Appendix 2. Project Description

2.1. Civil Engineering Report

BASELINE

AtkinsRéalis

Civil Engineering Planning Report

Bord Gáis Energy

12 May 2025

PEK3-ATR-ZZ-ZZ-RP-CE-300001

CASHLA PEAKER PLANT

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1. Introduction

1.1 Site Description

The greenfield site for the proposed Cashla Peaker Plant is approximately 11.54ha and is situated at Pollnagroagh and Rathmorrisy, Athenry. The site is situated approximately 14 kilometres east of Galway City and 2 kilometres west of Athenry. Covering an area of roughly 19.17 hectares, the wider project site lies between the northern and eastern arms of the M6/M18 interchange. Access to the Cashla Peaker Plant site will be provided through a newly proposed access road, measuring 1.15 kilometres in length, which will connect to the L3103. This connection point is located approximately 1 kilometre east of the M17 motorway.

1.2 Project Overview

The proposed development involves the construction of a gas-fired peaker plant, referred to as the Cashla Peaker Plant, and associated infrastructure. An overview of the proposed development is set out in Section 2.2. of this report.

1.3 Planning Application and Ancillary Infrastructure

The planning application for the open cycle gas turbine peaker power plant will be submitted as a Strategic Infrastructure Development (SID). It is important to note that the SID application covering the plant and access road will be separate from those relating to the cable route and substation.

1.4 Grid Connection and Infrastructure

A key feature of the site is the four-bay substation and 8.1km underground cable to Cashla Substation, constructed in accordance with EirGrid's 220kV standards to ensure compliance with national grid requirements. The substation will be supported by newly built access roads to facilitate movement within the site and connect the facility to the wider transport network. An ESB switchgear building will also be established as part of the plant's electrical infrastructure, contributing to the safe and reliable operation of the facility.

1.4.1 On-Site Infrastructure and Support Systems

To support the operation of the generator and turbine, the development will include dedicated fuel oil tanks and demineralised water tanks. A water treatment system will be installed to produce demineralised water required for plant operations. The site will also feature a steel stack, standing 30 metres high and 7 metres in diameter, designed for the safe discharge of exhaust gases from the turbine.

1.4.2 Ancillary Structures and Site Layout

Additional supporting structures will be constructed throughout the site, including pump houses, kiosks, internal roads, pipe racks and bridges, and an infiltration pond. The generator's support equipment will be housed in containerised units, allowing for straightforward installation and replacement as required.

1.4.3 Gas Supply Infrastructure

To the south of the site, a Gas Networks Ireland Above Ground Installation (GNI AGI) will be constructed. This facility will enable extraction of gas from the underground high-pressure transmission line passing through the site, ensuring a reliable fuel supply for the plant.

1.4.4 Operational Staffing and Control

The plant is designed for efficient operation, with a maximum of ten personnel required on-site at any one time. Remote control capabilities will be available, and a small security presence will be maintained as part of the operational plan.

1.4.5 Site Investigations and Environmental Considerations

Initial desktop studies have identified the site as being within a karst landscape, with early investigations revealing that bedrock is located close to the surface. There are no watercourses, streams, or culverts in the immediate vicinity of the site. Consequently, stormwater runoff will be managed by discharging to groundwater via infiltration in the proposed infiltration pond.

1.4.6 Wastewater Management

As the site is not served by a local foul sewer network, all wastewater streams must be collected and stored on-site before being transported off-site for appropriate treatment and disposal. These streams include domestic foul effluent, contaminated fire water runoff, chemicals from machine washdown, and rejection water from the demineralised water processing system.

2. Existing Site

2.1 Project Location

The greenfield site in Pollnagroagh and Rathmorrisy, Athenry is located approximately 14 kilometres east of Galway City and 2 kilometres west of Athenry. The project site with an area circa. 19.17 hectares (including the access road and cable route), is positioned between the northern and eastern arms of the M6/M18 interchange and stretches to Cashla Sub-Station. Access to the site will be provided via a newly proposed 1.15-kilometer-long access road connecting to the L3103, approximately 1 kilometre east of the M17 motorway. The location of the proposed site is presented in Figure 2-1.

Figure 2-1 - Project Location

Figure 2-2 - Site area components of the project redline boundary

The total site area is 19.17 ha. This is comprised of the main site area shown in red, the site access road shown in green, and the proposed HV cable route shown in blue. The proposed HV cable route (pink dashed line) is 8.1km to the site (Red area)

2.2 Overview of proposed Development

The following provides a summary description of the project assessed as part of the EIAR. The overall project is subject to two separate planning applications: one for the proposed Cashla Peaker Plant and one for the electricity transmission infrastructure. The project will function as a balancing asset, operating intermittently during periods of low renewable energy generation and high electricity demand. Notwithstanding the dual consenting approach, the developments constitute a single, integrated project, whereby the peaker plant will generate electricity for supply to the national grid. The submission of separate planning applications arises solely from planning legislation requirements, which necessitate distinct applications for Strategic Infrastructure Development.

Each application will seek a 10-year permission and detail on the relevant statutory development description is set out in the planning application form.

The proposed operational life is up to and including the 31st of December 2050, which is tied to Ireland's Climate Action Plan 2025.

The project site is approximately 19.17 hectares. This is broken down into the 'Cashla Peaker Plant Site' which is approximately 11.54 hectares and is located within the townlands of Pollnagroagh and Rathmorrissy, Athenry, Co. Galway. The balance, 7.63 hectares, relates to the grid connection and substation and is located across the townlands of Rathmorrissy, Pollnagroagh, Moanbaun, Castlelambert, Knocknacreeva, Caraunduff, Caherbriskaun, Lisheenkyle East, Barrettspark, Cashla, Athenry, Co. Galway. The grid connection route traverses approximately 8.1km including along the L7109, L71093, L7108 and L3103 roads.

The project comprises the following infrastructure:

a. The construction of an open-cycle gas turbine (OCGT) and generator with ancillary equipment including a 30m high stack and emissions monitoring unit, fuel storage and supply systems, cooling and air systems, compressed air and gas handling skids, a grid step-up transformer within a bund, an auxiliary transformer, a generator circuit breaker and an emergency diesel generator. The construction of ten buildings on-site including one single-storey administration building (approximately 390sqm), one-single storey ESB Substation building (approximately 32.5sqm), one single-storey workshop building (approximately 750.5sqm), one single storey water treatment plant building (approximately 104sqm), fuel forwarding and unloading area (approximately 104sqm), one single-storey electrical control building (approximately 243.5sqm), one single storey gas analyser kiosk (approximately 6.25sqm), one single-storey boiler house kiosk (approximately 37sqm), one single-storey ancillary pressure reduction kiosk (approximately 26sqm) and a single-storey electrical and instrumentation kiosk (approximately 19sqm). The installation of five above-ground tanks including two bunded fuel tanks (approximately 11.1m high), one fire and service water tank (approximately 13m high), one demineralised water tank (approximately 15.4m high) and one demineralised waste tank (approximately 5m high).

b. The construction of a Gas Networks Ireland (GNI) above ground pressure regulating installation, known as an Above Ground Installation (AGI). The AGI (named Rathmorrissy AGI) will connect to the mains transmission gas network which exists within the site. The AGI infrastructure will occupy an enclosed area of approximately 2,500 sq.m. It encompasses five single-storey buildings: the gas analyser kiosk (approximately 6.25 sqm), the boiler house kiosk (approximately 37 sqm) including 10 no boiler flues approximately 5.67 m above ground level and emergency generator, two pressure reduction kiosks – main (approximately 72 sqm) including approximately 5.24 m high vents, and ancillary (approximately 21.7 sqm) including approximately 3.72 high vents – and the electrical and instrumentation kiosk (approximately 19 sqm). Ancillary infrastructure will include a gas meter, filters, heat exchangers, and above-ground pipework. The compound will include lighting,3 no. parking spaces, internal access routes, concrete bases to support the infrastructure, and stone-chipped surfacing. It will be secured by an approximately 2.4 m high fence with an access gate.

   It is noted that the connection to the existing mains gas network (Mayo–Galway pipeline (BGE/85)) will be undertaken via a new transmission pipeline (named GNI146). The GNI146 gas pipeline is subject to Section 39A Consent under the Gas Act 1976, as amended.

c. Ancillary works including the provision of a new gated vehicular entrance off the L3103, the construction of an access road from the proposed Cashla Peaker Plant Site entrance to the new entrance off the L3103, the demolition of one farm outbuilding (in ruin), construction of internal access roads, hardstanding, security fencing (2.4m high), CCTV and gates, provision of a wastewater treatment system and associated underground wastewater storage tanks, drainage (foul and storm), soakaway retention pond, propane tank, construction of underground firewater retention tanks, provision of parking (12 no. spaces including mobility and EV Parking) and laydown area, 20 no. cycle parking spaces, landscaping and all ancillary on-site development works.

d. The electricity transmission infrastructure comprises the construction of an ESB substation compound within the Cashla Peaker Plant site. The infrastructure will include a 4-bay 220 kV substation incorporating a single-storey Air-Insulated Switchgear (AIS) substation building (approximately 388sqm) and access road; a 36m high telecommunications mast; a shunt reactor, ancillary works including lighting, security fencing (2.4m high), internal tracks, and 4 no. carparking spaces. It also consists of the construction of approximately 8.1 kilometres of an underground grid connection route and laying of cable from the proposed ESB Substation in the Cashla Peaker Plant Site to the Cashla 220kV Substation. The construction methodology includes three horizontal directional drilling (HDD) operations beneath the M6 and M17 motorways to minimise surface disruption.

The Cashla Peaker Plant involves an activity that will require an Industrial Emission Licence from the Environmental Protection Agency (EPA). This ensures that the project meets all necessary environmental standards related to emissions and other factors impacting the surrounding area. This does not apply to the electricity transmission infrastructure.

Additionally, the Cashla Peaker Plant includes the establishment of a facility where safety measures under the Major Accident Directive (Seveso) will apply. These regulations are designed to prevent and limit the consequences of potential industrial accidents, ensuring the project is both safe and compliant with industry best practices. This does not apply to the electricity transmission infrastructure.

2.3 Wayleaves

A desktop search of land direct revealed no existing registered wayleaves in the proposed site. Refer to Figure 2-3.

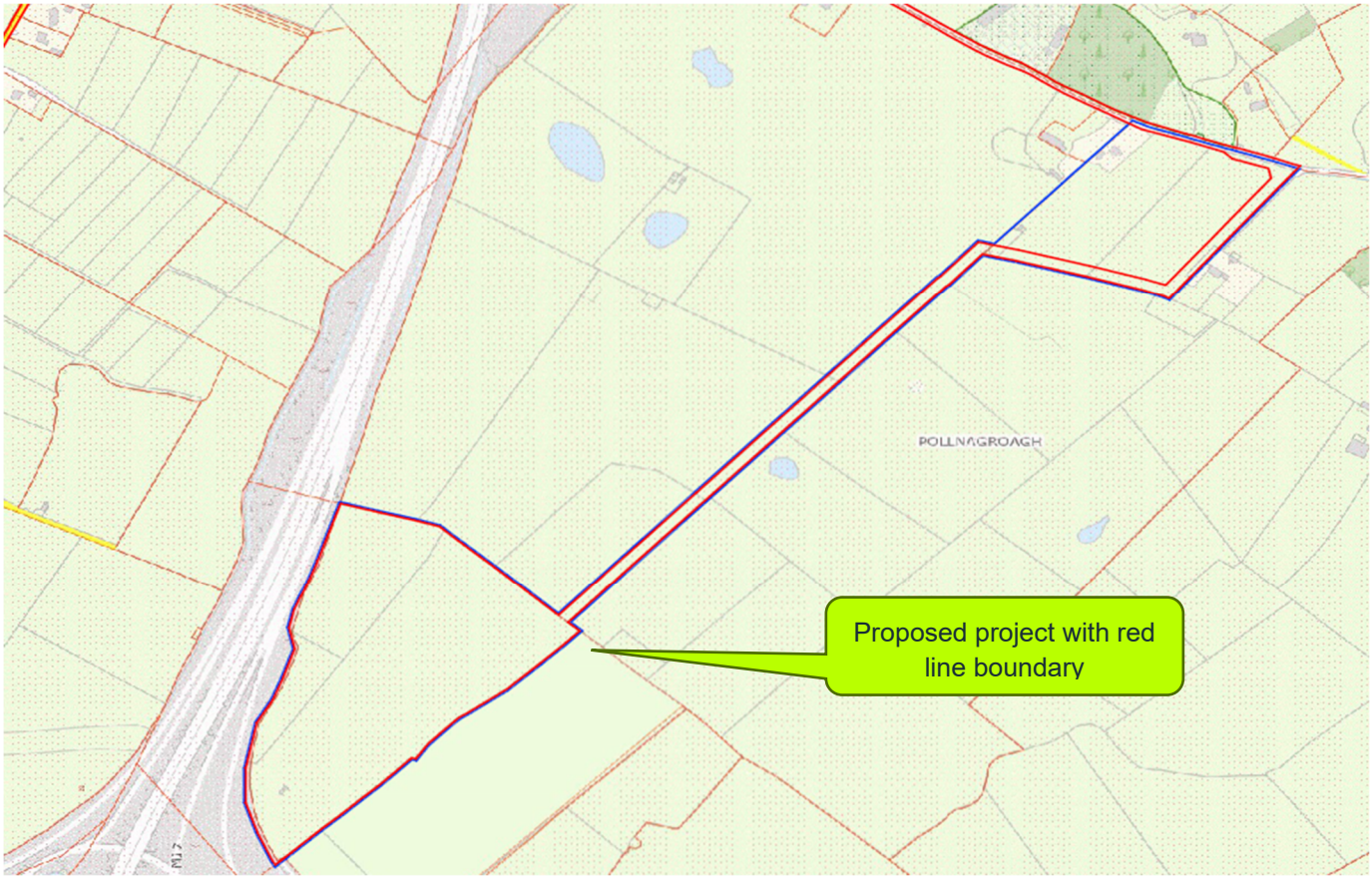


Figure 2-3 - Screenshot from Land Direct showing existing registered wayleaves.

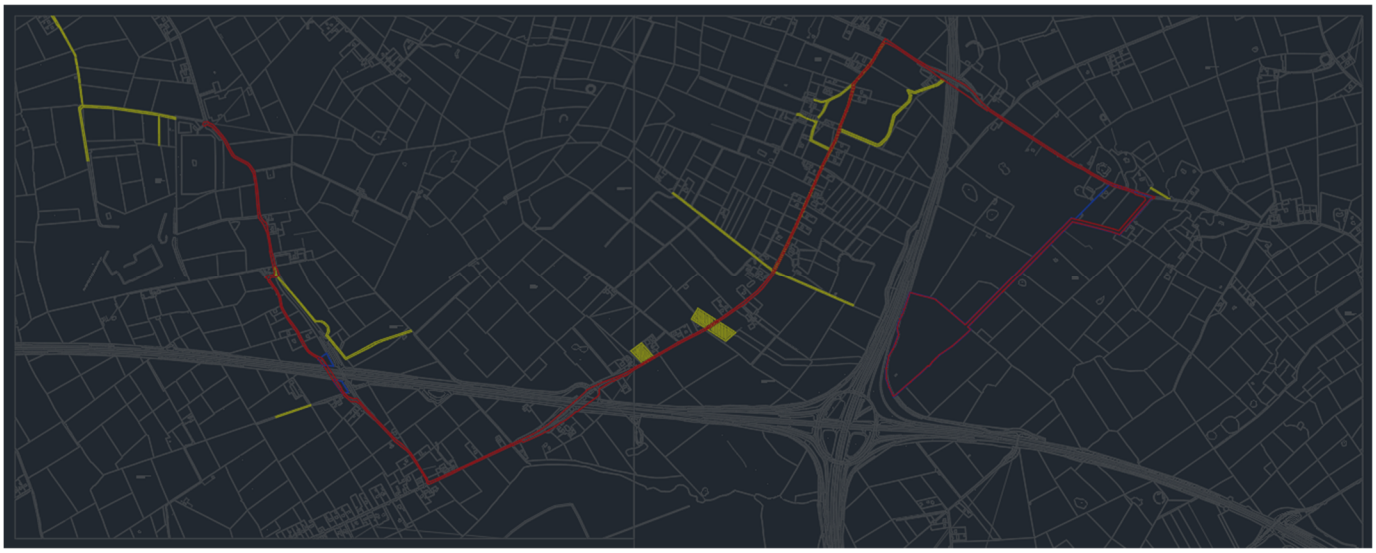


Figure 2-4 - Screenshot of all Land Direct wayleaves along proposed HV Cable Route

2.4 Topography

The topography of the site is undulating with a general low point of around 51.8 to the northeast of the site. The site rises as it heads south with an isolated high point to the southwest off 58.5 and general levels to the south of the site of around 57.0m AoD.

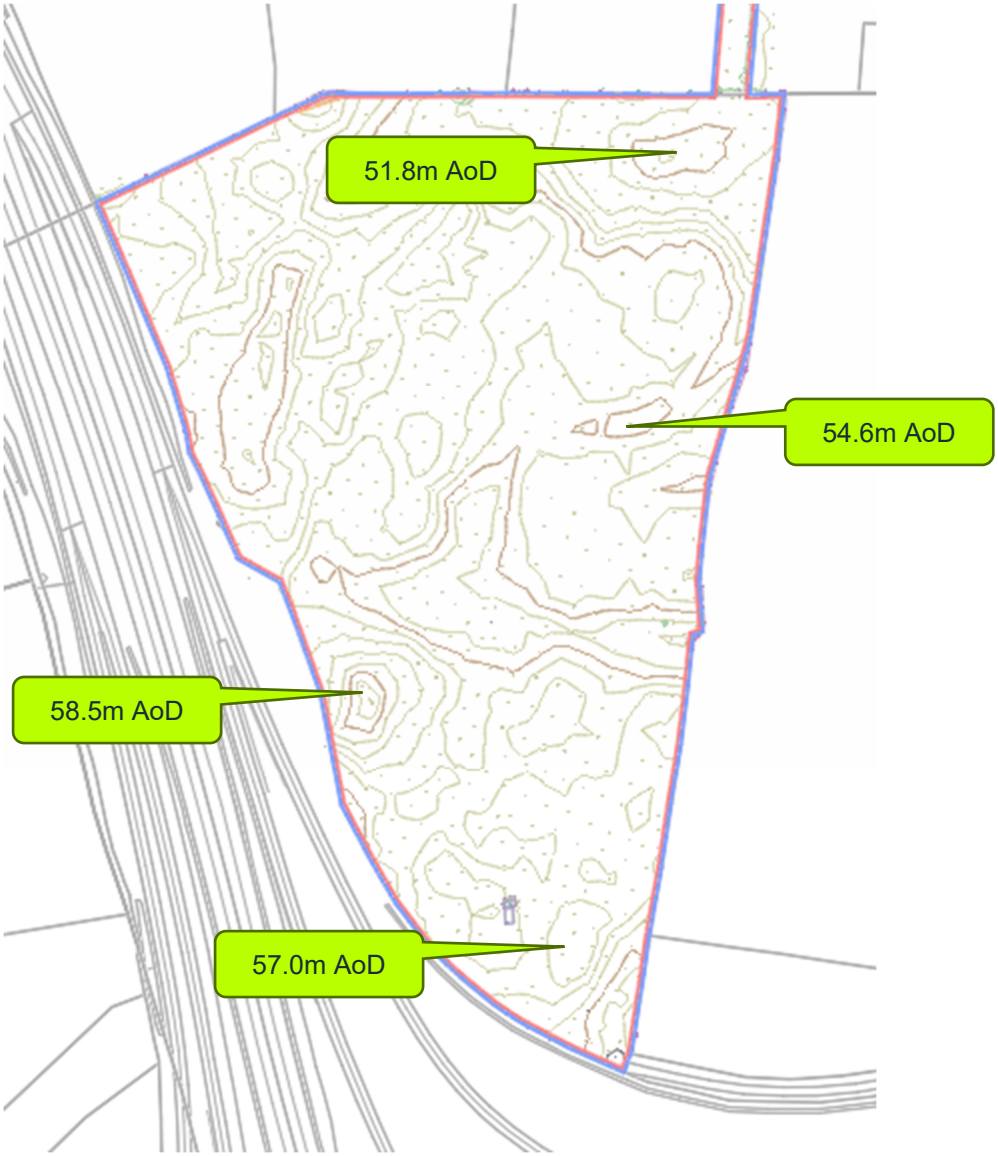


Figure 2-5 - Topographic survey of main site area

3. Exiting local infrastructure

A review of local infrastructure was undertaken through a desktop study. Record maps were obtained from the local authority, Uisce Éireann, ESB, telecommunications providers, and Bord Gáis Energy, and are included in Appendix A Utility Record Maps. Additional requests were made to Virgin Media and eNet; while no networks from these providers are present within the project boundary, some eNet networks are located along or near the route designated for Extraordinary Abnormal Loads.

3.1.1 Existing Gas Networks

3.1.1.1 Transmission Line

There is a 650mm diameter high pressure gas transmission main which runs south to north through the existing site. The location of the transmission line is presented in the obtained utility records in Appendix A.

3.1.1.2 Gas Wayleave and GNI consultation distances

There are wayleave distances associated with the gas transmission line that need to be observed for varying types of activity, a synopsis of these distances is shown in Table 3-1.

Activity	Distance within which GNI shall be consulted
Any excavation actions	10m
Piling	15m
Surface mineral extraction	100m
Land filling	100m
Demolition	150m
Blasting	400m
Wind farm	2 times the turbine mast height from the nearest edge of a transmission pipeline
Trenchless techniques	10m
Pressure testing	8m

Table 3-1 - Excerpt from GNI COP 'Working in the vicinity of the transmission network'.

3.1.2 Existing ESB Network

Existing ESB utility maps are included in Appendix A.

4. Proposed Infrastructure

4.1 Foul sewer

The onsite foul sewer has been designed and will be constructed in accordance with Uisce Éireann standards. It is proposed to install a small foul sewer network which will be partly gravity fed and partly pumped. The pumped section of the sewer will be to lift the effluent from the administration building to the proposed waste water treatment plant (WWTP). The proposed WWTP will be designed and installed in accordance with the current EPA Code of Practice Domestic Waste Water Treatment Systems. The foul sewer network will include a small package pump station. The rising main is approximately 35m in length and will discharge to a Uisce Éireann standard decompression manhole before discharging to the proposed WWTP.

The proposed peaker plant is proposed to be remotely controlled where possible and as such the staff on site will generally be 2-3 maintenance staff or security with an expected maximum population of 10 persons at any one time.

As such the proposed WWTP will be a package domestic plant such as a 10 Person ONE2CLEAN Wastewater Treatment System by Graf G50006 (or similar). This will discharge to underground storage tanks which will be emptied by tanker as required and taken to a muinicipal WWTP for disposal by a licensed contractor. The onsite WWTP is to prevent septicity occurring in the storage tanks between collection times.

The storage tanks will be sized as follows:

Maximum population on site = 10 persons.

Uisce Éireann allows 100 litres/person/day for onsite canteen

Storage for 7 days = 7 x 10 x 100 = 7000 litres.

As such it is proposed to install a 10cu.m underground GRP cesspool tank surrounded in concrete to contain the waste.

4.1.1 Foul sewer design parameters

Sl. No.	Particulars	Value
1.	Frequency of use (Kdu)	0
2.	Flow per dwelling per day (l/s)	0
3.	Domestic flow (l/s/ha)	0
4.	Industrial flow (l/s/ha)	0
5.	Additional flow (%)	0
6.	Minimum Velocity	0.75 m/s for pipes less than 300mm diameter 0.77 m/s for pipes 375mm and 450mm diameter

		(Page number 46, Wastewater-Code-of-Practice)
7.	Maximum Velocity	2.50 m/s (Page number 46, Wastewater-Code-of-Practice)
8.	Minimum Pipe Diameter	150 mm (Clause 3.8 and Table: Sewer Size/Gradient for Multiple Properties, page number 45, Wastewater-Code-of-Practice)
9.	Minimum cover depth of pipe	Areas without any possibility of vehicular access - depth not less than 0.5 m Driveways, footways, parking areas and yards with height restrictions to prevent entry by vehicles with a gross vehicle weight in excess of 7.5 tonnes - depth not less than 0.75 m Agricultural land and public open space - depth not less than 0.9 m Other roadways, highways and parking areas with unrestricted access to vehicles with a gross vehicle weight in excess of 7.5 tonnes – depth not less than 1.2 m. (Clause 3.9, Wastewater-Code-of-Practice)
10.	Chamber Diameter	1200mm diameter chamber for pipes less than 375mm diameter 1350mm diameter chamber for pipes of 375mm to 450 mm diameter (Clause 3.12.2, page number 56, Wastewater-Code-of-Practice)
11.	Maximum distance between chambers	90m for pipes of 225mm diameter and above 75m for pipes of 150mm diameter (Clause 3.3.5.8. Wastewater-Code-of-Practice)
12.	Flow rates	100 l/day (Appendix C, Wastewater-Code-of-Practice) Considering 10 person/day on site, total flow is 10x100 = 1000 l/day= 0.0116 l/s In the model, a minimum value of 0.1 l/s is required. So the same is considered at each outlet

13.	Septic tank	Tank is assumed to be emptied once a week. So, it's capacity is 10X100X7 = 7000 cubic meter. Considering any delay in empty, a volume of 10000 cubic meter is considered
14.	Minimum rising main pipe diameter	The minimum size for a Rising Main should not be less than 80mm internal diameter. Rising Mains less than 80mm will only be considered with the use of appropriately sized/type pumps. (Clause 3.8, Wastewater-Code-of-Practice)
15.	Velocity range of rising main	0.75 m/s to 1.8 m/s (Clause 3.2, Wastewater-Code-of-Practice)
16.	Pump	The flow rate is 1.8 l/s (6X0.3) as per clause 5.8 and 5.9.7, Wastewater-Code-of-Practice

Table 4-1 - Foul Sewer design parameters

The foul sewer design calculations are presented in Appendix D and the reader should refer to the engineering planning pack for the foul sewer layout drawings.

4.2 Storm Sewer

It is proposed to provide the site with a new storm sewer network which will include SuDS measures where practicable. There are no storm sewers or culverts in the immediate surroundings and as such it is proposed to discharge stormwater generated by the development by infiltration to ground.

The new network will be segregated into different sections to facilitate contaminated fire water collection and flow by gravity. The segregated areas will be controlled by actuator valves to control the flow path of these areas. The reader is referred to the submitted storm drainage drawings.

The site will require an IE License from the EPA and as such is limited in its discharge of stormwater to ground due to the possibility of contaminated firewater in the discharge. The proposed SuDS measures to be included are:

- Filter drains (external to the site)
- Infiltration pond with hydrocarbon interceptor.
- Sealed permeable paving (car parking areas)

The storm runoff will be collected through a series of gullies, linear drains and filter drains and will ultimately discharge to the infiltration pond to the north of the site via a class 1 full retention hydrocarbon separator. A BRE365 infiltration test has been carried out and is presented in Appendix F. The results of this test are the basis of design for the infiltration pond. The pond has been sized for the 100 year storm event + 20% climate change. A section through the pond including levels is include in the drainage drawings submitted as part of the planning drawings.

The storm drainage network has been designed with the following design criteria:

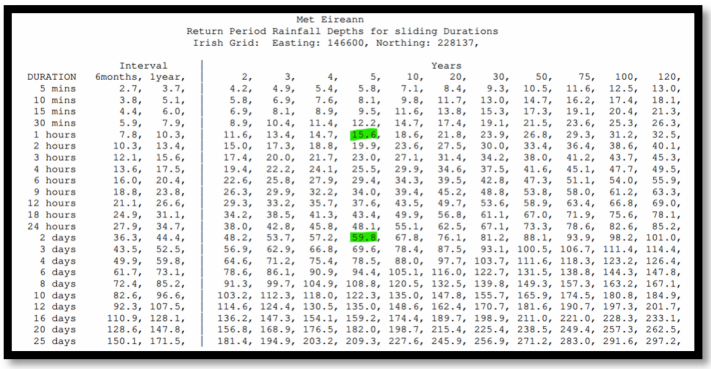
For collection and conveyance systems, the following storm events are to be considered with the associated surcharge requirements:

● 1 in 5 year + 20% climate change – Surcharge of the drainage system is allowed

● 1 in 30 year + 20% climate change – No flooding of the drainage system. For Swales this means 150 mm of freeboard should be achieved.

● 1 in 100 year + 20% climate change - Some short-term flooding managed such that it does not enter buildings or disrupt emergency access routes.

4.2.1 Design Parameters

Sl. No.	Particulars	Value
1.	Rainfall Method	Flood Studies Report (FSR)
2.	Return period	5 years
3.	M5-60	15.6 mm (Easting=146600, Northing=228137)
4.	Ratio R	0.26 (15.6/59.8) 
5.	Global time of entry	5 mins
6.	Maximum rainfall	250 mm/hr
7.	Minimum Velocity	1.00 m/s (Clause 6.5.1 Table 6.4, GDSDS-new-development)
8.	Maximum Velocity	3.00 m/s
9.	Minimum Pipe Diameter	225 mm (Clause 11.4, GDSDS-code-of-practice-for-drainage-works)
10.	Pipe diameter	225 mm, 300 mm, 375 mm, 450 mm, 525 mm, 600 mm
11.	Minimum cover depth of pipe	0.6m in fields and open spaces 0.9m below lightly trafficekd areas 1.2m (If that cannot be achieved, the pipes shall be fully surrounded in 150mm thick concrete with an absolute

Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 146600, Northing: 228137,

DURATION	Interval 6months	Interval 1year	Years 2	3	4	5	10	20	30	50	75	100	120
5 mins	2.7	3.7	4.2	4.9	5.4	5.8	7.1	8.4	9.3	10.5	11.6	12.5	13.0
10 mins	3.8	5.1	5.8	6.9	7.6	8.1	9.8	11.7	13.0	14.7	16.2	17.4	18.1
15 mins	4.4	6.0	6.9	8.1	8.9	9.5	11.6	13.8	15.3	17.3	19.1	20.4	21.3
30 mins	5.9	7.9	8.9	10.4	11.4	12.2	14.7	17.4	19.1	21.5	23.6	25.3	26.3
1 hours	7.8	10.3	11.6	13.4	14.7	15.6	18.6	21.8	23.9	26.8	29.3	31.2	32.5
2 hours	10.3	13.4	15.0	17.3	18.8	19.9	23.6	27.5	30.0	33.4	36.4	38.6	40.1
3 hours	12.1	15.6	17.4	20.0	21.7	23.0	27.1	31.4	34.2	38.0	41.2	43.7	45.3
4 hours	13.6	17.5	19.4	22.2	24.1	25.5	29.9	34.6	37.5	41.6	45.1	47.7	49.5
6 hours	16.0	20.4	22.6	25.8	27.9	29.4	34.3	39.5	42.8	47.3	51.1	54.0	55.9
9 hours	18.8	23.8	26.3	29.9	32.2	34.0	39.4	45.2	48.8	53.8	58.0	61.2	63.3
12 hours	21.1	26.6	29.3	33.2	35.7	37.6	43.5	49.7	53.6	58.9	63.4	66.8	69.0
18 hours	24.9	31.1	34.2	38.5	41.3	43.4	49.9	56.8	61.1	67.0	71.9	75.6	78.1
24 hours	27.9	34.7	38.0	42.8	45.8	48.1	55.1	62.5	67.1	73.3	78.6	82.6	85.2
2 days	36.3	44.4	48.2	53.7	57.2	59.8	67.8	76.1	81.2	88.1	93.9	98.2	101.0
3 days	43.5	52.5	56.9	62.9	66.8	69.6	78.4	87.5	93.1	100.5	106.7	111.4	114.4
4 days	49.9	59.8	64.6	71.2	75.4	78.5	88.0	97.7	103.7	111.6	118.3	123.2	126.4
6 days	61.7	73.1	78.6	86.1	90.9	94.4	105.1	116.0	122.7	131.5	138.8	144.3	147.8
8 days	72.4	85.2	91.3	99.7	104.9	108.8	120.5	132.5	139.8	149.3	157.3	163.2	167.1
10 days	82.6	96.6	103.2	112.3	118.0	122.3	135.0	147.8	155.7	165.9	174.5	180.8	184.9
12 days	92.3	107.5	114.6	124.4	130.5	135.0	148.6	162.4	170.7	181.6	190.7	197.3	201.7
16 days	110.9	128.1	136.2	147.3	154.1	159.2	174.4	189.7	198.9	211.0	221.0	228.3	233.1
20 days	128.6	147.8	156.8	168.9	176.5	182.0	198.7	215.4	225.4	238.5	249.4	257.3	262.5
25 days	150.1	171.5	181.4	194.9	203.2	209.3	227.6	245.9	256.9	271.2	283.0	291.6	297.2

		minimum depth of cover of 750mm) (Clause 11.8.2, GDSDS-code-of-practice-for-drainage-works)
12.	Chamber Diameter	Technical Design Guidelines Part H – Table 9 Type J – 1200mm (Depth of pipe is over 1.5m)
13.	Colebrook white pipe roughness coefficients for carrier drains	Ks=0.600 (Clause 6.5.1 Table 6.4, GDSDS-new-development)
14.	Colebrook white pipe roughness coefficients for filter drains	1.500
15.	Manning's 'n' for ditch and swale (If applicable)	0.045 to 0.050
16.	Minimum design gradient for ditch and swale	0.2% (1/500) to ensure flow conveyance in flat areas
17.	Minimum design gradient for pipes	1/500 (Such that the velocity is not less than 1.00 m/s)
18.	Maximum design gradient for pipes	Slope such that velocity of 3.0 m/s is not exceeded
19.	MADD factor	0 m3/ha
Percentage Runoff		
1.	Carriageways	1.00 (100% of impermeable area)
2.	Green fields and open spaces	0.15 (15% of impermeable area)
3.	Concrete	0.95 (95% of impermeable area)
4.	Gravel	0.30 (30% of impermeable area)
Soakaway		
1.	Drainage Stone Porosity	0.30
2.	Infiltration coefficient	0.2196 m/hr
3.	Infiltration depth	2.4m
4.	Porosity of the soakaway	0.95 (95%) (Modelled as Geocellular soakaway)

Table 4-2 - Storm Drainage Design Parameters

QBar calculations are not required as all storm water will be contained within the site and discharged to ground water. The storm sewer design calculations are presented in Appendix C

4.2.2 Temporary stormwater management

During construction, and until the permanent infiltration pond and hydrocarbon separators are operational, a temporary infiltration lagoon will be provided. The lagoon will be sized for the 1-in-10-year, 24-hour storm event and lined with permeable geotextile, filter aggregates, and sand to remove suspended solids before infiltration to groundwater. Surface water runoff generated during construction will be pumped to this lagoon for controlled infiltration.

4.3 Contaminated Firewater

Due to EPA licensing requirements, the site must collect all potentially contaminated firewater produced during a fire and store it for later disposal off-site by tankers. Typically these are high risk areas including buildings and generators/turbines etc. Roads with no buildings and grassed areas do not require to be included. The storage tanks must be sized to accommodate 2 hours of firefighting plus the runoff from a 10-year, 24-hour storm.

According to UK National guidance on water provision for firefighting, an industrial site exceeding 3 hectares should be capable of supplying 75 litres per second. Since Uisce Éireann cannot supply this volume, a static firefighting tank with a capacity of 540 cubic meters will be installed giving an allowance of 75 litres per second for 2 hours. This tank will also be combined with the service water tank with a final total volume of 1480 cu.m which includes the 540 cu.m.

To manage the contaminated firewater tank, which is also based on the 10-year, 24-hour storm runoff, it is proposed to divide the storm network into multiple individual areas. Each area will have a pH-controlled actuator valve. In the event of a fire, the firewater from the affected area will be diverted to the firewater tanks using these actuator valves, while any rainfall during the fire in other areas will continue to flow unimpeded to the soakaway pond northeast of the site. This division into separate areas helps reduce the size of the contaminated firewater storage tanks.

The maximum calculated runoff for the 10-year, 24-hour storm is 197 cubic meters, meaning the total storage tank size required will be 540 + 197 = 737 cubic meters. The contaminated firewater will be disposed of off-site by tanker to a suitable external wastewater treatment facility.

The tank will also dual use as a storage tank for rejected water during the production of demineralised water. As such the tank will have an additional 350 cu.m to store this rejected water making the total volume of the tank 1087 cu.m.

4.4 Demineralised water production wastewater

As part of the plant's turbine operation requirements, demineralised water is necessary. This water is injected into the turbine either for power augmentation when using gas or to reduce NOx gases when running on fuel oil. In both cases, the injected water vaporizes and exits the turbine through the stack.

To produce the demineralised water, an onsite treatment plant will convert potable water supplied by Uisce Éireann into demineralised water, which will be stored in a tank until needed. The process of creating and filling the tank with demineralised water takes several weeks.

The conversion process is expected to be approximately 75% efficient, meaning that 25% of the water used will be rejected as heavily mineralised waste water. This waste water will be stored in an above ground tank in the short term and moved to the underground contaminated firewater tank in the long term as required and removed off-site as required to a wastewater treatment plant for disposal by a licensed contractor.

4.5 Generator/Turbine solvent clean down disposal

Routine maintenance of the turbine involves cleaning the machine with solvents. These solvents are injected internally and drain down for collection beneath the machine. The collection system is closed and discharges all solvents to an underground tank, from where they are collected by tanker and disposed of off-site at a licensed facility capable of handling hydrocarbon waste. It is anticipated that this maintenance will occur several times a year, generating no more than 2 cubic meters of waste hydrocarbons each time.

4.6 Potable Water

It is proposed to supply the site with potable water via a new 150mm diameter water main which will come from Athenry (approx. 2km) and be installed by Uisce Éireann to the site entrance on the L3103 as outlined in the Confirmation of Feasibility. The water demand calculations are contained within the pre-connection enquiry to Uisce Éireann which is presented in Appendix E along with the Confirmation of Feasibility.

All new water mains will be designed and installed in accordance with Uisce Éireann Code of Practice and standard details.

The proposed watermain drawings are submitted as part of the S37E planning application.

A pre-connection enquiry has been submitted to Uisce Éireann for consideration and Confirmation of Feasibility received under reference number CDS25000940 (see appendix E of this report).

5. Roads and surfaces

The proposed roads within the peaker plant itself are proposed to be kerbed asphalt roads. It is proposed that the standard buildup will be (Roads outside the plant will be unkerbed):

- 40mm SMA surf (IS EM 13108-5)
- 60mm AC 20 Dense Bin (IS EN 13108-1)
- 120mm AC 32 Dense Base (IS EN 13108-1)
- 150mm Type B Granular Material
- 600mm Type 6F2 Capping

The concrete paved areas surrounding the generator are proposed to be:

- 300mm C32/40 concrete (Suitable exposure class) A393 mesh T&B
- 150 Type B Granular Material
- 600mm Type 6F2 capping

Concrete Areas in the tank farm are to be

- 200mm C32/40 concrete (Suitable exposure class) A393 mesh T&B
- 150 Type B granular material
- 600mm Type 6F2 capping

Gravel areas are to be gravel topping on soil lined with impermeable membrane underneath with a series of land drains to collect infiltrated runoff and discharge to soakaway via petrol interceptor.

- 100mm pea gravel/shingle
- Separation membrane
- 300mm soil with 100mm perforate land drain @ 5m c/c
- Impermeable membrane

Footpaths

- 100mm concrete
- 150mm type B granular material

5.1 Parking

A review of the Galway County Development Plan was undertaken to assess parking requirements for the proposed development. While the Plan does not specify a parking rate for developments of this particular type, it does provide guidance for industrial, manufacturing, and light industrial uses. According to Table 15.5 under Development Management Standard 31, the requirement is 1 parking space per 33 m² of floor area. Based on an estimated total floor area of approximately 2,053 m², this would equate to a requirement of 62 parking spaces.

The proposed development is a power station, which is likely to be classified as industrial. However, the facility is designed to operate remotely, with only a minimal on-site presence consisting primarily of security personnel. It is anticipated that no more than 10 individuals will be present on-site at any given time.

If the development were to be classified similarly to a data centre—based on its low occupancy—the parking requirement would be reduced to approximately 20.5 spaces. The current project includes provision for 19 parking bays, comprising 1 accessible bay, 4 EV charging bays, and 14 standard bays of which 4 will be provided as part of a substation subject of a future planning application to An Coimisiún Pleanála, along with 20 bicycle stands.

Parking provision has been determined based on the expected operational characteristics of the site. While the facility will be remotely operated for the majority of its lifecycle, it will require parking for both security and maintenance personnel. Although the exact number of vehicles associated with these functions cannot be precisely determined, the site is expected to accommodate up to 2 security vehicles and 10 maintenance vehicles during peak activity.

6. Cut and fill

It is proposed to cut and fill the site as presented in Table 6-1. The cut and fill has been calculated on a comparison of the final grade levels compared to the initial grade levels from the topographic survey.

