

TOBIN

102 Main Street Portlaoise
Social Housing
Engineering Services Report

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housing

BUILT ON KNOWLEDGE

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1. INTRODUCTION

1.1 BACKGROUND

TOBIN have been commissioned by Cluid Housing to provide Civil and Structural consultancy services for a proposed residential complex at 102 Main Street Portlaoise, co. Laois.

1.2 ADMINISTRATIVE JURISDICTION

The site is located within the jurisdiction of Laois County Council, whose offices are located at JFL Avenue, Portlaoise.

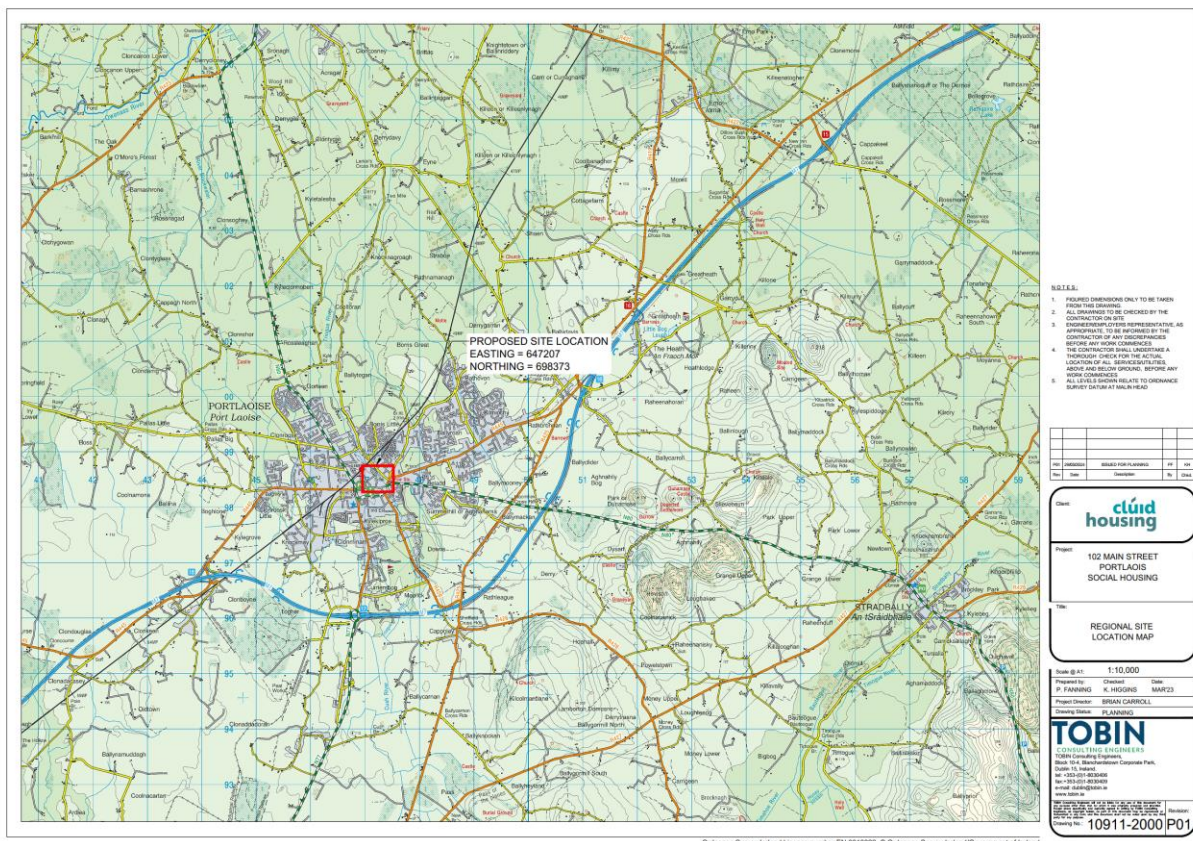


Figure 1-1: Site Location, drawing 10911-2000

The site is located on the eastern edge of Main Street within the town of Portlaoise. The site is bounded to the North by Main Street, to the West by an existing Publican House, to the East by a commercial property and to the South by the yard of a Commercial premises.

Presently the site is an existing derelict building, which was formerly used as a Publican House. The only access to the site is from Main Street.

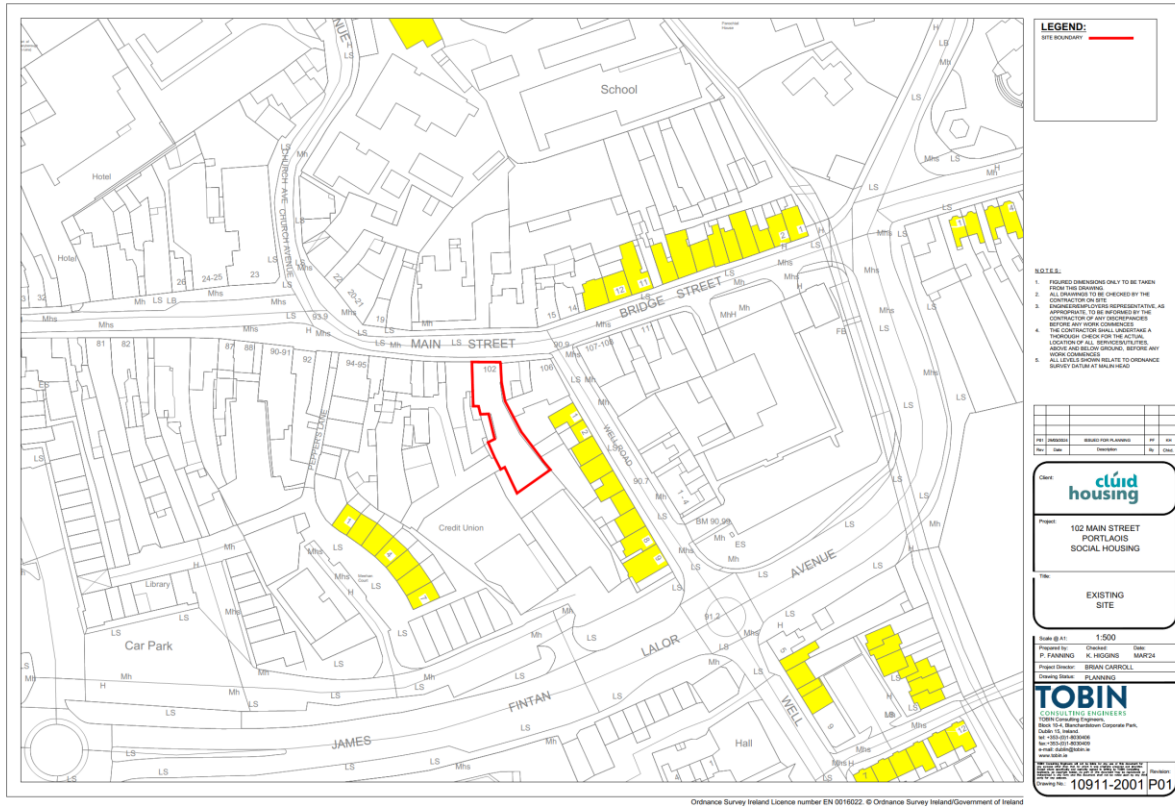


Figure 1-2: Existing Site Layout, drawing 10911-2001

1.3 PROPOSED DEVELOPMENT

It is proposed to demolish and rebuild a new residential building. A new three storey building will be constructed to the rear, incorporating the existing protected structure into the new development. The development will be made up of 10 apartments (8 No. 1 bed units, 2 No. 2 bed units) and an enterprise office.

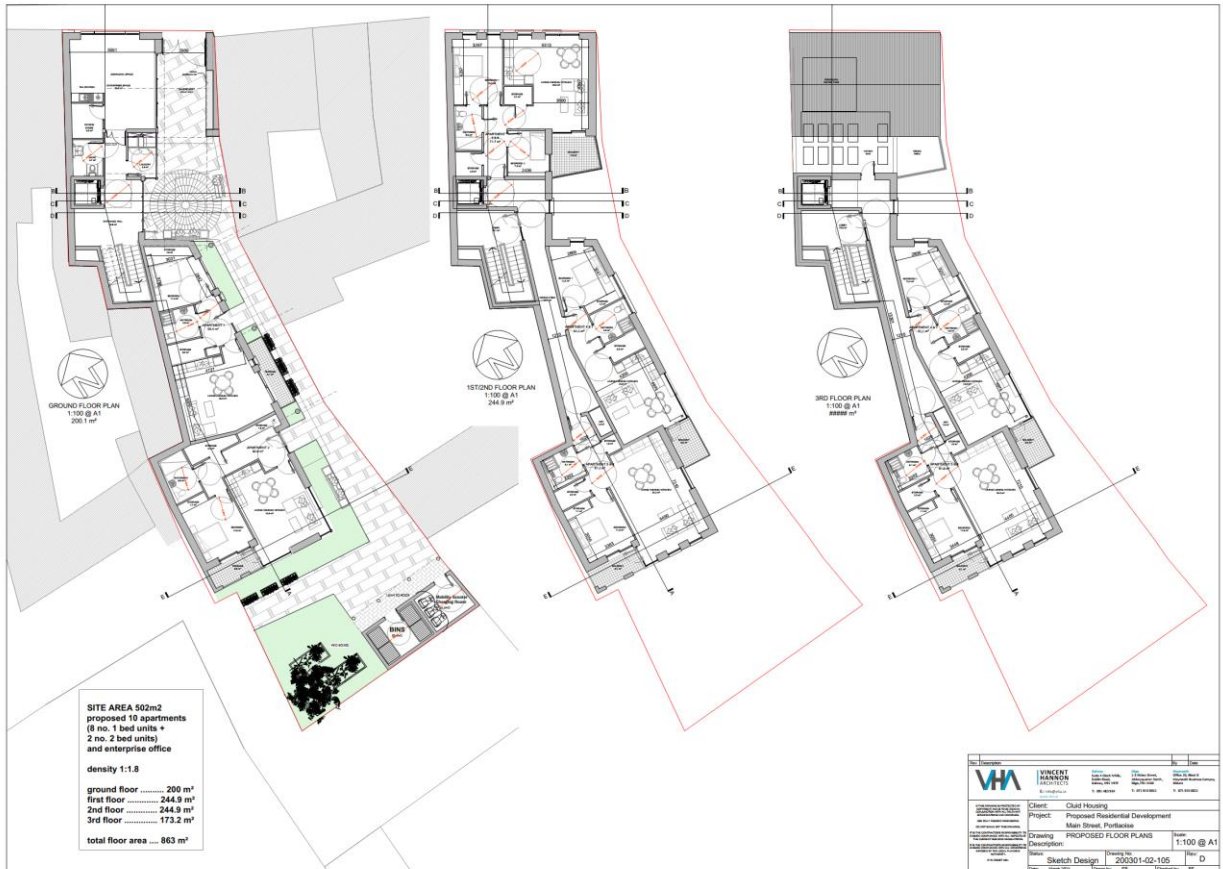


Figure 1-3: Proposed Development Layout, VHA drawing 200301-02-105

1.4 PURPOSE OF THE REPORT

The purpose of this report is to address the proposed service infrastructural requirements for the development. In the coming sections the potable water, surface water and wastewater proposed infrastructure will be detailed and layouts showcased.

