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Engineering Services Report for a

Proposed Mixed-Use Development

Belgard Square East, Belgard Road and Blessington Road, Dublin 24.

Client: Ravensbrook Limited.

Job No. Q003

June 2022

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ENGINEERING SERVICES REPORT

PROPOSED MIXED-USE DEVELOPMENT, BELGARD SQUARE EAST, BELGARD ROAD AND BLESSINGTON ROAD, DUBLIN 24.

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Q003	FB	RFM	RFM	11.10.2021	P1
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1.0 INTRODUCTION

Cronin & Sutton Consulting Engineers (CS Consulting) have been commissioned by Ravensbrook Limited to prepare an Engineering Services Report to accompany a planning application for a proposed mixed-use residential development at Belgard Square East, Belgard Road and Blessington Road, Tallaght, Dublin 24.

This report assesses the proposed development under the following headings:

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

Please refer to the Traffic and Transport Assessment under separate cover for details regarding facilities for pedestrians and cyclists and proposals for road infrastructure within the subject development.

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

- South Dublin Development Plan 2016–2022;
- Draft South Dublin Development Plan 2022-2028;
- Greater Dublin Regional Code of Practice for Drainage Works, Version 6.0;
- The Greater Dublin Strategic Drainage Study;
- Code of Practice for Water Infrastructure (Irish Water, 2020);
- Code of Practice for Wastewater Infrastructure (Irish Water, 2020);
- Local Authority Drainage Records.

The Engineering Services Report is to be read in conjunction with the engineering drawings submitted by CS Consulting.

2.0 SITE LOCATION

The proposed development site is located on Belgard Square East, Belgard Road and Blessington Road, Tallaght, Dublin 24. The site is in the administrative jurisdiction of South Dublin County Council (SDCC) and has a total area of circa 1.26ha.

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

The location of the proposed development site is shown in Figure 1 with the indicative extents of the development site, as well as relevant elements of the surrounding road network, shown in more detail in Figure 2.

The development site is bound by Belgard Square East to the west, Blessington Road to the north, Belgard Road to the east and existing commercial developments to the south.

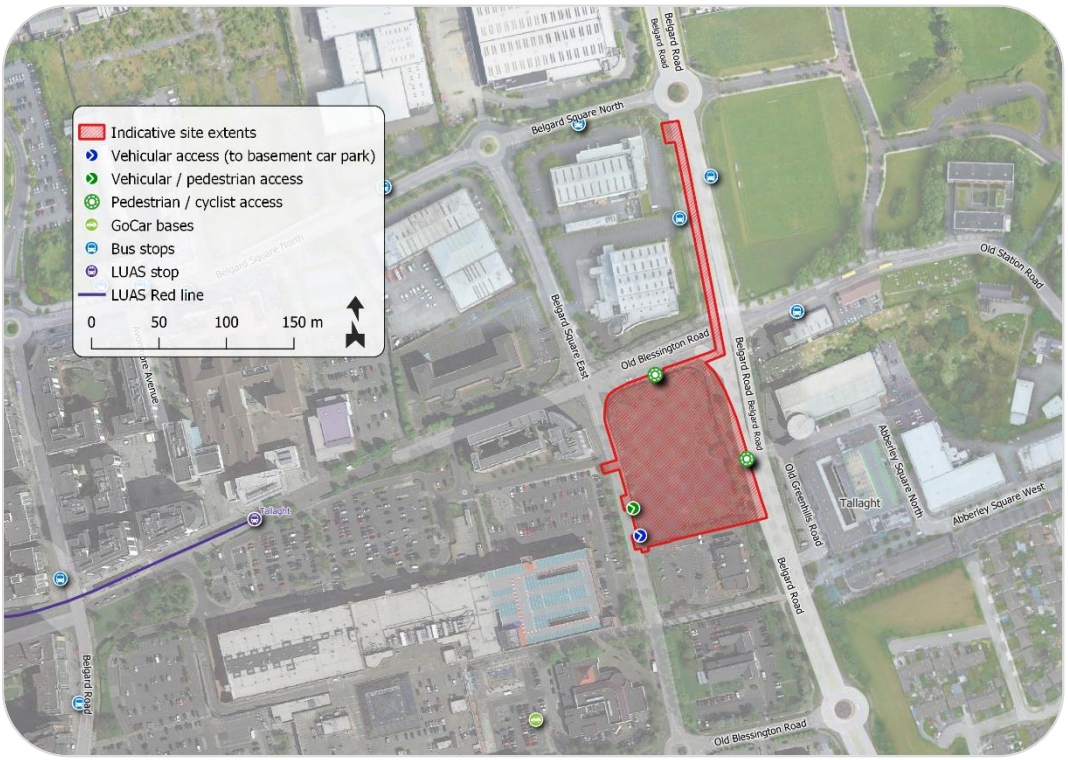

Figure 2 – Site Environs
(map data: NTA, OSM Contributors, Google)

2.1 Existing Land Use

The site is currently a brownfield site consisting primarily of hardstanding surfacing. No existing buildings are present on site. The site does not currently generate any vehicular traffic. A topographical survey has been carried out and survey information is shown on CS Consulting drawing no. **Q003-CSC-ZZ-XX-DR-C-0001**. 2no. existing storm sewers are present in close proximity to the subject development, these are described in section 5.1.

3.0 PROJECT DESCRIPTION

The proposed development will consist of the demolition of existing boundary wall and construction of:

c. 2,289 sqm of retail/commercial floor space across 10 no. units including retail, restaurant/café and Class 2 financial/professional services and office use, and a crèche (257sqm) at ground and first floor levels;

310 no. build to rent residential apartments including 99 no. one bedroom units, 203 no. 2 bedroom units and 8 no. three bedroom units within a part 6 to part 12 no. storey development across 3 blocks over partial basement;

c. 2,223 sqm of communal external amenity space provided in the form of a ground floor garden and external terraces at fifth, sixth, seventh and eighth floor levels; c. 1,026 sqm of public open space provided in the form of a central courtyard with landscaped areas at site perimeters;

c. 1,785 sqm of resident support facilities and services and amenities provided at basement, ground and first floor levels;

Vehicular access to the basement development from a new access point at Belgard Square East;

A new tertiary route will be provided in the southern part of the site linking Belgard Square East and Belgard Road;

Provision of 130 no. car parking spaces (including 8 no. club car spaces and 6 no. disabled access spaces) at basement level in addition to 5 no. set down spaces (4 no. serving creche) and 1 no. disabled access space at ground level, layby on Belgard Square East, 6 no. motorcycle spaces and a total of 763 no. bicycle parking spaces;

Provision of 4 no. Ø0.3m microwave link dishes to be mounted on 2 no. steel support pole affixed to lift shaft overrun, all enclosed in radio friendly GRP shrouds, together with associated equipment at roof level at Block B;

Provision of 3 no. ESB substations with switch rooms and plant rooms at basement level, hard and soft landscaped areas, bin and bicycle stores, public lighting, attenuation, green roof, plant at roof level, service connections and all ancillary site development works.

4.0 FOUL DRAINAGE

4.1 Existing Foul Drainage Infrastructure

At present the existing public drainage network is located in Belgard Square East to the west of the subject development site. Irish Water's drainage records indicate a 225mm diameter foul sewer flowing north to south adjacent to the site. Refer to Figure 3 and **Appendix A** for Irish Water drainage records.

Figure 3 - Existing Foul Infrastructure (source: Geological Survey Ireland)

4.2 Foul Effluent Generation

The proposed development shall consist of 310no. residential apartment units, comprising a total of 529no. bedrooms. The Irish Water *Code of Practice for Wastewater Infrastructure* specifies an average foul effluent flow rate of 150

litres per person per day for domestic dwellings and an average occupancy of 2.7 persons per residential unit (Section 3.7.2 of *Code of Practice for Wastewater Infrastructure*). Additionally, the development features a commercial area of 2289m^2 which translates to 305 persons (at a rate of 7.5m^2 per person), this will generate 100 l/head/day in accordance with Appendix C of Irish Water *Code of Practice for Wastewater Infrastructure*.

The maximum average effluent flow (dry weather flow or DWF) to be generated by the proposed development may be calculated as:

- ⇒ 150 l/day per person x 2.7 persons per residential unit x 310 units = 125,550 l/day = 125.55 m^3/day;
- ⇒ 100 l/day per person x 305no. persons = 30,500 l/day = 30.50 m3/day;
- ⇒ 1.45 l/sec + 0.35 l/sec = 1.80l/sec Average flow (1 DWF);
- ⇒ 10.8 l/sec Peak Flow (6 DWF - Population between 0 and 1000).

4.3 Proposed Foul Drainage Arrangements

All foul effluent generated from the proposed development from the upper floors shall be collected in separate foul pipes and flow under gravity, via the new 225mm sewer, to the existing 225mm diameter foul sewer on Belgard Square East to the west of the site via a new connection. A flow control device shall be installed to restrict the flow from the development to a maximum discharge rate of 4l/s as agreed with Irish Water in response to the Confirmation of Feasibility. Please refer to **Appendix D** for further information on Irish Water Correspondence. CS Consulting has carried out a hydraulic assessment to determine the impact of this restricted discharge flow on the proposed foul network. Hourly peak factors have been introduced to model the diurnal wastewater profile finding that the system has enough capacity to cope with the restricted discharge rate. A conservative approach was taken and a 12m^3

storage is provided in the car parking of the Creche to take into account extreme scenarios. Please refer to **Appendix C** for further details. Foul water generated within the development basement car parking area shall be collected and treated using a Class II petrol interceptor before being pumped to ground floor level and finally outfalling via gravity to the existing 225mm diameter foul sewer on Belgard Square East. The drainage network for the development will be in accordance with Part H of the Building Regulations and to the requirements and specifications of Irish Water. A Pre-Connection Enquiry has been submitted to Irish Water and Confirmation of Feasibility has been received. CS Consulting has contacted Irish Water to obtain the Statement of Design Acceptance on the proposed design. See **Appendix D** for further details.

The outfall into the public system will be onto Belgard Square East and the last private manhole will be designed in accordance with Irish Water requirements. Refer to CS Consulting Drawing **Q003-CSC-ZZ-XX-DR-C-0002** for more details.

5.0 STORMWATER DRAINAGE

5.1 Existing Stormwater Drainage Infrastructure

Following receipt of Irish Water drainage records (see **Appendix A**) there is a 225mm diameter public storm drain on Belgard Road to the east of the development site. An existing 1050mm diameter public storm sewer is present on Belgard Square East to the east of the subject development. A spur from this sewer is present in the north of the subject development site, in proximity to the site's boundary with Blessington Road.

