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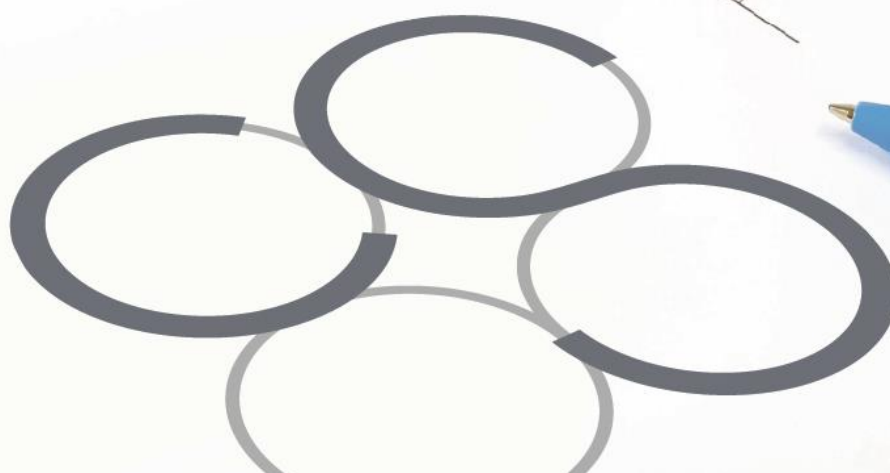
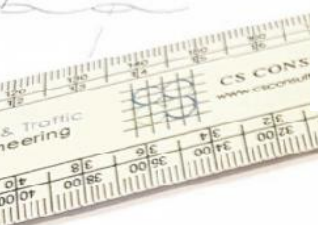
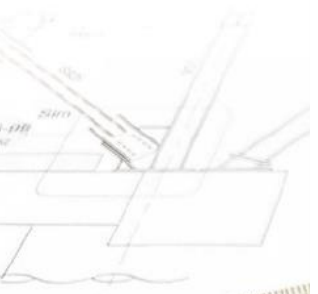
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Engineering Services Report Strategic Housing Development Clonattin, Gorey, Co. Wexford

Client: AXIS Construction

Job No. A091

November 2020



ENGINEERING SERVICES REPORT

STRATEGIC HOUSING DEVELOPMENT, CLONATTIN, GOREY, CO. WEXFORD

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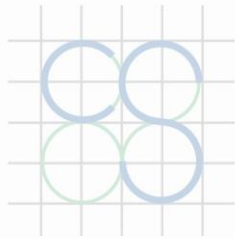
Appendix D: WinDES Microdrainage Stormwater Calculations

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1.0 INTRODUCTION

Cronin & Sutton Consulting Engineers (CS Consulting) have been commissioned by Axis Construction to prepare an Engineering Services Report to accompany a planning application for a proposed Strategic Housing Development at Clonattin, Gorey, County Wexford.

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

- Wexford County Development Plan 2013-2019;
- Gorey Town & Environs Local Area Plan 2017-2023;
- Department of the Environment Flooding Guidelines;
- Geological Survey of Ireland Maps;
- Local Authority Drainage Records.

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

2.0 SITE LOCATION AND PROPOSED DEVELOPMENT

2.1 Site Location

The proposed development site is located to the south of Clonattin Village in Gorey, Co. Wexford, approximately 500m to the east of Courtown Road. The site is located in the administrative jurisdiction of Wexford County Council and has a total area of approximately 15.5ha.

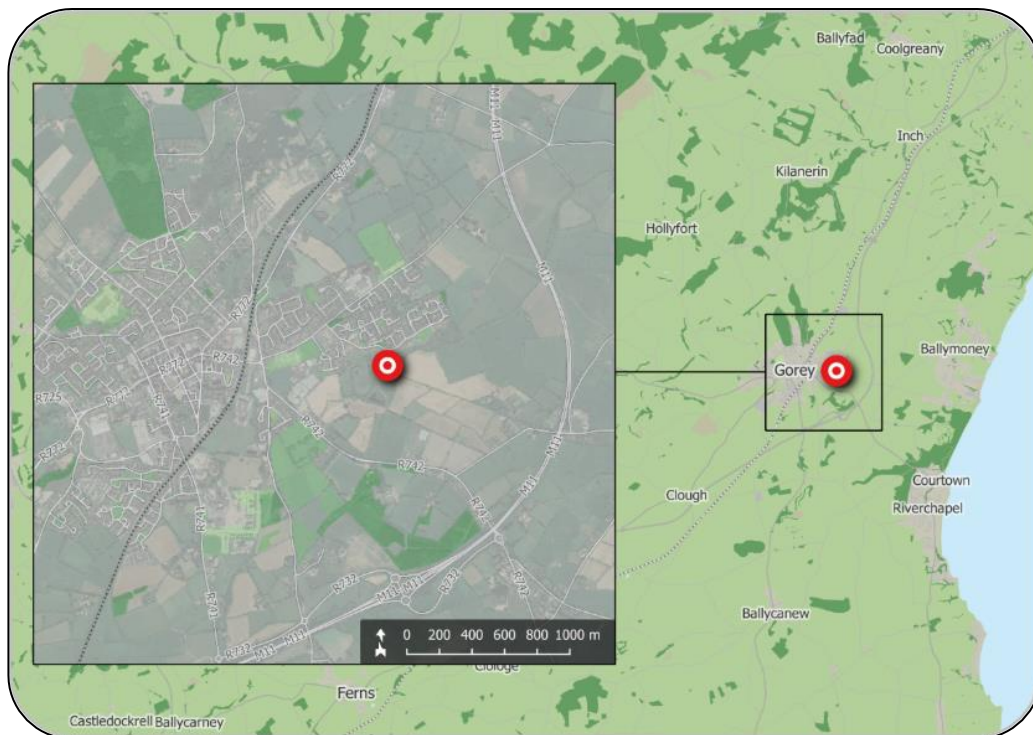


Figure 1 – Location of proposed development site
(map data & imagery: EPA, OSM Contributors, Google)

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

The site is bounded to the north by Clonattin Village; to the east, south and south-west by agriculture lands; and to north-west by existing residential properties.

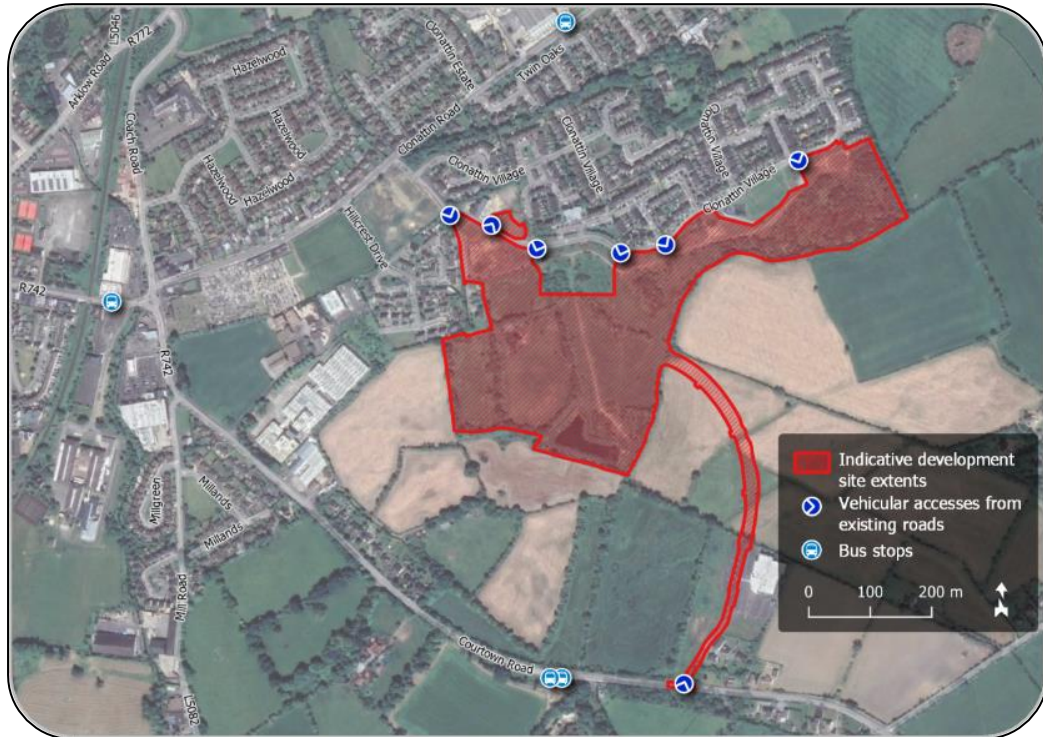


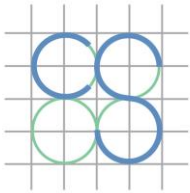
Figure 2 – Site extents and environs
(map data & imagery: NTA, OSM Contributors, Google)

2.2 Existing Land Use

The subject site is predominantly greenfield and currently generates no vehicular traffic. There are 2 no. existing derelict buildings (a dwelling and a shed) within the western part of the site, and an existing pond is located inside the site's southern boundary.

2.3 Description of Proposed Development

The proposed strategic housing development at this site in Clonattin, Gorey will include the demolition of the existing buildings and will provide 363no. residential units, a crèche, public open space, a new access road connecting to Courtown Road. All associated site development works and services provisions including parking, bin storage, substations, landscaping



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and all services required to facilitate the proposed development. A full description is provided in the statutory notices and in Chapter 3 of the EIAR.

3.0 FOUL DRAINAGE

3.1 Existing Foul Drainage Infrastructure

Wexford County Council's drainage records indicate a 300mm diameter uPVC foul sewer running through the subject site, from Clonattin Village towards Courtown Road to south-west of the proposed development. See **Appendix A** for Wexford County Council's drainage records. As part of the new development the existing 300mm sewer will be diverted as necessary to correspond with the proposed road network of the new development and retain its connection point to network on the Courtown Road.

3.2 Proposed Foul Drainage Arrangements

The proposed development is to consist of a 363no. residential units and based on Irish Water guidelines, the foul effluent generated shall be:

➤ For the residential units:

⇒ 450l/day per residential unit;

⇒ 450l/day/unit x 363 units = 163,350 l/day = 163.35 m³/day;

⇒ 1.891 l/sec Average flow (1 DWF);

⇒ 11.34 l/sec Peak Flow (6 DWF – Population between 751 to 1,000).

All foul effluent generated from the proposed development shall be collected in pipes of 150mm and 225mm diameter and flow under gravity into the diverted 300mm diameter uPVC sewer via new connections. The drainage network for the development shall be in accordance with Part H of the Building Regulations and to the requirements and specifications of Irish Water.



A Pre-Connection Enquiry has been submitted to Irish Water based for the proposed development and we have received a favourable Confirmation of Feasibility Letter and Statement of Design Acceptance from Irish Water (please see **Appendices B and C**).