The design principles adopted will be those of best engineering practices and standards used will be the most recent applicable publications.

2. POTABLE WATER SUPPLY

2.1 INTRODUCTION

Uisce Eireann's records indicate a 150mm Ductile Iron watermain and a 100mm uPVC watermain within Main Street.

Irish Water Web Map

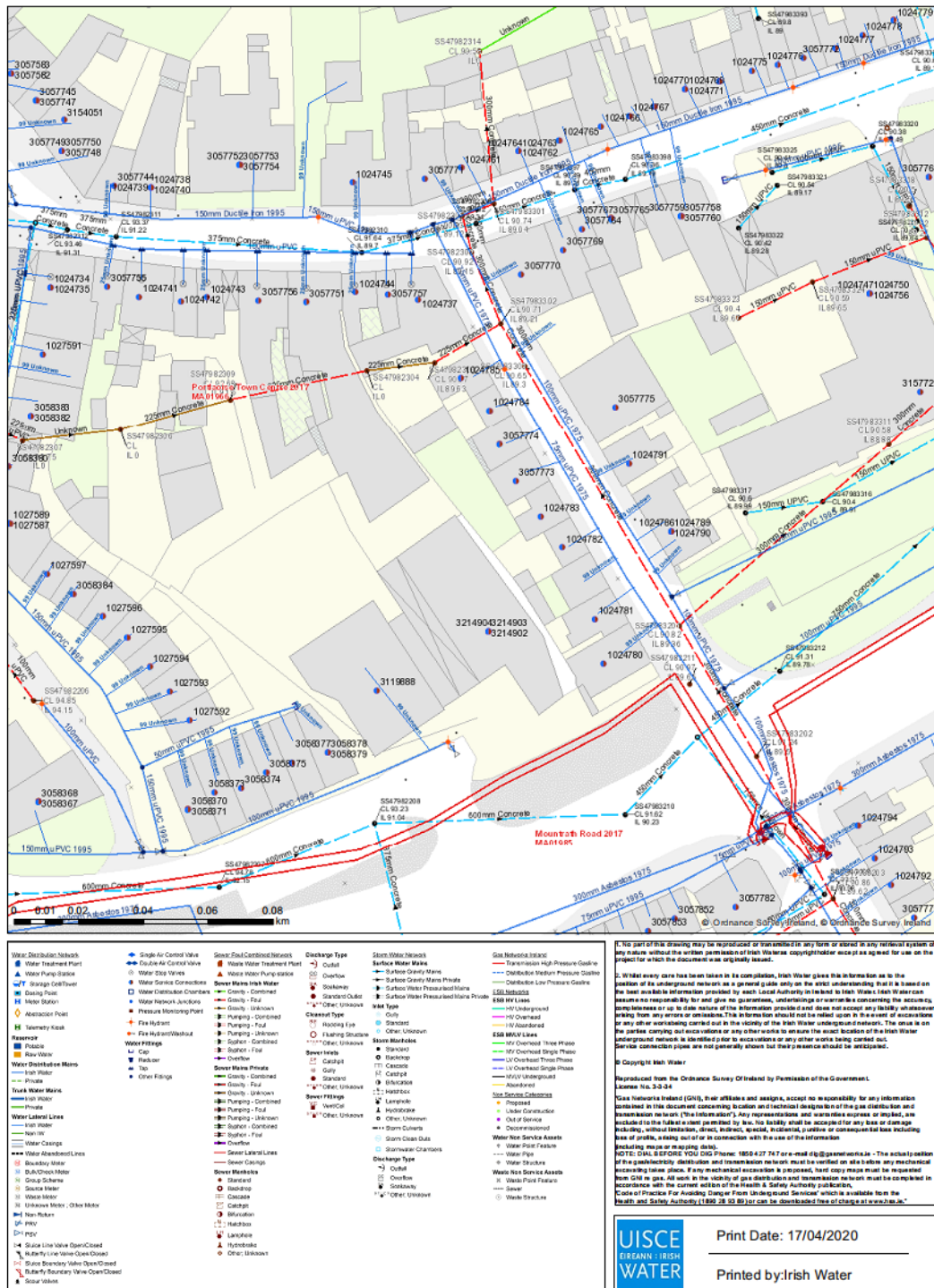


Figure 2-1: Uisce Eireann Record Map

For further information please refer to Appendix A for record maps.



2.2 PROPOSAL

There is an existing water supply serving the buildings on site. It is proposed to reuse the existing water supply connection.

There is an existing fire hydrant located within the footway opposite the building on Main Street.

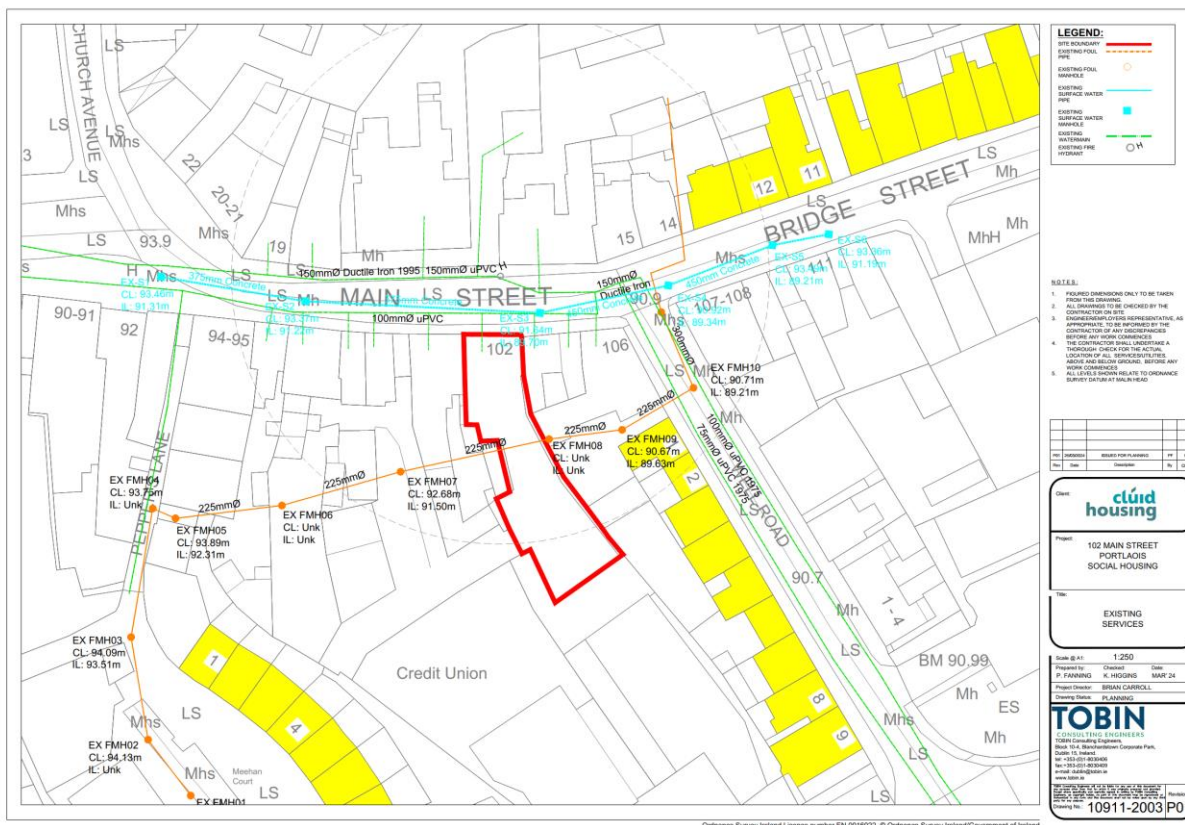


Figure 2-2: Existing Civil Services, drawing 10911-2003

A Pre-Connection application was issued to Uisce Eireann on the 13th October 2021. A Confirmation of Feasibility (COF) was received on the 23rd March 2022 and can be seen in Appendix B. The COF confirmed the development can be accommodated without infrastructure upgraded works.

Once planning is granted a Connection application will be made to Uisce Eireann and a self lay agreement be entered into between the developer and Uisce Eireann.



3. WASTEWATER INFRASTRUCTURE

3.1 INTRODUCTION

Uisce Eireann’s record maps indicate a 225mm diameter concrete pipe traverse beneath the existing building at the back of the site. The pipe discharges into a 300mm diameter Concrete pipe within Well Road, to the east of the site.