Figure 4 - Existing Storm Infrastructure (source: Geological Survey Ireland)

5.1.1 Existing Storm Sewer

It is noted that the existing 1050mm diameter public storm sewer is situated in close proximity to the subject development site's western boundary. It has been agreed in pre-planning discussions with SDCC that a distance of 5.0m shall be maintained between the outermost edge of the existing pipe and the proposed structure in order to facilitate maintenance of the existing pipe by SDCC. Please refer to CS Consulting drawings nos. Q003-CSC-ZZ-XX-DR-C-0016 and 0017 for details of existing surface water pipe in relation to the proposed building and substructure (including secant pile wall).

5.2 Proposed Stormwater Drainage Arrangements

Sustainable Drainage Solutions (SuDS) are concerned with water quantity, water quality, amenity and biodiversity.

In accordance with the requirements of *South Dublin County Council's Sustainable Drainage Systems (SuDS) Explanatory, Design and Evaluation Guide* all new developments are to incorporate the principles of Sustainable Urban Drainage Systems, (SuDs) as found in the SuDS manual CIRIA C753 The SuDS manual specifies four pillars of SuDS design: water quantity, water quality, amenity and biodiversity. The SuDS Management Train describes the use of a sequence of components that collectively provide the necessary processes to control the frequency of runoff, the flow rates and the volumes of runoff, and to reduce concentrations of contaminants to acceptable levels

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 by 20% 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: 821mm/year.

b) The sliding duration table for the site indicating the 1:100 year rainfall intensities to be used.

See **Appendix B** for Met Eireann Data.

A Soil Type 2 has been considered for calculation purposes according to the information derived from UK Suds website.

Using the data supplied by Met Eireann the greenfield runoff rate has been established as 2.2/s/ha and thus based on the development area, a restricted discharge rate of 2.0 l/s will be provided by means of a flow control device.

The attenuation volume for the site is located in the basement of the proposed building. The results of the hydraulic simulation have determined that a total of 700m^3 are to be provided for the 1:100 year event plus an allowance of 20% due to the effects of the climate change and a maximum discharge rate of 2.0 l/s. See **Appendix C** for details of the hydraulic calculations.

This volume will be provided in two dedicated concrete storage areas of the basement following the instructions of the design team. An internal 225mm surface water sewer shall connect the two attenuation storage areas. A flow control device shall be utilised to restrict the discharge rate to a maximum of 2.0l/s.

It is proposed that channel drains and local gullies shall be implemented around the perimeter of the subject development, to collect runoff from areas which are not proposed to be taken in charge by the local authority. Run-off from the proposed green roof areas shall be taken internally to be attenuated within the subject development prior to outfalling into the public system.

A flow control device will ensure that runoff leaves the site at a flow rate not greater than 2.0 l/s before connecting by gravity with the existing 1050mm surface water sewer in Belgard Square East. The existing storm water sewer in Belgard Square East connects to the existing on within Sean Walsh Park. Refer to CS drawings **Q003-CSC-ZZ-XX-DR-C-0002, 0003 and 0012** for further details.

Another important aspect that is to be achieved through the implementation of SuDS features throughout the scheme is to ensure that the first 5mm (preferably 10mm) of the majority of all rainfall events is captured on site as set out in Criterion 1.1 of GDSDS. Designing for interception has two key benefits.

1. Runoff characteristics from the site will more closely reflect greenfield runoff behaviour (where runoff will not occur for the majority of small rainfall events) and this will help to protect the morphology and ecology of the receiving surface water body.

2. The pollution load to any receiving surface water body that could potentially be associated with the total runoff volume from all such small events will be retained on site – where it will have time to biodegrade and/or be acted on by natural treatment processes.

Interception is delivered across the scheme using the following processes:

- Infiltration (rain garden and engineered tree pits)
- Evapotranspiration

The following table summarises the interception storage provided by the different SuDS features present in the scheme.

SuDS Element	Area (m2)	10mm Interception Storage (m3)
Permeable Pavement	1,964	19.64
Extensive Green Roof	1,468	14.68
Rain Garden	20	2.0
Engineered Tree Pits	64	6.4

This results in a total interception storage of 42.72 m^3 for the scheme.

5.2.1 SuDS Management Plan

As well as the control of the water quantity another important aspect defined in the policies of the Local Authority is to include Sustainable Urban Drainage Systems, SuDS, for all new applications, as such it is proposed to use a range of SuDS devices for the scheme to increase water quality, promote biodiversity and provide amenity to development occupants and visitors. Proposed SuDS devices are listed below:

SuDs proposals are as follows;

- Green Roofs;
    - The proposed green roof will contribute to increase water quality and promote biodiversity in accordance with *South Dublin County Council's Sustainable Drainage Systems (SuDS) Explanatory, Design and Evaluation Guide*. The proposed roof shall also serve an amenity function in some instances.
- Local tree pits & landscape areas will be utilized to aid in providing interception treatment for storm water run-off;
    - The proposed SuDS tree pits shall increase water quality, promote biodiversity and provide amenity to future development occupants in accordance with *South Dublin*

County Council's Sustainable Drainage Systems (SuDS) Explanatory, Design and Evaluation Guide.

- Rain Garden
    - The proposed rain garden shall promote biodiversity and provide amenity to future development occupants in accordance with *South Dublin County Council's Sustainable Drainage Systems (SuDS) Explanatory, Design and Evaluation Guide.*
- Attenuation Storage
    - The proposed attenuation storage system shall assist with water quantity in accordance with *South Dublin County Council's Sustainable Drainage Systems (SuDS) Explanatory, Design and Evaluation Guide.* This forms part of the overall SuDS train associated with the subject development.
- Permeable Surfacing
    - The proposed permeable surfacing shall provide benefits in relation to water quantity, and shall provide amenity to future development occupants in accordance with *South Dublin County Council's Sustainable Drainage Systems (SuDS) Explanatory, Design and Evaluation Guide.*

South Dublin County Council require the proposed site to be divided into the various surface components with regard to the run-off coefficient for each surface type. See *Table 1.0* below for a break down of same.

See CS Consulting drawing no. **Q003-CSC-ZZ-XX-DR-C-0004** for the proposed Suds layout and CS Consulting drawing no. **Q003-CSC-ZZ-XX-DR-C-0002** for the proposed drainage layout.

Table 1 - South Dublin Co. Co. Table of Runoff Coefficients

Structure Type	Area (m2)	Runoff Coefficients
Buildings	1760m^2	0.9
Greenroofs & roof gardens	2645m^2	0.85
Roads	3195m^2	0.95
Grass	1630m^2	.65
Total	**9230m2**	

5.3 SuDS Maintenance Plan

It is critical to consider an appropriate level of ongoing maintenance for proposed SuDS devices within the subject development. It is expected that periodic maintenance of SuDS devices may be required to ensure continuous operation of such devices. Maintenance protocols for the proposed green roof and SuDS measures shall vary depending on the specific measure proposed. Please refer to Table 2 for further details.

Table 2 - Typical Maintenance Requirements

Activity	Indicative frequency	Typical tasks
Routine/regular maintenance	Monthly	Litter picking Grass cutting Inspection of inlets, outlets and control structures.
Occasional maintenance	Annually	Silt control around components

		Vegetation management Silt removal from catchpits, soakaways, and cellular storage
Remedial Maintenance	As required (to repair issues encountered)	Removal of silt build up Inlet/outlet repairs Reinstatement following pollution

5.3.1 Taking in Charge of SuDS measures

It is noted that the *South Dublin County Council SuDS Explanatory Design and Evaluation Guide* states the following in relation to taking in charge of SuDS devices:

Where SuDS are to be taken in charge by SDCC they must be;

- *Within lands vested to SDCC*
- *Be accessible for maintenance*
- *Meet SDCC taking in charge requirements*

The proposed tree pits/rain garden is within the area for taking in charge. Following consultations with SDCC as part of the planning process, it was agreed that these SuDS measures could be taken in charge subject to ease of maintenance. The proposed SuDS tree pits shall be accessible for maintenance. The proposed SuDS tree pits shall require minimal maintenance.

6.0 POTABLE WATER SUPPLY

6.1 Existing Potable Water System

Records obtained from Irish Water indicate public watermains adjacent to the development site on Belgard Road and Blessington Road.

Figure 5 - Existing Watermain Infrastructure (source: Geological Survey Ireland)

6.2 Proposed Potable Water System

The proposed development is to consist of 310no. residential apartments at an estimated 2.7 occupants per apartments. Irish Water recommends that each person shall generate a domestic demand of of 150 l/head/day per s 3.7.2 of the *Code of Practice for Water Infrastructure (2020)*. Additionally, the development features a commercial area of 2,289m^2 which translates to 305 persons (at a rate of 7.5m^2 per person), this will require 100 l/head/day in accordance with Appendix D of *Code of Practice for Water Infrastructure*.

- ⇒ 150 l/day per person x 2.7 persons per residential unit x 310 units = 125,550 l/day = 125.55 m^3/day;
- ⇒ 100 l/day per person x 305no. persons = 30,500 l/day = 30.50 m3/day;
- ⇒ 1.45 l/sec + 0.35 l/sec = 1.80l/sec Average demand;
- ⇒ 9.0 l/sec Peak Flow (Peak demand = 5* Average demand).

A Pre-Connection Enquiry has been submitted to Irish Water and a favourable Confirmation of Feasibility has been received. CS Consulting has contacted Irish Water to obtain the Statement of Design Acceptance on the proposed design. Refer to **Appendix D** for details of the correspondence with Irish Water.

The following requirements from Irish Water outlined in the most recent Confirmation of Feasibility are accepted;

- In order to accommodate the proposed connection, the existing 6''CI main has to be replaced with a new 200mm ID pipe for approximately 165m. Connections with both, 150mm uPVC and 6'' CI (south), have to be maintained.
- The connection main should be a 150mm ID pipe, connected to the existing 150mm uPVC main. A bulk meter should be installed on the connection line.

- On-site water storage shall be required, for the average day peak week demand rate of commercial section, for 24 hour period with 12 hour refill time.

The proposed watermain infrastructure and routing plan is shown on drawing **Q003-CSC-XX-XX-DR-C-0004** included with this submission.

It should be noted that all off-site works are under the jurisdiction of Irish Water, and as such the proposed upgrade works outside the main subject development site shall be carried out by Irish Water.

7.0 COMMENTS RECEIVED FROM PLANNING AUTHORITIES

Both An Bord Pleanála and South Dublin County Council have reviewed the planning documentation submitted in respect of the proposed development during the pre-application consultation phase of the SHD process. A tripartite pre-application consultation meeting has also been held with An Bord Pleanála and South Dublin County Council.

The relevant opinions of An Bord Pleanála that pertain to engineering services, as communicated to the applicant, are reproduced below; also examined in this section are the recommendations of South Dublin County Council's Environmental Services Department, which were issued to An Bord Pleanála. In each case, we describe measures taken by the design team in response to these opinions and recommendations.

7.1 Opinions Issued by An Bord Pleanála

An Bord Pleanála has issued an opinion enumerating the items of specific information that should be submitted with any application for permission. This opinion did not include any specific items relating to engineering services.