SURFACE LEVEL DATA				
NUMBER	MINIMUM LEVEL	MAXIMUM LEVEL	COLOUR	
1	-2.50	-2.00		CUT
2	-2.00	-1.50		
3	-1.50	-1.00		
4	-1.00	-0.50		
5	-0.50	0.00		
6	0.00	0.50		FILL
7	0.50	1.00		
8	1.00	1.50		

The maximum depth excavated in the overall cut and fill is 2.5m. This is the level cut down to in the rough site grading. There will be an initial topsoil strip of the site which is approximately 150mm deep over the entire site.

The deepest excavation on the site will be the storage tank for the contaminated firewater which will be excavated to a depth of 47.495m AoD.

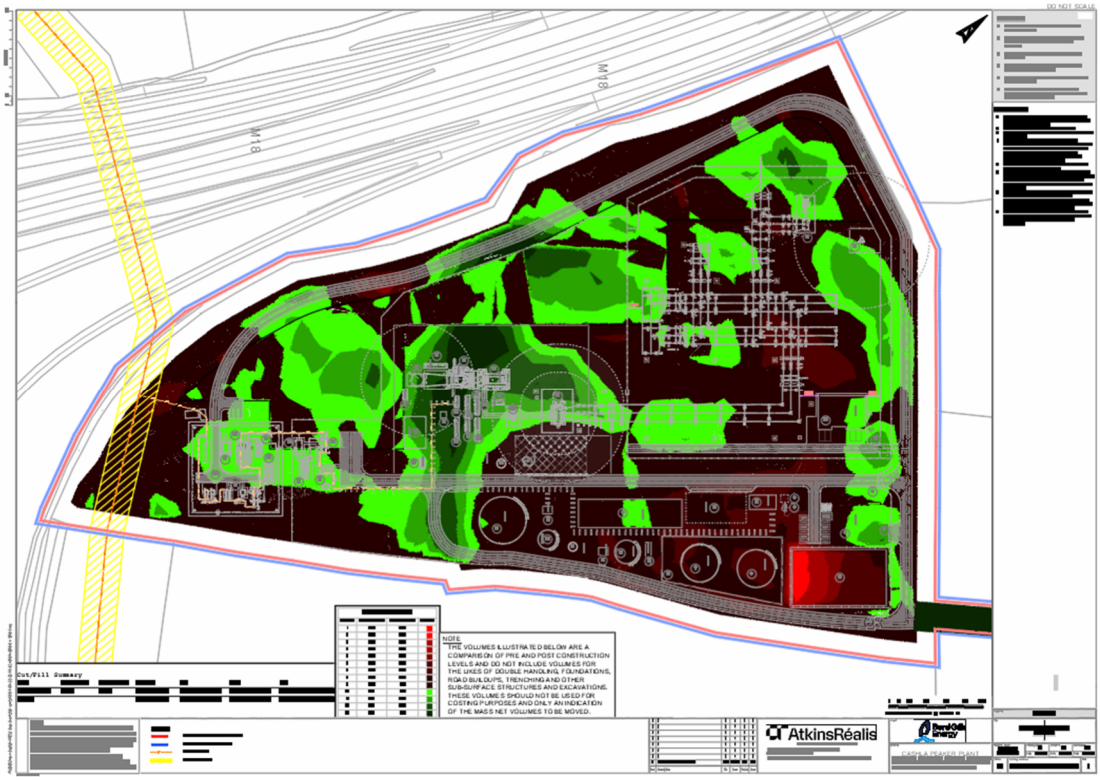


Table 6-1 - Cut and Fill Heat Map

	Cut (cu.m)	Fill (cu.m)	Net (cu.m)
Topsoil Strip	**10,698.00**	**0.00**	**10,698.00 (cut)**
Volume (c	**22,345.00**	**20533.00**	**1,812.00 (cut)**

Table 6-2 - Cut and Fill Volumes

In addition to this the following high level volumes should be considered and incorporated

Construction Item	Associated Volume (cu.m)
Roads imported materials	8,150
Concrete slabs imported materials	10,450
Building foundation imported materials	10,450
Gravel areas imported materials	5,217

Table 6-3 - Imported Materials

It is anticipated that ca. 13,000 m3 of excess subsoil (topsoil, native soil) will require offsite disposal. All such material will be removed and disposed of offsite to a suitably permitted / licenced waste recovery / disposal facility in accordance with relevant waste management legislation (including but not limited to the Waste Management Act of 1996 (as amended) and all subsequent waste management regulations as amended.

7. Traffic

The description of traffic and management of for the project is described in Chapter 10 of the EIAR as well as the Construction Traffic Management Plan. The reader is referred to those documents for a complete description.

8. Electrical

8.1 220kV Substation

The proposed project will involve construction of a 220 kV AIS 2-bay extendable to 4-bay substation compliant with EirGrid standards. As set out in Section 2.2 Project Description, the 220kV AIS substation and associated 220kV grid connection works will be subject of a S182B planning application to An Coimisiún Pleanála. Ownership of the substation will be transferred to EirGrid/ESB following construction. All substation works will be contained within the boundary of the proposed site.

The proposed substation will comprise:

- 1No. control building housing control and protection panels, telecoms, batteries, 1No. diesel generator and welfare facilities.
- 1No. telecommunications mast.
- 220 kV air insulated equipment including cables sealing ends, circuit breakers, disconnectors, surge arresters, current and voltage transformers, post insulators and associated busbars.
- 2.4m high palisade fencing and 1.4m high post & rail fencing, gates and access tracks, car-parking, lightning masts, lamp posts and CCTV.
- 1No. reactor

A customer owned compound connecting to the EirGrid/ESB owned substation via overhead busbars is also proposed consisting of:

- 1No. Electrical control building
- 1No. 220 kV power transformer with associated concrete bund and blast wall
- 1No. auxiliary transformer
- 220 kV air insulated equipment including circuit breakers, disconnectors, surge arresters, current and voltage transformers, post insulators and associated isolated phase busduct.
- Security fencing, gates and access tracks, lightning masts, lamp posts and CCTV.

8.2 Grid Connection

It is proposed to connect the 220 kV substation to the existing ESB 220kV Cashla substation via approximately 8.1km of underground cable (UGC). The grid connection, which will be subject to a future planning application to ACP, will comprise a single 220 kV circuit with three 200mm HDPE power cable ducts and two 125mm HDPE comms ducts installed in an open-cut trench, typically 700mm wide and 1425mm deep. The depth of the trench may vary depending on service crossings and the final design.

The majority of the Grid Connection is located within public roadways as shown in Figure 8-1, with precast cable joint bays and associated link box and comms chambers at approximately 760m to 900m intervals. There will be short sections of the UGC route located off-road for navigating into termination points at either end of the line.

The Grid Connection will also include trenchless installation in the form of horizontal directional drilling (HDD) at the proposed locations:

- Motorway (M17) crossing in townland of Castlelambert, converging onto road L3103
- Motorway (M6) crossing in townland of Caherbriskaun, converging onto road L-7108-28
- Motorway (M6) crossing in townland of Lisheenkyle East, converging onto road L7109

The UGC will also need to cross a Gas Networks Ireland (GNI) high pressure gas transmission pipeline along the L-7108-28. The crossing will be designed and built in accordance with GNI Code of Practice.

Figure 8-1 – Proposed Grid Connection UGC Route

A full set of drawings and documents relating to the cable route are included in the submission from TLI.

9. Mechanical

The Cashla Peaker Plant shall generate electricity for grid transmission using a single open cycle gas turbine and generator.

The turbine shall be equipped with an inlet air filtration system which will filter out any airborne particles. The inlet system shall also include noise silencers to minimize the noise from the turbine inlet. The turbine shall exhaust via an exhaust inline noise silencer to a vertical exhaust stack. The stack dimensions shall be sufficiently specified to ensure external air emissions shall remain within statutory air quality limits.

The turbine shall primarily combust natural gas fuel supplied from the national gas transmission network. The combustion process within the turbine shall control the polluting emissions to within the European 2010/75/EU Directive emission limits using a dry low NOx combustion process. Low sulphur diesel shall be used as a secondary fuel when the turbine is required to support the electrical grid and there is insufficient natural gas available. Low sulphur diesel combustion polluting emissions shall be controlled by a combination of a low NOx combustion system enhanced as required with demineralized water injection, and use of low sulphur fuel. Low sulphur diesel combustion emission limits shall be controlled within the European BREF Large Combustion Plant Best Available Techniques limits for fuels used for less than 500 hours per year.

The turbine and generator shall be supported by various auxiliary equipment for fuel supply, cooling, lubrication and cleaning purposes.

The fuel system includes a propane tank to supply propane gas for combustion ignition purposes when starting the turbine using low sulphur diesel.

9.1 Tank Farm

The plant is required to store a specified quantity of secondary fuel, in this case low sulphur diesel, to comply with the electrical transmission system's Grid Code. This fuel will be stored in two steel cylindrical fuel tanks contained within a sealed concrete bunded area to ensure any potential leakage is controlled and prevented from being released. The bund is sufficiently sized to accommodate 110% of each fuel tank volume and will be 2.5m high.

The combustion of low sulphur diesel requires injection of demineralised water into the turbine's combustion system to control emissions to the required levels. The volume of demineralised water stored is in direct relationship to the storage volume of low sulphur diesel.

A quantity of the water supplied to the site is stored as service water. The service water tank supplies all the water systems on site including the raw supply to the demineralised water system. It also serves as a break tank from the external potable water supply system. The service water volume is included in a combined fire and service water tank with a volume of 1480 cu.m.

9.2 Gas Fuel

Gas will be supplied from the high pressure national transmission pipeline system. The gas will be conditioned prior to supply to the gas turbine combustion control system. This conditioning will consist of filtration, heating, pressure control and removal of any liquid condensate. The system will also include a motor driven gas compressor in the event the supplied gas pressure falls below the minimum required for the gas turbine system.

9.3 Low sulphur diesel System

The low sulphur diesel system shall include motor driven pumps to offload the fuel oil from the supply tankers to the two storage tanks. The system shall also include motor driven pumps, filters and coalescer to supply the fuel to the gas turbine combustion system in a suitable condition.

9.4 Lubricating Oil

An auxiliary lubricating oil skid including a storage tank and associated pumps circulate lubricating oil to the gas turbine and generator.

9.5 Diesel Generator

An emergency diesel engine driven generator provides power to safely shut down the plant in the event the normal electrical transmission grid connection is not available. Other than routine start-up testing, the diesel generator shall rarely be operated.

9.6 Fire System

The fire system comprises a fire water tank, fire water distribution system with associated hydrants and spray nozzles, motor driven supply and jockey pumps and an emergency diesel driven pump.

9.7 Demineralised Water System

Demineralised water is primarily required for water injection into the turbine. The potable water supply to the site is required to be demineralised to avoid mineral deposits on the turbine combustion system and blading which would degrade their integrity. The potable water will be demineralised using a containerised water treatment system suitable for the chemical make-up of the water. This treatment system is expected to consist of either a reverse osmosis system or ion exchange system.

The demineralised water system will include motor driven pumps to pump the water through the water treatment system and to and from the demineralised water storage tank.

10. Gas AGI

A gas AGI designed by Gas Networks Ireland (GNI) is shown in the planning drawings. At this stage it is envisioned that the access to the AGI will be through the main site access to the north as illustrated in Figure 10-1. It is assumed that in general traffic to the AGI from the south will be light commercial vehicles such as vans. The AGI will be owned and operated by GNI and will not form part of the IED License for the Peaker Plant. Additional gas processing equipment is illustrated within the Peaker Plant north of the AGI to raise the temperature of the supplied gas to the temperature required by the turbine.

The GNI146 Rathmorrissy gas pipeline does not form part of the proposed development subject of the SID planning application but will be subject to a Section 39A Consent under the Gas Act 1976, as amended.

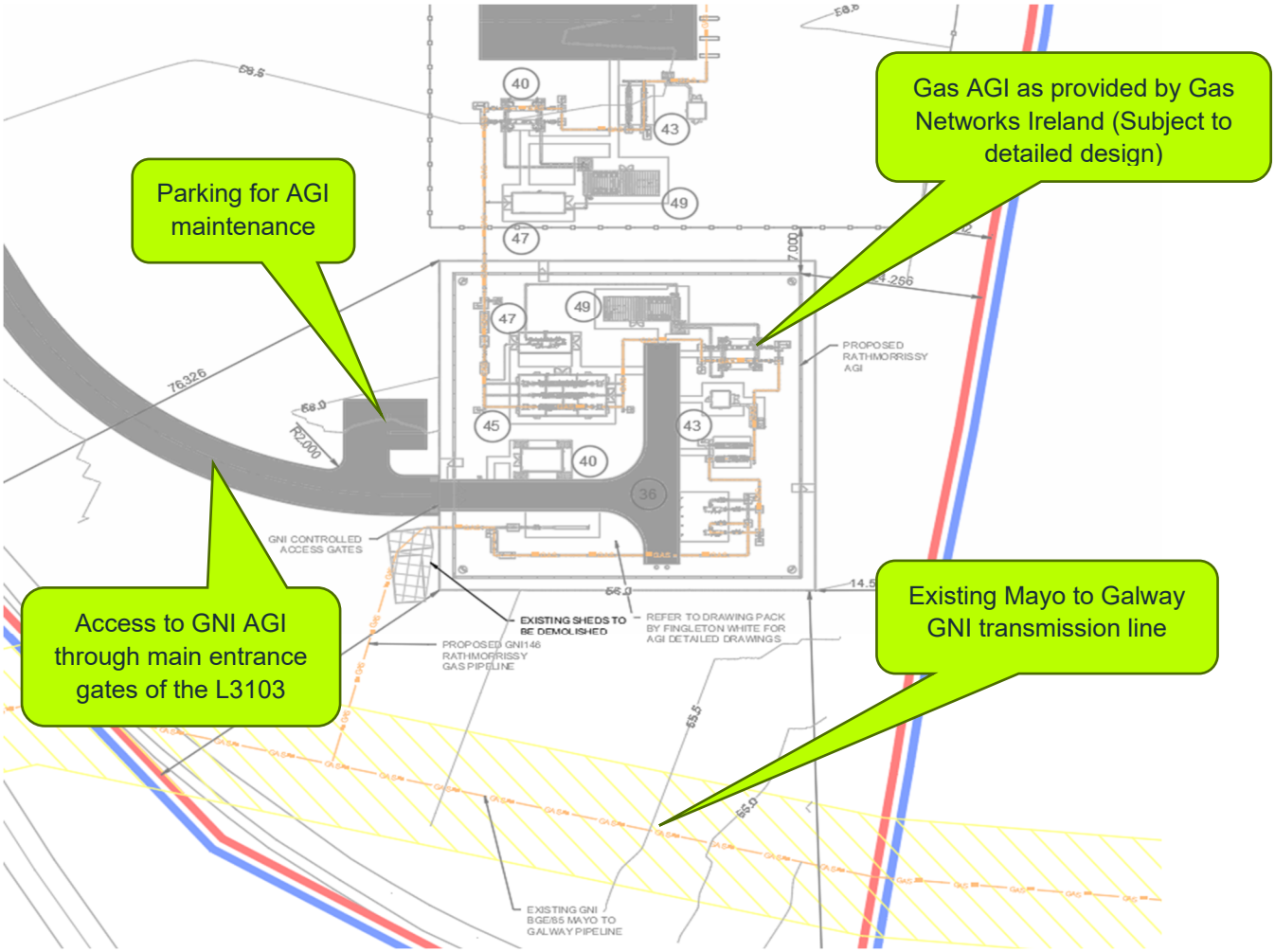


Figure 10-1 - Snip from drawing DR-CE-900031 showing access to gas AGI

The gas AGI will contain storm drainage which will discharge to a local soak pit within the AGI. As part of the controls to protect groundwater a Class 1 bypass hydrocarbon separator will be fitted prior to discharge to ground.

Drawings are included in the drawing pack from Gas Networks Ireland submitted as part of the S37E planning application drawing pack. Details on the operation of the AGI are set out in Chapter 2 Project Description of the EIAR.

11. Abnormal Load

11.1 Abnormal Load - Introduction

This section outlines the transportation requirements and constraints associated with delivering major equipment components to the project site. Equipment will arrive either as large standalone units or as smaller assemblies integrated into pre-assembled, skid-mounted systems.

The primary large-scale components include:

- Gas turbine
- Electrical generator
- Grid transformer

It is anticipated that three abnormal load movements will be required, each exceeding 280 tonnes. These movements will be scheduled over several months to align with the delivery timelines of individual equipment packages.

The following assessments have been undertaken:

- Auto-tracking from port to site
- Topographical survey to identify geometric constraints
- Structural assessment of bridges and culverts along proposed routes
- Pavement capacity analysis

The following reports have been produced:

- Abnormal Load Assessment Report
- Haulage Routes Pavement Analysis – Technical Note

The conclusions of these reports are summarized in this section. The final haul route will be agreed prior to the delivery of extraordinary or abnormal loads, which may occur several months after on-site construction begins. Pre- and post-construction surveys of the public road network proposed for use as haul routes—including inspections of bridges, culverts, and other relevant structures—shall be carried out by the applicant before any phase involving abnormal load movements. These requirements do not apply to earlier phases without such movements. The scope and locations of these surveys shall be agreed in advance with Galway County Council Roads Authority and include structural capacity assessments where required.

11.2 Abnormal Load - Delivery Road map

Equipment will arrive either as large standalone components or as smaller units integrated into skid-mounted systems. To facilitate transportation, major components will be partially disassembled, with removable parts shipped separately to reduce size and weight.

Disassembly Details:

- **Gas Turbine:** Shipped without enclosure, external fuel piping, and auxiliary systems (e.g., compressor bleed valves, ventilation fans).
- **Electrical Generator:** External cooling systems and auxiliary connections removed.
- **Transformer:** Insulated bushings and external oil tank detached; oil drained and unit sealed with dry gas for transport.

Following disassembly, the heaviest single component weighs approximately 380 tonnes. Transport height is constrained by the lowest bridge clearance along the designated route. Three abnormal load movements are expected, each exceeding 280 tonnes, scheduled over several months.

11.3 Extraordinary Abnormal Load Details

11.3.1 Proposed Loads

There are three proposed Extraordinary Abnormal Loads (EAL's) to be delivered to the project site. These loads are detailed below:

Component	Weight (t)	Length (mm)	Width (mm)	Height (mm)
Turbine	360	12,000	5,500	5,020
Generator	380	14,000	4,250	4,850
Step up Transformer	288	11,300	4,730	4,750

Table 11-1 - Extraordinary Abnormal Loads (EAL's) to be delivered to site

11.3.2 Proposed delivery routes

Two initial routes were identified from Galway Port to the project site in Pollinagroagh, Athenry, Co. Galway (red and blue routes). Both share a common section (yellow). After assessment, the red route was discounted due to inadequate bridge capacity. The blue route is therefore the preferred option.

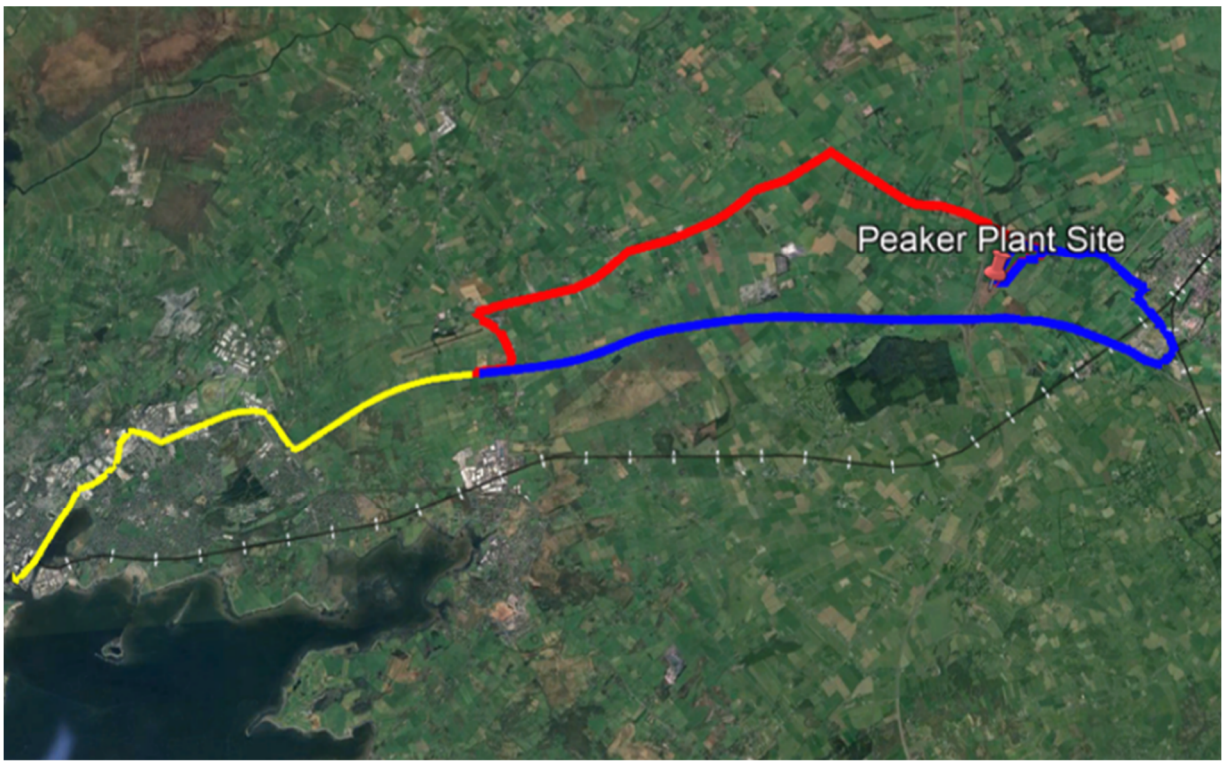


Figure 11-1 - Proposed delivery routes assessed (red route discounted)

11.3.3 Common yellow route

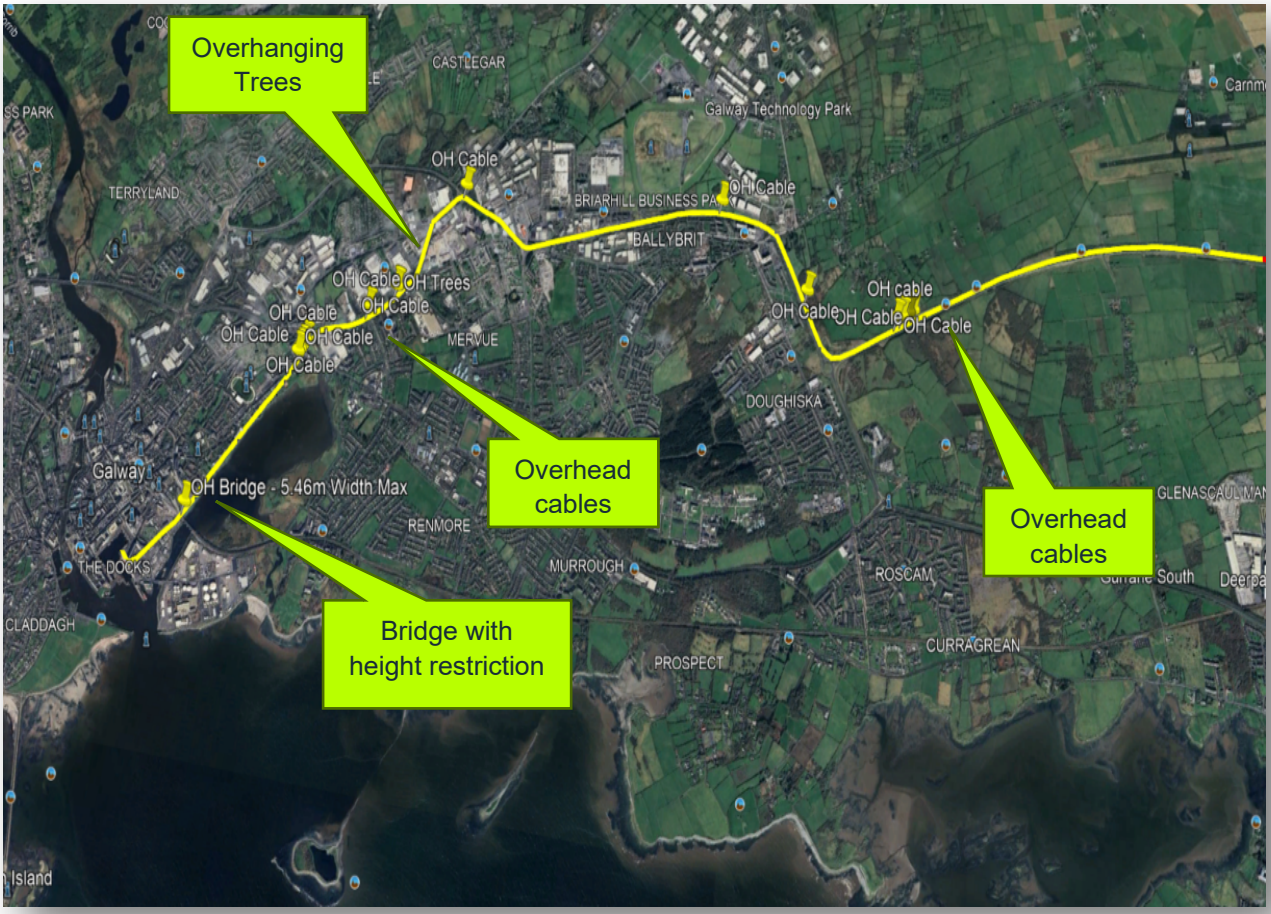


Figure 11-2 - Common route with restrictions identified

11.3.4 Red route with restrictions identified

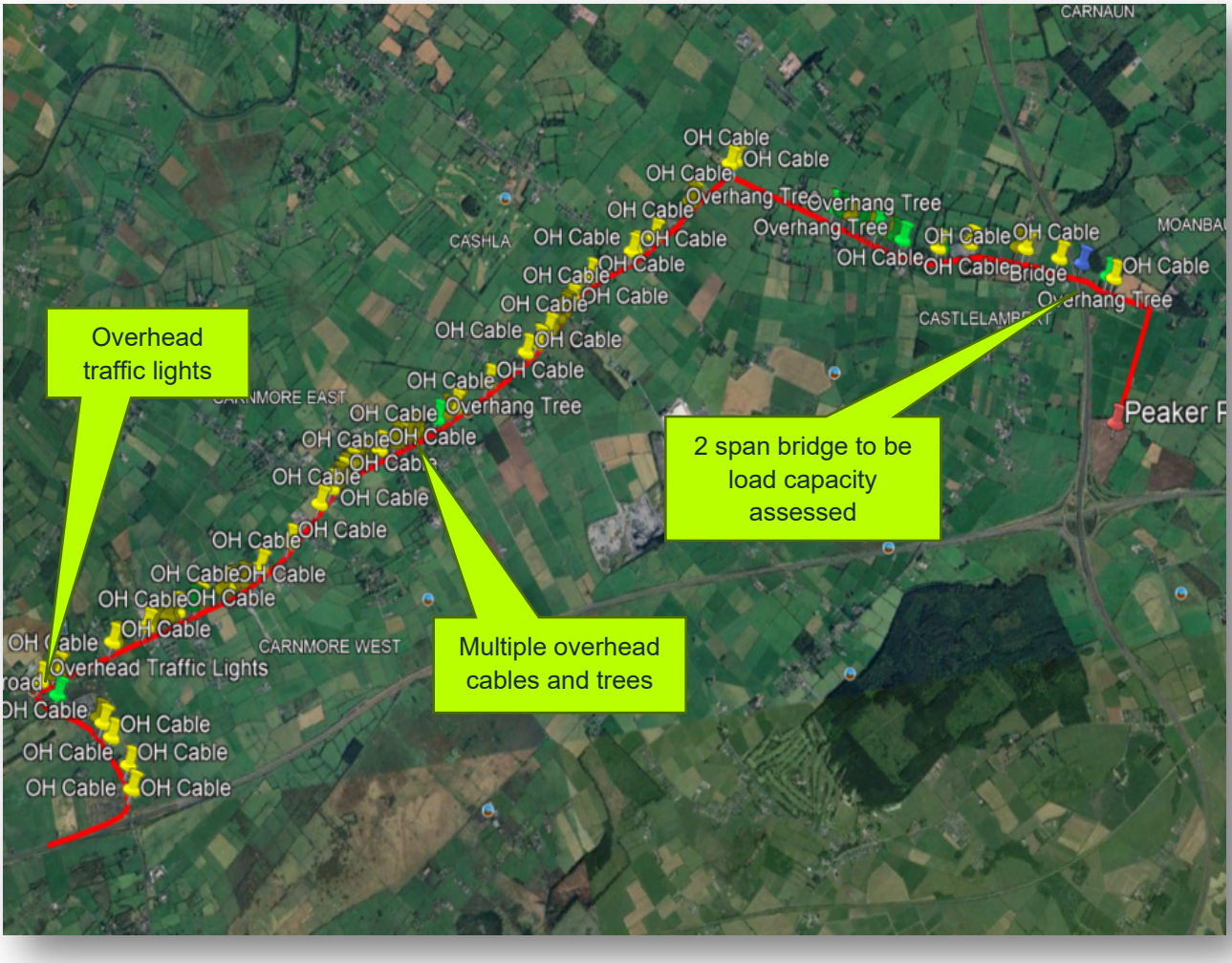


Figure 11-3 - Red route with restrictions identified

11.3.5 Blue route with restrictions identified

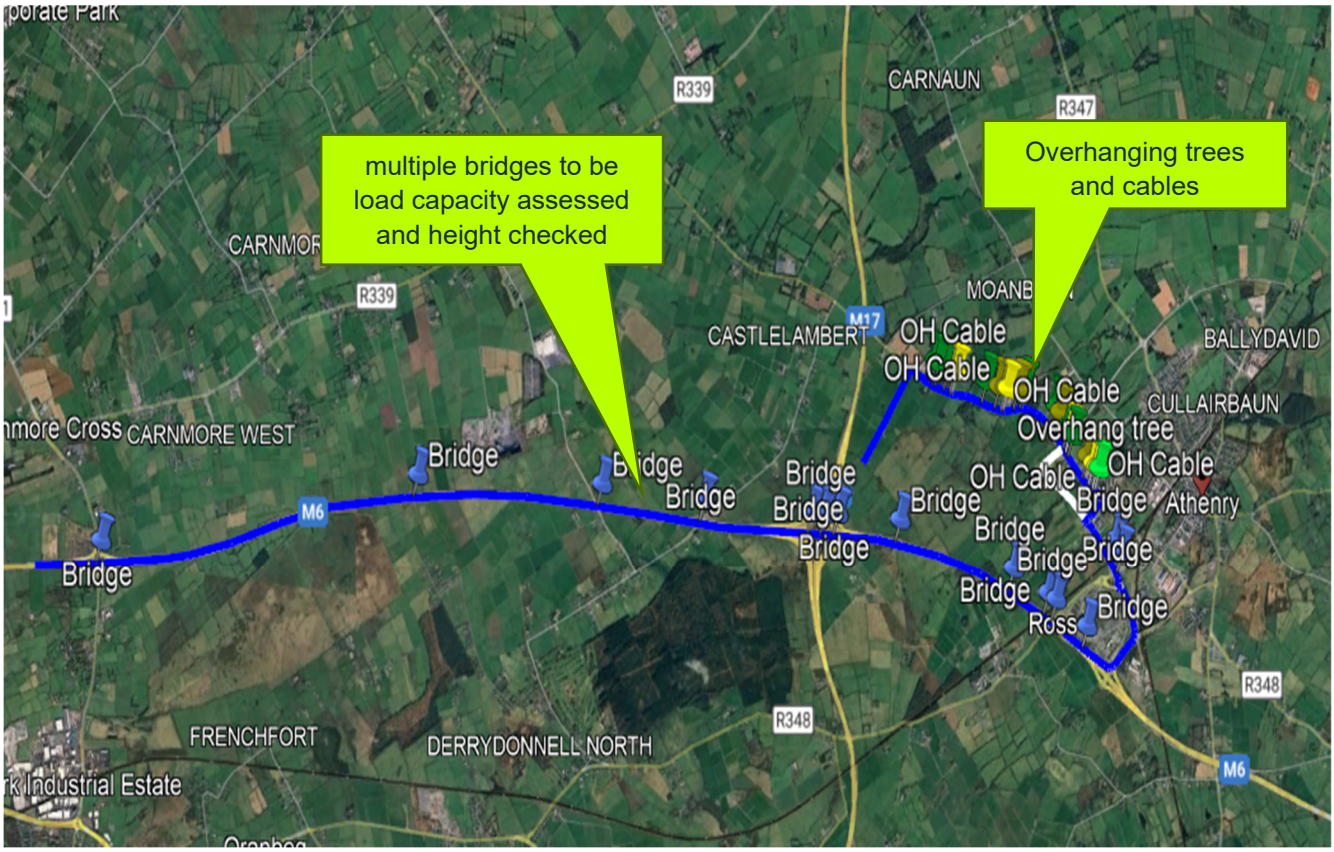
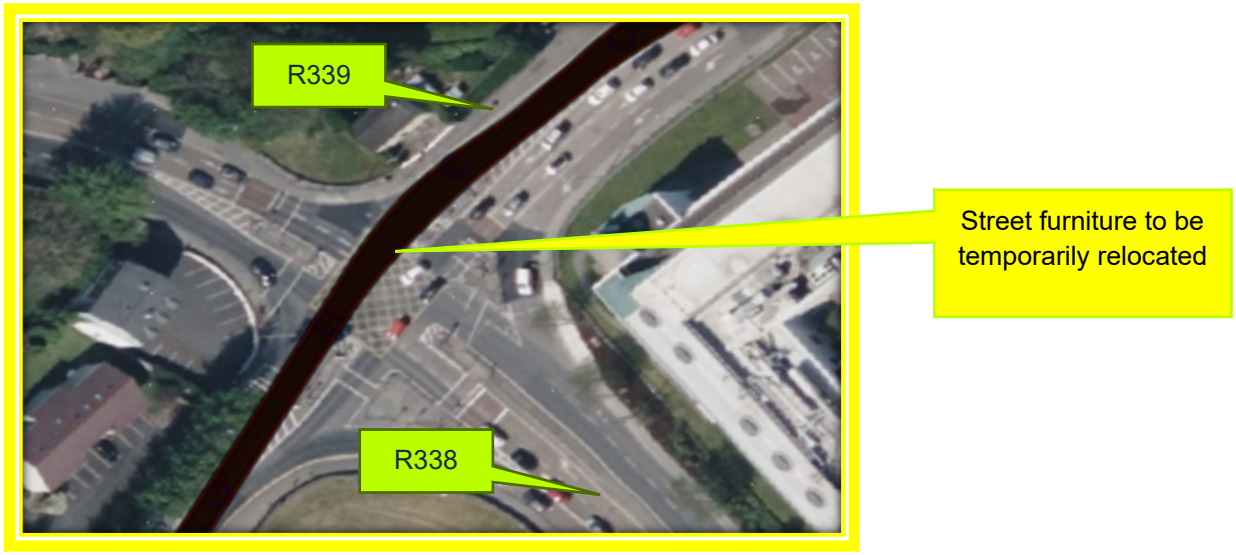
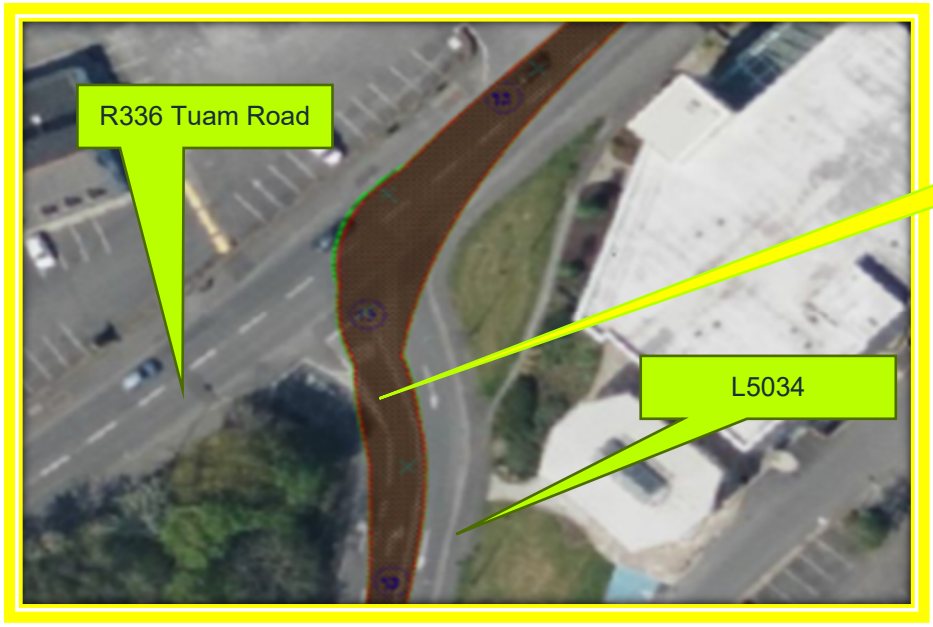


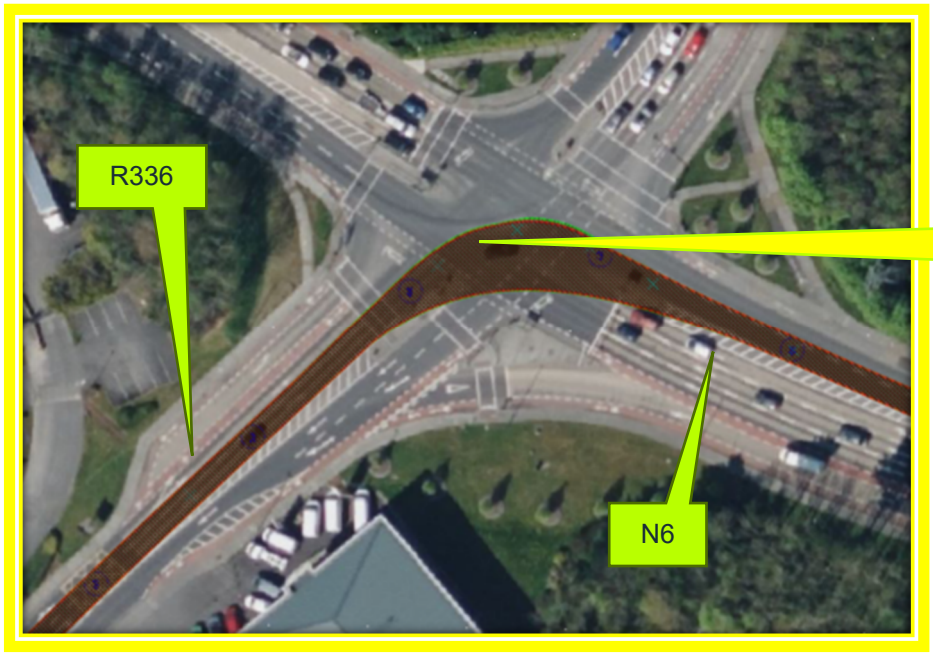
Figure 11-4 - Blue route with restrictions identified