Irish Water Web Map

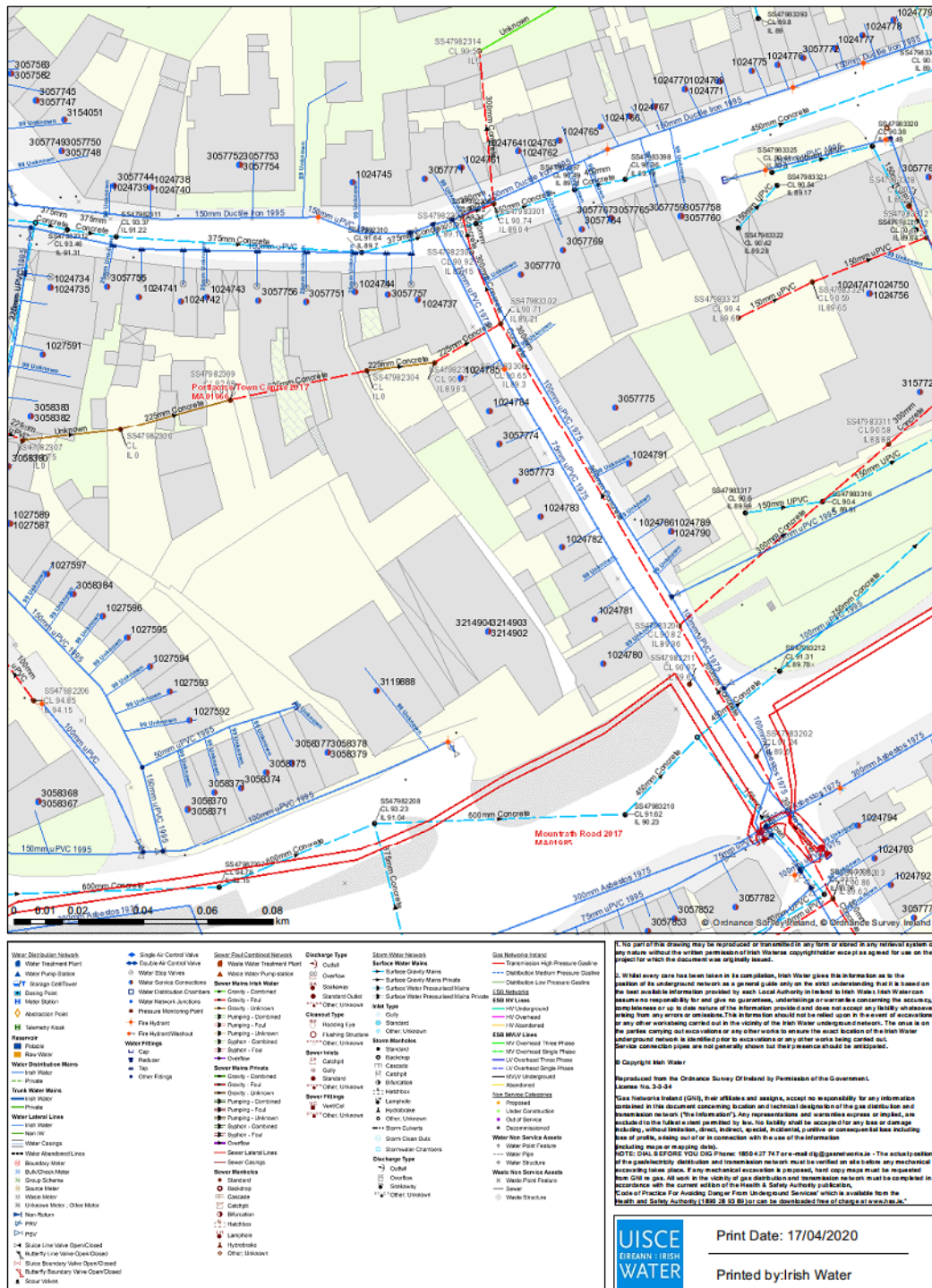


Figure 3-1: Uisce Eireann Record Map

For further information please refer to Appendix A for record maps.

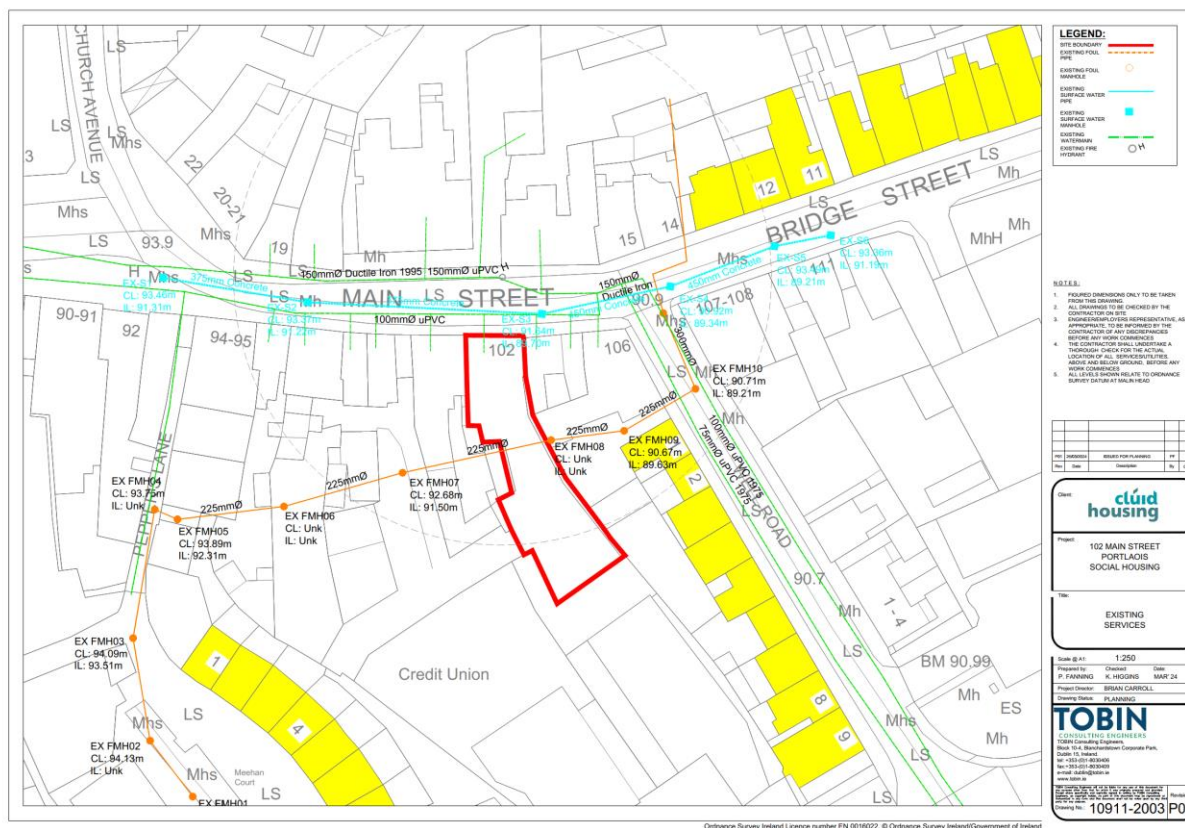


Figure 3-2: Existing Civil Services, drawing 10911-2003

3.2 PROPOSAL

The wastewater infrastructure has been designed in accordance with Uisce Eireann’s latest standard details, code of practice and Building Regulations Part H. The design is subject to approval by Uisce Eireann after a Connection Application has been made and a Build over Application.

Due to the location of the existing pipe within the site and the requirement within Uisce Eireann’s code of practice for private connections to be at 90 degrees to the main, two No. connections are required to accommodate this. Two No. Private inspection chamber will be provided within the site adjacent to the existing public main.



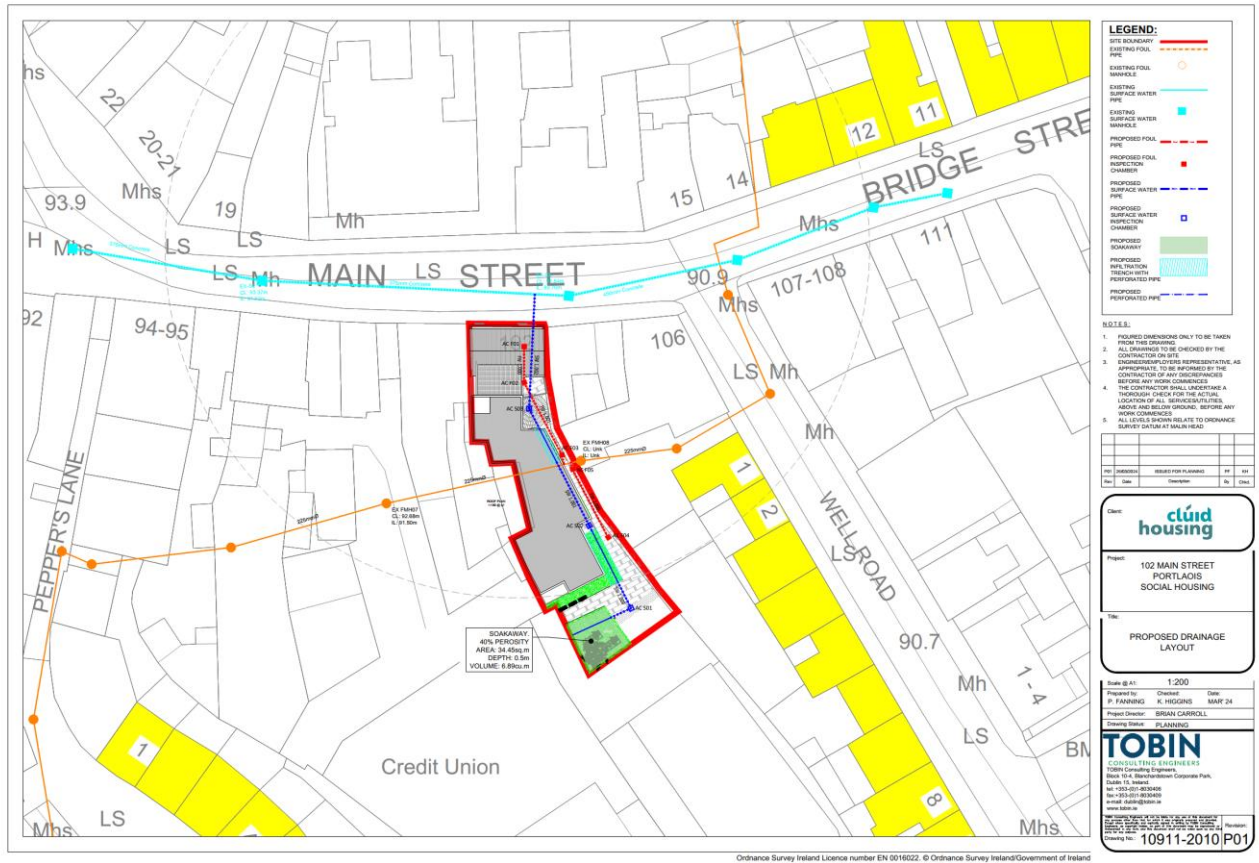


Figure 3-3: Proposed Drainage Layout, drawing 10911-2010

A Pre-Connection application was issued to Uisce Eireann on the 13th October 2021. A Confirmation of Feasibility (COF) was received on the 23rd March 2022 and can be seen in Appendix B. The COF confirmed the development can be accommodated without infrastructure upgraded works but a Build Over application is required. A build over application will be made to Uisce Eireann once planning is granted.

Once planning is granted a Connection application will be made to Uisce Eireann and a self lay agreement be entered into between the developer and Uisce Eireann



4. SURFACE WATER INFRASTRUCTURE

4.1 INTRODUCTION

Laois County Council's records indicates an existing 375mm diameter Concrete public main within Main Street, which falls from west to east.