7.2 Recommendations by South Dublin County Council

The South Dublin County Council on the 26th of November 2021 issued an internal report making the following recommendations in relation to the proposed development.

7.2.1 SDCC Recommendations – Public Realm Department

"A comprehensive SUDS Management Plan shall be submitted 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.

Additional natural SUDS features shall be incorporated into the proposed drainage system for the development such as rain gardens, detention basins, filter drains, swales etc. In addition, the applicant shall provide the following:

• Demonstrate how the proposed natural SUDS features will be incorporated and work within the drainage design for the proposed development."

Response to Recommendation - Public Realm Department

CS Consulting have liaised with Parkhood in relation to the provision of SuDS features for the subject development. It is proposed to provide the following SuDS features within the subject development;

- Green Roof
- Tree Pits
- Rain Gardens
- Attenuation Storage
- Permeable Surfacing

Following consultation with South Dublin County Council it has been sought to increase the SuDS features provided within the subject development. Please refer to section 5.2 for details of SuDS Management Plan and measures proposed which include attenuation storage to restrict run-off to the public system to 2.0l/s. A SuDS maintenance plan has been prepared outlining the expected maintenance requirements of each of the proposed SuDS features within the subject development. Please refer to section 5.3 for details. Please refer to CS Consulting drawings no. **Q003-CSC-ZZ-XX-DR-C-0002 and 0004** for details of SuDS arrangement and operation within the wider drainage design.

7.2.2 SDCC Recommendations – Water Services Planning

"In regard to surface water attenuation explore the use of blue roofs and other SuDS (Sustainable Drainage Systems) as an alternative to using concrete attenuation tanks."

Response to Recommendation - Water Services Planning

Following consultations with SDCC Water Services Planning Division it is proposed to increase SuDS proposed within the subject development. A large green roof area is proposed. CS Consulting have explored the possibility of the use of blue roofs as an alternative to concrete attenuation tanks. It is not proposed to include blue roofs within the proposed application – the proposed green roof shall provide interception and treatment to the rainfall prior to attenuation within the development and restricted outflow to the public system. This shall increase the quality of the water being released in comparison to the use of a blue roof. Furthermore, the use of blue roofs within the development significantly increases the loading on the proposed structure, and hence increases the structure required for construction with associated costs and environmental impacts.

Appendix A

Irish Water Drainage Records

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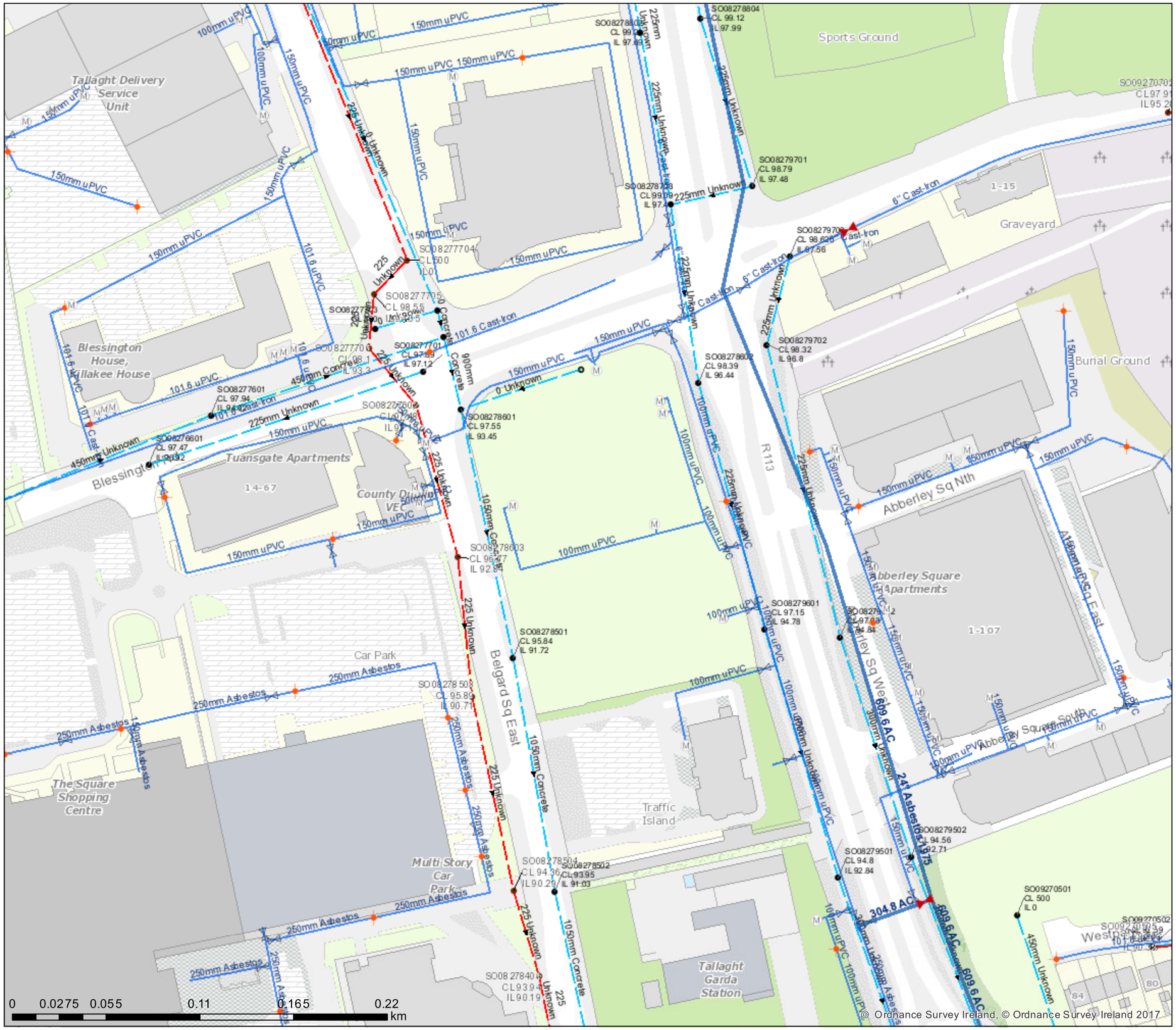
Irish Water Web Map



UISCE ÉIREANN : IRISH WATER

Print Date: 19/01/2021

Printed by:Irish Water

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
- Unknown 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
- Fire Hydrant
- Fire Hydrant/Washout

Water Fittings
- Cap
- Reducer
- Tap
- Other Fittings

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

Appendix B

Met Eireann Data

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Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 308852, Northing: 227652,

	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,	4.5,	5.6,	6.3,	6.9,	8.8,	11.0,	12.5,	14.6,	16.5,	18.0,	20.3,	22.2,	23.7,	N/A ,
10 mins	3.7,	5.4,	6.3,	7.8,	8.8,	9.6,	12.2,	15.3,	17.4,	20.3,	23.0,	25.1,	28.4,	30.9,	33.1,	N/A ,
15 mins	4.3,	6.3,	7.4,	9.2,	10.3,	11.3,	14.4,	18.0,	20.4,	23.9,	27.0,	29.5,	33.4,	36.4,	38.9,	N/A ,
30 mins	5.7,	8.3,	9.7,	11.9,	13.4,	14.6,	18.5,	23.0,	26.0,	30.4,	34.3,	37.3,	42.1,	45.8,	48.9,	N/A ,
1 hours	7.4,	10.8,	12.6,	15.4,	17.3,	18.8,	23.7,	29.4,	33.2,	38.6,	43.4,	47.2,	53.1,	57.7,	61.5,	N/A ,
2 hours	9.8,	14.1,	16.4,	20.0,	22.4,	24.2,	30.4,	37.6,	42.3,	49.0,	55.0,	59.7,	67.0,	72.7,	77.4,	N/A ,
3 hours	11.5,	16.5,	19.2,	23.2,	26.0,	28.1,	35.2,	43.4,	48.8,	56.4,	63.2,	68.6,	76.8,	83.2,	88.6,	N/A ,
4 hours	12.9,	18.4,	21.4,	25.9,	28.9,	31.3,	39.1,	48.0,	53.9,	62.3,	69.8,	75.6,	84.6,	91.6,	97.4,	N/A ,
6 hours	15.2,	21.5,	25.0,	30.1,	33.6,	36.3,	45.3,	55.4,	62.2,	71.7,	80.2,	86.8,	96.9,	104.9,	111.4,	N/A ,
9 hours	17.8,	25.2,	29.1,	35.1,	39.1,	42.2,	52.4,	64.0,	71.7,	82.5,	92.1,	99.6,	111.1,	120.0,	127.5,	N/A ,
12 hours	20.0,	28.1,	32.5,	39.0,	43.5,	46.9,	58.2,	70.9,	79.3,	91.1,	101.7,	109.8,	122.4,	132.1,	140.2,	N/A ,
18 hours	23.5,	32.9,	37.9,	45.5,	50.5,	54.5,	67.4,	81.9,	91.4,	104.9,	116.8,	126.1,	140.3,	151.3,	160.4,	N/A ,
24 hours	26.3,	36.8,	42.3,	50.6,	56.2,	60.6,	74.7,	90.7,	101.2,	115.9,	128.9,	139.0,	154.5,	166.5,	176.5,	211.3,
2 days	33.3,	45.2,	51.5,	60.7,	66.8,	71.5,	86.7,	103.5,	114.5,	129.6,	143.0,	153.2,	168.8,	180.8,	190.7,	224.9,
3 days	38.9,	52.0,	58.8,	68.7,	75.3,	80.3,	96.4,	114.0,	125.4,	141.1,	154.8,	165.3,	181.2,	193.3,	203.3,	237.7,
4 days	43.9,	58.0,	65.2,	75.7,	82.7,	88.0,	104.8,	123.1,	134.9,	151.1,	165.2,	175.9,	192.1,	204.5,	214.7,	249.4,
6 days	52.6,	68.3,	76.3,	87.9,	95.4,	101.2,	119.3,	138.9,	151.4,	168.5,	183.2,	194.4,	211.2,	224.1,	234.5,	270.1,
8 days	60.3,	77.4,	86.1,	98.5,	106.6,	112.7,	132.0,	152.7,	165.7,	183.6,	198.9,	210.5,	227.9,	241.1,	251.8,	288.3,
10 days	67.3,	85.7,	95.0,	108.2,	116.7,	123.2,	143.4,	165.0,	178.7,	197.1,	213.0,	224.9,	242.9,	256.4,	267.5,	304.7,
12 days	73.9,	93.5,	103.2,	117.1,	126.1,	132.9,	154.0,	176.4,	190.5,	209.6,	226.0,	238.3,	256.7,	270.6,	281.8,	319.8,
16 days	86.2,	107.8,	118.4,	133.5,	143.2,	150.6,	173.3,	197.2,	212.2,	232.3,	249.5,	262.4,	281.7,	296.1,	307.9,	347.2,
20 days	97.6,	120.9,	132.4,	148.6,	158.9,	166.7,	190.8,	216.0,	231.7,	252.9,	270.8,	284.2,	304.2,	319.2,	331.3,	371.9,
25 days	111.0,	136.3,	148.6,	166.0,	177.1,	185.4,	211.0,	237.6,	254.2,	276.4,	295.1,	309.2,	330.0,	345.5,	358.1,	400.1,