11.4 Auto tracking

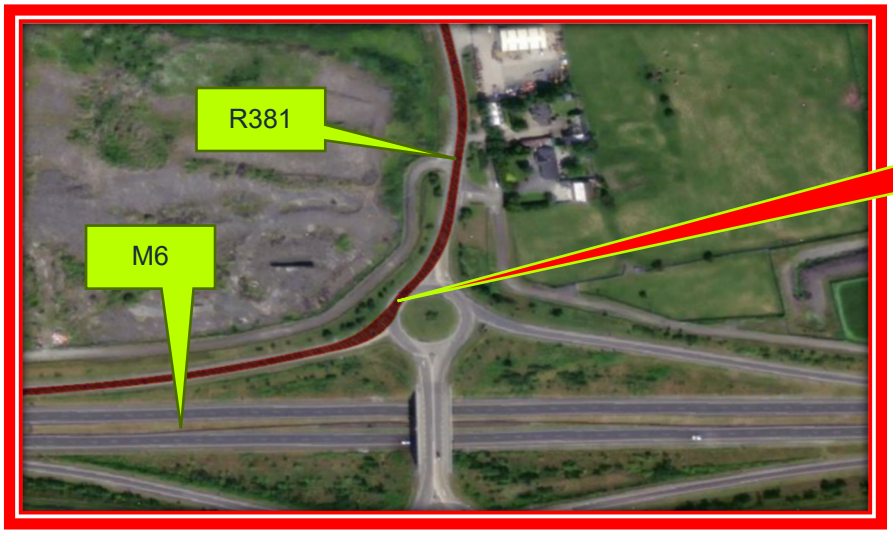
11.4.1 Yellow (common) route

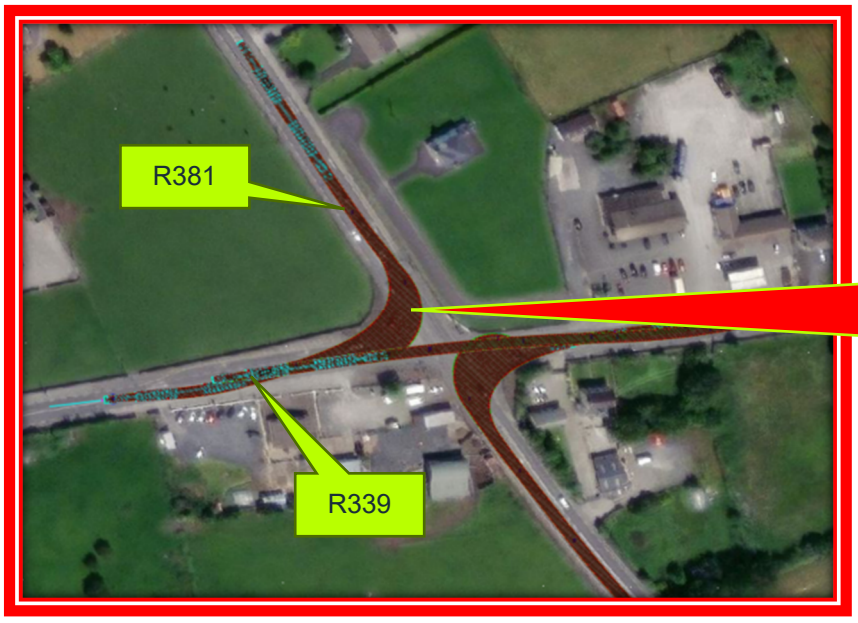


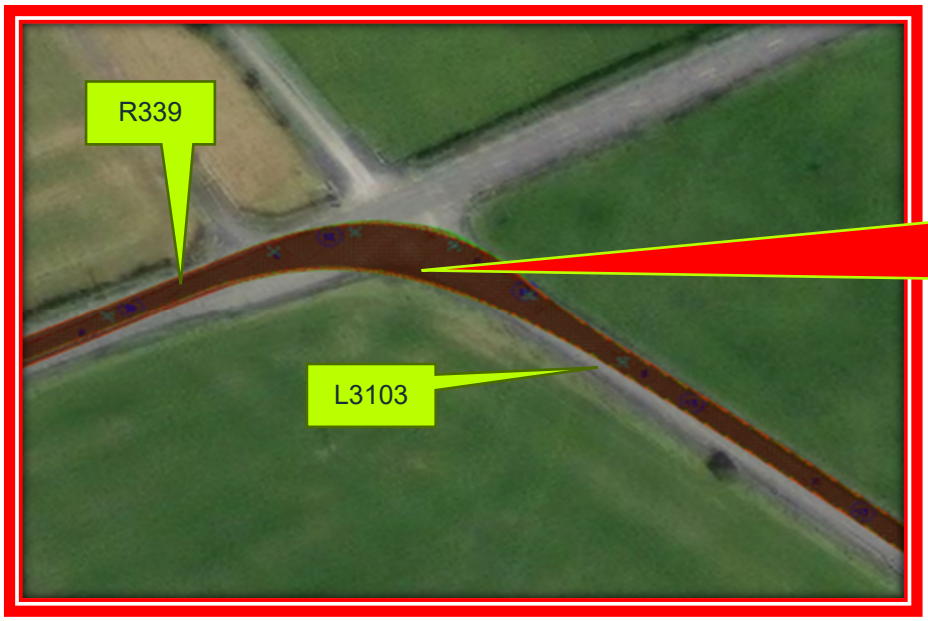

R336 Tuam Road
No additional works required.
L5034


R336
Street furniture to be temporarily relocated
N6

11.4.2 Red Route (discounted)



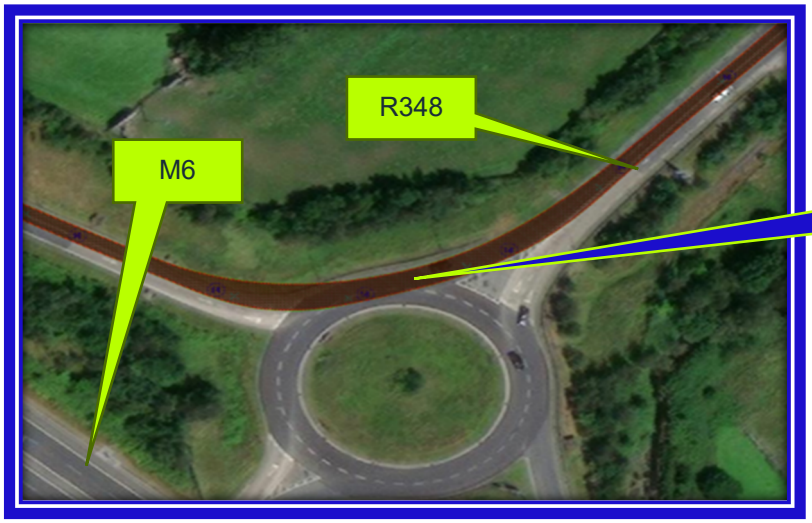


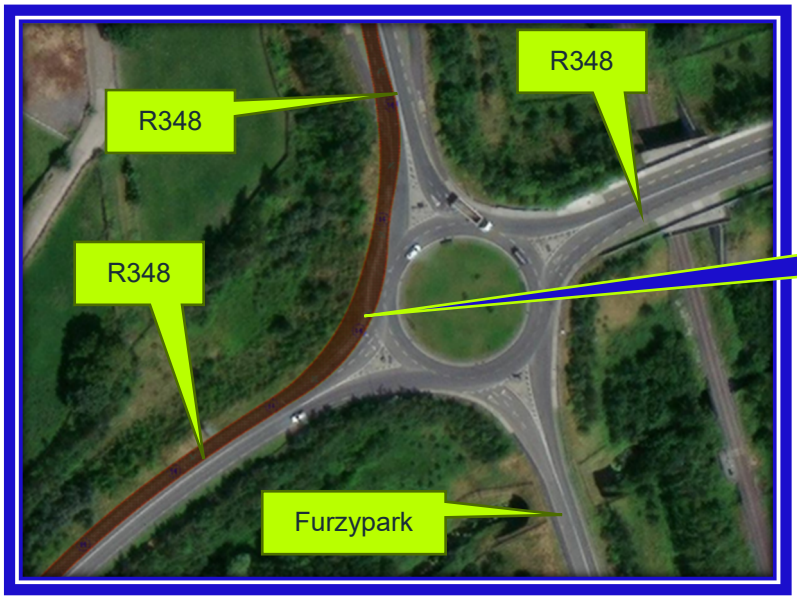


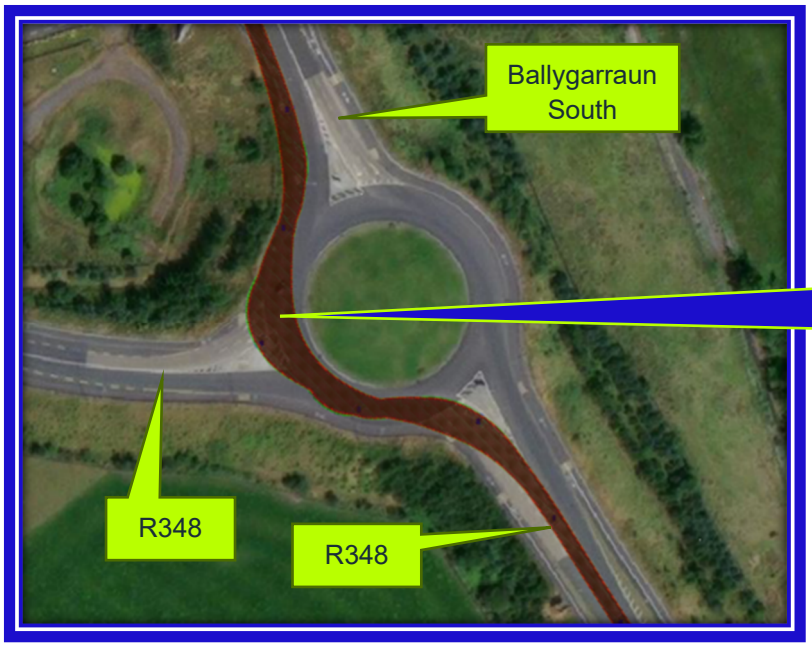
Overturn of Truck on the adjacent green spaces. Temporary track to be created to facilitate truck movements. Need approval from the land owner.

Temporary road to be constructed to facilitate delivery to the site.

11.4.3 Blue Route







Overrun of Truck on the island. Temporary track/works to be laid/carried out, to facilitate free flow of the truck

Reverse in the roundabout may be required. Temporary diversion of traffic may be needed. Temporary works to roundabout required

11.5 Bridges Assessment Along the Routes

Included within this submission is an Abnormal Load Assessment Report which has been commissioned by Bord Gáis Energy to confirm that the equipment up to 380 tonnes can be safely transported from Galway Port to the Cashla Peaker Plant using EAL vehicles. A summary of the report is provided below.

Routes Considered: Blue and red routes (with shared sections).

Structures Assessed: 20 identified; 9 key bridges and culverts analyzed in detail.

Methodology:

- Review of drawings and inspection reports
- Computer modeling of structural response under heavy loads
- Conservative assumptions applied where data was incomplete
- Comparison of expected stresses with original design capacities

Findings:

- All structures on the blue route passed safety checks.
- One structure on the red route (Castlelambert Overbridge) failed—overstressed under proposed loads.
- Conclusion: Blue route approved; red route unsuitable.

Conditions for Safe Transport:

- Vehicle speed ≤10 mph
- Use of slow lane
- No other traffic on bridge during crossing

Recommendations:

- Pre- and post-movement inspections for all bridges
- Confirm axle loads and spacing with haulier
- No further structural checks required for blue route

11.6 Pavement Assessment

A Level 1 and Level 2 FWD analysis is included within this submission. Within the analysis, IAPDM structural review concluded that pavement structures along the proposed route have sufficient residual capacity for anticipated loading. The cumulative demand (~0.02 MSA for 3 loads, 4 passes) is well below residual pavement life. No strengthening works are required, provided standard traffic management and operational controls are implemented.

11.7 Conclusion

EAL delivery planning involves multiple interconnected elements that require close coordination among stakeholders. As the project progresses and new information becomes available, timelines and deliverables may be adjusted. These changes are a result of project complexity rather than any lack of assessment.

Current Position:

- The **Blue route** is confirmed as suitable for abnormal load transport.
- The **Red route** is viable up to a limit of 275t but not all loads would be suitable for this route.

Final confirmation of the haul route will occur prior to EAL delivery, which may take place several months after construction begins. Pre- and post-construction surveys of the public road network—including bridges, culverts, and other relevant structures—will be undertaken by the applicant before any abnormal load movements. The scope and locations of these surveys will be agreed in advance with Galway County Council Roads Authority.

APPENDICES

Appendix A. Utility Record Maps

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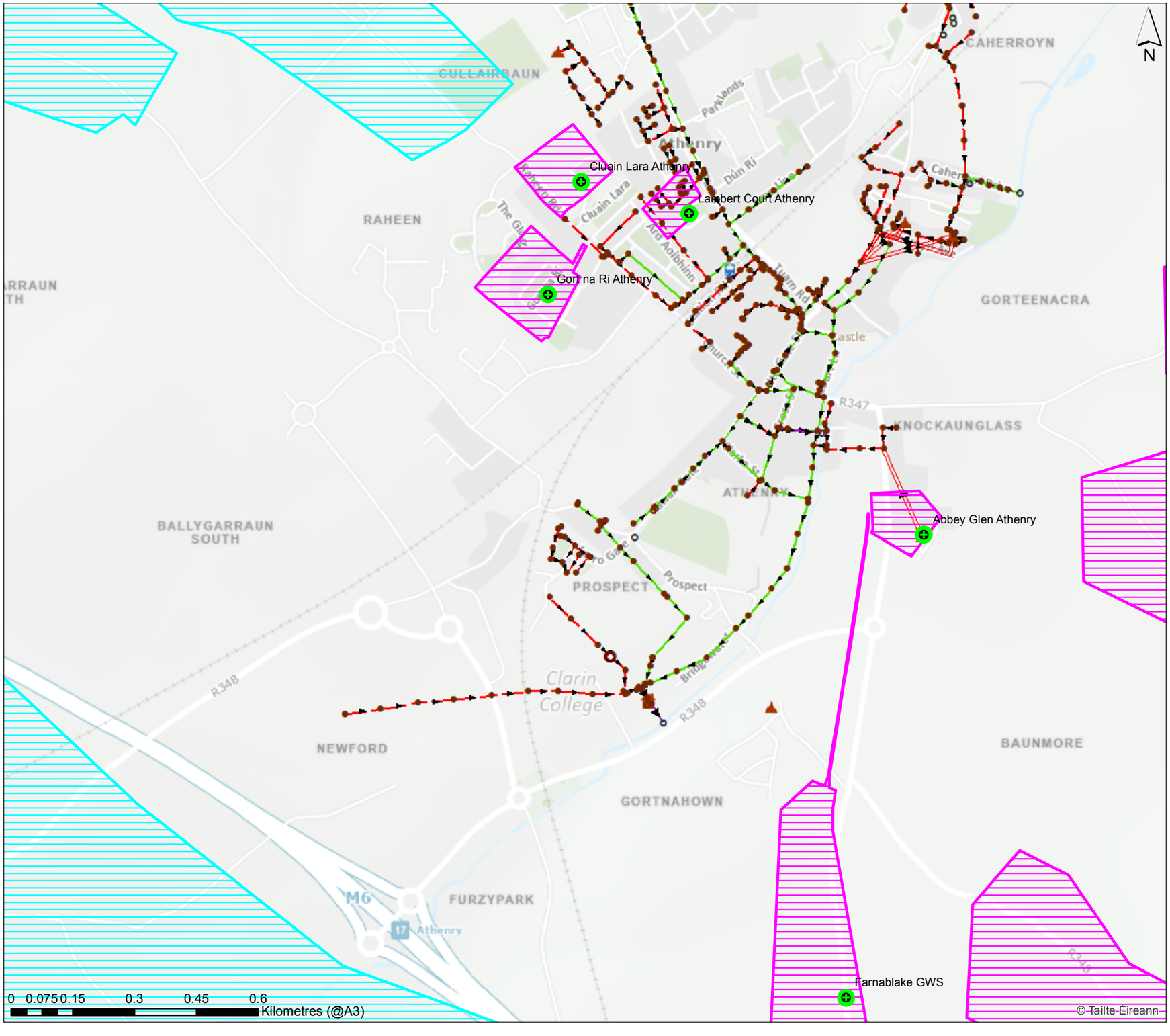
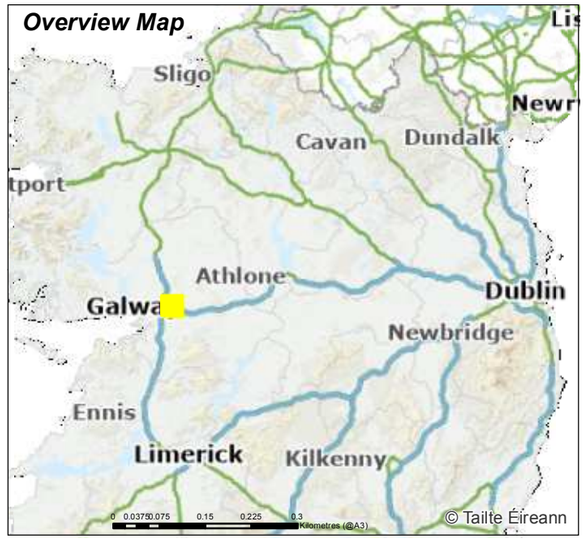
ÚE Water Utilities Network Editing





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
- Hydrant (FH, WO)

Water Fittings
- Cap
- Other Fitting

Sewer Foul Combined Network
- Waste Water Treatment Plant
- Waste Water Pump station

Sewer Mains Irish Water
- Gravity - Combined
- Gravity - Foul
- Gravity - Unknown
- Pumping - Combined
- Pumping - Foul
- Pumping - Unknown
- Syphon - Combined
- Syphon - Foul
- Overflow

Sewer Mains Private
- Gravity - Combined
- Gravity - Foul
- Gravity - Unknown
- Pumping - Combined
- Pumping - Foul
- Pumping - Unknown
- Syphon - Combined
- Syphon - Foul
- Overflow
- Sewer Lateral Lines
- Sewer Casings

Sewer Manholes
- Standard
- Backdrop
- Cascade
- Catchpit
- Bifurcation
- Hatchbox
- Lamphole
- Hydrobrake
- Other; Unknown

Discharge Type
- Outfall
- Overflow
- Soakaway
- Standard Outlet
- Other; Unknown

Cleanout Type
- Rodding Eye
- Flushing Structure
- Other; Unknown

Sewer Inlets
- Catchpit
- Gully
- Standard
- Other; Unknown

Sewer Fittings
- Vent/Col
- Other; Unknown

Storm Water Network

Surface Water Mains
- Surface Gravity Mains
- Surface Gravity Mains Private
- Surface Water Pressurised Mains
- Surface Water Pressurised Mains Private

Inlet Type
- Gully
- Standard
- Other; Unknown

Storm Manholes
- Standard
- Backdrop
- Cascade
- Catchpit
- Bifurcation
- Hatchbox
- Lamphole
- Hydrobrake
- Other; Unknown
- Storm Culverts
- Storm Clean Outs
- Stormwater Chambers

Discharge Type
- Outfall
- Overflow
- Soakaway
- Other; Unknown

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

ESB Networks

ESB HV Lines
- HV Underground
- HV Overhead
- HV Abandoned

ESB MVLV Lines
- MV Overhead Three Phase
- MV Overhead Single Phase
- LV Overhead Three Phase
- LV Overhead Single Phase
- MVLV Underground
- Abandoned

Non Service Categories
- Proposed
- Under Construction
- Out of Service
- Decommissioned

Water Non Service Assets
- Water Point Feature
- Water Pipe
- Water Structure

Waste Non Service Assets
- Waste Point Feature
- Sewer
- Waste Structure

1. Tá toirmeasc ar aon chuid den líníocht seo a aithsaigeadh nó a sheoladh ar aghaidh in aon slí, nó aon chuid den líníocht a stóráil ar aon chóras aisghabhála d'aon sórt gan cead i scríbhinn ó shealtóirí an chóipchirt de chuid Uisce Éireann seachas mar a aontófar an doiciméad a úsáid i ndáil leis an tionscadal dá n-eisíodh an doiciméad chuige ar dtús.

2. Cé go ndearnadh gach uile iarracht cúram a dhéanamh ina tomhsú, tugann Uisce Éireann an fhaisnéis seo i ndáil le láthair a líonra faoi thalamh mar threoir ghinearálta ar an dian-tuiscint go bhfuil an fhaisnéis bunaithe ar an eolas is fearr curtha ar fáil d'Uisce Éireann ó gach uile Údaras Áitiúil in Éirinn. Ní éanann Uisce Éireann freagracht as cruinneas, comhláne, nó nádúr chun dáta na faisnéise a tugadh agus ní thabharfaidh Uisce Éireann aon áitheantóil ná gealltanais ná barántaí maidir leis an bhfaisnéis agus ní éanann Uisce Éireann gach aon dliteanais. D'fhéadfadh a eascairt as aon earráidí nó as aon fhaillí ar bith.Níor cheart braith ar an bhfaisnéis seo má bhíonn tochailtí nó aon oibreacha eile ar siúl i gcóngar an líonra faoi thalamh de chuid Uisce Éireann. Is faoi na páirtithe ag déanamh na tochailtí nó aon oibreacha eile atá sé deimhin a dhéanamh de go sainaithneofar láthair chruinn an líonra faoi thalamh de chuid Uisce Éireann sula dtabharfar faoi thús a chur le haon tochailtí nó oibreacha eile.Ní léirítear naisc sheirbhíse de ghnáth ach bí ar an airdeall go bhféadfaidís a bheith ann.

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Uisce Éireann Irish Water

Print Date: 02/05/2025

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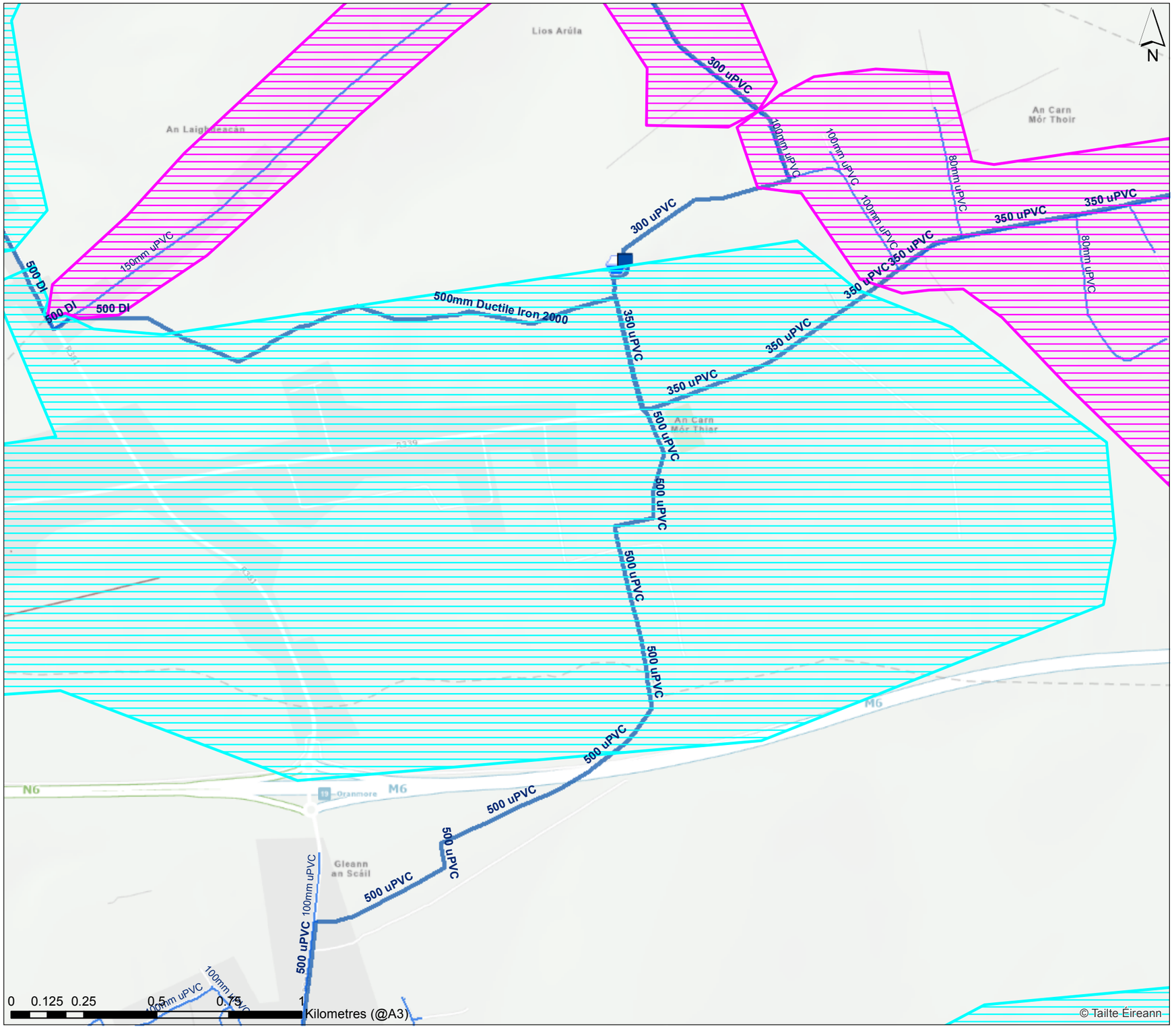

Water Distribution Network
- Water Treatment Plant
- Water Pump Station
- Storage Cell/Tower
- Dosing Point
- Meter Station
- Abstraction Point
- Telemetry Kiosk

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
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- Butterfly Boundary Valve Open/Closed
- Scour Valves
- Single Air Control Valve
- Double Air Control Valve
- Water Stop Valves
- Water Service Connections

- Water Distribution Chambers
- Water Network Junctions
- Pressure Monitoring Point
- Hydrant (FH, WO)

Water Fittings
- Cap
- Other Fitting

Sewer Foul Combined Network
- Waste Water Treatment Plant
- Waste Water Pump station

Sewer Mains Irish Water
- Gravity - Combined
- Gravity - Foul
- Gravity - Unknown
- Pumping - Combined
- Pumping - Foul
- Pumping - Unknown
- Syphon - Combined
- Syphon - Foul
- Overflow

Sewer Mains Private
- Gravity - Combined
- Gravity - Foul
- Gravity - Unknown
- Pumping - Combined
- Pumping - Foul
- Pumping - Unknown
- Syphon - Combined
- Syphon - Foul
- Overflow
- Sewer Lateral Lines
- Sewer Casings

Sewer Manholes
- Standard
- Backdrop
- Cascade
- Catchpit
- Bifurcation
- Hatchbox
- Lamphole
- Hydrobrake

- Other; Unknown

Discharge Type
- Outfall
- Overflow
- Soakaway
- Standard Outlet
- Other; Unknown

Cleanout Type
- Rodding Eye
- Flushing Structure
- Other; Unknown

Sewer Inlets
- Catchpit
- Gully
- Standard
- Other; Unknown

Sewer Fittings
- Vent/Col
- Other; Unknown

Storm Water Network

Surface Water Mains
- Surface Gravity Mains
- Surface Gravity Mains Private
- Surface Water Pressurised Mains
- Surface Water Pressurised Mains Private

Inlet Type
- Gully
- Standard
- Other; Unknown

Storm Manholes
- Standard
- Backdrop
- Cascade
- Catchpit
- Bifurcation
- Hatchbox
- Lamphole
- Hydrobrake
- Other; Unknown
- Storm Culverts

- Storm Clean Outs
- Stormwater Chambers

Discharge Type
- Outfall
- Overflow
- Soakaway
- Other; Unknown

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

ESB Networks

ESB HV Lines
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- HV Overhead
- HV Abandoned

ESB MVLV Lines
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- 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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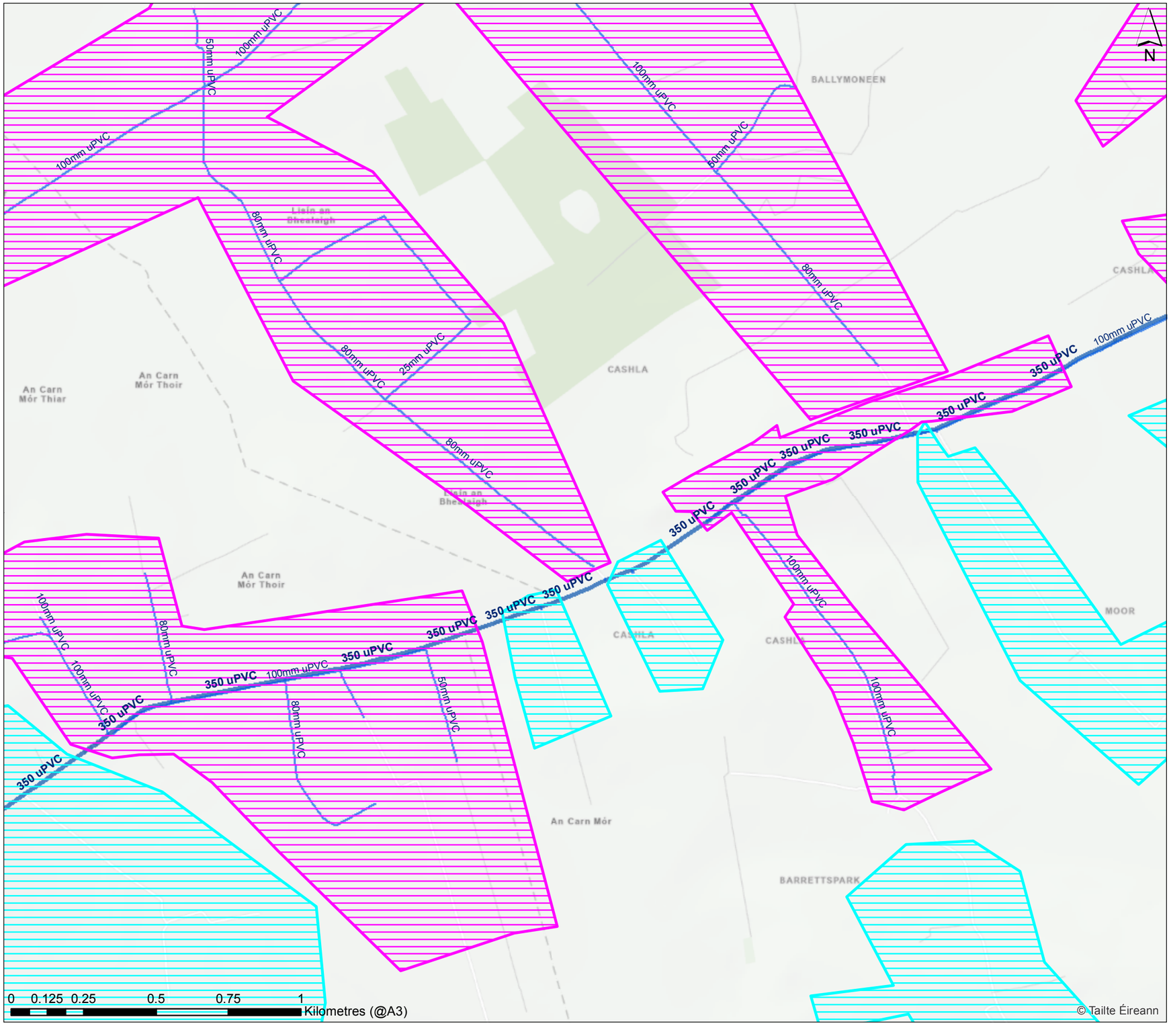

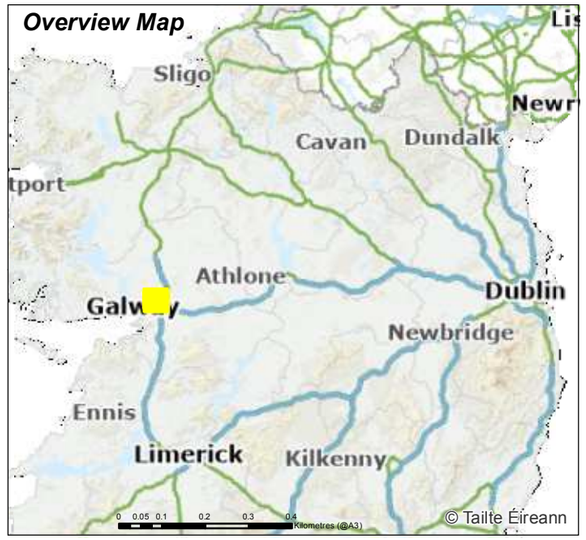

Water Distribution Network
Water Treatment Plant
Water Pump Station
Storage Cell/Tower
Dosing Point
Meter Station
Abstraction Point
Telemetry Kiosk
Reservoir: Potable, Raw Water
Water Distribution Mains: Irish Water, Private
Trunk Water Mains: Irish Water, Private
Water Lateral Lines: Irish Water, Non 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
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Scour Valves, Single Air Control Valve, Double Air Control Valve, Water Stop Valves, Water Service Connections
Water Distribution Chambers
Water Network Junctions
Pressure Monitoring Point
Hydrant (FH, WO)
Water Fittings: Cap, Other Fitting

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

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

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

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

Non Service Categories
Proposed, Under Construction, Out of Service, Decommissioned

Water Non Service Assets
Water Point Feature, Water Pipe, Water Structure

Waste Non Service Assets
Waste Point Feature, Sewer, Waste Structure

1. Tá toirmeasc ar aon chuid den líníocht seo a aithsaigeadh nó a sheoladh ar aghaidh in aon slí, nó aon chuid den líníocht a stóráil ar aon chóras aisghabhála d'aon sórt gan cead i scríbhinn ó shealtóirí an chóipchirt de chuid Uisce Éireann seachas mar a aontófar an doiciméad a úsáid i ndáil leis an tionscadal dá n-eiscrífí an doiciméad chuige ar dtús.

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Uisce Éireann Irish Water

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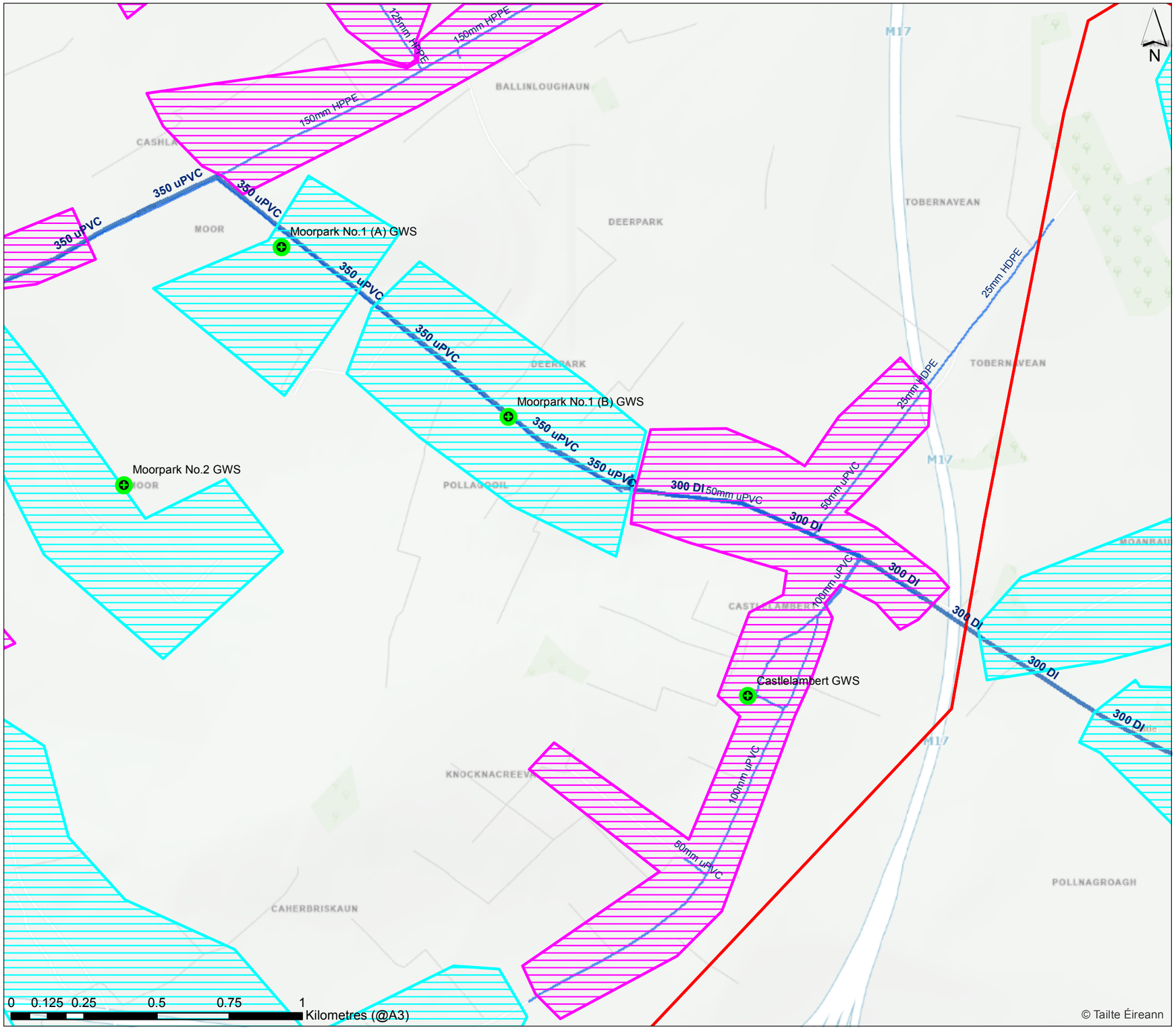

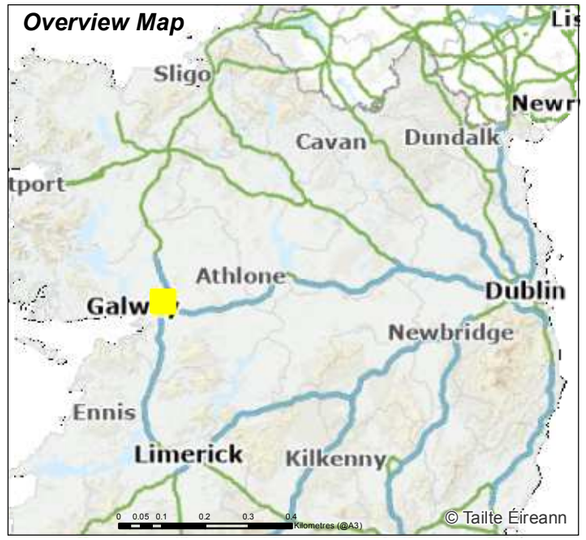

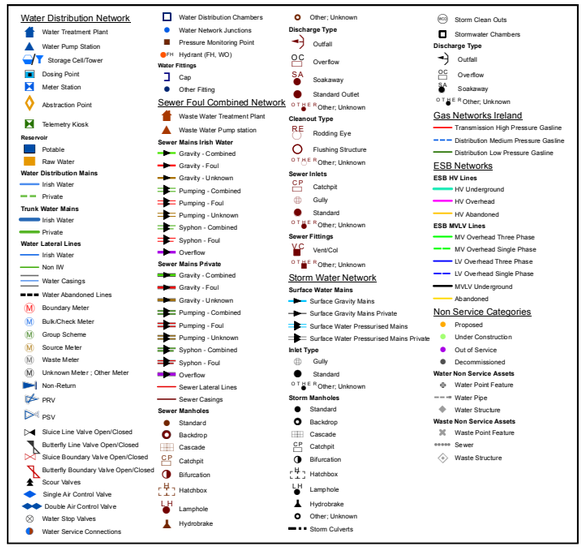

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Uisce Éireann Irish Water

Print Date: 02/05/2025

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ÚE Water Utilities Network Editing

Moanbaun GWS

Private 2" GWS

Cluain Lara Athenry

Lambert Court Athenry

Gort na Ri Athenry

50mm uPVC
100mm uPVC
300 DI
25mm HDPE
80mm uPVC
50mm HDPE
90mm PE
150mm uPVC
125mm uPVC
350 uPVC
200mm uPVC
250 uPVC
300 uPVC

MOANBAUN
POLLNAGROAGH
RAHEEN
BALLYGARRAUN NORTH
BALLYGARRAUN SOUTH
BALLYGARRAUN WEST
RATHMORRISSY
NEWFORD
GORTNAHOWN
FURZYPARK
PROSPECT
Clarin College
M17
M18
M6
R345

0 0.125 0.25 0.5 0.75 1 Kilometres (@A3)

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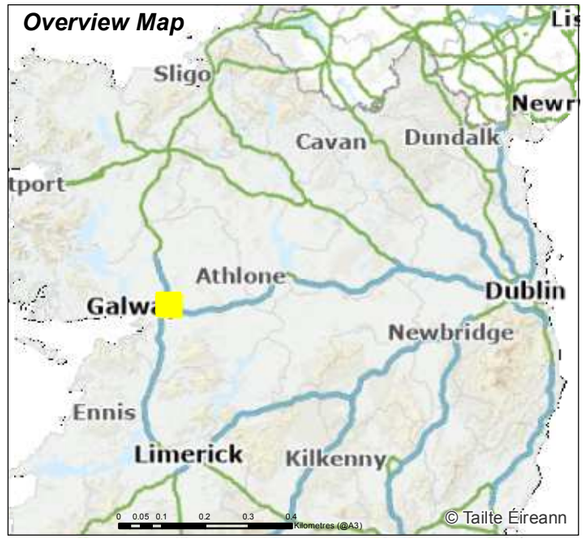
Overview Map



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
Hydrant (FH, WO)
Water Fittings: Cap, Other Fitting

Sewer Foul Combined Network
Waste Water Treatment Plant
Waste Water Pump station
Sewer Mains Irish Water: Gravity - Combined, Gravity - Foul, Gravity - Unknown, Pumping - Combined, Pumping - Foul, Pumping - Unknown, Syphon - Combined, Syphon - Foul, Overflow
Sewer Mains Pévate: 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

