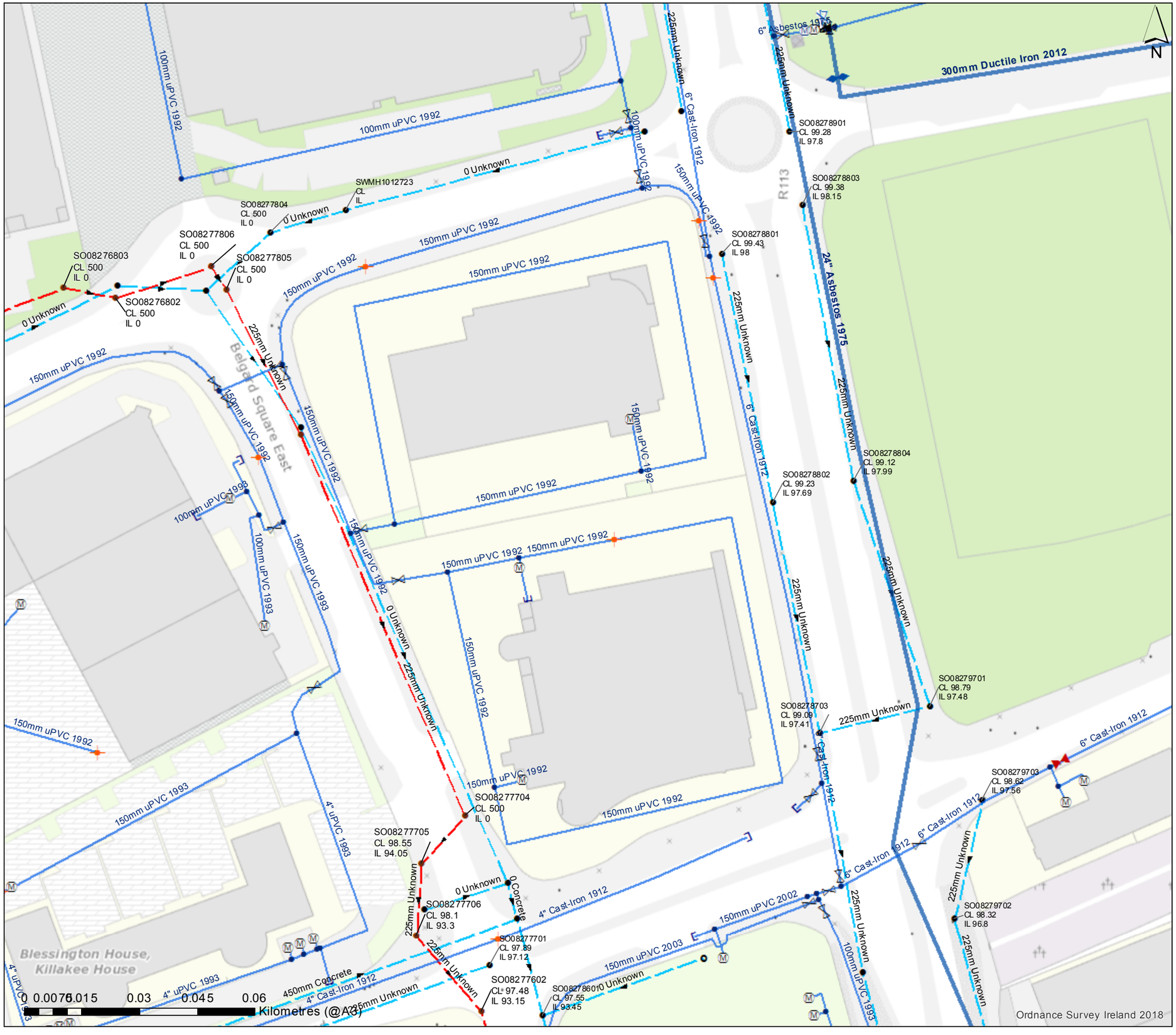
The confirmation of feasibility from Irish Water also requires that "at connection application stage, local pressure tests must be performed to identify any local water network upgrades which may be required for the connection".

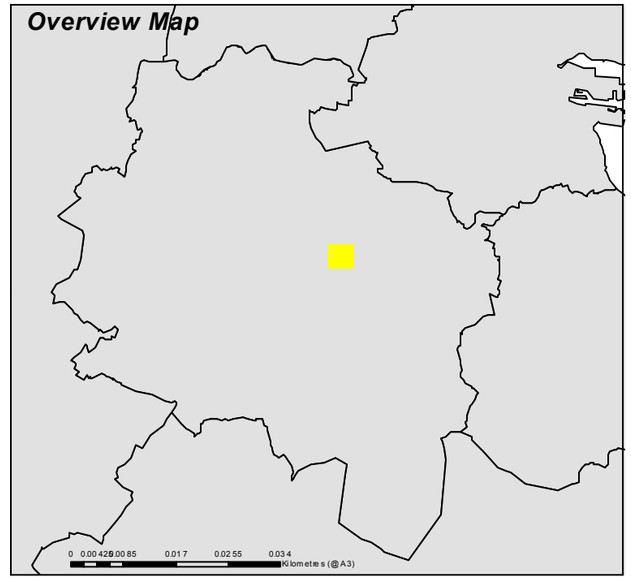
Please refer to Appendix B for a copy of the confirmation of feasibility letter from Irish Water.