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

Appendix C

Attenuation Calculations

CS CONSULTING

GROUP

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	18.100	Add Flow / Climate Change (%)	0
Ratio R	0.253	Minimum Backdrop Height (m)	0.600
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.585	4-8	0.167

Total Area Contributing (ha) = 0.752

Total Pipe Volume (m³) = 2.965

Network Design Table for Storm

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	60.551	0.606	100.0	0.357	4.00	0.0	0.600	o	225	Pipe/Conduit	
S1.001	13.883	0.139	100.0	0.395	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.002	13.825	0.138	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.003	3.839	0.038	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	50.00	4.77	92.659	0.357	0.0	0.0	0.0	1.31	52.0	48.4
S1.001	50.00	5.00	91.958	0.752	0.0	0.0	0.0	1.00	17.8«	101.8
S1.002	50.00	5.23	91.819	0.752	0.0	0.0	0.0	1.00	17.8«	101.8
S1.003	50.00	5.30	91.681	0.752	0.0	0.0	0.0	1.00	17.8«	101.8

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SATT TANK 1	96.000	3.341	Open Manhole	1200	S1.000	92.659	225				
SATT TANK 2	95.500	3.542	Open Manhole	1200	S1.001	91.958	150	S1.000	92.054	225	171
S4	96.650	4.831	Open Manhole	1200	S1.002	91.819	150	S1.001	91.819	150	
S5	95.890	4.209	Open Manhole	1200	S1.003	91.681	150	S1.002	91.681	150	
S	95.840	4.197	Open Manhole	0		OUTFALL		S1.003	91.643	150	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
SATT TANK 1	708814.786	727681.591	708814.786	727681.591	Required	
SATT TANK 2	708758.908	727658.265	708758.908	727658.265	Required	
S4	708762.497	727644.854	708762.497	727644.854	Required	
S5	708761.143	727631.095	708761.143	727631.095	Required	
S	708757.551	727629.738			No Entry	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	o	225	SATT TANK 1	96.000	92.659	3.116	Open Manhole	1200
S1.001	o	150	SATT TANK 2	95.500	91.958	3.392	Open Manhole	1200
S1.002	o	150	S4	96.650	91.819	4.681	Open Manhole	1200
S1.003	o	150	S5	95.890	91.681	4.059	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	60.551	100.0	SATT TANK 2	95.500	92.054	3.221	Open Manhole	1200
S1.001	13.883	100.0	S4	96.650	91.819	4.681	Open Manhole	1200
S1.002	13.825	100.0	S5	95.890	91.681	4.059	Open Manhole	1200
S1.003	3.839	100.0	S	95.840	91.643	4.047	Open Manhole	0

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.357	0.357	0.357
1.001	User	-	100	0.395	0.395	0.395
1.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.752	0.752	0.752

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.003	S	95.840	91.643	92.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	18.100	Storm Duration (mins)	30
Ratio R	0.253		

Online Controls for Storm

Hydro-Brake® Optimum Manhole: SATT TANK 2, DS/PN: S1.001, Volume (m³): 6.4

Unit Reference	MD-SHE-0050-2000-3542-2000
Design Head (m)	3.542
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	50
Invert Level (m)	91.958
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	3.542	2.0	Kick-Flo®	0.443	0.8
Flush-Flo™	0.212	1.0	Mean Flow over Head Range	-	1.4

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	0.9	0.800	1.0	2.000	1.5	4.000	2.1	7.000	2.7
0.200	1.0	1.000	1.1	2.200	1.6	4.500	2.2	7.500	2.8
0.300	0.9	1.200	1.2	2.400	1.7	5.000	2.3	8.000	2.9
0.400	0.9	1.400	1.3	2.600	1.7	5.500	2.4	8.500	3.0
0.500	0.8	1.600	1.4	3.000	1.8	6.000	2.5	9.000	3.1
0.600	0.9	1.800	1.5	3.500	2.0	6.500	2.6	9.500	3.2

Storage Structures for Storm

Tank or Pond Manhole: SATT TANK 1, DS/PN: S1.000

Invert Level (m) 92.659

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	133.1	3.000	133.1	3.010	0.6

Tank or Pond Manhole: SATT TANK 2, DS/PN: S1.001

Invert Level (m) 92.098

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	100.0	3.000	100.0	3.001	0.0

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	18.800
Region	Scotland and Ireland	Ratio R	0.263
Cv (Summer)	0.750		
Cv (Winter)	0.840		

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 20

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	SATT TANK 1	2880 Winter	1	+0%	1/180 Winter				93.257
S1.001	SATT TANK 2	2880 Winter	1	+0%	1/15 Summer	100/2880 Winter			93.255
S1.002	S4	2880 Winter	1	+0%					91.847
S1.003	S5	2880 Winter	1	+0%					91.713

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	SATT TANK 1	0.373	0.000	0.04			2.0	SURCHARGED	
S1.001	SATT TANK 2	1.147	0.000	0.08			1.3	SURCHARGED	
S1.002	S4	-0.122	0.000	0.08			1.3	OK	
S1.003	S5	-0.118	0.000	0.10			1.3	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	18.800
Region	Scotland and Ireland	Ratio R	0.263
Cv (Summer)	0.750		
Cv (Winter)	0.840		

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 20

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	SATT TANK 1	4320 Winter	30	+0%	1/180 Winter				94.209
S1.001	SATT TANK 2	4320 Winter	30	+0%	1/15 Summer	100/2880 Winter			94.207
S1.002	S4	4320 Winter	30	+0%					91.850
S1.003	S5	4320 Winter	30	+0%					91.717

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	SATT TANK 1	1.325	0.000	0.03			1.6	SURCHARGED	
S1.001	SATT TANK 2	2.099	0.000	0.10			1.6	SURCHARGED	
S1.002	S4	-0.119	0.000	0.10			1.6	OK	
S1.003	S5	-0.114	0.000	0.13			1.6	OK	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	18.800
Region	Scotland and Ireland	Ratio R	0.263
Cv (Summer)	0.750		
Cv (Winter)	0.840		

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 20

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	SATT TANK 1	4320 Winter	100	+20%	1/180 Winter				95.396
S1.001	SATT TANK 2	4320 Winter	100	+20%	1/15 Summer	100/2880 Winter			95.413
S1.002	S4	4320 Winter	100	+20%					91.853
S1.003	S5	4320 Winter	100	+20%					91.721

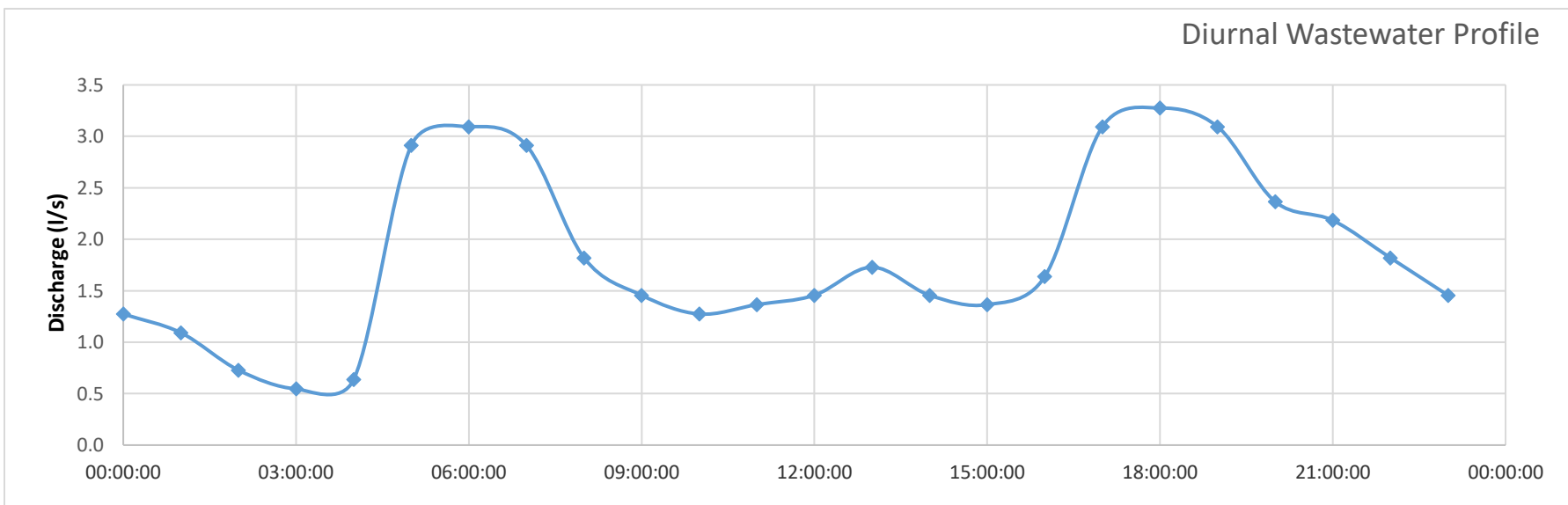
PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	SATT TANK 1	2.512	0.000	0.04			1.8	SURCHARGED	
S1.001	SATT TANK 2	3.305	0.000	0.12			2.0	FLOOD RISK	
S1.002	S4	-0.116	0.000	0.12			2.0	OK	
S1.003	S5	-0.110	0.000	0.16			2.0	OK	