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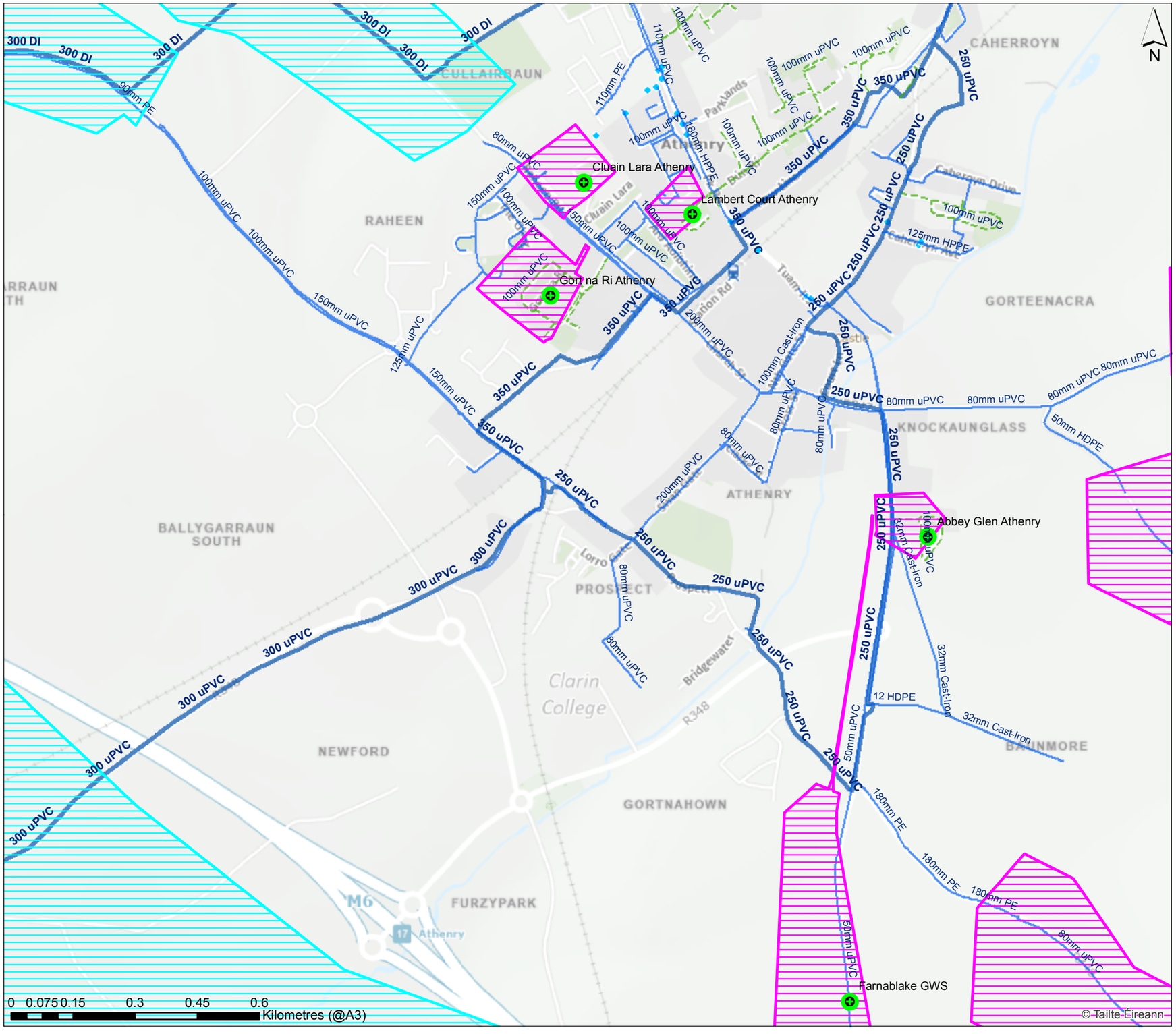

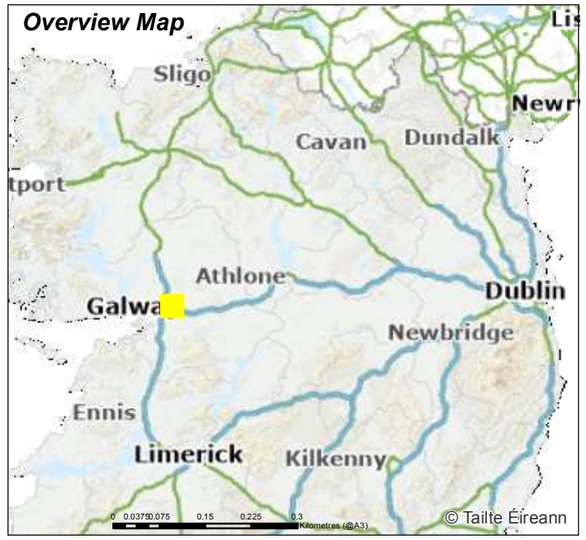

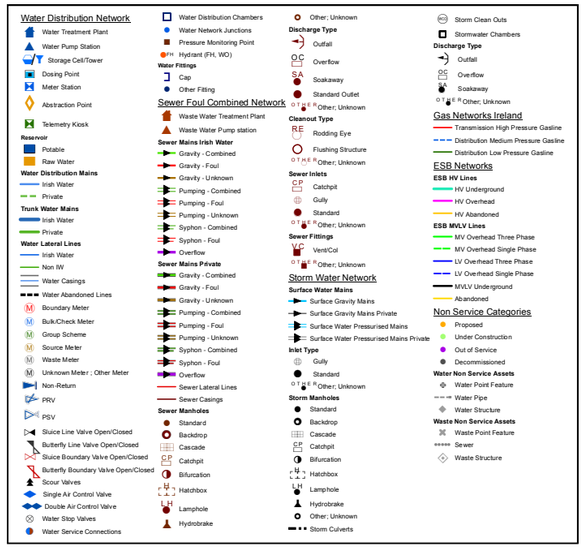

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Uisce Éireann Irish Water

Print Date: 02/05/2025

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A3

Cashla 220kV Substation

green indicates cable route (to be submitted as separate SID application)

Proposed site boundary

open eir Civil Engineering Infrastructure Service

Scale: 1:15000

Irish National Grid Co-Ordinates Centre XY: 545413 m, 728546 m

Date 02/12/2025

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open eir Civil Engineering Infrastructure Service

Scale: 1:15000

Irish National Grid Co-Ordinates Centre XY: 345472 m, 730758 m

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A3

open eir Civil Engineering Infrastructure Service

Scale: 1:15000	Irish National Grid Co-Ordinates Centre XY: 340551 m, 728740 m
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Drawing Produced: 25/04/2025 16:31

Description of Works:

Peaker Plant Route B

Project Reference:

Peaker Plant Route B

Customer Name: Caoimhe Maguire

Company: Atkins Realis

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LEGEND

- DUCT
- THIRD PARTY DUCT
- THIRD PARTY CHAMBER
- CARRIAGEWAY CHAMBER (CW1)
- CARRIAGEWAY CHAMBER (CW2)
- CARRIAGEWAY CHAMBER (CW3)
- FOOTWAY CHAMBER (FW1)
- FOOTWAY CHAMBER (FW2)
- FOOTWAY CHAMBER (FW3)
- VERGECHAMBER (VW1)
- VERGE CHAMBER (VW2)
- VERGE CHAMBER (VW3)
- CHAMBER LXXX
- SWEPT T SWTXXX
- CAP END CPXXX
- SPLICE POINT
- LOOPJOINT
- DESCRIPTION — SPECIAL ENGINEERING DIFFICULTY
- SWEPT TEE

NOTES:
ALL DUCTS AT STANDARD DEPTH
600mm IN CARRIAGEWAY
450mm IN FOOTWAY/GRASS
UNLESS OTHERWISE SHOWN eg
350

SHEET SCHEMATIC

nnn

CPnnn CUSTOMER PREMISES

DUCT CONFIGURATION
(4 X110mm WITH 1 DUCT SUBDUCTED)

COR1CH00_nnn-00_nnn

Drawing Produced: 25/04/2025 16:31

Description of Works:

Peaker Plant Route B

Project Reference:

Peaker Plant Route B

Customer Name: Caoimhe Maguire

Company: Atkins Realis

Disclaimer:

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LEGEND

DUCT

THIRD PARTY DUCT

THIRD PARTY CHAMBER

CARRIAGEWAY CHAMBER (CW1)
CARRIAGEWAY CHAMBER (CW2)
CARRIAGEWAY CHAMBER (CW3)

FOOTWAY CHAMBER (FW1)
FOOTWAY CHAMBER (FW2)
FOOTWAY CHAMBER (FW3)

VERGECHAMBER (VW1)
VERGE CHAMBER (VW2)
VERGE CHAMBER (VW3)

CHAMBER LXXX
SWEPT T SWTXXX
CAP END CPXXX

SPLICE POINT

LOOPJOINT

DESCRIPTION

SPECIAL ENGINEERING DIFFICULTY

SWEPT TEE

NOTES:

ALL DUCTS AT STANDARD DEPTH
600mm IN CARRIAGEWAY
450mm IN FOOTWAY/GRASS
UNLESS OTHERWISE SHOWN eg

350

SHEET SCHEMATIC

nnn

CPnnn CUSTOMER PREMISES

DUCT CONFIGURATION
(4 X110mm WITH 1 DUCT SUBDUCTED)

COR1CH00_nnn-00_nnn

Drawing Produced: 25/04/2025 16:34

Description of Works:

Peaker Plant Route A

Project Reference:

Peaker Plant Route A

Customer Name: Caoimhe Maguire

Company: Atkins Realis

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LEGEND

DUCT
THIRD PARTY DUCT
THIRD PARTY CHAMBER
CARRIAGEWAY CHAMBER (CW1)
CARRIAGEWAY CHAMBER (CW2)
CARRIAGEWAY CHAMBER (CW3)
FOOTWAY CHAMBER (FW1)
FOOTWAY CHAMBER (FW2)
FOOTWAY CHAMBER (FW3)
VERGECHAMBER (VW1)
VERGE CHAMBER (VW2)
VERGE CHAMBER (VW3)
CHAMBER LXXX
SWEPT T SWTXXX
CAP END CPXXX
SPLICE POINT
LOOPJOINT
DESCRIPTION
SPECIAL ENGINEERING DIFFICULTY
SWEPT TEE

NOTES:
ALL DUCTS AT STANDARD DEPTH
600mm IN CARRIAGEWAY
450mm IN FOOTWAY/GRASS
UNLESS OTHERWISE SHOWN eg
350

SHEET SCHEMATIC
nnn
CPnnn
CUSTOMER PREMISES

DUCT CONFIGURATION
(4 X110mm WITH 1 DUCT SUBDUCTED)

COR1CH00_nnn-00_nnn

Drawing Produced: 25/04/2025 16:34

Description of Works:

Peaker Plant Route A

Project Reference:

Peaker Plant Route A

Customer Name: Caoimhe Maguire

Company: Atkins Realis

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LEGEND

DUCT
THIRD PARTY DUCT
THIRD PARTY CHAMBER
CARRIAGEWAY CHAMBER (CW1)
CARRIAGEWAY CHAMBER (CW2)
CARRIAGEWAY CHAMBER (CW3)
FOOTWAY CHAMBER (FW1)
FOOTWAY CHAMBER (FW2)
FOOTWAY CHAMBER (FW3)
VERGECHAMBER (VW1)
VERGE CHAMBER (VW2)
VERGE CHAMBER (VW3)
CHAMBER LXXX
SWEPT T SWTXXX
CAP END CPXXX
SPLICE POINT
LOOPJOINT
DESCRIPTION
SPECIAL ENGINEERING DIFFICULTY
SWEPT TEE

NOTES:
ALL DUCTS AT STANDARD DEPTH
600mm IN CARRIAGEWAY
450mm IN FOOTWAY/GRASS
UNLESS OTHERWISE SHOWN eg
350

SHEET SCHEMATIC
nnn
CPnnn
CUSTOMER PREMISES

DUCT CONFIGURATION
(4 X110mm WITH 1 DUCT SUBDUCTED)
COR1CH00_nnn-00_nnn

Drawing Produced: 25/04/2025 16:34

Description of Works:

Peaker Plant Route A

Project Reference:

Peaker Plant Route A

Customer Name: Caoimhe Maguire

Company: Atkins Realis

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LEGEND

DUCT
THIRD PARTY DUCT

THIRD PARTY CHAMBER
CARRIAGEWAY CHAMBER (CW1)
CARRIAGEWAY CHAMBER (CW2)
CARRIAGEWAY CHAMBER (CW3)
FOOTWAY CHAMBER (FW1)
FOOTWAY CHAMBER (FW2)
FOOTWAY CHAMBER (FW3)
VERGECHAMBER (VW1)
VERGE CHAMBER (VW2)
VERGE CHAMBER (VW3)
CHAMBER LXXX
SWEPT T SWTXXX
CAP END CPXXX

SPLICE POINT
LOOPJOINT
DESCRIPTION
SPECIAL ENGINEERING DIFFICULTY
SWEPT TEE

NOTES:
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600mm IN CARRIAGEWAY
450mm IN FOOTWAY/GRASS
UNLESS OTHERWISE SHOWN eg
350

SHEET SCHEMATIC
nnn
CPnnn
CUSTOMER PREMISES

DUCT CONFIGURATION
(4 X110mm WITH 1 DUCT SUBDUCTED)

COR1CH00_nnn-00_nnn

ESB Networks

TITLE:

20250512-070_A0_1

COLOUR CODE:

- BLACK - 38KV & HIGHER VOLTAGE OVERHEAD LINES
- GREEN - MV(10KV/20KV) OVERHEAD LINES
- BLUE - LV (400V/230V) OVERHEAD LINES
- CYAN - 38KV & HIGHER VOLTAGE UNDERGROUND CABLE ROUTES
- RED - MV/LV (10KV/20KV/400V/230V) UNDERGROUND CABLE ROUTES

DATE: 12-May-2025

** SCALE: 1:2500

** SCALE WHEN PRINTED ON AN A0 PAGE
XY COORDINATES DISPLAYED IN IRISH GRID COORDINATE SYSTEM

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WARNING

THIS MAP INDICATES THE APPROXIMATE LOCATION OF ESB TRANSMISSION (400KV, 220KV, 110KV, 38KV) AND DISTRIBUTION (20KV, 10KV, 230V/400V) UNDERGROUND CABLES AND OVERHEAD LINES IN THE GENERAL AREA OF THE PROPOSED WORKS. ESB NETWORKS TAKES NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF THE MAP. IT IS THE USER'S RESPONSIBILITY TO INDEPENDENTLY VERIFY THE INFORMATION AND THE LOCATION OF UNDERGROUND CABLES AND OVERHEAD LINES. LOW VOLTAGE (230V/400V) SERVICE CABLES (E.G. HOUSE SERVICES, FACTORY/SHOP SERVICES, PUBLIC LIGHTING LAMP SERVICES, ETC) ARE NOT INCLUDED BUT THEIR PRESENCE SHOULD BE ANTICIPATED. THE DEPTHS OF UNDERGROUND CABLES MUST NEVER BE ASSUMED. BEFORE ANY MECHANICAL EXCAVATION IS UNDERTAKEN, THE ACTUAL LOCATION OF ALL UNDERGROUND ELECTRICITY CABLES MUST BE ESTABLISHED AND VERIFIED ON THE SITE USING:
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(B) CABLE LOCATER EQUIPMENT OPERATED IN BOTH POWER AND RADIO MODES;
(C) CAREFUL HAND DIGGING OF TRIAL HOLES USING 'SAFE DIGGING PRACTICE'.
REFER ALSO TO 'HSA CODE OF PRACTICE FOR AVOIDING DANGER FROM UNDERGROUND SERVICES'.
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X,Y: 137496 , 229342

X,Y: 140395 , 229342

X,Y: 140395 , 227422

HIGH VOLTAGE

IF YOU INTEND WORKING, OR UNDERTAKING DEVELOPMENT WITHIN A CORRIDOR EXTENDING 40 METRES ON EITHER SIDE OF ANY HIGH VOLTAGE OVERHEAD LINES OR WITHIN A CORRIDOR EXTENDING 5 METRES ON EITHER SIDE OF ANY HIGH VOLTAGE UNDERGROUND CABLES YOU MUST CONTACT ESB NETWORKS IN ADVANCE OF WORKS AT 1800 372 757 OR EMAIL DIG@ESB.IE TO AGREE SAFE WORKING PROCEDURES AND NECESSARY CLEARANCES BETWEEN THE LINES AND THE DEVELOPMENT IN ADVANCE OF ANY EXCAVATION.

LYDACAN S
CARNMORE N W
CARNMORE NW
CARNMORE W
KINGS WAREHOUSE
CARNMORE
CARNMORE MILK
CARNMORE MW
CARNMORE MID
CARNMORE MS
CARNMORE COMM CENT
CARNMORE LR S
CARNMORE FEENEY
CARNMORE FARMWAY
KILTULLA RD NTH
CARNMORE CROSS M
CARNMORE CROSS UP
KILTULLA RD
CARNMORE MID W
CARNMORE MAST
CARNMORE CROSS
CARNMORE X M
CARNMORE X UP
CARNMORE W LR
CARNMORE S W
CARNMORE LR S E
CARNMORE ASTRO PITCH
AERPORT VIEW MID
AERPORT VIEW E
AERPHORT VIEW
CARNMORE CROSS LOWER
CARNMORE S UP
CARANMORE WORKSHOP
AERPORT VIEW M
AIRPORT HSE
CARNMORE WEST K
CORNMORE S
DIVILLYS MEATS
CARNMORE S W
LYONS WAREHOUSES
CARNMORE S E
GLENNASCAUL PL
GLENASCAUL SHED
GLENASCAUL UPP
CARNMORE KING

ESB Networks

TITLE:

20250512-070_A0_2

COLOUR CODE:

- BLACK - 38KV & HIGHER VOLTAGE OVERHEAD LINES
- GREEN - MV(10KV/20KV) OVERHEAD LINES
- BLUE - LV (400V/230V) OVERHEAD LINES
- CYAN - 38KV & HIGHER VOLTAGE UNDERGROUND CABLE ROUTES
- RED - MV/LV (10KV/20KV/400V/230V) UNDERGROUND CABLE ROUTES

DATE: 12-May-2025

** SCALE: 1:2500

** SCALE WHEN PRINTED ON AN A0 PAGE
XY COORDINATES DISPLAYED IN IRISH GRID COORDINATE SYSTEM

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(B) CABLE LOCATER EQUIPMENT OPERATED IN BOTH POWER AND RADIO MODES;
(C) CAREFUL HAND DIGGING OF TRIAL HOLES USING 'SAFE DIGGING PRACTICE'.
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X,Y: 139936 , 230460

X,Y: 142836 , 230460

X,Y: 142836 , 228541

MOUNTAIN RD FARM
LISHEEN MID E
LISHEEN MID
1 SCAN 2
8A LISHEEN NEW
LISHEEN VIEW
LISHEENAVALLA S W
10 PDM 06P
8 SCAN 2 99
LISHEENAVALLA LOWER
LISHEENAVALLA HO
LISHEENAVALLA S
LISHEENAVALLA E
CASHLA LR
CASHLA LOWER
CASHLA N
CASHLA S
CASHLA NE
CASHLA E
CASHLA UPPER
CASHLA MID
CASHLA WORKSHOP
CASHLA W
CASHLA QUARRIES
CARNMORE SCHOOL
CARNMORE WEST UPR
CARNMORE E UPR
CARNMORE PLANT
CARNMORE VILLAGE
CARNMORE VILL M
1 PDM 04P
SCHOOL RD LO
SCHOOL RD
5 SCAN 04
CARNMORE FARM
CARNMORE HILL
CARNMORE E MID
CARNMORE VILL LR
CARNMORE ROONEY
CARNMORE W JUNCTION
NEWELL ROOFING
GREANEY GLASS
CARNMORE GLASS
CARNMORE NE
CARNMORE WEST HSE
CARNMORE E M
CARNMORE HA
CARNMORE HSE
CARNMORE SW
CARNMORE MID S
CARNMORE LANE
CARNMORE MASSUD
CARNMORE E
CARNMORE CON
CARNMORE HI
CARNMORE S
CARNMORE LARDINER
SUNSHINE ALO
CARNMORE UPR N
CARNMORE ME
CARNMORE VIEW
CARNMORE UPR
CARNMORE RISE
CARNMORE EU
CLOCHMEOIL PUMP HSE
906X 15 DV
CLOCHMEOIL
CLOCHMAOL AVE
430 ACSR
200 ACSR
3X1185 XLP

HIGH VOLTAGE

IF YOU INTEND WORKING, OR UNDERTAKING DEVELOPMENT WITHIN A CORRIDOR EXTENDING 40 METRES ON EITHER SIDE OF ANY HIGH VOLTAGE OVERHEAD LINES OR WITHIN A CORRIDOR EXTENDING 5 METRES ON EITHER SIDE OF ANY HIGH VOLTAGE UNDERGROUND CABLES YOU MUST CONTACT ESB NETWORKS IN ADVANCE OF WORKS AT 1800 372 757 OR EMAIL DIG@ESB.IE TO AGREE SAFE WORKING PROCEDURES AND NECESSARY CLEARANCES BETWEEN THE LINES AND THE DEVELOPMENT IN ADVANCE OF ANY EXCAVATION.

ESB Networks

TITLE:

20250512-070_A0_3

COLOUR CODE:

- BLACK - 38KV & HIGHER VOLTAGE OVERHEAD LINES
- GREEN - MV(10KV/20KV) OVERHEAD LINES
- BLUE - LV (400V/230V) OVERHEAD LINES
- CYAN - 38KV & HIGHER VOLTAGE UNDERGROUND CABLE ROUTES
- RED - MV/LV (10KV/20KV/400V/230V) UNDERGROUND CABLE ROUTES

DATE: 12-May-2025

** SCALE: 1:2500

** SCALE WHEN PRINTED ON AN A0 PAGE
XY COORDINATES DISPLAYED IN IRISH GRID COORDINATE SYSTEM

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WARNING

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X,Y: 142299 , 231240

X,Y: 145199 , 231240

ESB NETWORKS HAS ISSUED THIS MAP AS A PDF DOCUMENT. IF VIEWING A PAPER VERSION OF THIS MAP, THE VIEWER MUST ENSURE THAT IT HAS BEEN PRINTED IN COLOUR TO FIT TO AN A0 (OR LARGER) PAGESIZE AND THAT EACH OF THE COLOURS INDICATED ON THE COLOUR CODE LEGEND ABOVE ARE CLEAR AND DISTINCT FROM EACH OTHER TO MAINTAIN A CORRECT REPRESENTATION OF THE ELECTRICAL NETWORK INFORMATION.

GALWAY EGGS
CASHLA LO
BALLYMONEEN S
CASHLA I.F.T.
CASHLA UPPER
CASHLA M
CASHLA RD
CASHLA LR
CASHLA MIDDLE
CASHLA PUMP HO
CASHLA W
CASHLA CORNER
CASHLA LR M
CASHLA LOWER
CASHLA N
CASHLA CROSS
CASHLA S
CASHLA E
CASHLA UPPER
CASHLA MID WEST
CASHLA S LR
CASHLA S E
MOOR OUTER
MOOR
MOOR E
MOOR S
CASHLA LODGE
CASHLA EAST
BALLYLOUGHAN CROSS
GRANGE ROAD SOUTH
MOOR PARK N
MOOR PARK
MOORPARK MID
MOORPARK UPPER
POLLAGOOIL W
POLLAGOOIL

4X95 XLP
38kV A/CV
4X185 XLP
P1

HIGH VOLTAGE

IF YOU INTEND WORKING, OR UNDERTAKING DEVELOPMENT WITHIN A CORRIDOR EXTENDING 40 METRES ON EITHER SIDE OF ANY HIGH VOLTAGE OVERHEAD LINES OR WITHIN A CORRIDOR EXTENDING 5 METRES ON EITHER SIDE OF ANY HIGH VOLTAGE UNDERGROUND CABLES YOU MUST CONTACT ESB NETWORKS IN ADVANCE OF WORKS AT 1800 372 757 OR EMAIL DIG@ESB.IE TO AGREE SAFE WORKING PROCEDURES AND NECESSARY CLEARANCES BETWEEN THE LINES AND THE DEVELOPMENT IN ADVANCE OF ANY EXCAVATION.

X,Y: 145199 , 229320

ESB Networks

TITLE:

20250512-070_A0_4

COLOUR CODE:

- BLACK - 38KV & HIGHER VOLTAGE OVERHEAD LINES
- GREEN - MV(10KV/20KV) OVERHEAD LINES
- BLUE - LV (400V/230V) OVERHEAD LINES
- CYAN - 38KV & HIGHER VOLTAGE UNDERGROUND CABLE ROUTES
- RED - MV/LV (10KV/20KV/400V/230V) UNDERGROUND CABLE ROUTES

DATE: 12-May-2025

** SCALE: 1:2500

** SCALE WHEN PRINTED ON AN A0 PAGE
XY COORDINATES DISPLAYED IN IRISH GRID COORDINATE SYSTEM

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X,Y: 144419 , 230735

X,Y: 147319 , 230735

X,Y: 147319 , 228815

HIGH VOLTAGE

IF YOU INTEND WORKING, OR UNDERTAKING DEVELOPMENT WITHIN A CORRIDOR EXTENDING 40 METRES ON EITHER SIDE OF ANY HIGH VOLTAGE OVERHEAD LINES OR WITHIN A CORRIDOR EXTENDING 5 METRES ON EITHER SIDE OF ANY HIGH VOLTAGE UNDERGROUND CABLES YOU MUST CONTACT ESB NETWORKS IN ADVANCE OF WORKS AT 1800 372 757 OR EMAIL DIG@ESB.IE TO AGREE SAFE WORKING PROCEDURES AND NECESSARY CLEARANCES BETWEEN THE LINES AND THE DEVELOPMENT IN ADVANCE OF ANY EXCAVATION.

MOORPARK MID
MOORPARK UPPER
POLLAGOOIL W
POLLAGOOL VIEW
POLLAGOOIL M
POLLAGOOIL E
POLLAGOOIL S
POLLAGOOIL UPP
POLLAGOOIL SHED
DEERPARK BEG
CASTLELAMBERT NW
CASTLELAMBERT W
CASTLELAMBERT NE
CASTLELAMBERT SW
CASTLELAMBERT UPR
CASTLELAMBERT N
CASTLELAMBERT MID E
CASTLELAMBERT M
CASTLELAMBERT HOUSE
CASTLELAMBERT DAIRY
CASTLELAMBERT NTH UR
CASTLELAMBERT FARM
CASTLELAMBERT E
CASTLELAMBERT SE
TOBERNAVEAN SE
TOBERNAVEAN STUDFARM
TOBERNAVEAN WOOD
TOBERNAVEAN SOUTH
MOANBAUN`S W
MOANBAUN UPPER

ESB Networks

TITLE:

20250512-070_A0_5

COLOUR CODE:

- BLACK - 38KV & HIGHER VOLTAGE OVERHEAD LINES
- GREEN - MV(10KV/20KV) OVERHEAD LINES
- BLUE - LV (400V/230V) OVERHEAD LINES
- CYAN - 38KV & HIGHER VOLTAGE UNDERGROUND CABLE ROUTES
- RED - MV/LV (10KV/20KV/400V/230V) UNDERGROUND CABLE ROUTES

DATE: 12-May-2025

** SCALE: 1:2500

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XY COORDINATES DISPLAYED IN IRISH GRID COORDINATE SYSTEM

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REFER ALSO TO 'HSA CODE OF PRACTICE FOR AVOIDING DANGER FROM UNDERGROUND SERVICES'.
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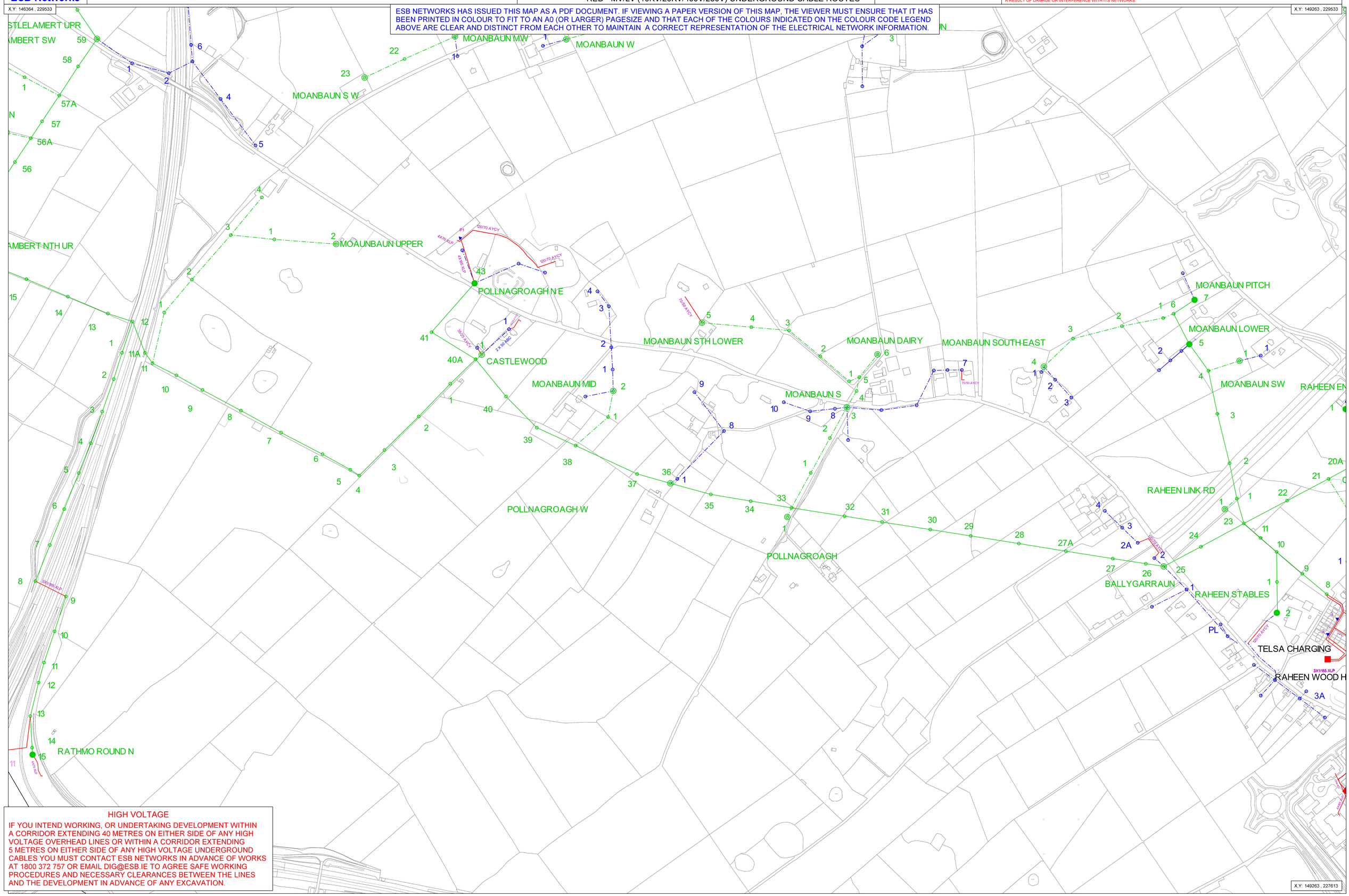
X,Y: 146364 , 229533

X,Y: 149263 , 229533



X,Y: 149263 , 227613

HIGH VOLTAGE

IF YOU INTEND WORKING, OR UNDERTAKING DEVELOPMENT WITHIN A CORRIDOR EXTENDING 40 METRES ON EITHER SIDE OF ANY HIGH VOLTAGE OVERHEAD LINES OR WITHIN A CORRIDOR EXTENDING 5 METRES ON EITHER SIDE OF ANY HIGH VOLTAGE UNDERGROUND CABLES YOU MUST CONTACT ESB NETWORKS IN ADVANCE OF WORKS AT 1800 372 757 OR EMAIL DIG@ESB.IE TO AGREE SAFE WORKING PROCEDURES AND NECESSARY CLEARANCES BETWEEN THE LINES AND THE DEVELOPMENT IN ADVANCE OF ANY EXCAVATION.

ESB Networks

TITLE:

20250512-070_A0_6

COLOUR CODE:

- BLACK - 38KV & HIGHER VOLTAGE OVERHEAD LINES
- GREEN - MV(10KV/20KV) OVERHEAD LINES
- BLUE - LV (400V/230V) OVERHEAD LINES
- CYAN - 38KV & HIGHER VOLTAGE UNDERGROUND CABLE ROUTES
- RED - MV/LV (10KV/20KV/400V/230V) UNDERGROUND CABLE ROUTES

DATE: 12-May-2025

** SCALE: 1:2500

** SCALE WHEN PRINTED ON AN A0 PAGE
XY COORDINATES DISPLAYED IN IRISH GRID COORDINATE SYSTEM

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WARNING

THIS MAP INDICATES THE APPROXIMATE LOCATION OF ESB TRANSMISSION (400KV, 220KV, 110KV, 38KV) AND DISTRIBUTION (20KV, 10KV, 230V/400V) UNDERGROUND CABLES AND OVERHEAD LINES IN THE GENERAL AREA OF THE PROPOSED WORKS. ESB NETWORKS TAKES NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF THE MAP. IT IS THE USER'S RESPONSIBILITY TO INDEPENDENTLY VERIFY THE INFORMATION AND THE LOCATION OF UNDERGROUND CABLES AND OVERHEAD LINES. LOW VOLTAGE (230V/400V) SERVICE CABLES (E.G. HOUSE SERVICES, FACTORY/SHOP SERVICES, PUBLIC LIGHTING LAMP SERVICES, ETC) ARE NOT INCLUDED BUT THEIR PRESENCE SHOULD BE ANTICIPATED. THE DEPTHS OF UNDERGROUND CABLES MUST NEVER BE ASSUMED. BEFORE ANY MECHANICAL EXCAVATION IS UNDERTAKEN, THE ACTUAL LOCATION OF ALL UNDERGROUND ELECTRICITY CABLES MUST BE ESTABLISHED AND VERIFIED ON THE SITE USING:
(A) UP-TO-DATE MAP RECORDS;
(B) CABLE LOCATER EQUIPMENT OPERATED IN BOTH POWER AND RADIO MODES;
(C) CAREFUL HAND DIGGING OF TRIAL HOLES USING 'SAFE DIGGING PRACTICE'.
REFER ALSO TO 'HSA CODE OF PRACTICE FOR AVOIDING DANGER FROM UNDERGROUND SERVICES'.
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X,Y: 147531 , 228316

X,Y: 150431 , 228316

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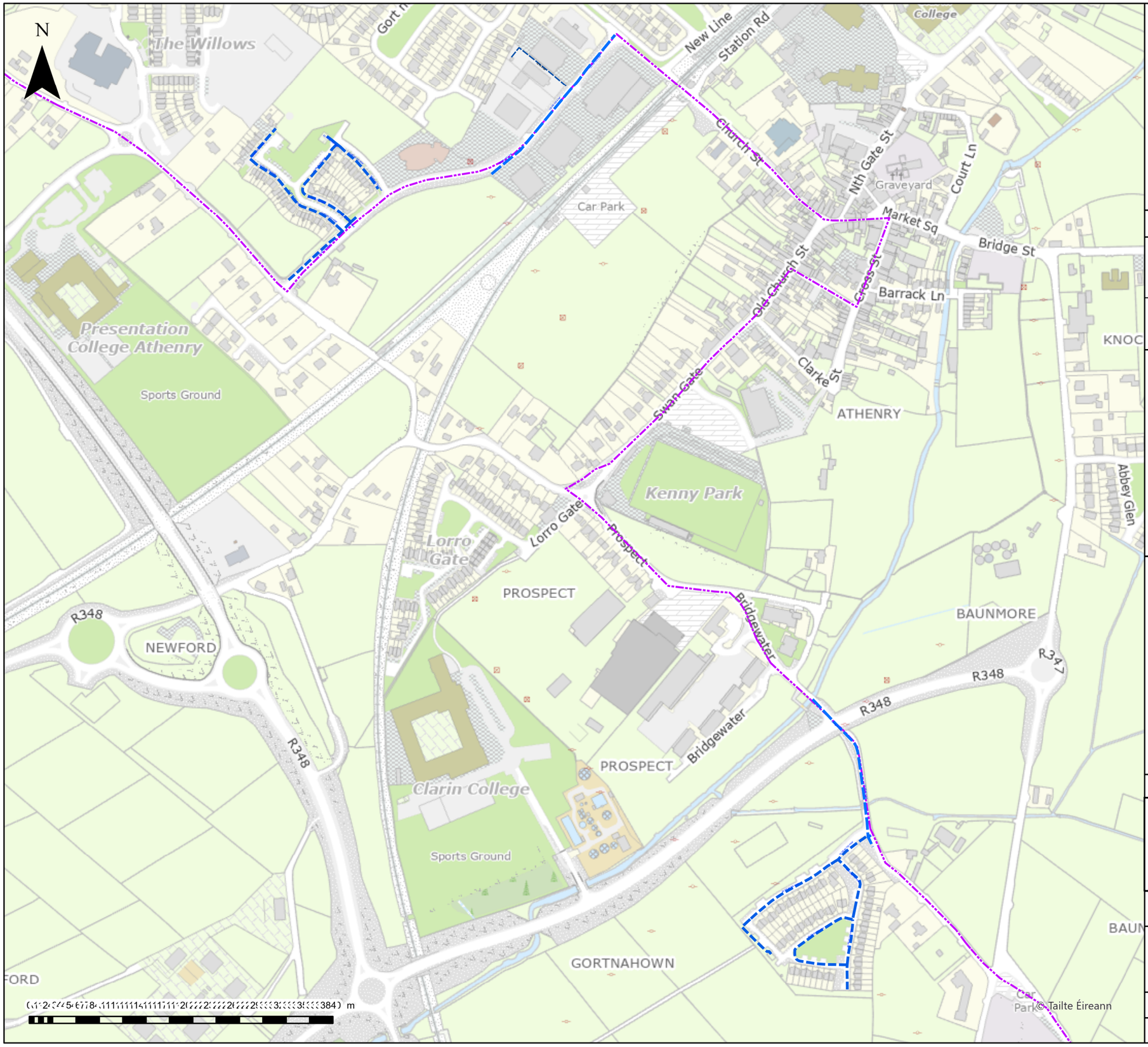
RAHEEN WOOD
THE GLADE
TELSA CHARGING
RAHEEN WOOD HOTEL
PRES COLLEGE
MILLING PLANT
SEWAGE PUMP HOUSE
SECONDARY SCHOOL
ATHENRY PL
UISCE EIR ATHENRY
GORTBRIDE
NEWFORD HOUSE
TEAGASC FARM PL
TEAGASC RECLOSER
TEAGASC W
NEWFORD WEST
COLLEGE STAFF HOUSES
AGR PIGGERY
N6 PL TEAGASC
AGRICULTURAL COLL
FURZYPARK
FARNABLAKE N

HIGH VOLTAGE

IF YOU INTEND WORKING, OR UNDERTAKING DEVELOPMENT WITHIN A CORRIDOR EXTENDING 40 METRES ON EITHER SIDE OF ANY HIGH VOLTAGE OVERHEAD LINES OR WITHIN A CORRIDOR EXTENDING 5 METRES ON EITHER SIDE OF ANY HIGH VOLTAGE UNDERGROUND CABLES YOU MUST CONTACT ESB NETWORKS IN ADVANCE OF WORKS AT 1800 372 757 OR EMAIL DIG@ESB.IE TO AGREE SAFE WORKING PROCEDURES AND NECESSARY CLEARANCES BETWEEN THE LINES AND THE DEVELOPMENT IN ADVANCE OF ANY EXCAVATION.

X,Y: 150431 , 226396



Important Safety Notice: Damage to gas pipelines can result in serious injury or death. Gas network information is provided as a general guide. The exact location and depth of medium or low pressure distribution gas pipes must be verified on site by carrying out necessary investigations, including, for example, hand digging trial holes along the route of the pipe. Service pipes are not generally shown but their presence should always be anticipated.

High pressure transmission pipelines are shown in red. If a transmission pipeline is identified within 10m of any intended excavations then work must not proceed before GNI has been consulted. The true location and depth of a transmission pipeline must be verified on site by a representative of GNI. Contact can be made through 1800 427 747.

All work in the vicinity of the gas network must be completed in accordance with the current edition of the Health and Safety Authority publication, 'Code of Practice For Avoiding Danger From Underground Services' which is available from the Health and Safety Authority (0818 289 389) or can be downloaded at www.hsa.ie.