Further discussions took place with Irish Water in advance of submission of this planning application and the statement of design acceptance is included in this report.

Appendix A: Irish Water Drainage Records

IWGIS Water Utilities Network





Water Distribution Network
Water Treatment Plant
Water Pump Station
Storage Cell/Tower
Dosing Point
Meter Station
Abstraction Point
Telemetry Kiosk
Reservoir: Potable, Raw Water
Water Distribution Mains: Irish Water, Private
Trunk Water Mains: Irish Water, Private
Water Lateral Lines: Irish Water, Non IW
Water Casings
Water Abandoned Lines
Boundary Meter
Bulk/Check Meter
Group Scheme
Source Meter
Waste Meter
Unkno Meter ; Other Meter
Non-Return
PRV
PSV
Sluice Line Valve Open/Closed
Butterfly Line Valve Open/Closed
Sluice Boundary Valve Open/Closed
Butterfly Boundary Valve Open/Closed
Scour Valves
Single Air Control Valve
Double Air Control Valve
Water Stop Valves
Water Service Connections
Water Distribution Chambers
Water Network Junctions
Pressure Monitoring Point
Hydrant (FH, WO)
Water Fittings: Cap, Other Fitting

Sewer Foul Combined Network
Waste Water Treatment Plant
Waste Water Pump station
Sewer Mains Irish Water: Gravity - Combined, Gravity - Foul, Gravity - Unknown, Pumping - Combined, Pumping - Foul, Pumping - Unknown, Syphon - Combined, Syphon - Foul, Overflow
Sewer Mains Private: Gravity - Combined, Gravity - Foul, Gravity - Unknown, Pumping - Combined, Pumping - Foul, Pumping - Unknown, Syphon - Combined, Syphon - Foul, Overflow
Sewer Lateral Lines
Sewer Casings
Sewer Manholes: Standard, Backdrop, Cascade, Catchpit, Bifurcation, Hatchbox, Lamphole, Hydrobrake
Other; Unknown
Discharge Type: Outfall, Overflow, Soakaway, Standard Outlet, Other; Unknown
Cleanout Type: Rodding Eye, Flushing Structure, Other; Unknown
Sewer Inlets: Catchpit, Gully, Standard, Other; Unknown
Sewer Fittings: Vent/Col, Other; Unknown

Storm Water Network
Surface Water Mains: Surface Gravity Mains, Surface Gravity Mains Private, Surface Water Pressurised Mains, Surface Water Pressurised Mains Private
Inlet Type: Gully, Standard, Other; Unknown
Storm Manholes: Standard, Backdrop, Cascade, Catchpit, Bifurcation, Hatchbox, Lamphole, Hydrobrake, Other; Unknown
Storm Culverts
Storm Clean Outs
Stormwater Chambers
Discharge Type: Outfall, Overflow, Soakaway, Other; Unknown

Gas Networks Ireland
Transmission High Pressure Gasline
Distribution Medium Pressure Gasline
Distribution Low Pressure Gasline

ESB Networks
ESB HV Lines: HV Underground, HV Overhead, HV Abandoned
ESB MVLV Lines: MV Overhead Three Phase, MV Overhead Single Phase, LV Overhead Three Phase, LV Overhead Single Phase, MVLV Underground, Abandoned

Non Service Categories
Proposed
Under Construction
Out of Service
Decommissioned

Water Non Service Assets
Water Point Feature
Water Pipe
Water Structure

Waste Non Service Assets
Waste Point Feature
Sewer
Waste Structure

UISCE ÉIREANN : IRISH WATER

Print Date: 12/08/2020

Printed by: cbolger

CS CONSULTING
GROUP

Appendix B: Irish Water Confirmation of Feasibility Letter

Damien Byrne

CS Consulting
19-22 Dame Street
Dublin 2,
D02WK40

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

15 September 2021

Re: CDS20005423 pre-connection enquiry - Subject to contract | Contract denied

Connection for Multi/Mixed Use Development of 390 units at Lands at Belgard Road, Cookstown, Dublin