JOB NAME: BELGARD SQUARE EAST			JOB NO: Q003		DATE: 05/22
TITLE:			CALCS BY: RFM		CHECK'D:
RCD.	48	ISSUE.	1	REV.	1

Allowable Outflow	4.0 l/s

	Duration (min)		Multiplier	Discharge Q (l/s)	Proposed Runoff (m^3)		Total Runoff (m^3)	Allowable Outflow (m^3)	Storage Req'd (m^3)
1	60	00:00:00	0.70	1.3	4.6		4.6	14.4	-9.8
2	120	01:00:00	0.60	1.1	7.9		7.9	28.8	-20.9
3	180	02:00:00	0.40	0.7	7.9		7.9	43.2	-35.3
4	240	03:00:00	0.30	0.5	7.9		7.9	57.6	-49.7
5	300	04:00:00	0.35	0.6	11.5		11.5	72.0	-60.5
6	360	05:00:00	1.60	2.9	62.9		62.9	86.4	-23.5
7	420	06:00:00	1.70	3.1	78.0		78.0	100.8	-22.8
8	480	07:00:00	1.60	2.9	83.9		83.9	115.2	-31.3
9	540	08:00:00	1.00	1.8	59.0		59.0	129.6	-70.6
10	600	09:00:00	0.80	1.5	52.4		52.4	144.0	-91.6
11	660	10:00:00	0.70	1.3	50.4		50.4	158.4	-108.0
12	720	11:00:00	0.75	1.4	59.0		59.0	172.8	-113.8
13	780	12:00:00	0.80	1.5	68.1		68.1	187.2	-119.1
14	840	13:00:00	0.95	1.7	87.1		87.1	201.6	-114.5
15	900	14:00:00	0.80	1.5	78.6		78.6	216.0	-137.4
16	960	15:00:00	0.75	1.4	78.6		78.6	230.4	-151.8
17	1020	16:00:00	0.90	1.6	100.2		100.2	244.8	-144.6
18	1080	17:00:00	1.70	3.1	200.5		200.5	259.2	-58.7
19	1140	18:00:00	1.80	3.3	224.1		224.1	273.6	-49.5
20	1200	19:00:00	1.70	3.1	222.7		222.7	288.0	-65.3
21	1260	20:00:00	1.30	2.4	178.9		178.9	302.4	-123.5
22	1320	21:00:00	1.20	2.2	173.0		173.0	316.8	-143.8
23	1380	22:00:00	1.00	1.8	150.7		150.7	331.2	-180.5
24	1440	23:00:00	0.80	1.5	125.8		125.8	345.6	-219.8

Storage required =	-10	m^3

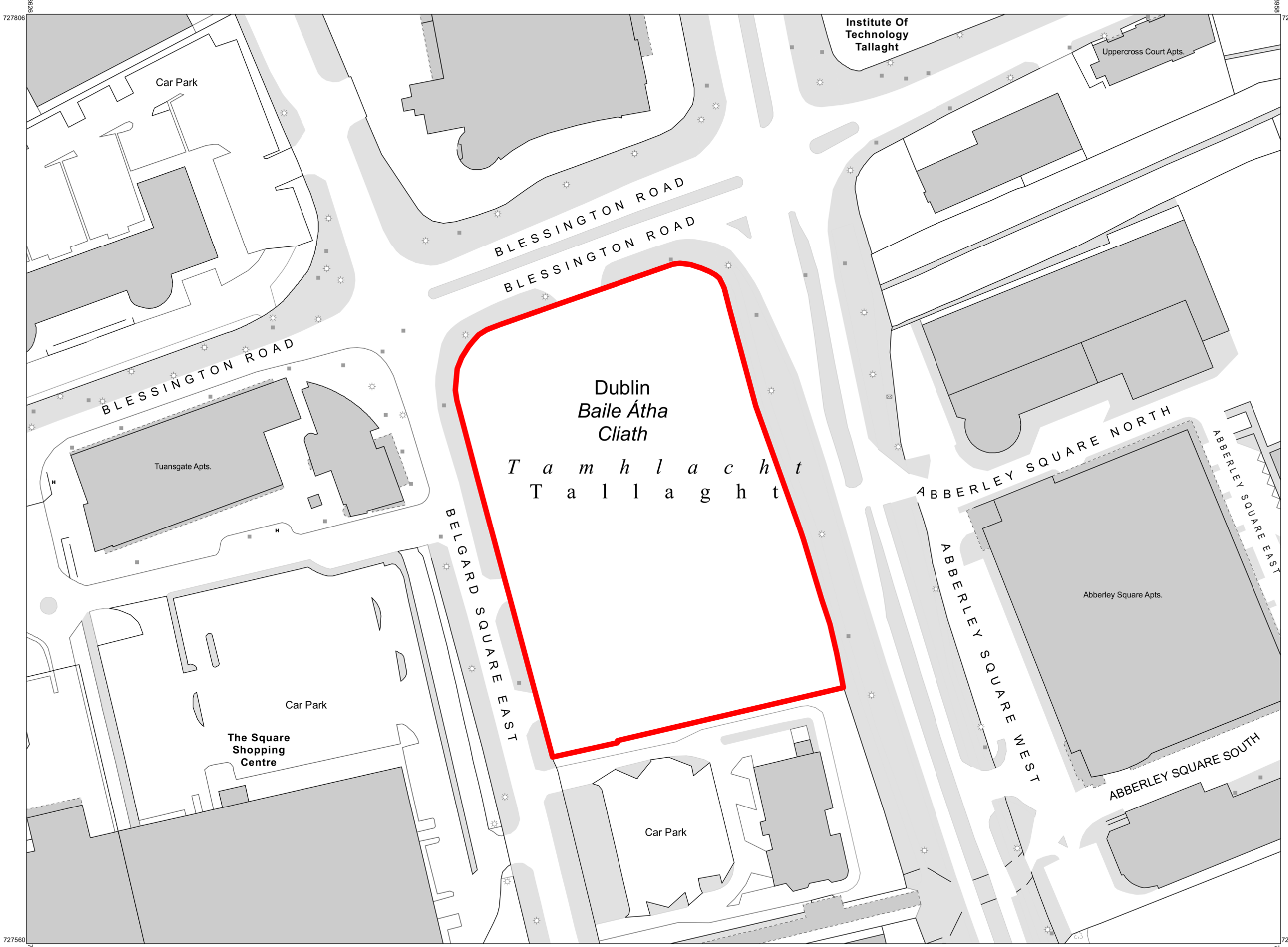


Appendix D:

Irish Water Correspondence

CS CONSULTING

GROUP



N

CENTRE COORDINATES:
ITM 708792,727683

PUBLISHED:
13/01/2021

ORDER NO.:
50165107_1

MAP SERIES:
1:1,000
1:1,000

MAP SHEETS:
3390-11
3390-12

REV	DATE	DESCRIPTION	CKH	DRN

STATUS CODE DESCRIPTION
SUITABLE FOR INFORMATION

CLIENT:
Ravensbrook Limited

PROJECT:
Belgard Square East

FIRST ISSUE:
950820

SCALE @ A3:
1 : 1000

FIRST ISSUE:
01/14/21

DRAWN/CHECKED:
LF / BR

STATUS CODE: S2

DRAWING NUMBER: BR-HJL-00-00-DR-A-0001

REVISION

DRAWING:
Site Location Plan

Henry J Lyons

Architecture + Interiors
henryjlyons.com

+353 1 888 3333
info@henryjlyons.com

51-54 Pearse Street
Dublin D02 KA66

CS Consulting / Robert Fitzmaurice

19-22 Dame Street
Dublin 2
Co. Dublin
D02E267

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

26 April 2022

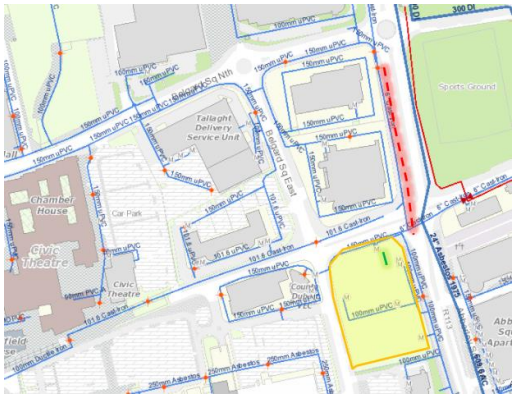
Re: CDS21001249 pre-connection enquiry - Subject to contract | Contract denied

Connection for Multi/Mixed Use Development of 321 units at Lands at Belgard Square East, Dublin 24, Co. Dublin

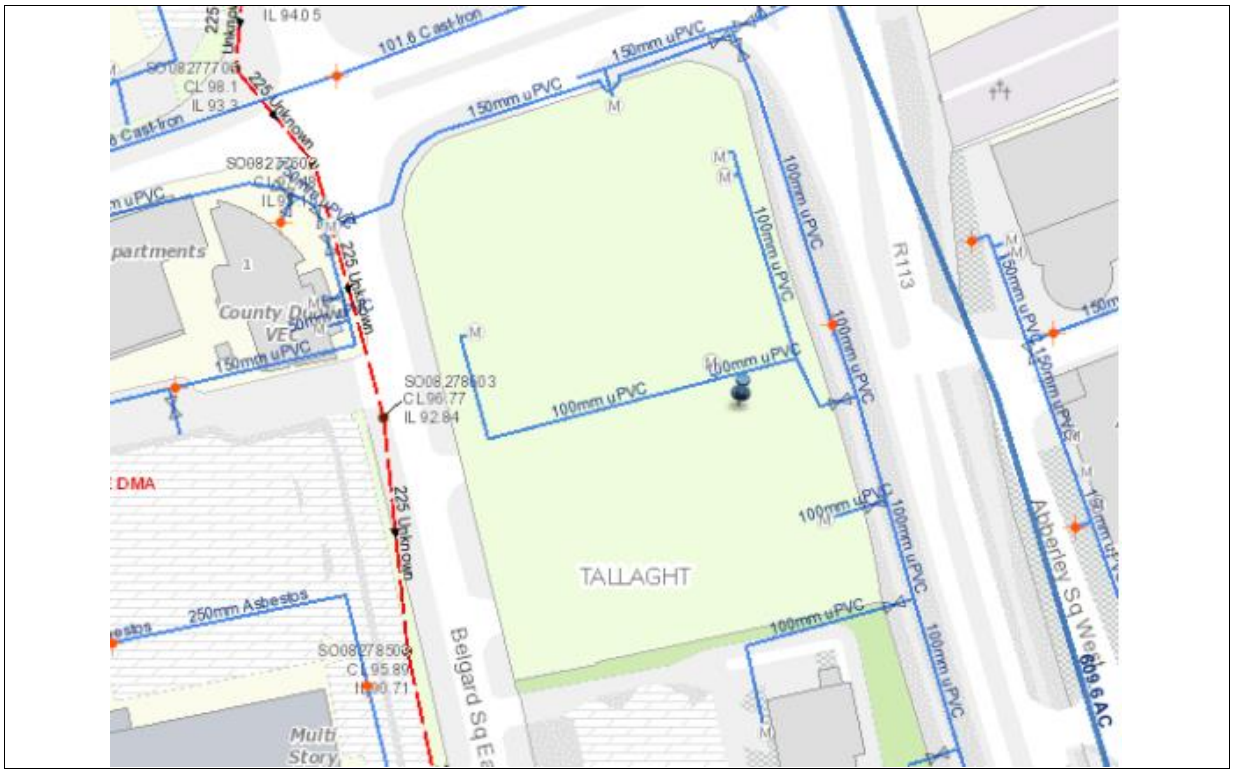
Dear Sir/Madam,

Irish Water has reviewed your pre-connection enquiry in relation to a Water & Wastewater connection at Lands at Belgard Square East, Dublin 24, Co. 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	In order to accommodate the proposed connection, the existing 6''CI main has to be replaced with a new 200mm ID pipe for approximately 165m (red dashed line below). Connections with both, 150mm uPVC (north) and 6'' CI (south), have to be maintained. The connection main should be a 150mm ID pipe (green line below), connected to the existing 150mm uPVC main. A bulk meter should be installed on the connection line. On-site water storage will be required, for the average day peak week demand rate of the commercial section, for 24-hour period with 12- hour refill time.