External upgrade works shall potentially be required to serve the development, but the exact upgrade works shall be confirmed at the connection agreement stage as all modelling works by Irish Water shall be fully completed by then. In discussions with Irish Water all upgrade works shall be carried out by Irish Water and the costings of the upgrade works will form part of the connection agreement at a future date. We confirm the developer shall accommodate and agree all costings with Irish Water on the required upgrade works once a formal connection offer and agreement is issued by Irish Water following a favourable grant of planning.

The proposed foul water drainage infrastructure and routing plan is shown on drawings CLO-CSC-ZZ-XX-DR-C-0011, CLO-CSC-ZZ-XX-DR-C-0012 and CLO-CSC-ZZ-XX-DR-C-0013 included with this submission.

4.0 STORMWATER DRAINAGE

4.1 Existing Stormwater Drainage Infrastructure

Following receipt of Wexford County Council's drainage records (see **Appendix A**) there is an existing 600mm diameter public storm drain traversing the development site where it outfalls into an existing attenuation pond constructed as part of the Clonattin Village development directly to the north. As part of the new development the existing 600mm surface water pipe shall be diverted as necessary to correspond with the proposed road network of the new development and retain its outfall connection to the existing attenuation pond.

4.2 Proposed Stormwater Drainage Arrangements

The proposed development site is currently undeveloped, however there is an existing development directly to the north (Clonattin Village). As part of the development of the Clonattin Village estate, a surface water pipe and an attenuation pond were constructed on the development lands subject to this application (Planning reference: 2003/4476). The attenuation pond was constructed to store approximately **6050 cubic metres** of storm water (7,500m³ when you include the freeboard) which allowed for the future discharge of surface water runoff of the applicant lands to discharge into. The existing attenuation pond caters in excess of the 1 in 100 year storm event across both developments.

A hydrobrake/flow control system was also installed on the outfall of the attenuation pond to the local stream and by restricting the flow, the likelihood of the proposed development adversely affecting the public drainage system or contributing to downstream flooding is mitigated. The existing hydrobrake/flow control system shall remain unchanged post the



development of the applicant lands, therefore there shall be no increase in flood risk downstream of the applicant lands.

It is the policy of the Local Authority to include Sustainable Urban Drainage Systems, SuDS, for all new applications, as such it is proposed to use a range of SuDS devices for the scheme and they are listed below:

SuDS proposals are as follows:

- Infiltration trenches to rear garden
- Swales adjacent to roadways
- Rainwater harvesting such as waterbutts to each individual house for local irrigation and wash down.
- Permeable paving to private parking spaces and terraced areas for initial interception storage.
- Waterbutts to individual houses for local garden irrigation, car washing etc

See drawing nos. CLO-CSC-ZZ-XX-DR-C-0011, CLO-CSC-ZZ-XX-DR-C-0012, CLO-CSC-ZZ-XX-DR-C-0013, CLO-CSC-ZZ-XX-DR-C-0016, CLO-CSC-ZZ-XX-DR-C-0017, and CLO-CSC-ZZ-XX-DR-C-0018 included with this submission.

5.0 POTABLE WATER SUPPLY

5.1 Existing Potable Water System

Records obtained from Wexford County Council's records indicate a 150mm diameter uPVC public watermain on Clonattin Village to the north of the proposed development.

5.2 Proposed Potable Water System

It is proposed to make a new connection off the existing 150mm diameter public watermain on Clonattin Village to the development site and supply a 100mm and 150mm internal diameter watermain to the proposed development site.

The proposed development is to consist of a 363no. residential units and based on Irish Water guidelines, the potable water requirements shall be:

➤ For the residential units:

⇒ 405 l/day per residential unit (based on 2.7 persons per unit x 150l/person/day).

⇒ 405 l/day/unit x 363units = 147,015 l/day = 147.02 m³/day;

⇒ 1.702 l/sec Average water demand;

⇒ 8.5 l/sec Peak water demand (5 times average water demand).

A Pre-Connection Enquiry has been submitted to Irish Water based on the above water demand we have received a favourable Confirmation of Feasibility Letter and Statement of Design Acceptance from Irish Water (please see **Appendices B and C**). Similarly to the foul drainage, some upgrade works maybe required to facilitate the development, but these



upgrade works shall be confirmed at shall be confirmed at the connection agreement stage as all modelling works by Irish Water shall be fully completed by then. All upgrade works shall be carried out by Irish water and costs associated will form part of the connection agreement. We confirm the developer shall accommodate and agree all costings with Irish Water on the required upgrade works once a formal connection offer and agreement is issued by Irish Water following a favourable grant of planning.

The proposed watermain infrastructure and routing plan is shown on CLO-CSC-ZZ-XX-DR-C-0008, CLO-CSC-ZZ-XX-DR-C-0009 and CLO-CSC-ZZ-XX-DR-C-0010 included with this submission.

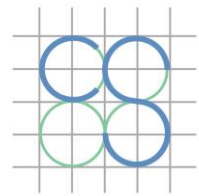
6.0 RESPONSE TO AN BORD PLEANÁLA OPINION

An Bord Pleanála has in June 2020 issued an opinion enumerating the items of specific information that should be submitted with any application for permission. The following items among these are of relevance to this Engineering Services Report:

1. *Water Infrastructure proposals to meet the requirements outlined in the submission on file of Irish water dated 18th March 2020.*

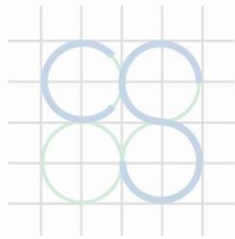
As previously mentioned, external upgrade works shall potentially be required to serve the development, but the exact upgrade works shall be confirmed at the connection agreement stage as all modelling works by Irish Water shall be fully completed by then. In discussions with Irish Water all upgrade works shall be carried out by Irish Water and the costings of the upgrade works will form part of the connection agreement at a future date. We confirm the developer shall accommodate the required upgrade works and shall agree all costings with Irish Water once a formal connection offer and agreement is issued by Irish Water following a favourable grant of planning.

For the proposed development a Pre-Connection Enquiry has been submitted to Irish Water based for the proposed development and we have received a favourable Confirmation of Feasibility Letter and Statement of Design Acceptance from Irish Water (please see **Appendices B and C**).



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Appendix A: Drainage & Watermain Records



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Goreybridge



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Legend

Stormwater Gravity Mains (Irish Water Owned)

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

Storm Fittings

- Vent/Col
- Other; Unknown
- Storm Discharge Points
- Outfall
- Overflow
- Soakaway
- Other; Unknown
- Storm Culverts
- Storm Clean Outs
- Sewer Gravity Mains (Irish Water owned)
- Combined
- Foul
- Overflow
- Unknown

Sewer Gravity Mains (Non-Irish Water owned)

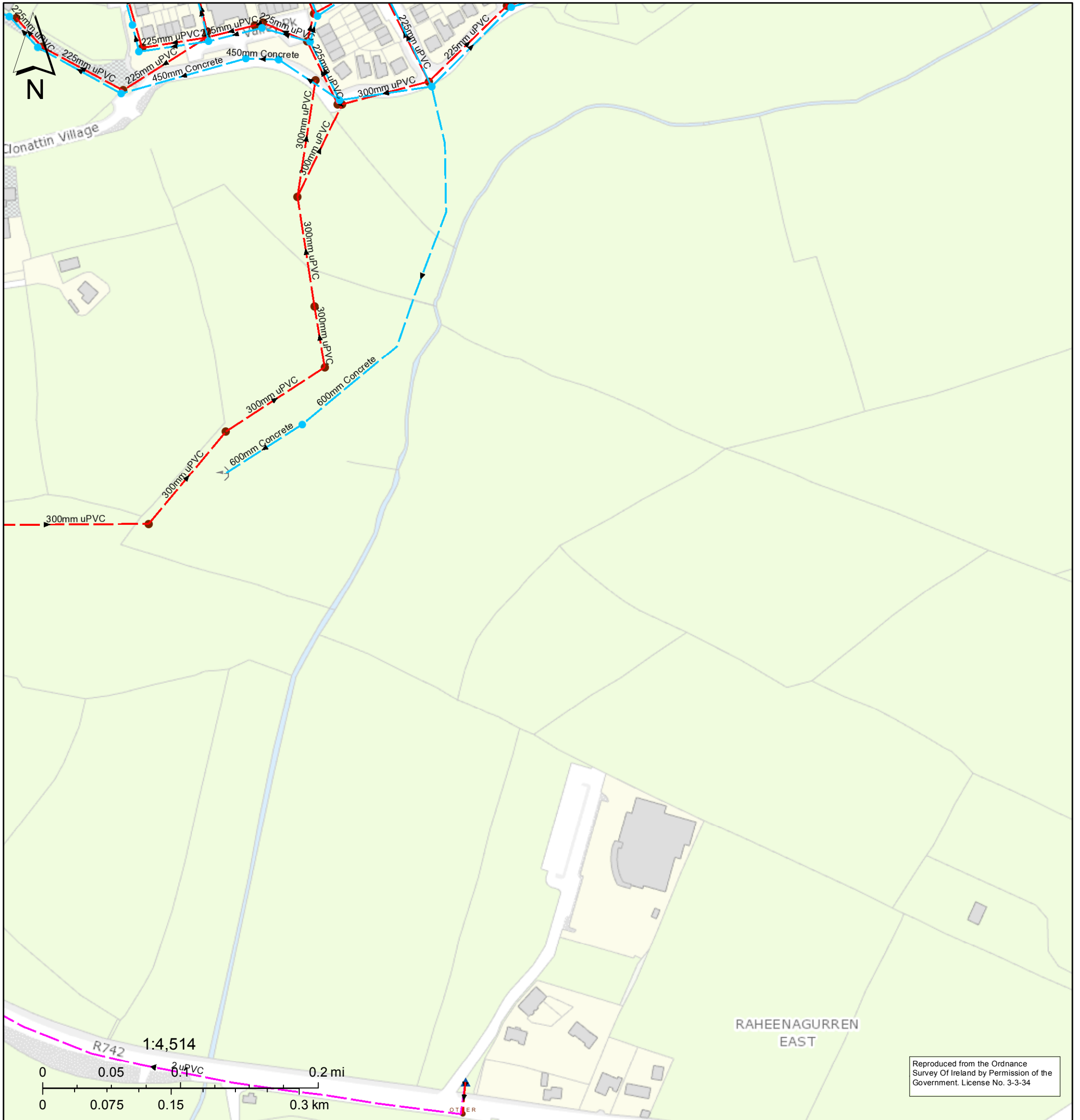
- Combined
- Foul
- Overflow
- Unknown
- Sewer Pressurized Mains (Irish Water owned)
- Combined
- Foul
- Overflow
- Unknown
- Sewer Pressurized Mains (Non-Irish Water owned)
- Combined
- Foul
- Overflow
- Unknown