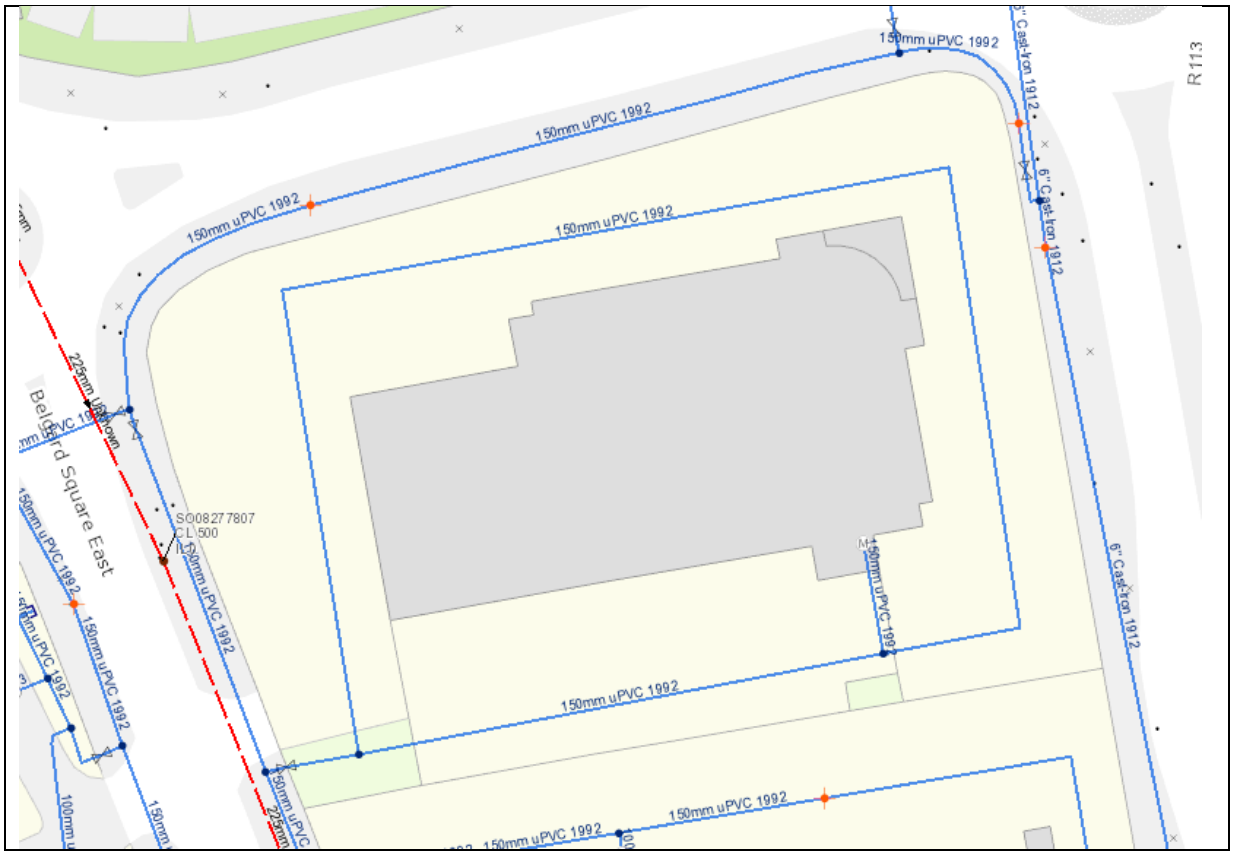
Dear Sir/Madam,

Irish Water has reviewed your pre-connection enquiry in relation to a Water & Wastewater connection at Lands at Belgard Road, Cookstown, Dublin (the **Premises**). Based upon the details you have provided with your pre-connection enquiry and on our desk top analysis of the capacity currently available in the Irish Water network(s) as assessed by Irish Water, we wish to advise you that your proposed connection to the Irish Water network(s) can be facilitated at this moment in time.

SERVICE	**OUTCOME OF PRE-CONNECTION ENQUIRY** **THIS IS NOT A CONNECTION OFFER. YOU MUST APPLY FOR A CONNECTION(S) TO THE IRISH WATER NETWORK(S) IF YOU WISH TO PROCEED.**
Water Connection	Feasible Subject to upgrades
Wastewater Connection	Feasible Subject to upgrades
SITE SPECIFIC COMMENTS	
Water Connection	The connection should be 150mm ID pipe connected to the existing 150mm uPVC main as shown below

	 At connection application stage, local pressure tests must be performed to identify any local water network upgrades which may be required for the connection. The local upgrades will be funded by the Customer.
Wastewater Connection	Irish Water can facilitate the connection subject to the development adhering to strict flow management. This is to ensure no further detriment in the downstream network resulting from the new connections to the existing sewer. The flow control and storage measures will be installed, owned, operated and managed by the developer locally on the private side, and will be required until Irish Water have increased capacity in the downstream network. Providing this arrangement can be facilitated and managed on the private network, your connection can be facilitated subject to a Connection Agreement with Irish Water. The period of time for operating and maintaining flow control measures are subject to the delivery of the public network upgrade and will be a condition of any potential connection. The capital upgrade project is currently at preliminary design stage. In addition to the above removing any existing misconnections or installing dedicated separate storm water systems will be required to preserve the existing capacity for foul only flows. Local Network upgrades or extensions required to connect to strategic infrastructure and point of connection will be assessed at connection application stage.
The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this development shall comply with the Irish Water Connections and Developer Services Standard Details and Codes of Practice that are available on the Irish Water website. Irish Water reserves the right to supplement these requirements with Codes of Practice and these will be issued with the connection agreement.	