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- Aurora Telecom Duct
- Aurora Telecom Sub Duct
- Aurora Telecom Inserted Gas Pipe

Aurora TELECOM

Aurora Telecom Queries - 01-8926166 (Office Hours)
Aurora_Network_Queries@gasnetworks.ie
Aurora Telecom Emergency Only 1800 427399 / 01 2030120

- Transmission Pipe (High Pressure)
- Transmission Pipe (Construction Issue)
- Distribution Pipe (Medium Pressure)
- Distribution Pipe (Low Pressure)
- 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	CP Test Point		Protection (Slabbing)
	End Cap		Protection (Sleeve)
	Hot Tap		Reducer
	Installation		Service Terminator
	Valve		Tee
	Mains Verification**		Transition

** Please contact GNI on 1800-427747 for specific information

DIAL BEFORE YOU DIG 1800 42 77 47
In Emergency call 1800 20 50 50 Gas Networks Ireland

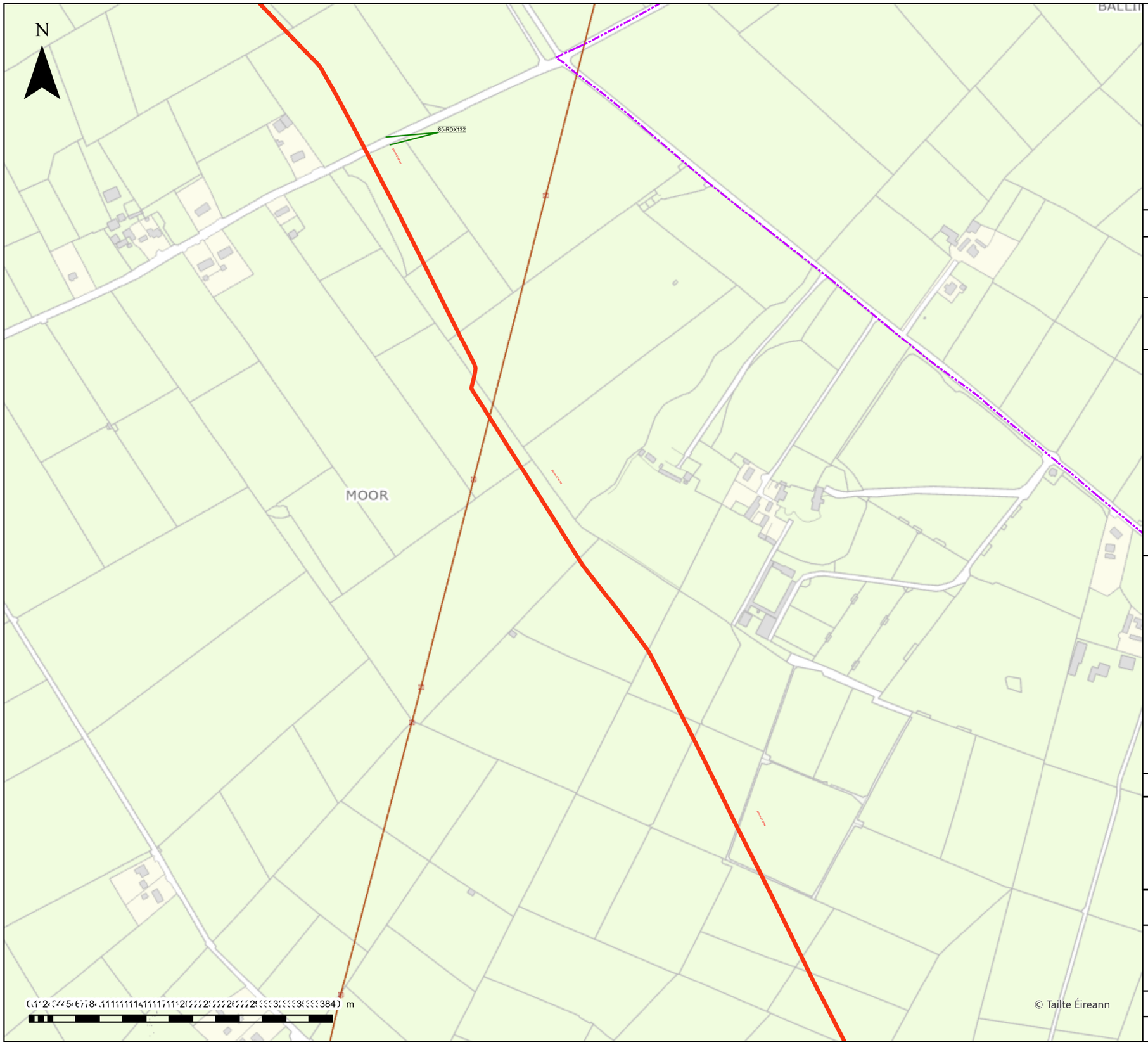
Gas Networks Ireland

GAS NETWORK INFORMATION

Description: test

Location: 549843,727503

Plot Date: 08/05/2025 11:12	Scale: 5000 @ A3
Plotted By: 27582	Ref ID: *27582_08052025111255*



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- Aurora Telecom Sub Duct
- Aurora Telecom Inserted Gas Pipe

Aurora TELECOM

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Aurora Telecom Emergency Only 1800 427399 / 01 2030120

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- Transmission Pipe (Construction Issue)
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- Distribution Pipe (Low Pressure)
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- Service Pipe (Low Pressure)
- Strategic Pipe (Medium Pressure)
- Strategic Pipe (Low Pressure)
- Inserted
- Abandoned Pipe

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

** Please contact GNI on 1800-427747 for specific information

DIAL BEFORE YOU DIG 1800 42 77 47
In Emergency call 1800 20 50 50 Gas Networks Ireland

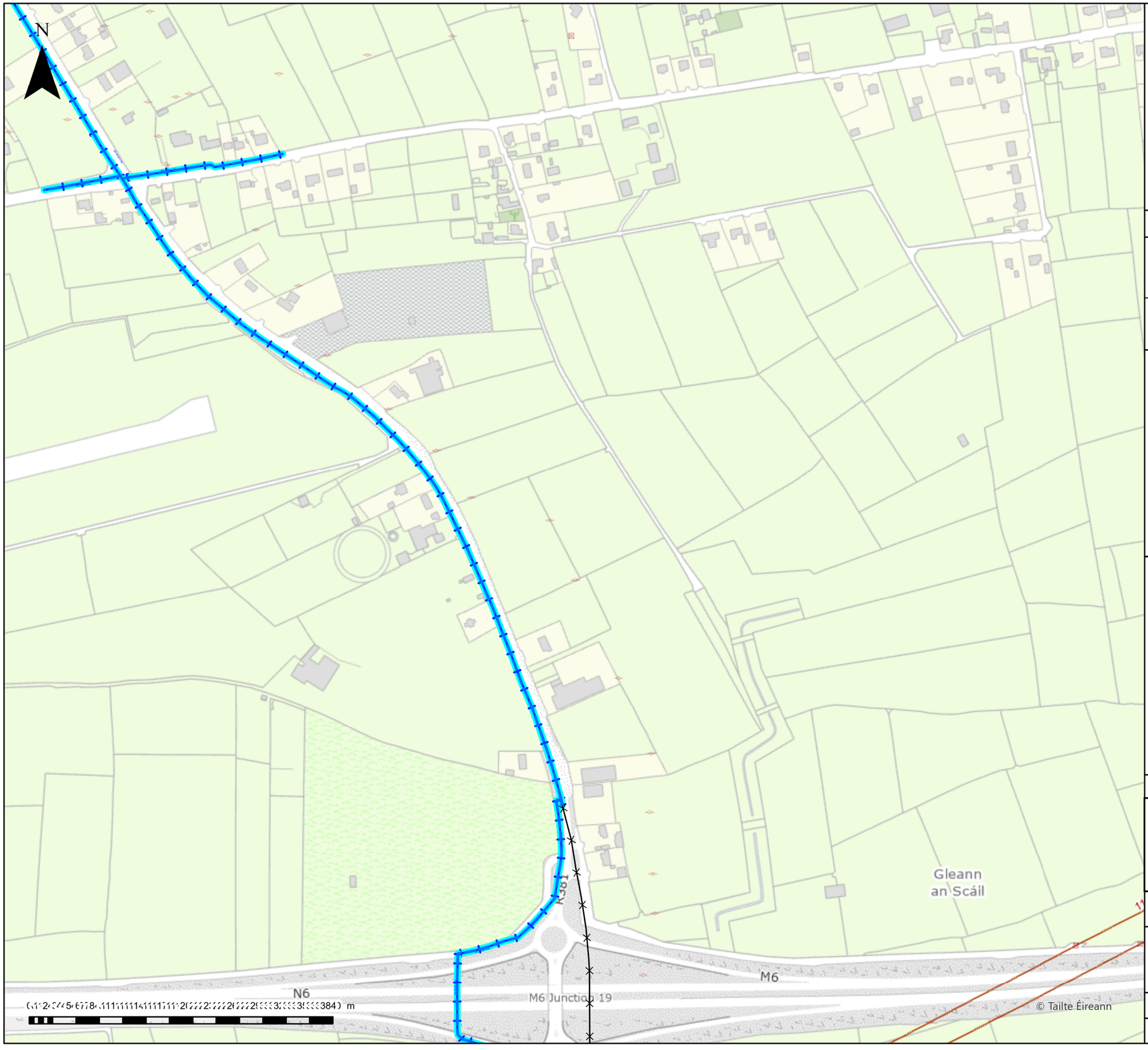
Gas Networks Ireland

GAS NETWORK INFORMATION

Description: test

Location: 544182,730285

Plot Date: 08/05/2025 11:12	Scale: 5000 @ A3
Plotted By: 27582	Ref ID: *27582_08052025111224*



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

** Please contact GNI on 1800-427747 for specific information

DIAL BEFORE YOU DIG 1800 42 77 47
In Emergency call 1800 20 50 50 Gas Networks Ireland

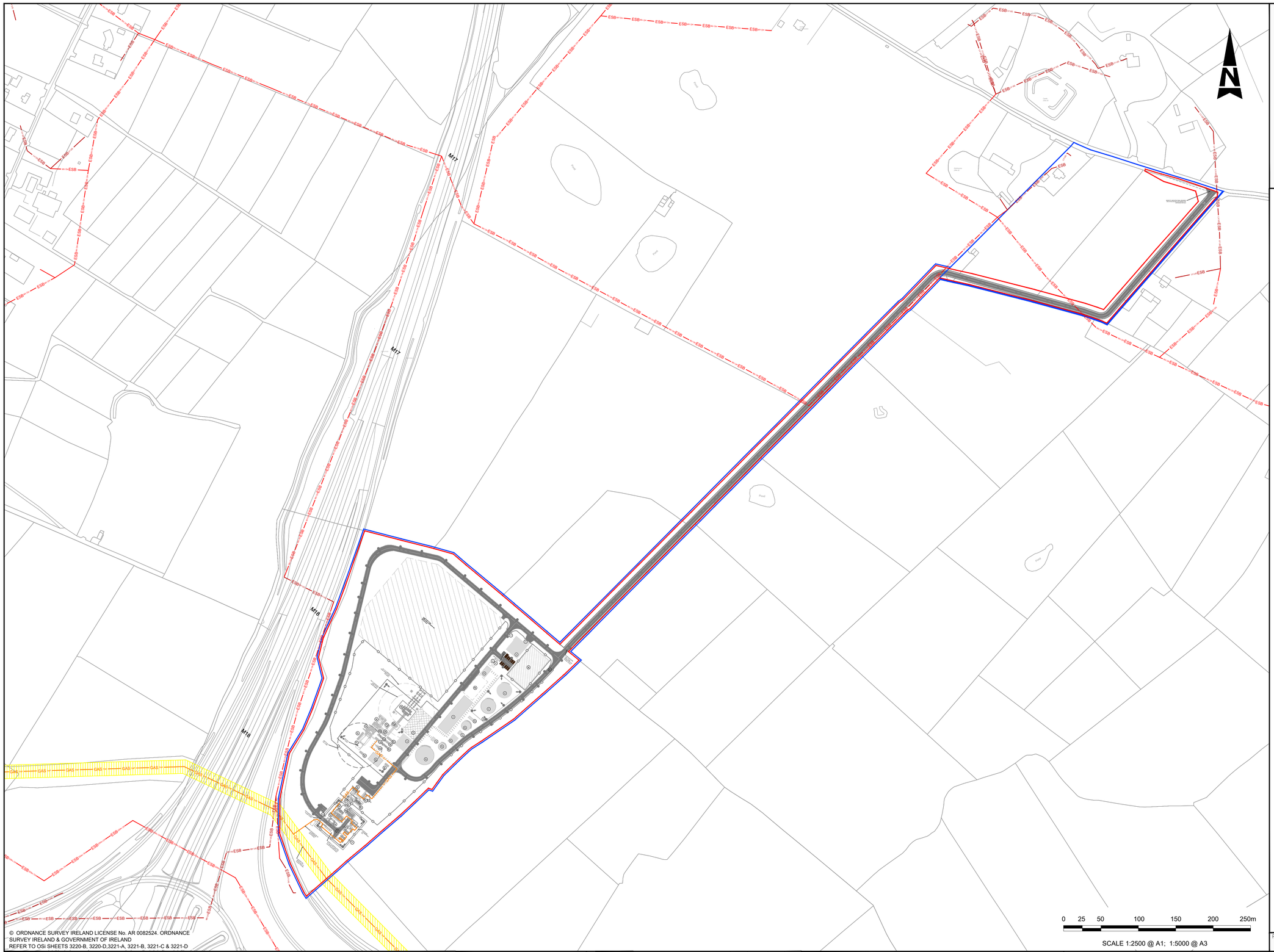
Gas Networks Ireland

GAS NETWORK INFORMATION

Description: test

Location: 538428,728224

Plot Date: 08/05/2025 11:11	Scale: 5000 @ A3
Plotted By: 27582	Ref ID: *27582_08052025111114*



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A1

DO NOT SCALE

GENERAL NOTES

1. ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE
2. ONLY WRITTEN DIMENSIONS SHALL BE USED. NO DIMENSIONS SHALL BE SCALED FROM THE DRAWINGS
3. ALL LEVELS ARE IN METERS AND ARE TO MALIN HEAD DATUM
4. ALL COORDINATES ARE IN METERS AND ARE TO IRISH TRANSVERSE MERCATOR
5. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE SPECIFICATION
6. THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSES OF THE PLANNING APPLICATION AND IS SUBJECT TO DETAILED DESIGN.

LEGEND:

- PROJECT BOUNDARY FOR PLANNING
- LAND OWNERSHIP BOUNDARY
- EXISTING ESB LV UNDERGROUND
- EXISTING ESB MV UNDERGROUND
- EXISTING ESB MV OVERHEAD
- EXISTING ESB 220kV OVERHEAD
- EXISTING GAS MAIN
- WAYLEAVE

Rev	Description	By	Date	Chk'd	Auth
0	ISSUED FOR PLANNING	PS	01.12.25	ND	AJB

AtkinsRéalis
DUBLIN | CORK | GALWAY | DUNDALK
ATKINS HOUSE,150 AIRSIDE BUSINESS PARK, SWORDS, DUBLIN, K67 K5W4.
Tel : +353 1 810 8000 Email : info.ie@atkinsréalis.com

Client: Bord Gáis Energy

Project: CASHLA PEAKER PLANT
Rathmorrissy and Pollnagroagh (Townlands), Athenry, Co. Galway.

Purpose: PLANNING

Title: EXISTING ESB INFRASTRUCUTRE

Original Scale	Design/Drawn	Checked	Authorised
1:2500 at A1	PS Date 01.12.25	ND Date 01.12.25	AJB Date 01.12.25

Status	Drawing Number	Rev
A2	PEK3-ATK-ZZ-01-DR-CE-902711	0

File: PEK3-ATK-ZZ-01-DR-CE-902711.dwg Plotted by: DEWH1347
Date: Feb 09, 2026 - 12:04pm

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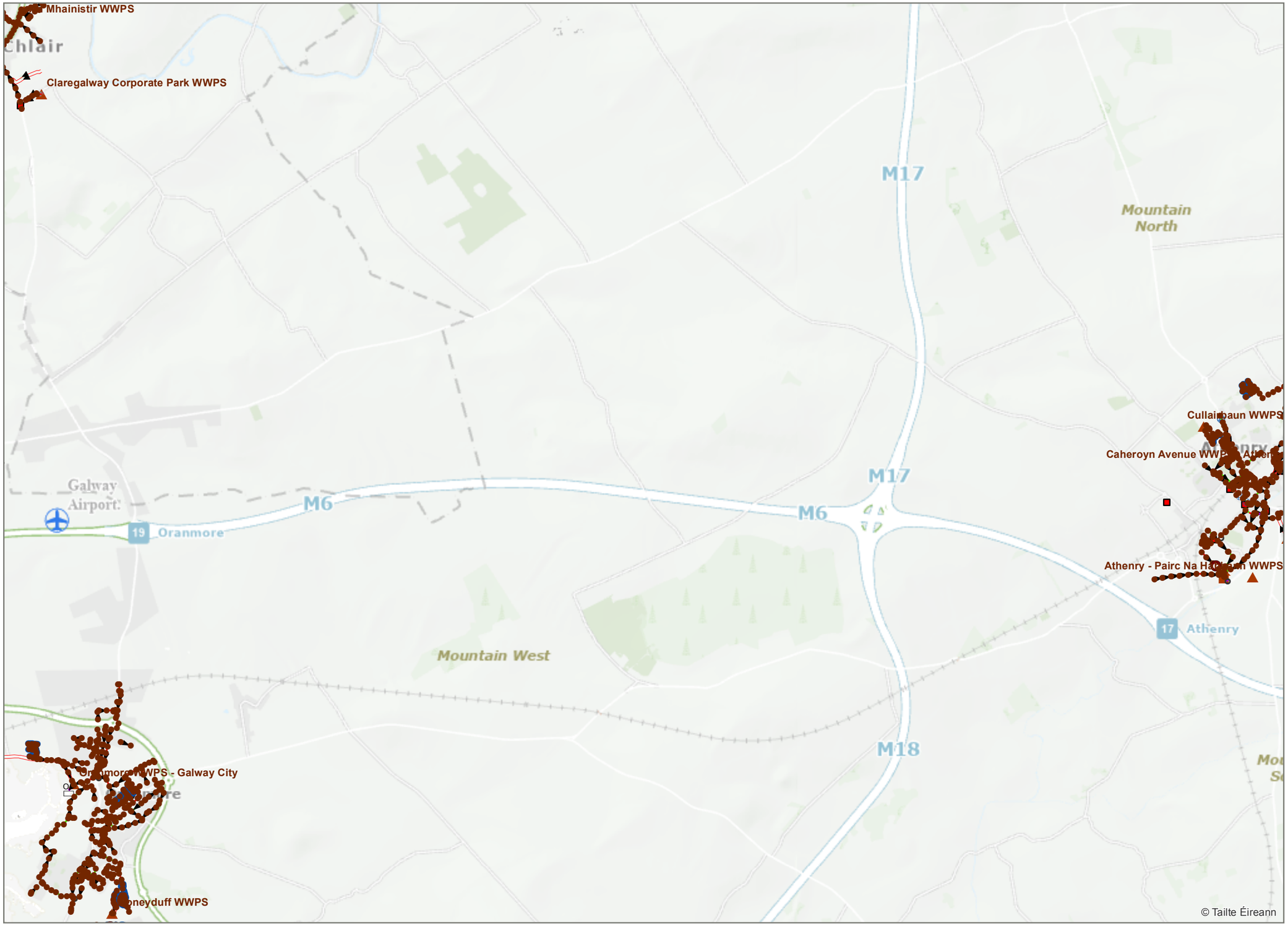

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Sewer Network
Athenry-Oranmore, Co.Galway

Uisce Éireann
Irish Water

- Backdrop
  - Other; Unknown

Sewer Discharge Points
- Overflow
- Other; Unknown

Sewer Inlets
- Gully
- Other; Unknown

Sewer Fittings
- Vent/Col
- Other; Unknown

Sewer Mains (Irish Water)
- Gravity - Combined
- Gravity - Foul
- Gravity - Overflow
- Gravity - Unknown
- Pumping - Foul

Sewer Mains (Private)
- Gravity - Foul
- Pumping - Foul

Sewer Lateral Lines
- Sewer Lateral Lines

Pump Station
- Pump Station

Waste Water Treatment Plant
- Waste Water Treatment Plant

0 325 650 1,300 m

Coordinate System: TM65 Irish Grid
Projection: Transverse Mercator

Scale @ A3:	1:40,000
Drawing No.:	IW-AGG-2023-000
Drawn By:	RG
Checked By:	<Add Name>
Approved By:	<Add Name>
Drawn Date	01/05/2025
Checked Date:	<dd/mm/yyyy>
Approved Date:	<dd/mm/yyyy>

DRAFT

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Water Distribution
Athenry-Oranmore, Co.Galway

Uisce Éireann
Irish Water

- Group Scheme

Boundary Meter
- District (Boundary Meter)

Water Hydrants
- Fire Hydrant
- Washout

Reservoir
- Potable

Pump Stations
- Pump Stations

Water Network Structures
- Water Network Structures

Abstraction Point
- Abstraction Point

Kisok
- Kisok

Water Fittings
- Cap
- Other Fitting

Water Mains(Irish Water Owned)
- Potable Water

Water Mains(Non Irish Water Owned)
- Potable Water

Water Abandoned Lines
- Water Abandoned Lines

0 325 650 1,300 m

Coordinate System: TM65 Irish Grid
Projection: Transverse Mercator

Scale @ A3:	1:40,000
Drawing No.:	IW-AGG-2023-000
Drawn By:	RG
Checked By:	<Add Name>
Approved By:	<Add Name>
Drawn Date	01/05/2025
Checked Date:	<dd/mm/yyyy>
Approved Date:	<dd/mm/yyyy>

DRAFT

Appendix B. Met Eireann Rainfall Data

Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 146600, Northing: 228137,

	Interval		Years									
DURATION	6months,	1year,	2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	120,
5 mins	2.7,	3.7,	4.2,	4.9,	5.4,	5.8,	7.1,	8.4,	9.3,	10.5,	11.6,	12.5,	13.0,
10 mins	3.8,	5.1,	5.8,	6.9,	7.6,	8.1,	9.8,	11.7,	13.0,	14.7,	16.2,	17.4,	18.1,
15 mins	4.4,	6.0,	6.9,	8.1,	8.9,	9.5,	11.6,	13.8,	15.3,	17.3,	19.1,	20.4,	21.3,
30 mins	5.9,	7.9,	8.9,	10.4,	11.4,	12.2,	14.7,	17.4,	19.1,	21.5,	23.6,	25.3,	26.3,
1 hours	7.8,	10.3,	11.6,	13.4,	14.7,	15.6,	18.6,	21.8,	23.9,	26.8,	29.3,	31.2,	32.5,
2 hours	10.3,	13.4,	15.0,	17.3,	18.8,	19.9,	23.6,	27.5,	30.0,	33.4,	36.4,	38.6,	40.1,
3 hours	12.1,	15.6,	17.4,	20.0,	21.7,	23.0,	27.1,	31.4,	34.2,	38.0,	41.2,	43.7,	45.3,
4 hours	13.6,	17.5,	19.4,	22.2,	24.1,	25.5,	29.9,	34.6,	37.5,	41.6,	45.1,	47.7,	49.5,
6 hours	16.0,	20.4,	22.6,	25.8,	27.9,	29.4,	34.3,	39.5,	42.8,	47.3,	51.1,	54.0,	55.9,
9 hours	18.8,	23.8,	26.3,	29.9,	32.2,	34.0,	39.4,	45.2,	48.8,	53.8,	58.0,	61.2,	63.3,
12 hours	21.1,	26.6,	29.3,	33.2,	35.7,	37.6,	43.5,	49.7,	53.6,	58.9,	63.4,	66.8,	69.0,
18 hours	24.9,	31.1,	34.2,	38.5,	41.3,	43.4,	49.9,	56.8,	61.1,	67.0,	71.9,	75.6,	78.1,
24 hours	27.9,	34.7,	38.0,	42.8,	45.8,	48.1,	55.1,	62.5,	67.1,	73.3,	78.6,	82.6,	85.2,
2 days	36.3,	44.4,	48.2,	53.7,	57.2,	59.8,	67.8,	76.1,	81.2,	88.1,	93.9,	98.2,	101.0,
3 days	43.5,	52.5,	56.9,	62.9,	66.8,	69.6,	78.4,	87.5,	93.1,	100.5,	106.7,	111.4,	114.4,
4 days	49.9,	59.8,	64.6,	71.2,	75.4,	78.5,	88.0,	97.7,	103.7,	111.6,	118.3,	123.2,	126.4,
6 days	61.7,	73.1,	78.6,	86.1,	90.9,	94.4,	105.1,	116.0,	122.7,	131.5,	138.8,	144.3,	147.8,
8 days	72.4,	85.2,	91.3,	99.7,	104.9,	108.8,	120.5,	132.5,	139.8,	149.3,	157.3,	163.2,	167.1,
10 days	82.6,	96.6,	103.2,	112.3,	118.0,	122.3,	135.0,	147.8,	155.7,	165.9,	174.5,	180.8,	184.9,
12 days	92.3,	107.5,	114.6,	124.4,	130.5,	135.0,	148.6,	162.4,	170.7,	181.6,	190.7,	197.3,	201.7,
16 days	110.9,	128.1,	136.2,	147.3,	154.1,	159.2,	174.4,	189.7,	198.9,	211.0,	221.0,	228.3,	233.1,
20 days	128.6,	147.8,	156.8,	168.9,	176.5,	182.0,	198.7,	215.4,	225.4,	238.5,	249.4,	257.3,	262.5,
25 days	150.1,	171.5,	181.4,	194.9,	203.2,	209.3,	227.6,	245.9,	256.9,	271.2,	283.0,	291.6,	297.2,

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 C. Storm sewer calculations

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	5	Maximum Rainfall (mm/hr)	250.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	Scotland and Ireland	Connection Type	Level Soffits
M5-60 (mm)	15.600	Minimum Backdrop Height (m)	0.200
Ratio-R	0.260	Preferred Cover Depth (m)	1.200
CV	1.000	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
3	0.077	5.00	57.465		546483.757	728254.957	1.050
1	0.033	5.00	57.013		546518.316	728237.837	1.050
4	0.053	5.00	57.383	1200	546468.272	728188.687	2.049
5	0.056	5.00	56.858		546441.692	728116.310	2.117
6	0.029	5.00	56.451		546417.414	728068.171	2.125
7	0.059	5.00	56.139		546415.612	728029.722	2.109
8	0.024	5.00	56.061		546427.121	728007.333	2.225
12			56.056	1200	546420.387	727981.144	2.066
15			56.722	1200	546475.478	728048.112	3.446
16	0.028	5.00	56.838	1200	546447.690	728094.346	1.350
17	0.014	5.00	56.493	1200	546509.135	728042.209	1.811
21	0.046	5.00	56.505	1200	546501.650	728026.108	3.717
22	0.058	5.00	56.283	1200	546529.759	728059.174	3.619
23	0.063	5.00	55.706	1200	546586.686	728127.419	3.296
59	0.065	5.00	55.236	1200	546631.348	728179.844	3.053
37	0.024	5.00	57.090		546523.011	728254.559	1.050
38	0.060	5.00	57.283	1200	546490.532	728274.309	1.623
39	0.085	5.00	56.603	1200	546509.418	728340.613	1.634
41	0.082	5.00	56.052	1200	546588.817	728333.114	1.976
2			57.352	1200	546477.322	728190.302	1.947
46	0.008	5.00	53.906	1200	546684.416	728258.568	1.668
55	0.051	5.00	53.664	1200	546685.671	728246.559	3.008
60	0.017	5.00	54.080	1200	546669.723	728226.416	3.529
49	0.050	5.00	55.829	1200	546572.792	728052.771	1.664
50	0.056	5.00	55.212	1200	546624.464	728100.273	1.560
51	0.048	5.00	54.543	1200	546696.092	728152.365	2.121
40	0.044	5.00	57.033		546526.008	728258.431	1.050
53	0.044	5.00	52.995	1200	546745.329	728206.618	1.775
68		5.00	51.108	1200	546721.109	728183.949	0.680
54	0.016	5.00	53.563	1200	546695.858	728245.794	2.869
68_OUT			51.108	1200	546723.869	728181.369	0.717
67			52.980	1200	546695.996	728204.581	2.543
67_OUT	0.057		51.108	1200	546698.578	728202.431	0.680
10	0.026	5.00	56.308	1200	546489.685	727969.396	0.900
11	0.017	5.00	55.306	1200	546458.111	727942.365	0.900
48			55.982	1200	546560.006	728047.986	1.589
47	0.022	5.00	56.176	1200	546541.540	728058.978	1.425
52	0.018	5.00	53.102	1200	546742.466	728197.796	1.575
25	1.062	5.00	56.425	1200	546515.102	728044.830	1.725
26			55.911	1200	546568.842	728108.690	1.725

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Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
27			55.329	1500	546624.649	728174.829	1.725
30			55.259	1500	546626.506	728170.450	2.184
28	0.156	5.00	56.283	1200	546526.572	728052.622	1.500
29	0.078	5.00	55.784	1200	546577.586	728114.511	1.500
36			55.213	1500	546630.862	728175.555	4.146
36_OUT			55.385	1200	546635.223	728171.525	4.330
35			54.081	1200	546669.037	728222.328	2.386
42			56.176	1200	546591.384	728341.483	2.152
24	0.117	5.00	55.303	1500	546624.981	728172.351	3.062
34			53.605	1200	546681.560	728224.386	1.825
31	0.043	5.00	53.217	1200	546700.336	728210.039	0.750
32	0.006	5.00	53.225	1200	546715.293	728228.218	0.993
33	0.057	5.00	53.518	1200	546696.736	728242.848	1.597
66			53.672	1200	546677.753	728219.758	3.156
44			54.341		546645.968	728303.279	1.103
43			56.605		546605.537	728337.243	2.695
45			53.633	1200	546690.672	728265.595	1.323
18	0.055	5.00	56.512	1200	546506.789	728039.440	1.866
9			56.045	1200	546433.927	728015.493	2.291
14			55.981	1200	546442.581	728008.872	2.311
13			56.010	1200	546428.017	727990.813	2.190
61	0.007	5.00	53.608	450	546679.614	728199.691	0.700
62			53.874	450	546673.333	728204.719	1.092
64			53.892	1200	546678.561	728211.123	1.159
63	0.009	5.00	53.660	450	546684.743	728206.020	0.700

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1	1	2	62.781	1.500	55.963	55.480	0.483	130.0	150	6.36	51.8
2	2	4	9.193	0.600	55.405	55.334	0.071	130.0	225	6.50	51.3
3	3	4	68.055	1.500	56.415	55.334	1.081	63.0	150	6.03	52.9
4	4	5	77.150	1.500	55.334	54.741	0.593	130.0	150	8.17	46.7
5	5	6	53.921	1.500	54.741	54.326	0.415	130.0	150	9.34	44.1
6	6	7	38.493	1.500	54.326	54.030	0.296	130.0	150	10.18	42.4
7	7	8	25.174	1.500	54.030	53.836	0.194	130.0	150	10.73	41.4
8	8	9	10.626	1.500	53.836	53.754	0.082	130.0	150	10.96	41.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1	0.767	13.6	6.2	0.900	1.722	0.033	0.0	71	0.750
2	1.145	45.5	6.2	1.722	1.824	0.033	0.0	56	0.805
3	1.105	19.5	14.7	0.900	1.899	0.077	0.0	98	1.216
4	0.767	13.6	27.6	1.899	1.967	0.163	0.0	150	0.782
5	0.767	13.6	35.0	1.967	1.975	0.220	0.0	150	0.782
6	0.767	13.6	38.1	1.975	1.959	0.249	0.0	150	0.782
7	0.767	13.6	46.0	1.959	2.075	0.308	0.0	150	0.782
8	0.767	13.6	49.1	2.075	2.141	0.332	0.0	150	0.782

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Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
9	9	14	10.896	1.500	53.754	53.670	0.084	130.0	150	11.19	40.6
10	10	11	41.564	1.500	55.408	54.406	1.002	41.5	150	5.51	54.7
11	11	12	54.103	0.600	54.406	53.990	0.416	130.0	150	6.53	51.2
12	12	13	12.317	1.500	53.990	53.895	0.095	130.0	150	6.80	50.4
13	13	14	23.200	1.500	53.820	53.670	0.150	154.7	225	7.22	49.2
14	14	15	51.209	1.500	53.670	53.276	0.394	130.0	150	12.31	38.8
15	15	21	34.193	0.600	53.276	53.013	0.263	130.0	150	12.95	37.8
16	16	17	80.603	1.500	55.488	54.682	0.806	100.0	150	6.53	51.2
17	17	18	3.630	1.500	54.682	54.646	0.036	100.0	150	6.60	51.0
18	18	21	14.288	0.600	54.646	54.503	0.143	100.0	150	6.84	50.3
21	21	22	43.401	0.600	52.788	52.664	0.124	350.0	375	13.71	36.8
22	22	23	88.873	0.600	52.664	52.410	0.254	350.0	375	15.24	34.9
23	23	24	59.037	0.600	52.410	52.241	0.169	350.0	375	16.27	33.8
24	24	36	6.697	0.600	52.241	52.203	0.038	175.0	375	16.35	33.7
25	25	26	83.463	0.600	54.700	54.186	0.514	162.4	525	5.79	53.7
26	26	27	86.541	0.600	54.186	53.604	0.582	148.7	525	6.58	51.1
27	27	36	6.255	0.600	53.604	53.488	0.116	53.9	525	6.61	51.0
28	28	29	80.204	0.600	54.783	54.284	0.499	160.7	300	6.08	52.7
29	29	30	74.312	0.600	54.284	53.075	1.209	61.5	300	6.70	50.7
30	30	36	6.711	0.600	53.075	53.010	0.065	103.2	300	6.77	50.5
31	31	32	23.541	0.600	52.467	52.232	0.235	100.0	150	5.39	55.1
32	32	33	23.630	0.600	52.232	51.996	0.236	100.0	150	5.78	53.7
33	33	34	23.899	0.600	51.921	51.780	0.141	170.0	225	6.18	52.4

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
9	0.767	13.6	48.7	2.141	2.161	0.332	0.0	150	0.782
10	1.363	24.1	5.2	0.750	0.750	0.026	0.0	47	1.081
11	0.880	15.5	7.9	0.750	1.916	0.043	0.0	76	0.884
12	0.767	13.6	7.8	1.916	1.965	0.043	0.0	82	0.795
13	0.922	36.7	7.6	1.965	2.086	0.043	0.0	70	0.729
14	0.767	13.6	52.5	2.161	3.296	0.375	0.0	150	0.782
15	0.880	15.5	51.2	3.296	3.342	0.375	0.0	150	0.896
16	0.876	15.5	5.2	1.200	1.661	0.028	0.0	60	0.789
17	0.876	15.5	7.8	1.661	1.716	0.042	0.0	75	0.877
18	1.005	17.8	17.6	1.716	1.852	0.097	0.0	122	1.142
21	0.963	106.3	68.8	3.342	3.244	0.518	0.0	220	1.022
22	0.963	106.3	72.6	3.244	2.921	0.576	0.0	228	1.033
23	0.963	106.3	77.9	2.921	2.687	0.639	0.0	239	1.048
24	1.366	150.9	91.9	2.687	2.635	0.755	0.0	211	1.430
25	1.755	379.9	205.9	1.200	1.200	1.062	0.0	276	1.788
26	1.834	397.1	196.1	1.200	1.200	1.062	0.0	261	1.829
27	3.055	661.2	195.7	1.200	1.200	1.062	0.0	195	2.677
28	1.237	87.5	29.8	1.200	1.200	0.156	0.0	120	1.122
29	2.009	142.0	43.0	1.200	1.884	0.234	0.0	113	1.767
30	1.547	109.3	42.8	1.884	1.903	0.234	0.0	130	1.456
31	1.005	17.8	8.6	0.600	0.843	0.043	0.0	74	0.996
32	1.005	17.8	9.6	0.843	1.372	0.049	0.0	78	1.022
33	1.000	39.7	20.1	1.372	1.600	0.106	0.0	114	1.004

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Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
34	34	35	12.691	0.600	51.780	51.695	0.085	150.0	225	6.38	51.7
35	35	36	60.374	0.600	51.695	51.292	0.403	149.8	225	7.32	48.9
36	36	36_OUT	5.938	0.600	51.067	51.055	0.012	500.0	525	16.45	33.6
37	37	38	38.012	1.500	56.040	55.660	0.380	100.0	150	5.72	53.9
38	38	39	69.067	1.500	55.660	54.969	0.691	100.0	150	7.04	49.7
39	39	41	81.848	1.500	54.969	54.151	0.818	100.0	150	8.60	45.7
40	40	41	97.583	1.500	55.983	54.151	1.832	53.3	150	6.35	51.8
41	41	42	8.759	1.500	54.076	54.024	0.052	170.0	225	8.76	45.3
42	42	43	14.774	1.500	54.024	53.910	0.114	130.0	150	9.08	44.6
43	43	44	52.804	1.500	53.910	53.238	0.672	78.6	150	9.97	42.8
44	44	45	58.468	1.500	53.238	52.385	0.853	68.5	150	10.89	41.1
45	45	46	9.408	1.500	52.310	52.238	0.072	130.0	225	11.05	40.8
46	46	55	12.074	0.600	52.238	52.145	0.093	130.0	225	11.22	40.5
47	47	48	21.490	0.600	54.751	54.393	0.358	60.0	225	5.21	55.8
48	48	49	13.652	0.600	54.393	54.165	0.228	60.0	225	5.35	55.3
49	49	50	70.399	1.500	54.198	53.652	0.546	128.9	225	6.51	51.3
50	50	51	88.595	1.500	53.652	52.572	1.080	82.0	225	7.67	48.0
51	51	52	64.994	1.500	52.422	51.527	0.895	72.6	375	8.25	46.5
52	52	53	9.279	0.600	51.527	51.220	0.307	30.2	375	8.29	46.4
53	53	54	63.104	0.600	51.220	50.694	0.526	120.0	375	8.93	45.0
54	54	55	10.216	1.500	50.694	50.660	0.034	300.0	375	9.12	44.6
55	55	60	25.692	0.600	50.656	50.551	0.105	244.7	375	11.60	39.9
24a	24	59	9.833	0.600	52.241	52.183	0.058	170.0	375	5.12	56.2
27a	27	59	8.368	0.600	53.604	53.588	0.016	520.0	525	5.14	56.1

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
34	1.065	42.3	19.9	1.600	2.161	0.106	0.0	109	1.049
35	1.066	42.4	18.8	2.161	3.696	0.106	0.0	105	1.035
36	0.995	215.3	261.8	3.621	3.805	2.158	0.0	525	1.004
37	0.876	15.5	4.7	0.900	1.473	0.024	0.0	57	0.765
38	0.876	15.5	15.1	1.473	1.484	0.084	0.0	120	0.999
39	0.876	15.5	28.0	1.484	1.751	0.169	0.0	150	0.893
40	1.202	21.2	8.2	0.900	1.751	0.044	0.0	65	1.124
41	0.879	35.0	48.4	1.751	1.927	0.295	0.0	225	0.896
42	0.767	13.6	47.6	2.002	2.545	0.295	0.0	150	0.782
43	0.989	17.5	45.7	2.545	0.953	0.295	0.0	150	1.008
44	1.059	18.7	43.8	0.953	1.098	0.295	0.0	150	1.079
45	1.006	40.0	43.6	1.098	1.443	0.295	0.0	225	1.025
46	1.145	45.5	44.4	1.443	1.294	0.304	0.0	181	1.299
47	1.691	67.2	4.5	1.200	1.364	0.022	0.0	39	0.967
48	1.691	67.2	4.4	1.364	1.439	0.022	0.0	39	0.967
49	1.010	40.2	13.4	1.406	1.335	0.072	0.0	89	0.908
50	1.268	50.4	22.2	1.335	1.746	0.128	0.0	104	1.226
51	1.883	207.9	29.6	1.746	1.200	0.176	0.0	96	1.342
52	3.306	365.1	32.6	1.200	1.400	0.195	0.0	75	2.076
53	1.653	182.5	38.7	1.400	2.494	0.238	0.0	117	1.323
54	0.924	102.0	40.9	2.494	2.629	0.254	0.0	165	0.874
55	1.154	127.4	87.7	2.633	3.154	0.609	0.0	229	1.240
24a	1.386	153.1	0.0	2.687	2.678	0.000	0.0	0	0.000
27a	0.975	211.1	0.0	1.200	1.123	0.000	0.0	0	0.000