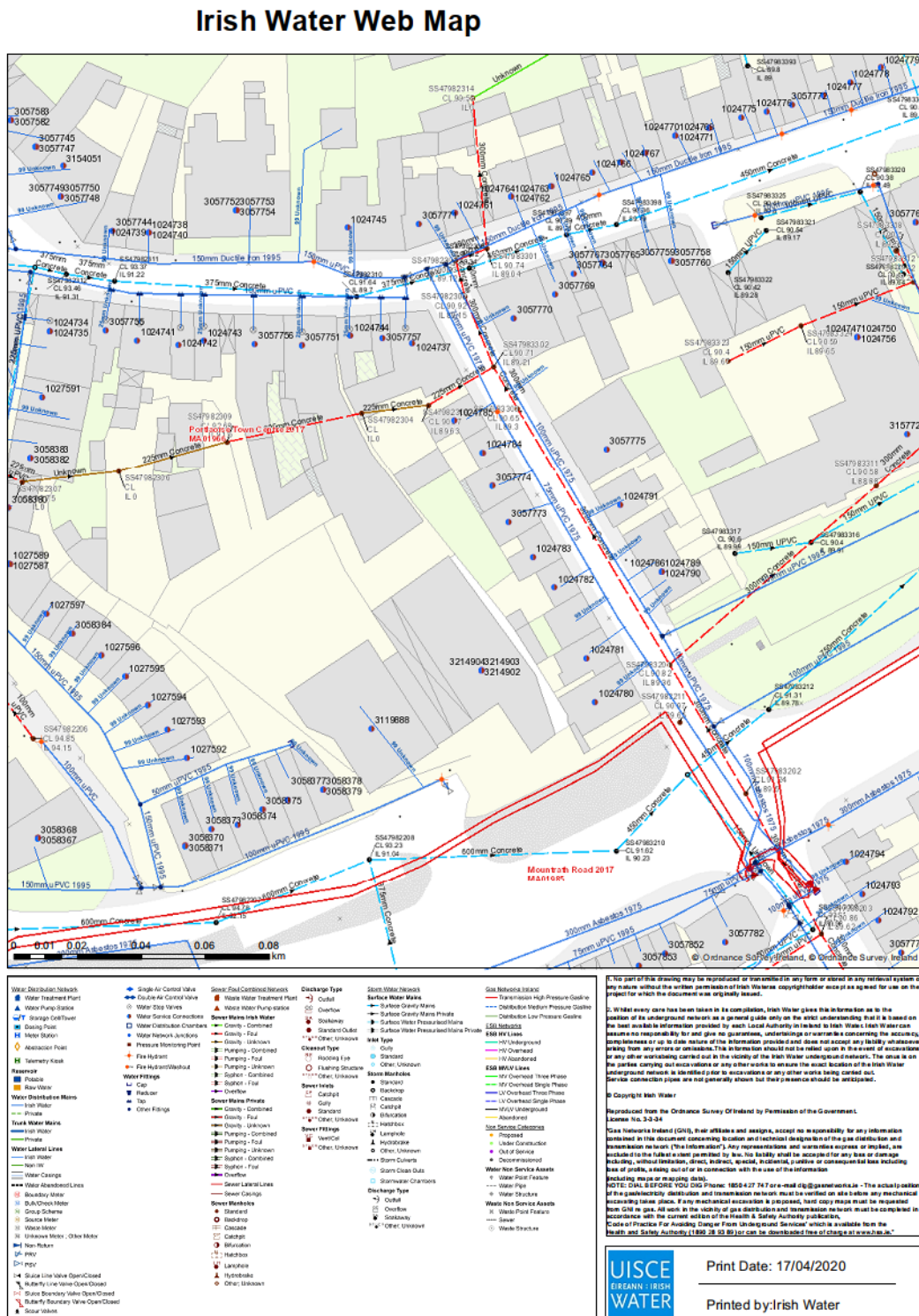


Figure 4-1: Uisce Eireann Record Map

For further information please refer to Appendix A for record maps.

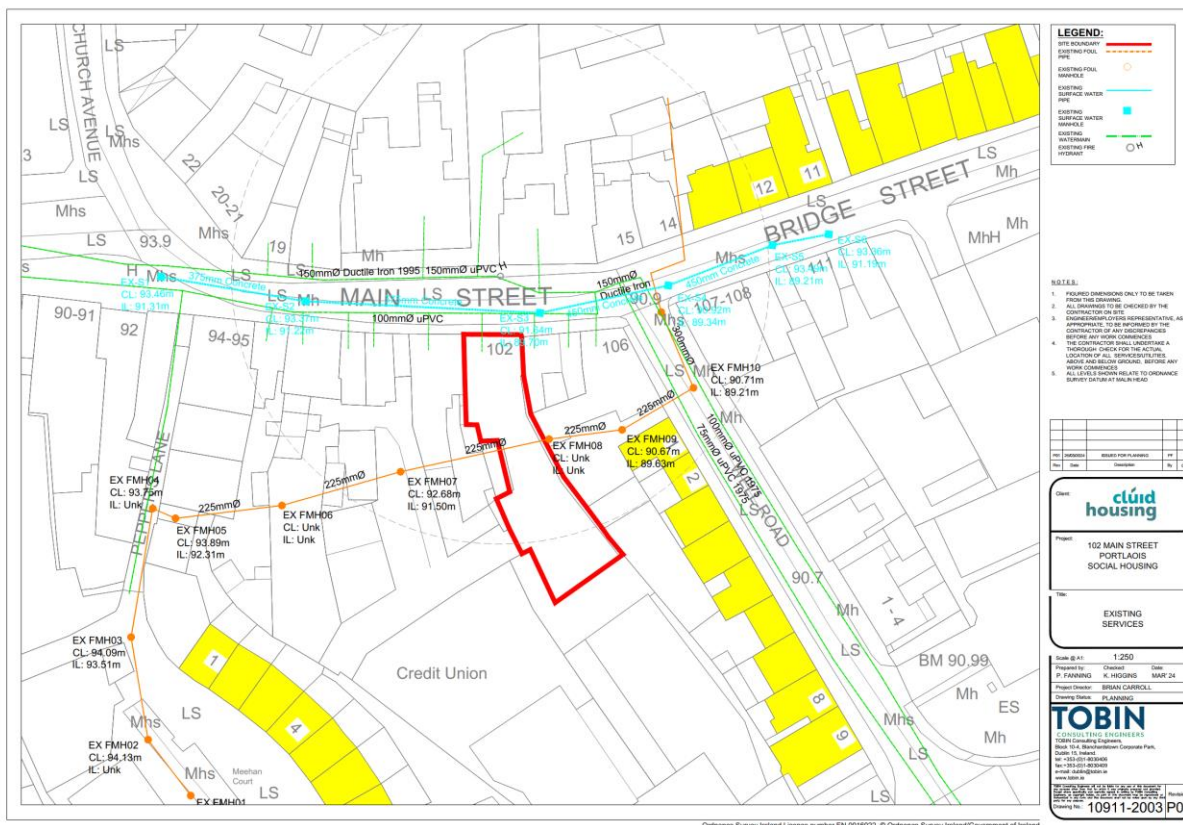


Figure 4-2: Existing Civil Services, drawing 10911-2003

4.2 DESIGN PRINCIPLES

The design and management of the Surface Water for the proposed development will comply with the policies and guidelines outlined in the following.

- The Greater Dublin Strategic Drainage Study (GSDSDS).
- Laois County Council’s Development Plan, 2021-2078
- DCC’s Sustainable Drainage Design & Evaluation Guide, 2021
- Recommendations for Site Development Works for Housing Areas published by the Department of the Environment.
- Greater Dublin Regional Code of Practice for Drainage Works.
- The SuDs Manual (2015).

The key design principles of the Surface Water drainage are as follows.

1. The flow from the development to the existing Surface Water Infrastructure is designed to equal the natural greenfield runoff in accordance with the GSDSDS and sustainable drainage best practice.
2. There are no additional or increased flows for the developed site compared to the existing greenfield condition.
3. The site will have an Attenuation Area designed to store volumes from the 30 year and 100-year storm events on site in accordance with SuDs best practise.

4. The design of the attenuation system includes an allowance for 20% climate change.

4.3 PROPOSAL

It is proposed to construct a new surface water conveyance system within the site, which will provide treatment, storage and infiltration to the existing surface water public main.

All surface water collected on site will pass through green Sustainable Urban Drainage System (SuDs), this will allow for a certain level of treatment of the surface water and also infiltration into the ground. It is proposed to construct underground pipes to convey surface water from source to the SuDs infrastructure. The underground pipes will have slopes between 1:200 and 1:40 to ensure self-cleansing velocities are achieved.

The surface water infrastructure has been designed in accordance with the “Greater Dublin Regional Code of Practice for Drainage Works” (Draft version 6.0) and Laois County Council’s Development Plan 2021-2027.

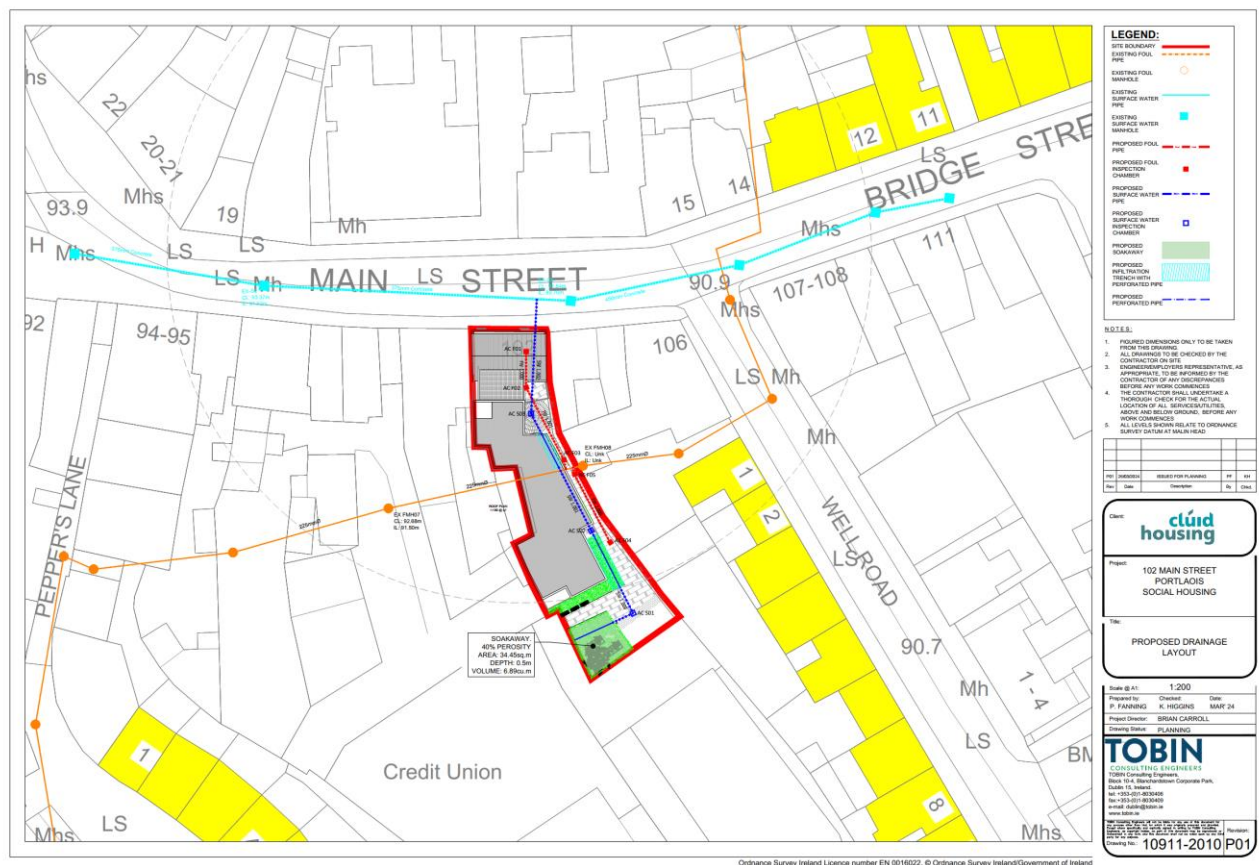


Figure 4-3: Proposed Drainage Layout, drawing 10911-2010

Surface water drainage for the proposed development is designed using the recommendations of the GSDS, EN752 and BS8301:1985, with the following parameters applied:

- Return period for pipe network 2 years,
- Time of entry 4 minutes
- Pipe Friction (Ks) 0.6 mm
- Minimum Velocity 0.75 m/s
- M5 - 2D = 57.2
- M5-60 = 15.8 mm

- Ratio r (M5-60/M5-2D) = 0.276
- Climate Change 20% for rainfall intensities.

