DOSA

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CONSULTING ENGINEERS

RESIDENTIAL DEVELOPMENT, COUNTESS ROAD, KILLARNEY, CO. KERRY

INFRASTRUCTURE REPORT

DATE 05/06/2026

REVISION 4

JOB NO. 7334

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1 Introduction

DOSA Consulting Engineers were engaged as Engineers for the proposed development at Countess Road, Killarney, Co. Kerry. The purpose of this Infrastructure Report is to provide details of the Storm Water design elements associated with the proposed development.

1.1 Objectives

A number of site investigations have been carried out and their findings have been incorporated to deal with solutions to:

- Surface Water Drainage Network
- Foul Drainage Network
- Water Supply

The proposals for the foul sewer & water infrastructure associated with this development were discussed with Mr. Stephen Gill, Senior Design Engineer, Southern Region, Irish Water. The Confirmation of Feasibility as issued by Irish Water is included in Appendix A of this Report with the Statement of Design Acceptance (SODA) included in Appendix B.

Following the Opinion received from Kerry County Council from the Section 247 meeting, the report has been amended to address queries raised by the Council. Prior to submitting we confirm that we have held a meeting with Mr Brian O' Connor, Municipal District Engineer, Kerry County Council & Mr. Stephen Sheehan, Executive Engineer Kerry County Council to discuss the drainage strategy and proposed amendments.

1.2 Site Location

The application site is located on Countess Road, less than 1km from Killarney town centre. The development lands consist primarily of undeveloped greenfield sites with some mature hedgerows and planting. The north-eastern part of the site is currently occupied by two existing dwellings, which are to be demolished. The site is bounded to the west by existing private residential houses and the Countess Grove residential estate. To the south, the site abuts the Doire Collie residential estate. To the north, the site fronts onto Countess Road, and to the east, it adjoins existing residential developments and large, undeveloped farmland currently zoned for residential development.

A snapshot of the site location is outlined in Figure 1.2 below.



Figure 1.2 – Context Map

1.3 Site Topography

The topography of the site slopes from the south and the north to a low point in the middle of the south and then slopes downwards towards the western boundary. The elevation height along the perimeter on the northern boundary rises from +34.50m to +35.75m at its high point, the southern boundary rises from +31.50m to +38.75m at the high point, the eastern boundary rises from +31.50m to +38.75m at the high point and then down to levels of +29.0m along the western boundary. A snapshot of the site topography is outlined in Figure 1.3 below. A snapshot of the existing topography is outlined in Figure 1.3 below.



Figure 1.3 – Site Topography

1.4 Proposed Development

The proposed development will consist of the construction of a residential development of 259 no. residential units with ancillary single storey creche, landscaping and all associated site development works.

The proposed development includes the demolition of 2 no. existing two-storey semi-detached dwelling houses and an existing ruinous structure on the site and construction of 103 no. two storey houses (3-bed units), comprising of 27 no. terraced units, 62 no. end of terrace units, and 14 no. side entry units, 82 no. courtyard apartment units over 2 no. storeys (42 no. 1-bed units, 40 no. 2-bed units), and 74 no. apartment units (34 no. 1-bed units, 40 no. 2-bed units) in 2 no. part 3 storey and part 4 storey blocks.

Vehicular access to the proposed development will be via one entrance from Countess Road (L3904) to the north, with the entrance design including improvement works on the public road inclusive of a raised crossing point. The design includes pedestrian/cycle infrastructure to/from Countess Road and internally within the development site and to adjoining areas.

Ancillary site works include car parking, provision of bicycle parking and bin storage facilities serving the proposed apartment/courtyard apartment buildings and creche, 2 no. ESB substations, landscaping, water services and drainage infrastructure (including foul and storm network upgrades in Countess Grove), and all associated site development works. The proposed development also provides for the demolition of an existing site boundary walls along Countess Road.

A Natura Impact Statement (NIS) has been prepared and will be submitted to the Planning Authority with the application.

A snapshot of the proposed development is outlined in Figure 1.4 below.

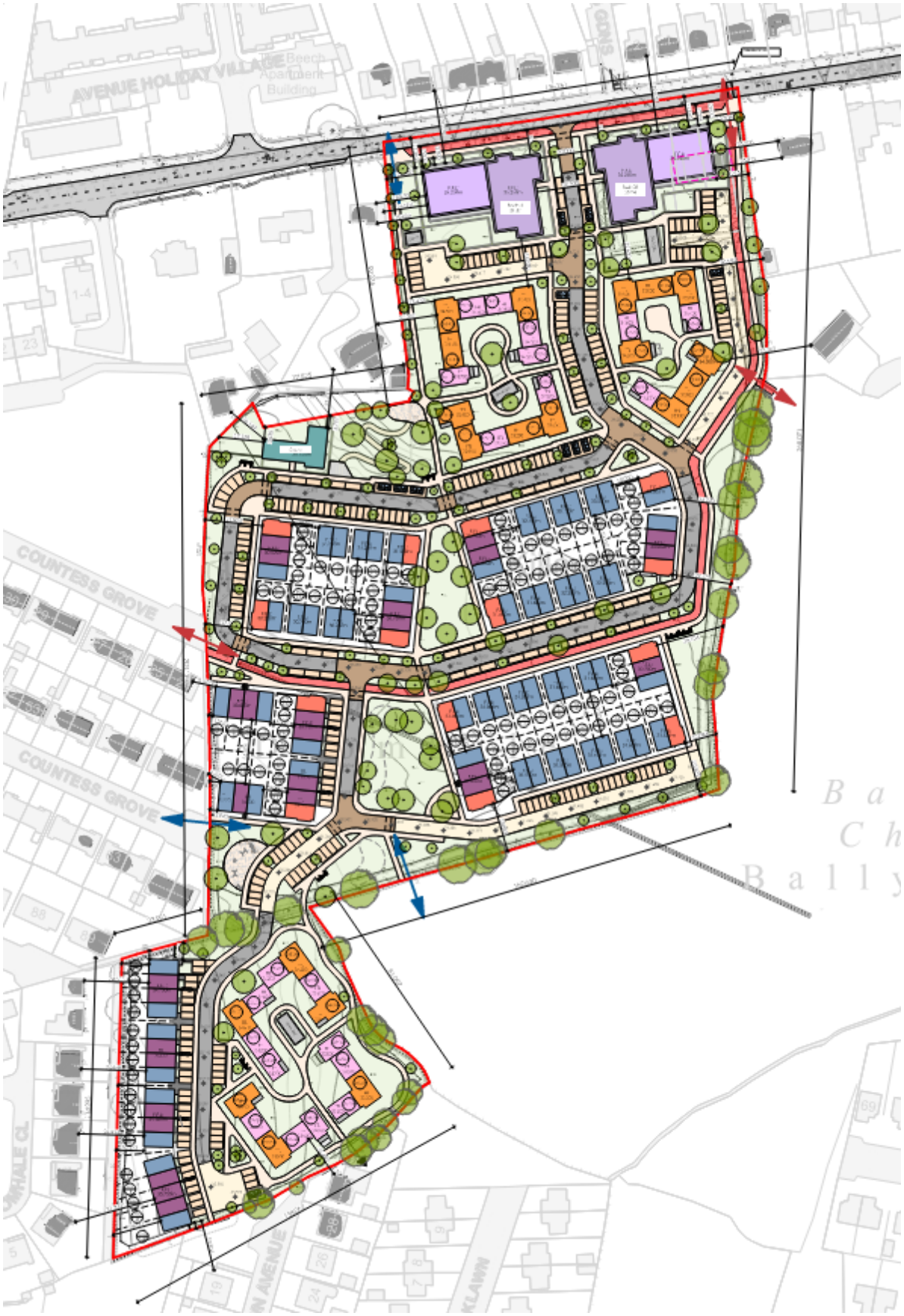


Figure 1.4 – Proposed Development

2 Surface Water System

The runoff from the entire developed site will discharge to the existing Kerry County Council public stormwater network on the Countess Road via the existing Countess Grove estate.

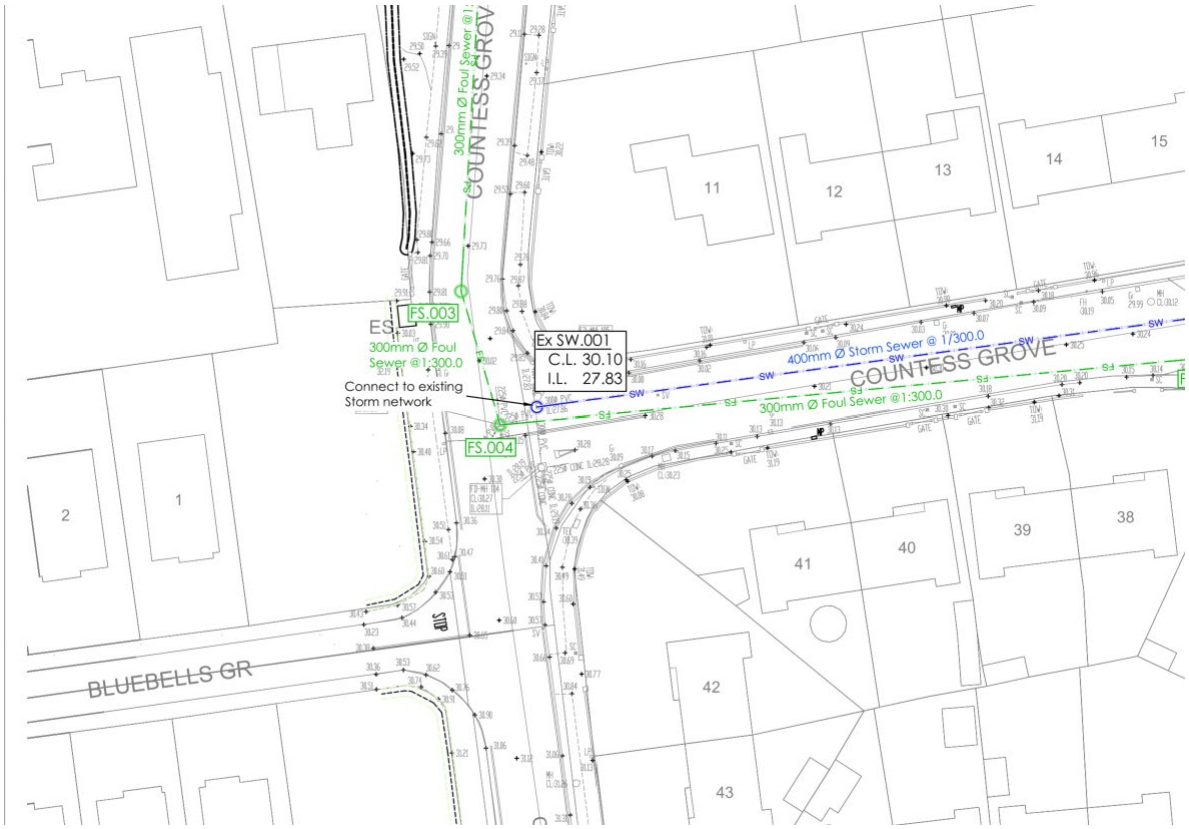


Figure 2.0: Existing Stormwater Network Connection Point

In order to reduce the effects of the surface runoff on potential flooding, a Stormwater Management Plan will be applied to surface water discharges into adjacent watercourses. The Stormwater Management Plan can be applied to control the rate of runoff from new development. The maximum permitted surface water outflow from the new development is to be restricted to that of the existing Greenfield site by the usage of attenuation storage.

Control of runoff by attenuation methods requires a hydraulic control to restrict the magnitude of flows passing downstream, together with an upstream storage capacity to contain the volume of runoff held back by the hydraulic control. The flows are proposed to be attenuated in the surface water system by adopting flood storage attenuation tanks along with restricted outlets as the control devise. The storage volume required has been designed using the computer aided design package Windes 10.4.

The attenuation strategy for the site is for the detention of flows in interlinked attenuation tanks.

It is noted that the infiltration results are poor for the site and the use and implementation of Nature Based Solutions is restricted as a result. The design has endeavoured to incorporate as many features as is feasible. Full details have been included in the "Drainage Impact Assessment Report" submitted as part of the application. The stormwater network design whilst incorporating these features also provides for full attenuation for the 1 in 100-year event as a future proof measure.

2.1 Surface Water Drainage Network

The surface water drainage network for the proposed development was modelled using the Microdrainage software application. The surface water pipe lengths, slopes, contributing impermeable areas, upstream invert levels, upstream cover levels and pipe diameters were entered into the model using the drawings supplied.

2.2 Design Criteria:

The proposed surface water drains have been designed in accordance with the Greater Dublin Strategic Drainage Study (GDSDS), the Department of the Environment's Recommendations for Site Development Works for Housing Areas, the Department of the Environment's Building Regulations "Technical Guidance Document Part H Drainage and Waste Water Disposal" and BS EN 752: 2008 Drain and Sewer Systems Outside Buildings.

- Return period for pipe work design 2 years
- Return period for attenuation design 100 years
- Soil Type 2
- Allowable Outflow 28.50 l/sec
- Time of entry 5 minutes
- M5 – 60 21.500 mm
- Ratio "r" 0.244
- Pipe Friction (Ks) 0.6 mm
- Minimum Velocity (based on pipe flowing full) 1.0 m/s
- Rainfall Runoff from Roads and Footpaths 100%
- Rainfall Runoff from Roofs 80%
- Rainfall Runoff from Driveways 80%
- Rainfall Runoff from Green Areas 20%
- Rainfall Depth Factored for Climate Change (as per GDSDS) 20%

(in accordance with GDSDS Volume 2, Chapter 6, Table 6.2 – see below)

Climate Change Category	Characteristics
River flows	20% increase in flows for all return periods up to 100 years
Sea level	400+mm rise (see Climate Change policy document for sea levels as a function of return period)
Rainfall	10% increase in depth (factor all intensities by 1.1)
	Modify time series rainfall in accordance with the GDSDS climate change policy document

Table 6.2 Climate Change Factors to be Applied to Drainage Design

The global variables required for the model were the M5-60 and Rainfall Ratio. These two factors may be read from maps contained in the Wallingford procedure. They enable the program to calculate the intensity, duration and frequency characteristics of storms.

M5-60 is the rainfall depth based on a 60-minute storm of 5 years return period. Ratio R is the ratio of the 60-minute storm to the 2-day storm for the 5-year return period events. These values are as follows:

- M5-60 = 21.500mm
- Ratio R = 0.244

Microdrainage generates design storms using the principles set out in the Flood Studies Report (NERC 1975).

A summer rainfall profile was used for the design of the pipework and a winter rainfall profile was used for the design of the storm water attenuation to give the critical design. A summer profile gives higher rainfall intensities and results in higher runoff rates and is used to determine the required capacity of the pipework. A winter rainfall profile gives a flatter more sustained profile and results in higher runoff volumes and is used to determine the attenuation/storage requirements.

The surface water drainage network was assessed for compliance with maximum and minimum velocities, pipe length etc. The network was designed to ensure velocities in the network and pipe gradients did not exceed the maximum velocity of 4.0m/s. The minimum velocity allowed was 1.00m/s.

The design of the drainage network was assessed using events with a range of different durations to determine the critical event for each return period analysed as follows:

- 1 in 2-year return period events were used to ensure that the system did not surcharge;
- 1 in 100 year return period events were used to ensure that flooding did not occur.

2.2.1 Pre-Development Conditions

The combined catchment area of this proposed development is 5.961 hectares (ha). For this development, the permissible outflow is calculated using the estimation method contained in the Institute of Hydrology Report No. 124: Flood estimation for small catchments.

$$QBAR = 0.00108 \times (AREA)^{0.89} \times (SAAR)^{1.17} \times (SOIL)^{2.17}$$

QBAR = The Mean Annual Peak Flow (Permissible outflow in m3.sec

AREA = Area of the Catchment (site) in km^2

SAAR = Standard Annual Average Rainfall

SOIL = Soil index

As the development is smaller than 50 ha, the analysis for determining the permissible outflow uses 50 ha in the formula and linearly interpolates the flow rate value based on the ratio of the development to 50 ha. This is a statistical based method within the Microdrainage Software utilizing the Regional Flood Frequency by Catchment Characteristics to give the Index Flood (QBAR)

Design summary sheets for the QBAR value are contained in Appendix B.

The Mean Annual Peak Flow (permissible outflow) was calculated for the particular design development areas.

The allowable runoff estimation method utilises IH 124 and the Soil Index value taken from the Micrcodrainage Design Package mapping system gives a Soil Index of 0.3.

2.2.2 Post-Development Conditions

The stormwater management plan adopted for the particular development involves using interlinked attenuation tanks located in the green areas of the site.

All surface water runoff arising from the paved development will be drained away from the site. The attenuation tanks/basins will be designed for a 100-year storm event. The maximum discharge from the tanks will be limited to calculated permissible runoff (QBAR) for the catchment area.