The map included below outlines the current Irish Water infrastructure adjacent to your site:



Reproduced from the Ordnance Survey of Ireland by Permission of the Government. License No. 3-3-34

Whilst every care has been taken in its compilation 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 to Irish Water. Irish Water can assume no responsibility for and give no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided and does not accept any liability whatsoever arising from any errors or omissions. This information should not be relied upon in the event of excavations or any other works being carried out in the vicinity of the Irish Water underground network. The onus is on the parties carrying out excavations or any other works to ensure the exact location of the Irish Water underground network is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.

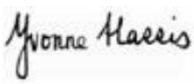
General Notes:

1) The initial assessment referred to above is carried out taking into account water demand and wastewater discharge volumes and infrastructure details on the date of the assessment. **The availability of capacity may change at any date after this assessment.**
2) This feedback does not constitute a contract in whole or in part to provide a connection to any Irish Water infrastructure. All feasibility assessments are subject to the constraints of the Irish Water Capital Investment Plan.
3) The feedback provided is subject to a Connection Agreement/contract being signed at a later date.
4) A Connection Agreement will be required to commencing the connection works associated with the enquiry this can be applied for at https://www.water.ie/connections/get-connected/
5) A Connection Agreement cannot be issued until all statutory approvals are successfully in place.

6) Irish Water Connection Policy/ Charges can be found at https://www.water.ie/connections/information/connection-charges/
7) Please note the Confirmation of Feasibility does not extend to your fire flow requirements.
8) Irish Water is not responsible for the management or disposal of storm water or ground waters. You are advised to contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges
9) To access Irish Water Maps email datarequests@water.ie
10) All works to the Irish Water infrastructure, including works in the Public Space, shall have to be carried out by Irish Water.

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

Yours sincerely,



Yvonne Harris

Head of Customer Operations

CS CONSULTING
GROUP

Appendix C: Attenuation Calculations

Project: Proposed Development at Belgard Dublin
Project No.: L088
Calculation: Attenuation 100-year - Total Site
Calcs By: DF
Checked By:
Date:

CS CONSULTING GROUP
DUBLIN - LONDON - LIMERICK

Site Location:	Belgard Dublin		
Design Storm Return Period:	100 years		
Climate Change Factor:	20 %		
Soil Type:	2		
Total Site Area:	0.913 ha		
Hardstand and Roof Areas:	0.714 ha	.....@	100% Impervious
Permeable Pavement:	0.110 ha	.....@	90% Impervious
Effective Impermeable Area:	0.813 ha		

Allowable Outflow	**Calculate**	0.144
IH124: QBAR = 0.00108 x $AREA^{0.89}$ x $SAAR^{1.17}$ x $SOIL^{2.17}$		
AREA:	0.0091 km^2	
SAAR:	825 mm	
SOIL:	0.3	
QBAR/ha	2.21 l/s/ha	
Allowable Outflow	**2.0 l/s**	Minimum Allowable Discharge = 2 L/S

Storage required =	**1139 m^3**	

Duration (min)	Rainfall 100-Year (mm)	Rainfall 100-Year with CCF (mm)	Intensity (mm/hr)	Discharge (Q = 2.71iA) (l/s)	Proposed Runoff (m^3)	Contiguous Land Runoff (m^3)	Total Runoff (m^3)	Allowable Outflow (m^3)	Storage Required (m^3)
5	18.0	21.6	259.2	571	171	0	171	1	171
10	25.1	30.1	180.7	398	239	0	239	1	238
15	29.6	35.5	142.1	313	282	0	282	2	280
30	37.3	44.8	89.5	197	355	0	355	4	351
60	47.2	56.6	56.6	125	449	0	449	7	442
120	59.6	71.5	35.8	79	567	0	567	14	553
180	68.3	82.0	27.3	60	650	0	650	22	628
240	75.3	90.4	22.6	50	717	0	717	29	688
360	86.3	103.6	17.3	38	821	0	821	43	778
540	98.9	118.7	13.2	29	941	0	941	65	877
720	109.0	130.8	10.9	24	1037	0	1037	86	951
1080	125.0	150.0	8.3	18	1190	0	1190	130	1060
1440	137.8	165.4	6.9	15	1312	0	1312	173	1139
2880	151.8	182.2	3.8	8	1445	0	1445	346	1099
4320	163.8	196.6	2.7	6	1559	0	1559	518	1041
5760	174.3	209.2	2.2	5	1659	0	1659	691	968
8640	192.6	231.1	1.6	4	1833	0	1833	1037	796
11520	208.6	250.3	1.3	3	1985	0	1985	1382	603
14400	222.9	267.5	1.1	2	2122	0	2122	1728	394
17280	236.1	283.3	1.0	2	2247	0	2247	2074	174
23040	260.1	312.1	0.8	2	2476	0	2476	2765	-289
28800	281.7	338.0	0.7	2	2681	0	2681	3456	-775
36000	306.4	367.7	0.6	1	2916	0	2916	4320	-1404

CS CONSULTING
GROUP

Appendix D: Irish Water Statement of Design Acceptance

Robert Fitzmaurice
Cronin & Sutton Consulting
19 22 Dame Street
Dublin 2 D02 E267

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

13 May 2022

Re: Design Submission for Lands at Belgard Road, Cookstown, Dublin (the "Development")
(the "Design Submission") / Connection Reference No: CDS20005423