The surface water drainage network has been designed and simulated for a range of storm events (including 1 in 5, 1 in 30 and 1 in 100-year storm events) using the Source Control module of MicroDrainage. Refer to Appendix D for simulation results.

4.3.1 SuDs (Sustainable Urban Drainage Systems)

A number of SuDs features have been proposed as part of the surface water drainage system in accordance with the GSDs. SuDs are incorporated to attenuate runoff and volumes; reduce pollutant concentrations in surface water and to replicate the natural characteristics of surface water run off for the site in its pre-developed state.

The following SuDs features are proposed:

4.3.1.1 Permeable Surfacing

It is proposed to install permeable surfacing within the common paving area on the ground floor of the site. The water, once permeated into the pavement, will be allowed to infiltrate into the ground. The inclusion of the permeable paving will slow the surface water run off at source, treat the surface water runoff and provide storage. Refer to figure below.

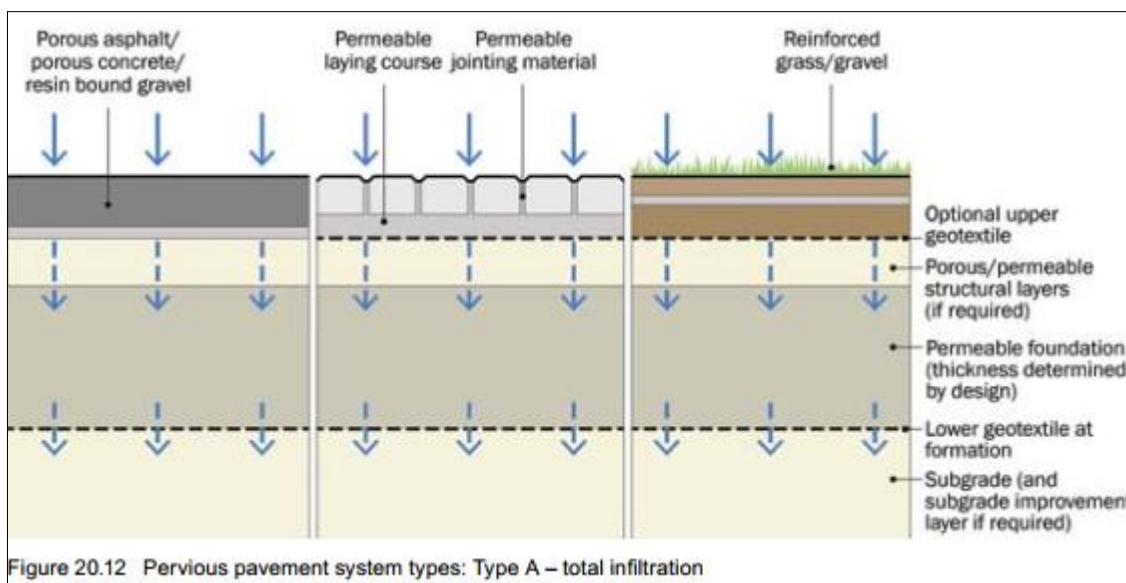


Figure 4-4: Typical Cross Section of infiltration permeable paving (Extract from CIRIA SuDs Manual)

4.3.1 Soakaway

It is proposed to install a soakaway within the landscape area to the South of the site. The surface water will be collected through gullies and underground pipes and directed to a perforated pipe within the soakaway. The perforated pipe will allow the collected water to discharge into the soakaway. The collected water will be allowed to infiltrate into the groundwater.

When the rate of water being collected by the underground pipes exceeds the infiltration rate into the ground, the collected water will be stored within the porous stone and allowed to discharge into the existing 375mm Diameter pipe in Main Street.

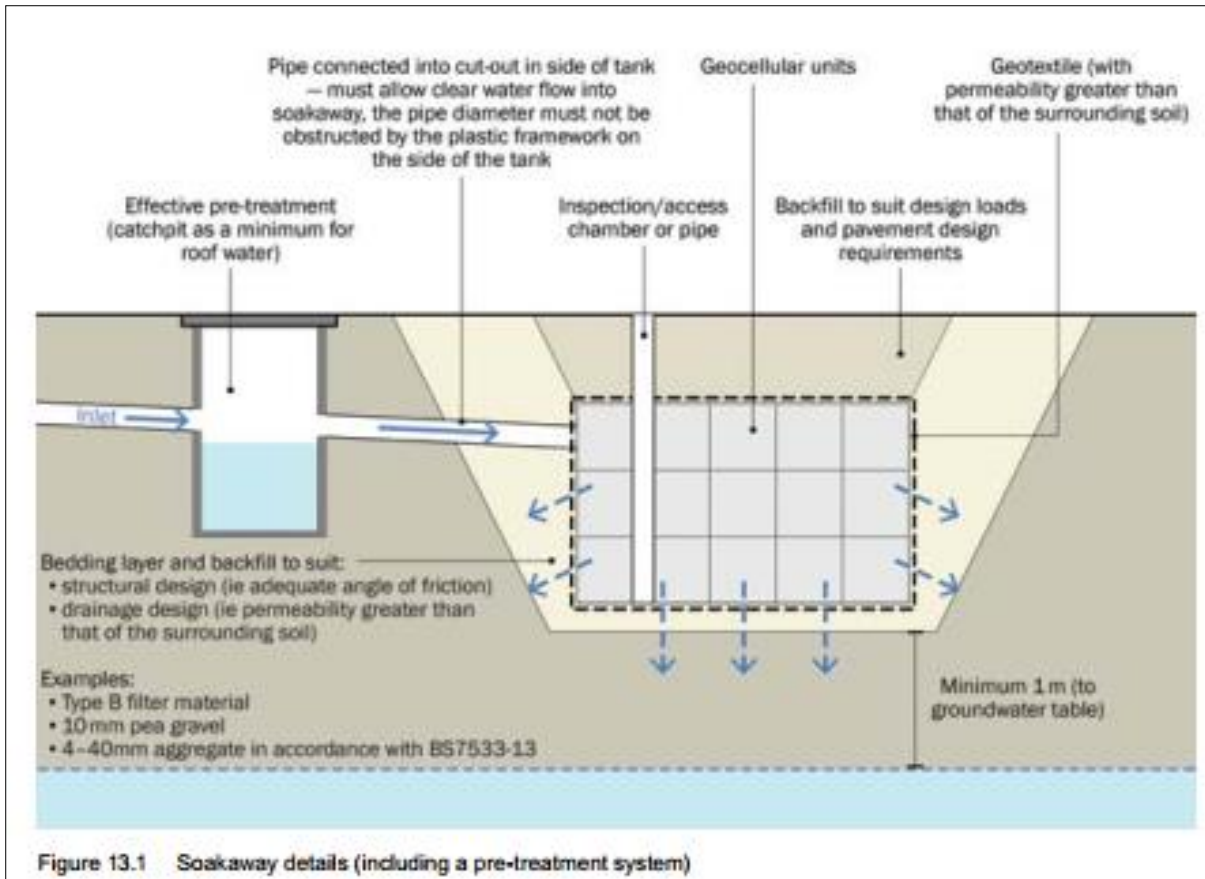
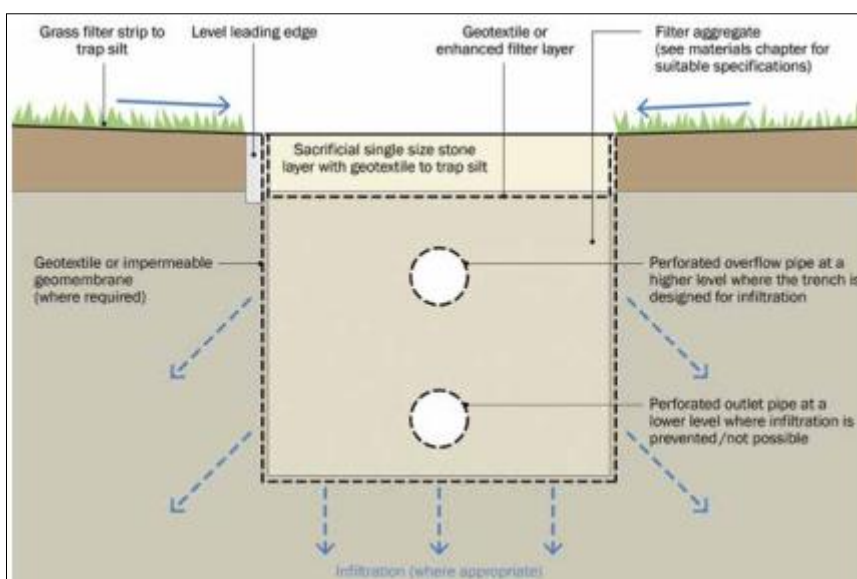


Figure 4-5: Typical Cross Section of a Soakaway (Extract from CIRIA SuDs Manual)

4.3.2 Filter Trench

It is proposed to install two filter trenches within the landscape areas adjacent the building. The surface water discharging from the site will pass through the filter trenches and be allowed to infiltrate into the ground through the use of perforated pipes.

When the rate of water being collected by the underground pipes exceeds the infiltration rate into the ground, the collected water will be stored within the porous stone and allowed to discharge into the existing 375mm Diameter pipe in Main Street.



4.3.3 Treatment Train

Through the SuDs measures described above, the surface water management (treatment train) approach has been incorporated into the development in accordance with the GDSDS. This will assure the surface water runoff quantity and quality issues are addressed.

In accordance with the GDSDS, the following four objectives of the treatment train provide an integrated and balanced approach to help mitigate the changes in surface water runoff flows that occur as land is urbanised and to help mitigate the impacts of surface water quality on receiving systems:

1. **Pollution Prevention:** spill prevention (protection provided by filter trench, permeable surfacing and soakaways), recycling, public awareness, and participation.
2. **Source Control:** conveyance and infiltration of runoff (provided by the proposed surface water network, soakaway, permeable surfacing and filter trench).
3. **Site Control:** reduction in volume and rate of surface water runoff, with some additional treatment provided (provided by soakaway, filter trench and Permeable surfacing).
4. **Regional Control:** Interception of runoff downstream of all source and on-site controls to provide follow-up flow management and water quality treatment (provided by the Existing Surface Water infrastructure).

The above measures ensure a suitable treatment train is provided in accordance with GDSDS.