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



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Legend

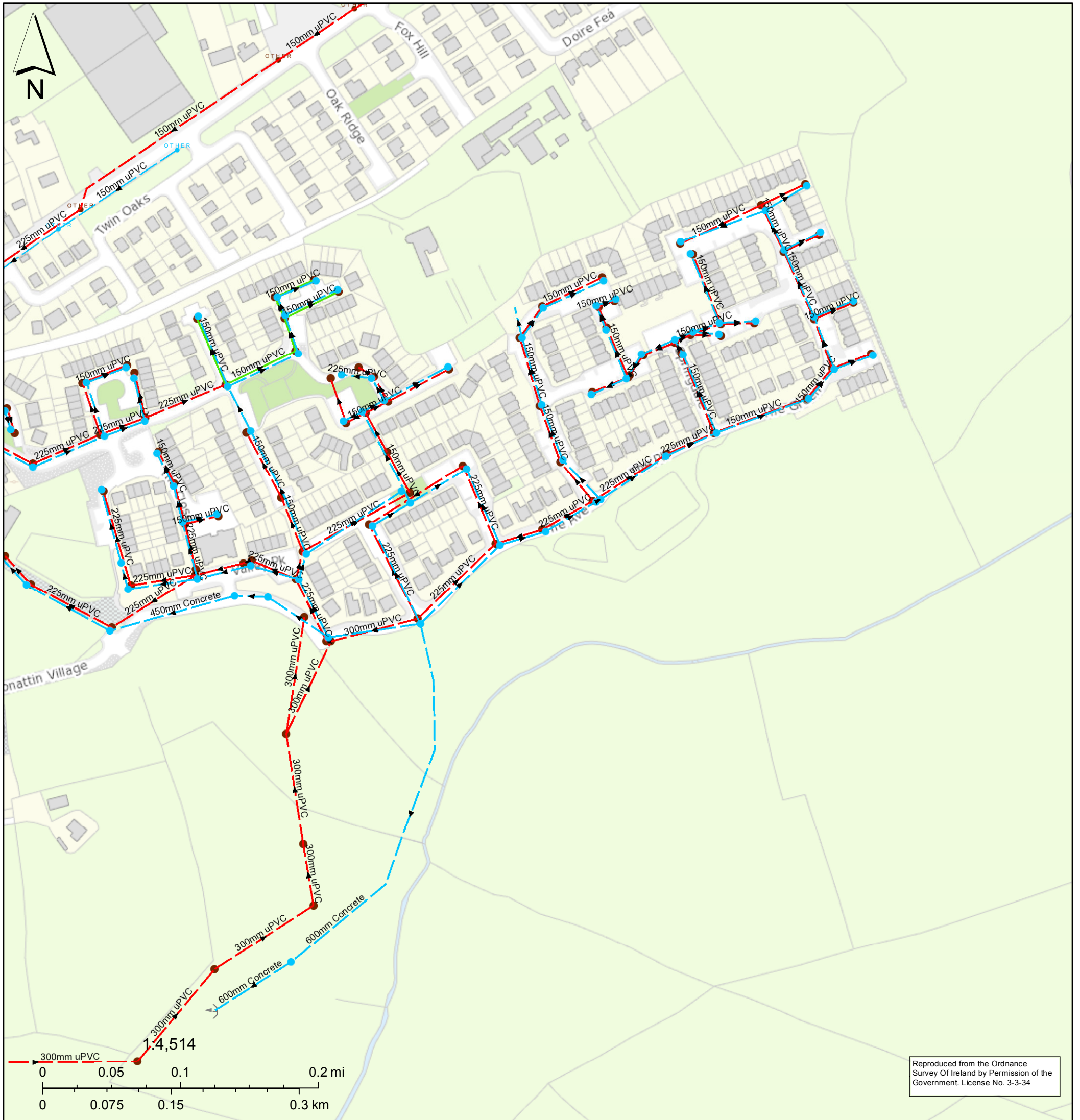
Stormwater Gravity Mains (Irish Water Owned)		Storm Fittings		Sewer Gravity Mains (Non-Irish Water owned)	
—	Surface	—	Vent/Col	—	Combined
—	Surface	—	Other; Unknown	—	Foul
Stormwater Gravity Mains (Non-Irish Water Owned)		Storm Discharge Points		Sewer Gravity Mains (Irish Water owned)	
—	Surface	—	Outfall	—	Combined
+	Cascade	—	Overflow	+	Foul
+	Catchpit	+	Soakaway	—	Overflow
+	Hatchbox	—	Other; Unknown	—	Unknown
+	Lamphole	—	Storm Culverts	Sewer Pressurized Mains (Irish Water owned)	
+	Standard	+	Storm Clean Outs	—	Combined
—	Other; Unknown	Sewer Gravity Mains (Irish Water owned)		+	Foul
Storm Inlets		—	Combined	—	Overflow
+	Gully	—	Foul	—	Unknown
+	Standard	—	Overflow	Sewer Pressurized Mains (Non-Irish Water owned)	
—	Other; Unknown	—	Unknown	—	Combined
		—		+	Foul
		—		—	Overflow
		—		—	Unknown

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Goreybridge



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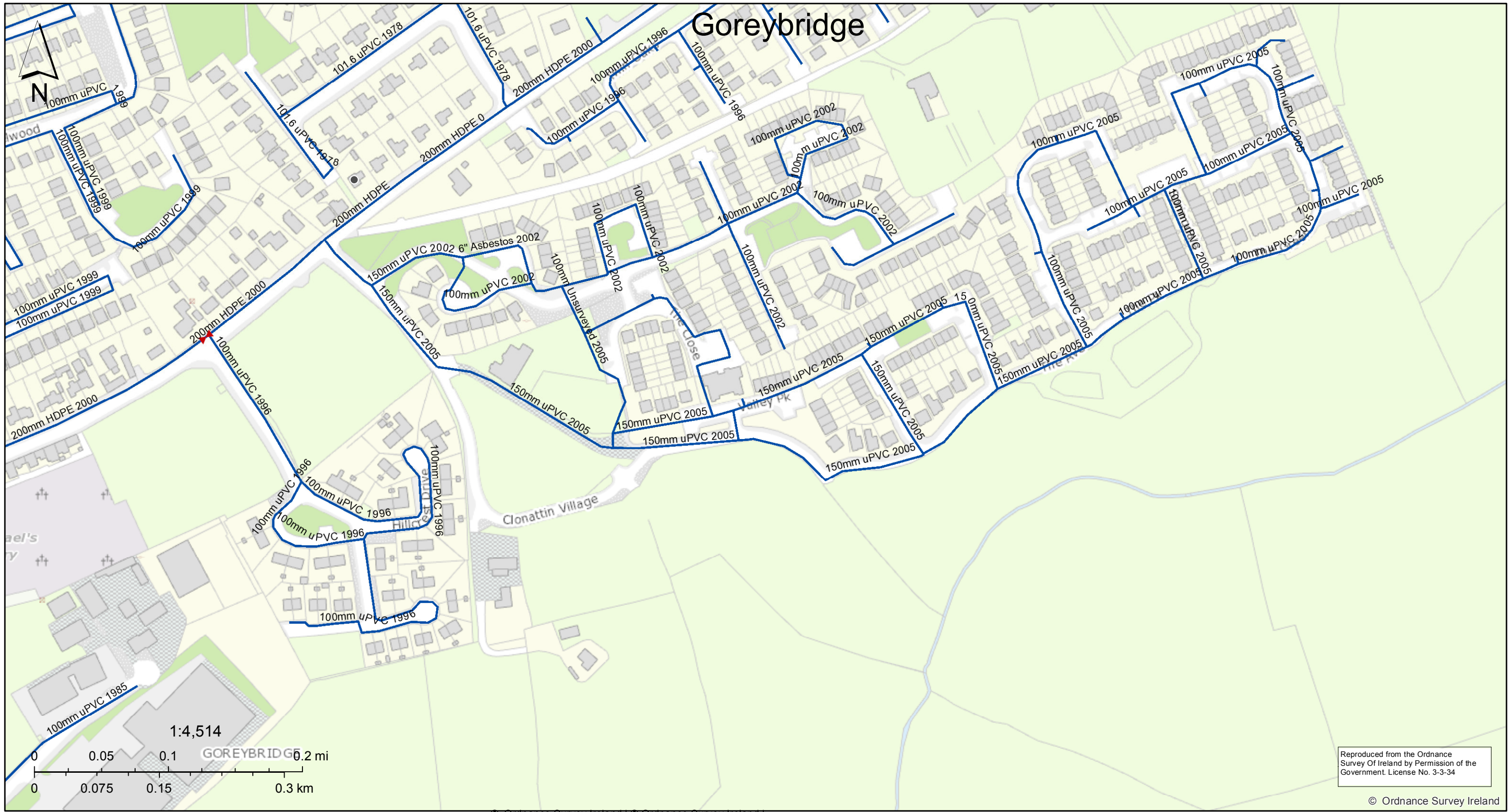
Legend

Stormwater Gravity Mains (Irish Water Owned)		Storm Fittings		Sewer Gravity Mains (Non-Irish Water owned)	
— Surface	— Vent/Col	— Combined	— Other; Unknown	— Foul	— Overflow
Stormwater Gravity Mains (Non-Irish Water Owned)		Storm Discharge Points		Sewer Gravity Mains (Irish Water owned)	
— Surface	— Outfall	— Combined	— Overflow	— Foul	— Overflow
Storm Manholes		— Soakaway		Sewer Pressurized Mains (Irish Water owned)	
— Cascade	— Other; Unknown	— Storm Culverts		— Combined	— Foul
— Catchpit	— Storm Clean Outs	— Sewer Gravity Mains (Irish Water owned)		— Overflow	— Unknown
— Hatchbox	— Sewer Gravity Mains (Irish Water owned)	— Combined	Sewer Pressurized Mains (Non-Irish Water owned)		
— Lamphole	— Combined	— Foul	— Combined	— Foul	— Overflow
— Standard	— Overflow	— Unknown	— Foul	— Overflow	— Unknown
— Other; Unknown	— Unknown	— Unknown	— Unknown	— Unknown	— Unknown
Storm Inlets		— Unknown		— Unknown	
— Gully					
— Standard					
— Other; Unknown					