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Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
30a	30	59	10.579	0.600	53.075	52.899	0.176	60.0	300	5.09	56.3
59	59	60	60.346	0.600	52.183	51.843	0.340	177.5	375	5.88	53.4
60	60	66	10.433	0.600	50.551	50.516	0.035	300.2	375	11.76	39.6
61	61	62	8.045	0.600	52.908	52.828	0.080	100.0	100	5.17	56.0
62	62	64	8.267	0.600	52.782	52.733	0.049	170.0	225	5.31	55.4
63	63	64	8.017	0.600	52.960	52.858	0.102	78.6	100	5.15	56.1
64	64	66	8.673	0.600	52.733	52.547	0.186	46.6	225	5.39	55.1
34a	34	66	5.993	0.600	51.780	51.720	0.060	100.0	225	5.08	56.4
66	66	67	23.732	0.600	50.516	50.437	0.079	300.2	375	12.14	39.0
67	67	67_OUT	3.360	0.600	50.437	50.428	0.009	373.3	375	12.20	38.9
68	68	68_OUT	3.778	0.600	50.428	50.391	0.037	102.1	225	5.05	56.5

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
30a	2.033	143.7	0.0	1.884	2.037	0.000	0.0	0	0.000
59	1.357	149.8	12.5	2.678	1.862	0.065	0.0	73	0.835
60	1.040	114.9	98.9	3.154	2.781	0.691	0.0	269	1.164
61	0.769	6.0	1.5	0.600	0.946	0.007	0.0	34	0.637
62	1.000	39.7	1.5	0.867	0.934	0.007	0.0	29	0.477
63	0.869	6.8	1.7	0.600	0.934	0.009	0.0	35	0.729
64	1.920	76.3	3.2	0.934	0.900	0.016	0.0	31	0.956
34a	1.307	52.0	0.0	1.600	1.727	0.000	0.0	0	0.000
66	1.040	114.9	99.7	2.781	2.168	0.707	0.0	271	1.166
67	0.932	102.9	99.5	2.168	0.305	0.707	0.0	298	1.055
68	1.293	51.4	0.0	0.455	0.492	0.000	0.0	0	0.000

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1	62.781	130.0	150	Filterdrain	57.013	55.963	0.900	57.352	55.480	1.722
2	9.193	130.0	225	Carrierdrain	57.352	55.405	1.722	57.383	55.334	1.824
3	68.055	63.0	150	Filterdrain	57.465	56.415	0.900	57.383	55.334	1.899
4	77.150	130.0	150	Filterdrain	57.383	55.334	1.899	56.858	54.741	1.967
5	53.921	130.0	150	Filterdrain	56.858	54.741	1.967	56.451	54.326	1.975
6	38.493	130.0	150	Filterdrain	56.451	54.326	1.975	56.139	54.030	1.959
7	25.174	130.0	150	Filterdrain	56.139	54.030	1.959	56.061	53.836	2.075
8	10.626	130.0	150	Filterdrain	56.061	53.836	2.075	56.045	53.754	2.141
9	10.896	130.0	150	Filterdrain	56.045	53.754	2.141	55.981	53.670	2.161

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1	1		Junction		2	1200	Manhole	Adoptable
2	2	1200	Manhole	Adoptable	4	1200	Manhole	Adoptable
3	3		Junction		4	1200	Manhole	Adoptable
4	4	1200	Manhole	Adoptable	5		Junction	
5	5		Junction		6		Junction	
6	6		Junction		7		Junction	
7	7		Junction		8		Junction	
8	8		Junction		9	1200	Manhole	Adoptable
9	9	1200	Manhole	Adoptable	14	1200	Manhole	Adoptable

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Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
10	41.564	41.5	150	Filterdrain	56.308	55.408	0.750	55.306	54.406	0.750
11	54.103	130.0	150	Carrierdrain	55.306	54.406	0.750	56.056	53.990	1.916
12	12.317	130.0	150	Filterdrain	56.056	53.990	1.916	56.010	53.895	1.965
13	23.200	154.7	225	Filterdrain	56.010	53.820	1.965	55.981	53.670	2.086
14	51.209	130.0	150	Filterdrain	55.981	53.670	2.161	56.722	53.276	3.296
15	34.193	130.0	150	Carrierdrain	56.722	53.276	3.296	56.505	53.013	3.342
16	80.603	100.0	150	Filterdrain	56.838	55.488	1.200	56.493	54.682	1.661
17	3.630	100.0	150	Filterdrain	56.493	54.682	1.661	56.512	54.646	1.716
18	14.288	100.0	150	Carrierdrain	56.512	54.646	1.716	56.505	54.503	1.852
21	43.401	350.0	375	Carrierdrain	56.505	52.788	3.342	56.283	52.664	3.244
22	88.873	350.0	375	Carrierdrain	56.283	52.664	3.244	55.706	52.410	2.921
23	59.037	350.0	375	Carrierdrain	55.706	52.410	2.921	55.303	52.241	2.687
24	6.697	175.0	375	Carrierdrain	55.303	52.241	2.687	55.213	52.203	2.635
25	83.463	162.4	525	Carrierdrain	56.425	54.700	1.200	55.911	54.186	1.200
26	86.541	148.7	525	Carrierdrain	55.911	54.186	1.200	55.329	53.604	1.200
27	6.255	53.9	525	Carrierdrain	55.329	53.604	1.200	55.213	53.488	1.200
28	80.204	160.7	300	Carrierdrain	56.283	54.783	1.200	55.784	54.284	1.200
29	74.312	61.5	300	Carrierdrain	55.784	54.284	1.200	55.259	53.075	1.884
30	6.711	103.2	300	Carrierdrain	55.259	53.075	1.884	55.213	53.010	1.903
31	23.541	100.0	150	Carrierdrain	53.217	52.467	0.600	53.225	52.232	0.843
32	23.630	100.0	150	Carrierdrain	53.225	52.232	0.843	53.518	51.996	1.372
33	23.899	170.0	225	Carrierdrain	53.518	51.921	1.372	53.605	51.780	1.600
34	12.691	150.0	225	Carrierdrain	53.605	51.780	1.600	54.081	51.695	2.161
35	60.374	149.8	225	Carrierdrain	54.081	51.695	2.161	55.213	51.292	3.696

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
10	10	1200	Manhole	Adoptable	11	1200	Manhole	Adoptable
11	11	1200	Manhole	Adoptable	12	1200	Manhole	Adoptable
12	12	1200	Manhole	Adoptable	13	1200	Manhole	Adoptable
13	13	1200	Manhole	Adoptable	14	1200	Manhole	Adoptable
14	14	1200	Manhole	Adoptable	15	1200	Manhole	Adoptable
15	15	1200	Manhole	Adoptable	21	1200	Manhole	Adoptable
16	16	1200	Manhole	Adoptable	17	1200	Manhole	Adoptable
17	17	1200	Manhole	Adoptable	18	1200	Manhole	Adoptable
18	18	1200	Manhole	Adoptable	21	1200	Manhole	Adoptable
21	21	1200	Manhole	Adoptable	22	1200	Manhole	Adoptable
22	22	1200	Manhole	Adoptable	23	1200	Manhole	Adoptable
23	23	1200	Manhole	Adoptable	24	1500	Manhole	Adoptable
24	24	1500	Manhole	Adoptable	36	1500	Manhole	Adoptable
25	25	1200	Manhole	Adoptable	26	1200	Manhole	Adoptable
26	26	1200	Manhole	Adoptable	27	1500	Manhole	Adoptable
27	27	1500	Manhole	Adoptable	36	1500	Manhole	Adoptable
28	28	1200	Manhole	Adoptable	29	1200	Manhole	Adoptable
29	29	1200	Manhole	Adoptable	30	1500	Manhole	Adoptable
30	30	1500	Manhole	Adoptable	36	1500	Manhole	Adoptable
31	31	1200	Manhole	Adoptable	32	1200	Manhole	Adoptable
32	32	1200	Manhole	Adoptable	33	1200	Manhole	Adoptable
33	33	1200	Manhole	Adoptable	34	1200	Manhole	Adoptable
34	34	1200	Manhole	Adoptable	35	1200	Manhole	Adoptable
35	35	1200	Manhole	Adoptable	36	1500	Manhole	Adoptable

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Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
36	5.938	500.0	525	Carrierdrain	55.213	51.067	3.621	55.385	51.055	3.805
37	38.012	100.0	150	Filterdrain	57.090	56.040	0.900	57.283	55.660	1.473
38	69.067	100.0	150	Filterdrain	57.283	55.660	1.473	56.603	54.969	1.484
39	81.848	100.0	150	Filterdrain	56.603	54.969	1.484	56.052	54.151	1.751
40	97.583	53.3	150	Filterdrain	57.033	55.983	0.900	56.052	54.151	1.751
41	8.759	170.0	225	Carrierdrain	56.052	54.076	1.751	56.176	54.024	1.927
42	14.774	130.0	150	Filterdrain	56.176	54.024	2.002	56.605	53.910	2.545
43	52.804	78.6	150	Filterdrain	56.605	53.910	2.545	54.341	53.238	0.953
44	58.468	68.5	150	Filterdrain	54.341	53.238	0.953	53.633	52.385	1.098
45	9.408	130.0	225	Filterdrain	53.633	52.310	1.098	53.906	52.238	1.443
46	12.074	130.0	225	Carrierdrain	53.906	52.238	1.443	53.664	52.145	1.294
47	21.490	60.0	225	Carrierdrain	56.176	54.751	1.200	55.982	54.393	1.364
48	13.652	60.0	225	Carrierdrain	55.982	54.393	1.364	55.829	54.165	1.439
49	70.399	128.9	225	Filterdrain	55.829	54.198	1.406	55.212	53.652	1.335
50	88.595	82.0	225	Filterdrain	55.212	53.652	1.335	54.543	52.572	1.746
51	64.994	72.6	375	Filterdrain	54.543	52.422	1.746	53.102	51.527	1.200
52	9.279	30.2	375	Carrierdrain	53.102	51.527	1.200	52.995	51.220	1.400
53	63.104	120.0	375	Filterdrain	52.995	51.220	1.400	53.563	50.694	2.494
54	10.216	300.0	375	Filterdrain	53.563	50.694	2.494	53.664	50.660	2.629
55	25.692	244.7	375	Carrierdrain	53.664	50.656	2.633	54.080	50.551	3.154
24a	9.833	170.0	375	Carrierdrain	55.303	52.241	2.687	55.236	52.183	2.678
27a	8.368	520.0	525	Carrierdrain	55.329	53.604	1.200	55.236	53.588	1.123
30a	10.579	60.0	300	Carrierdrain	55.259	53.075	1.884	55.236	52.899	2.037
59	60.346	177.5	375	Carrierdrain	55.236	52.183	2.678	54.080	51.843	1.862
60	10.433	300.2	375	Carrierdrain	54.080	50.551	3.154	53.672	50.516	2.781

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
36	36	1500	Manhole	Adoptable	36_OUT	1200	Manhole	Adoptable
37	37		Junction		38	1200	Manhole	Adoptable
38	38	1200	Manhole	Adoptable	39	1200	Manhole	Adoptable
39	39	1200	Manhole	Adoptable	41	1200	Manhole	Adoptable
40	40		Junction		41	1200	Manhole	Adoptable
41	41	1200	Manhole	Adoptable	42	1200	Manhole	Adoptable
42	42	1200	Manhole	Adoptable	43		Junction	
43	43		Junction		44		Junction	
44	44		Junction		45	1200	Manhole	Adoptable
45	45	1200	Manhole	Adoptable	46	1200	Manhole	Adoptable
46	46	1200	Manhole	Adoptable	55	1200	Manhole	Adoptable
47	47	1200	Manhole	Adoptable	48	1200	Manhole	Adoptable
48	48	1200	Manhole	Adoptable	49	1200	Manhole	Adoptable
49	49	1200	Manhole	Adoptable	50	1200	Manhole	Adoptable
50	50	1200	Manhole	Adoptable	51	1200	Manhole	Adoptable
51	51	1200	Manhole	Adoptable	52	1200	Manhole	Adoptable
52	52	1200	Manhole	Adoptable	53	1200	Manhole	Adoptable
53	53	1200	Manhole	Adoptable	54	1200	Manhole	Adoptable
54	54	1200	Manhole	Adoptable	55	1200	Manhole	Adoptable
55	55	1200	Manhole	Adoptable	60	1200	Manhole	Adoptable
24a	24	1500	Manhole	Adoptable	59	1200	Manhole	Adoptable
27a	27	1500	Manhole	Adoptable	59	1200	Manhole	Adoptable
30a	30	1500	Manhole	Adoptable	59	1200	Manhole	Adoptable
59	59	1200	Manhole	Adoptable	60	1200	Manhole	Adoptable
60	60	1200	Manhole	Adoptable	66	1200	Manhole	Adoptable

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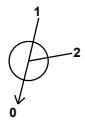
Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
61	8.045	100.0	100	Carrierdrain	53.608	52.908	0.600	53.874	52.828	0.946
62	8.267	170.0	225	Carrierdrain	53.874	52.782	0.867	53.892	52.733	0.934
63	8.017	78.6	100	Carrierdrain	53.660	52.960	0.600	53.892	52.858	0.934
64	8.673	46.6	225	Carrierdrain	53.892	52.733	0.934	53.672	52.547	0.900
34a	5.993	100.0	225	Carrierdrain	53.605	51.780	1.600	53.672	51.720	1.727
66	23.732	300.2	375	Carrierdrain	53.672	50.516	2.781	52.980	50.437	2.168
67	3.360	373.3	375	Carrierdrain	52.980	50.437	2.168	51.108	50.428	0.305
68	3.778	102.1	225	Carrierdrain	51.108	50.428	0.455	51.108	50.391	0.492

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
61	61	450	Manhole	Adoptable	62	450	Manhole	Adoptable
62	62	450	Manhole	Adoptable	64	1200	Manhole	Adoptable
63	63	450	Manhole	Adoptable	64	1200	Manhole	Adoptable
64	64	1200	Manhole	Adoptable	66	1200	Manhole	Adoptable
34a	34	1200	Manhole	Adoptable	66	1200	Manhole	Adoptable
66	66	1200	Manhole	Adoptable	67	1200	Manhole	Adoptable
67	67	1200	Manhole	Adoptable	67_OUT	1200	Manhole	Adoptable
68	68	1200	Manhole	Adoptable	68_OUT	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
3	546483.757	728254.957	57.465	1.050		0	3	56.415	150
1	546518.316	728237.837	57.013	1.050		0	1	55.963	150
4	546468.272	728188.687	57.383	2.049	1200	 1	3	55.334	150
						2	2	55.334	225
						0	4	55.334	150
5	546441.692	728116.310	56.858	2.117		1	4	54.741	150
						0	5	54.741	150
6	546417.414	728068.171	56.451	2.125		1	5	54.326	150
						0	6	54.326	150
7	546415.612	728029.722	56.139	2.109		1	6	54.030	150
						0	7	54.030	150
8	546427.121	728007.333	56.061	2.225		1	7	53.836	150
						0	8	53.836	150

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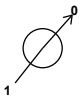
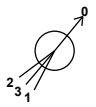
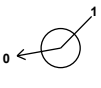
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
12	546420.387	727981.144	56.056	2.066	1200	1	11	53.990	150
						0	12	53.990	150
15	546475.478	728048.112	56.722	3.446	1200	1	14	53.276	150
						0	15	53.276	150
16	546447.690	728094.346	56.838	1.350	1200				
						0	16	55.488	150
17	546509.135	728042.209	56.493	1.811	1200	1	16	54.682	150
						0	17	54.682	150
21	546501.650	728026.108	56.505	3.717	1200	1	18	54.503	150
						2	15	53.013	150
						0	21	52.788	375
22	546529.759	728059.174	56.283	3.619	1200	 1	21	52.664	375
						0	22	52.664	375
23	546586.686	728127.419	55.706	3.296	1200	1	22	52.410	375
						0	23	52.410	375
59	546631.348	728179.844	55.236	3.053	1200	 1	30a	52.899	300
						2	27a	53.588	525
						3	24a	52.183	375
						0	59	52.183	375
37	546523.011	728254.559	57.090	1.050					
						0	37	56.040	150
38	546490.532	728274.309	57.283	1.623	1200	1	37	55.660	150
						0	38	55.660	150
39	546509.418	728340.613	56.603	1.634	1200	1	38	54.969	150
						0	39	54.969	150
41	546588.817	728333.114	56.052	1.976	1200	1	40	54.151	150
						2	39	54.151	150
						0	41	54.076	225
2	546477.322	728190.302	57.352	1.947	1200	 1	1	55.480	150
						0	2	55.405	225

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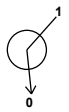
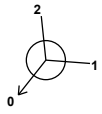
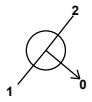
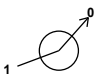
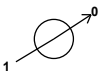
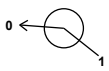
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
46	546684.416	728258.568	53.906	1.668	1200	 1 0	45 46	52.238 52.238	225 225
55	546685.671	728246.559	53.664	3.008	1200	 1 2 0	54 46 55	50.660 52.145 50.656	375 225 375
60	546669.723	728226.416	54.080	3.529	1200	 1 2 0	59 55 60	51.843 50.551 50.551	375 375 375
49	546572.792	728052.771	55.829	1.664	1200	 1 0	48 49	54.165 54.198	225 225
50	546624.464	728100.273	55.212	1.560	1200	 1 0	49 50	53.652 53.652	225 225
51	546696.092	728152.365	54.543	2.121	1200	1 0	50 51	52.572 52.422	225 375
40	546526.008	728258.431	57.033	1.050		0	40	55.983	150
53	546745.329	728206.618	52.995	1.775	1200	1 0	52 53	51.220 51.220	375 375
68	546721.109	728183.949	51.108	0.680	1200	0	68	50.428	225
54	546695.858	728245.794	53.563	2.869	1200	 1 0	53 54	50.694 50.694	375 375
68_OUT	546723.869	728181.369	51.108	0.717	1200	1	68	50.391	225
67	546695.996	728204.581	52.980	2.543	1200	1 0	66 67	50.437 50.437	375 375
67_OUT	546698.578	728202.431	51.108	0.680	1200	1	67	50.428	375

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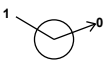
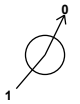
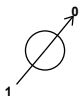
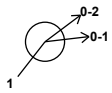
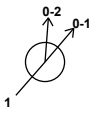
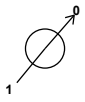
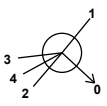
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
10	546489.685	727969.396	56.308	0.900	1200				
						0	10	55.408	150
11	546458.111	727942.365	55.306	0.900	1200		1	10	54.406	150
						0	11	54.406	150
48	546560.006	728047.986	55.982	1.589	1200		1	47	54.393	225
						0	48	54.393	225
47	546541.540	728058.978	56.176	1.425	1200				
						0	47	54.751	225
52	546742.466	728197.796	53.102	1.575	1200		1	51	51.527	375
						0	52	51.527	375
25	546515.102	728044.830	56.425	1.725	1200				
						0	25	54.700	525
26	546568.842	728108.690	55.911	1.725	1200		1	25	54.186	525
						0	26	54.186	525
27	546624.649	728174.829	55.329	1.725	1500		1	26	53.604	525
							0-1	27	53.604	525
							0-2	27a	53.604	525
30	546626.506	728170.450	55.259	2.184	1500		1	29	53.075	300
							0-1	30	53.075	300
							0-2	30a	53.075	300
28	546526.572	728052.622	56.283	1.500	1200				
						0	28	54.783	300
29	546577.586	728114.511	55.784	1.500	1200		1	28	54.284	300
						0	29	54.284	300
36	546630.862	728175.555	55.213	4.146	1500		1	35	51.292	225
							2	30	53.010	300
							3	27	53.488	525
							4	24	52.203	375
							0	36	51.067	525
36_OUT	546635.223	728171.525	55.385	4.330	1200		1	36	51.055	525

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Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
35	546669.037	728222.328	54.081	2.386	1200	1	34	51.695	225
						0	35	51.695	225
42	546591.384	728341.483	56.176	2.152	1200	1	41	54.024	225
						0	42	54.024	150
24	546624.981	728172.351	55.303	3.062	1500	1	23	52.241	375
						0-1	24	52.241	375
						0-2	24a	52.241	375
34	546681.560	728224.386	53.605	1.825	1200	1	33	51.780	225
						0-1	34	51.780	225
						0-2	34a	51.780	225
31	546700.336	728210.039	53.217	0.750	1200	0	31	52.467	150
32	546715.293	728228.218	53.225	0.993	1200	1	31	52.232	150
						0	32	52.232	150
33	546696.736	728242.848	53.518	1.597	1200	1	32	51.996	150
						0	33	51.921	225
66	546677.753	728219.758	53.672	3.156	1200	1	34a	51.720	225
						2	64	52.547	225
						3	60	50.516	375
						0	66	50.516	375
44	546645.968	728303.279	54.341	1.103		1	43	53.238	150
						0	44	53.238	150
43	546605.537	728337.243	56.605	2.695		1	42	53.910	150
						0	43	53.910	150
45	546690.672	728265.595	53.633	1.323	1200	1	44	52.385	150
						0	45	52.310	225
18	546506.789	728039.440	56.512	1.866	1200	1	17	54.646	150
						0	18	54.646	150
9	546433.927	728015.493	56.045	2.291	1200	1	8	53.754	150
						0	9	53.754	150

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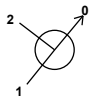
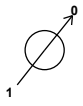
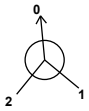
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
14	546442.581	728008.872	55.981	2.311	1200		1	13	53.670	225
							2	9	53.670	150
							0	14	53.670	150
13	546428.017	727990.813	56.010	2.190	1200		1	12	53.895	150
							0	13	53.820	225
61	546679.614	728199.691	53.608	0.700	450					
							0	61	52.908	100
62	546673.333	728204.719	53.874	1.092	450		1	61	52.828	100
							0	62	52.782	225
64	546678.561	728211.123	53.892	1.159	1200		1	63	52.858	100
							2	62	52.733	225
							0	64	52.733	225
63	546684.743	728206.020	53.660	0.700	450					
							0	63	52.960	100

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
Rainfall Events	Singular	Skip Steady State	x
FSR Region	Scotland and Ireland	Drain Down Time (mins)	1440
M5-60 (mm)	15.600	Additional Storage (m³/ha)	0.0
Ratio-R	0.260	Starting Level (m)	
Summer CV	1.000	Check Discharge Rate(s)	x
Winter CV	1.000	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
5	20	0	0
10	20	0	0
30	20	0	0
100	20	0	0

Node 68 Infiltration Basin Storage Structure

Base Inf Coefficient (m/hr)	0.21960	Invert Level (m)	50.428
Side Inf Coefficient (m/hr)	0.21960	Time to half empty (mins)	124
Safety Factor	2.0	Analyse flow through structure	x
Porosity	0.95		

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Inlets

67_OUT

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	1233.0	1300.0	0.680	1500.0	1499.8

Node 36_OUT Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	51.055
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	0

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	492.0	0.0	3.560	492.0	0.0	3.561	0.0	0.0	4.330	0.0	0.0

Node 6 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.21960	Porosity	0.30	Link	5
Side Inf Coefficient (m/hr)	0.21960	Invert Level (m)	54.326	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	41	Diameter (mm)	450

Node 7 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.21960	Porosity	0.30	Link	6
Side Inf Coefficient (m/hr)	0.21960	Invert Level (m)	54.030	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	47	Diameter (mm)	450

Node 8 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.21960	Porosity	0.30	Link	7
Side Inf Coefficient (m/hr)	0.21960	Invert Level (m)	53.836	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	46	Diameter (mm)	450

Node 11 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.21960	Porosity	0.30	Link	10
Side Inf Coefficient (m/hr)	0.21960	Invert Level (m)	54.406	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	1	Diameter (mm)	450

Node 17 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.21960	Porosity	0.30	Link	16
Side Inf Coefficient (m/hr)	0.21960	Invert Level (m)	54.682	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	4	Diameter (mm)	450

Node 38 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.21960	Porosity	0.30	Link	37
Side Inf Coefficient (m/hr)	0.21960	Invert Level (m)	55.660	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	17	Diameter (mm)	450

Node 39 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.21960	Porosity	0.30	Link	38
Side Inf Coefficient (m/hr)	0.21960	Invert Level (m)	54.969	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	23	Diameter (mm)	450

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Node 41 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.21960	Porosity	0.30	Link	39
Side Inf Coefficient (m/hr)	0.21960	Invert Level (m)	54.151	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	27	Diameter (mm)	450

Node 41 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.21960	Porosity	0.30	Link	40
Side Inf Coefficient (m/hr)	0.21960	Invert Level (m)	54.151	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	27	Diameter (mm)	450

Node 5 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.21960	Porosity	0.30	Link	4
Side Inf Coefficient (m/hr)	0.21960	Invert Level (m)	54.741	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	37	Diameter (mm)	450

Node 43 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.21960	Porosity	0.30	Link	42
Side Inf Coefficient (m/hr)	0.21960	Invert Level (m)	53.910	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	29	Diameter (mm)	450

Node 4 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.21960	Porosity	0.30	Link	3
Side Inf Coefficient (m/hr)	0.21960	Invert Level (m)	55.334	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	25	Diameter (mm)	450

Node 2 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.21960	Porosity	0.30	Link	1
Side Inf Coefficient (m/hr)	0.21960	Invert Level (m)	55.480	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	24	Diameter (mm)	450

Node 44 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.21960	Porosity	0.30	Link	43
Side Inf Coefficient (m/hr)	0.21960	Invert Level (m)	53.238	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	11	Diameter (mm)	450

Node 45 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.21960	Porosity	0.30	Link	44
Side Inf Coefficient (m/hr)	0.21960	Invert Level (m)	52.385	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	0	Diameter (mm)	450

Node 18 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.21960	Porosity	0.30	Link	17
Side Inf Coefficient (m/hr)	0.21960	Invert Level (m)	54.646	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	7	Diameter (mm)	450

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Node 15 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.21960	Porosity	0.30	Link	14
Side Inf Coefficient (m/hr)	0.21960	Invert Level (m)	53.276	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	5	Diameter (mm)	450

Node 12 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.21960	Porosity	0.30	Link	11
Side Inf Coefficient (m/hr)	0.21960	Invert Level (m)	53.990	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	22	Diameter (mm)	450

Node 9 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.21960	Porosity	0.30	Link	8
Side Inf Coefficient (m/hr)	0.21960	Invert Level (m)	53.754	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	47	Diameter (mm)	450

Node 13 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.21960	Porosity	0.30	Link	12
Side Inf Coefficient (m/hr)	0.21960	Invert Level (m)	53.895	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	35	Diameter (mm)	450

Node 14 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.21960	Porosity	0.30	Link	9
Side Inf Coefficient (m/hr)	0.21960	Invert Level (m)	53.670	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	45	Diameter (mm)	450

Node 63 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.21960	Invert Level (m)	52.960	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.21960	Time to half empty (mins)	0	Depth (m)	0.350
Safety Factor	2.0	Width (m)	15.000	Inf Depth (m)	
Porosity	0.30	Length (m)	5.000		

Node 61 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.21960	Invert Level (m)	52.908	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	0.350
Safety Factor	2.0	Width (m)	16.200	Inf Depth (m)	
Porosity	0.30	Length (m)	5.000		

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Results for 5 year +20% CC Critical Storm Duration. Lowest mass balance: 99.33%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	3	12	56.624	0.209	18.8	0.0000	0.0000	SURCHARGED
15 minute summer	1	11	56.045	0.082	8.1	0.0000	0.0000	OK
30 minute summer	4	22	55.975	0.641	29.3	2.3662	0.0000	SURCHARGED
30 minute summer	5	23	55.407	0.666	25.3	3.5487	0.0000	SURCHARGED
60 minute summer	6	40	54.979	0.653	18.6	2.9576	0.0000	SURCHARGED
30 minute summer	7	22	54.702	0.672	24.7	2.5189	0.0000	SURCHARGED
60 minute summer	8	40	54.415	0.579	20.6	1.5038	0.0000	SURCHARGED
60 minute summer	12	41	54.141	0.151	7.6	0.3181	0.0000	SURCHARGED
60 minute summer	15	43	53.436	0.160	17.1	0.3519	0.0000	SURCHARGED
15 minute summer	16	11	55.557	0.069	6.8	0.0776	0.0000	OK
15 minute summer	17	12	54.837	0.155	9.9	0.2976	0.0000	SURCHARGED
30 minute summer	21	19	52.960	0.172	43.8	0.1944	0.0000	OK
15 minute summer	22	12	52.854	0.190	56.3	0.2147	0.0000	OK
30 minute summer	23	20	52.633	0.223	69.4	0.2523	0.0000	OK
30 minute summer	59	19	52.466	0.283	131.1	0.3198	0.0000	OK
15 minute summer	37	10	56.104	0.064	5.8	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	3	3	4	18.0	1.043	0.921	1.1981	
15 minute summer	1	1	2	7.8	0.649	0.578	0.8628	
15 minute summer	4	4	5	14.2	0.819	1.049	1.3582	
30 minute summer	4	Infiltration		1.8				
15 minute summer	5	5	6	14.9	0.855	1.097	0.9493	
30 minute summer	5	Infiltration		2.8				
15 minute summer	6	6	7	13.5	0.770	0.999	0.6777	
60 minute summer	6	Infiltration		2.2				
15 minute summer	7	7	8	16.8	0.956	1.240	0.4432	
30 minute summer	7	Infiltration		1.8				
30 minute summer	8	8	9	18.1	1.026	1.331	0.1871	
60 minute summer	8	Infiltration		1.1				
15 minute summer	12	12	13	9.4	0.815	0.695	0.1813	
60 minute summer	12	Infiltration		0.5				
60 minute summer	15	15	21	16.5	1.005	1.062	0.5570	
60 minute summer	15	Infiltration		0.5				
15 minute summer	16	16	17	6.6	0.634	0.424	1.0139	
15 minute summer	17	17	18	10.2	0.657	0.658	0.0639	
15 minute summer	17	Infiltration		0.5				
30 minute summer	21	21	22	43.7	0.832	0.411	2.2819	
15 minute summer	22	22	23	56.2	0.920	0.529	5.4483	
30 minute summer	23	23	24	67.4	1.114	0.634	4.0576	
15 minute summer	59	59	60	130.7	1.519	0.872	5.1946	
15 minute summer	37	37	38	5.7	0.475	0.371	0.4697	

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Results for 5 year +20% CC Critical Storm Duration. Lowest mass balance: 99.33%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	38	21	56.027	0.367	19.3	1.2264	0.0000	SURCHARGED
30 minute summer	39	22	55.685	0.716	31.6	4.0598	0.0000	SURCHARGED
30 minute summer	41	23	54.758	0.682	44.2	4.3387	0.0000	SURCHARGED
30 minute summer	2	22	55.977	0.572	14.6	2.6356	0.0000	SURCHARGED
30 minute summer	46	20	52.353	0.115	20.8	0.1296	0.0000	OK
15 minute summer	55	12	52.164	1.508	107.7	1.7053	0.0000	SURCHARGED
15 minute summer	60	12	52.100	1.549	205.3	1.7516	0.0000	SURCHARGED
15 minute summer	49	11	54.301	0.136	17.4	0.1538	0.0000	OK
15 minute summer	50	12	53.774	0.122	30.2	0.1377	0.0000	OK
15 minute summer	51	11	52.531	0.109	38.5	0.1232	0.0000	OK
15 minute summer	40	10	56.057	0.074	10.7	0.0000	0.0000	OK
15 minute summer	53	13	52.224	1.004	103.3	1.1355	0.0000	SURCHARGED
180 minute summer	68	128	50.593	0.165	82.5	202.1219	0.0000	OK
15 minute summer	54	12	52.172	1.478	79.2	1.6714	0.0000	SURCHARGED
15 minute summer	68_OUT	1	50.391	0.000	0.0	0.0000	0.0000	OK
15 minute summer	67	12	51.605	1.168	223.8	1.3209	0.0000	SURCHARGED
180 minute summer	67_OUT	128	50.606	0.178	122.7	0.0000	0.0000	OK
15 minute summer	10	10	55.461	0.053	6.4	0.0596	0.0000	OK
15 minute summer	11	11	54.495	0.089	10.4	0.1163	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	38	38	39	14.7	0.848	0.948	1.2159	
30 minute summer	38	Infiltration		0.9				
60 minute summer	39	39	41	16.1	0.956	1.039	1.4409	
30 minute summer	39	Infiltration		2.5				
15 minute summer	41	41	42	24.3	0.706	0.696	0.3484	
30 minute summer	41	Infiltration		2.3				
30 minute summer	41	Infiltration		1.4				
15 minute summer	2	2	4	-8.9	-0.231	-0.196	0.3656	
30 minute summer	2	Infiltration		1.8				
30 minute summer	46	46	55	20.8	1.075	0.456	0.2330	
15 minute summer	55	55	60	112.5	1.020	0.883	2.8338	
15 minute summer	60	60	66	211.9	1.921	1.844	1.1507	
15 minute summer	49	49	50	17.1	0.901	0.426	1.3871	
15 minute summer	50	50	51	28.0	1.286	0.555	1.9281	
15 minute summer	51	51	52	38.1	1.523	0.183	4.4422	
15 minute summer	40	40	41	10.4	0.778	0.488	1.2847	
15 minute summer	53	53	54	78.6	0.829	0.430	6.9602	
15 minute summer	68	Pump	68_OUT	0.0				0.0
180 minute summer	68	Infiltration		40.8				
15 minute summer	54	54	55	86.3	0.782	0.846	1.1268	
15 minute summer	67	67	67_OUT	229.9	3.222	2.234	0.2104	
15 minute summer	10	10	11	6.3	0.798	0.261	0.3385	
15 minute summer	11	11	12	10.1	0.915	0.652	0.6112	

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Results for 5 year +20% CC Critical Storm Duration. Lowest mass balance: 99.33%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	48	11	54.435	0.042	5.3	0.0479	0.0000	OK
15 minute summer	47	10	54.795	0.044	5.4	0.0495	0.0000	OK
15 minute summer	52	13	52.223	0.696	65.9	0.7874	0.0000	SURCHARGED
15 minute summer	25	10	55.028	0.328	258.5	0.3705	0.0000	OK
15 minute summer	26	11	54.507	0.321	255.9	0.3632	0.0000	OK
15 minute summer	27	11	53.832	0.228	256.7	0.4033	0.0000	OK
15 minute summer	30	11	53.181	0.106	56.1	0.1869	0.0000	OK
15 minute summer	28	10	54.922	0.139	38.1	0.1576	0.0000	OK
15 minute summer	29	11	54.422	0.138	56.4	0.1560	0.0000	OK
15 minute summer	36	12	51.523	0.456	285.9	0.8054	0.0000	OK
15 minute summer	36_OUT	12	51.418	0.363	286.8	0.0000	0.0000	OK
15 minute summer	35	13	51.804	0.109	17.1	0.1235	0.0000	OK
30 minute summer	42	23	54.730	0.706	24.3	0.7983	0.0000	SURCHARGED
15 minute summer	24	12	52.467	0.226	86.8	0.3994	0.0000	OK
15 minute summer	34	12	51.897	0.117	31.4	0.1324	0.0000	OK
15 minute summer	31	10	52.552	0.085	10.5	0.0962	0.0000	OK
15 minute summer	32	11	52.325	0.093	11.9	0.1049	0.0000	OK
15 minute summer	33	10	52.056	0.135	25.3	0.1530	0.0000	OK
15 minute summer	66	12	51.906	1.390	218.1	1.5726	0.0000	SURCHARGED
30 minute summer	44	27	53.417	0.179	20.6	0.1334	0.0000	SURCHARGED

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	11	Infiltration		0.1				
15 minute summer	48	48	49	5.2	0.360	0.078	0.2064	
15 minute summer	47	47	48	5.3	1.010	0.079	0.1136	
15 minute summer	52	52	53	66.5	1.345	0.182	1.0234	
15 minute summer	25	25	26	255.9	1.840	0.674	11.6094	
15 minute summer	26	26	27	256.7	2.246	0.646	9.8825	
15 minute summer	27	27	36	171.3	2.218	0.259	0.4842	
15 minute summer	27	27a	59	84.6	1.048	0.401	0.6759	
15 minute summer	30	30	36	23.7	1.157	0.217	0.1377	
15 minute summer	30	30a	59	32.1	1.550	0.224	0.2194	
15 minute summer	28	28	29	37.4	1.189	0.428	2.5282	
15 minute summer	29	29	30	56.1	2.090	0.395	1.9981	
15 minute summer	36	36	36_OUT	286.8	1.587	1.332	1.0645	138.2
15 minute summer	35	35	36	20.5	0.696	0.484	1.7237	
15 minute summer	42	42	43	23.1	1.313	1.705	0.2601	
15 minute summer	24	24	36	84.1	1.314	0.557	0.4285	
15 minute summer	24	24a	59	24.6	0.703	0.160	0.7793	
15 minute summer	34	34	35	17.1	0.992	0.404	0.2314	
15 minute summer	34	34a	66	13.4	1.031	0.258	0.1680	
15 minute summer	31	31	32	10.4	0.972	0.586	0.2537	
15 minute summer	32	32	33	11.8	1.055	0.663	0.2636	
15 minute summer	33	33	34	25.2	1.301	0.635	0.5204	
15 minute summer	66	66	67	223.8	2.029	1.948	2.6176	
30 minute summer	44	44	45	19.6	1.190	1.048	0.9830	

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Results for 5 year +20% CC Critical Storm Duration. Lowest mass balance: 99.33%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	43	25	54.409	0.499	23.1	0.8026	0.0000	SURCHARGED
30 minute summer	45	21	52.431	0.121	19.6	0.1443	0.0000	OK
15 minute summer	18	12	54.820	0.174	19.4	0.2538	0.0000	SURCHARGED
60 minute summer	9	41	54.277	0.523	17.4	1.2267	0.0000	SURCHARGED
60 minute summer	14	42	54.137	0.467	19.4	1.0957	0.0000	SURCHARGED
60 minute summer	13	42	54.138	0.318	7.6	0.6186	0.0000	SURCHARGED
15 minute summer	61	11	52.929	0.021	1.8	0.1108	0.0000	OK
15 minute summer	62	12	52.800	0.018	0.5	0.0029	0.0000	OK
15 minute summer	64	12	52.754	0.021	1.3	0.0238	0.0000	OK
15 minute summer	63	11	52.983	0.023	2.1	0.1286	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	44	Infiltration		0.4				
30 minute summer	43	43	44	20.6	1.175	1.178	0.9296	
30 minute summer	43	Infiltration		0.6				
30 minute summer	45	45	46	19.6	0.954	0.489	0.1975	
30 minute summer	45	Infiltration		0.0				
15 minute summer	18	18	21	19.0	1.104	1.073	0.2391	
15 minute summer	18	Infiltration		0.1				
60 minute summer	9	9	14	15.7	0.894	1.160	0.1918	
60 minute summer	9	Infiltration		0.5				
30 minute summer	14	14	15	17.2	0.975	1.266	0.9015	
60 minute summer	14	Infiltration		0.4				
15 minute summer	13	13	14	6.7	0.277	0.183	0.9227	
60 minute summer	13	Infiltration		0.3				
15 minute summer	61	61	62	0.5	0.473	0.091	0.0094	
15 minute summer	61	Infiltration		1.0				
15 minute summer	62	62	64	0.6	0.326	0.014	0.0140	
15 minute summer	64	64	66	1.3	0.724	0.017	0.0159	
15 minute summer	63	63	64	0.8	0.569	0.114	0.0109	
15 minute summer	63	Infiltration		1.1				

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Results for 10 year +20% CC Critical Storm Duration. Lowest mass balance: 99.20%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	3	12	56.994	0.579	21.7	0.0000	0.0000	SURCHARGED
30 minute summer	1	22	56.137	0.174	8.8	0.0000	0.0000	SURCHARGED
30 minute summer	4	23	56.106	0.772	31.4	3.2747	0.0000	SURCHARGED
30 minute summer	5	24	55.505	0.764	27.6	4.4640	0.0000	SURCHARGED
60 minute summer	6	41	55.076	0.750	19.4	3.6635	0.0000	SURCHARGED
30 minute summer	7	22	54.801	0.770	26.3	3.0307	0.0000	SURCHARGED
60 minute summer	8	40	54.499	0.663	21.8	1.7889	0.0000	SURCHARGED
60 minute summer	12	41	54.209	0.219	8.8	0.5939	0.0000	SURCHARGED
60 minute summer	15	44	53.450	0.174	17.6	0.4024	0.0000	SURCHARGED
15 minute summer	16	11	55.563	0.075	7.9	0.0845	0.0000	OK
15 minute summer	17	12	54.897	0.215	11.4	0.4993	0.0000	SURCHARGED
30 minute summer	21	19	52.970	0.182	48.0	0.2059	0.0000	OK
15 minute summer	22	12	52.866	0.202	62.4	0.2282	0.0000	OK
30 minute summer	23	20	52.650	0.240	77.2	0.2715	0.0000	OK
15 minute summer	59	12	52.497	0.314	153.5	0.3553	0.0000	OK
30 minute summer	37	21	56.167	0.127	6.4	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	3	3	4	18.9	1.087	0.969	1.1981	
15 minute summer	1	1	2	9.0	0.677	0.666	0.9632	
30 minute summer	4	4	5	13.7	0.788	1.009	1.3582	
30 minute summer	4	Infiltration		2.2				
15 minute summer	5	5	6	13.8	0.862	1.019	0.9493	
30 minute summer	5	Infiltration		3.3				
15 minute summer	6	6	7	13.8	0.784	1.018	0.6777	
60 minute summer	6	Infiltration		2.5				
15 minute summer	7	7	8	17.4	0.988	1.282	0.4432	
30 minute summer	7	Infiltration		2.0				
30 minute summer	8	8	9	18.8	1.068	1.386	0.1871	
60 minute summer	8	Infiltration		1.2				
15 minute summer	12	12	13	10.9	0.832	0.805	0.2159	
60 minute summer	12	Infiltration		0.7				
60 minute summer	15	15	21	16.9	1.005	1.090	0.5598	
60 minute summer	15	Infiltration		0.5				
15 minute summer	16	16	17	7.6	0.634	0.492	1.0624	
15 minute summer	17	17	18	11.3	0.662	0.729	0.0639	
15 minute summer	17	Infiltration		0.7				
30 minute summer	21	21	22	48.0	0.847	0.451	2.4592	
15 minute summer	22	22	23	62.2	0.937	0.585	5.9405	
30 minute summer	23	23	24	74.9	1.136	0.705	4.5647	
15 minute summer	59	59	60	145.9	1.525	0.974	6.3025	
15 minute summer	37	37	38	6.7	0.490	0.432	0.5717	