Dear Robert Fitzmaurice,

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: Antonio Garzón
Phone: 0838983711
Email: antonio.garzon@water.ie

Yours sincerely,

Yvonne Harris

Yvonne Harris
Head of Customer Operations

Appendix A

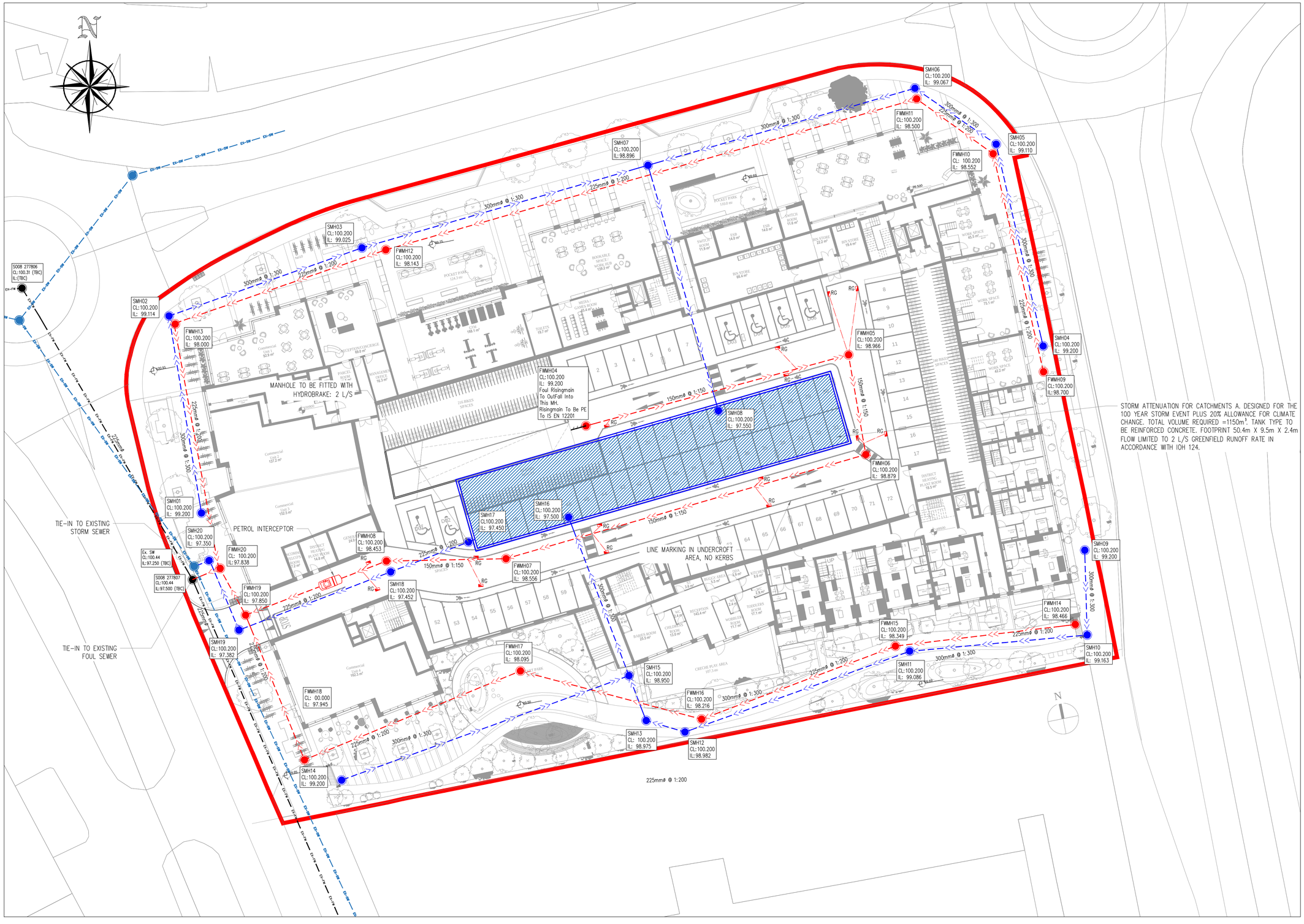
Document Title & Revision

- BR-CSC-ZZ-00-DR-C-0005 Proposed Foul and Surface Water Drainage - Ground Level
- BR-CSC-ZZ-00-DR-C-0006 Proposed Watermain
- BR-CSC-ZZ-XX-DR-C-0027_Foul Sewer Longsections

While Irish Water notes that the water and wastewater services infrastructure will remain private and not be vested, we have the following comments: It is recommended that loops shall have a minimum of four connected houses and one hydrant.
Commercial connection details will be assessed at Connection Application stage.

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.