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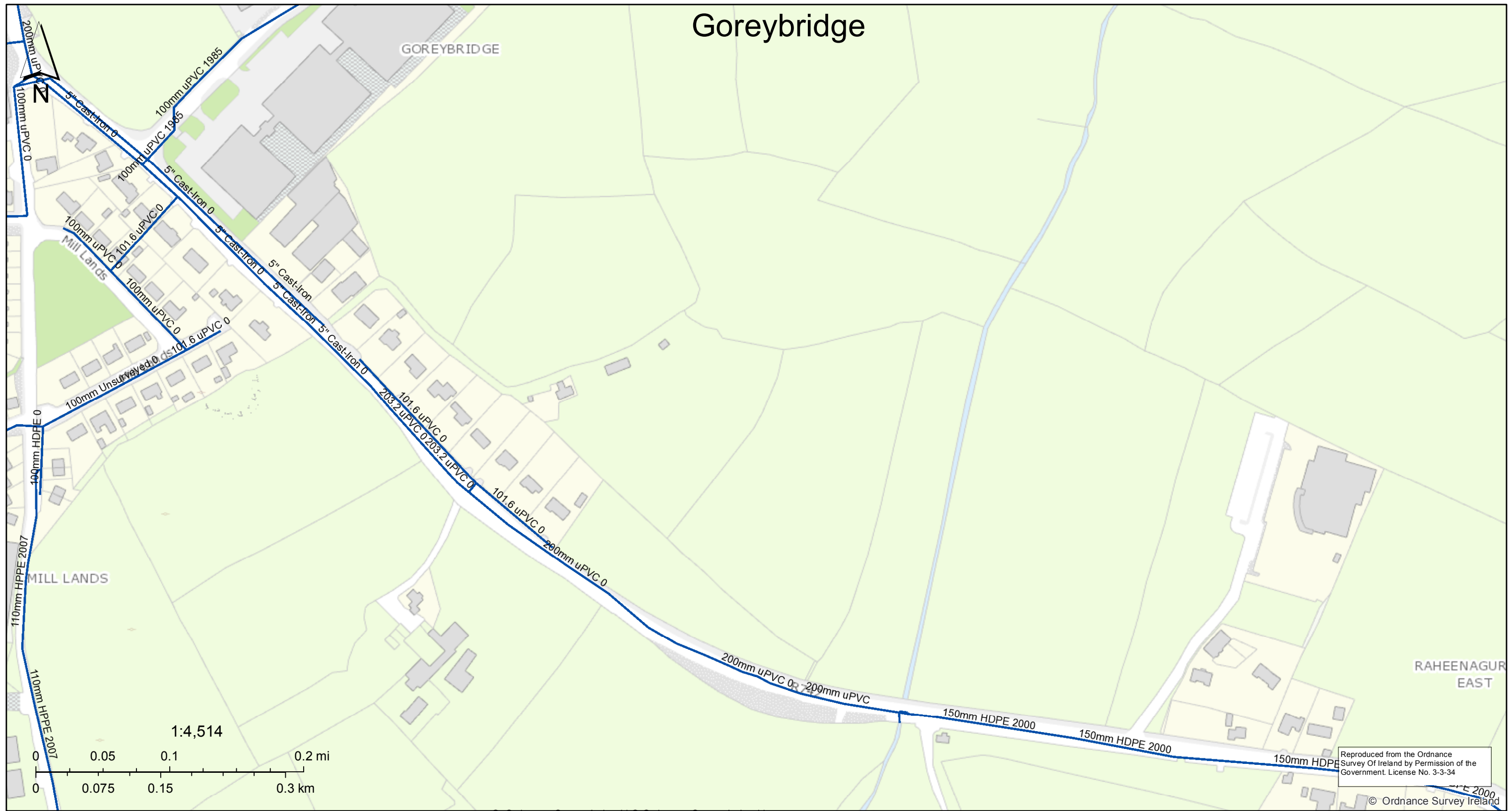
Legend				
Flow Control Valves	○ Other	Treatment Plant	Potable Water	Water Abandoned Lines
Non-return	Boundary Valves	Reservoir	Water Mains(Non Irish Water Owned)	Water Casings
○ Hydro	Open	Potable	Untreated	
Orifice Plate	Closed	Raw Water	Potable Water	
PRV	Part Closed	Pump Stations	Water Lateral Lines	
PSV	Boundary Meter	Water Mains(Irish Water Owned)	Irish Water	
	District (Boundary Meter)	Untreated	Non IW	

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Goreybridge



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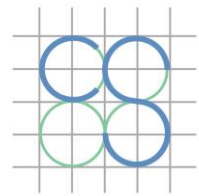
Legend

Flow Control Valves	○ Other	Treatment Plant	Potable Water	Water Abandoned Lines
Non-return	Boundary Valves	Reservoir	Water Mains(Non Irish Water Owned)	Water Casings
○ Hydro	Open	Potable	Untreated	
Orifice Plate	Closed	Raw Water	Potable Water	
PRV	Part Closed	Pump Stations	Water Lateral Lines	
PSV	Boundary Meter	Water Mains(Irish Water Owned)	Irish Water	
	District (Boundary Meter)	Untreated	Non IW	

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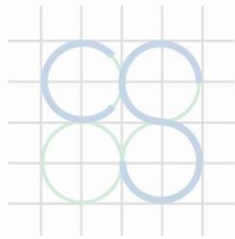


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Appendix B: Confirmation of Feasibility Letter from Irish Water



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

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

www.water.ie

Gessica Silva
CS Consulting
19-22 Dame Street
Dublin 2
Dublin
Ireland
D02E267

5 December 2019

Dear Gessica Silva,

**Re: Connection Reference No CDS19006889 pre-connection enquiry -
Subject to contract | Contract denied**

**Connection for Housing Development of 400 unit(s) at Lands at Clonattin, Goreybridge,
Wexford.**

Irish Water has reviewed your pre-connection enquiry in relation to a Water & Wastewater connection at Lands at Clonattin, Goreybridge, Wexford.

Based upon the details that you have provided with your pre-connection enquiry and on the capacity currently available in the network(s), as assessed by Irish Water, we wish to advise you that, subject to a valid connection agreement being put in place, your proposed connection to the Irish Water network(s) can be facilitated.

Water Treatment and Network:

Due to the high level of development interest in Gorey, Irish Water is currently modelling Gorey's water treatment and watermain network. It will be a number of months before this model is complete. Based on the current information available; Creagh WTP does not have the capacity to cater for all the proposed developments in Gorey. To cater for this, the water supply from Gorey Rural WSS will have to be increased. This will require upgrades to the water network in Gorey.

Irish Water will be in a position to confirm these upgrades, once the results of modelling are received. It is not envisaged all the proposed developments in Gorey will be built at once. The required upgrades may be built as each development progresses.

The confirmation of feasibility to connect to the Irish Water infrastructure does not extend to your fire flow requirements.

Wastewater Treatment:

The development can connect to Courtown-Gorey WWTP at this time, without any need for upgrade works.

Wastewater Network:

There is a DN300 sewer traversing the site. This should be accounted for in the site layout, or alternatively the sewer will need to be diverted.

Irish Water is currently modelling Gorey's foul sewer network, however it will be a number of months before completion. Based on current information available, the following upgrades are envisioned for this development;

- Approximately 480m of DN225 sewer to be upgraded to DN375 along Courtown Road,
- Approximately 80m of DN300 sewer to be upgraded to DN450 adjacent to Courtown Road/Esmonde Street roundabout.

These upgrades may not be limited to these items. Irish Water will be in a position to confirm the required upgrades, once the results of sewer network modelling are received.

Strategic Housing Development planning:

Irish Water notes that the scale of this development dictates that it is subject to the Strategic Housing Development planning process. Therefore: in advance of submitting your full application to An Bord Pleanála for assessment, you must have reviewed this development with Irish Water and received a Statement of Design Acceptance in relation to the layout of water and wastewater services.

General:

All infrastructure should be designed and installed in accordance with the Irish Water Codes of Practice and Standard Details. A design proposal for the water and/or wastewater infrastructure should be submitted to Irish Water for assessment. Prior to submitting your planning application, you are required to submit these detailed design proposals to Irish Water for review.

You are advised that this correspondence does not constitute an offer in whole or in part to provide a connection to any Irish Water infrastructure and is provided subject to a connection agreement being signed at a later date.

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

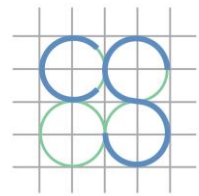
If you have any further questions, please contact Brian Lyons from the design team on 02254610 or email brilyons@water.ie. For further information, visit **www.water.ie/connections**.

Yours sincerely,



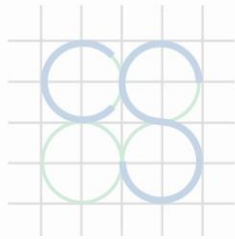
Maria O'Dwyer

Connections and Developer Services



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GROUP

Appendix C: Design Statement of Acceptance from Irish Water



CS CONSULTING
GROUP

Gessica Silva
CS Consulting
19-22 Dame Street
Dublin 2
Dublin, Ireland D02E267

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

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

www.water.ie

8 October 2020

Re: Design Submission for Lands at Clonattin, Goreybridge, Wexford (the “Development”) (the “Design Submission”) / Connection Reference No: CDS19006889

Dear Gessica Silva,

Many thanks for your recent Design Submission.

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

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

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

If you have any further questions, please contact your Irish Water representative:

Name: Alvaro Lyons

Email: agarcia@water.ie

Yours sincerely,



Maria O’Dwyer
Connections and Developer Services

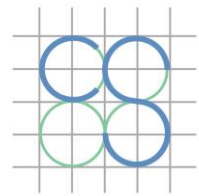
Appendix A

Document Title & Revision

CLO-CSC-ZZ-XX-DR-C-0008-Proposed Watermain
CLO-CSC-ZZ-XX-DR-C-0009-Proposed Watermain
CLO-CSC-ZZ-XX-DR-C-0010-Proposed Watermain
CLO-CSC-ZZ-XX-DR-C-0011-Proposed Drainage
CLO-CSC-ZZ-XX-DR-C-0012-Proposed Drainage
CLO-CSC-ZZ-XX-DR-C-0013-Proposed Drainage
CLO-CSC-ZZ-XX-DR-C-0042-Foul Longsections
CLO-CSC-ZZ-XX-DR-C-0043-Foul Longsections
CLO-CSC-ZZ-XX-DR-C-0044-Foul Longsections
CLO-CSC-ZZ-XX-DR-C-0045-Foul Longsections
CLO-CSC-ZZ-XX-DR-C-0046-Foul Longsections
CLO-CSC-ZZ-XX-DR-C-0047-Foul Longsections

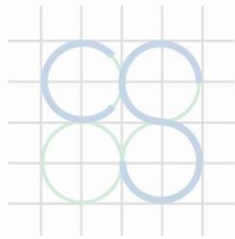
For further information, visit www.water.ie/connections

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



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Appendix D: WinDES Microdrainage Stormwater Calculations



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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	17.800	Add Flow / Climate Change (%)	0
Ratio R	0.278	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Inverts








Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	1.315	4-8	3.733	8-12	1.021

Total Area Contributing (ha) = 6.068

Total Pipe Volume (m³) = 518.235

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	37.800	0.756	50.0	0.148	2.00	0.0	0.600	o	225	Pipe/Conduit	
S2.000	13.089	0.327	40.0	0.060	2.00	0.0	0.600	o	225	Pipe/Conduit	
S1.001	26.500	0.550	48.2	0.064	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.002	71.330	0.476	149.9	0.198	0.00	0.0	0.600	o	300	Pipe/Conduit	
S3.000	39.475	0.658	60.0	0.035	2.00	0.0	0.600	o	225	Pipe/Conduit	
S3.001	30.710	0.341	90.1	0.055	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.003	55.900	0.621	90.0	0.129	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	50.00	2.34	49.550	0.148	0.0	0.0	0.0	1.85	73.7	20.0
S2.000	50.00	2.11	49.400	0.060	0.0	0.0	0.0	2.07	82.5	8.1
S1.001	50.00	2.57	48.700	0.272	0.0	0.0	0.0	1.89	75.1	36.8
S1.002	50.00	3.50	48.150	0.470	0.0	0.0	0.0	1.28	90.6	63.6
S3.000	50.00	2.39	49.275	0.035	0.0	0.0	0.0	1.69	67.3	4.7
S3.001	50.00	2.76	48.617	0.090	0.0	0.0	0.0	1.38	54.8	12.2
S1.003	50.00	4.06	47.290	0.689	0.0	0.0	0.0	1.66	117.2	93.3

45 O'Connell Street
Limerick
Ireland

Clonnatin SHD
Clonnatin
Wexford

Date 04/11/2020
File A091-CLONNATIN-STORM NETWORK

Designed by DF
Checked by GL



Innovyze

Network 2020.1

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.004	8.450	1.619	5.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S4.000	36.600	0.366	100.0	0.165	2.00	0.0	0.600	o	225	Pipe/Conduit	
S5.000	24.773	0.413	60.0	0.042	2.00	0.0	0.600	o	225	Pipe/Conduit	
S4.001	47.460	0.500	94.9	0.044	0.00	0.0	0.600	o	225	Pipe/Conduit	
S4.002	9.264	0.100	92.6	0.004	0.00	0.0	0.600	o	225	Pipe/Conduit	
S4.003	24.308	0.243	100.0	0.041	0.00	0.0	0.600	o	225	Pipe/Conduit	
S4.004	26.245	0.262	100.2	0.073	0.00	0.0	0.600	o	300	Pipe/Conduit	
S4.005	19.012	0.250	76.0	0.027	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.005	71.635	0.478	149.9	0.109	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.006	28.594	0.191	149.7	0.024	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.007	16.030	0.107	149.8	0.010	0.00	0.0	0.600	o	450	Pipe/Conduit	
S6.000	26.853	0.746	36.0	0.100	2.00	0.0	0.600	o	225	Pipe/Conduit	
S6.001	48.992	1.719	28.5	0.080	0.00	0.0	0.600	o	225	Pipe/Conduit	
S6.002	25.244	0.421	60.0	0.068	0.00	0.0	0.600	o	225	Pipe/Conduit	
S6.003	7.070	0.071	99.6	0.006	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.008	53.475	0.357	149.8	0.038	0.00	0.0	0.600	o	450	Pipe/Conduit	
S7.000	24.031	0.401	59.9	0.075	2.00	0.0	0.600	o	225	Pipe/Conduit	
S7.001	27.028	0.225	120.1	0.022	0.00	0.0	0.600	o	225	Pipe/Conduit	
S7.002	7.122	0.059	120.7	0.005	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.004	50.00	4.08	46.669	0.689	0.0	0.0	0.0	6.93	489.6	93.3
S4.000	50.00	2.47	47.200	0.165	0.0	0.0	0.0	1.31	52.0	22.3
S5.000	50.00	2.24	47.550	0.042	0.0	0.0	0.0	1.69	67.3	5.7
S4.001	50.00	3.06	46.500	0.251	0.0	0.0	0.0	1.34	53.4	34.0
S4.002	50.00	3.17	46.000	0.255	0.0	0.0	0.0	1.36	54.0	34.5
S4.003	50.00	3.48	45.900	0.296	0.0	0.0	0.0	1.31	52.0	40.1
S4.004	50.00	3.76	45.657	0.369	0.0	0.0	0.0	1.57	111.0	50.0
S4.005	50.00	3.93	45.300	0.396	0.0	0.0	0.0	1.80	127.6	53.6
S1.005	50.00	4.89	45.050	1.194	0.0	0.0	0.0	1.48	163.2	161.7
S1.006	50.00	5.18	44.572	1.218	0.0	0.0	0.0	1.66	263.9	164.9
S1.007	50.00	5.34	44.381	1.228	0.0	0.0	0.0	1.66	263.8	166.3
S6.000	50.00	2.20	47.650	0.100	0.0	0.0	0.0	2.19	87.0	13.5
S6.001	50.00	2.54	46.904	0.180	0.0	0.0	0.0	2.46	97.8	24.4
S6.002	50.00	2.79	45.185	0.248	0.0	0.0	0.0	1.69	67.3	33.6
S6.003	50.00	2.88	44.764	0.254	0.0	0.0	0.0	1.31	52.1	34.4
S1.008	50.00	5.88	44.274	1.520	0.0	0.0	0.0	1.66	263.8	205.8
S7.000	50.00	2.24	45.550	0.075	0.0	0.0	0.0	1.69	67.3	10.2
S7.001	50.00	2.61	45.149	0.097	0.0	0.0	0.0	1.19	47.4	13.1
S7.002	50.00	2.71	44.924	0.102	0.0	0.0	0.0	1.19	47.3	13.8

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Date 04/11/2020

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Network 2020.1

















Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.009	45.148	0.301	150.0	0.060	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.010	38.613	0.257	150.2	0.030	0.00	0.0	0.600	o	450	Pipe/Conduit	
S8.000	25.323	0.253	100.1	0.700	2.00	0.0	0.600	o	600	Pipe/Conduit	
S8.001	22.035	0.220	100.2	0.050	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.011	50.137	0.167	300.2	0.072	0.00	0.0	0.600	o	1050	Pipe/Conduit	
S9.000	28.800	0.480	60.0	0.120	2.00	0.0	0.600	o	225	Pipe/Conduit	
S9.001	26.790	0.357	75.0	0.055	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.012	38.197	0.127	300.8	0.078	0.00	0.0	0.600	o	1050	Pipe/Conduit	
S1.013	57.368	0.191	300.4	0.098	0.00	0.0	0.600	o	1050	Pipe/Conduit	
S1.014	62.960	0.211	298.4	0.190	0.00	0.0	0.600	o	1050	Pipe/Conduit	
S10.000	10.535	0.263	40.1	0.037	2.00	0.0	0.600	o	225	Pipe/Conduit	
S10.001	64.140	1.145	56.0	0.046	0.00	0.0	0.600	o	225	Pipe/Conduit	
S10.002	61.520	3.538	17.4	0.143	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.015	34.040	0.113	301.2	0.044	0.00	0.0	0.600	o	1050	Pipe/Conduit	
S11.000	23.280	0.291	80.0	0.048	2.00	0.0	0.600	o	225	Pipe/Conduit	
S1.016	46.920	0.156	300.8	0.093	0.00	0.0	0.600	o	1050	Pipe/Conduit	
S1.017	46.916	0.156	300.7	0.074	0.00	0.0	0.600	o	1050	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.009	49.10	6.33	43.917	1.682	0.0	0.0	0.0	1.66	263.7	223.6
S1.010	47.91	6.72	43.616	1.712	0.0	0.0	0.0	1.66	263.4	223.6
S8.000	50.00	2.17	43.000	0.700	0.0	0.0	0.0	2.43	688.3	94.8
S8.001	50.00	2.32	42.747	0.750	0.0	0.0	0.0	2.43	688.0	101.6
S1.011	46.69	7.14	42.050	2.534	0.0	0.0	0.0	1.98	1717.7	320.4
S9.000	50.00	2.28	43.900	0.120	0.0	0.0	0.0	1.69	67.3	16.2
S9.001	50.00	2.58	43.420	0.175	0.0	0.0	0.0	1.51	60.1	23.7
S1.012	45.82	7.46	41.883	2.787	0.0	0.0	0.0	1.98	1716.1	345.8
S1.013	44.58	7.94	41.756	2.885	0.0	0.0	0.0	1.98	1717.3	348.3
S1.014	43.32	8.47	41.565	3.075	0.0	0.0	0.0	1.99	1723.0	360.7
S10.000	50.00	2.08	46.300	0.037	0.0	0.0	0.0	2.07	82.4	5.0
S10.001	50.00	2.70	46.037	0.083	0.0	0.0	0.0	1.75	69.6	11.2
S10.002	50.00	3.02	44.892	0.226	0.0	0.0	0.0	3.15	125.4	30.6
S1.015	42.67	8.76	41.354	3.345	0.0	0.0	0.0	1.98	1714.7	386.5
S11.000	50.00	2.27	43.800	0.048	0.0	0.0	0.0	1.46	58.2	6.5
S1.016	41.81	9.15	41.241	3.486	0.0	0.0	0.0	1.98	1716.1	394.7
S1.017	41.00	9.55	41.085	3.560	0.0	0.0	0.0	1.98	1716.2	395.3















Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S12.000	65.710	0.292	225.0	0.100	2.00	0.0	0.600	o	225	Pipe/Conduit	
S12.001	69.880	0.400	174.7	0.143	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.018	9.449	0.031	304.8	0.000	0.00	0.0	0.600	o	1050	Pipe/Conduit	
S13.000	83.190	0.555	149.9	0.183	2.00	0.0	0.600	o	225	Pipe/Conduit	
S14.000	44.789	2.421	18.5	0.120	2.00	0.0	0.600	o	225	Pipe/Conduit	
S14.001	44.789	2.239	20.0	0.061	0.00	0.0	0.600	o	225	Pipe/Conduit	
S13.001	65.320	0.327	199.8	0.129	0.00	0.0	0.600	o	300	Pipe/Conduit	
S15.000	23.069	1.208	19.1	0.042	2.00	0.0	0.600	o	225	Pipe/Conduit	
S15.001	55.590	2.460	22.6	0.138	0.00	0.0	0.600	o	225	Pipe/Conduit	
S15.002	60.054	2.502	24.0	0.112	0.00	0.0	0.600	o	225	Pipe/Conduit	
S16.000	11.177	0.186	60.1	0.037	2.00	0.0	0.600	o	225	Pipe/Conduit	
S17.000	12.374	0.206	60.1	0.040	2.00	0.0	0.600	o	225	Pipe/Conduit	
S16.001	17.830	0.178	100.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S13.002	46.912	0.188	249.5	0.060	0.00	0.0	0.600	o	375	Pipe/Conduit	
S13.003	42.586	0.213	199.9	0.096	0.00	0.0	0.600	o	375	Pipe/Conduit	
S13.004	40.351	0.238	169.5	0.097	0.00	0.0	0.600	o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S12.000	50.00	3.26	41.620	0.100	0.0	0.0	0.0	0.87	34.5	13.5
S12.001	50.00	4.44	41.328	0.243	0.0	0.0	0.0	0.99	39.2	32.9
S1.018	40.84	9.63	40.928	3.803	0.0	0.0	0.0	1.97	1704.6	420.6
S13.000	50.00	3.30	42.750	0.183	0.0	0.0	0.0	1.07	42.4	24.8
S14.000	50.00	2.24	47.386	0.120	0.0	0.0	0.0	3.06	121.5	16.2
S14.001	50.00	2.50	44.965	0.181	0.0	0.0	0.0	2.94	116.9	24.5
S13.001	50.00	4.28	42.195	0.493	0.0	0.0	0.0	1.11	78.4	66.8
S15.000	50.00	2.13	49.200	0.042	0.0	0.0	0.0	3.01	119.6	5.7
S15.001	50.00	2.46	47.992	0.180	0.0	0.0	0.0	2.76	109.9	24.4
S15.002	50.00	2.84	45.532	0.292	0.0	0.0	0.0	2.68	106.6	39.5
S16.000	50.00	2.11	42.900	0.037	0.0	0.0	0.0	1.69	67.2	5.0
S17.000	50.00	2.12	42.900	0.040	0.0	0.0	0.0	1.69	67.2	5.4
S16.001	50.00	2.35	42.300	0.077	0.0	0.0	0.0	1.31	51.9	10.4
S13.002	50.00	4.97	41.868	0.922	0.0	0.0	0.0	1.14	126.2	124.9
S13.003	50.00	5.52	41.680	1.018	0.0	0.0	0.0	1.28	141.1	137.8
S13.004	50.00	6.01	41.467	1.115	0.0	0.0	0.0	1.39	153.4	151.0

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S18.000	54.483	0.612	89.0	0.121	2.00	0.0	0.600	o	225	Pipe/Conduit	
S18.001	33.055	0.220	150.3	0.026	0.00	0.0	0.600	o	225	Pipe/Conduit	
S19.000	43.835	0.244	179.7	0.174	2.00	0.0	0.600	o	225	Pipe/Conduit	
S18.002	29.800	0.099	301.0	0.034	0.00	0.0	0.600	o	300	Pipe/Conduit	
S20.000	42.926	0.622	69.0	0.145	2.00	0.0	0.600	o	225	Pipe/Conduit	
S18.003	26.210	0.087	301.3	0.026	0.00	0.0	0.600	o	375	Pipe/Conduit	
S21.000	71.265	1.370	52.0	0.173	2.00	0.0	0.600	o	225	Pipe/Conduit	
S18.004	17.777	0.134	132.7	0.016	0.00	0.0	0.600	o	375	Pipe/Conduit	
S22.000	31.613	0.210	150.5	0.122	2.00	0.0	0.600	o	225	Pipe/Conduit	
S22.001	38.013	0.270	140.8	0.090	0.00	0.0	0.600	o	225	Pipe/Conduit	
S18.005	43.378	0.108	401.6	0.051	0.00	0.0	0.600	o	450	Pipe/Conduit	
S23.000	21.578	0.144	149.8	0.083	2.00	0.0	0.600	o	225	Pipe/Conduit	
S23.001	14.584	0.097	150.4	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S18.006	36.772	0.093	395.4	0.050	0.00	0.0	0.600	o	450	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S18.000	50.00	2.65	42.582	0.121	0.0	0.0	0.0	1.39	55.1	16.4
S18.001	50.00	3.17	41.970	0.147	0.0	0.0	0.0	1.06	42.3	19.9
S19.000	50.00	2.75	42.000	0.174	0.0	0.0	0.0	0.97	38.7	23.6
S18.002	50.00	3.72	41.750	0.355	0.0	0.0	0.0	0.90	63.7	48.1
S20.000	50.00	2.45	42.440	0.145	0.0	0.0	0.0	1.58	62.7	19.6
S18.003	50.00	4.14	41.651	0.526	0.0	0.0	0.0	1.04	114.7	71.2
S21.000	50.00	2.65	42.970	0.173	0.0	0.0	0.0	1.82	72.3	23.4
S18.004	50.00	4.33	41.564	0.715	0.0	0.0	0.0	1.57	173.6	96.8
S22.000	50.00	2.50	41.910	0.122	0.0	0.0	0.0	1.06	42.3	16.5
S22.001	50.00	3.07	41.700	0.212	0.0	0.0	0.0	1.10	43.7	28.7
S18.005	50.00	5.05	41.430	0.978	0.0	0.0	0.0	1.01	160.4	132.4
S23.000	50.00	2.34	41.910	0.083	0.0	0.0	0.0	1.07	42.4	11.2
S23.001	50.00	2.57	41.766	0.083	0.0	0.0	0.0	1.06	42.3	11.2
S18.006	50.00	5.65	41.322	1.111	0.0	0.0	0.0	1.02	161.6	150.4

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S13.005	39.620	0.099	400.2	0.039	0.00	0.0	0.600	o	600	Pipe/Conduit	
S13.006	8.400	0.021	400.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.019	50.000	0.167	300.0	0.000	0.00	0.0	0.600	o	1050	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S13.005	48.41	6.55	41.229	2.265	0.0	0.0	0.0	1.21	342.4	296.9
S13.006	48.06	6.67	41.130	2.265	0.0	0.0	0.0	1.21	342.5	296.9
S1.019	40.02	10.05	40.897	6.068	0.0	0.0	0.0	1.98	1718.3	657.7

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SS1	51.000	1.450	Open Manhole	1200	S1.000	49.550	225				
SS2	50.860	1.460	Open Manhole	1200	S2.000	49.400	225				
SS3	50.584	1.884	Open Manhole	1200	S1.001	48.700	225	S1.000	48.794	225	94
								S2.000	49.073	225	373
SS4	49.700	1.550	Open Manhole	1200	S1.002	48.150	300	S1.001	48.150	225	
SS5.2	50.775	1.500	Open Manhole	1200	S3.000	49.275	225				
SS5.1	50.112	1.495	Open Manhole	1200	S3.001	48.617	225	S3.000	48.617	225	
SS5	49.770	2.480	Open Manhole	1200	S1.003	47.290	300	S1.002	47.674	300	384
								S3.001	48.276	225	911
SS6	48.320	1.651	Open Manhole	1200	S1.004	46.669	300	S1.003	46.669	300	
SS7	48.480	1.280	Open Manhole	1200	S4.000	47.200	225				
SS8	49.160	1.610	Open Manhole	1200	S5.000	47.550	225				
SS9	48.822	2.322	Open Manhole	1200	S4.001	46.500	225	S4.000	46.834	225	334
								S5.000	47.137	225	637
SS10	48.435	2.435	Open Manhole	1200	S4.002	46.000	225	S4.001	46.000	225	
SS11	48.390	2.490	Open Manhole	1200	S4.003	45.900	225	S4.002	45.900	225	
SS12	48.640	2.983	Open Manhole	1200	S4.004	45.657	300	S4.003	45.657	225	
SS13	48.340	3.040	Open Manhole	1200	S4.005	45.300	300	S4.004	45.395	300	95
SS14	48.130	3.080	Open Manhole	1350	S1.005	45.050	375	S1.004	45.050	300	
								S4.005	45.050	300	
SS15	47.770	3.198	Open Manhole	1350	S1.006	44.572	450	S1.005	44.572	375	
SS16	47.580	3.199	Open Manhole	1350	S1.007	44.381	450	S1.006	44.381	450	
SS17	49.150	1.500	Open Manhole	1200	S6.000	47.650	225				
SS18	48.450	1.546	Open Manhole	1200	S6.001	46.904	225	S6.000	46.904	225	
SS19	46.966	1.781	Open Manhole	1200	S6.002	45.185	225	S6.001	45.185	225	
SS20	47.150	2.386	Open Manhole	1200	S6.003	44.764	225	S6.002	44.764	225	
SS21	47.300	3.026	Open Manhole	1350	S1.008	44.274	450	S1.007	44.274	450	
								S6.003	44.693	225	194
SS22	47.000	1.450	Open Manhole	1200	S7.000	45.550	225				
SS23	46.620	1.471	Open Manhole	1200	S7.001	45.149	225	S7.000	45.149	225	
SS24	46.640	1.716	Open Manhole	1200	S7.002	44.924	225	S7.001	44.924	225	
SS25	46.720	2.803	Open Manhole	1350	S1.009	43.917	450	S1.008	43.917	450	
								S7.002	44.865	225	723
SS26	46.200	2.584	Open Manhole	1350	S1.010	43.616	450	S1.009	43.616	450	
SS27	46.500	3.500	Open Manhole	1500	S8.000	43.000	600				
SS28	45.850	3.103	Open Manhole	1500	S8.001	42.747	600	S8.000	42.747	600	
SS29	45.100	3.050	Open Manhole	1950	S1.011	42.050	1050	S1.010	43.359	450	709
								S8.001	42.527	600	27
SS30	45.550	1.650	Open Manhole	1200	S9.000	43.900	225				
SS31	44.980	1.560	Open Manhole	1200	S9.001	43.420	225	S9.000	43.420	225	
SS32	44.590	2.707	Open Manhole	1950	S1.012	41.883	1050	S1.011	41.883	1050	
								S9.001	43.063	225	355
SS33	44.200	2.444	Open Manhole	1950	S1.013	41.756	1050	S1.012	41.756	1050	
SS34	43.670	2.105	Open Manhole	1950	S1.014	41.565	1050	S1.013	41.565	1050	