Based on the proposed development design there will be a change in the land surface. Therefore, due to this proposed change a corresponding increase in the peak rate of surface runoff from the site will arise during times of high rainfall.

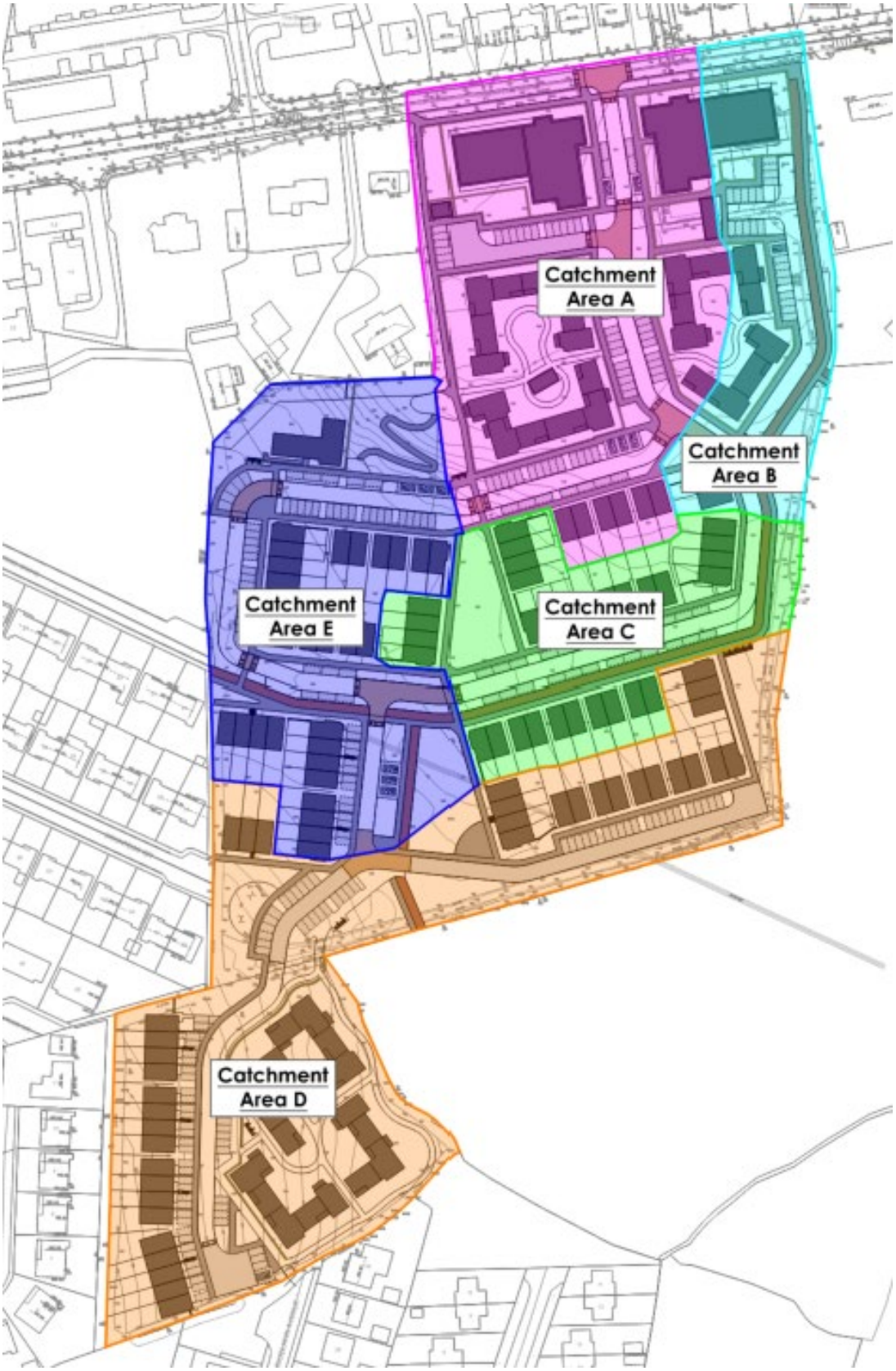


Fig 2.1 Proposed Development

Contributing Area	Permissible Outflow (l/sec)
Catchment Area No. A	6.90 l/sec
Catchment Area No. B	2.90 l/sec
Catchment Area No. C	3.90 l/sec
Catchment Area No. D	9.40 l/sec
Catchment Area No. E	5.40 l/sec

The flood peak runoff rates from the post-development grassy permeable area (Q_p grass) and the post-development impervious area (Q_p imp.) using the Rational Method (100% impermeability of hard surfaces) are calculated using Windes 10.4. The Sources Control Module of the Microdrainage Software was used to design the attenuation tank capacities. This module also provides the critical storm duration for the attenuation tank during the design process.

It should be noted that climate change has been accounted for in the design. As per volume 5 of the GDSDS a factor of 20% has been incorporated into the design.

2.3 Attenuation Tanks

2.3.1 Volume of Attenuation Tanks

The capacity of the attenuation tanks is designed to cater for the capacity required for a 1 in 100-year ARI event. These capacities are summarised as follows:

Tank No.	Capacity (m^3)	Restricted Outlet (l/sec)
A	642.6	6.90 l/sec
B	375.0	2.90 l/sec
C	220.0	6.80 l/sec (3.90l/sec & 2.90 l/sec)
D	650.0	9.40 l/sec
E	235.0	28.50 l/sec (6.90l/sec & 2.90 l/sec& 3.90 l/sec& 9.40 l/sec& 5.40 l/sec)

2.4 Hydrocarbon Treatment

A petrol interceptor is a trap used to filter out hydrocarbon pollutants from rainwater runoff. It is used in construction to prevent fuel contamination of streams carrying away the runoff.

Petrol interceptors work on the premise that some hydrocarbons such as petroleum and diesel float on the top of water. The contaminated water enters the interceptor typically after flowing off roads or hardstanding areas before being deposited into the first tank inside the interceptor.

The first tank builds up a layer of the hydrocarbon as well as other scum. Typically, petrol interceptors have 3 separate tanks each connected with a dip pipe, as more liquid enters the interceptor the water enters into the second tank leaving the majority of the hydrocarbon behind as it cannot enter the dip pipe, whose opening into the second tank is below the surface.

However, some of the contaminants may by chance enter the second tank. This second tank will not build up as much of the hydrocarbon on its surface. As before, the water is pushed into the third tank and more water enters the second.

The third tank should be practically clear of any hydrocarbon floating on its surface. As a precaution, the outlet pipe is also a dip pipe. When the water leaves the third tank via the outlet pipe it should be contaminant free.

In this project there are a number of catchment areas and attenuation tanks that eventually discharge to the adjoining public network.

A summary of the proposed interceptor is as per the table below.

Table 2.4 – Petrol Interceptor Details

Catchment Reference	Petrol Interceptor Make & Model	Oil Storage Capacity (l)
Catchment Area No. A	1 No. Conder CSNB20s	2000.0 litres
Catchment Area No. B	1 No. Conder CSNB10s	1000.0 litres
Catchment Area No. C	1 No. Conder CSNB10s	1000.0 litres
Catchment Area No. D	1 No. Conder CSNB20s	2000.0 litres
Catchment Area No. E	1 No. Conder CSNB15s	8335.0 litres

2.5 Silt Control

The proposed petrol interceptor from Conder Environmental also includes a silt storage capacity in addition to the oil storage capacity that allow silt to be collected in the interceptor prior to discharge to the proposed detention basins. This silt build-up can then be removed from the interceptor. The amount of silt storage from the proposed petrol interceptor is outlined in Table 2.5 below.

Table 2.5 – Petrol Interceptor Silt Storage Details

Catchment Reference	Petrol Interceptor Make & Model	Silt Storage Capacity (l)
Catchment Area No. A	1 No. Conder CSNB20s	300.0 litres
Catchment Area No. B	1 No. Conder CSNB10s	150.0 litres

Catchment Area No. C	1 No. Conder CSNB10s	150.0 litres
Catchment Area No. D	1 No. Conder CSNB20s	300.0 litres
Catchment Area No. E	1 No. Conder CSNB15s	225.0 litres

2.6 Construction & Operational Stage Run-Off

Both construction and operational phase surface-water drainage from the proposed development site will ultimately discharge into the adjacent stormwater watercourses. Where surface-water run-off occurs at the site during the construction phase, it will be managed and controlled prior to discharge into the environment by implementing standard environmental controls. Temporary banks shall be in place to ensure that runoff is directed to a temporary detention pond which shall be provided to reduce the amount of silt in the run-off. The location of these banks and temporary detention ponds will be indicated and confirmed in a Construction Stage Construction & Environmental Management Plan. The development will also include the construction of a gravity surface-water drainage network throughout the site. The surface-water drainage network will include the installation of dedicated attenuation facilities upstream of proposed outfall to the public network, to attenuate discharges to the undeveloped Greenfield run-off rates with the operation of proprietary hydro-brake flow-control devices. The attenuation facility is sized on the basis of a design storm with a 100-year return period and an additional 20% allowance for the effect of climate change.

The attenuation facilities will be in the form of a series of interlinked detention basins. They will be an off-line component of the drainage network into which runoff is diverted once flows reach a specified threshold.

3 Foul Sewer System

3.1 Foul Sewer Design

A Pre-Connection Enquiry was submitted to Uisce Éireann. The Uisce Éireann Reference Number for this enquiry is CDS25001852. The Confirmation of Feasibility document is included in Appendix A of this Report. This confirmed that, subject to a valid connection agreement being put in place, the proposed connection to the Uisce Éireann network could be facilitated.

- **Wastewater Connection** - Feasible without infrastructure upgrade by Uisce Éireann

The foul sewer has been designed using the System 1 and Simulation Modules of the Micro-drainage package. The foul network design addresses present day design issues and can view velocities at Full Bore, Proportional Depth and 1/3 flow.

A model of the proposed foul drainage network was built using the micro-drainage software applications. The model was analysed and amended until the results met with the design criteria specified.

The network has been designed to achieve self-cleansing velocities at 1/3 flow whilst maintaining minimum gradients.

3.1.1 Development Breakdown

Application 259 No. Residential Units

Section 3.6 of The Irish Water Code of Practice Wastewater Infrastructure states that for the gravity sewers shall be designed to carry a minimum wastewater volume of 6 times the dry weather flow (6DWF) which is to be taken as 446 litres per dwelling

Loading = (259) (446) / (24) (60) (60) = 1.337 litres/second

6DWF = 8.022 litres/second

The overall quantity of wastewater for the proposed development is estimated at **115.51 m³** per day.

This is based on the unit schedule submitted by the architect. The foul waste within the development will be collected via an internal gravity network and will discharge to the public foul sewer via a gravity connection.

All works will be in accordance with Uisce Eireann Code of Practice for Wastewater Supply & the Wastewater Infrastructure Standard Details Document Number: IW-CDS-5030-01.

The foul water network model was built and analysed using the Micro-drainage Software application and was assessed to ensure velocities maintained a self-cleansing velocity. The system will consist of an internal gravity network discharging to the existing Uisce Eireann asset.

4 Water Supply

As with the drainage network, a Pre-Connection Enquiry was submitted to Uisce Éireann under Reference No. CDS25001852. The Confirmation of Feasibility document is included in Appendix A of this Report. This confirmed that, subject to a valid connection agreement being put in place, the proposed connection to the Uisce Éireann network could be facilitated.

- **Water Connection** - Feasible Subject to upgrades

- In order to supply the proposed Development, upgrade is required of the existing 100mm uPVC main to 250mm ID pipe. Location of the upgrade is shown on the figure below. The Developer will be required to fund the upgrade works. The fee will be calculated at a connection application stage.



It is proposed to provide a new 150mm (internal diameter) HDPE connection to the public watermain on the Countess Road with associated valves and metering requirements. Internally within the development it is proposed to have a series of 100mm Ø branches and loops with associated hydrants, valves and metering requirements.

Water distribution supply to each building will be sized to cater for the requirements of those particular uses. Metered connections will be made to the main in accordance with Irish Water specifications and details.

All works will be in accordance with Uisce Éireann Code of Practice for Water Supply & the Water Infrastructure Standard Details Document Number: IW-CDS-5020-01.

5 Irish Water Approval

Design of both the foul and water networks has been submitted to Irish Water prior to lodgement and a "Statement of Design Acceptance" has been obtained. A copy of the letter is attached in Appendix B of this report.

6 Summary of Results

The storm water network was built and analysed using the Microdrainage Software application and were assessed for a 1 in 2 year storm & 1 in 100 year storm. A summary of the results is shown in Tables 5.1 below and in the Microdrainage outputs in the Appendices.

The global variables, pipeline and manhole schedules for both the surface water network and foul network were printed and are included in the Appendices. These show the basic pipe details such as pipe length, diameter, roughness coefficient, upstream invert, velocity, etc.

Table 5.1 Summary of Surcharge and Flooding

Attenuation Tank Reference	Storm Event	Results
Attenuation Tank No. 1	1 in 2 year	No surcharge of the stormwater network
	1 in 100 year	Surcharge
Attenuation Tank No. 2	1 in 2 year	No surcharge of the stormwater network
	1 in 100 year	Surcharge
Attenuation Tank No. 3	1 in 2 year	No surcharge of the stormwater network
	1 in 100 year	Surcharge
Attenuation Tank No. 4	1 in 2 year	No surcharge of the stormwater network
	1 in 100 year	Surcharge
Attenuation Tank No. 5	1 in 2 year	No surcharge of the stormwater network
	1 in 100 year	Surcharge

The stormwater system is designed to ensure no surcharge occurs during a 1 in 2-year return period event.

No flooding was predicted to occur for the 1 in 100-year return period event. Surcharging and flood risk occurred for a number of critical storm events but this is allowed and does not compromise the network.

Table 5.2 Outlet Control Summary

Attenuation Reference	Hydrobrake Reference	Limiting Discharge (l/s)	Design Head (m)	Hydrobrake Diameter (mm)
Attenuation Tank No. 1	MD4	6.90 l/sec	2.0	80
Attenuation Tank No. 2	MD4	2.90 l/sec	2.0	52
Attenuation Tank No. 3	MD4	6.80 l/sec (3.90l/sec & 2.90 l/sec)	1.50	85
Attenuation Tank No. 4	MD4	9.40 l/sec	2.0	92
Attenuation Tank No. 5	MD4	28.50 l/sec (6.90l/sec & 2.90 l/sec& 3.90 l/sec& 9.40 l/sec& 5.40 l/sec)	1.0	190

Table 5.3: Storage Tank Summary

Tank/Basin No.	Storage Type	Capacity (m^3)	Invert Level (m)	Maximum Storage Level (m)
Attenuation Tank No. 1	Tank	642.6	29.495	31.495
Attenuation Tank No. 2	Tank	375.0	30.500	32.750
Attenuation Tank No. 3	Tank	220.0	29.145	30.645
Attenuation Tank No. 4	Tank	650.0	29.094	31.094
Attenuation Tank No. 5	Tank	235.0	28.658	29.658

The foul water network model was built and analysed using the Micro-drainage Software application and was assessed to ensure velocities maintained a self-cleansing velocity. The system will consist of an internal gravity network discharging to the existing Uisce Éireann asset.

Should planning permission be granted and constructed, the applicant undertakes to submit a report certifying the quality of the completed works to the Planning Authority. The report shall be prepared by a competent third-party consulting engineer with evidence of professional indemnity insurance.

Appendix A – Uisce Eireann Confirmation of Feasibility

CONFIRMATION OF FEASIBILITY

Stephen O'Grady

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Cork City

www.water.ie

8 May 2025

Our Ref: CDS25001852 Pre-Connection Enquiry
Site At, Countess Road, Killarney, Co. Kerry

Dear Applicant/Agent,

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

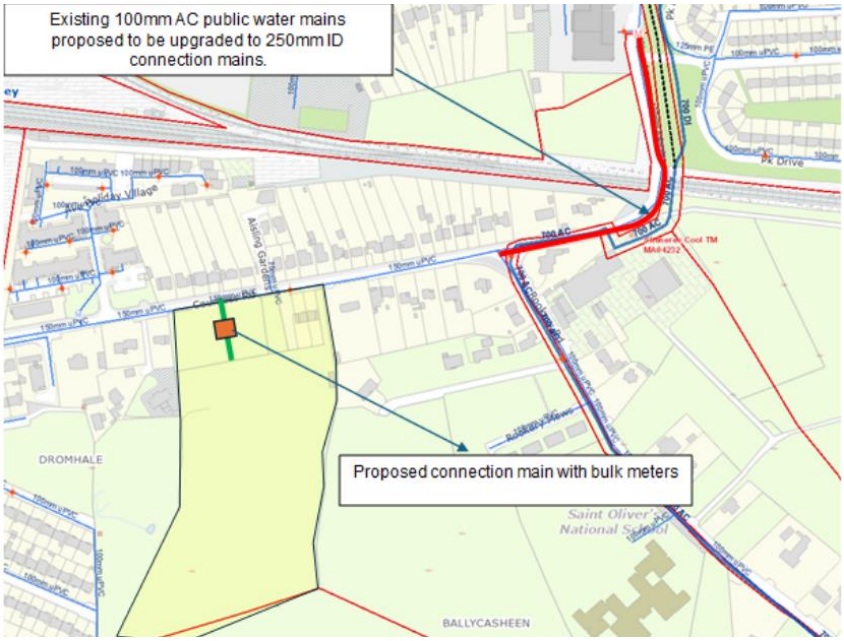
Uisce Éireann has reviewed the pre-connection enquiry in relation to a Water & Wastewater connection for a Housing Development of 250 unit(s) at Site At, Countess Road, Killarney, Kerry, (the **Development)**.