LEGEND:

- EXISTING FOUL SEWER
- EXISTING SURFACE WATER SEWER
- PROPOSED FOUL SEWER
- PROPOSED SURFACE WATER SEWER
- PROPOSED RISING MAIN
- PIPE NUMBER, DIAMETER AND GRADIENT — 225mmø @ 1:150
- FOUL AND STORM MANHOLE NUMBER, COVER AND INVERT LEVELS — FWMH04 CL: 00.000 IL: 00.000 / SWMH04 CL: 00.000 IL: 00.000
- PROPOSED STORAGE ATTENUATION TANK
- PROPOSED GULLY — RG
- PROPOSED PERMEABLE PAVING
- PROPOSED FOUL WATER INSPECTION CHAMBER — 100mmø FIC
- PROPOSED SURFACE WATER INSPECTION CHAMBER — 150mmø SIC
- PROPOSED ACO DRAIN — ACO
- 150mm Dia' PERIMETER LAND DRAIN WITH COLLECTION AJ — AJ
- DRAINAGE INFRASTRUCTURE TO BE INSTALLED AT A LATER STAGE. SHOWN INDICATIVELY
- PROPOSED TREE PIT ATTENUATION SYSTEM

PROPOSED FOUL & SURFACE WATER DRAINAGE

SCALE= 1:250

L088

PLANNING DRAWING

THIS DRAWING HAS BEEN ISSUED FOR PLANNING PURPOSES ONLY AND MUST NOT BE USED FOR ANY OTHER CIRCUMSTANCES

NOTES

1. For setting out refer to Architect's drawings.
2. This drawing to be read in conjunction with all other Architectural and Engineering drawings and all other relevant drawings and Specifications.
3. DO NOT SCALE THIS DRAWING. Use figured dimensions only.
4. No part of this document may be reproduced or transmitted in any form or stored in any retrieval system of any nature without the written permission as copyright holder except as agreed for use on the project for which the document was originally issued.
5. Ordnance Survey Ireland Licence Number EN 0074022

Rev. No.	Date	REVISION NOTE	Drn. By	Chkd. By
P1	15.04.2022	ISSUED FOR REVIEW	DB	DB
P2	13.05.2022	Layout Up Dated Following IW Comments	RFM	RFM

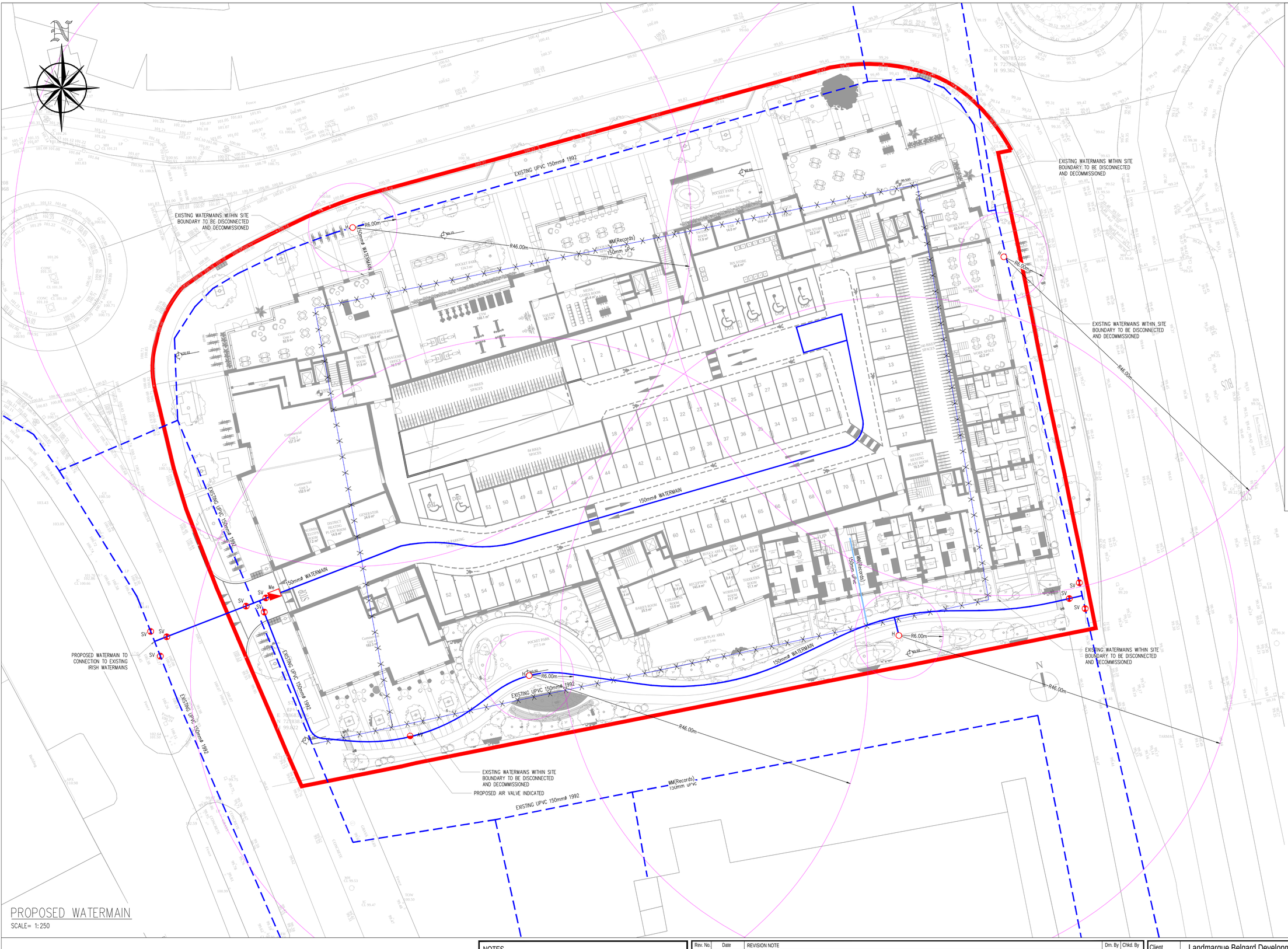
Client	Landmarque Belgard Development Co. Ltd
Project	The Arboury Belgard Road, Dublin 24
Title	PROPOSED FOUL AND SURFACE WATER DRAINAGE - GROUND LEVEL
Dwg. No.	BR-CSC-ZZ-00-DR-C-0005