4.3.4 Interception

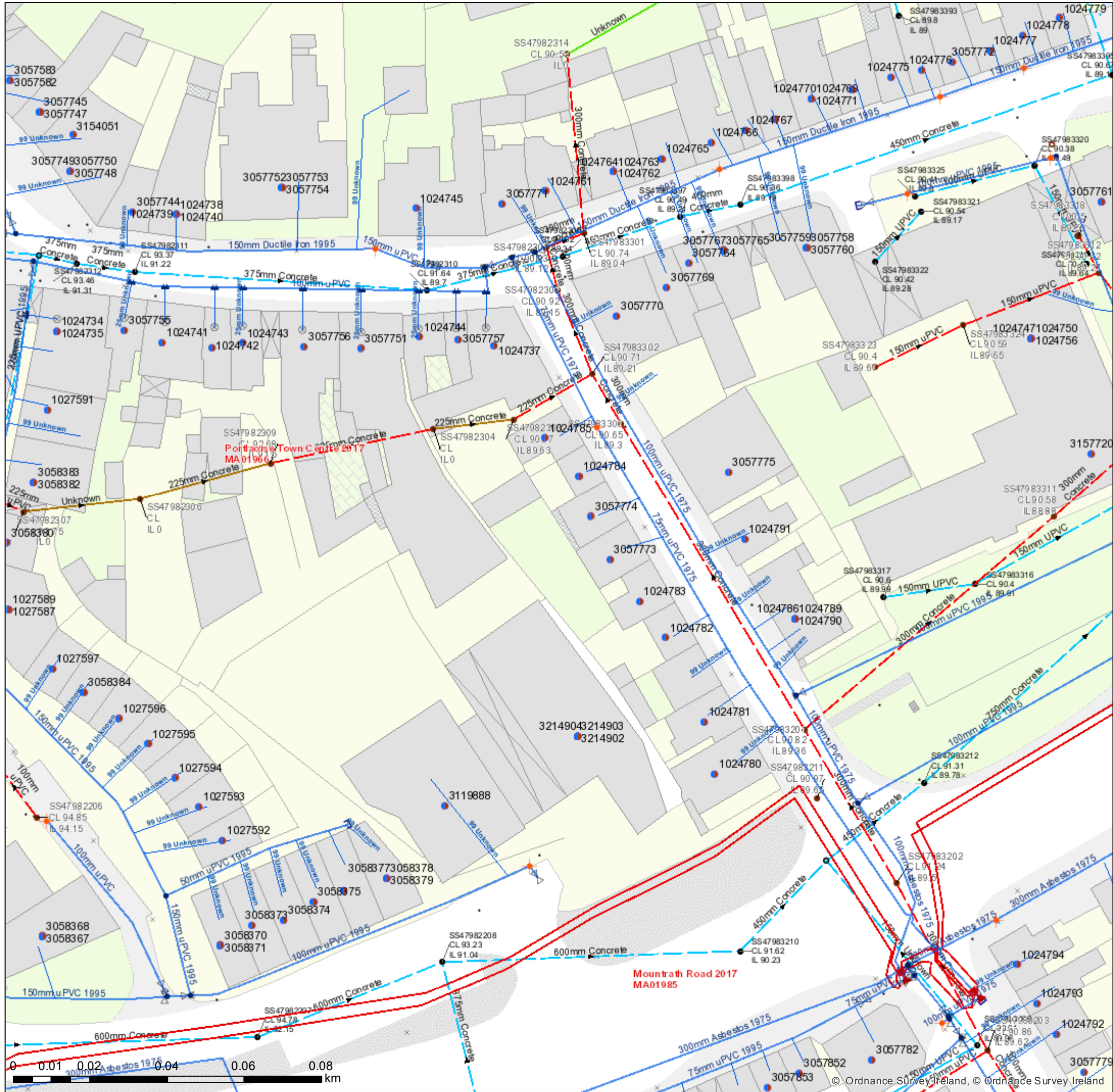
Interception storage has been provided on site by the permeable paving, soakaway and filter trench. The initial 5-10mm of rainfall falling onto the car parking areas will be allowed to infiltrate through the permeable paving and further infiltrate into the ground by the soakaway and filter trench.

Rainfall falling onto the impermeable roof will be collected through gutters and downpipes. The collected water will discharge to the perforated pipes within the Soakaway, and filter trench. The perforated pipes will allow the water to seep out into the soakaway and filter trench and infiltrate into the ground.

The initial rainfall falling onto the roofs will either be discharged to the soakaway or filter trench.