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Results for 10 year +20% CC Critical Storm Duration. Lowest mass balance: 99.20%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	38	21	56.150	0.490	22.4	1.9136	0.0000	SURCHARGED
30 minute summer	39	22	55.813	0.844	34.0	5.2409	0.0000	SURCHARGED
30 minute summer	41	23	54.853	0.777	49.0	5.6960	0.0000	SURCHARGED
30 minute summer	2	23	56.109	0.704	16.8	3.7478	0.0000	SURCHARGED
15 minute summer	46	13	52.356	0.118	20.9	0.1331	0.0000	OK
15 minute summer	55	12	52.293	1.637	112.5	1.8511	0.0000	SURCHARGED
15 minute summer	60	12	52.221	1.670	234.6	1.8882	0.0000	SURCHARGED
15 minute summer	49	11	54.310	0.145	20.1	0.1639	0.0000	OK
15 minute summer	50	12	53.786	0.134	35.2	0.1514	0.0000	OK
15 minute summer	51	11	52.539	0.117	44.7	0.1328	0.0000	OK
15 minute summer	40	10	56.064	0.081	12.4	0.0000	0.0000	OK
15 minute summer	53	12	52.370	1.150	80.7	1.3010	0.0000	SURCHARGED
240 minute summer	68	168	50.628	0.200	83.3	244.1793	0.0000	OK
15 minute summer	54	12	52.308	1.614	86.9	1.8255	0.0000	SURCHARGED
15 minute summer	68_OUT	1	50.391	0.000	0.0	0.0000	0.0000	OK
15 minute summer	67	11	51.638	1.201	250.6	1.3584	0.0000	SURCHARGED
240 minute summer	67_OUT	164	50.641	0.213	135.1	0.0000	0.0000	OK
15 minute summer	10	10	55.465	0.057	7.3	0.0640	0.0000	OK
15 minute summer	11	11	54.503	0.097	11.9	0.1292	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	38	38	39	13.3	0.755	0.858	1.2159	
30 minute summer	38	Infiltration		1.2				
15 minute summer	39	39	41	16.0	0.954	1.035	1.4409	
30 minute summer	39	Infiltration		3.1				
15 minute summer	41	41	42	25.3	0.701	0.724	0.3484	
30 minute summer	41	Infiltration		2.7				
30 minute summer	41	Infiltration		1.7				
15 minute summer	2	2	4	-9.1	0.236	-0.200	0.3656	
30 minute summer	2	Infiltration		2.3				
30 minute summer	46	46	55	21.2	1.081	0.465	0.2368	
15 minute summer	55	55	60	116.0	1.052	0.910	2.8338	
15 minute summer	60	60	66	237.8	2.156	2.070	1.1507	
15 minute summer	49	49	50	19.7	0.932	0.492	1.5546	
15 minute summer	50	50	51	32.5	1.331	0.644	2.1625	
15 minute summer	51	51	52	44.0	1.458	0.211	4.5412	
15 minute summer	40	40	41	12.0	0.777	0.567	1.3354	
15 minute summer	53	53	54	86.2	0.822	0.472	6.9602	
15 minute summer	68	Pump	68_OUT	0.0				0.0
240 minute summer	68	Infiltration		41.1				
15 minute summer	54	54	55	90.3	0.819	0.886	1.1268	
15 minute summer	67	67	67_OUT	255.8	3.485	2.486	0.2148	
15 minute summer	10	10	11	7.2	0.824	0.299	0.3760	
15 minute summer	11	11	12	11.6	0.939	0.748	0.6830	

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Results for 10 year +20% CC Critical Storm Duration. Lowest mass balance: 99.20%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	48	10	54.438	0.045	6.1	0.0513	0.0000	OK
15 minute summer	47	10	54.798	0.047	6.2	0.0531	0.0000	OK
15 minute summer	52	12	52.370	0.843	142.4	0.9534	0.0000	SURCHARGED
15 minute summer	25	10	55.063	0.363	298.8	0.4110	0.0000	OK
15 minute summer	26	11	54.539	0.353	295.5	0.3998	0.0000	OK
15 minute summer	27	11	53.852	0.248	296.5	0.4387	0.0000	OK
15 minute summer	30	11	53.190	0.115	65.0	0.2034	0.0000	OK
15 minute summer	28	10	54.935	0.152	44.1	0.1717	0.0000	OK
15 minute summer	29	11	54.434	0.150	65.3	0.1698	0.0000	OK
15 minute summer	36	12	51.595	0.528	351.5	0.9326	0.0000	SURCHARGED
15 minute summer	36_OUT	12	51.457	0.402	352.0	0.0000	0.0000	OK
15 minute summer	35	13	51.847	0.152	39.0	0.1721	0.0000	OK
30 minute summer	42	23	54.824	0.800	25.1	0.9043	0.0000	SURCHARGED
15 minute summer	24	12	52.498	0.257	102.7	0.4541	0.0000	OK
15 minute summer	34	12	51.960	0.180	41.1	0.2040	0.0000	OK
15 minute summer	31	10	52.561	0.094	12.2	0.1063	0.0000	OK
15 minute summer	32	11	52.335	0.103	13.8	0.1161	0.0000	OK
15 minute summer	33	10	52.069	0.148	29.2	0.1674	0.0000	OK
15 minute summer	66	12	51.971	1.455	239.3	1.6459	0.0000	SURCHARGED
60 minute summer	44	44	53.452	0.214	20.7	0.1981	0.0000	SURCHARGED

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	11	Infiltration		0.1				
15 minute summer	48	48	49	6.0	0.381	0.090	0.2233	
15 minute summer	47	47	48	6.1	1.051	0.091	0.1256	
15 minute summer	52	52	53	-95.4	1.392	-0.261	1.0234	
15 minute summer	25	25	26	295.5	1.894	0.778	13.0234	
15 minute summer	26	26	27	296.5	2.318	0.747	11.0377	
15 minute summer	27	27	36	196.9	2.292	0.298	0.5382	
15 minute summer	27	27a	59	98.8	1.096	0.468	0.7545	
15 minute summer	30	30	36	27.5	1.201	0.252	0.1539	
15 minute summer	30	30a	59	37.2	1.607	0.259	0.2450	
15 minute summer	28	28	29	43.3	1.230	0.495	2.8217	
15 minute summer	29	29	30	65.0	2.163	0.457	2.2340	
15 minute summer	36	36	36_OUT	352.0	1.740	1.635	1.1681	162.9
15 minute summer	35	35	36	34.5	0.926	0.815	2.0630	
15 minute summer	42	42	43	23.9	1.356	1.760	0.2601	
15 minute summer	24	24	36	101.8	1.372	0.675	0.4966	
15 minute summer	24	24a	59	26.0	0.707	0.170	0.8806	
15 minute summer	34	34	35	39.0	1.265	0.922	0.3895	
15 minute summer	34	34a	66	14.9	1.057	0.287	0.2214	
15 minute summer	31	31	32	12.1	0.999	0.679	0.2852	
15 minute summer	32	32	33	13.6	1.085	0.765	0.2957	
15 minute summer	33	33	34	29.1	1.340	0.732	0.7094	
15 minute summer	66	66	67	250.6	2.273	2.182	2.6176	
60 minute summer	44	44	45	20.0	1.192	1.067	0.9859	

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Results for 10 year +20% CC Critical Storm Duration. Lowest mass balance: 99.20%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	43	41	54.488	0.578	22.8	0.9598	0.0000	SURCHARGED
15 minute summer	45	13	52.432	0.122	19.7	0.1458	0.0000	OK
15 minute summer	18	12	54.876	0.230	22.0	0.3441	0.0000	SURCHARGED
60 minute summer	9	41	54.353	0.599	17.9	1.4205	0.0000	SURCHARGED
60 minute summer	14	42	54.204	0.534	19.8	1.2709	0.0000	SURCHARGED
60 minute summer	13	42	54.205	0.385	8.6	0.8066	0.0000	SURCHARGED
15 minute summer	61	12	52.931	0.023	2.1	0.1377	0.0000	OK
15 minute summer	62	12	52.803	0.021	0.7	0.0033	0.0000	OK
15 minute summer	64	12	52.756	0.023	1.6	0.0263	0.0000	OK
15 minute summer	63	11	52.986	0.026	2.4	0.1547	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	44	Infiltration		0.5				
30 minute summer	43	43	44	20.8	1.183	1.192	0.9296	
60 minute summer	43	Infiltration		0.7				
60 minute summer	45	45	46	19.9	0.952	0.498	0.1990	
15 minute summer	45	Infiltration		0.0				
15 minute summer	18	18	21	21.4	1.218	1.206	0.2435	
15 minute summer	18	Infiltration		0.1				
60 minute summer	9	9	14	16.1	0.917	1.190	0.1918	
60 minute summer	9	Infiltration		0.5				
60 minute summer	14	14	15	17.6	0.998	1.296	0.9015	
60 minute summer	14	Infiltration		0.5				
15 minute summer	13	13	14	7.2	0.269	0.197	0.9227	
60 minute summer	13	Infiltration		0.4				
15 minute summer	61	61	62	0.7	0.505	0.114	0.0110	
15 minute summer	61	Infiltration		1.2				
15 minute summer	62	62	64	0.7	0.351	0.017	0.0163	
15 minute summer	64	64	66	1.6	0.768	0.021	0.0184	
15 minute summer	63	63	64	0.9	0.600	0.137	0.0125	
15 minute summer	63	Infiltration		1.2				

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Results for 30 year +20% CC Critical Storm Duration. Lowest mass balance: 99.17%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	3	11	57.465	1.050	27.5	0.0000	0.0000	FLOOD RISK
30 minute summer	1	20	56.405	0.442	11.3	0.0000	0.0000	SURCHARGED
30 minute summer	4	23	56.343	1.009	39.2	5.2967	0.0000	SURCHARGED
60 minute summer	5	41	55.710	0.969	27.5	6.5990	0.0000	SURCHARGED
60 minute summer	6	41	55.272	0.946	21.1	5.0898	0.0000	SURCHARGED
60 minute summer	7	38	55.002	0.972	26.3	4.0795	0.0000	SURCHARGED
60 minute summer	8	40	54.665	0.829	24.0	2.3533	0.0000	SURCHARGED
60 minute summer	12	42	54.335	0.345	11.3	1.3140	0.0000	SURCHARGED
60 minute summer	15	44	53.484	0.208	18.6	0.5449	0.0000	SURCHARGED
15 minute summer	16	11	55.574	0.086	10.0	0.0976	0.0000	OK
15 minute summer	17	12	55.016	0.334	14.5	1.0410	0.0000	SURCHARGED
30 minute summer	21	19	52.988	0.200	55.3	0.2257	0.0000	OK
15 minute summer	22	11	52.889	0.225	74.2	0.2543	0.0000	OK
15 minute summer	23	13	52.721	0.311	93.4	0.3514	0.0000	OK
15 minute summer	59	12	52.643	0.460	195.8	0.5201	0.0000	SURCHARGED
30 minute summer	37	21	56.460	0.420	8.1	0.0000	0.0000	SURCHARGED

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	3	3	4	22.2	1.260	1.136	1.1981	
15 minute summer	1	1	2	10.2	0.681	0.756	1.1052	
15 minute summer	4	4	5	13.8	0.826	1.016	1.3582	
30 minute summer	4	Infiltration		2.9				
15 minute summer	5	5	6	14.4	0.868	1.065	0.9493	
60 minute summer	5	Infiltration		4.2				
15 minute summer	6	6	7	14.1	0.801	1.040	0.6777	
60 minute summer	6	Infiltration		3.2				
15 minute summer	7	7	8	18.3	1.042	1.352	0.4432	
60 minute summer	7	Infiltration		2.5				
30 minute summer	8	8	9	20.2	1.148	1.490	0.1871	
60 minute summer	8	Infiltration		1.5				
15 minute summer	12	12	13	12.9	0.842	0.951	0.2168	
60 minute summer	12	Infiltration		1.2				
60 minute summer	15	15	21	17.8	1.025	1.146	0.5652	
60 minute summer	15	Infiltration		0.7				
15 minute summer	16	16	17	9.7	0.632	0.624	1.1323	
15 minute summer	17	17	18	14.0	0.795	0.905	0.0639	
15 minute summer	17	Infiltration		1.2				
30 minute summer	21	21	22	55.4	0.862	0.521	2.7868	
30 minute summer	22	22	23	73.7	0.946	0.693	7.0033	
15 minute summer	23	23	24	90.9	1.187	0.855	6.0925	
30 minute summer	59	59	60	165.3	1.556	1.103	6.5329	
15 minute summer	37	37	38	7.8	0.515	0.504	0.6692	

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Results for 30 year +20% CC Critical Storm Duration. Lowest mass balance: 99.17%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	38	22	56.436	0.776	27.8	3.6806	0.0000	SURCHARGED
30 minute summer	39	23	56.055	1.086	40.3	7.7614	0.0000	SURCHARGED
60 minute summer	41	40	55.038	0.962	49.3	8.7527	0.0000	SURCHARGED
30 minute summer	2	23	56.344	0.939	20.2	6.0034	0.0000	SURCHARGED
15 minute summer	46	12	52.476	0.238	23.4	0.2694	0.0000	SURCHARGED
15 minute summer	55	12	52.448	1.792	113.8	2.0271	0.0000	SURCHARGED
15 minute summer	60	12	52.351	1.800	251.0	2.0353	0.0000	SURCHARGED
15 minute summer	49	11	54.327	0.162	25.5	0.1835	0.0000	OK
15 minute summer	50	12	53.810	0.158	44.7	0.1790	0.0000	OK
15 minute summer	51	13	52.606	0.184	56.9	0.2077	0.0000	OK
15 minute summer	40	10	56.078	0.095	15.7	0.0000	0.0000	OK
15 minute summer	53	12	52.551	1.331	104.8	1.5058	0.0000	SURCHARGED
240 minute summer	68	172	50.693	0.265	95.6	325.6345	0.0000	SURCHARGED
15 minute summer	54	12	52.475	1.781	92.1	2.0142	0.0000	SURCHARGED
15 minute summer	68_OUT	1	50.391	0.000	0.0	0.0000	0.0000	OK
15 minute summer	67	11	51.694	1.257	272.5	1.4212	0.0000	SURCHARGED
240 minute summer	67_OUT	172	50.708	0.280	161.8	0.0000	0.0000	OK
15 minute summer	10	10	55.473	0.065	9.3	0.0731	0.0000	OK
15 minute summer	11	11	54.523	0.117	15.2	0.1603	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	38	38	39	14.8	0.852	0.959	1.2159	
30 minute summer	38	Infiltration		1.9				
30 minute summer	39	39	41	16.3	0.957	1.054	1.4409	
30 minute summer	39	Infiltration		4.1				
15 minute summer	41	41	42	26.9	0.696	0.770	0.3484	
60 minute summer	41	Infiltration		3.5				
60 minute summer	41	Infiltration		2.1				
15 minute summer	2	2	4	-12.5	-0.314	-0.274	0.3656	
30 minute summer	2	Infiltration		3.2				
15 minute summer	46	46	55	26.9	1.074	0.592	0.4802	
15 minute summer	55	55	60	121.5	1.102	0.954	2.8338	
30 minute summer	60	60	66	273.2	2.477	2.378	1.1507	
15 minute summer	49	49	50	25.0	0.983	0.623	1.8783	
15 minute summer	50	50	51	41.2	1.394	0.818	2.6193	
30 minute summer	51	51	52	55.6	1.510	0.267	4.7172	
15 minute summer	40	40	41	15.3	0.942	0.719	1.4319	
15 minute winter	53	53	54	85.1	0.893	0.466	6.9602	
15 minute summer	68	Pump	68_OUT	0.0				0.0
240 minute summer	68	Infiltration		41.7				
15 minute summer	54	54	55	91.4	0.829	0.896	1.1268	
30 minute summer	67	67	67_OUT	291.2	3.658	2.831	0.2485	
15 minute summer	10	10	11	9.2	0.868	0.381	0.4558	
15 minute summer	11	11	12	14.7	0.976	0.949	0.8491	

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Results for 30 year +20% CC Critical Storm Duration. Lowest mass balance: 99.17%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	48	10	54.444	0.051	7.8	0.0579	0.0000	OK
15 minute summer	47	10	54.804	0.053	7.9	0.0601	0.0000	OK
15 minute summer	52	12	52.558	1.031	100.9	1.1657	0.0000	SURCHARGED
15 minute summer	25	10	55.148	0.448	378.0	0.5071	0.0000	OK
15 minute summer	26	11	54.608	0.422	371.6	0.4777	0.0000	OK
15 minute summer	27	11	53.888	0.284	373.1	0.5023	0.0000	OK
15 minute summer	30	11	53.207	0.132	82.1	0.2335	0.0000	OK
15 minute summer	28	10	54.959	0.176	55.7	0.1988	0.0000	OK
15 minute summer	29	11	54.457	0.173	82.5	0.1959	0.0000	OK
15 minute summer	36	12	51.724	0.657	473.2	1.1605	0.0000	SURCHARGED
15 minute summer	36_OUT	12	51.513	0.458	474.4	0.0000	0.0000	OK
15 minute summer	35	12	52.013	0.318	50.5	0.3598	0.0000	SURCHARGED
60 minute summer	42	40	55.005	0.981	24.9	1.1101	0.0000	SURCHARGED
15 minute summer	24	12	52.629	0.388	170.4	0.6859	0.0000	SURCHARGED
15 minute summer	34	12	52.077	0.297	50.8	0.3355	0.0000	SURCHARGED
15 minute summer	31	10	52.579	0.112	15.4	0.1272	0.0000	OK
15 minute summer	32	12	52.373	0.141	17.4	0.1589	0.0000	OK
15 minute summer	33	12	52.191	0.270	36.8	0.3050	0.0000	SURCHARGED
15 minute summer	66	12	52.077	1.561	270.1	1.7650	0.0000	SURCHARGED
60 minute summer	44	45	53.516	0.278	21.6	0.3519	0.0000	SURCHARGED

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	11	Infiltration		0.2				
15 minute summer	48	48	49	7.7	0.417	0.115	0.2553	
15 minute summer	47	47	48	7.8	1.124	0.116	0.1496	
15 minute summer	52	52	53	75.5	1.332	0.207	1.0234	
15 minute summer	25	25	26	371.6	1.958	0.978	15.8204	
15 minute summer	26	26	27	373.1	2.418	0.940	13.2194	
15 minute summer	27	27	36	245.1	2.412	0.371	0.6360	
15 minute summer	27	27a	59	126.7	1.184	0.600	0.8957	
15 minute summer	30	30	36	35.0	1.276	0.320	0.1840	
15 minute summer	30	30a	59	47.0	1.700	0.327	0.2925	
15 minute summer	28	28	29	54.7	1.298	0.626	3.3828	
15 minute summer	29	29	30	82.1	2.279	0.578	2.6760	
15 minute summer	36	36	36_OUT	474.4	2.202	2.203	1.2354	213.1
15 minute summer	35	35	36	34.3	0.863	0.810	2.4011	
15 minute summer	42	42	43	25.0	1.419	1.842	0.2601	
15 minute summer	24	24	36	166.2	1.569	1.101	0.6855	
15 minute summer	24	24a	59	-58.7	0.712	-0.384	1.0846	
15 minute summer	34	34	35	50.5	1.280	1.194	0.5047	
15 minute summer	34	34a	66	-19.0	1.072	-0.366	0.2383	
15 minute summer	31	31	32	15.2	1.039	0.858	0.3486	
15 minute summer	32	32	33	17.2	1.109	0.966	0.4106	
15 minute summer	33	33	34	36.3	1.377	0.914	0.9505	
30 minute summer	66	66	67	289.6	2.626	2.521	2.6176	
60 minute summer	44	44	45	20.6	1.190	1.101	0.9909	

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Results for 30 year +20% CC Critical Storm Duration. Lowest mass balance: 99.17%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	43	42	54.640	0.730	23.6	1.2643	0.0000	SURCHARGED
15 minute summer	45	12	52.513	0.203	20.2	0.2848	0.0000	OK
15 minute summer	18	12	54.990	0.344	25.9	0.5297	0.0000	SURCHARGED
60 minute summer	9	41	54.497	0.743	19.4	1.7904	0.0000	SURCHARGED
60 minute summer	14	42	54.329	0.659	20.4	1.5958	0.0000	SURCHARGED
60 minute summer	13	42	54.330	0.510	8.5	1.1556	0.0000	SURCHARGED
15 minute summer	61	12	52.935	0.027	2.7	0.1881	0.0000	OK
15 minute summer	62	12	52.806	0.024	0.9	0.0038	0.0000	OK
15 minute summer	64	12	52.760	0.027	2.2	0.0306	0.0000	OK
15 minute summer	63	11	52.990	0.030	3.1	0.2118	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	44	Infiltration		0.7				
30 minute summer	43	43	44	21.7	1.230	1.240	0.9296	
60 minute summer	43	Infiltration		0.8				
15 minute summer	45	45	46	21.6	0.962	0.540	0.3648	
15 minute summer	45	Infiltration		0.3				
15 minute summer	18	18	21	25.2	1.432	1.419	0.2475	
15 minute summer	18	Infiltration		0.1				
60 minute summer	9	9	14	17.2	0.978	1.270	0.1918	
60 minute summer	9	Infiltration		0.6				
60 minute summer	14	14	15	18.6	1.058	1.373	0.9015	
60 minute summer	14	Infiltration		0.6				
15 minute winter	13	13	14	7.3	0.284	0.200	0.9227	
60 minute summer	13	Infiltration		0.5				
15 minute summer	61	61	62	0.9	0.550	0.155	0.0137	
15 minute summer	61	Infiltration		1.4				
15 minute summer	62	62	64	0.9	0.382	0.024	0.0204	
15 minute summer	64	64	66	2.2	0.841	0.029	0.0229	
15 minute summer	63	63	64	1.3	0.653	0.186	0.0156	
15 minute summer	63	Infiltration		1.4				

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Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.22%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	3	10	57.465	1.050	35.5	0.0000	0.0000	FLOOD RISK
30 minute summer	1	20	56.792	0.829	14.7	0.0000	0.0000	FLOOD RISK
30 minute summer	4	24	56.663	1.329	49.8	8.3821	0.0000	SURCHARGED
60 minute summer	5	42	55.999	1.258	32.5	9.6091	0.0000	SURCHARGED
60 minute summer	6	41	55.550	1.224	23.4	7.1109	0.0000	SURCHARGED
60 minute summer	7	38	55.289	1.259	29.9	5.5683	0.0000	SURCHARGED
60 minute summer	8	40	54.890	1.054	27.1	3.1170	0.0000	SURCHARGED
60 minute summer	12	43	54.498	0.508	13.8	2.5302	0.0000	SURCHARGED
60 minute summer	15	46	53.529	0.253	19.9	0.7591	0.0000	SURCHARGED
15 minute summer	16	11	55.591	0.103	12.9	0.1169	0.0000	OK
30 minute summer	17	20	55.187	0.505	18.5	2.1552	0.0000	SURCHARGED
15 minute summer	21	13	53.076	0.288	65.2	0.3252	0.0000	OK
15 minute summer	22	12	53.039	0.375	90.5	0.4239	0.0000	OK
15 minute summer	23	11	52.945	0.535	108.2	0.6052	0.0000	SURCHARGED
15 minute summer	59	11	52.843	0.660	252.7	0.7465	0.0000	SURCHARGED
30 minute summer	37	22	56.896	0.856	10.6	0.0000	0.0000	FLOOD RISK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	3	3	4	27.7	1.571	1.417	1.1981	
15 minute summer	1	1	2	11.8	0.687	0.873	1.1052	
15 minute summer	4	4	5	14.2	0.833	1.050	1.3582	
30 minute summer	4	Infiltration		4.2				
15 minute summer	5	5	6	14.0	0.874	1.033	0.9493	
60 minute summer	5	Infiltration		5.6				
30 minute winter	6	6	7	14.5	0.825	1.070	0.6777	
60 minute summer	6	Infiltration		4.1				
30 minute summer	7	7	8	19.7	1.121	1.456	0.4432	
60 minute summer	7	Infiltration		3.1				
30 minute summer	8	8	9	22.6	1.284	1.667	0.1871	
60 minute summer	8	Infiltration		1.8				
15 minute summer	12	12	13	13.5	0.884	0.997	0.2168	
60 minute summer	12	Infiltration		1.7				
60 minute summer	15	15	21	18.9	1.081	1.214	0.5713	
60 minute summer	15	Infiltration		0.8				
15 minute summer	16	16	17	12.3	0.745	0.797	1.2310	
15 minute summer	17	17	18	17.3	0.981	1.116	0.0639	
30 minute summer	17	Infiltration		1.9				
15 minute summer	21	21	22	65.5	0.864	0.616	4.3330	
15 minute summer	22	22	23	89.9	0.980	0.845	9.7982	
30 minute summer	23	23	24	112.5	1.223	1.059	6.5116	
30 minute summer	59	59	60	169.6	1.564	1.132	6.6560	
15 minute summer	37	37	38	8.3	0.513	0.537	0.6692	

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Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.22%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	38	22	56.864	1.204	33.9	6.3617	0.0000	SURCHARGED
30 minute summer	39	23	56.417	1.448	49.4	11.5527	0.0000	FLOOD RISK
30 minute summer	41	24	55.303	1.227	70.1	13.7811	0.0000	SURCHARGED
30 minute summer	2	24	56.663	1.258	25.9	9.0733	0.0000	SURCHARGED
15 minute summer	46	12	52.700	0.462	28.3	0.5226	0.0000	SURCHARGED
15 minute summer	55	12	52.687	2.031	130.6	2.2976	0.0000	SURCHARGED
15 minute summer	60	12	52.536	1.985	268.5	2.2454	0.0000	SURCHARGED
15 minute summer	49	11	54.352	0.187	33.0	0.2111	0.0000	OK
15 minute summer	50	12	53.923	0.271	57.8	0.3070	0.0000	SURCHARGED
15 minute summer	51	12	53.002	0.580	72.5	0.6554	0.0000	SURCHARGED
30 minute summer	40	20	56.272	0.289	19.5	0.0000	0.0000	SURCHARGED
15 minute summer	53	12	52.875	1.655	86.6	1.8715	0.0000	FLOOD RISK
240 minute winter	68	192	50.790	0.362	88.2	448.0693	0.0000	SURCHARGED
15 minute summer	54	12	52.741	2.047	94.9	2.3152	0.0000	SURCHARGED
15 minute summer	68_OUT	1	50.391	0.000	0.0	0.0000	0.0000	OK
15 minute summer	67	10	51.762	1.325	291.0	1.4987	0.0000	SURCHARGED
240 minute winter	67_OUT	188	50.806	0.378	139.1	0.0000	0.0000	OK
15 minute summer	10	10	55.483	0.075	12.0	0.0847	0.0000	OK
30 minute summer	11	20	54.694	0.288	19.0	0.5259	0.0000	SURCHARGED

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	38	38	39	14.7	0.852	0.949	1.2159	
30 minute summer	38	Infiltration		2.9				
30 minute winter	39	39	41	17.0	0.965	1.097	1.4409	
30 minute summer	39	Infiltration		5.6				
15 minute summer	41	41	42	28.6	0.719	0.818	0.3484	
30 minute summer	41	Infiltration		4.8				
30 minute summer	41	Infiltration		3.1				
15 minute summer	2	2	4	-15.1	-0.380	-0.332	0.3656	
30 minute summer	2	Infiltration		4.5				
15 minute summer	46	46	55	30.7	1.094	0.674	0.4802	
15 minute summer	55	55	60	133.9	1.214	1.051	2.8338	
30 minute summer	60	60	66	286.5	2.598	2.494	1.1507	
15 minute summer	49	49	50	32.3	1.025	0.805	2.3353	
30 minute summer	50	50	51	51.7	1.426	1.026	3.2455	
15 minute summer	51	51	52	72.1	1.504	0.347	7.1686	
15 minute summer	40	40	41	18.8	1.087	0.885	1.7179	
15 minute summer	53	53	54	89.2	0.850	0.489	6.9602	
15 minute summer	68	Pump	68_OUT	0.0				0.0
240 minute winter	68	Infiltration		42.7				
15 minute summer	54	54	55	95.8	0.869	0.939	1.1268	
30 minute summer	67	67	67_OUT	311.6	3.812	3.028	0.2761	
15 minute summer	10	10	11	11.9	0.907	0.493	0.5483	
15 minute summer	11	11	12	16.5	1.004	1.064	0.9525	

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Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.22%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	48	10	54.451	0.058	10.1	0.0660	0.0000	OK
15 minute summer	47	10	54.812	0.061	10.2	0.0687	0.0000	OK
15 minute summer	52	12	52.898	1.371	100.1	1.5506	0.0000	FLOOD RISK
15 minute summer	25	11	55.868	1.168	489.0	1.3211	0.0000	SURCHARGED
15 minute summer	26	11	54.982	0.796	479.8	0.9000	0.0000	SURCHARGED
15 minute summer	27	11	53.932	0.328	472.1	0.5797	0.0000	OK
15 minute summer	30	11	53.230	0.155	106.2	0.2731	0.0000	OK
15 minute summer	28	10	54.994	0.211	72.1	0.2381	0.0000	OK
15 minute summer	29	11	54.490	0.206	106.7	0.2335	0.0000	OK
15 minute summer	36	11	51.878	0.811	623.8	1.4330	0.0000	SURCHARGED
15 minute summer	36_OUT	11	51.549	0.494	621.4	0.0000	0.0000	OK
15 minute summer	35	11	52.163	0.468	53.4	0.5289	0.0000	SURCHARGED
30 minute summer	42	24	55.267	1.243	27.9	1.4062	0.0000	SURCHARGED
15 minute summer	24	11	52.783	0.542	242.2	0.9568	0.0000	SURCHARGED
15 minute summer	34	11	52.239	0.459	55.8	0.5195	0.0000	SURCHARGED
15 minute summer	31	12	52.939	0.472	19.9	0.5342	0.0000	FLOOD RISK
15 minute summer	32	12	52.707	0.475	20.4	0.5376	0.0000	SURCHARGED
15 minute summer	33	11	52.422	0.501	43.5	0.5663	0.0000	SURCHARGED
15 minute summer	66	11	52.237	1.721	288.1	1.9470	0.0000	SURCHARGED
60 minute summer	44	47	53.603	0.365	22.8	0.6314	0.0000	SURCHARGED

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	11	Infiltration		0.5				
15 minute summer	48	48	49	10.0	0.455	0.149	0.2956	
15 minute summer	47	47	48	10.1	1.207	0.150	0.1801	
15 minute summer	52	52	53	78.0	1.374	0.214	1.0234	
15 minute summer	25	25	26	479.8	2.221	1.263	18.0307	
15 minute summer	26	26	27	472.1	2.495	1.189	15.4887	
15 minute summer	27	27	36	306.6	2.541	0.464	0.7538	
15 minute summer	27	27a	59	163.5	1.284	0.775	1.0644	
15 minute summer	30	30	36	45.4	1.360	0.416	0.2242	
15 minute summer	30	30a	59	60.6	1.803	0.422	0.3554	
15 minute summer	28	28	29	70.7	1.365	0.809	4.1570	
15 minute summer	29	29	30	106.2	2.398	0.748	3.2803	
15 minute summer	36	36	36_OUT	621.4	2.877	2.886	1.2672	283.8
15 minute winter	35	35	36	34.9	0.879	0.825	2.4011	
15 minute summer	42	42	43	26.1	1.484	1.926	0.2601	
15 minute summer	24	24	36	237.5	2.154	1.574	0.7238	
15 minute summer	24	24a	59	-114.2	-1.036	-0.746	1.0846	
15 minute winter	34	34	35	54.1	1.362	1.278	0.5047	
30 minute summer	34	34a	66	22.1	1.119	0.425	0.2344	
30 minute summer	31	31	32	17.8	1.058	1.004	0.4144	
15 minute summer	32	32	33	20.4	1.160	1.150	0.4160	
30 minute summer	33	33	34	43.6	1.437	1.098	0.9344	
30 minute summer	66	66	67	310.3	2.813	2.701	2.6176	
60 minute summer	44	44	45	21.4	1.215	1.141	0.9960	

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Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.22%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	43	25	54.849	0.939	25.9	1.6810	0.0000	SURCHARGED
15 minute summer	45	12	52.709	0.399	21.2	0.8793	0.0000	SURCHARGED
30 minute summer	18	20	55.147	0.501	31.1	0.7845	0.0000	SURCHARGED
60 minute summer	9	41	54.687	0.933	21.5	2.2773	0.0000	SURCHARGED
60 minute summer	14	43	54.491	0.821	21.4	2.0170	0.0000	SURCHARGED
60 minute summer	13	43	54.492	0.672	8.2	1.6086	0.0000	SURCHARGED
15 minute summer	61	12	52.941	0.033	3.5	0.2696	0.0000	OK
15 minute summer	62	12	52.810	0.028	1.3	0.0045	0.0000	OK
15 minute summer	64	12	52.765	0.032	3.1	0.0361	0.0000	OK
30 minute summer	63	19	52.996	0.036	3.8	0.2982	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	44	Infiltration		0.9				
30 minute summer	43	43	44	22.9	1.299	1.309	0.9296	
30 minute summer	43	Infiltration		1.0				
15 minute summer	45	45	46	27.2	0.971	0.681	0.3742	
15 minute summer	45	Infiltration		0.8				
30 minute summer	18	18	21	30.3	1.723	1.708	0.2490	
30 minute summer	18	Infiltration		0.2				
30 minute summer	9	9	14	19.2	1.088	1.412	0.1918	
60 minute summer	9	Infiltration		0.7				
60 minute summer	14	14	15	19.9	1.130	1.466	0.9015	
60 minute summer	14	Infiltration		0.7				
15 minute summer	13	13	14	7.9	0.274	0.216	0.9227	
60 minute summer	13	Infiltration		0.6				
15 minute summer	61	61	62	1.3	0.604	0.219	0.0176	
15 minute summer	61	Infiltration		1.6				
15 minute summer	62	62	64	1.3	0.421	0.033	0.0261	
15 minute summer	64	64	66	3.1	0.926	0.041	0.0290	
15 minute summer	63	63	64	1.8	0.713	0.257	0.0197	
30 minute summer	63	Infiltration		1.7				

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Appendix D. Foul sewer calculations

Design Settings

Frequency of use (kDU)	0.00	Minimum Velocity (m/s)	0.75
Flow per dwelling per day (l/day)	0	Connection Type	Level Soffits
Domestic Flow (l/s/ha)	0.0	Minimum Backdrop Height (m)	0.200
Industrial Flow (l/s/ha)	0.0	Preferred Cover Depth (m)	1.200
Additional Flow (%)	0	Include Intermediate Ground	✓

Nodes

Name	Add Inflow (l/s)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
FW-1	0.1	55.570		546608.264	728161.994	1.350
FW-2		54.590	1500	546656.914	728203.691	1.711
FW-3		54.830	1200	546649.328	728210.469	1.669
FW-4	0.1	55.200		546621.197	728152.898	1.350
FW-5		55.340	1200	546616.790	728156.642	1.586
FW-6	0.1	53.500		546687.406	728226.881	1.050
FW-7		53.860	1800	546681.363	728232.124	1.555
FW-10		54.580	1200	546663.317	728198.349	1.763
FW-8 Decompression manhole		54.300	1200	546663.287	728210.855	1.350
FW-9		54.590	1200	546658.866	728202.079	1.730

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)
1.000	FW-1	FW-3	63.532	1.500	54.220	53.161	1.059	60.0	150
2.001	FW-5	FW-2	61.835	1.500	53.754	53.091	0.663	93.3	150
2.000	FW-4	FW-5	5.783	1.500	53.850	53.754	0.096	60.0	150
1.002	FW-2	FW-9	2.532	1.500	52.879	52.860	0.019	135.0	150
1.001	FW-3	FW-2	10.173	1.500	53.161	53.086	0.075	135.0	150
3.000	FW-6	FW-7	8.001	1.500	52.450	52.317	0.133	60.0	150
3.002	FW-8 Decompression manhole	FW-2	9.589	0.300	52.950	52.879	0.071	135.0	150
1.003	FW-9	FW-10	5.807	1.500	52.860	52.817	0.043	135.0	150
3.001	FW-7	FW-8 Decompression manhole	27.912	1.500	52.305	52.950	-0.645	-43.3	60

Name	Pro Vel @ 1/3 Q (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Dwellings (ha)	Σ Units (ha)	Σ Add Inflow (ha)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	0.192	1.132	20.0	0.1	1.200	1.519	0.000	0	0.0	0.1	8	0.274
2.001	0.167	0.907	16.0	0.1	1.436	1.349	0.000	0	0.0	0.1	9	0.243
2.000	0.192	1.132	20.0	0.1	1.200	1.436	0.000	0	0.0	0.1	8	0.274
1.002	0.212	0.753	13.3	0.3	1.561	1.580	0.000	0	0.0	0.3	16	0.305
1.001	0.150	0.753	13.3	0.1	1.519	1.354	0.000	0	0.0	0.1	10	0.211
3.000	0.192	1.132	20.0	0.1	0.900	1.393	0.000	0	0.0	0.1	8	0.274
3.002	0.172	0.940	16.6	0.1	1.200	1.561	0.000	0	0.0	0.1	8	0.254
1.003	0.211	0.753	13.3	0.3	1.580	1.613	0.000	0	0.0	0.3	16	0.303
3.001	0.000	0.750	2.1	0.1	1.495	1.290	0.000	0	0.0	0.1	150	0.000

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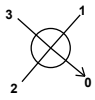
Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	63.532	60.0	150	Carrierdrain	55.570	54.220	1.200	54.830	53.161	1.519
2.001	61.835	93.3	150	Carrierdrain	55.340	53.754	1.436	54.590	53.091	1.349
2.000	5.783	60.0	150	Carrierdrain	55.200	53.850	1.200	55.340	53.754	1.436
1.002	2.532	135.0	150	Carrierdrain	54.590	52.879	1.561	54.590	52.860	1.580
1.001	10.173	135.0	150	Carrierdrain	54.830	53.161	1.519	54.590	53.086	1.354
3.000	8.001	60.0	150	Carrierdrain	53.500	52.450	0.900	53.860	52.317	1.393
3.002	9.589	135.0	150	Carrierdrain	54.300	52.950	1.200	54.590	52.879	1.561
1.003	5.807	135.0	150	Carrierdrain	54.590	52.860	1.580	54.580	52.817	1.613
3.001	27.912	-43.3	60	Carrierdrain	53.860	52.305	1.495	54.300	52.950	1.290

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	FW-1		Junction		FW-3	1200	Manhole	Adoptable
2.001	FW-5	1200	Manhole	Adoptable	FW-2	1500	Manhole	Adoptable
2.000	FW-4		Junction		FW-5	1200	Manhole	Adoptable
1.002	FW-2	1500	Manhole	Adoptable	FW-9	1200	Manhole	Adoptable
1.001	FW-3	1200	Manhole	Adoptable	FW-2	1500	Manhole	Adoptable
3.000	FW-6		Junction		FW-7	1800	Manhole	Adoptable
3.002	FW-8 Decompression manhole	1200	Manhole	Adoptable	FW-2	1500	Manhole	Adoptable
1.003	FW-9	1200	Manhole	Adoptable	FW-10	1200	Manhole	Adoptable
3.001	FW-7	1800	Manhole	Adoptable	FW-8 Decompression manhole	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
FW-1	546608.264	728161.994	55.570	1.350					
						0	1.000	54.220	150
FW-2	546656.914	728203.691	54.590	1.711	1500		1	3.002	52.879	150
							2	2.001	53.091	150
							3	1.001	53.086	150
							0	1.002	52.879	150
FW-3	546649.328	728210.469	54.830	1.669	1200		1	1.000	53.161	150
							0	1.001	53.161	150
FW-4	546621.197	728152.898	55.200	1.350					
						0	2.000	53.850	150
FW-5	546616.790	728156.642	55.340	1.586	1200		1	2.000	53.754	150
							0	2.001	53.754	150
FW-6	546687.406	728226.881	53.500	1.050					
						0	3.000	52.450	150

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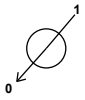
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
FW-7	546681.363	728232.124	53.860	1.555	1800	1	3.000	52.317	150
						0	3.001	52.305	60
FW-10	546663.317	728198.349	54.580	1.763	1200	1	1.003	52.817	150
FW-8 Decompression manhole	546663.287	728210.855	54.300	1.350	1200	1	3.001	52.950	60
									
						0	3.002	52.950	150
FW-9	546658.866	728202.079	54.590	1.730	1200	1	1.002	52.860	150
						0	1.003	52.860	150

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Appendix E. Uisce Éireann Pre-Connection Application and Confirmation of Feasibility

Pre-connection enquiry form

Business developments, mixed use developments, housing developments

This form is to be filled out by applicants enquiring about the feasibility of a water and/or wastewater connection to Uisce Éireann infrastructure. If completing this form by hand, please use BLOCK CAPITALS and black ink. Please note that this is a digital PDF form and can be filled in electronically

Please refer to the **Guide to completing the pre-connection enquiry form** on page 14 of this document when completing the form.