Date	Drn by	Chkd by	Aprvd by	Scale	Revision
Feb. 2021	DF	DB	DR	1/250@A1	P2

CS Consulting Group
DUBLIN | LONDON | LIMERICK
Head Office
19-22 Dame Street, Dublin 2.
T: +353 (0)1 5480863
e: info@csconsulting.ie
w: www.csconsulting.ie

NSAI Certified

Quality	I.S. EN ISO 9001:2008
Environment	I.S. EN ISO 14001:2004
Energy	I.S. EN ISO 50001:2011
Health & Safety	OHSAS 18001:2007



PROPOSED WATERMAIN

SCALE= 1:250

LEGEND:

- EXISTING PUBLIC WATERMAINS
- EXISTING PIPE TO BE DECOMMISSIONED
- EXISTING PRIVATE WATERMAINS
- PROPOSED WATERMAINS
- SLUICE VALVE TO IRISH WATER STANDARD DETAIL STD-W-15 — SV
- AIR VALVE TO IRISH WATER STANDARD DETAIL STD-W-22 — AV
- HYDRANT TO IRISH WATER STANDARD DETAIL STD-W-19 — H
- SCOUR VALVE TO IRISH WATER STANDARD DETAIL STD-W-30 — Sc.V
- BULK METER TO IRISH WATER STANDARD DETAIL STD-W-26 — Me
- THRUST BLOCK — TB

WATERMAIN NOTES:

1. ALL PIPE WORK, VALVES, CHAMBERS, NETWORK ARRANGEMENTS AND ALL ASSOCIATED WATERMAIN WORKS TO BE IN ACCORDANCE WITH IRISH WATER CODES OF PRACTICE AND STANDARD DETAILS.
2. ALL NEW WATERMAIN MATERIAL SHALL BE IN ACCORDANCE WITH SECTION 3.9 OF THE IRISH WATER CODE OF PRACTICE.
3. ALL MANHOLES IN GRASSED AREAS TO HAVE 200mm WIDE X 100mm DEEP CONCRETE PLINTH/KERB CAST TO THEIR PERIMETER TO ENSURE THEY ARE NOT OVERGROWN. CONCRETE TO BE GRADE C20/25.
4. PROPOSED WATERMAINS TO BE LOCATED A MINIMUM OF 300mm FROM THE WASTEWATER INFRASTRUCTURE IN ACCORDANCE WITH SECTION 3.5.18 OF THE 3.15.18 OF THE IRISH WATER WASTEWATER CODE OF PRACTICE.
5. THE LOCATION OF THE BULK METER, VALVES AND HYDRANTS SHALL BE DESIGNED IN ACCORDANCE WITH SECTION 3.15.4 OF THE IRISH WATER CODE OF PRACTICE.
6. NOTE THE FIRE SAFETY CERTIFICATE HAS NOT BEEN COMPLETED YET, BUT AS PART OF THIS DEVELOPMENT, IT IS CONFIRMED THAT HYDRANTS SHALL NOT BE LOCATED ANY MORE THAN 46M FROM ANY PART OF THE DEVELOPMENT.
7. ALL WATERMAIN WORKS TO BE TAKEN IN CHARGE TO BE AIR PRESSURE TESTED IN ACCORDANCE WITH IRISH WATER CODE OF PRACTICE SECTION 4.10.

L088

PLANNING DRAWING
THIS DRAWING HAS BEEN ISSUED FOR PLANNING PURPOSES ONLY AND MUST NOT BE USED FOR ANY OTHER CIRCUMSTANCES

NOTES
1. For setting out refer to Architect's drawings.
2. This drawing to be read in conjunction with all other Architectural and Engineering drawings and all other relevant drawings and Specifications.
3. DO NOT SCALE THIS DRAWING. Use figured dimensions only.
4. No part of this document may be reproduced or transmitted in any form or stored in any retrieval system of any nature without the written permission as copyright holder except as agreed for use on the project for which the document was originally issued.
5. Ordnance Survey Ireland Licence Number EN 0074022