Appendix A SERVICE RECORD MAPS

Irish Water Web Map



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 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 Syphon - Unknown Overflow Sewer Mains Private Gravity - Combined Gravity - Foul Gravity - Unknown Pumping - Combined Pumping - Foul Pumping - Unknown Syphon - Combined Syphon - Foul Syphon - Unknown Overflow Sewer Lateral Lines Sewer Casings Sewer Manholes Standard Backdrop Cascade Catchpit Bifurcation 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
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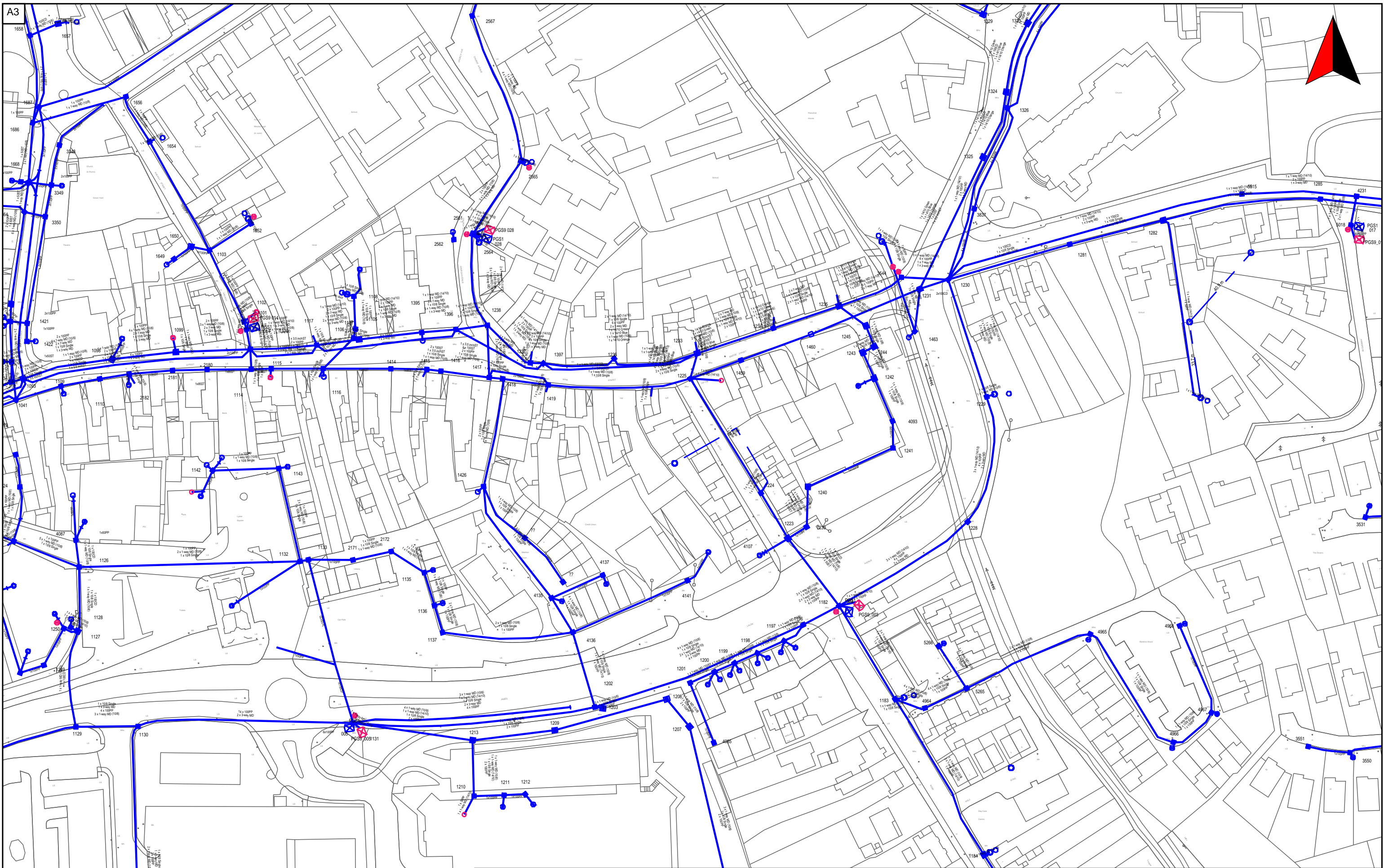
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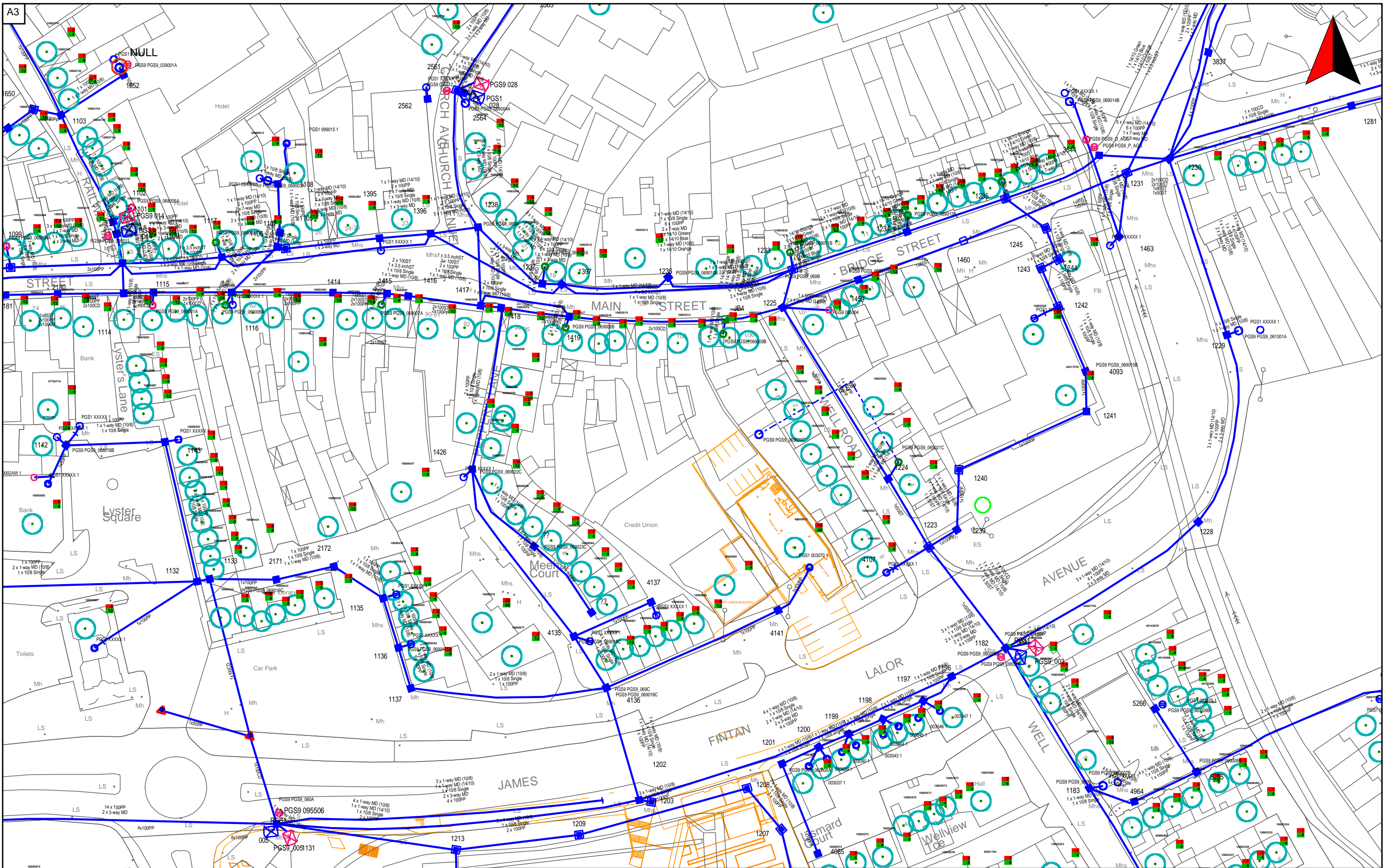
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 - CYAN - 38KV & HIGHER VOLTAGE UNDERGROUND CABLE ROUTES
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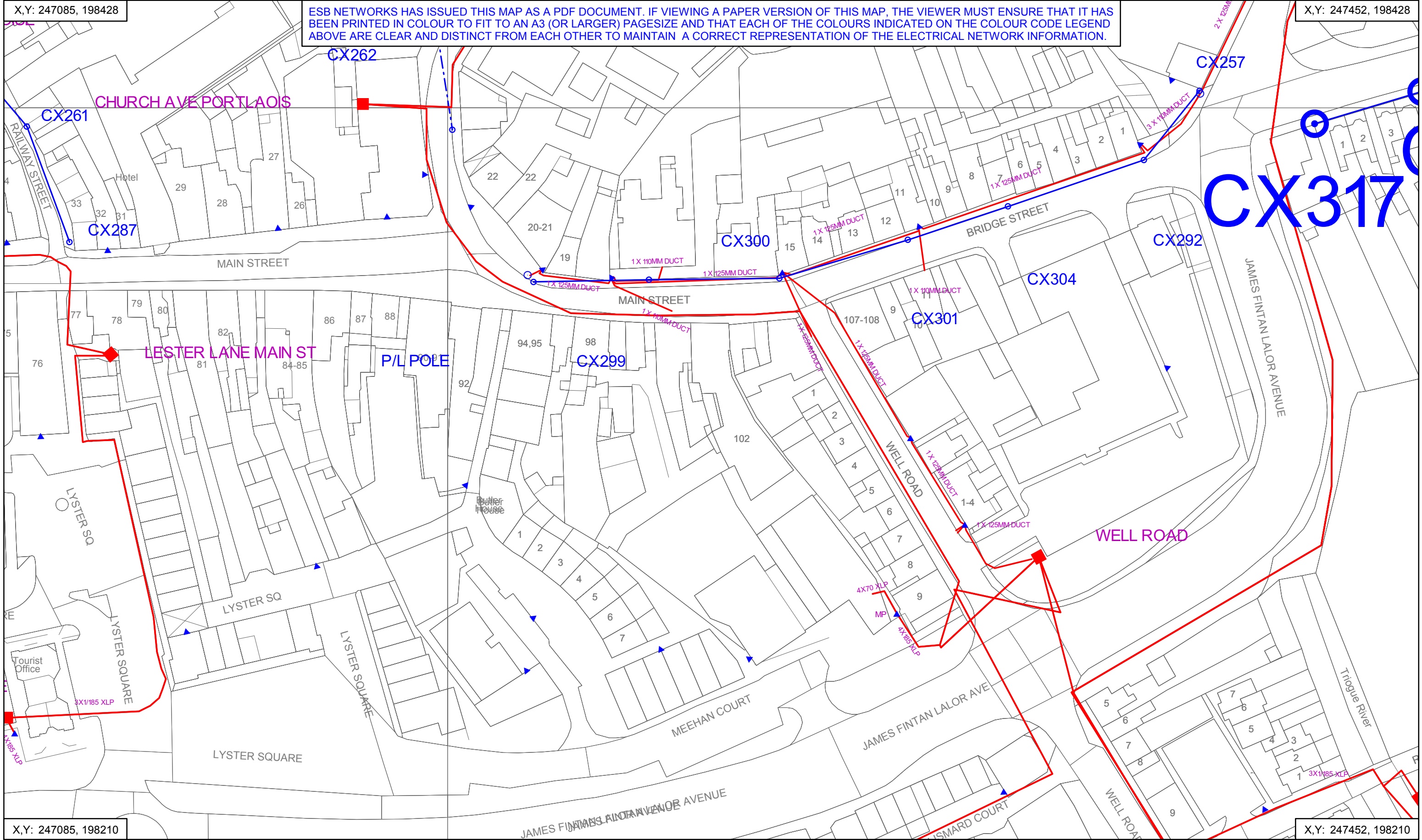
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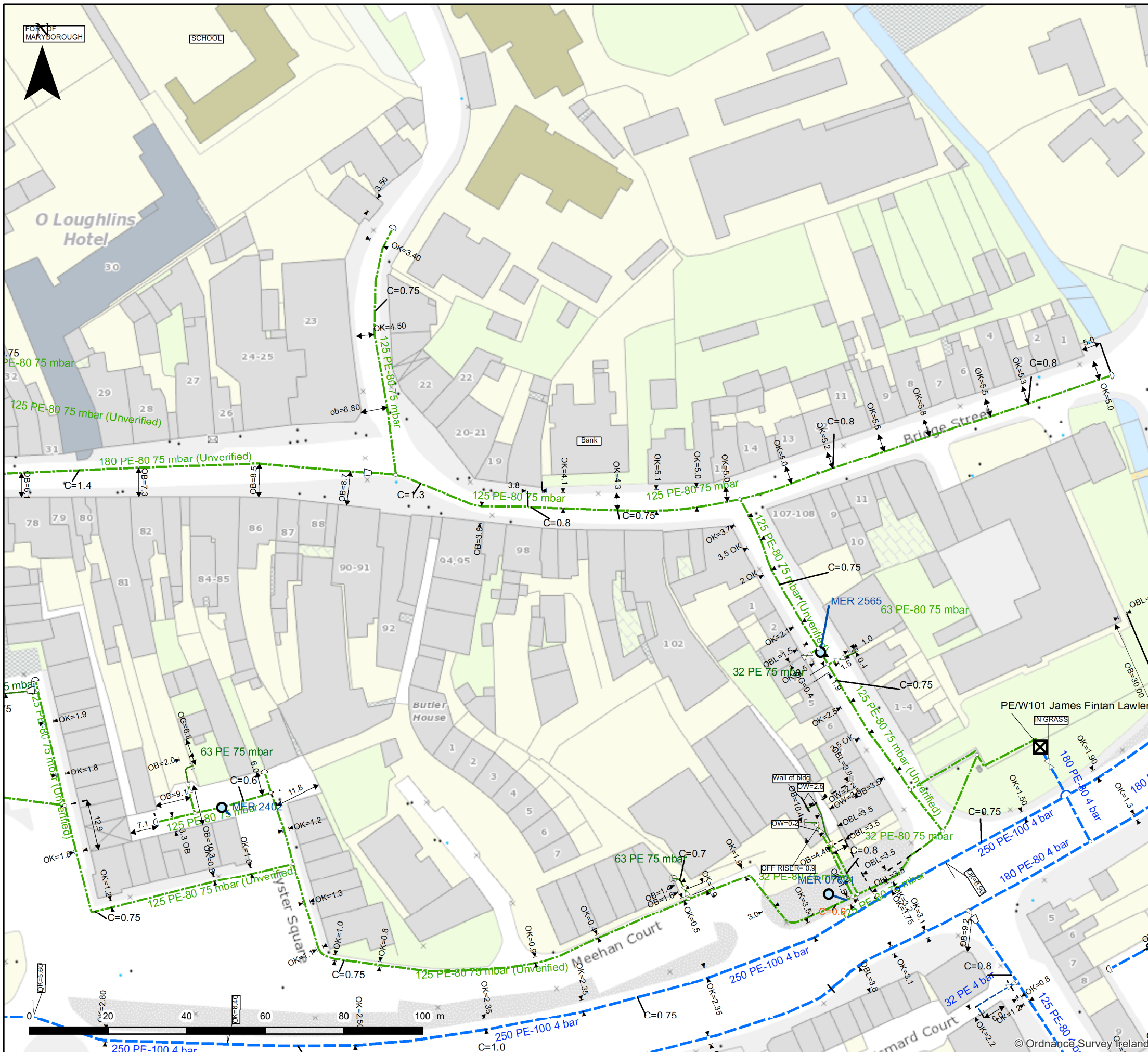
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	Service Pipe (Medium Pressure)
	Service Pipe (Low Pressure)
	Strategic Pipe (Medium Pressure)
	Strategic Pipe (Low Pressure)
	Inserted
	Abandoned Pipe

C=?	Cover (depth in metres)		Pressure Monitor
	CP Test Point		Protection (Slabbing)
	End Cap		Protection (Sleeve)
	Hot Tap		Reducer
	Installation		Service Terminator
	Valve		Tee
	Mains Verification**		Transition

** Please contact GNI on 1850-427747 for specific information




GAS NETWORK INFORMATION

Description:	
Location: 647192,698379	
Plot Date: 17/04/2020 14:32	Scale: 1000 @ A3
Plotted By: 1085	Ref ID: 1085_17042020143245

Appendix B CONFIRMATION OF FEASIBILITY



Patrick Fanning
 Block 10-4
 Blanchardstown
 Corporate Park
 Dublin
 D15X98N
 Ireland

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

23 March 2022

Re: CDS22002071 pre-connection enquiry - Subject to contract | Contract denied

Connection for Multi/Mixed Use Development of 11 unit(s) at 102 Main Street, Portlaoise, Co. Laois

Dear Sir/Madam,

Irish Water has reviewed your pre-connection enquiry in relation to a Water & Wastewater connection at 102 Main Street, Portlaoise, Co. Laois (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 <u>THIS IS NOT A CONNECTION OFFER. YOU MUST APPLY FOR A CONNECTION(S) TO THE IRISH WATER NETWORK(S) IF YOU WISH TO PROCEED.</u>
Water Connection	Feasible without infrastructure upgrade by Irish Water
Wastewater Connection	Feasible without infrastructure upgrade by Irish Water
SITE SPECIFIC COMMENTS	
Wastewater Connection	As there is an existing sewer running under the existing building an IW build Over/Near application will have to be applied for before a IW connection agreement can be obtained, Please contact diversions@water.ie to apply for build over agreement.
<p>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.</p>	

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.