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

- **Water Connection** - Feasible Subject to upgrades

- In order to supply the proposed Development, upgrade is required of the existing 100mm uPVC main to 250mm ID pipe. Location of the upgrade is shown on the figure below. The Developer will be required to fund the upgrade works. The fee will be calculated at a connection application stage.

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.



- **Wastewater Connection** - Feasible without infrastructure upgrade by Uisce Éireann

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?

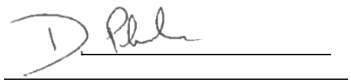
- **Section A -** What is important to know?
- **Section B -** Details of Uisce Éireann's Network(s)

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 & Wastewater 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 B – Uisce Eireann Statement of Design Acceptance

Stephen O Grady
Dosa Engineers
Joyce House
Barrack Square
Ballincollig, Cork P31KP84

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

13 March 2026

Re: Design Submission for Site At, Countess Road, Killarney, Kerry (the "Development") (the "Design Submission") / Connection Reference No: CDS25001852

Dear Stephen,

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, Uisce Éireann has no objection to your proposals.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Uisce Éireann infrastructure. Before you can connect to our network you must sign a connection agreement with Uisce Éireann. This can be applied for by completing the connection application form at www.water.ie/connections. Uisce Éireann'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 Uisce Éireann's network(s) (the "**Self-Lay Works**"), as reflected in your Design Submission. Acceptance of the Design Submission by Uisce Éireann does not, in any way, render Uisce Éireann liable for any elements of the design and/or construction of the Self-Lay Works.

If you have any further questions, please contact your Uisce Éireann representative:
Name: Marina Byrne
Phone: 01 89 25991/ 087691 9231
Email: mzbyrne@water.ie

Yours sincerely,

Dermot Phelan

Dermot Phelan
Connections and Developer Services

Stiúrthóirí / Directors: Jerry Grant (Cathaoirleach / Chairperson), Niall Gleeson (POF / CEO), Gerard Britchfield, Douglas Millican, Michael Nolan, Patricia King, Eileen Maher, Cathy Mannion, 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.

Appendix A

Document Title & Revision

- *7334-0020 Proposed Stormwater & Foul Sewer Layout Plans (1 of 3)*
- *7334-0021 Proposed Stormwater & Foul Sewer Layout Plans (2 of 3)*
- *7334-0022 Proposed Stormwater & Foul Sewer Layout Plans (3 of 3)*
- *7334-0023 Stormwater/ Foul Manhole & Pipe Schedules*
- *7334-0025 Proposed Wastewater Details (Sheet 1 of 2)*
- *7334-0026 Proposed Wastewater Details (Sheet 2 of 2)*
- *7334-0030 Proposed Watermain Layout Plan (1 of 2)*
- *7334-0031 Proposed Watermain Layout Plan (2 of 2)*
- *7334-0035 Proposed Watermain Details (Sheet 1 of 2)*
- *7334-0036 Proposed Watermain Details (Sheet 2 of 2)*

Standard Details/Code of Practice Exemption:

1. *Proposed use of PVC-A Watermain*
2. *Proprietary wastewater inspection chamber unit*

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 Uisce Éireann will not, in any way, render Uisce Éireann liable for any elements of the design and/or construction of the Self-Lay Works.

Appendix C – Allowable Runoff QBAR Values

ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.300
Area (ha)	1.447	Urban	0.000
SAAR (mm)	1600	Region Number	Ireland South

Results l/s

QBAR Rural	6.9
QBAR Urban	6.9
Q100 years	12.8
Q1 year	5.9
Q30 years	11.0
Q100 years	12.8

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ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.300
Area (ha)	0.615	Urban	0.000
SAAR (mm)	1600	Region Number	Ireland South

Results	**l/s**
QBAR Rural	2.9
QBAR Urban	2.9
Q100 years	5.4
Q1 year	2.5
Q30 years	4.7
Q100 years	5.4

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ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.300
Area (ha)	0.808	Urban	0.000
SAAR (mm)	1600	Region Number	Ireland South

Results l/s

QBAR Rural	3.9
QBAR Urban	3.9
Q100 years	7.1
Q1 year	3.3
Q30 years	6.2
Q100 years	7.1

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ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.300
Area (ha)	1.958	Urban	0.000
SAAR (mm)	1600	Region Number	Ireland South

Results l/s

QBAR Rural	9.4
QBAR Urban	9.4
Q100 years	17.3
Q1 year	8.0
Q30 years	14.9
Q100 years	17.3

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ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.300
Area (ha)	1.133	Urban	0.000
SAAR (mm)	1600	Region Number	Ireland South

Results l/s

QBAR Rural	5.4
QBAR Urban	5.4
Q100 years	10.0
Q1 year	4.6
Q30 years	8.6
Q100 years	10.0

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Appendix D – 1 in 2 Year Design Sheets

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	100	Add Flow / Climate Change (%)	20
M5-60 (mm)	21.500	Minimum Backdrop Height (m)	0.200
Ratio R	0.244	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	50	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.00	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)	Time (mins)	Area (ha)
0-4	0.000	4-8	1.476	8-12	1.976	12-16	0.108

Total Area Contributing (ha) = 3.559

Total Pipe Volume (m³) = 129.323

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
S1.000	36.580	0.250	146.3	0.350	5.00	0.0	0.600	o	300
S1.001	3.340	0.022	151.8	0.000	0.00	0.0	0.600	o	300
S1.002	11.935	0.080	149.2	0.020	0.00	0.0	0.600	o	300
S2.000	43.415	0.260	167.0	0.143	5.00	0.0	0.600	o	225
S2.001	13.395	0.080	167.4	0.013	0.00	0.0	0.600	o	225

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	50.00	5.47	33.550	0.350	0.0	0.0	9.5	1.30	91.7	56.9
S1.001	50.00	5.51	33.300	0.350	0.0	0.0	9.5	1.27	90.0	56.9
S1.002	50.00	5.67	33.278	0.370	0.0	0.0	10.0	1.28	90.8	60.1
S2.000	50.00	5.72	32.800	0.143	0.0	0.0	3.9	1.01	40.1	23.2
S2.001	50.00	5.94	32.540	0.156	0.0	0.0	4.2	1.01	40.1	25.3

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
S1.003	22.895	0.137	167.1	0.055	0.00	0.0	0.600	o	375
S1.004	5.280	0.032	165.0	0.000	0.00	0.0	0.600	o	375
S1.005	27.705	0.166	166.9	0.122	0.00	0.0	0.600	o	375
S1.006	3.010	0.018	167.2	0.000	0.00	0.0	0.600	o	375
S1.007	7.320	0.044	166.4	0.001	0.00	0.0	0.600	o	375
S1.008	14.580	0.182	80.1	0.017	0.00	0.0	0.600	o	375
S1.009	3.010	0.038	79.2	0.000	0.00	0.0	0.600	o	375
S1.010	63.315	1.918	33.0	0.213	0.00	0.0	0.600	o	375
S1.011	6.730	0.084	80.1	0.000	0.00	0.0	0.600	o	375
S3.000	48.090	1.750	27.5	0.067	5.00	0.0	0.600	o	225
S3.001	1.000	0.005	200.0	0.000	0.00	0.0	0.600	o	225
S1.012	1.000	0.005	200.0	0.000	0.00	0.0	0.600	o	450
S1.013	8.445	0.034	248.4	0.000	0.00	0.0	0.600	o	225
S4.000	32.075	0.400	80.2	0.138	5.00	0.0	0.600	o	225
S1.014	31.710	0.232	136.7	0.075	0.00	0.0	0.600	o	225

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.003	50.00	6.21	32.460	0.581	0.0	0.0	15.7	1.40	154.5	94.4
S1.004	50.00	6.27	32.323	0.581	0.0	0.0	15.7	1.41	155.5	94.4
S1.005	50.00	6.60	32.291	0.703	0.0	0.0	19.0	1.40	154.6	114.2
S1.006	50.00	6.64	32.125	0.703	0.0	0.0	19.0	1.40	154.4	114.2
S1.007	50.00	6.73	32.107	0.704	0.0	0.0	19.1	1.40	154.8	114.4
S1.008	50.00	6.85	32.063	0.721	0.0	0.0	19.5	2.03	223.8	117.2
S1.009	50.00	6.87	31.881	0.721	0.0	0.0	19.5	2.04	225.0	117.2
S1.010	50.00	7.20	31.843	0.934	0.0	0.0	25.3	3.16	349.4	151.8
S1.011	50.00	7.26	29.925	0.934	0.0	0.0	25.3	2.03	223.7	151.8
S3.000	50.00	5.32	32.750	0.067	0.0	0.0	1.8	2.51	99.6	10.9
S3.001	50.00	5.34	31.000	0.067	0.0	0.0	1.8	0.92	36.6	10.9
S1.012	50.00	7.27	29.500	1.001	0.0	0.0	27.1	1.43	228.1	162.7
S1.013	50.00	5.17	29.495	0.000	6.9	0.0	1.2	0.83	32.8	6.9
S4.000	50.00	5.37	29.900	0.138	0.0	0.0	3.7	1.46	58.1	22.4
S1.014	50.00	5.84	29.461	0.213	6.9	0.0	7.1	1.12	44.4	42.9

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
S1.015	5.100	0.050	102.0	0.001	0.00	0.0	0.600	o	225
S1.016	2.755	0.050	55.1	0.000	0.00	0.0	0.600	o	225
S1.017	5.680	0.050	113.6	0.001	0.00	0.0	0.600	o	225
S1.018	43.305	0.413	104.9	0.082	0.00	0.0	0.600	o	300
S5.000	21.350	0.214	100.0	0.263	5.00	0.0	0.600	o	225
S5.001	42.000	0.787	53.4	0.096	0.00	0.0	0.600	o	225
S5.002	4.295	0.100	43.0	0.000	0.00	0.0	0.600	o	225
S5.003	3.600	0.100	36.0	0.000	0.00	0.0	0.600	o	225
S5.004	3.770	0.100	37.7	0.000	0.00	0.0	0.600	o	225
S5.005	37.100	0.400	92.8	0.089	0.00	0.0	0.600	o	300
S6.000	24.470	0.500	48.9	0.053	5.00	0.0	0.600	o	225
S5.006	14.265	0.350	40.8	0.000	0.00	0.0	0.600	o	300
S5.007	8.075	0.081	100.0	0.039	0.00	0.0	0.600	o	300
S5.008	1.000	0.010	100.0	0.000	0.00	0.0	0.600	o	300
S5.009	14.175	0.085	166.8	0.000	0.00	0.0	0.600	o	225
S5.010	24.670	0.148	167.0	0.000	0.00	0.0	0.600	o	225
S5.011	6.445	0.039	167.0	0.000	0.00	0.0	0.600	o	225

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.015	50.00	5.90	29.229	0.214	6.9	0.0	7.2	1.29	51.5	43.1
S1.016	50.00	5.93	29.179	0.214	6.9	0.0	7.2	1.77	70.2	43.1
S1.017	50.00	6.01	29.129	0.215	6.9	0.0	7.2	1.23	48.7	43.2
S1.018	50.00	6.48	29.079	0.297	6.9	0.0	9.4	1.54	108.5	56.5
S5.000	50.00	5.27	33.800	0.263	0.0	0.0	7.1	1.31	52.0	42.7
S5.001	50.00	5.66	33.587	0.359	0.0	0.0	9.7	1.79	71.3	58.3
S5.002	50.00	5.70	32.800	0.359	0.0	0.0	9.7	2.00	79.6	58.3
S5.003	50.00	5.73	32.700	0.359	0.0	0.0	9.7	2.19	87.0	58.3
S5.004	50.00	5.75	32.600	0.359	0.0	0.0	9.7	2.14	85.0	58.3
S5.005	50.00	6.13	32.500	0.448	0.0	0.0	12.1	1.63	115.4	72.8
S6.000	50.00	5.22	32.600	0.053	0.0	0.0	1.4	1.87	74.5	8.6
S5.006	50.00	6.23	32.100	0.501	0.0	0.0	13.6	2.47	174.6	81.4
S5.007	50.00	6.32	31.750	0.540	0.0	0.0	14.6	1.57	111.1	87.7
S5.008	50.00	6.33	30.400	0.540	0.0	0.0	14.6	1.57	111.1	87.7
S5.009	50.00	5.23	30.390	0.000	2.9	0.0	0.5	1.01	40.1	2.9
S5.010	50.00	5.64	30.305	0.000	2.9	0.0	0.6	1.01	40.1	3.5
S5.011	50.00	5.75	30.157	0.000	2.9	0.0	0.6	1.01	40.1	3.5

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
S5.012	6.915	0.041	167.0	0.000	0.00	0.0	0.600	o	225
S5.013	82.120	0.677	121.3	0.308	0.00	0.0	0.600	o	300
S5.014	14.350	0.250	57.4	0.000	0.00	0.0	0.600	o	300
S5.015	1.000	0.005	200.0	0.000	0.00	0.0	0.600	o	300
S5.016	11.500	0.058	198.3	0.000	0.00	0.0	0.600	o	225
S5.017	5.385	0.027	199.4	0.085	0.00	0.0	0.600	o	225
S5.018	5.755	0.034	169.3	0.000	0.00	0.0	0.600	o	225
S5.019	15.355	0.092	167.0	0.000	0.00	0.0	0.600	o	225
S7.000	49.840	0.300	166.1	0.038	5.00	0.0	0.600	o	225
S7.001	85.100	0.550	154.7	0.193	0.00	0.0	0.600	o	225
S7.002	4.580	0.050	91.6	0.000	0.00	0.0	0.600	o	225
S7.003	43.495	0.275	158.2	0.083	0.00	0.0	0.600	o	300
S7.004	6.590	0.025	263.6	0.000	0.00	0.0	0.600	o	300
S8.000	18.335	0.100	183.4	0.099	5.00	0.0	0.600	o	225
S8.001	6.155	0.100	61.6	0.000	0.00	0.0	0.600	o	225
S8.002	51.600	0.350	147.4	0.165	0.00	0.0	0.600	o	300
S8.003	9.895	0.450	22.0	0.032	0.00	0.0	0.600	o	300
S8.004	8.200	0.450	18.2	0.026	0.00	0.0	0.600	o	300

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S5.012	50.00	5.86	30.119	0.000	2.9	0.0	0.6	1.01	40.1	3.5
S5.013	50.00	6.82	30.077	0.308	2.9	0.0	8.9	1.43	100.8	53.5
S5.014	50.00	6.94	29.400	0.308	2.9	0.0	8.9	2.08	147.0	53.5
S5.015	50.00	6.95	29.150	0.308	2.9	0.0	8.9	1.11	78.3	53.5
S5.016	50.00	5.21	29.145	0.000	6.8	0.0	1.1	0.92	36.8	6.8
S5.017	50.00	5.30	29.087	0.085	6.8	0.0	3.7	0.92	36.7	22.0
S5.018	50.00	5.40	29.060	0.085	6.8	0.0	3.7	1.00	39.8	22.0
S5.019	50.00	5.65	29.026	0.085	6.8	0.0	3.7	1.01	40.1	22.0
S7.000	50.00	5.82	30.600	0.038	0.0	0.0	1.0	1.01	40.2	6.2
S7.001	50.00	7.17	30.300	0.231	0.0	0.0	6.3	1.05	41.7	37.5
S7.002	50.00	7.23	29.750	0.231	0.0	0.0	6.3	1.37	54.3	37.5
S7.003	50.00	7.81	29.700	0.314	0.0	0.0	8.5	1.25	88.2	51.0
S7.004	50.00	7.92	29.425	0.314	0.0	0.0	8.5	0.96	68.1	51.0
S8.000	50.00	5.32	34.050	0.099	0.0	0.0	2.7	0.96	38.3	16.1
S8.001	50.00	5.38	33.950	0.099	0.0	0.0	2.7	1.67	66.4	16.1
S8.002	50.00	6.04	33.850	0.264	0.0	0.0	7.1	1.29	91.4	42.9
S8.003	50.00	6.09	33.500	0.296	0.0	0.0	8.0	3.37	238.0	48.1
S8.004	50.00	6.13	33.050	0.322	0.0	0.0	8.7	3.70	261.6	52.3