	
Wastewater Connection	Connection points and local network upgrades or extensions required to connect to strategic infrastructure, will be assessed at a connection application stage or upon completion of a modelling exercise which is currently in progress. Any misconnections from the site will need to be removed. The Customer will be required to implement strict flow management within the Site.
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:



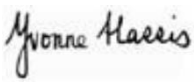
Whilst every care has been taken in its compilation Irish Water gives this information as to the position of its underground network as a general guide only on the strict understanding that it is based on the best available information provided by each Local Authority in Ireland to Irish Water. Irish 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

HEAD OFFICE: 19-22 Dame Street, Dublin 2, D02 E267, Ireland

T | +353 1 5480863 | E | info@csconsulting.ie | www.csconsulting.ie

Irish Water

Colvill House

24-26 Talbot Street,

Dublin 1

Sent By: Email

Job Ref: Q003

A – FB, RFM

Date: 3-Mar-22

RE: Proposed Strategic Housing Development at Belgard Square East, Dublin 24, Co. Dublin.

Cronin & Sutton Consulting Engineers (CS Consulting) have been commissioned by Ravensbrook Limited to prepare civil engineering documentation to accompany a planning application for a proposed mixed-use development at Belgard Square East, Tallaght, Dublin 24.

The proposed development is to consist of 326no. residential apartments at an estimated 2.7 occupants per apartments. It is noted that Irish Water recommends that each bedroom shall generate an effluent volume of 150 l/head/day. An additional safety factor of 1.1 is also applied, resulting in a wastewater production of 446l/unit/day. Additionally, the development features a commercial area of 1702m^2 which translates to 227 persons (at a rate of 7.5m^2 per person), this will generate 100 l/head/day in accordance with Irish Water guidance.

Therefore, the proposed new development will generate wastewater in the order of 167.93 m^3/day which equates to:

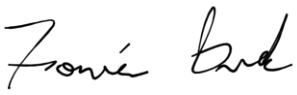
- 1.94 l/s Dry Weather Flow (DWF),
- 8.7435 l/s Peak Flow (4.5DWF).

All foul effluent generated from the proposed development from the upper floors shall be collected in separate foul pipes and flow under gravity, via the new 225mm sewer, to the existing 225mm diameter foul sewer on Belgard Square East to the west of the site via a new connection. Please refer to CS Consulting drawing no. Q003-CSC-ZZ-XX-DR-C-0002 and Q003-CSC-ZZ-XX-DR-C-0003. The drainage network for the development will be in accordance with Part H of the Building Regulations and to the requirements and specifications of Irish Water.

It is noted that the received Confirmation of Feasibility (13th October 2021) requires that strict flow management within the site prior to discharge into the public network. As such, it is proposed that a

maximum discharge rate of 4.0l/s (2*DWF) shall be applied to the wastewater leaving the subject development. Please confirm that the discharge rate outlined above is acceptable to Irish Water.

It is understood that a modelling exercise is currently being undertaken of the existing wastewater infrastructure in the vicinity of the proposed development to determine the upgrades to be undertaken to facilitate future development of the wider area. At such time as upgrades are complete there shall no longer be a requirement for strict flow management within the site.



Fionnán Burke
Civil and Traffic Engineer
BSc (Hons), ME, MIEI
for Cronin & Sutton Consulting

From:	Marina Zivanovic Byrne
To:	Robert Fitzmaurice
Subject:	FW: Q003 Belgard Wastewater Flow Management
Date:	Friday 8 April 2022 12:28:09
Attachments:	image001.png CDS21001249 COF.pdf Q003 Irish Water Wastewater Letter 20220304.pdf

Hi Robert,

In relation to the CDS21001249 wastewater management proposal:
Irish Water has no objection to the proposed discharge rate of 4l/s. At connection application stage the connection proposal will be reassessed, and 5 l/s discharge rate may be allowed. The new wastewater network and PS should be designed such that the PS can be bypassed at a future date with permission of Irish Water.

Kind Regards,

Marina

From: Fionnan De Burca <Fionnan@csconsulting.ie>
Sent: Wednesday 23 March 2022 12:12
To: Marina Zivanovic Byrne <mzbyrne@water.ie>
Cc: Mark McEntee <mark.mcentee@csconsulting.ie>; Niall Barrett <niall.barrett@csconsulting.ie>; Damien Byrne <damien.byrne@csconsulting.ie>; Marc Montrull <Marc.Montrull@csconsulting.ie>; Robert Fitzmaurice <robert.fitzmaurice@csconsulting.ie>; Tom Moyne <tom.moyne@csconsulting.ie>
Subject: RE: Q003 Belgard Wastewater Flow Management

Marina,

Could you provide an update on the below? I attach the letter outlining our proposal again for your convenience.

Can you please confirm receipt of this email as we are intending to lodge in the coming weeks?

Kind regards,
Fionnán

Fionnan De Burca Civil Engineer
BSc (Hons), ME, MIEI

T 01-5480863 M +353 85 7480632
E Fionnan@csconsulting.ie W www.csconsulting.ie

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E: info@csconsulting.ie

It may suit our Team to send emails at various times of day but we do not expect a response or action outside of normal working hours.

From: Fionnan De Burca
Sent: Friday 4 March 2022 17:55
To: mzbyrne@water.ie
Cc: Mark McEntee <mark.mcentee@csconsulting.ie>; Niall Barrett <niall.barrett@csconsulting.ie>; Damien Byrne <damien.byrne@csconsulting.ie>; Marc Montrull <Marc.Montrull@csconsulting.ie>; Robert Fitzmaurice <robert.fitzmaurice@csconsulting.ie>
Subject: Q003 Belgard Wastewater Flow Management

Hi Marina,

Please find attached Confirmation of Feasibility for your information, which was provided for a project which is under development at Belgard Road, Tallaght, Dublin 24.

I note the requirement for strict flow management of foul water within the site. Please refer to the attached letter outlining proposed flow management and maximum discharge rate.

Could you please confirm that the proposals outlined within the attached would be acceptable to Irish Water?

Kind regards,

Fionnan De Burca Civil Engineer
BSc (Hons), ME, MIEI

T 01-5480863 M +353 85 7480632
E Fionnan@csconsulting.ie W www.csconsulting.ie

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E: info@csconsulting.ie

It may suit our Team to send emails at various times of day but we do not expect a response or action outside of normal working hours.

haon fhreagracht as athruithe nó as idircheapadh a rinneadh ar an ríomhphost seo i ndiaidh é a sheoladh nó as aon dochar do chórais na bhfaighteoirí déanta ag an teachtaireacht seo nó ag a ceangaltáin. Más é do thoil é, tabhair faoi deara chomh maith go bhféadfar monatóireacht a dhéanamh ar theachtaireachtaí chuig nó ó Uisce Éireann chun comhlíonadh le polasaithe agus le caighdeáin Uisce Éireann a chinntiú agus chun ár ngnó a chosaint. Fochuideachta gníomhaíochta de chuid Ervia is ea Uisce Éireann atá faoi theorainn scaireanna, de bhun fhorálacha an tAcht um Sheirbhísí Uisce 2013, a bhfuil a bpríomh ionad gnó ag 24-26 Teach Colvill, Sráid na Talbóide, BÁC 1.

Go raibh maith agat as d’aird a thabhairt.

Robert Fitzmaurice
19-22 Dame Street
Dublin 2
Co. Dublin D02E267

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

1 June 2022

Re: Design Submission for Lands at Belgard Square East, Dublin 24, Co. Dublin (the "Development")
(the "Design Submission") / Connection Reference No: CDS21001249

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: 083 8983711
Email: antonio.garzon@water.ie

Yours sincerely,

Yvonne Harris

Yvonne Harris
Head of Customer Operations

Appendix A

Document Title & Revision

- Q003-CSC-ZZ-XX-DR-C-0002 Proposed Ground Floor Drainage Layout P6
- Q003-CSC-ZZ-XX-DR-C-0003 Proposed Basement Drainage Layout P4
- Q003-CSC-ZZ-XX-DR-C-0004 Proposed Watermain Layout P7
- Q003-CSC-ZZ-XX-DR-C-0023 Proposed Foul Sewer Long Sections P1

Additional Comments

The design submission will be subject to further technical review at connection application stage.

This Statement of Design Acceptance does not extend to proposed pump station and rising main arrangements.

*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:

- SITE BOUNDARY
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- EXISTING FOUL SEWER
- PROPOSED FOUL SEWER
- PROPOSED RC FOUL WATER TANK
- PROPOSED SW INSPECTION CHAMBER
- PROPOSED FOUL RISING MAIN
- PROPOSED SLOT DRAIN — ACO DRAIN
- PROPOSED RAIN GARDEN
- PROPOSED PERMEABLE PAVING
- PROPOSED ENGINEERED TREE PIT — STP
- PROPOSED 150mmø PERFORATED LAND DRAIN
- BASEMENT OUTLINE

N

BLESSINGTON ROAD

BELGARD ROAD

BELGARD SQUARE EAST

SWIC1 CL: 97.500m IL: 96.650m

SWIC2 CL: 97.600m IL: 96.325m

SWIC3 CL: 97.500m IL: 96.225m

SWIC4 CL: 97.400m IL: 96.125m

SWIC5 CL: 97.150m IL: 95.712m

SWIC6 CL: 97.250m IL: 95.885m

SWIC7 CL: 97.250m IL: 96.000m

SWIC8 CL: 97.100m IL: 96.190m

SWIC9 CL: 97.500m IL: 96.500m

SWIC10 CL: 97.500m IL: 96.400m

SWIC11 CL: 97.300m IL: 96.150m

SWIC12 CL: 96.600m IL: 95.750m

SWIC13 CL: 96.500m IL: 95.650

SWIC 14 CL: 96.900m IL: 95.900m

EX.SMH CL: 97.55 IL: 93.45

EX.FMH CL: 97.48 IL: 93.13

EX.FMH CL: 96.77 IL: 92.84

EX.SMH CL: 95.84 IL: 91.72

EX.FMH CL: 95.89 IL: 90.71

FMH 8 CL: 96.600 IL: 93.425 LAST FOUL MANHOLE TO IRISH WATER REQUIREMENTS

SMH 1 CL: 96.300m IL: 91.819 FITTED WITH FLOW CONTROL SET TO 2.0 l/s

SMH 2 CL: 95.890m IL: 91.681m

FMH 7 CL: 95.700 IL: 93.889

FMH 6 MANHOLE FITTED WITH A FLOW CONTROL DEVICE (HYDROBRAKE) SET TO 4.0 l/s AS PER IW INSTRUCTIONS

CL: 95.700
IL: 93.975

PROPOSED RC FW STORAGE TANK. CL: 95.700 IL: 94.005 DIMENSIONS: 5mx4mx0.6m VOLUME: 12m³

225mmø PVC-U SN8 @ 1:100

CONNECTION TO BASEMENT DRAINAGE SYSTEM BY M&E ENGINEER

CONNECTION TO BASEMENT DRAINAGE SYSTEM BY M&E ENGINEER

RAIN GARDEN

EXISTING 900mmø CONCRETE STORM WATER SEWER

EXISTING STORM WATER SEWER

EXISTING 225mmø FOUL WATER SEWER

EXISTING 1050mmø STORM WATER SEWER

EXISTING 225mmø STORM WATER SEWER

EXISTING 300mmø STORM WATER SEWER

ø150mm @ 1:100

225mmø PVC-U SN8 @ 1:TBC

225mmø PVC-U SN8 @ 1:100

+97.600m
+97.294m
+97.413m
+97.600m
+97.600m
+97.480m
+97.339m
+97.163m
+96.900m
+95.500m