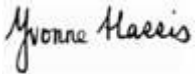
General Notes:

- 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 Tony Scanlan from the design team on 021 42 18905 or email toscanlon@water.ie For further information, visit **www.water.ie/connections**.

Yours sincerely,



Yvonne Harris

Head of Customer Operations

Appendix C RAINFALL SUMMARY

Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 247264, Northing: 198336,

DURATION	Interval		Years										
	6months,	1year,	2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	120,
5 mins	2.7,	3.7,	4.2,	5.0,	5.5,	5.9,	7.2,	8.6,	9.5,	10.8,	11.9,	12.8,	13.3,
10 mins	3.8,	5.2,	5.9,	7.0,	7.7,	8.2,	10.0,	12.0,	13.3,	15.0,	16.6,	17.8,	18.6,
15 mins	4.5,	6.1,	7.0,	8.2,	9.1,	9.7,	11.8,	14.1,	15.6,	17.7,	19.5,	20.9,	21.9,
30 mins	5.9,	8.0,	9.0,	10.6,	11.6,	12.4,	14.9,	17.7,	19.5,	22.0,	24.2,	25.9,	27.0,
1 hours	7.8,	10.4,	11.7,	13.6,	14.9,	15.8,	18.9,	22.3,	24.5,	27.4,	30.0,	32.0,	33.3,
2 hours	10.4,	13.5,	15.2,	17.5,	19.1,	20.3,	24.0,	28.0,	30.6,	34.2,	37.2,	39.6,	41.1,
3 hours	12.2,	15.8,	17.7,	20.3,	22.1,	23.4,	27.6,	32.1,	34.9,	38.8,	42.2,	44.8,	46.5,
4 hours	13.7,	17.7,	19.7,	22.6,	24.5,	25.9,	30.4,	35.3,	38.4,	42.6,	46.2,	48.9,	50.7,
6 hours	16.1,	20.6,	22.9,	26.2,	28.3,	29.9,	34.9,	40.3,	43.7,	48.4,	52.4,	55.4,	57.4,
9 hours	19.0,	24.1,	26.7,	30.3,	32.7,	34.5,	40.1,	46.1,	49.9,	55.0,	59.4,	62.7,	64.9,
12 hours	21.3,	26.9,	29.7,	33.7,	36.3,	38.2,	44.3,	50.7,	54.8,	60.3,	64.9,	68.5,	70.8,
18 hours	25.1,	31.4,	34.6,	39.1,	41.9,	44.1,	50.9,	58.0,	62.5,	68.5,	73.7,	77.5,	80.1,
24 hours	28.1,	35.1,	38.5,	43.4,	46.5,	48.9,	56.1,	63.8,	68.6,	75.0,	80.5,	84.6,	87.4,
2 days	34.5,	42.2,	46.0,	51.3,	54.7,	57.2,	65.0,	73.2,	78.2,	84.9,	90.6,	94.9,	97.7,
3 days	40.1,	48.6,	52.7,	58.5,	62.1,	64.8,	73.2,	81.8,	87.2,	94.3,	100.3,	104.8,	107.7,
4 days	45.2,	54.4,	58.9,	65.0,	68.9,	71.9,	80.7,	89.9,	95.5,	103.0,	109.3,	114.0,	117.1,
6 days	54.7,	65.2,	70.2,	77.1,	81.5,	84.8,	94.6,	104.7,	110.9,	119.1,	126.0,	131.0,	134.4,
8 days	63.6,	75.2,	80.7,	88.3,	93.1,	96.7,	107.4,	118.4,	125.1,	133.9,	141.3,	146.7,	150.3,
10 days	72.0,	84.7,	90.7,	98.9,	104.1,	107.9,	119.5,	131.3,	138.4,	147.9,	155.7,	161.5,	165.3,
12 days	80.1,	93.8,	100.2,	109.1,	114.6,	118.7,	131.1,	143.6,	151.2,	161.2,	169.5,	175.6,	179.6,
16 days	95.8,	111.3,	118.6,	128.5,	134.8,	139.3,	153.1,	167.0,	175.5,	186.5,	195.7,	202.4,	206.8,
20 days	110.9,	128.1,	136.2,	147.2,	154.0,	159.1,	174.2,	189.4,	198.6,	210.6,	220.5,	227.8,	232.6,
25 days	129.4,	148.6,	157.6,	169.8,	177.3,	182.9,	199.6,	216.3,	226.3,	239.5,	250.3,	258.3,	263.4,

NOTES:

These values are derived from a Depth Duration Frequency (DDF) Model update 2023

For details refer to:

'Mateus C., and Coonan, B. 2023. Estimation of point rainfall frequencies in Ireland. Technical Note No. 68. Met Eireann',

Available for download at:

<http://hdl.handle.net/2262/102417>

Appendix D MICRODRAINAGE SIMULATION RESULTS

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes GSDS Manhole Sizes IW Foul

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	5	PIMP (%)	100
M5-60 (mm)	15.800	Add Flow / Climate Change (%)	20
Ratio R	0.276	Minimum Backdrop Height (m)	0.200
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	0.032	4-8	0.005

Total Area Contributing (ha) = 0.038

Total Pipe Volume (m³) = 1.998

Network Design Table for Storm

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
1.000	5.757	0.029	200.0	0.010	4.00	0.0	0.600	o	225	Pipe/Conduit	
1.001	12.175	0.061	200.0	0.004	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.002	17.246	0.086	200.0	0.011	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.003	15.064	0.075	200.0	0.013	0.00	0.0	0.600	o	225	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)
1.000	50.00	4.10	90.825	0.010	0.0	0.0	0.3	0.92	36.6	1.6
1.001	50.00	4.32	90.796	0.013	0.0	0.0	0.4	0.92	36.6	2.2
1.002	50.00	4.64	90.735	0.025	0.0	0.0	0.7	0.92	36.6	4.0
1.003	50.00	4.91	90.649	0.038	0.0	0.0	1.0	0.92	36.6	6.2

Block 10-3
 Blanchardstown Corporate Park
 Dublin 15



Date 10/04/2024 11:59
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 Checked by

Micro Drainage Network 2018.1.1

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
Soakaway	91.800	0.975	Open Manhole	1200	1.000	90.825	225				
AC 1	91.800	1.004	Open Manhole	1200	1.001	90.796	225	1.000	90.796	225	
Ac 2	91.800	1.065	Open Manhole	1200	1.002	90.735	225	1.001	90.735	225	
Ac 3	91.800	1.151	Open Manhole	1200	1.003	90.649	225	1.002	90.649	225	
	91.640	1.066	Open Manhole	0		OUTFALL		1.003	90.574	225	

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)
1.000	o	225	Soakaway	91.800	90.825	0.750	Open Manhole	1200
1.001	o	225	Ac 1	91.800	90.796	0.779	Open Manhole	1200
1.002	o	225	Ac 2	91.800	90.735	0.840	Open Manhole	1200
1.003	o	225	Ac 3	91.800	90.649	0.926	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)
1.000	5.757	200.0	AC 1	91.800	90.796	0.779	Open Manhole	1200
1.001	12.175	200.0	Ac 2	91.800	90.735	0.840	Open Manhole	1200
1.002	17.246	200.0	Ac 3	91.800	90.649	0.926	Open Manhole	1200
1.003	15.064	200.0		91.640	90.574	0.841	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	0.008	0.008	0.008
	User	-	100	0.002	0.002	0.010
1.001	User	-	60	0.006	0.004	0.004
1.002	User	-	100	0.010	0.010	0.010
	User	-	60	0.002	0.001	0.011
1.003	User	-	100	0.012	0.012	0.012
	User	-	60	0.002	0.001	0.013
				Total	Total	Total
				0.042	0.038	0.038

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)
1.003		91.640	90.574	89.925	0	0


Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	20.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	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 Storage Structures 2
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	5	Cv (Summer)	0.750
Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	15.800	Storm Duration (mins)	30
Ratio R	0.276		

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Micro Drainage	Network 2018.1.1	

Online Controls for Storm


Hydro-Brake® Optimum Manhole: Ac 3, DS/PN: 1.003, Volume (m³): 1.9

Unit Reference	MD-SHE-0067-2000-1000-2000
Design Head (m)	1.000
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	67
Invert Level (m)	90.649
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	2.0
Flush-Flo™	0.296	1.9
Kick-Flo®	0.599	1.6
Mean Flow over Head Range	-	1.7

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)
0.100	1.6	1.200	2.2	3.000	3.3	7.000	4.9
0.200	1.9	1.400	2.3	3.500	3.5	7.500	5.1
0.300	1.9	1.600	2.5	4.000	3.8	8.000	5.2
0.400	1.9	1.800	2.6	4.500	4.0	8.500	5.4
0.500	1.8	2.000	2.7	5.000	4.2	9.000	5.5
0.600	1.6	2.200	2.9	5.500	4.4	9.500	5.7
0.800	1.8	2.400	3.0	6.000	4.6		
1.000	2.0	2.600	3.1	6.500	4.7		

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Micro Drainage	Network 2018.1.1	

Storage Structures for Storm

House Soakaway Manhole: Soakaway, DS/PN: 1.000

Infiltration Coefficient Base (m/hr)	0.15700	Pit Width (m)	5.000
Infiltration Coefficient Side (m/hr)	0.15700	Number Required	1
Safety Factor	2.0	Cap Volume Depth (m)	0.600
Porosity	0.30	Cap Infiltration Depth (m)	0.400
Invert Level (m)	90.825		

Filter Drain Manhole: Ac 2, DS/PN: 1.002

Infiltration Coefficient Base (m/hr)	0.15700	Pipe Diameter (m)	0.200
Infiltration Coefficient Side (m/hr)	0.15700	Pipe Depth above Invert (m)	0.300
Safety Factor	2.0	Number of Pipes	1
Porosity	0.30	Slope (1:X)	200.0
Invert Level (m)	90.735	Cap Volume Depth (m)	0.800
Trench Width (m)	0.2	Cap Infiltration Depth (m)	0.400
Trench Length (m)	11.7		

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

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	20.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coefficient	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 Storage Structures	2
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.276
Region	Scotland and Ireland	Cv (Summer)	0.750
M5-60 (mm)	15.800	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	OFF
Inertia Status	OFF

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, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	Soakaway	30 Winter	100	+0%	100/30 Winter				91.101
1.001	AC 1	30 Winter	100	+0%	100/15 Winter				91.101
1.002	Ac 2	30 Winter	100	+0%	30/15 Winter				91.100
1.003	Ac 3	30 Winter	100	+0%	30/15 Summer				91.099

PN	US/MH Name	Surcharged		Flooded		Pipe		Level Exceeded
		Depth (m)	Volume (m³)	Flow / Cap. (l/s)	Overflow (l/s)	Flow (l/s)	Status	
1.000	Soakaway	0.051	0.000	0.04		1.1	SURCHARGED	
1.001	AC 1	0.079	0.000	0.04		1.4	SURCHARGED	
1.002	Ac 2	0.140	0.000	0.05		1.7	SURCHARGED	
1.003	Ac 3	0.225	0.000	0.06		1.9	SURCHARGED	