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
S8.005	12.785	0.400	32.0	0.029	0.00	0.0	0.600	o	300
S8.006	4.190	0.100	41.9	0.000	0.00	0.0	0.600	o	300
S8.007	18.015	0.850	21.2	0.023	0.00	0.0	0.600	o	300
S9.000	24.345	0.400	60.9	0.036	5.00	0.0	0.600	o	225
S9.001	27.680	0.800	34.6	0.048	0.00	0.0	0.600	o	225
S9.002	11.570	0.069	167.0	0.000	0.00	0.0	0.600	o	225
S9.003	21.010	0.126	166.7	0.043	0.00	0.0	0.600	o	225
S9.004	22.260	0.111	200.0	0.047	0.00	0.0	0.600	o	225
S9.005	12.080	0.060	200.0	0.000	0.00	0.0	0.600	o	225
S9.006	6.775	0.041	167.0	0.000	0.00	0.0	0.600	o	225
S9.007	3.650	0.021	173.8	0.000	0.00	0.0	0.600	o	225
S9.008	36.185	0.217	167.0	0.037	0.00	0.0	0.600	o	225
S9.009	17.895	0.107	167.0	0.000	0.00	0.0	0.600	o	225
S8.008	5.445	0.033	167.0	0.000	0.00	0.0	0.600	o	375
S8.009	33.680	1.017	33.1	0.142	0.00	0.0	0.600	o	375
S7.005	5.415	0.032	167.0	0.000	0.00	0.0	0.600	o	450
S7.006	6.000	0.268	22.4	0.000	0.00	0.0	0.600	o	450

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S8.005	50.00	6.21	32.600	0.351	0.0	0.0	9.5	2.79	197.3	57.0
S8.006	50.00	6.24	32.200	0.351	0.0	0.0	9.5	2.44	172.2	57.0
S8.007	50.00	6.32	32.100	0.374	0.0	0.0	10.1	3.43	242.5	60.8
S9.000	50.00	5.24	32.750	0.036	0.0	0.0	1.0	1.68	66.8	5.8
S9.001	50.00	5.45	32.350	0.084	0.0	0.0	2.3	2.23	88.7	13.6
S9.002	50.00	5.64	31.550	0.084	0.0	0.0	2.3	1.01	40.1	13.6
S9.003	50.00	5.99	31.481	0.127	0.0	0.0	3.4	1.01	40.1	20.6
S9.004	50.00	6.39	31.355	0.174	0.0	0.0	4.7	0.92	36.6	28.3
S9.005	50.00	6.61	31.243	0.174	0.0	0.0	4.7	0.92	36.6	28.3
S9.006	50.00	6.72	31.183	0.174	0.0	0.0	4.7	1.01	40.1	28.3
S9.007	50.00	6.78	31.142	0.174	0.0	0.0	4.7	0.99	39.3	28.3
S9.008	50.00	7.38	31.121	0.211	0.0	0.0	5.7	1.01	40.1	34.3
S9.009	50.00	7.67	30.905	0.211	0.0	0.0	5.7	1.01	40.1	34.3
S8.008	50.00	7.74	30.798	0.585	0.0	0.0	15.8	1.40	154.5	95.1
S8.009	50.00	7.92	30.765	0.727	0.0	0.0	19.7	3.16	348.8	118.1
S7.005	50.00	7.98	29.400	1.041	0.0	0.0	28.2	1.57	249.8	169.2
S7.006	50.00	8.01	29.368	1.041	0.0	0.0	28.2	4.31	685.1	169.2

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
S7.007	1.000	0.006	166.7	0.000	0.00	0.0	0.600	o	450
S7.008	11.850	0.047	252.1	0.000	0.00	0.0	0.600	o	225
S10.000	45.015	0.300	150.1	0.119	5.00	0.0	0.600	o	225
S7.009	3.815	0.023	167.0	0.000	0.00	0.0	0.600	o	225
S5.020	30.955	0.124	250.0	0.081	0.00	0.0	0.600	o	300
S5.021	22.200	0.089	250.0	0.087	0.00	0.0	0.600	o	375
S5.022	5.400	0.022	250.0	0.000	0.00	0.0	0.600	o	375
S5.023	5.310	0.021	250.0	0.000	0.00	0.0	0.600	o	375
S1.019	1.000	0.004	250.0	0.000	0.00	0.0	0.600	o	450
S1.020	1.000	0.004	250.0	0.000	0.00	0.0	0.600	o	450
S1.021	23.220	0.077	300.0	0.000	0.00	0.0	0.600	o	450
S1.022	144.725	0.482	300.0	0.000	0.00	0.0	0.600	o	450
S1.023	80.520	0.268	300.0	0.000	0.00	0.0	0.600	o	450

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S7.007	50.00	8.02	29.100	1.041	0.0	0.0	28.2	1.57	250.0	169.2
S7.008	50.00	5.24	29.094	0.000	9.4	0.0	1.6	0.82	32.6	9.4
S10.000	50.00	5.70	29.350	0.119	0.0	0.0	3.2	1.07	42.3	19.3
S7.009	50.00	5.77	29.047	0.119	9.4	0.0	5.1	1.01	40.1	30.6
S5.020	50.00	6.29	28.934	0.285	16.2	0.0	11.0	0.99	70.0	65.8
S5.021	50.00	6.61	28.811	0.372	16.2	0.0	13.3	1.14	126.1	79.9
S5.022	50.00	6.69	28.722	0.372	16.2	0.0	13.3	1.14	126.1	79.9
S5.023	50.00	6.77	28.700	0.372	16.2	0.0	13.3	1.14	126.1	79.9
S1.019	50.00	6.78	28.666	0.669	23.1	0.0	22.7	1.28	203.8	136.4
S1.020	50.00	6.80	28.662	0.669	23.1	0.0	22.7	1.28	203.8	136.4
S1.021	50.00	5.33	28.658	0.000	28.5	0.0	4.8	1.17	185.8	28.5
S1.022	50.00	7.40	28.581	0.000	28.5	0.0	5.7	1.17	185.8	34.2
S1.023	50.00	8.54	28.098	0.000	28.5	0.0	5.7	1.17	185.8	34.2

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
SSW.123	35.050	1.500	1050	S1.000	33.550	300				
SSW.122	34.870	1.570	1050	S1.001	33.300	300	S1.000	33.300	300	
SSW.121	34.800	1.522	1050	S1.002	33.278	300	S1.001	33.278	300	
SSW.125	34.300	1.500	1050	S2.000	32.800	225				
SSW.124	34.600	2.060	1200	S2.001	32.540	225	S2.000	32.540	225	
SSW.120	34.700	2.240	1350	S1.003	32.460	375	S1.002	33.198	300	663
							S2.001	32.460	225	
SSW.119	34.600	2.277	1350	S1.004	32.323	375	S1.003	32.323	375	
SSW.118	34.500	2.209	1350	S1.005	32.291	375	S1.004	32.291	375	
SSW.117	34.350	2.225	1350	S1.006	32.125	375	S1.005	32.125	375	
SSW.116	34.300	2.193	1350	S1.007	32.107	375	S1.006	32.107	375	
SSW.115	34.250	2.187	1350	S1.008	32.063	375	S1.007	32.063	375	
SSW.114	33.600	1.719	1350	S1.009	31.881	375	S1.008	31.881	375	
SSW.113	33.500	1.657	1350	S1.010	31.843	375	S1.009	31.843	375	
SSW.112	31.500	1.575	1350	S1.011	29.925	375	S1.010	29.925	375	
SSW.127	34.250	1.500	1050	S3.000	32.750	225				
SSW.126	32.500	1.500	1050	S3.001	31.000	225	S3.000	31.000	225	
SSW.111	32.000	2.500	1350	S1.012	29.500	450	S1.011	29.841	375	266
							S3.001	30.995	225	1270
SSW.110	32.000	2.505	1350	S1.013	29.495	225	S1.012	29.495	450	
SSW.109	31.400	1.500	1050	S4.000	29.900	225				
SSW.108	30.900	1.439	1050	S1.014	29.461	225	S1.013	29.461	225	
							S4.000	29.500	225	39
SSW.107	30.650	1.421	1050	S1.015	29.229	225	S1.014	29.229	225	
SSW.106	30.600	1.421	1050	S1.016	29.179	225	S1.015	29.179	225	
SSW.105	30.550	1.421	1050	S1.017	29.129	225	S1.016	29.129	225	
SSW.104	30.500	1.421	1050	S1.018	29.079	300	S1.017	29.079	225	
SSW.227	35.300	1.500	1050	S5.000	33.800	225				
SSW.226	35.500	1.914	1200	S5.001	33.587	225	S5.000	33.587	225	
SSW.225	34.300	1.501	1050	S5.002	32.800	225	S5.001	32.800	225	
SSW.224	34.200	1.501	1050	S5.003	32.700	225	S5.002	32.700	225	
SSW.223	34.100	1.501	1050	S5.004	32.600	225	S5.003	32.600	225	
SSW.222	34.000	1.501	1050	S5.005	32.500	300	S5.004	32.500	225	
SSW.221	34.100	1.500	1050	S6.000	32.600	225				
SSW.220	33.600	1.501	1050	S5.006	32.100	300	S5.005	32.100	300	
							S6.000	32.100	225	
SSW.219	33.250	1.501	1050	S5.007	31.750	300	S5.006	31.750	300	
SSW.218	33.250	2.850	1200	S5.008	30.400	300	S5.007	31.669	300	1269
SSW.217	33.250	2.860	1200	S5.009	30.390	225	S5.008	30.390	300	
SSW.216	33.000	2.695	1200	S5.010	30.305	225	S5.009	30.305	225	
SSW.214	32.800	2.643	1200	S5.011	30.157	225	S5.010	30.157	225	
SSW.213	32.700	2.581	1200	S5.012	30.119	225	S5.011	30.119	225	
SSW.212	32.600	2.523	1200	S5.013	30.077	300	S5.012	30.077	225	
SSW.210	30.900	1.500	1050	S5.014	29.400	300	S5.013	29.400	300	
SSW.209	30.900	1.750	1050	S5.015	29.150	300	S5.014	29.150	300	
SSW.208	30.900	1.755	1200	S5.016	29.145	225	S5.015	29.145	300	

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SSW.207	30.800	1.713	1050	S5.017	29.087	225	S5.016	29.087	225	
SSW.206	30.750	1.690	1050	S5.018	29.060	225	S5.017	29.060	225	
SSW.205	30.700	1.674	1050	S5.019	29.026	225	S5.018	29.026	225	
SSW.332	32.100	1.500	1050	S7.000	30.600	225				
SSW.331	31.800	1.500	1050	S7.001	30.300	225	S7.000	30.300	225	
SSW.330	31.250	1.500	1050	S7.002	29.750	225	S7.001	29.750	225	
SSW.329	31.200	1.500	1050	S7.003	29.700	300	S7.002	29.700	225	
SSW.328	30.925	1.500	1050	S7.004	29.425	300	S7.003	29.425	300	
SSW.316	35.550	1.500	1050	S8.000	34.050	225				
SSW.315	35.450	1.500	1050	S8.001	33.950	225	S8.000	33.950	225	
SSW.314	35.350	1.500	1050	S8.002	33.850	300	S8.001	33.850	225	
SSW.313	35.000	1.500	1050	S8.003	33.500	300	S8.002	33.500	300	
SSW.312	34.550	1.500	1050	S8.004	33.050	300	S8.003	33.050	300	
SSW.311	34.100	1.500	1050	S8.005	32.600	300	S8.004	32.600	300	
SSW.310	33.650	1.450	1050	S8.006	32.200	300	S8.005	32.200	300	
SSW.309	33.550	1.450	1050	S8.007	32.100	300	S8.006	32.100	300	
SSW.327	34.250	1.500	1050	S9.000	32.750	225				
SSW.326	33.850	1.500	1050	S9.001	32.350	225	S9.000	32.350	225	
SSW.325	33.050	1.500	1050	S9.002	31.550	225	S9.001	31.550	225	
SSW.324	33.050	1.569	1050	S9.003	31.481	225	S9.002	31.481	225	
SSW.323	33.050	1.695	1050	S9.004	31.355	225	S9.003	31.355	225	
SSW.322	32.650	1.407	1050	S9.005	31.243	225	S9.004	31.243	225	
SSW.321	32.650	1.467	1050	S9.006	31.183	225	S9.005	31.183	225	
SSW.320	32.650	1.508	1050	S9.007	31.142	225	S9.006	31.142	225	
SSW.319	32.650	1.529	1050	S9.008	31.121	225	S9.007	31.121	225	
SSW.318	32.700	1.795	1200	S9.009	30.905	225	S9.008	30.905	225	
SSW.308	32.700	1.902	1350	S8.008	30.798	375	S8.007	31.250	300	377
							S9.009	30.798	225	
SSW.307	32.350	1.585	1350	S8.009	30.765	375	S8.008	30.765	375	
SSW.305	30.900	1.500	1350	S7.005	29.400	450	S7.004	29.400	300	
							S8.009	29.748	375	273
SSW.304	30.850	1.482	1350	S7.006	29.368	450	S7.005	29.368	450	
SSW.303	30.850	1.750	1350	S7.007	29.100	450	S7.006	29.100	450	
SSW.302	30.650	1.556	1350	S7.008	29.094	225	S7.007	29.094	450	
SSW.317	30.850	1.500	1050	S10.000	29.350	225				
SSW.301	30.550	1.503	1050	S7.009	29.047	225	S7.008	29.047	225	
							S10.000	29.050	225	3
SSW.204	30.500	1.566	1050	S5.020	28.934	300	S5.019	28.934	225	
							S7.009	29.024	225	15
SSW.203	30.300	1.489	1350	S5.021	28.811	375	S5.020	28.811	300	
SSW.202	30.150	1.428	1350	S5.022	28.722	375	S5.021	28.722	375	
SSW.201	30.100	1.400	1350	S5.023	28.700	375	S5.022	28.700	375	
SSW.103	30.050	1.384	1350	S1.019	28.666	450	S1.018	28.666	300	
							S5.023	28.679	375	
SSW.102	30.050	1.388	1350	S1.020	28.662	450	S1.019	28.662	450	
SSW.101	30.050	1.392	1350	S1.021	28.658	450	S1.020	28.658	450	

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SSW.003	30.290	1.709	1350	S1.022	28.581	450	S1.021	28.581	450	
SSW.002	30.230	2.132	1350	S1.023	28.098	450	S1.022	28.098	450	
SEx SW.001	30.100	2.270	0		OUTFALL		S1.023	27.830	450	

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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 DIAM., L*W (mm)
S1.000	o	300	SSW.123	35.050	33.550	1.200	1050
S1.001	o	300	SSW.122	34.870	33.300	1.270	1050
S1.002	o	300	SSW.121	34.800	33.278	1.222	1050
S2.000	o	225	SSW.125	34.300	32.800	1.275	1050
S2.001	o	225	SSW.124	34.600	32.540	1.835	1200
S1.003	o	375	SSW.120	34.700	32.460	1.865	1350
S1.004	o	375	SSW.119	34.600	32.323	1.902	1350
S1.005	o	375	SSW.118	34.500	32.291	1.834	1350
S1.006	o	375	SSW.117	34.350	32.125	1.850	1350
S1.007	o	375	SSW.116	34.300	32.107	1.818	1350
S1.008	o	375	SSW.115	34.250	32.063	1.812	1350
S1.009	o	375	SSW.114	33.600	31.881	1.344	1350
S1.010	o	375	SSW.113	33.500	31.843	1.282	1350
S1.011	o	375	SSW.112	31.500	29.925	1.200	1350
S3.000	o	225	SSW.127	34.250	32.750	1.275	1050
S3.001	o	225	SSW.126	32.500	31.000	1.275	1050