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SS35	47.750	1.450	Open Manhole	1200	S10.000	46.300	225				
SS36	47.500	1.463	Open Manhole	1200	S10.001	46.037	225	S10.000	46.037	225	
SS37	46.440	1.548	Open Manhole	1200	S10.002	44.892	225	S10.001	44.892	225	
SS38	44.809	3.455	Open Manhole	1950	S1.015	41.354	1050	S1.014	41.354	1050	
								S10.002	41.354	225	
SS39	45.250	1.450	Open Manhole	1200	S11.000	43.800	225				
SS40	45.450	4.209	Open Manhole	1950	S1.016	41.241	1050	S1.015	41.241	1050	
								S11.000	43.509	225	1443
SS41	45.150	4.065	Open Manhole	1950	S1.017	41.085	1050	S1.016	41.085	1050	
SS42	43.260	1.640	Open Manhole	1200	S12.000	41.620	225				
SS43	42.600	1.272	Open Manhole	1200	S12.001	41.328	225	S12.000	41.328	225	
SS44	43.310	2.382	Open Manhole	1950	S1.018	40.928	1050	S1.017	40.929	1050	1
								S12.001	40.928	225	
SS45	44.330	1.580	Open Manhole	1200	S13.000	42.750	225				
SS46	48.886	1.500	Open Manhole	1200	S14.000	47.386	225				
SS47	46.636	1.671	Open Manhole	1200	S14.001	44.965	225	S14.000	44.965	225	
SS48	44.590	2.395	Open Manhole	1200	S13.001	42.195	300	S13.000	42.195	225	
								S14.001	42.726	225	456
SS49	50.650	1.450	Open Manhole	1200	S15.000	49.200	225				
SS50	49.573	1.581	Open Manhole	1200	S15.001	47.992	225	S15.000	47.992	225	
SS51	47.080	1.548	Open Manhole	1200	S15.002	45.532	225	S15.001	45.532	225	
SS52.2	44.350	1.450	Open Manhole	1200	S16.000	42.900	225				
SS52.3	44.350	1.450	Open Manhole	1200	S17.000	42.900	225				
SS52.1	44.300	2.000	Open Manhole	1200	S16.001	42.300	225	S16.000	42.714	225	414
								S17.000	42.694	225	394
SS52	44.250	2.382	Open Manhole	1350	S13.002	41.868	375	S13.001	41.868	300	
								S15.002	43.030	225	1012
								S16.001	42.122	225	104
SS53	44.722	3.042	Open Manhole	1350	S13.003	41.680	375	S13.002	41.680	375	
SS54	44.170	2.703	Open Manhole	1350	S13.004	41.467	375	S13.003	41.467	375	
SS55	44.110	1.528	Open Manhole	1200	S18.000	42.582	225				
SS56	43.284	1.314	Open Manhole	1200	S18.001	41.970	225	S18.000	41.970	225	
SS57.1	43.400	1.400	Open Manhole	1200	S19.000	42.000	225				
SS57	42.940	1.190	Open Manhole	1200	S18.002	41.750	300	S18.001	41.750	225	
								S19.000	41.756	225	
SS58.1	43.970	1.530	Open Manhole	1200	S20.000	42.440	225				
SS58	43.300	1.649	Open Manhole	1350	S18.003	41.651	375	S18.002	41.651	300	
								S20.000	41.818	225	17
SS59.1	44.420	1.450	Open Manhole	1200	S21.000	42.970	225				
SS59	42.870	1.306	Open Manhole	1350	S18.004	41.564	375	S18.003	41.564	375	
								S21.000	41.600	225	
SS60.2	43.040	1.130	Open Manhole	1200	S22.000	41.910	225				
SS60.1	43.320	1.620	Open Manhole	1200	S22.001	41.700	225	S22.000	41.700	225	
SS60	42.920	1.490	Open Manhole	1350	S18.005	41.430	450	S18.004	41.430	375	

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SS60A	43.400	1.490	Open Manhole	1200	S23.000	41.910	225	S22.001	41.430	225	
SS60B	43.530	1.764	Open Manhole	1200	S23.001	41.766	225	S23.000	41.766	225	
SS60A	43.350	2.028	Open Manhole	1350	S18.006	41.322	450	S18.005	41.322	450	
								S23.001	41.669	225	122
SS61	43.260	2.031	Open Manhole	1500	S13.005	41.229	600	S13.004	41.229	375	
								S18.006	41.229	450	
SS62	43.410	2.280	Open Manhole	1500	S13.006	41.130	600	S13.005	41.130	600	
SS63	43.180	2.283	Open Manhole	1950	S1.019	40.897	1050	S1.018	40.897	1050	
								S13.006	41.109	600	
S	0.000		Open Manhole	0		OUTFALL		S1.019	40.730	1050	

No coordinates have been specified, layout information cannot be produced.

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	o	225	SS1	51.000	49.550	1.225	Open Manhole	1200
S2.000	o	225	SS2	50.860	49.400	1.235	Open Manhole	1200
S1.001	o	225	SS3	50.584	48.700	1.659	Open Manhole	1200
S1.002	o	300	SS4	49.700	48.150	1.250	Open Manhole	1200
S3.000	o	225	SS5.2	50.775	49.275	1.275	Open Manhole	1200
S3.001	o	225	SS5.1	50.112	48.617	1.270	Open Manhole	1200
S1.003	o	300	SS5	49.770	47.290	2.180	Open Manhole	1200
S1.004	o	300	SS6	48.320	46.669	1.351	Open Manhole	1200
S4.000	o	225	SS7	48.480	47.200	1.055	Open Manhole	1200
S5.000	o	225	SS8	49.160	47.550	1.385	Open Manhole	1200
S4.001	o	225	SS9	48.822	46.500	2.097	Open Manhole	1200
S4.002	o	225	SS10	48.435	46.000	2.210	Open Manhole	1200
S4.003	o	225	SS11	48.390	45.900	2.265	Open Manhole	1200
S4.004	o	300	SS12	48.640	45.657	2.683	Open Manhole	1200
S4.005	o	300	SS13	48.340	45.300	2.740	Open Manhole	1200
S1.005	o	375	SS14	48.130	45.050	2.705	Open Manhole	1350
S1.006	o	450	SS15	47.770	44.572	2.748	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	37.800	50.0	SS3	50.584	48.794	1.565	Open Manhole	1200
S2.000	13.089	40.0	SS3	50.584	49.073	1.286	Open Manhole	1200
S1.001	26.500	48.2	SS4	49.700	48.150	1.325	Open Manhole	1200
S1.002	71.330	149.9	SS5	49.770	47.674	1.796	Open Manhole	1200
S3.000	39.475	60.0	SS5.1	50.112	48.617	1.270	Open Manhole	1200
S3.001	30.710	90.1	SS5	49.770	48.276	1.269	Open Manhole	1200
S1.003	55.900	90.0	SS6	48.320	46.669	1.351	Open Manhole	1200
S1.004	8.450	5.2	SS14	48.130	45.050	2.780	Open Manhole	1350
S4.000	36.600	100.0	SS9	48.822	46.834	1.763	Open Manhole	1200
S5.000	24.773	60.0	SS9	48.822	47.137	1.460	Open Manhole	1200
S4.001	47.460	94.9	SS10	48.435	46.000	2.210	Open Manhole	1200
S4.002	9.264	92.6	SS11	48.390	45.900	2.265	Open Manhole	1200
S4.003	24.308	100.0	SS12	48.640	45.657	2.758	Open Manhole	1200
S4.004	26.245	100.2	SS13	48.340	45.395	2.645	Open Manhole	1200
S4.005	19.012	76.0	SS14	48.130	45.050	2.780	Open Manhole	1350
S1.005	71.635	149.9	SS15	47.770	44.572	2.823	Open Manhole	1350
S1.006	28.594	149.7	SS16	47.580	44.381	2.749	Open Manhole	1350

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.007	o	450	SS16	47.580	44.381	2.749	Open Manhole	1350
S6.000	o	225	SS17	49.150	47.650	1.275	Open Manhole	1200
S6.001	o	225	SS18	48.450	46.904	1.321	Open Manhole	1200
S6.002	o	225	SS19	46.966	45.185	1.556	Open Manhole	1200
S6.003	o	225	SS20	47.150	44.764	2.161	Open Manhole	1200
S1.008	o	450	SS21	47.300	44.274	2.576	Open Manhole	1350
S7.000	o	225	SS22	47.000	45.550	1.225	Open Manhole	1200
S7.001	o	225	SS23	46.620	45.149	1.246	Open Manhole	1200
S7.002	o	225	SS24	46.640	44.924	1.491	Open Manhole	1200
S1.009	o	450	SS25	46.720	43.917	2.353	Open Manhole	1350
S1.010	o	450	SS26	46.200	43.616	2.134	Open Manhole	1350
S8.000	o	600	SS27	46.500	43.000	2.900	Open Manhole	1500
S8.001	o	600	SS28	45.850	42.747	2.503	Open Manhole	1500
S1.011	o	1050	SS29	45.100	42.050	2.000	Open Manhole	1950
S9.000	o	225	SS30	45.550	43.900	1.425	Open Manhole	1200
S9.001	o	225	SS31	44.980	43.420	1.335	Open Manhole	1200
S1.012	o	1050	SS32	44.590	41.883	1.657	Open Manhole	1950

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.007	16.030	149.8	SS21	47.300	44.274	2.576	Open Manhole	1350
S6.000	26.853	36.0	SS18	48.450	46.904	1.321	Open Manhole	1200
S6.001	48.992	28.5	SS19	46.966	45.185	1.556	Open Manhole	1200
S6.002	25.244	60.0	SS20	47.150	44.764	2.161	Open Manhole	1200
S6.003	7.070	99.6	SS21	47.300	44.693	2.382	Open Manhole	1350
S1.008	53.475	149.8	SS25	46.720	43.917	2.353	Open Manhole	1350
S7.000	24.031	59.9	SS23	46.620	45.149	1.246	Open Manhole	1200
S7.001	27.028	120.1	SS24	46.640	44.924	1.491	Open Manhole	1200
S7.002	7.122	120.7	SS25	46.720	44.865	1.630	Open Manhole	1350
S1.009	45.148	150.0	SS26	46.200	43.616	2.134	Open Manhole	1350
S1.010	38.613	150.2	SS29	45.100	43.359	1.291	Open Manhole	1950
S8.000	25.323	100.1	SS28	45.850	42.747	2.503	Open Manhole	1500
S8.001	22.035	100.2	SS29	45.100	42.527	1.973	Open Manhole	1950
S1.011	50.137	300.2	SS32	44.590	41.883	1.657	Open Manhole	1950
S9.000	28.800	60.0	SS31	44.980	43.420	1.335	Open Manhole	1200
S9.001	26.790	75.0	SS32	44.590	43.063	1.302	Open Manhole	1950
S1.012	38.197	300.8	SS33	44.200	41.756	1.394	Open Manhole	1950