NOTES:

- REFER TO CS CONSULTING DRAWING No. Q003-CSC-ZZ-XX-DR-C-0003 FOR BASEMENT DRAINAGE LAYOUT DETAILS.
- FOR PODIUM DRAINAGE DETAILS REFER TO LANDSCAPE ARCHITECT AND MEP INFORMATION

PROPOSED GROUND FLOOR DRAINAGE LAYOUT.

SCALE 1:500

DRAFT

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Q003

NOTES

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Rev. No.	Date	REVISION NOTE	Drn. By	Chkd. By
P1	05.10.2021	EXISTING STORM MANHOLE LOCATION CONFIRMED.	IK	FDB
P2	10.03.2022	DRAINAGE LAYOUT REVISED	MM	FDB
P3	13.05.2022	SITE BOUNDARY AND DRAINAGE LAYOUT REVISED	IK	FDB
P4	19.05.2022	FOUL WATER CONNECTION AND SITE BOUNDARY REVISED	IK	FDB
P5	24.05.2022	UPDATED FOLLOWING IRISH WATER REQUIREMENTS	IK	MM
P6	30.05.2022	UPDATED FOLLOWING IRISH WATER REQUIREMENTS	IK	MM

Architect	Henry J. Lyons
Project	Proposed Development On The Belgard Square East.
Title	Proposed Ground Floor Drainage Layout
Dwg. No.	Q003-CSC-ZZ-XX-DR-C-0002

Date	Drn by	Chkd by	Aprvd by	Scale	Revision
Sept 2021	IK	FDB	NB	1:500 @ A1	P6

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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

LEGEND:

- SITE BOUNDARY
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- PROPOSED SW ATTENUATION TANK
- PROPOSED FW PUMP STATION
- EXISTING FOUL SEWER
- PROPOSED FOUL SEWER
- PROPOSED GULLY
- PROPOSED FOUL RISING MAIN

NOTE:
SURFACE WATER COLLECTED IN PIPES SLUNG TO UNDERSIDE OF GROUND FLOOR SLAB AND ROUTED TO ATTENUATION TANKS. UNDERSLUNG DRAINAGE DESIGN BY OTHERS (TO M&E DESIGN).

BLESSINGTON ROAD

EXISTING 900mmø CONCRETE STORM WATER SEWER

EXISTING STORM WATER SEWER

EXISTING 225mmø STORM WATER SEWER

EX.SMH
CL: 97.55
IL: 93.45

EX.FMH
CL: 97.48
IL: 93.13

EXISTING 225mmø FOUL WATER SEWER

EXISTING 1050mmø STORM WATER SEWER

PROPOSED ATTENUATION FACILITY #2 WITHIN BASEMENT DESIGNED FOR THE 100 YEAR EVENT +20%CC.

ATTENUATION VOLUME: 300m³
WATER LEVEL: 95.419m
IL: 91.958m

REFER TO ARCHITECTURAL & STRUCTURAL DRAWINGS FOR FURTHER DETAILS

FOR CONTINUATION REFER TO CS DRAWING: 'Q003-CSC-ZZ-XX-DR-C-0002 Proposed Ground Floor Drainage Layout'

EX.FMH
CL: 96.77
IL: 92.84

PUMP STATION KIOSK. M&E ENGINEER TO CONFIRM POWER AND TELEMETRY REQUIREMENTS.

PACKAGE PUMP STATION BY SPECIALIST. PUMP STATION TO INCLUDE STANDBY AND DUTY PUMPS. PROVISION OF ADDITIONAL CAPACITY TO BE CONFIRMED AT LATER STAGE OF THE DESIGN

RISING MAIN SIZED TO MANUFACTURER'S REQUIREMENTS. EXACT ROUTE TBC ON SITE TO AVOID PROPOSED SERVICES

EX.SMH
CL: 95.84
IL: 91.72

EX.FMH
CL: 95.89
IL: 90.71

FOR CONTINUATION REFER TO CS DRAWING: 'Q003-CSC-ZZ-XX-DR-C-0002 Proposed Ground Floor Drainage Layout'

FMH 3
CL: 93.050m
IL: 92.200m

FMH 1
CL: 93.050m
IL: 92.200m

150mmø PVC-U SN8 @ 1:70

150mmø PVC-U SN8 @ 1:70

ø225mm @ 1:100

150mmø PVC-U @ 1:70

150mmø PVC-U SN8 @ 1:70

150mmø PVC-U SN8 @ 1:70

FMH 2
CL: 93.050m
IL: 91.532

FMH 4
CL: 93.050m
IL: 91.295m

FMH 10
CL: 93.050m
IL: 91.590m

400m³

400m³

300m³

CLASS II OIL SEPARATOR

PROPOSED ATTENUATION FACILITY #1 WITHIN BASEMENT DESIGNED FOR THE 100 YEAR EVENT +20%CC.

ATTENUATION VOLUME: 400m³
WATER LEVEL: 95.397m
IL: 92.659m

REFER TO ARCHITECTURAL & STRUCTURAL DRAWINGS FOR FURTHER DETAILS

BELGARD ROAD

BELGARD SQUARE EAST

EXISTING 300mmø STORM WATER SEWER

EXISTING 1050mmø STORM WATER SEWER

McDonald's Car Park

PROPOSED BASEMENT DRAINAGE LAYOUT.

SCALE 1:250

DRAFT

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Q003

NOTES

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5. Ordnance Survey Ireland Licence Number EN 0074022

Rev. No.	Date	REVISION NOTE	Drn. By	Chkd. By
P1	05.10.2021	EXISTING STORM MANHOLE LOCATION CONFIRMED	IK	FDB
P2	10.03.2022	DRAINAGE LAYOUT REVISED	MM	FDB
P3	24.05.2022	UPDATED FOLLOWING IRISH WATER REQUIREMENTS	IK	MM
P4	30.05.2022	UPDATED FOLLOWING IRISH WATER REQUIREMENTS	IK	MM

Architect	Henry J. Lyons
Project	Proposed Development On The Belgard Square East.
Title	Proposed Basement Drainage Layout
Dwg. No.	Q003-CSC-ZZ-XX-DR-C-0003

Date	Drn by	Chkd by	Aprvd by	Scale	Revision
Sept 2021	IK	FDB	NB	1:250 @ A1	P4

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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

NOTE:

1. ALL PIPE WORK, VALVES, CHAMBERS, NETWORK ARRANGEMENTS AND ALL ASSOCIATED WATERMAIN WORKS TO COMPLY WITH THE IRISH WATER INFRASTRUCTURE STANDARD DETAILS.
2. ALL NEW WATERMAIN MATERIAL SHALL BE IN ACCORDANCE WITH SECTION 3.9 OF THE IRISH WATER CODE OF PRACTICE. MDPE PIPES SHALL BE OF A TYPE PE-80 AND HAVE AN SDR-11 RATING. THEY SHALL CONFORM TO IS EN 12201: PART 1, PART 2 AND PART 3.
3. THE PROPOSED 150mm WATERMAINS WILL BE LOCATED A MINIMUM OF 300mm FROM THE WASTEWATER INFRASTRUCTURE IN ACCORDANCE WITH SECTION 3.5.18 OF THE IRISH WATER WASTEWATER CODE OF PRACTICE AND TYPICAL SERVICE LAYOUT DISTANCES (HORIZONTAL AND VERTICAL) SHALL BE AS PER IRISH WATER STANDARD DETAIL STD-W-11.
4. AIR PRESSURE TESTS TO ALL WORKS TO BE TAKEN IN CHARGE TO IRISH WATER CODE OF PRACTICE SECTION 4.10.
5. MANIFOLD CHAMBERS WILL BE USED TO PROVIDE A COMMUNAL BOX FOR THE APARTMENT BLOCK AND THAT EACH DWELLING UNIT WILL HAVE IT'S OWN SUPPLY PIPE AND METER AND STOP VALVE. ALL METERS IN THE MANIFOLD SHALL BE TAGGED TO INDICATE WHICH PROPERTY IS SUPPLIED AND ANY UNUSED OUTLETS WILL BE BLANKED OFF IN ACCORDANCE WITH SECTION 3.15.3 OF THE IRISH WATER WASTEWATER CODE OF PRACTICE.
6. BULK METERS SHALL COMPLY WITH SECTION 3.15.4 OF THE IRISH WATERS CODE OF PRACTICE FOR WATER INFRASTRUCTURE.
7. WATERMAIN T-JUNCTIONS SHALL BE AT 90 DEGREE ANGLES AS PER IRISH WATER DETAIL STD-W-07.
8. THRUST BLOCKS TO BE PROVIDED AT DEAD ENDS, BENDS, TEE JUNCTIONS, VALVE CHAMBERS (AS PER DETAILS) OR ANY ABRUPT CHANGE IN VERTICAL OR HORIZONTAL DIRECTION AND AT ANY LOCATION WHERE WATER PRESSURE IS LIKELY TO DISTORT THE PIPE LINE INSTALLATION OR CAUSE DISPROPORTIONATE MOVEMENT. THRUST BLOCKS TO BE IN ACCORDANCE WITH SECTION 4.9 OF THE IRISH WATER CODE OF PRACTICE AND IRISH WATER STANDARD DETAIL STD-W-28.
9. ANY NEW PLANTING OF TREES, SHRUBS ETC. TO BE IN STRICT ACCORDANCE WITH THE IRISH WATER STANDARD DETAIL STD-W-12A. ANY PROPOSED WATERMAIN LOCATED IN PROXIMITY TO EXISTING TREES SHALL BE IN ACCORDANCE WITH STANDARD IRISH WATER DETAIL STD-W-12.
10. 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 UNITS.