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S1.000	36.580	146.3	SSW.122	34.870	33.300	1.270	1050
S1.001	3.340	151.8	SSW.121	34.800	33.278	1.222	1050
S1.002	11.935	149.2	SSW.120	34.700	33.198	1.202	1350
S2.000	43.415	167.0	SSW.124	34.600	32.540	1.835	1200
S2.001	13.395	167.4	SSW.120	34.700	32.460	2.015	1350
S1.003	22.895	167.1	SSW.119	34.600	32.323	1.902	1350
S1.004	5.280	165.0	SSW.118	34.500	32.291	1.834	1350
S1.005	27.705	166.9	SSW.117	34.350	32.125	1.850	1350
S1.006	3.010	167.2	SSW.116	34.300	32.107	1.818	1350
S1.007	7.320	166.4	SSW.115	34.250	32.063	1.812	1350
S1.008	14.580	80.1	SSW.114	33.600	31.881	1.344	1350
S1.009	3.010	79.2	SSW.113	33.500	31.843	1.282	1350
S1.010	63.315	33.0	SSW.112	31.500	29.925	1.200	1350
S1.011	6.730	80.1	SSW.111	32.000	29.841	1.784	1350
S3.000	48.090	27.5	SSW.126	32.500	31.000	1.275	1050
S3.001	1.000	200.0	SSW.111	32.000	30.995	0.780	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 DIAM., L*W (mm)
S1.012	o	450	SSW.111	32.000	29.500	2.050	1350
S1.013	o	225	SSW.110	32.000	29.495	2.280	1350
S4.000	o	225	SSW.109	31.400	29.900	1.275	1050
S1.014	o	225	SSW.108	30.900	29.461	1.214	1050
S1.015	o	225	SSW.107	30.650	29.229	1.196	1050
S1.016	o	225	SSW.106	30.600	29.179	1.196	1050
S1.017	o	225	SSW.105	30.550	29.129	1.196	1050
S1.018	o	300	SSW.104	30.500	29.079	1.121	1050
S5.000	o	225	SSW.227	35.300	33.800	1.275	1050
S5.001	o	225	SSW.226	35.500	33.587	1.689	1200
S5.002	o	225	SSW.225	34.300	32.800	1.276	1050
S5.003	o	225	SSW.224	34.200	32.700	1.276	1050
S5.004	o	225	SSW.223	34.100	32.600	1.276	1050
S5.005	o	300	SSW.222	34.000	32.500	1.201	1050

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S1.012	1.000	200.0	SSW.110	32.000	29.495	2.055	1350
S1.013	8.445	248.4	SSW.108	30.900	29.461	1.214	1050
S4.000	32.075	80.2	SSW.108	30.900	29.500	1.175	1050
S1.014	31.710	136.7	SSW.107	30.650	29.229	1.196	1050
S1.015	5.100	102.0	SSW.106	30.600	29.179	1.196	1050
S1.016	2.755	55.1	SSW.105	30.550	29.129	1.196	1050
S1.017	5.680	113.6	SSW.104	30.500	29.079	1.196	1050
S1.018	43.305	104.9	SSW.103	30.050	28.666	1.084	1350
S5.000	21.350	100.0	SSW.226	35.500	33.587	1.689	1200
S5.001	42.000	53.4	SSW.225	34.300	32.800	1.276	1050
S5.002	4.295	43.0	SSW.224	34.200	32.700	1.276	1050
S5.003	3.600	36.0	SSW.223	34.100	32.600	1.276	1050
S5.004	3.770	37.7	SSW.222	34.000	32.500	1.276	1050
S5.005	37.100	92.8	SSW.220	33.600	32.100	1.201	1050

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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 DIAM., L*W (mm)
S6.000	o	225	SSW.221	34.100	32.600	1.275	1050
S5.006	o	300	SSW.220	33.600	32.100	1.201	1050
S5.007	o	300	SSW.219	33.250	31.750	1.201	1050
S5.008	o	300	SSW.218	33.250	30.400	2.550	1200
S5.009	o	225	SSW.217	33.250	30.390	2.635	1200
S5.010	o	225	SSW.216	33.000	30.305	2.470	1200
S5.011	o	225	SSW.214	32.800	30.157	2.418	1200
S5.012	o	225	SSW.213	32.700	30.119	2.356	1200
S5.013	o	300	SSW.212	32.600	30.077	2.223	1200
S5.014	o	300	SSW.210	30.900	29.400	1.200	1050
S5.015	o	300	SSW.209	30.900	29.150	1.450	1050
S5.016	o	225	SSW.208	30.900	29.145	1.530	1200
S5.017	o	225	SSW.207	30.800	29.087	1.488	1050
S5.018	o	225	SSW.206	30.750	29.060	1.465	1050
S5.019	o	225	SSW.205	30.700	29.026	1.449	1050
S7.000	o	225	SSW.332	32.100	30.600	1.275	1050
S7.001	o	225	SSW.331	31.800	30.300	1.275	1050

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S6.000	24.470	48.9	SSW.220	33.600	32.100	1.275	1050
S5.006	14.265	40.8	SSW.219	33.250	31.750	1.201	1050
S5.007	8.075	100.0	SSW.218	33.250	31.669	1.281	1200
S5.008	1.000	100.0	SSW.217	33.250	30.390	2.560	1200
S5.009	14.175	166.8	SSW.216	33.000	30.305	2.470	1200
S5.010	24.670	167.0	SSW.214	32.800	30.157	2.418	1200
S5.011	6.445	167.0	SSW.213	32.700	30.119	2.356	1200
S5.012	6.915	167.0	SSW.212	32.600	30.077	2.298	1200
S5.013	82.120	121.3	SSW.210	30.900	29.400	1.200	1050
S5.014	14.350	57.4	SSW.209	30.900	29.150	1.450	1050
S5.015	1.000	200.0	SSW.208	30.900	29.145	1.455	1200
S5.016	11.500	198.3	SSW.207	30.800	29.087	1.488	1050
S5.017	5.385	199.4	SSW.206	30.750	29.060	1.465	1050
S5.018	5.755	169.3	SSW.205	30.700	29.026	1.449	1050
S5.019	15.355	167.0	SSW.204	30.500	28.934	1.341	1050
S7.000	49.840	166.1	SSW.331	31.800	30.300	1.275	1050
S7.001	85.100	154.7	SSW.330	31.250	29.750	1.275	1050

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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 DIAM., L*W (mm)
S7.002	o	225	SSW.330	31.250	29.750	1.275	1050
S7.003	o	300	SSW.329	31.200	29.700	1.200	1050
S7.004	o	300	SSW.328	30.925	29.425	1.200	1050
S8.000	o	225	SSW.316	35.550	34.050	1.275	1050
S8.001	o	225	SSW.315	35.450	33.950	1.275	1050
S8.002	o	300	SSW.314	35.350	33.850	1.200	1050
S8.003	o	300	SSW.313	35.000	33.500	1.200	1050
S8.004	o	300	SSW.312	34.550	33.050	1.200	1050
S8.005	o	300	SSW.311	34.100	32.600	1.200	1050
S8.006	o	300	SSW.310	33.650	32.200	1.150	1050
S8.007	o	300	SSW.309	33.550	32.100	1.150	1050
S9.000	o	225	SSW.327	34.250	32.750	1.275	1050
S9.001	o	225	SSW.326	33.850	32.350	1.275	1050
S9.002	o	225	SSW.325	33.050	31.550	1.275	1050
S9.003	o	225	SSW.324	33.050	31.481	1.344	1050
S9.004	o	225	SSW.323	33.050	31.355	1.470	1050
S9.005	o	225	SSW.322	32.650	31.243	1.182	1050

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S7.002	4.580	91.6	SSW.329	31.200	29.700	1.275	1050
S7.003	43.495	158.2	SSW.328	30.925	29.425	1.200	1050
S7.004	6.590	263.6	SSW.305	30.900	29.400	1.200	1350
S8.000	18.335	183.4	SSW.315	35.450	33.950	1.275	1050
S8.001	6.155	61.6	SSW.314	35.350	33.850	1.275	1050
S8.002	51.600	147.4	SSW.313	35.000	33.500	1.200	1050
S8.003	9.895	22.0	SSW.312	34.550	33.050	1.200	1050
S8.004	8.200	18.2	SSW.311	34.100	32.600	1.200	1050
S8.005	12.785	32.0	SSW.310	33.650	32.200	1.150	1050
S8.006	4.190	41.9	SSW.309	33.550	32.100	1.150	1050
S8.007	18.015	21.2	SSW.308	32.700	31.250	1.150	1350
S9.000	24.345	60.9	SSW.326	33.850	32.350	1.275	1050
S9.001	27.680	34.6	SSW.325	33.050	31.550	1.275	1050
S9.002	11.570	167.0	SSW.324	33.050	31.481	1.344	1050
S9.003	21.010	166.7	SSW.323	33.050	31.355	1.470	1050
S9.004	22.260	200.0	SSW.322	32.650	31.243	1.182	1050
S9.005	12.080	200.0	SSW.321	32.650	31.183	1.242	1050

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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 DIAM., L*W (mm)
S9.006	o	225	SSW.321	32.650	31.183	1.242	1050
S9.007	o	225	SSW.320	32.650	31.142	1.283	1050
S9.008	o	225	SSW.319	32.650	31.121	1.304	1050
S9.009	o	225	SSW.318	32.700	30.905	1.570	1200
S8.008	o	375	SSW.308	32.700	30.798	1.527	1350
S8.009	o	375	SSW.307	32.350	30.765	1.210	1350
S7.005	o	450	SSW.305	30.900	29.400	1.050	1350
S7.006	o	450	SSW.304	30.850	29.368	1.032	1350
S7.007	o	450	SSW.303	30.850	29.100	1.300	1350
S7.008	o	225	SSW.302	30.650	29.094	1.331	1350
S10.000	o	225	SSW.317	30.850	29.350	1.275	1050
S7.009	o	225	SSW.301	30.550	29.047	1.278	1050
S5.020	o	300	SSW.204	30.500	28.934	1.266	1050
S5.021	o	375	SSW.203	30.300	28.811	1.114	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S9.006	6.775	167.0	SSW.320	32.650	31.142	1.283	1050
S9.007	3.650	173.8	SSW.319	32.650	31.121	1.304	1050
S9.008	36.185	167.0	SSW.318	32.700	30.905	1.570	1200
S9.009	17.895	167.0	SSW.308	32.700	30.798	1.677	1350
S8.008	5.445	167.0	SSW.307	32.350	30.765	1.210	1350
S8.009	33.680	33.1	SSW.305	30.900	29.748	0.777	1350
S7.005	5.415	167.0	SSW.304	30.850	29.368	1.032	1350
S7.006	6.000	22.4	SSW.303	30.850	29.100	1.300	1350
S7.007	1.000	166.7	SSW.302	30.650	29.094	1.106	1350
S7.008	11.850	252.1	SSW.301	30.550	29.047	1.278	1050
S10.000	45.015	150.1	SSW.301	30.550	29.050	1.275	1050
S7.009	3.815	167.0	SSW.204	30.500	29.024	1.251	1050
S5.020	30.955	250.0	SSW.203	30.300	28.811	1.189	1350
S5.021	22.200	250.0	SSW.202	30.150	28.722	1.053	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 DIAM., L*W (mm)
S5.022	o	375	SSW.202	30.150	28.722	1.053	1350
S5.023	o	375	SSW.201	30.100	28.700	1.025	1350
S1.019	o	450	SSW.103	30.050	28.666	0.934	1350
S1.020	o	450	SSW.102	30.050	28.662	0.938	1350
S1.021	o	450	SSW.101	30.050	28.658	0.942	1350
S1.022	o	450	SSW.003	30.290	28.581	1.259	1350
S1.023	o	450	SSW.002	30.230	28.098	1.682	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S5.022	5.400	250.0	SSW.201	30.100	28.700	1.025	1350
S5.023	5.310	250.0	SSW.103	30.050	28.679	0.996	1350
S1.019	1.000	250.0	SSW.102	30.050	28.662	0.938	1350
S1.020	1.000	250.0	SSW.101	30.050	28.658	0.942	1350
S1.021	23.220	300.0	SSW.003	30.290	28.581	1.259	1350
S1.022	144.725	300.0	SSW.002	30.230	28.098	1.682	1350
S1.023	80.520	300.0	SEx SW.001	30.100	27.830	1.820	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.023	SEx SW.001	30.100	27.830	27.830	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Foul Sewage per hectare (l/s)	0.000
PIMP (% impervious)	100	Additional Flow - % of Total Flow	20.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Run Time (mins)	60
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	5
Number of Online Controls	5	Number of Time/Area Diagrams	0
Number of Offline Controls	0		

Synthetic Rainfall Details

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Simulation Criteria for Storm

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	21.500	Storm Duration (mins)	30
Ratio R	0.244		

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Online Controls for Storm

Hydro-Brake® Manhole: SSW.110, DS/PN: S1.013, Volume (m³): 3.5

Design Head (m) 2.000 Hydro-Brake® Type Md4 Invert Level (m) 29.495
Design Flow (l/s) 6.9 Diameter (mm) 80

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.4	1.200	5.5	3.000	8.6	7.000	13.2
0.200	3.5	1.400	5.9	3.500	9.3	7.500	13.7
0.300	3.0	1.600	6.3	4.000	10.0	8.000	14.1
0.400	3.2	1.800	6.7	4.500	10.6	8.500	14.5
0.500	3.5	2.000	7.1	5.000	11.2	9.000	15.0
0.600	3.9	2.200	7.4	5.500	11.7	9.500	15.4
0.800	4.5	2.400	7.7	6.000	12.2		
1.000	5.0	2.600	8.0	6.500	12.7		

Hydro-Brake® Manhole: SSW.217, DS/PN: S5.009, Volume (m³): 3.2

Design Head (m) 2.250 Hydro-Brake® Type Md4 Invert Level (m) 30.390
Design Flow (l/s) 2.9 Diameter (mm) 50

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.1	1.200	2.1	3.000	3.4	7.000	5.2
0.200	0.9	1.400	2.3	3.500	3.6	7.500	5.3
0.300	1.1	1.600	2.5	4.000	3.9	8.000	5.5
0.400	1.2	1.800	2.6	4.500	4.1	8.500	5.7
0.500	1.4	2.000	2.8	5.000	4.4	9.000	5.8
0.600	1.5	2.200	2.9	5.500	4.6	9.500	6.0
0.800	1.7	2.400	3.0	6.000	4.8		
1.000	1.9	2.600	3.1	6.500	5.0		

Hydro-Brake® Manhole: SSW.208, DS/PN: S5.016, Volume (m³): 2.0

Design Head (m) 1.500 Hydro-Brake® Type Md4 Invert Level (m) 29.145
Design Flow (l/s) 6.8 Diameter (mm) 85

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.6	1.200	6.2	3.000	9.8	7.000	14.9
0.200	4.1	1.400	6.7	3.500	10.5	7.500	15.4
0.300	3.5	1.600	7.1	4.000	11.3	8.000	15.9
0.400	3.6	1.800	7.6	4.500	11.9	8.500	16.4
0.500	4.0	2.000	8.0	5.000	12.6	9.000	16.9
0.600	4.4	2.200	8.4	5.500	13.2	9.500	17.4
0.800	5.0	2.400	8.7	6.000	13.8		
1.000	5.6	2.600	9.1	6.500	14.4		

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Hydro-Brake® Manhole: SSW.302, DS/PN: S7.008, Volume (m³): 2.2

Design Head (m) 2.000 Hydro-Brake® Type Md4 Invert Level (m) 29.094
Design Flow (l/s) 9.4 Diameter (mm) 92

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	1.200	7.2	3.000	11.4	7.000	17.5
0.200	5.1	1.400	7.8	3.500	12.3	7.500	18.1
0.300	4.3	1.600	8.3	4.000	13.2	8.000	18.7
0.400	4.3	1.800	8.8	4.500	14.0	8.500	19.2
0.500	4.7	2.000	9.3	5.000	14.7	9.000	19.8
0.600	5.1	2.200	9.8	5.500	15.5	9.500	20.3
0.800	5.9	2.400	10.2	6.000	16.2		
1.000	6.6	2.600	10.6	6.500	16.8		

Hydro-Brake® Manhole: SSW.101, DS/PN: S1.021, Volume (m³): 1.9

Design Head (m) 1.000 Hydro-Brake® Type Md4 Invert Level (m) 28.658
Design Flow (l/s) 28.5 Diameter (mm) 190

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.3	1.200	30.9	3.000	48.7	7.000	74.4
0.200	16.2	1.400	33.3	3.500	52.6	7.500	77.0
0.300	27.7	1.600	35.6	4.000	56.3	8.000	79.6
0.400	31.4	1.800	37.7	4.500	59.7	8.500	82.0
0.500	29.4	2.000	39.8	5.000	62.9	9.000	84.4
0.600	26.8	2.200	41.7	5.500	66.0	9.500	86.7
0.800	26.2	2.400	43.6	6.000	68.9		
1.000	28.3	2.600	45.4	6.500	71.7		

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Storage Structures for Storm