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.013	o	1050	SS33	44.200	41.756	1.394	Open Manhole	1950
S1.014	o	1050	SS34	43.670	41.565	1.055	Open Manhole	1950
S10.000	o	225	SS35	47.750	46.300	1.225	Open Manhole	1200
S10.001	o	225	SS36	47.500	46.037	1.238	Open Manhole	1200
S10.002	o	225	SS37	46.440	44.892	1.323	Open Manhole	1200
S1.015	o	1050	SS38	44.809	41.354	2.405	Open Manhole	1950
S11.000	o	225	SS39	45.250	43.800	1.225	Open Manhole	1200
S1.016	o	1050	SS40	45.450	41.241	3.159	Open Manhole	1950
S1.017	o	1050	SS41	45.150	41.085	3.015	Open Manhole	1950
S12.000	o	225	SS42	43.260	41.620	1.415	Open Manhole	1200
S12.001	o	225	SS43	42.600	41.328	1.047	Open Manhole	1200
S1.018	o	1050	SS44	43.310	40.928	1.332	Open Manhole	1950
S13.000	o	225	SS45	44.330	42.750	1.355	Open Manhole	1200
S14.000	o	225	SS46	48.886	47.386	1.275	Open Manhole	1200
S14.001	o	225	SS47	46.636	44.965	1.446	Open Manhole	1200
S13.001	o	300	SS48	44.590	42.195	2.095	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.013	57.368	300.4	SS34	43.670	41.565	1.055	Open Manhole	1950
S1.014	62.960	298.4	SS38	44.809	41.354	2.405	Open Manhole	1950
S10.000	10.535	40.1	SS36	47.500	46.037	1.238	Open Manhole	1200
S10.001	64.140	56.0	SS37	46.440	44.892	1.323	Open Manhole	1200
S10.002	61.520	17.4	SS38	44.809	41.354	3.230	Open Manhole	1950
S1.015	34.040	301.2	SS40	45.450	41.241	3.159	Open Manhole	1950
S11.000	23.280	80.0	SS40	45.450	43.509	1.716	Open Manhole	1950
S1.016	46.920	300.8	SS41	45.150	41.085	3.015	Open Manhole	1950
S1.017	46.916	300.7	SS44	43.310	40.929	1.331	Open Manhole	1950
S12.000	65.710	225.0	SS43	42.600	41.328	1.047	Open Manhole	1200
S12.001	69.880	174.7	SS44	43.310	40.928	2.157	Open Manhole	1950
S1.018	9.449	304.8	SS63	43.180	40.897	1.233	Open Manhole	1950
S13.000	83.190	149.9	SS48	44.590	42.195	2.170	Open Manhole	1200
S14.000	44.789	18.5	SS47	46.636	44.965	1.446	Open Manhole	1200
S14.001	44.789	20.0	SS48	44.590	42.726	1.639	Open Manhole	1200
S13.001	65.320	199.8	SS52	44.250	41.868	2.082	Open Manhole	1350

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S15.000	o	225	SS49	50.650	49.200	1.225	Open Manhole	1200
S15.001	o	225	SS50	49.573	47.992	1.356	Open Manhole	1200
S15.002	o	225	SS51	47.080	45.532	1.323	Open Manhole	1200
S16.000	o	225	SS52.2	44.350	42.900	1.225	Open Manhole	1200
S17.000	o	225	SS52.3	44.350	42.900	1.225	Open Manhole	1200
S16.001	o	225	SS52.1	44.300	42.300	1.775	Open Manhole	1200
S13.002	o	375	SS52	44.250	41.868	2.007	Open Manhole	1350
S13.003	o	375	SS53	44.722	41.680	2.667	Open Manhole	1350
S13.004	o	375	SS54	44.170	41.467	2.328	Open Manhole	1350
S18.000	o	225	SS55	44.110	42.582	1.303	Open Manhole	1200
S18.001	o	225	SS56	43.284	41.970	1.089	Open Manhole	1200
S19.000	o	225	SS57.1	43.400	42.000	1.175	Open Manhole	1200
S18.002	o	300	SS57	42.940	41.750	0.890	Open Manhole	1200
S20.000	o	225	SS58.1	43.970	42.440	1.305	Open Manhole	1200
S18.003	o	375	SS58	43.300	41.651	1.274	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S15.000	23.069	19.1	SS50	49.573	47.992	1.356	Open Manhole	1200
S15.001	55.590	22.6	SS51	47.080	45.532	1.323	Open Manhole	1200
S15.002	60.054	24.0	SS52	44.250	43.030	0.995	Open Manhole	1350
S16.000	11.177	60.1	SS52.1	44.300	42.714	1.361	Open Manhole	1200
S17.000	12.374	60.1	SS52.1	44.300	42.694	1.381	Open Manhole	1200
S16.001	17.830	100.2	SS52	44.250	42.122	1.903	Open Manhole	1350
S13.002	46.912	249.5	SS53	44.722	41.680	2.667	Open Manhole	1350
S13.003	42.586	199.9	SS54	44.170	41.467	2.328	Open Manhole	1350
S13.004	40.351	169.5	SS61	43.260	41.229	1.656	Open Manhole	1500
S18.000	54.483	89.0	SS56	43.284	41.970	1.089	Open Manhole	1200
S18.001	33.055	150.3	SS57	42.940	41.750	0.965	Open Manhole	1200
S19.000	43.835	179.7	SS57	42.940	41.756	0.959	Open Manhole	1200
S18.002	29.800	301.0	SS58	43.300	41.651	1.349	Open Manhole	1350
S20.000	42.926	69.0	SS58	43.300	41.818	1.257	Open Manhole	1350
S18.003	26.210	301.3	SS59	42.870	41.564	0.931	Open Manhole	1350

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Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S21.000	o	225	SS59.1	44.420	42.970	1.225	Open Manhole	1200
S18.004	o	375	SS59	42.870	41.564	0.931	Open Manhole	1350
S22.000	o	225	SS60.2	43.040	41.910	0.905	Open Manhole	1200
S22.001	o	225	SS60.1	43.320	41.700	1.395	Open Manhole	1200
S18.005	o	450	SS60	42.920	41.430	1.040	Open Manhole	1350
S23.000	o	225	SS60A	43.400	41.910	1.265	Open Manhole	1200
S23.001	o	225	SS60B	43.530	41.766	1.539	Open Manhole	1200
S18.006	o	450	SS60A	43.350	41.322	1.578	Open Manhole	1350
S13.005	o	600	SS61	43.260	41.229	1.431	Open Manhole	1500
S13.006	o	600	SS62	43.410	41.130	1.680	Open Manhole	1500
S1.019	o	1050	SS63	43.180	40.897	1.233	Open Manhole	1950

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S21.000	71.265	52.0	SS59	42.870	41.600	1.045	Open Manhole	1350
S18.004	17.777	132.7	SS60	42.920	41.430	1.115	Open Manhole	1350
S22.000	31.613	150.5	SS60.1	43.320	41.700	1.395	Open Manhole	1200
S22.001	38.013	140.8	SS60	42.920	41.430	1.265	Open Manhole	1350
S18.005	43.378	401.6	SS60A	43.350	41.322	1.578	Open Manhole	1350
S23.000	21.578	149.8	SS60B	43.530	41.766	1.539	Open Manhole	1200
S23.001	14.584	150.4	SS60A	43.350	41.669	1.456	Open Manhole	1350
S18.006	36.772	395.4	SS61	43.260	41.229	1.581	Open Manhole	1500
S13.005	39.620	400.2	SS62	43.410	41.130	1.680	Open Manhole	1500
S13.006	8.400	400.0	SS63	43.180	41.109	1.471	Open Manhole	1950
S1.019	50.000	300.0	S	0.000	40.730		Open Manhole	0

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Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.148	0.148	0.148
2.000	-	-	100	0.060	0.060	0.060
1.001	-	-	100	0.064	0.064	0.064
1.002	-	-	100	0.198	0.198	0.198
3.000	-	-	100	0.035	0.035	0.035
3.001	-	-	100	0.055	0.055	0.055
1.003	-	-	100	0.129	0.129	0.129
1.004	-	-	100	0.000	0.000	0.000
4.000	-	-	100	0.165	0.165	0.165
5.000	-	-	100	0.042	0.042	0.042
4.001	-	-	100	0.044	0.044	0.044
4.002	-	-	100	0.004	0.004	0.004
4.003	-	-	100	0.041	0.041	0.041
4.004	-	-	100	0.073	0.073	0.073
4.005	-	-	100	0.027	0.027	0.027
1.005	-	-	100	0.109	0.109	0.109
1.006	-	-	100	0.024	0.024	0.024
1.007	-	-	100	0.010	0.010	0.010
6.000	-	-	100	0.100	0.100	0.100
6.001	-	-	100	0.080	0.080	0.080
6.002	-	-	100	0.068	0.068	0.068
6.003	-	-	100	0.006	0.006	0.006
1.008	-	-	100	0.038	0.038	0.038
7.000	-	-	100	0.075	0.075	0.075
7.001	-	-	100	0.022	0.022	0.022
7.002	-	-	100	0.005	0.005	0.005
1.009	-	-	100	0.060	0.060	0.060
1.010	-	-	100	0.030	0.030	0.030
8.000	-	-	100	0.700	0.700	0.700
8.001	-	-	100	0.050	0.050	0.050
1.011	-	-	100	0.072	0.072	0.072
9.000	-	-	100	0.120	0.120	0.120
9.001	-	-	100	0.055	0.055	0.055
1.012	-	-	100	0.078	0.078	0.078
1.013	-	-	100	0.098	0.098	0.098
1.014	-	-	100	0.190	0.190	0.190
10.000	-	-	100	0.037	0.037	0.037
10.001	-	-	100	0.046	0.046	0.046
10.002	-	-	100	0.143	0.143	0.143
1.015	-	-	100	0.044	0.044	0.044
11.000	-	-	100	0.048	0.048	0.048
1.016	-	-	100	0.093	0.093	0.093
1.017	-	-	100	0.074	0.074	0.074
12.000	-	-	100	0.100	0.100	0.100
12.001	-	-	100	0.143	0.143	0.143
1.018	-	-	100	0.000	0.000	0.000
13.000	-	-	100	0.183	0.183	0.183
14.000	-	-	100	0.120	0.120	0.120
14.001	-	-	100	0.061	0.061	0.061
13.001	-	-	100	0.129	0.129	0.129
15.000	-	-	100	0.042	0.042	0.042
15.001	-	-	100	0.138	0.138	0.138
15.002	-	-	100	0.112	0.112	0.112
16.000	-	-	100	0.037	0.037	0.037
17.000	-	-	100	0.040	0.040	0.040
16.001	-	-	100	0.000	0.000	0.000
13.002	-	-	100	0.060	0.060	0.060
13.003	-	-	100	0.096	0.096	0.096
13.004	-	-	100	0.097	0.097	0.097
18.000	-	-	100	0.121	0.121	0.121

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Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
18.001	-	-	100	0.026	0.026	0.026
19.000	-	-	100	0.174	0.174	0.174
18.002	-	-	100	0.034	0.034	0.034
20.000	-	-	100	0.145	0.145	0.145
18.003	-	-	100	0.026	0.026	0.026
21.000	-	-	100	0.173	0.173	0.173
18.004	-	-	100	0.016	0.016	0.016
22.000	-	-	100	0.122	0.122	0.122
22.001	-	-	100	0.090	0.090	0.090
18.005	-	-	100	0.051	0.051	0.051
23.000	-	-	100	0.083	0.083	0.083
23.001	-	-	100	0.000	0.000	0.000
18.006	-	-	100	0.050	0.050	0.050
13.005	-	-	100	0.039	0.039	0.039
13.006	-	-	100	0.000	0.000	0.000
1.019	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				6.068	6.068	6.068