LEGEND:

- EXISTING WATERMAIN
- EXISTING WATERMAIN TO BE REMOVED
- EXISTING HYDRANT
- EXISTING SLUICE VALVE
- PROPOSED WATERMAIN
- PROPOSED 25mm WATERMAIN WITH METER UNIT
- PROPOSED SLUICE VALVE
- PROPOSED HYDRANT
- PROPOSED BULK METER
- PROPOSED AIR VALVE
- PROPOSED SCOUR VALVE
- SITE BOUNDARY
- COMMERCIAL UNITS
- BASEMENT OUTLINE

PROPOSED 200mmø (I.D) PE100/SDR17 WATERMAIN

EXISTING 6" CAST-IRON

PROPOSED ON-LINE AIR VALVE TO BE LOCATED AT HIGH POINT. TO BE CONSTRUCTED TO IRISH WATER STANDARD DETAIL STD-W-22

BULK METER AS PER SECTION 3.15.4 AND 3.19 OF THE IRISH WATER CODE OF PRACTICE FOR WATER

NEW OFF-LINE HYDRANT TO BE CONSTRUCTED TO IRISH WATER STANDARD DETAIL STD-W-19

CONNECTION TO EXISTING 150mm MAIN AND 100mm BRANCH, FITTED WITH AN 80mm AQUAMAG, COMPLETE WITH BATTERY TELEMETRY UNITS WHICH WILL BE SUPPLIED AND COMMISSIONED BY SDCC ON BEHALF OF IRISH WATER

BLESSINGTON ROAD

NEW ON-LINE HYDRANT TO BE CONSTRUCTED TO IRISH WATER STANDARD DETAIL STD-W-18

EXISTING 150mm uPVC WATERMAIN

EXISTING 6" CAST-IRON

IN-LINE FLOW METER TO BE CONSTRUCTED TO IRISH WATER STANDARD DETAIL STD-W-26G

NOTE:

ALL COMMERCIAL SERVICE CONNECTIONS AND BULK FLOW METERS IN ACCORDANCE WITH STD-W-26G AND SECTION 3.15.3 OF WATER CODE OF PRACTICE.

EXISTING 150mm uPVC WATERMAIN

NOTE:

POTABLE WATER DESIGN IN PODIUM AREAS BY MEP ENGINEER. REFER TO MEP DRAWINGS AND SPECIFICATION FOR FURTHER DETAILS

PROPOSED 150mmø (O.D) WATERMAIN

EXISTING 100mm uPVC WATERMAIN

BELGARD ROAD

EXISTING 100mm MAIN TO BE BLANK CAPPED AT R113 CONNECTION POINT

IN-LINE FLOW METER TO BE CONSTRUCTED TO IRISH WATER STANDARD DETAIL STD-W-26G

NEW OFF-LINE HYDRANT TO BE CONSTRUCTED TO IRISH WATER STANDARD DETAIL STD-W-19

PROPOSED OFF-LINE SCOUR VALVE AND SCOUR CHAMBER PROVIDED WITH A NON-RETURN VALVE CONSTRUCTED TO IRISH WATER STANDARD DETAIL STD-W-30B. CONNECTION TO SW NETWORK TO BE AGREED WITH SDCC

EXISTING 250mm ASBESTOS WATERMAIN

BELGARD SQUARE EAST

PROPOSED WATERMAIN LAYOUT.

SCALE 1:500

DRAFT

PLANNING DRAWING.
NOT FOR CONSTRUCTION.
ALL LEVELS GIVEN ARE RELATIVE TO ORDNANCE DATUM.
THIS DRAWING HAS BEEN ISSUED FOR INFORMATION PURPOSES ONLY AND MUST NOT BE USED FOR CONSTRUCTION UNDER ANY CIRCUMSTANCES

Q003

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.
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Rev. No.	Date	REVISION NOTE	Drn. By	Chkd. By
P1	19.10.2021	WATERMAIN LAYOUT TO IW COMMENTS REVISED	IK	FDB
P2	22.04.2022	ISSUED FOR PLANNING	IK	FDB
P3	26.04.2022	POINT OF CONNECTION REVISED	IK	FDB
P4	28.04.2022	SITE BOUNDARY REVISED	IK	FDB
P5	17.05.2022	SITE BOUNDARY AND WATERMAIN LAYOUT REVISED	IK	FDB
P6	24.05.2022	UPDATED FOLLOWING IRISH WATER REQUIREMENTS	IK	MM
P7	30.05.2022	UPDATED FOLLOWING IRISH WATER REQUIREMENTS	IK	MM

Architect	Henry J. Lyons
Project	Proposed Development On The Belgard Square East.
Title	Proposed Watermain Layout
Dwg. No.	Q003-CSC-ZZ-XX-DR-C-0004

Date	Drn by	Chkd by	Aprvd by	Scale	Revision
Sept 2021	IK	FDB	NB	1:500 @ A1	P7

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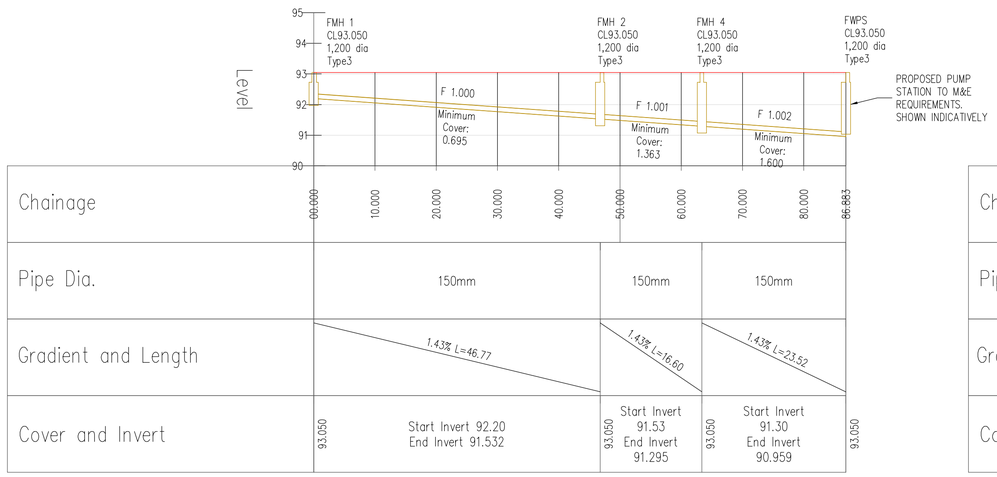
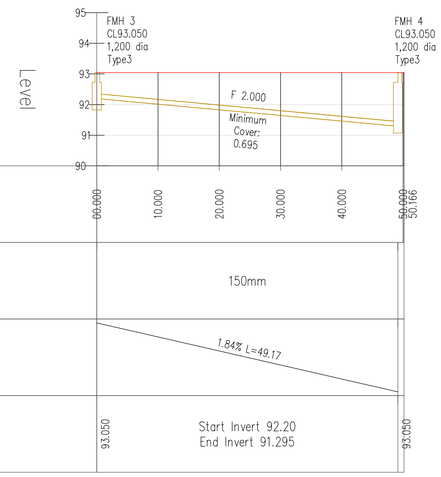
Health & Safety OHSAS 18001:2007



FMH1 – FWPS – LONGSECTION

SCALE: H 1:500,V 1:100. DATUM: 90.000



FMH 3 – FMH 4 – LONGSECTION

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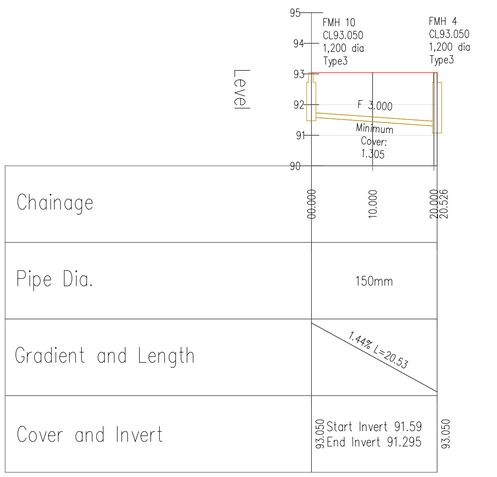

FMH 10 – FMH 4 – LONGSECTION

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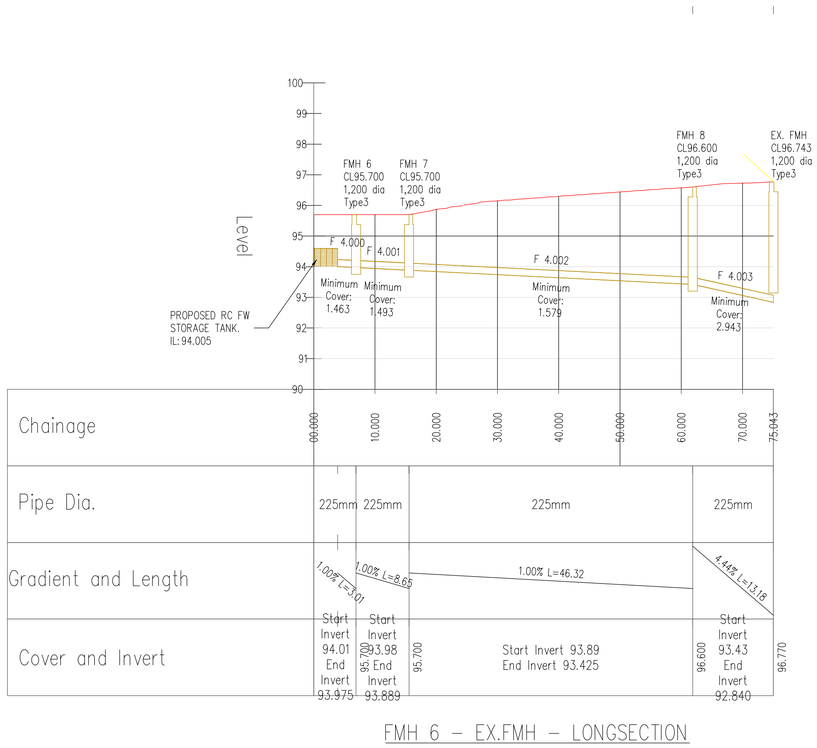

FMH 6 – EX.FMH – LONGSECTION

SCALE: H 1:500,V 1:100. DATUM: 90.000

Q003

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P1	30.05.2022	UPDATED FOLLOWING IRISH WATER REQUIREMENTS	IK	MM

Architect	Henry J. Lyons
Project	Proposed Development On The Belgard Square East.
Title	Proposed Foul Sewer Long Sections
Dwg. No.	Q003-CSC-ZZ-XX-DR-C-0023

Date	Drn by	Chkd by	Aprvd by	Scale	Revision
May 2022	IK	FDB	NB	As Shown @ A1	P1

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