Tank or Pond Manhole: SSW.110, DS/PN: S1.013

Invert Level (m) 29.495

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	321.3	2.000	321.3

Tank or Pond Manhole: SSW.217, DS/PN: S5.009

Invert Level (m) 30.390

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	166.6	2.250	166.6

Tank or Pond Manhole: SSW.208, DS/PN: S5.016

Invert Level (m) 29.145

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	220.0	1.000	220.0

Tank or Pond Manhole: SSW.302, DS/PN: S7.008

Invert Level (m) 29.094

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	650.0	1.000	650.0

Tank or Pond Manhole: SSW.101, DS/PN: S1.021

Invert Level (m) 28.658

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	235.0	1.000	235.0

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

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 2
Climate Change (%) 0

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
S1.000	15 Winter	2	0%					
S1.001	15 Winter	2	0%	2/15 Summer				
S1.002	15 Winter	2	0%					
S2.000	15 Winter	2	0%					
S2.001	15 Winter	2	0%	2/15 Summer				
S1.003	15 Winter	2	0%					
S1.004	15 Winter	2	0%	2/15 Winter				
S1.005	15 Winter	2	0%	2/15 Winter				
S1.006	15 Winter	2	0%	2/15 Summer				
S1.007	15 Winter	2	0%	2/15 Summer				
S1.008	15 Winter	2	0%					
S1.009	15 Winter	2	0%	2/15 Winter				
S1.010	15 Winter	2	0%					
S1.011	1440 Winter	2	0%	2/15 Summer				
S3.000	15 Winter	2	0%					
S3.001	15 Winter	2	0%					
S1.012	1440 Winter	2	0%	2/60 Summer				
S1.013	1440 Winter	2	0%	2/15 Summer				
S4.000	15 Winter	2	0%					
S1.014	15 Winter	2	0%					
S1.015	15 Winter	2	0%	2/15 Summer				
S1.016	15 Winter	2	0%	2/15 Summer				
S1.017	15 Winter	2	0%	2/15 Summer				
S1.018	15 Winter	2	0%					
S5.000	15 Winter	2	0%	2/15 Summer				
S5.001	15 Winter	2	0%	2/15 Summer				
S5.002	15 Winter	2	0%	2/15 Summer				
S5.003	15 Winter	2	0%	2/15 Summer				
S5.004	15 Winter	2	0%	2/15 Summer				
S5.005	15 Winter	2	0%					
S6.000	15 Winter	2	0%					
S5.006	15 Winter	2	0%					
S5.007	15 Winter	2	0%	2/15 Summer				
S5.008	1440 Winter	2	0%	2/15 Summer				
S5.009	1440 Winter	2	0%	2/15 Summer				
S5.010	1440 Winter	2	0%					
S5.011	30 Summer	2	0%					
S5.012	30 Summer	2	0%					

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
S5.013	15 Winter	2	0%					
S5.014	960 Winter	2	0%					
S5.015	960 Winter	2	0%	2/240 Summer				
S5.016	960 Winter	2	0%	2/60 Winter				
S5.017	15 Winter	2	0%					
S5.018	15 Winter	2	0%					
S5.019	15 Winter	2	0%					
S7.000	15 Winter	2	0%					
S7.001	15 Winter	2	0%					
S7.002	15 Winter	2	0%	2/15 Summer				
S7.003	15 Winter	2	0%					
S7.004	15 Winter	2	0%	2/15 Summer				
S8.000	15 Winter	2	0%					
S8.001	15 Winter	2	0%					
S8.002	15 Winter	2	0%					
S8.003	15 Winter	2	0%					
S8.004	15 Winter	2	0%					
S8.005	15 Winter	2	0%					
S8.006	15 Winter	2	0%					
S8.007	15 Winter	2	0%					
S9.000	15 Winter	2	0%					
S9.001	15 Winter	2	0%					
S9.002	15 Winter	2	0%					
S9.003	15 Winter	2	0%					
S9.004	15 Winter	2	0%					
S9.005	15 Winter	2	0%					
S9.006	15 Winter	2	0%					
S9.007	15 Winter	2	0%					
S9.008	15 Winter	2	0%					
S9.009	15 Winter	2	0%	2/15 Summer				
S8.008	15 Winter	2	0%					
S8.009	15 Winter	2	0%					
S7.005	15 Winter	2	0%					
S7.006	1440 Winter	2	0%					
S7.007	1440 Winter	2	0%	2/360 Winter				
S7.008	1440 Winter	2	0%	2/60 Summer				
S10.000	15 Winter	2	0%					
S7.009	15 Winter	2	0%					
S5.020	15 Winter	2	0%					
S5.021	240 Winter	2	0%					
S5.022	240 Winter	2	0%					
S5.023	240 Winter	2	0%	2/240 Winter				
S1.019	240 Winter	2	0%					
S1.020	240 Winter	2	0%					
S1.021	240 Winter	2	0%					
S1.022	240 Winter	2	0%					
S1.023	240 Winter	2	0%					

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

PN	US/MH Name	Water Level (m)	Surch'ed Depth (m)	Flooded Volume (m^3)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
S1.000	SSW.123	33.800	-0.050	0.000	0.80	0.0	67.9	OK
S1.001	SSW.122	33.637	0.037	0.000	1.28	0.0	67.3	SURCHARGED
S1.002	SSW.121	33.531	-0.047	0.000	1.00	0.0	70.8	OK
S2.000	SSW.125	32.950	-0.075	0.000	0.75	0.0	28.6	OK
S2.001	SSW.124	32.837	0.072	0.000	0.75	0.0	26.2	SURCHARGED
S1.003	SSW.120	32.799	-0.036	0.000	0.77	0.0	102.1	OK
S1.004	SSW.119	32.730	0.032	0.000	1.01	0.0	97.1	SURCHARGED
S1.005	SSW.118	32.698	0.032	0.000	0.83	0.0	112.7	SURCHARGED
S1.006	SSW.117	32.584	0.084	0.000	1.34	0.0	111.7	SURCHARGED
S1.007	SSW.116	32.501	0.019	0.000	1.06	0.0	111.9	SURCHARGED
S1.008	SSW.115	32.356	-0.082	0.000	0.67	0.0	111.2	OK
S1.009	SSW.114	32.278	0.022	0.000	1.02	0.0	109.1	SURCHARGED
S1.010	SSW.113	32.013	-0.205	0.000	0.42	0.0	136.8	OK
S1.011	SSW.112	30.636	0.336	0.000	0.15	0.0	17.2	SURCHARGED
S3.000	SSW.127	32.807	-0.168	0.000	0.14	0.0	13.6	OK
S3.001	SSW.126	31.108	-0.117	0.000	0.46	0.0	13.6	OK
S1.012	SSW.111	30.635	0.685	0.000	0.14	0.0	18.4	SURCHARGED
S1.013	SSW.110	30.634	0.914	0.000	0.20	0.0	5.3	SURCHARGED
S4.000	SSW.109	30.016	-0.109	0.000	0.51	0.0	27.8	OK
S1.014	SSW.108	29.661	-0.025	0.000	0.89	0.0	37.0	OK
S1.015	SSW.107	29.488	0.034	0.000	1.13	0.0	35.7	SURCHARGED
S1.016	SSW.106	29.423	0.019	0.000	1.13	0.0	35.7	SURCHARGED
S1.017	SSW.105	29.358	0.004	0.000	1.14	0.0	36.0	SURCHARGED
S1.018	SSW.104	29.225	-0.154	0.000	0.47	0.0	47.6	OK
S5.000	SSW.227	34.100	0.075	0.000	1.04	0.0	49.4	SURCHARGED
S5.001	SSW.226	33.885	0.074	0.000	0.90	0.0	60.9	SURCHARGED
S5.002	SSW.225	33.261	0.237	0.000	1.35	0.0	60.3	SURCHARGED
S5.003	SSW.224	33.078	0.154	0.000	1.35	0.0	60.2	SURCHARGED
S5.004	SSW.223	32.896	0.072	0.000	1.35	0.0	60.2	SURCHARGED
S5.005	SSW.222	32.683	-0.117	0.000	0.68	0.0	72.6	OK
S6.000	SSW.221	32.660	-0.165	0.000	0.16	0.0	10.9	OK
S5.006	SSW.220	32.262	-0.138	0.000	0.56	0.0	81.8	OK
S5.007	SSW.219	32.078	0.028	0.000	1.24	0.0	88.0	SURCHARGED
S5.008	SSW.218	31.725	1.025	0.000	0.17	0.0	10.0	SURCHARGED
S5.009	SSW.217	31.725	1.110	0.000	0.06	0.0	2.3	SURCHARGED
S5.010	SSW.216	30.341	-0.189	0.000	0.06	0.0	2.3	OK
S5.011	SSW.214	30.235	-0.147	0.000	0.04	0.0	1.3	OK
S5.012	SSW.213	30.234	-0.109	0.000	0.06	0.0	1.7	OK
S5.013	SSW.212	30.236	-0.141	0.000	0.53	0.0	51.0	OK
S5.014	SSW.210	29.588	-0.112	0.000	0.07	0.0	9.0	OK
S5.015	SSW.209	29.585	0.134	0.000	0.15	0.0	8.9	SURCHARGED
S5.016	SSW.208	29.584	0.214	0.000	0.13	0.0	4.1	SURCHARGED
S5.017	SSW.207	29.204	-0.108	0.000	0.52	0.0	14.2	OK
S5.018	SSW.206	29.175	-0.111	0.000	0.47	0.0	14.1	OK
S5.019	SSW.205	29.159	-0.093	0.000	0.40	0.0	14.1	OK
S7.000	SSW.332	30.669	-0.156	0.000	0.20	0.0	7.5	OK
S7.001	SSW.331	30.487	-0.038	0.000	0.93	0.0	37.7	OK
S7.002	SSW.330	30.025	0.050	0.000	1.14	0.0	35.9	SURCHARGED

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

PN	US/MH Name	Water Level (m)	Surch'ed Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
S7.003	SSW.329	29.960	-0.040	0.000	0.56	0.0	45.8	OK
S7.004	SSW.328	29.873	0.148	0.000	1.11	0.0	53.9	SURCHARGED
S8.000	SSW.316	34.176	-0.099	0.000	0.58	0.0	20.0	OK
S8.001	SSW.315	34.057	-0.118	0.000	0.45	0.0	20.2	OK
S8.002	SSW.314	34.012	-0.138	0.000	0.56	0.0	47.9	OK
S8.003	SSW.313	33.616	-0.184	0.000	0.31	0.0	52.9	OK
S8.004	SSW.312	33.171	-0.179	0.000	0.34	0.0	57.1	OK
S8.005	SSW.311	32.731	-0.169	0.000	0.39	0.0	62.0	OK
S8.006	SSW.310	32.402	-0.098	0.000	0.79	0.0	62.3	OK
S8.007	SSW.309	32.216	-0.184	0.000	0.32	0.0	65.9	OK
S9.000	SSW.327	32.802	-0.173	0.000	0.12	0.0	7.4	OK
S9.001	SSW.326	32.417	-0.158	0.000	0.19	0.0	15.6	OK
S9.002	SSW.325	31.658	-0.117	0.000	0.46	0.0	15.7	OK
S9.003	SSW.324	31.611	-0.094	0.000	0.63	0.0	23.1	OK
S9.004	SSW.323	31.527	-0.053	0.000	0.90	0.0	30.2	OK
S9.005	SSW.322	31.449	-0.019	0.000	0.91	0.0	28.7	OK
S9.006	SSW.321	31.400	-0.008	0.000	0.94	0.0	28.1	OK
S9.007	SSW.320	31.367	0.000	0.000	1.06	0.0	28.0	OK
S9.008	SSW.319	31.337	-0.009	0.000	0.86	0.0	32.5	OK
S9.009	SSW.318	31.172	0.043	0.000	0.94	0.0	33.8	SURCHARGED
S8.008	SSW.308	31.092	-0.081	0.000	0.97	0.0	93.8	OK
S8.009	SSW.307	30.923	-0.217	0.000	0.36	0.0	113.7	OK
S7.005	SSW.305	29.850	0.000	0.000	1.08	0.0	156.5	OK
S7.006	SSW.304	29.698	-0.120	0.000	0.07	0.0	19.4	OK
S7.007	SSW.303	29.697	0.147	0.000	0.14	0.0	19.3	SURCHARGED
S7.008	SSW.302	29.696	0.377	0.000	0.18	0.0	5.1	SURCHARGED
S10.000	SSW.317	29.477	-0.098	0.000	0.59	0.0	23.8	OK
S7.009	SSW.301	29.199	-0.073	0.000	0.79	0.0	21.5	OK
S5.020	SSW.204	29.133	-0.101	0.000	0.76	0.0	48.3	OK
S5.021	SSW.203	29.108	-0.077	0.000	0.26	0.0	27.8	OK
S5.022	SSW.202	29.097	0.000	0.000	0.35	0.0	27.2	OK
S5.023	SSW.201	29.091	0.016	0.000	0.35	0.0	27.0	SURCHARGED
S1.019	SSW.103	29.086	-0.030	0.000	0.34	0.0	45.7	OK
S1.020	SSW.102	29.084	-0.028	0.000	0.34	0.0	45.5	OK
S1.021	SSW.101	29.083	-0.025	0.000	0.20	0.0	30.5	OK
S1.022	SSW.003	28.704	-0.326	0.000	0.17	0.0	30.5	OK
S1.023	SSW.002	28.224	-0.324	0.000	0.17	0.0	30.5	OK

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Appendix E – 1 in 100 Year Design Sheets

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	100	Add Flow / Climate Change (%)	20
M5-60 (mm)	21.500	Minimum Backdrop Height (m)	0.200
Ratio R	0.244	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	50	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.00	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)	Time (mins)	Area (ha)
0-4	0.000	4-8	1.476	8-12	1.976	12-16	0.108

Total Area Contributing (ha) = 3.559

Total Pipe Volume (m³) = 129.323

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
S1.000	36.580	0.250	146.3	0.350	5.00	0.0	0.600	o	300
S1.001	3.340	0.022	151.8	0.000	0.00	0.0	0.600	o	300
S1.002	11.935	0.080	149.2	0.020	0.00	0.0	0.600	o	300
S2.000	43.415	0.260	167.0	0.143	5.00	0.0	0.600	o	225
S2.001	13.395	0.080	167.4	0.013	0.00	0.0	0.600	o	225

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	50.00	5.47	33.550	0.350	0.0	0.0	9.5	1.30	91.7	56.9
S1.001	50.00	5.51	33.300	0.350	0.0	0.0	9.5	1.27	90.0	56.9
S1.002	50.00	5.67	33.278	0.370	0.0	0.0	10.0	1.28	90.8	60.1
S2.000	50.00	5.72	32.800	0.143	0.0	0.0	3.9	1.01	40.1	23.2
S2.001	50.00	5.94	32.540	0.156	0.0	0.0	4.2	1.01	40.1	25.3

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
S1.003	22.895	0.137	167.1	0.055	0.00	0.0	0.600	o	375
S1.004	5.280	0.032	165.0	0.000	0.00	0.0	0.600	o	375
S1.005	27.705	0.166	166.9	0.122	0.00	0.0	0.600	o	375
S1.006	3.010	0.018	167.2	0.000	0.00	0.0	0.600	o	375
S1.007	7.320	0.044	166.4	0.001	0.00	0.0	0.600	o	375
S1.008	14.580	0.182	80.1	0.017	0.00	0.0	0.600	o	375
S1.009	3.010	0.038	79.2	0.000	0.00	0.0	0.600	o	375
S1.010	63.315	1.918	33.0	0.213	0.00	0.0	0.600	o	375
S1.011	6.730	0.084	80.1	0.000	0.00	0.0	0.600	o	375
S3.000	48.090	1.750	27.5	0.067	5.00	0.0	0.600	o	225
S3.001	1.000	0.005	200.0	0.000	0.00	0.0	0.600	o	225
S1.012	1.000	0.005	200.0	0.000	0.00	0.0	0.600	o	450
S1.013	8.445	0.034	248.4	0.000	0.00	0.0	0.600	o	225
S4.000	32.075	0.400	80.2	0.138	5.00	0.0	0.600	o	225
S1.014	31.710	0.232	136.7	0.075	0.00	0.0	0.600	o	225

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.003	50.00	6.21	32.460	0.581	0.0	0.0	15.7	1.40	154.5	94.4
S1.004	50.00	6.27	32.323	0.581	0.0	0.0	15.7	1.41	155.5	94.4
S1.005	50.00	6.60	32.291	0.703	0.0	0.0	19.0	1.40	154.6	114.2
S1.006	50.00	6.64	32.125	0.703	0.0	0.0	19.0	1.40	154.4	114.2
S1.007	50.00	6.73	32.107	0.704	0.0	0.0	19.1	1.40	154.8	114.4
S1.008	50.00	6.85	32.063	0.721	0.0	0.0	19.5	2.03	223.8	117.2
S1.009	50.00	6.87	31.881	0.721	0.0	0.0	19.5	2.04	225.0	117.2
S1.010	50.00	7.20	31.843	0.934	0.0	0.0	25.3	3.16	349.4	151.8
S1.011	50.00	7.26	29.925	0.934	0.0	0.0	25.3	2.03	223.7	151.8
S3.000	50.00	5.32	32.750	0.067	0.0	0.0	1.8	2.51	99.6	10.9
S3.001	50.00	5.34	31.000	0.067	0.0	0.0	1.8	0.92	36.6	10.9
S1.012	50.00	7.27	29.500	1.001	0.0	0.0	27.1	1.43	228.1	162.7
S1.013	50.00	5.17	29.495	0.000	6.9	0.0	1.2	0.83	32.8	6.9
S4.000	50.00	5.37	29.900	0.138	0.0	0.0	3.7	1.46	58.1	22.4
S1.014	50.00	5.84	29.461	0.213	6.9	0.0	7.1	1.12	44.4	42.9