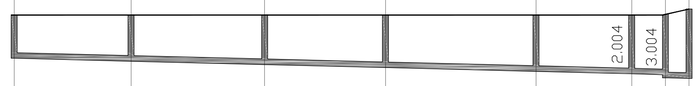
Rev. No.	Date	REVISION NOTE	Drn. By	Chkd. By
P1	12.04.2022	ISSUED FOR INFORMATION	SC	RF
P2	13.05.2022	Details Added In Following Irish Water Review	RFM	RFM

Client	Landmarque Belgard Development Co. Ltd
Project	The Arboury Belgard Road, Dublin 24
Title	PROPOSED WATERMAIN
Dwg. No.	BR-CSC-ZZ-00-DR-C-0006

Date	Drn by	Chkd by	Aprvd by	Scale	Revision
Feb. 2021	PS	DB	DR	1/250@A1	P2

CS Consulting Group
DUBLIN | LONDON | LIMERICK
Head Office
19-22 Dame Street, Dublin 2.
T: +353 (0)1 5480863
e: info@csconsulting.ie
w: www.csconsulting.ie
NSAI Certified
Quality I.S. EN ISO 9001:2008
Environment I.S. EN ISO 14001:2004
Energy I.S. EN ISO 50001:2011
Health & Safety OHSAS 18001:2007

MH Name	1	2	3 (Fitted with Pump)
			
Hor Scale 500 Ver Scale 100			
Datum (m)72.000	1.000	1.001	
PN	150	150	
Dia (mm)	150.0	150.0	
Slope (1:X)			
Cover Level (m)	96.200	96.200	96.200
Invert Level (m)	95.200	95.046 95.046	94.711
	23.069	50.309	
Length (m)			

MH Name	14	15	16	17	18			Ex. MH S008
								
Hor Scale 500 Ver Scale 100						2.004	3.004	
Datum (m)75.000								
PN	1.000	1.001	1.002	1.003	1.004			
Dia (mm)	225	225	225	225	225			
Slope (1:X)	200.0	199.8	200.2	199.8	199.8			
Cover Level (m)	100.200	100.200	100.200	100.200	100.200	100.200	100.200	100.440
Invert Level (m)	98.466	98.349 98.349	98.215 98.215	98.094 98.094	97.943 97.943	97.847 97.847	97.802	97.685
Length (m)	23.423	26.778	24.226	30.165	19.182			

MH Name	4	5	6	7	8	19
						1.004
Hor Scale 500 Ver Scale 100						
Datum (m)75.000						
PN	2.000		2.002	2.003	2.004	
Dia (mm)	150		150	150	150	
Slope (1:X)	150.2		149.9	150.2	149.9	
Cover Level (m)	100.200	100.200	100.200	100.200	100.200	100.200
Invert Level (m)	99.200	98.966 98.966	98.879 98.879	98.556 98.556	98.453 98.453	98.323
Length (m)	35.156		48.415	15.466	19.487	

MH Name	9	10	11	12	13	20
						1.005
Hor Scale 500 Ver Scale 100						
Datum (m)75.000						
PN	3.000		3.002	3.003	3.004	
Dia (mm)	225		225	225	225	
Slope (1:X)	199.4		199.8	199.5	199.7	
Cover Level (m)	100.200	100.200	100.200	100.200	100.200	100.200
Invert Level (m)	98.552	98.404 98.404	98.348 98.348	97.991 97.991	97.848 97.848	97.686
Length (m)	29.515		71.333	28.526	32.352	

L088

PLANNING DRAWING
THIS DRAWING HAS BEEN ISSUED FOR PLANNING PURPOSES ONLY AND MUST NOT BE USED FOR ANY OTHER CIRCUMSTANCES

NOTES
1. For setting out refer to Architect's drawings.
2. This drawing to be read in conjunction with all other Architectural and Engineering drawings and all other relevant drawings and Specifications.
3. DO NOT SCALE THIS DRAWING. Use figured dimensions only.
4. No part of this document may be reproduced or transmitted in any form or stored in any retrieval system of any nature without the written permission as copyright holder except as agreed for use on the project for which the document was originally issued.
5. Ordnance Survey Ireland Licence Number EN 0074022

Rev. No.	Date	REVISION NOTE	Drn. By	Chkd. By
P1	13.05.2022	DRAWING ISSUED TO IRISH WATER	RFM	RFM

Client	Landmarque Belgard Development Co. Ltd
Project	The Arboury Belgard Road, Dublin 24
Title	PROPOSED FOUL SEWER LONGSECTIONS
Dwg. No.	BR-CSC-ZZ-00-DR-C-0027

Date	Drn by	Chkd by	Aprvd by	Scale	Revision
May. 2022	RFM	RFM	RFM	Horz 1:500@A1 Vert 1:100@A1	P1

CS Consulting Group
DUBLIN | LONDON | LIMERICK
Head Office
19-22 Dame Street, Dublin 2.
T: +353 (0)1 5480863
e: info@csconsulting.ie
w: www.csconsulting.ie

NSAI Certified
Quality I.S. EN ISO 9001:2008
Environment I.S. EN ISO 14001:2004
Energy I.S. EN ISO 50001:2011
Health & Safety OHSAS 18001:2007

CS CONSULTING
GROUP