*** Denotes mandatory/ required field. Please note, if mandatory fields are not completed the application will be returned.**

Section A | Applicant details

1 *Applicant details:

Registered company name (if applicable): Bord Gais Energy Ltd

Trading name (if applicable): Bord Gais Energy

Company registration number (if applicable): 463078

Parent company registered company name (if applicable): N/A

Parent company registration number (if applicable): N/A

If you are not a registered company/business, please provide the applicant's name: N/A

*Contact name:

*Postal address: 6900

BUILDING 6900, AVENUE 6000

CORK AIRPORT BUSINESS PARK

*Eircode: T12CFR6

Please provide either a landline or a mobile number

Landline: N/A

*Mobile:

*Email:

2 Agent details (if applicable):

The fields marked with * in this section are mandatory if using an agent

*Contact name:

Company name (if applicable): Atkins Réalis

*Postal address: Atkins house, 150 Lakeshore Drive, Airside Business Park

Swords, Co. Dublin

*Eircode: K67 K5W

Please provide either a landline or a mobile number

Landline:

*Mobile

*Email: .com

3 *Please indicate whether it is the applicant or agent who should receive future correspondence in relation to the enquiry:

Applicant | Agent ✔

Section B | Site details

4 *Site address 1 (include Site name/Building name/Building number):

POLLNAGROAGH

***Address 2**

***Address 3**

***City/Town** ATHENRY

***County** CO GALWAY **Eircode**

5 *Irish Grid co-ordinates (proposed connection point):

Eastings (X) 146599 Northings (Y) 228133

Note: Values for Eastings must be between 015,900 and 340,000. Northings, between 029,000 and 362,000

Eg. co-ordinates of GPO, O'Connell St., Dublin: E(X) 315,878 N(Y) 234,619

6 *Local Authority where proposed development is located:

GALWAY COUNTY COUNCIL

7 *Has full planning permission been granted? Yes No ✔

If 'Yes', please provide the current or previous planning reference number:

N/A

8 ***Is this development affiliated with a government body/agency?** Yes ☐ No ☑

If 'Yes', please specify the body/agency:

N / A

Eg. IDA, HSE, LDA, etc.

Section C | Development details

9 ***Please outline the domestic and/or industry/business use proposed:**

Domestic:

Property type	Number of units	Property type	Number of units
House	N/A	Apartments	N/A
Duplex	N/A	Number of Apartment Blocks	N/A

Industry/business:

Property type	Number of units	Property type	Number of units
Agricultural	N/A	Brewery / Distillery	N/A
Restaurant / Café / Pub	N/A	Car Wash / Valeting	N/A
Creche	N/A	Data Centre	N/A
Fire Hydrant	N/A	Fire Station	N/A
Food Processing	N/A	Hotel Accommodation	N/A
Industrial / Manufacturing	N/A	Laundry / Laundrette	N/A
Office	N/A	Primary Care Centre	N/A
Residential / Nursing Care Home	N/A	Retail	N/A
School	N/A	Sports Facility	N/A
Student Accommodation	N/A	Warehouse	N/A

Other (please specify type)	Power Generation Station	No. of Units	1

9.1 Please provide additional details if your proposed business use are in the Food Processing, Industrial unit/ Manufacturing, Sports Facility or Other Categories.

Large Open Cycle Gas Turbine

Project to enter T-4

Capacity Auction

9.2 Please provide the maximum expected occupancy in number of people, according to the proposed development you selected, e.g. Number of office workers, number of nursing home residents, maximum pub occupancy, number of hotel beds, number of retail workers:

0	0	0	0	1	0

10 ***Approximate start date of proposed development:**

0	1	/	1	0	/	2	0	2	8

11 ***Is the development multi-phased?** Yes No ✔

If 'Yes', application must include a master-plan identifying the development phases and the current phase number.

If 'Yes', please provide details of variations in water demand volumes and wastewater discharge loads due to phasing requirements.

12 ***Please indicate the type of connection required by ticking the appropriate box below:**

Both Water and Wastewater		Please complete both Sections D and E
Water only	✔	Please go to Section D
Wastewater only		Please go to Section E

Reason for only applying for one service (if applicable):

O	N	S	I	T	E		W	A	S	T	E	W	A	T	E	R		D	I	S	P	O	S	A	L		B	Y	
S	E	P	T	I	C		T	A	N	K		A	N	D		P	E	R	C	O	L	A	T	I	O	N			
A	R	E	A																										

Section D | Water connection and demand details

13 ***Is there an existing connection to public water mains at the site?** Yes ☐ No ✔

13.1 If yes, is this enquiry for an additional connection to one already installed? Yes ☐ No ✔

13.2 If yes, is this enquiry to increase the size of an existing connection? Yes ☐ No ✔

14 **Approximate date water connection is required:** 01 / 10 / 2027

15 ***What diameter of water connection is required to service the development?** 150 mm

16 ***Is more than one connection required to the public infrastructure to service this development?** Yes ☐ No ✔

If 'Yes', how many? No

17 **Please indicate the business water demand (shops, offices, schools, hotels, restaurants, etc.):**

Post-development peak hour water demand	N/A	**l/s**
Post-development average hour water demand	N/A	**l/s**

Please include calculations on the attached sheet provided. Where there will be a daily/weekly/seasonal variation in the water demand profile, please provide all such details.

18 **Please indicate the industrial water demand (industry-specific water requirements):**

Post-development peak hour water demand	6	**l/s**
Post-development average hour water demand	4.5	**l/s**

Please include calculations on the attached sheet provided. Where there will be a daily/weekly/seasonal variation in the water demand profile, please provide all such details.

19 **What is the existing ground level at the property boundary at connection point (if known) above Malin Head Ordnance Datum?** 52.8 m

20 **What is the highest finished floor level of the proposed development above Malin Head Ordnance Datum?** m

21 **Is on-site water storage being provided?** Yes ✔ No ☐

Please include calculations on the attached sheet provided.

22 **Are there fire flow requirements?** Yes ☐ No ✔

Additional fire flow requirements over and above those identified in Q17-18	N/A	**l/s**

Please include calculations on the attached sheet provided, and include confirmation of requirements from the Fire Authority.

23 **Do you propose to supplement your potable water supply from other sources?** Yes ☐ No ✔

If 'Yes', please indicate how you propose to supplement your potable water supply from other sources (see **Guide to completing the application form** on page 15 of this document for further details):

N / A

Section E | Wastewater connection and discharge details

24 ***Is there an existing connection to a public sewer at the site?** Yes ☐ No ☐

24.1 If yes, is this enquiry for an additional connection to the one already installed? Yes ☐ No ☐

24.2 If yes, is this enquiry to increase the size of an existing connection? Yes ☐ No ☐

25 ***Approximate date that wastewater connection is required:** ☐☐ / ☐☐ / ☐☐☐☐

26 ***What diameter of wastewater connection is required to service the development?** ☐☐☐ mm

27 ***Is more than one connection required to the public infrastructure to service this development?** Yes ☐ No ☐

If 'Yes', how many? ☐☐

28 **Please indicate the commercial wastewater hydraulic load (shops, offices, schools, hotels, restaurants, etc.):**

Post-development peak discharge		**l/s**
Post-development average discharge		**l/s**

Please include calculations on the attached sheet provided.

29 **Please indicate the industrial wastewater hydraulic load (industry-specific discharge requirements):**

Post-development peak discharge		**l/s**
Post-development average discharge		**l/s**

Please include calculations on the attached sheet provided.

30 Wastewater organic load:

Characteristic	Max concentration (mg/l)	Average concentration (mg/l)	Maximum daily load (kg/day)
Biochemical oxygen demand (BOD)			
Chemical oxygen demand (COD)			
Suspended solids (SS)			
Total nitrogen (N)			
Total phosphorus (P)			
Other			

Temperature range	
pH range	

31 *Storm water run-off will only be accepted from brownfield sites that already have a storm/surface water connection to a combined sewer. In the case of such brownfield sites, please indicate if the development intends discharging surface water to the combined wastewater collection system:

Yes ☐ No ☐

If 'Yes', please give reason for discharge and comment on adequacy of SUDS/attenuation measures proposed.

Please submit detailed calculations on discharge volumes, peak flows and attenuation volumes with this application

32 *Do you propose to pump the wastewater? Yes ☐ No ☐

If 'Yes', please include justification for your pumped solution with this application.

33 What is the existing ground level at the property boundary at connection point (if known) above Malin Head Ordnance Datum?

☐☐☐☐☐ m

34 What is the lowest finished floor level on site above Malin Head Ordnance Datum? ☐☐☐☐☐ m

35 What is the proposed invert level of the pipe exiting the property to the public road?

☐☐☐☐☐ m

Section F | Supporting documentation

Please provide the following additional information (all mandatory):

> Site location map: A site location map to a scale of 1:1000, which clearly identifies the land or structure to which the enquiry relates. The map shall include the following details: ✔

i. The scale shall be clearly indicated on the map.

ii. The boundaries shall be delineated in red.

iii. The site co-ordinates shall be marked on the site location map.

> Details of planning and development exemptions (if applicable). ✔

> Calculations (calculation sheets provided below). ✔

> Site layout map to a scale of 1:500 showing layout of proposed development, water network and wastewater network layouts, additional water/wastewater infrastructure if proposed, connection points to Uisce Éireann infrastructure. ✔

> Conceptual design of the connection asset from the proposed development to the existing Uisce Éireann infrastructure, including service conflicts, gradients, pipe sizes and invert levels. ✔

> Any other information that might help Uisce Éireann assess this pre-connection enquiry. ✔

Section G | Declaration

I/We hereby make this application to Uisce Éireann for a water and/or wastewater connection as detailed on this form.

I/We understand that any alterations made to this application must be declared to Uisce Éireann.

The details that I/we have given with this application are accurate.

I/We have enclosed all the necessary supporting documentation.

Any personal data you provide will be stored and processed by Uisce Éireann and may be transferred to third parties for the purposes of the water and/or wastewater connection process. I hereby give consent to Uisce Éireann to store and process my personal data and to transfer my personal data to third parties, if required, for the purposes of the connection process.

If you wish to revoke consent at any time or wish to see Uisce Éireann's full Data Protection Notice, please see **https://www.water.ie/privacy-notice/**

Signature: | | Date: 1 0 / 0 2 / 2 0 2 5

Your full name (in BLOCK CAPITALS):

N	I	K		D	E	W	H	I	R	S	T																		

Uisce Éireann will carry out a formal assessment based on the information provided on this form. Any future connection offer made by Uisce Éireann will be based on the information that has been provided here.

Please submit the completed form to **newconnections@water.ie** or alternatively, post to:

Uisce Éireann
PO Box 860
South City Delivery Office
Cork City

Please note that if you are sending us your application form and any associated documentation by email, the maximum file size that we can receive in any one email is 35MB.

Please note, if mandatory fields are not completed the application will be returned.

Uisce Éireann is subject to the provisions of the Freedom of Information Act 2014 ("FOIA") and the codes of practice issued under FOIA as may be amended, updated or replaced from time to time. The FOIA enables members of the public to obtain access to records held by public bodies subject to certain exemptions such as where the requested records may not be released, for example to protect another individual's privacy rights or to protect commercially sensitive information. Please clearly label any document or part thereof which contains commercially sensitive information. Uisce Éireann accepts no responsibility for any loss or damage arising as a result of its processing of freedom of information requests.

Calculations

Water demand

10 persons @ 60l/p/day (industrial no canteen)
600 litres/day = 600/24/60/60=0.007litres/sec average demand

On-site storage

DEMIN WATER TANK
VOLUME 6500CU.M
REQUIRES 6500/0.75=8666CU.M TO FILL DUE TO 75% WATER EXTRACTION EFFICIENCY.

Fire flow requirements

on site static fire fighting tanks
First fill only 1hr @ 50l/s = 180cu.m storage

Foul wastewater discharge

Guide to completing the pre-connection enquiry form

This form should be completed by applicants enquiring about the feasibility of a water and/or wastewater connection to Uisce Éireann infrastructure.

The Uisce Éireann Codes of Practice are available at **www.water.ie** for reference.

Section A | Applicant Details

Question 1: This question requires the applicant or company enquiring about the feasibility of a connection to identify themselves, their postal address, and to provide their contact details.

Question 2: If the applicant has employed a consulting engineer or an agent to manage the enquiry on their behalf, the agent's address and contact details should be recorded here.

Question 3: Please indicate whether it is the applicant or the agent who should receive future correspondence in relation to the enquiry.

Section B | Site details

Question 4: This is the address of the site requiring the water/wastewater service connection and for which this enquiry is being made.

Question 5: Please provide the Irish Grid co-ordinates of the proposed site. Irish grid positions on maps are expressed in two dimensions as Eastings (E or X) and Northings (N or Y) relative to an origin. You will find these coordinates on your Ordnance Survey map which is required to be submitted with an application.

Question 6: Please identify the Local Authority that is or will be dealing with your planning application, for example Cork City Council.

Question 7: Please indicate if planning permission has been granted for this application, and if so, please provide the planning permission reference number.

Question 8: Please indicate if this development is affiliated with a government body/agency, and if so, specify

Section C | Development details

Question 9: Please specify the number of different property/premises types by filling in the tables provided.

Question 9.1: Please provide additional details if your proposed business use are in the Food Processing, Industrial unit/ Manufacturing, Sports Facility or Other Categories.

Question 9.2: Please indicate the maximum expected occupancy in numbers of people according to the proposed development you selected.

Question 10: Please indicate the approximate commencement date of works on the development.

Question 11: Please indicate if a phased building approach is to be adopted when developing the site. If so, please provide details of the phase master-plan and the proposed variation in water demand/wastewater discharge as a result of the phasing of the development.

Question 12: Please indicate the type of connection required by ticking the appropriate box and proceed to complete the appropriate section or sections.

Section D | Water connection and demand details

Question 13: Please indicate if a water connection already exists for this site.

Question 13.1: Please indicate if this enquiry concerns an additional connection to one already installed on the site.

Question 13.2: Please indicate if you are proposing to upgrade the water connection to facilitate an increase in water demand. Uisce Éireann will determine what impact this will have on our infrastructure.

Question 14: Please indicate the approximate date that the proposed connection to the water infrastructure will be required.

Question 15: Please indicate what diameter of water connection is required to service this development.

Question 16: Please indicate if more than one connection is required to service this development. Please note that the connection size provided may be used to determine the connection charge.

Question 17: If this connection enquiry concerns a business premises, please provide calculations for the water demand and include your calculations on the calculation sheet provided. Business premises include shops, offices, hotels, schools, etc. Demand rates (peak and average) are site specific. Average demand is the total daily volume divided by a 24-hour time period and expressed in litres per second (l/s). For design purposes, please refer to the Uisce Éireann Codes of Practice for Water Infrastructure.

Question 18: If this connection enquiry is for an industrial premises, please calculate the water demand and include your calculations on the calculation sheet provided. Demand rates (peak and average) are site specific. Average demand is the total daily volume divided by a 24-hour time period and expressed in litres per second (l/s). The peak demand for sizing of the pipe network will be as per the specific business production requirements. For design purposes, please refer to the Uisce Éireann Codes of Practice for Water Infrastructure.

Question 19: Please specify the ground level at the location where connection to the public water mains will be made. This is required in order to determine if there is sufficient pressure in the existing water infrastructure to serve your proposed development. Levels should be quoted in metres relative to Malin Head Ordnance Datum.

Question 20: Please specify the highest finished floor level on site. This is required in order to determine if there is sufficient pressure in the existing water infrastructure to serve your proposed development. Levels should be quoted in metres relative to Malin Head Ordnance Datum.

Question 21: If storage is required, water storage capacity of 24-hour water demand must usually be provided at the proposed site. In some cases, 24-hour storage capacity may not be required, for example 24-hour storage for a domestic house would be provided in an attic storage tank. Please calculate the 24-hour water storage requirements and include your calculations on the attached sheet provided. Please also confirm that on-site storage is being provided by ticking the appropriate box.

Question 22: The water supply system shall be designed and constructed to reliably convey the water flows that are required of the development including fire flow requirements by the Fire Authority. The Fire Authority will provide the requirement for fire flow rates that the water supply system will have to carry. Please note that while flows in excess of your required demand may be achieved in the Uisce Éireann network and could be utilised in the event of a fire, Uisce Éireann cannot guarantee a flow rate to meet your fire flow requirement. To guarantee a flow to meet the Fire Authority requirements, you should provide adequate fire storage capacity within your development. Please include your calculations on the attached sheet provided, and further provide confirmation of the Fire Authority requirements.

Question 23: Please identify proposed additional water supply sources, that is, do you intend to connect to the public water mains or the public mains and supplement from other sources? If supplementing public water supply with a supply from another source, please provide details as to how the potable water supply is to be protected from cross contamination at the premises.

Section E | Wastewater connection and discharge details

Question 24: Please indicate if a wastewater connection to a public sewer already exists for this site.

Question 24.1: Please indicate if this enquiry relates to an additional wastewater connection to one already installed.

Question 24.2: Please indicate if you are proposing to upgrade the wastewater connection to facilitate an increased discharge. Uisce Éireann will determine what impact this will have on our infrastructure.

Question 25: Please specify the approximate date that the proposed connection to the wastewater infrastructure will be required.

Question 26: Please indicate what diameter of wastewater connection is required to service this development.

Question 27: Please indicate if more than one connection is required to service this development. Please indicate number required.

Question 28: If this enquiry relates to a business premises, please provide calculations for the wastewater discharge and include your calculations on the attached sheet provided. Business premises include shops, offices, hotels, schools, etc. Discharge rates (peak and average) are site specific. Average discharge is the total daily volume divided by a 24-hour time period and expressed in litres per second (l/s). For design purposes, please refer to the Uisce Éireann Codes of Practice for Wastewater Infrastructure.

Question 29: If this enquiry relates to an industrial premises, please provide calculations for the wastewater discharge and include your calculations on the calculation sheet provided. Discharge rates (peak and average) are site specific. Average discharge is the total daily volume divided by a 24-hour time period and expressed in litres per second (l/s). The peak discharge for sizing of the pipe network will be as per the specific business production requirements. For design purposes, please refer to the Uisce Éireann Codes of Practice for Wastewater Infrastructure.

Question 30: Please specify the maximum and average concentrations and the maximum daily load of each of the wastewater characteristics listed in the wastewater organic load table (if not domestic effluent), and also specify if any other significant concentrations are expected in the effluent. Please complete the table and provide additional supporting documentation if relevant. Note that the concentration shall be in mg/l and the load shall be in kg/day. Note that for business premises (shops, offices, schools, hotels, etc.) for which only domestic effluent will be discharged (excluding discharge from canteens/ restaurants which would require a Trade Effluent Discharge licence), there is no need to complete this question.

Question 31: In exceptional circumstances, such as brownfield sites, where the only practical outlet for storm/ surface water is to a combined sewer, Uisce Éireann will consider permitting a restricted attenuated flow to the combined sewer. Storm/surface water will only be accepted from brownfield sites that already have a storm/surface water connection to a combined sewer and the applicant must demonstrate how the storm/surface water flow from the proposed site is minimised using sustainable urban drainage system (SUDS). This type of connection will only be considered on a case by case basis. Please advise if the proposed development intends discharging surface water to the combined wastewater collection system.

Question 32: Please specify if the development needs to pump its wastewater discharge to gain access to Uisce Éireann infrastructure.

Question 33: Please specify the ground level at the location where connection to the public sewer will be made. This is required to determine if the development can be connected to the public sewer via gravity discharge. Levels should be quoted in metres relative to Malin Head Ordnance Datum.

Question 34: Please specify the lowest floor level of the proposed development. This is required in order to determine if the development can be connected to the public sewer via gravity discharge. Levels should be quoted in metres relative to Malin Head Ordnance Datum.

Question 35: Please specify the proposed invert level of the pipe exiting the property to the public road.

Section F | Supporting documentation

Please provide additional information as listed.

Section G | Declaration

Please review the declaration, sign, and return the completed application form to Uisce Éireann by email or by post using the contact details provided in Section G.

Notes

Notes

CONFIRMATION OF FEASIBILITY

Nik Dewhirst

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

Uisce Éireann
PO Box 448
South City
Delivery Office
Cork City

www.water.ie

2 May 2025

Our Ref: CDS25000940 Pre-Connection Enquiry
Pollnagroagh, Athenry, Co.Galway

Dear Applicant/Agent,

We have completed the review of the Pre-Connection Enquiry.

Uisce Éireann has reviewed the pre-connection enquiry in relation to a Water connection for a Business Connection of 1 unit(s) at Pollnagroagh, Athenry, Co.Galway, (the **Development)**.

Based upon the details provided we can advise the following regarding connecting to the networks;

- **Water Connection**
  - Feasible without infrastructure upgrade by Uisce Éireann
  - No direct Connection is permitted to the existing 300mm Trunk Main.
    The connection is feasible, however, a water network extension will be required to be installed by Uisce Éireann and funded by the Customer in order to facilitate the proposed development.
    Approximately 2km of existing water mains will be required to be upsized to 150mm to satisfy the proposed demands.
    The main will also need to be extended on the public road to the proposed connection point (approximately 150m)
    Tank Filling will be limited to occur only during nighttime off peak flow times. The customer is responsible for ensuring the tanks are to be filled strictly between the

Stiúrthóirí / Directors: Niall Gleeson (POF / CEO), Jerry Grant (Cathaoirleach / Chairperson), Gerard Britchfield, Liz Joyce, Michael Nolan, Patricia King, Eileen Maher, Cathy Mannion, Paul Reid, Michael Walsh.
Oifig Chláraithe / Registered Office: Teach Colvill, 24-26 Sráid Thalbóid, Baile Átha Cliath 1, D01 NP86 / Colvill House, 24-26 Talbot Street, Dublin, Ireland D01NP86
Is cuideachta ghníomhaíochta ainmnithe atá faoi theorainn scaireanna é Uisce Éireann / Uisce Éireann is a designated activity company, limited by shares.
Cláraithe in Éirinn Uimh.: 530363 / Registered in Ireland No.: 530363.

hours of 12am and 6am by way of automated controls.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Uisce Éireann infrastructure. Before the Development can be connected to our network(s) you must submit a connection application and be granted and sign a connection agreement with Uisce Éireann.

As the network capacity changes constantly, this review is only valid at the time of its completion. As soon as planning permission has been granted for the Development, a completed connection application should be submitted. The connection application is available at www.water.ie/connections/get-connected/

Where can you find more information?

- **Section A -** What is important to know?
- **Section B -** Details of Uisce Éireann's Network(s)

This letter is issued to provide information about the current feasibility of the proposed connection(s) to Uisce Éireann's network(s). This is not a connection offer and capacity in Uisce Éireann's network(s) may only be secured by entering into a connection agreement with Uisce Éireann.

For any further information, visit **www.water.ie/connections**, **email newconnections@water.ie** or contact 1800 278 278**.**

Yours sincerely,

Dermot Phelan
Connections Delivery Manager

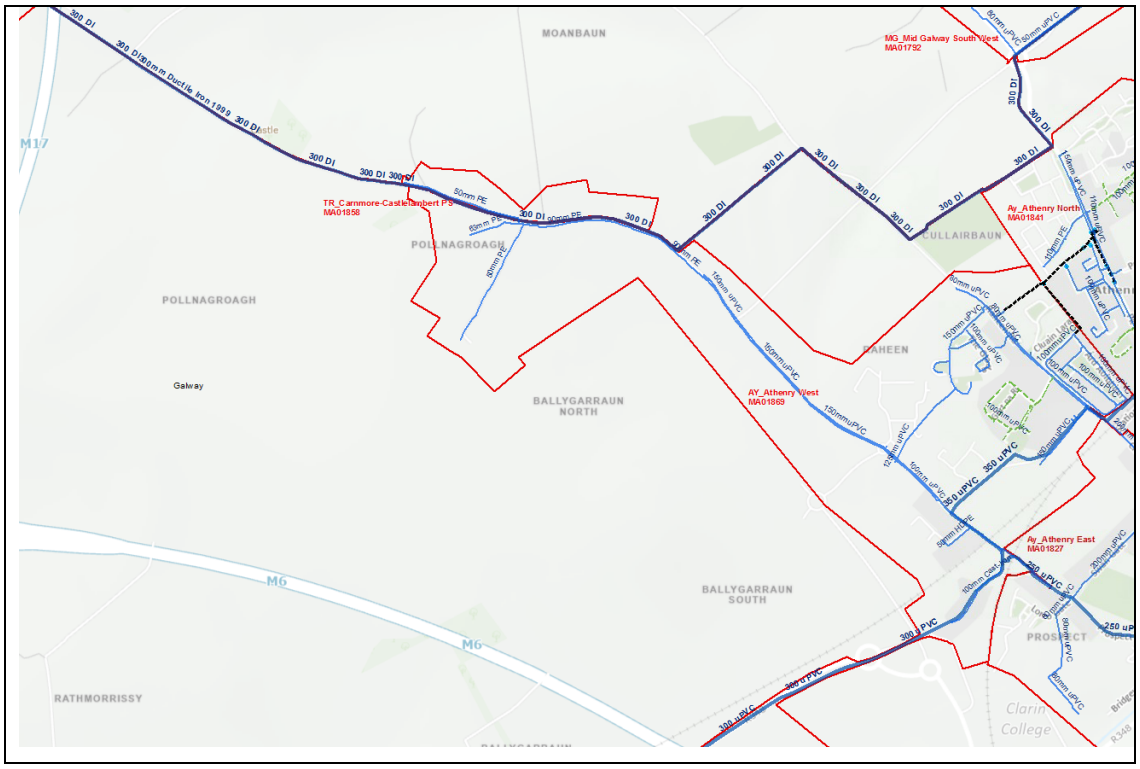
Section A - What is important to know?

What is important to know?	Why is this important?
Do you need a contract to connect?	• Yes, a contract is required to connect. This letter does not constitute a contract or an offer in whole or in part to provide a connection to Uisce Éireann's network(s). • Before the Development can connect to Uisce Éireann's network(s), you must submit a connection application and be granted and sign a connection agreement with Uisce Éireann.
When should I submit a Connection Application?	• A connection application should only be submitted after planning permission has been granted.
Where can I find information on connection charges?	• Uisce Éireann connection charges can be found at: https://www.water.ie/connections/information/charges/
Who will carry out the connection work?	• All works to Uisce Éireann's network(s), including works in the public space, must be carried out by Uisce Éireann*. *Where a Developer has been granted specific permission and has been issued a connection offer for Self-Lay in the Public Road/Area, they may complete the relevant connection works
Fire flow Requirements	• The Confirmation of Feasibility does not extend to fire flow requirements for the Development. Fire flow requirements are a matter for the Developer to determine. • **What to do?** - Contact the relevant Local Fire Authority
Plan for disposal of storm water	• The Confirmation of Feasibility does not extend to the management or disposal of storm water or ground waters. • **What to do?** - Contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges.
Where do I find details of Uisce Éireann's network(s)?	• Requests for maps showing Uisce Éireann's network(s) can be submitted to: datarequests@water.ie

What are the design requirements for the connection(s)?	• The design and construction of the Water pipes and related infrastructure to be installed in this Development shall comply with ***the Uisce Éireann Connections and Developer Services Standard Details and Codes of Practice,*** available at www.water.ie/connections
Trade Effluent Licensing	• Any person discharging trade effluent** to a sewer, must have a Trade Effluent Licence issued pursuant to section 16 of the Local Government (Water Pollution) Act, 1977 (as amended). • More information and an application form for a Trade Effluent License can be found at the following link: https://www.water.ie/business/trade-effluent/about/ **trade effluent is defined in the Local Government (Water Pollution) Act, 1977 (as amended)

Section B – Details of Uisce Éireann's Network(s)

The map included below outlines the current Uisce Éireann infrastructure adjacent the Development: To access Uisce Éireann Maps email datarequests@water.ie



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Note: The information provided on the included maps as to the position of Uisce Éireann's underground network(s) is provided as a general guide only. The information is based on the best available information provided by each Local Authority in Ireland to Uisce Éireann.

Whilst every care has been taken in respect of the information on Uisce Éireann's network(s), Uisce Éireann assumes no responsibility for and gives no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided, nor does it accept any liability whatsoever arising from or out of any errors or omissions. This information should not be solely relied upon in the event of excavations or any other works being carried out in the vicinity of Uisce Éireann's underground network(s). The onus is on the parties carrying out excavations or any other works to ensure the exact location of Uisce Éireann's underground network(s) 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.

Appendix F. BRE365 test results

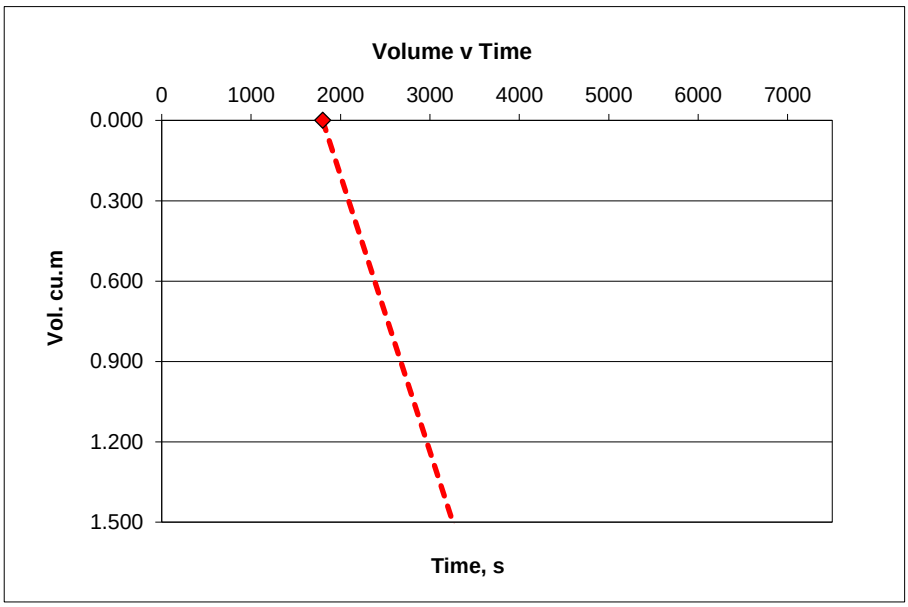
P25025 **Galway Peaker** **27/02/2025**

Test 1 **SA01** E546726.444 N728214.041 52.169mOD

l, m	**2.300**	b, m	**1.200**	d, m	**1.600**
l_base, m	**2.300**			d_eff, m	**0.560**
l_eff, m	**2.300**				

	Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
	30	1.040	1800	0.56	0.00	0.000
empty	55	1.600	3300	0.00	0.56	1.546

Area	2.760 m^2	$V_{p75\text{-}25\ theory}$	volume	0.7728	m^3
50% Area_eff, a_{p50}	4.720 m^2	$V_{p\ 75\ -\ 25\ actual}$	volume	0.7728	m^3
50% Area_act, a_{p50}	4.720 m^2	$t_{p\ 75\text{-}\ 25\ actual}$	time	750	s
		Infiltration Coefficient	*f*	2.18E-04	ms^-1



NOTES:
Water drains as the pit is being filled.
Water does not rise above 1.04m bgl.

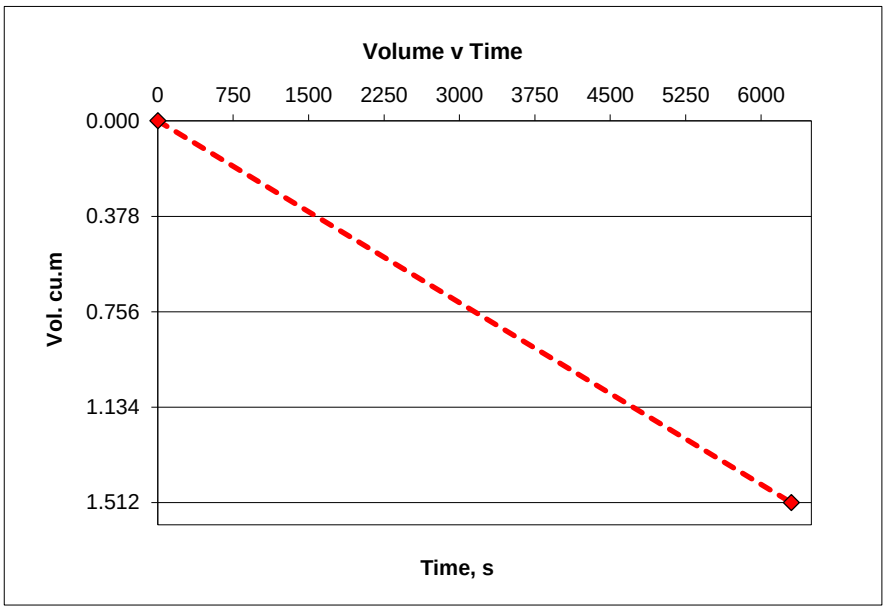
P25025 **Galway Peaker** **27/02/2025**

Test 1 **SA02 (PT01)** E546540.557 N728314.574 55.797mOD

l, m	**2.100**	b, m	**1.200**	d, m	**1.000**
l_base, m	**2.100**			d_eff, m	**0.600**
l_eff, m	**2.100**				

	Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
	0	0.400	0	0.60	0.00	0.000
empty	105	1.000	6300	0.00	0.60	1.512

Area	2.520	m^2	$V_{p75\text{-}25\ theory}$	volume	0.7560	m^3
50% Area_eff, a_{p50}	4.500	m^2	$V_{p\ 75\ -\ 25\ actual}$	volume	0.7560	m^3
50% Area_act, a_{p50}	4.500	m^2	$t_{p\ 75\text{-}\ 25\ actual}$	time	3150	s
			Infiltration Coefficient	*f*	5.33E-05	ms^-1



NOTES:
This was the proposed location for percolation test. Percolation test not carried out due to Soakaway test done instead.

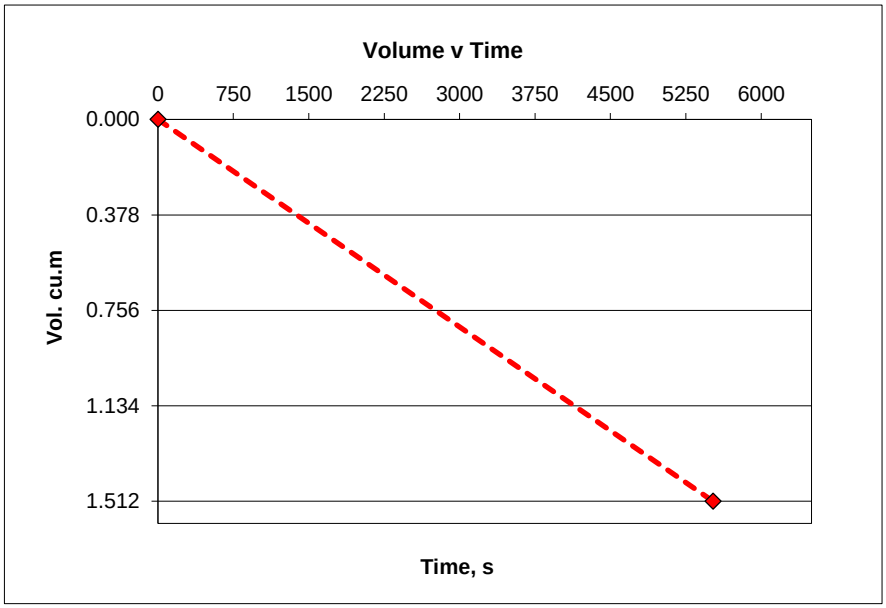
P25025 **Galway Peaker** **27/02/2025**

Test 2 **SA02 (PT01)** E546540.557 N728314.574 55.797mOD

l, m	**2.100**	b, m	**1.200**	d, m	**1.000**
l_base, m	**2.100**			d_eff, m	**0.600**
l_eff, m	**2.100**				

	Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
	0	0.400	0	0.60	0.00	0.000
empty	92	1.000	5520	0.00	0.60	1.512

Area	2.520	m^2	$V_{p75\text{-}25\ theory}$	volume	0.7560	m^3
50% Area_eff, a_{p50}	4.500	m^2	$V_{p\ 75\ -\ 25\ actual}$	volume	0.7560	m^3
50% Area_act, a_{p50}	4.500	m^2	$t_{p\ 75\text{-}\ 25\ actual}$	time	2760	s
			Infiltration Coefficient	*f*	6.09E-05	ms^-1



NOTES:
This was the proposed location for percolation test. Percolation test not carried out due to Soakaway test done instead.

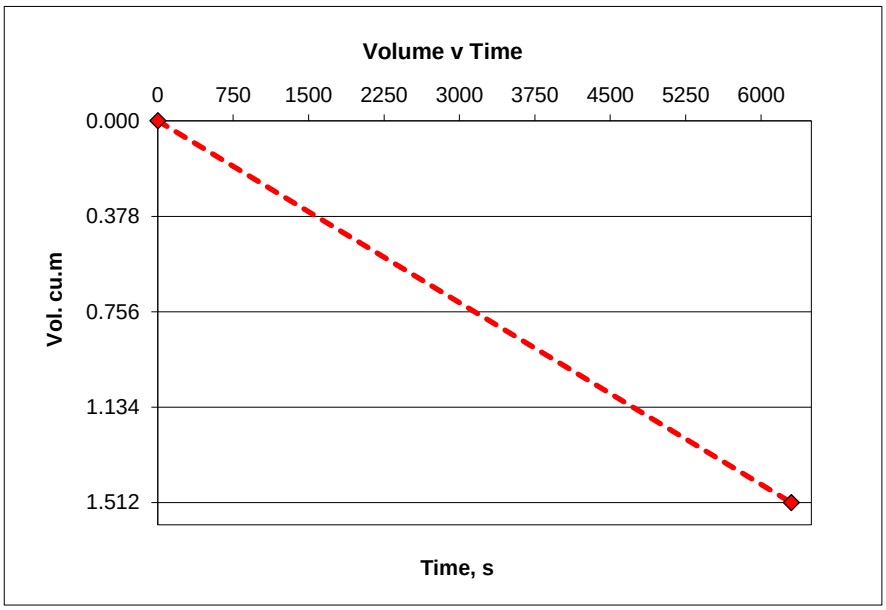
P25025 **Galway Peaker** **27/02/2025**

Test 3 **SA02 (PT01)** E546540.557 N728314.574 55.797mOD

l, m	**2.100**	b, m	**1.200**	d, m	**1.000**
l_base, m	**2.100**			d_eff, m	**0.600**
l_eff, m	**2.100**				

	Time, min	Measure, m bgl	Time, sec	Depth water, m	Fall, m	Volume
	0	0.400	0	0.60	0.00	0.000
empty	105	1.000	6300	0.00	0.60	1.512

Area	2.520	m^2	$V_{p75\text{-}25\ theory}$	volume	0.7560	m^3
50% Area_eff, a_{p50}	4.500	m^2	$V_{p\ 75\ -\ 25\ actual}$	volume	0.7560	m^3
50% Area_act, a_{p50}	4.500	m^2	$t_{p\ 75\text{-}\ 25\ actual}$	time	3150	s
			Infiltration Coefficient	*f*	5.33E-05	ms^-1



NOTES:
This was the proposed location for percolation test. Percolation test not carried out due to Soakaway test done instead.

AtkinsRéalis

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