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
S1.015	5.100	0.050	102.0	0.001	0.00	0.0	0.600	o	225
S1.016	2.755	0.050	55.1	0.000	0.00	0.0	0.600	o	225
S1.017	5.680	0.050	113.6	0.001	0.00	0.0	0.600	o	225
S1.018	43.305	0.413	104.9	0.082	0.00	0.0	0.600	o	300
S5.000	21.350	0.214	100.0	0.263	5.00	0.0	0.600	o	225
S5.001	42.000	0.787	53.4	0.096	0.00	0.0	0.600	o	225
S5.002	4.295	0.100	43.0	0.000	0.00	0.0	0.600	o	225
S5.003	3.600	0.100	36.0	0.000	0.00	0.0	0.600	o	225
S5.004	3.770	0.100	37.7	0.000	0.00	0.0	0.600	o	225
S5.005	37.100	0.400	92.8	0.089	0.00	0.0	0.600	o	300
S6.000	24.470	0.500	48.9	0.053	5.00	0.0	0.600	o	225
S5.006	14.265	0.350	40.8	0.000	0.00	0.0	0.600	o	300
S5.007	8.075	0.081	100.0	0.039	0.00	0.0	0.600	o	300
S5.008	1.000	0.010	100.0	0.000	0.00	0.0	0.600	o	300
S5.009	14.175	0.085	166.8	0.000	0.00	0.0	0.600	o	225
S5.010	24.670	0.148	167.0	0.000	0.00	0.0	0.600	o	225
S5.011	6.445	0.039	167.0	0.000	0.00	0.0	0.600	o	225

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.015	50.00	5.90	29.229	0.214	6.9	0.0	7.2	1.29	51.5	43.1
S1.016	50.00	5.93	29.179	0.214	6.9	0.0	7.2	1.77	70.2	43.1
S1.017	50.00	6.01	29.129	0.215	6.9	0.0	7.2	1.23	48.7	43.2
S1.018	50.00	6.48	29.079	0.297	6.9	0.0	9.4	1.54	108.5	56.5
S5.000	50.00	5.27	33.800	0.263	0.0	0.0	7.1	1.31	52.0	42.7
S5.001	50.00	5.66	33.587	0.359	0.0	0.0	9.7	1.79	71.3	58.3
S5.002	50.00	5.70	32.800	0.359	0.0	0.0	9.7	2.00	79.6	58.3
S5.003	50.00	5.73	32.700	0.359	0.0	0.0	9.7	2.19	87.0	58.3
S5.004	50.00	5.75	32.600	0.359	0.0	0.0	9.7	2.14	85.0	58.3
S5.005	50.00	6.13	32.500	0.448	0.0	0.0	12.1	1.63	115.4	72.8
S6.000	50.00	5.22	32.600	0.053	0.0	0.0	1.4	1.87	74.5	8.6
S5.006	50.00	6.23	32.100	0.501	0.0	0.0	13.6	2.47	174.6	81.4
S5.007	50.00	6.32	31.750	0.540	0.0	0.0	14.6	1.57	111.1	87.7
S5.008	50.00	6.33	30.400	0.540	0.0	0.0	14.6	1.57	111.1	87.7
S5.009	50.00	5.23	30.390	0.000	2.9	0.0	0.5	1.01	40.1	2.9
S5.010	50.00	5.64	30.305	0.000	2.9	0.0	0.6	1.01	40.1	3.5
S5.011	50.00	5.75	30.157	0.000	2.9	0.0	0.6	1.01	40.1	3.5

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
S5.012	6.915	0.041	167.0	0.000	0.00	0.0	0.600	o	225
S5.013	82.120	0.677	121.3	0.308	0.00	0.0	0.600	o	300
S5.014	14.350	0.250	57.4	0.000	0.00	0.0	0.600	o	300
S5.015	1.000	0.005	200.0	0.000	0.00	0.0	0.600	o	300
S5.016	11.500	0.058	198.3	0.000	0.00	0.0	0.600	o	225
S5.017	5.385	0.027	199.4	0.085	0.00	0.0	0.600	o	225
S5.018	5.755	0.034	169.3	0.000	0.00	0.0	0.600	o	225
S5.019	15.355	0.092	167.0	0.000	0.00	0.0	0.600	o	225
S7.000	49.840	0.300	166.1	0.038	5.00	0.0	0.600	o	225
S7.001	85.100	0.550	154.7	0.193	0.00	0.0	0.600	o	225
S7.002	4.580	0.050	91.6	0.000	0.00	0.0	0.600	o	225
S7.003	43.495	0.275	158.2	0.083	0.00	0.0	0.600	o	300
S7.004	6.590	0.025	263.6	0.000	0.00	0.0	0.600	o	300
S8.000	18.335	0.100	183.4	0.099	5.00	0.0	0.600	o	225
S8.001	6.155	0.100	61.6	0.000	0.00	0.0	0.600	o	225
S8.002	51.600	0.350	147.4	0.165	0.00	0.0	0.600	o	300
S8.003	9.895	0.450	22.0	0.032	0.00	0.0	0.600	o	300
S8.004	8.200	0.450	18.2	0.026	0.00	0.0	0.600	o	300

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S5.012	50.00	5.86	30.119	0.000	2.9	0.0	0.6	1.01	40.1	3.5
S5.013	50.00	6.82	30.077	0.308	2.9	0.0	8.9	1.43	100.8	53.5
S5.014	50.00	6.94	29.400	0.308	2.9	0.0	8.9	2.08	147.0	53.5
S5.015	50.00	6.95	29.150	0.308	2.9	0.0	8.9	1.11	78.3	53.5
S5.016	50.00	5.21	29.145	0.000	6.8	0.0	1.1	0.92	36.8	6.8
S5.017	50.00	5.30	29.087	0.085	6.8	0.0	3.7	0.92	36.7	22.0
S5.018	50.00	5.40	29.060	0.085	6.8	0.0	3.7	1.00	39.8	22.0
S5.019	50.00	5.65	29.026	0.085	6.8	0.0	3.7	1.01	40.1	22.0
S7.000	50.00	5.82	30.600	0.038	0.0	0.0	1.0	1.01	40.2	6.2
S7.001	50.00	7.17	30.300	0.231	0.0	0.0	6.3	1.05	41.7	37.5
S7.002	50.00	7.23	29.750	0.231	0.0	0.0	6.3	1.37	54.3	37.5
S7.003	50.00	7.81	29.700	0.314	0.0	0.0	8.5	1.25	88.2	51.0
S7.004	50.00	7.92	29.425	0.314	0.0	0.0	8.5	0.96	68.1	51.0
S8.000	50.00	5.32	34.050	0.099	0.0	0.0	2.7	0.96	38.3	16.1
S8.001	50.00	5.38	33.950	0.099	0.0	0.0	2.7	1.67	66.4	16.1
S8.002	50.00	6.04	33.850	0.264	0.0	0.0	7.1	1.29	91.4	42.9
S8.003	50.00	6.09	33.500	0.296	0.0	0.0	8.0	3.37	238.0	48.1
S8.004	50.00	6.13	33.050	0.322	0.0	0.0	8.7	3.70	261.6	52.3

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
S8.005	12.785	0.400	32.0	0.029	0.00	0.0	0.600	o	300
S8.006	4.190	0.100	41.9	0.000	0.00	0.0	0.600	o	300
S8.007	18.015	0.850	21.2	0.023	0.00	0.0	0.600	o	300
S9.000	24.345	0.400	60.9	0.036	5.00	0.0	0.600	o	225
S9.001	27.680	0.800	34.6	0.048	0.00	0.0	0.600	o	225
S9.002	11.570	0.069	167.0	0.000	0.00	0.0	0.600	o	225
S9.003	21.010	0.126	166.7	0.043	0.00	0.0	0.600	o	225
S9.004	22.260	0.111	200.0	0.047	0.00	0.0	0.600	o	225
S9.005	12.080	0.060	200.0	0.000	0.00	0.0	0.600	o	225
S9.006	6.775	0.041	167.0	0.000	0.00	0.0	0.600	o	225
S9.007	3.650	0.021	173.8	0.000	0.00	0.0	0.600	o	225
S9.008	36.185	0.217	167.0	0.037	0.00	0.0	0.600	o	225
S9.009	17.895	0.107	167.0	0.000	0.00	0.0	0.600	o	225
S8.008	5.445	0.033	167.0	0.000	0.00	0.0	0.600	o	375
S8.009	33.680	1.017	33.1	0.142	0.00	0.0	0.600	o	375
S7.005	5.415	0.032	167.0	0.000	0.00	0.0	0.600	o	450
S7.006	6.000	0.268	22.4	0.000	0.00	0.0	0.600	o	450

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S8.005	50.00	6.21	32.600	0.351	0.0	0.0	9.5	2.79	197.3	57.0
S8.006	50.00	6.24	32.200	0.351	0.0	0.0	9.5	2.44	172.2	57.0
S8.007	50.00	6.32	32.100	0.374	0.0	0.0	10.1	3.43	242.5	60.8
S9.000	50.00	5.24	32.750	0.036	0.0	0.0	1.0	1.68	66.8	5.8
S9.001	50.00	5.45	32.350	0.084	0.0	0.0	2.3	2.23	88.7	13.6
S9.002	50.00	5.64	31.550	0.084	0.0	0.0	2.3	1.01	40.1	13.6
S9.003	50.00	5.99	31.481	0.127	0.0	0.0	3.4	1.01	40.1	20.6
S9.004	50.00	6.39	31.355	0.174	0.0	0.0	4.7	0.92	36.6	28.3
S9.005	50.00	6.61	31.243	0.174	0.0	0.0	4.7	0.92	36.6	28.3
S9.006	50.00	6.72	31.183	0.174	0.0	0.0	4.7	1.01	40.1	28.3
S9.007	50.00	6.78	31.142	0.174	0.0	0.0	4.7	0.99	39.3	28.3
S9.008	50.00	7.38	31.121	0.211	0.0	0.0	5.7	1.01	40.1	34.3
S9.009	50.00	7.67	30.905	0.211	0.0	0.0	5.7	1.01	40.1	34.3
S8.008	50.00	7.74	30.798	0.585	0.0	0.0	15.8	1.40	154.5	95.1
S8.009	50.00	7.92	30.765	0.727	0.0	0.0	19.7	3.16	348.8	118.1
S7.005	50.00	7.98	29.400	1.041	0.0	0.0	28.2	1.57	249.8	169.2
S7.006	50.00	8.01	29.368	1.041	0.0	0.0	28.2	4.31	685.1	169.2

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
S7.007	1.000	0.006	166.7	0.000	0.00	0.0	0.600	o	450
S7.008	11.850	0.047	252.1	0.000	0.00	0.0	0.600	o	225
S10.000	45.015	0.300	150.1	0.119	5.00	0.0	0.600	o	225
S7.009	3.815	0.023	167.0	0.000	0.00	0.0	0.600	o	225
S5.020	30.955	0.124	250.0	0.081	0.00	0.0	0.600	o	300
S5.021	22.200	0.089	250.0	0.087	0.00	0.0	0.600	o	375
S5.022	5.400	0.022	250.0	0.000	0.00	0.0	0.600	o	375
S5.023	5.310	0.021	250.0	0.000	0.00	0.0	0.600	o	375
S1.019	1.000	0.004	250.0	0.000	0.00	0.0	0.600	o	450
S1.020	1.000	0.004	250.0	0.000	0.00	0.0	0.600	o	450
S1.021	23.220	0.077	300.0	0.000	0.00	0.0	0.600	o	450
S1.022	144.725	0.482	300.0	0.000	0.00	0.0	0.600	o	450
S1.023	80.520	0.268	300.0	0.000	0.00	0.0	0.600	o	450

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S7.007	50.00	8.02	29.100	1.041	0.0	0.0	28.2	1.57	250.0	169.2
S7.008	50.00	5.24	29.094	0.000	9.4	0.0	1.6	0.82	32.6	9.4
S10.000	50.00	5.70	29.350	0.119	0.0	0.0	3.2	1.07	42.3	19.3
S7.009	50.00	5.77	29.047	0.119	9.4	0.0	5.1	1.01	40.1	30.6
S5.020	50.00	6.29	28.934	0.285	16.2	0.0	11.0	0.99	70.0	65.8
S5.021	50.00	6.61	28.811	0.372	16.2	0.0	13.3	1.14	126.1	79.9
S5.022	50.00	6.69	28.722	0.372	16.2	0.0	13.3	1.14	126.1	79.9
S5.023	50.00	6.77	28.700	0.372	16.2	0.0	13.3	1.14	126.1	79.9
S1.019	50.00	6.78	28.666	0.669	23.1	0.0	22.7	1.28	203.8	136.4
S1.020	50.00	6.80	28.662	0.669	23.1	0.0	22.7	1.28	203.8	136.4
S1.021	50.00	5.33	28.658	0.000	28.5	0.0	4.8	1.17	185.8	28.5
S1.022	50.00	7.40	28.581	0.000	28.5	0.0	5.7	1.17	185.8	34.2
S1.023	50.00	8.54	28.098	0.000	28.5	0.0	5.7	1.17	185.8	34.2

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
SSW.123	35.050	1.500	1050	S1.000	33.550	300				
SSW.122	34.870	1.570	1050	S1.001	33.300	300	S1.000	33.300	300	
SSW.121	34.800	1.522	1050	S1.002	33.278	300	S1.001	33.278	300	
SSW.125	34.300	1.500	1050	S2.000	32.800	225				
SSW.124	34.600	2.060	1200	S2.001	32.540	225	S2.000	32.540	225	
SSW.120	34.700	2.240	1350	S1.003	32.460	375	S1.002	33.198	300	663
							S2.001	32.460	225	
SSW.119	34.600	2.277	1350	S1.004	32.323	375	S1.003	32.323	375	
SSW.118	34.500	2.209	1350	S1.005	32.291	375	S1.004	32.291	375	
SSW.117	34.350	2.225	1350	S1.006	32.125	375	S1.005	32.125	375	
SSW.116	34.300	2.193	1350	S1.007	32.107	375	S1.006	32.107	375	
SSW.115	34.250	2.187	1350	S1.008	32.063	375	S1.007	32.063	375	
SSW.114	33.600	1.719	1350	S1.009	31.881	375	S1.008	31.881	375	
SSW.113	33.500	1.657	1350	S1.010	31.843	375	S1.009	31.843	375	
SSW.112	31.500	1.575	1350	S1.011	29.925	375	S1.010	29.925	375	
SSW.127	34.250	1.500	1050	S3.000	32.750	225				
SSW.126	32.500	1.500	1050	S3.001	31.000	225	S3.000	31.000	225	
SSW.111	32.000	2.500	1350	S1.012	29.500	450	S1.011	29.841	375	266
							S3.001	30.995	225	1270
SSW.110	32.000	2.505	1350	S1.013	29.495	225	S1.012	29.495	450	
SSW.109	31.400	1.500	1050	S4.000	29.900	225				
SSW.108	30.900	1.439	1050	S1.014	29.461	225	S1.013	29.461	225	
							S4.000	29.500	225	39
SSW.107	30.650	1.421	1050	S1.015	29.229	225	S1.014	29.229	225	
SSW.106	30.600	1.421	1050	S1.016	29.179	225	S1.015	29.179	225	
SSW.105	30.550	1.421	1050	S1.017	29.129	225	S1.016	29.129	225	
SSW.104	30.500	1.421	1050	S1.018	29.079	300	S1.017	29.079	225	
SSW.227	35.300	1.500	1050	S5.000	33.800	225				
SSW.226	35.500	1.914	1200	S5.001	33.587	225	S5.000	33.587	225	
SSW.225	34.300	1.501	1050	S5.002	32.800	225	S5.001	32.800	225	
SSW.224	34.200	1.501	1050	S5.003	32.700	225	S5.002	32.700	225	
SSW.223	34.100	1.501	1050	S5.004	32.600	225	S5.003	32.600	225	
SSW.222	34.000	1.501	1050	S5.005	32.500	300	S5.004	32.500	225	
SSW.221	34.100	1.500	1050	S6.000	32.600	225				
SSW.220	33.600	1.501	1050	S5.006	32.100	300	S5.005	32.100	300	
							S6.000	32.100	225	
SSW.219	33.250	1.501	1050	S5.007	31.750	300	S5.006	31.750	300	
SSW.218	33.250	2.850	1200	S5.008	30.400	300	S5.007	31.669	300	1269
SSW.217	33.250	2.860	1200	S5.009	30.390	225	S5.008	30.390	300	
SSW.216	33.000	2.695	1200	S5.010	30.305	225	S5.009	30.305	225	
SSW.214	32.800	2.643	1200	S5.011	30.157	225	S5.010	30.157	225	
SSW.213	32.700	2.581	1200	S5.012	30.119	225	S5.011	30.119	225	
SSW.212	32.600	2.523	1200	S5.013	30.077	300	S5.012	30.077	225	
SSW.210	30.900	1.500	1050	S5.014	29.400	300	S5.013	29.400	300	
SSW.209	30.900	1.750	1050	S5.015	29.150	300	S5.014	29.150	300	
SSW.208	30.900	1.755	1200	S5.016	29.145	225	S5.015	29.145	300	

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SSW.207	30.800	1.713	1050	S5.017	29.087	225	S5.016	29.087	225	
SSW.206	30.750	1.690	1050	S5.018	29.060	225	S5.017	29.060	225	
SSW.205	30.700	1.674	1050	S5.019	29.026	225	S5.018	29.026	225	
SSW.332	32.100	1.500	1050	S7.000	30.600	225				
SSW.331	31.800	1.500	1050	S7.001	30.300	225	S7.000	30.300	225	
SSW.330	31.250	1.500	1050	S7.002	29.750	225	S7.001	29.750	225	
SSW.329	31.200	1.500	1050	S7.003	29.700	300	S7.002	29.700	225	
SSW.328	30.925	1.500	1050	S7.004	29.425	300	S7.003	29.425	300	
SSW.316	35.550	1.500	1050	S8.000	34.050	225				
SSW.315	35.450	1.500	1050	S8.001	33.950	225	S8.000	33.950	225	
SSW.314	35.350	1.500	1050	S8.002	33.850	300	S8.001	33.850	225	
SSW.313	35.000	1.500	1050	S8.003	33.500	300	S8.002	33.500	300	
SSW.312	34.550	1.500	1050	S8.004	33.050	300	S8.003	33.050	300	
SSW.311	34.100	1.500	1050	S8.005	32.600	300	S8.004	32.600	300	
SSW.310	33.650	1.450	1050	S8.006	32.200	300	S8.005	32.200	300	
SSW.309	33.550	1.450	1050	S8.007	32.100	300	S8.006	32.100	300	
SSW.327	34.250	1.500	1050	S9.000	32.750	225				
SSW.326	33.850	1.500	1050	S9.001	32.350	225	S9.000	32.350	225	
SSW.325	33.050	1.500	1050	S9.002	31.550	225	S9.001	31.550	225	
SSW.324	33.050	1.569	1050	S9.003	31.481	225	S9.002	31.481	225	
SSW.323	33.050	1.695	1050	S9.004	31.355	225	S9.003	31.355	225	
SSW.322	32.650	1.407	1050	S9.005	31.243	225	S9.004	31.243	225	
SSW.321	32.650	1.467	1050	S9.006	31.183	225	S9.005	31.183	225	
SSW.320	32.650	1.508	1050	S9.007	31.142	225	S9.006	31.142	225	
SSW.319	32.650	1.529	1050	S9.008	31.121	225	S9.007	31.121	225	
SSW.318	32.700	1.795	1200	S9.009	30.905	225	S9.008	30.905	225	
SSW.308	32.700	1.902	1350	S8.008	30.798	375	S8.007	31.250	300	377
							S9.009	30.798	225	
SSW.307	32.350	1.585	1350	S8.009	30.765	375	S8.008	30.765	375	
SSW.305	30.900	1.500	1350	S7.005	29.400	450	S7.004	29.400	300	
							S8.009	29.748	375	273
SSW.304	30.850	1.482	1350	S7.006	29.368	450	S7.005	29.368	450	
SSW.303	30.850	1.750	1350	S7.007	29.100	450	S7.006	29.100	450	
SSW.302	30.650	1.556	1350	S7.008	29.094	225	S7.007	29.094	450	
SSW.317	30.850	1.500	1050	S10.000	29.350	225				
SSW.301	30.550	1.503	1050	S7.009	29.047	225	S7.008	29.047	225	
							S10.000	29.050	225	3
SSW.204	30.500	1.566	1050	S5.020	28.934	300	S5.019	28.934	225	
							S7.009	29.024	225	15
SSW.203	30.300	1.489	1350	S5.021	28.811	375	S5.020	28.811	300	
SSW.202	30.150	1.428	1350	S5.022	28.722	375	S5.021	28.722	375	
SSW.201	30.100	1.400	1350	S5.023	28.700	375	S5.022	28.700	375	
SSW.103	30.050	1.384	1350	S1.019	28.666	450	S1.018	28.666	300	
							S5.023	28.679	375	
SSW.102	30.050	1.388	1350	S1.020	28.662	450	S1.019	28.662	450	
SSW.101	30.050	1.392	1350	S1.021	28.658	450	S1.020	28.658	450	

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SSW.003	30.290	1.709	1350	S1.022	28.581	450	S1.021	28.581	450	
SSW.002	30.230	2.132	1350	S1.023	28.098	450	S1.022	28.098	450	
SEx SW.001	30.100	2.270	0		OUTFALL		S1.023	27.830	450	

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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 DIAM., L*W (mm)
S1.000	o	300	SSW.123	35.050	33.550	1.200	1050
S1.001	o	300	SSW.122	34.870	33.300	1.270	1050
S1.002	o	300	SSW.121	34.800	33.278	1.222	1050
S2.000	o	225	SSW.125	34.300	32.800	1.275	1050
S2.001	o	225	SSW.124	34.600	32.540	1.835	1200
S1.003	o	375	SSW.120	34.700	32.460	1.865	1350
S1.004	o	375	SSW.119	34.600	32.323	1.902	1350
S1.005	o	375	SSW.118	34.500	32.291	1.834	1350
S1.006	o	375	SSW.117	34.350	32.125	1.850	1350
S1.007	o	375	SSW.116	34.300	32.107	1.818	1350
S1.008	o	375	SSW.115	34.250	32.063	1.812	1350
S1.009	o	375	SSW.114	33.600	31.881	1.344	1350
S1.010	o	375	SSW.113	33.500	31.843	1.282	1350
S1.011	o	375	SSW.112	31.500	29.925	1.200	1350
S3.000	o	225	SSW.127	34.250	32.750	1.275	1050
S3.001	o	225	SSW.126	32.500	31.000	1.275	1050

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S1.000	36.580	146.3	SSW.122	34.870	33.300	1.270	1050
S1.001	3.340	151.8	SSW.121	34.800	33.278	1.222	1050
S1.002	11.935	149.2	SSW.120	34.700	33.198	1.202	1350
S2.000	43.415	167.0	SSW.124	34.600	32.540	1.835	1200
S2.001	13.395	167.4	SSW.120	34.700	32.460	2.015	1350
S1.003	22.895	167.1	SSW.119	34.600	32.323	1.902	1350
S1.004	5.280	165.0	SSW.118	34.500	32.291	1.834	1350
S1.005	27.705	166.9	SSW.117	34.350	32.125	1.850	1350
S1.006	3.010	167.2	SSW.116	34.300	32.107	1.818	1350
S1.007	7.320	166.4	SSW.115	34.250	32.063	1.812	1350
S1.008	14.580	80.1	SSW.114	33.600	31.881	1.344	1350
S1.009	3.010	79.2	SSW.113	33.500	31.843	1.282	1350
S1.010	63.315	33.0	SSW.112	31.500	29.925	1.200	1350
S1.011	6.730	80.1	SSW.111	32.000	29.841	1.784	1350
S3.000	48.090	27.5	SSW.126	32.500	31.000	1.275	1050
S3.001	1.000	200.0	SSW.111	32.000	30.995	0.780	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 DIAM., L*W (mm)
S1.012	o	450	SSW.111	32.000	29.500	2.050	1350
S1.013	o	225	SSW.110	32.000	29.495	2.280	1350
S4.000	o	225	SSW.109	31.400	29.900	1.275	1050
S1.014	o	225	SSW.108	30.900	29.461	1.214	1050
S1.015	o	225	SSW.107	30.650	29.229	1.196	1050
S1.016	o	225	SSW.106	30.600	29.179	1.196	1050
S1.017	o	225	SSW.105	30.550	29.129	1.196	1050
S1.018	o	300	SSW.104	30.500	29.079	1.121	1050
S5.000	o	225	SSW.227	35.300	33.800	1.275	1050
S5.001	o	225	SSW.226	35.500	33.587	1.689	1200
S5.002	o	225	SSW.225	34.300	32.800	1.276	1050
S5.003	o	225	SSW.224	34.200	32.700	1.276	1050
S5.004	o	225	SSW.223	34.100	32.600	1.276	1050
S5.005	o	300	SSW.222	34.000	32.500	1.201	1050

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S1.012	1.000	200.0	SSW.110	32.000	29.495	2.055	1350
S1.013	8.445	248.4	SSW.108	30.900	29.461	1.214	1050
S4.000	32.075	80.2	SSW.108	30.900	29.500	1.175	1050
S1.014	31.710	136.7	SSW.107	30.650	29.229	1.196	1050
S1.015	5.100	102.0	SSW.106	30.600	29.179	1.196	1050
S1.016	2.755	55.1	SSW.105	30.550	29.129	1.196	1050
S1.017	5.680	113.6	SSW.104	30.500	29.079	1.196	1050
S1.018	43.305	104.9	SSW.103	30.050	28.666	1.084	1350
S5.000	21.350	100.0	SSW.226	35.500	33.587	1.689	1200
S5.001	42.000	53.4	SSW.225	34.300	32.800	1.276	1050
S5.002	4.295	43.0	SSW.224	34.200	32.700	1.276	1050
S5.003	3.600	36.0	SSW.223	34.100	32.600	1.276	1050
S5.004	3.770	37.7	SSW.222	34.000	32.500	1.276	1050
S5.005	37.100	92.8	SSW.220	33.600	32.100	1.201	1050

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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 DIAM., L*W (mm)
S6.000	o	225	SSW.221	34.100	32.600	1.275	1050
S5.006	o	300	SSW.220	33.600	32.100	1.201	1050
S5.007	o	300	SSW.219	33.250	31.750	1.201	1050
S5.008	o	300	SSW.218	33.250	30.400	2.550	1200
S5.009	o	225	SSW.217	33.250	30.390	2.635	1200
S5.010	o	225	SSW.216	33.000	30.305	2.470	1200
S5.011	o	225	SSW.214	32.800	30.157	2.418	1200
S5.012	o	225	SSW.213	32.700	30.119	2.356	1200
S5.013	o	300	SSW.212	32.600	30.077	2.223	1200
S5.014	o	300	SSW.210	30.900	29.400	1.200	1050
S5.015	o	300	SSW.209	30.900	29.150	1.450	1050
S5.016	o	225	SSW.208	30.900	29.145	1.530	1200
S5.017	o	225	SSW.207	30.800	29.087	1.488	1050
S5.018	o	225	SSW.206	30.750	29.060	1.465	1050
S5.019	o	225	SSW.205	30.700	29.026	1.449	1050
S7.000	o	225	SSW.332	32.100	30.600	1.275	1050
S7.001	o	225	SSW.331	31.800	30.300	1.275	1050

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S6.000	24.470	48.9	SSW.220	33.600	32.100	1.275	1050
S5.006	14.265	40.8	SSW.219	33.250	31.750	1.201	1050
S5.007	8.075	100.0	SSW.218	33.250	31.669	1.281	1200
S5.008	1.000	100.0	SSW.217	33.250	30.390	2.560	1200
S5.009	14.175	166.8	SSW.216	33.000	30.305	2.470	1200
S5.010	24.670	167.0	SSW.214	32.800	30.157	2.418	1200
S5.011	6.445	167.0	SSW.213	32.700	30.119	2.356	1200
S5.012	6.915	167.0	SSW.212	32.600	30.077	2.298	1200
S5.013	82.120	121.3	SSW.210	30.900	29.400	1.200	1050
S5.014	14.350	57.4	SSW.209	30.900	29.150	1.450	1050
S5.015	1.000	200.0	SSW.208	30.900	29.145	1.455	1200
S5.016	11.500	198.3	SSW.207	30.800	29.087	1.488	1050
S5.017	5.385	199.4	SSW.206	30.750	29.060	1.465	1050
S5.018	5.755	169.3	SSW.205	30.700	29.026	1.449	1050
S5.019	15.355	167.0	SSW.204	30.500	28.934	1.341	1050
S7.000	49.840	166.1	SSW.331	31.800	30.300	1.275	1050
S7.001	85.100	154.7	SSW.330	31.250	29.750	1.275	1050

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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 DIAM., L*W (mm)
S7.002	o	225	SSW.330	31.250	29.750	1.275	1050
S7.003	o	300	SSW.329	31.200	29.700	1.200	1050
S7.004	o	300	SSW.328	30.925	29.425	1.200	1050
S8.000	o	225	SSW.316	35.550	34.050	1.275	1050
S8.001	o	225	SSW.315	35.450	33.950	1.275	1050
S8.002	o	300	SSW.314	35.350	33.850	1.200	1050
S8.003	o	300	SSW.313	35.000	33.500	1.200	1050
S8.004	o	300	SSW.312	34.550	33.050	1.200	1050
S8.005	o	300	SSW.311	34.100	32.600	1.200	1050
S8.006	o	300	SSW.310	33.650	32.200	1.150	1050
S8.007	o	300	SSW.309	33.550	32.100	1.150	1050
S9.000	o	225	SSW.327	34.250	32.750	1.275	1050
S9.001	o	225	SSW.326	33.850	32.350	1.275	1050
S9.002	o	225	SSW.325	33.050	31.550	1.275	1050
S9.003	o	225	SSW.324	33.050	31.481	1.344	1050
S9.004	o	225	SSW.323	33.050	31.355	1.470	1050
S9.005	o	225	SSW.322	32.650	31.243	1.182	1050

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S7.002	4.580	91.6	SSW.329	31.200	29.700	1.275	1050
S7.003	43.495	158.2	SSW.328	30.925	29.425	1.200	1050
S7.004	6.590	263.6	SSW.305	30.900	29.400	1.200	1350
S8.000	18.335	183.4	SSW.315	35.450	33.950	1.275	1050
S8.001	6.155	61.6	SSW.314	35.350	33.850	1.275	1050
S8.002	51.600	147.4	SSW.313	35.000	33.500	1.200	1050
S8.003	9.895	22.0	SSW.312	34.550	33.050	1.200	1050
S8.004	8.200	18.2	SSW.311	34.100	32.600	1.200	1050
S8.005	12.785	32.0	SSW.310	33.650	32.200	1.150	1050
S8.006	4.190	41.9	SSW.309	33.550	32.100	1.150	1050
S8.007	18.015	21.2	SSW.308	32.700	31.250	1.150	1350
S9.000	24.345	60.9	SSW.326	33.850	32.350	1.275	1050
S9.001	27.680	34.6	SSW.325	33.050	31.550	1.275	1050
S9.002	11.570	167.0	SSW.324	33.050	31.481	1.344	1050
S9.003	21.010	166.7	SSW.323	33.050	31.355	1.470	1050
S9.004	22.260	200.0	SSW.322	32.650	31.243	1.182	1050
S9.005	12.080	200.0	SSW.321	32.650	31.183	1.242	1050

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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 DIAM., L*W (mm)
S9.006	o	225	SSW.321	32.650	31.183	1.242	1050
S9.007	o	225	SSW.320	32.650	31.142	1.283	1050
S9.008	o	225	SSW.319	32.650	31.121	1.304	1050
S9.009	o	225	SSW.318	32.700	30.905	1.570	1200
S8.008	o	375	SSW.308	32.700	30.798	1.527	1350
S8.009	o	375	SSW.307	32.350	30.765	1.210	1350
S7.005	o	450	SSW.305	30.900	29.400	1.050	1350
S7.006	o	450	SSW.304	30.850	29.368	1.032	1350
S7.007	o	450	SSW.303	30.850	29.100	1.300	1350
S7.008	o	225	SSW.302	30.650	29.094	1.331	1350
S10.000	o	225	SSW.317	30.850	29.350	1.275	1050
S7.009	o	225	SSW.301	30.550	29.047	1.278	1050
S5.020	o	300	SSW.204	30.500	28.934	1.266	1050
S5.021	o	375	SSW.203	30.300	28.811	1.114	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S9.006	6.775	167.0	SSW.320	32.650	31.142	1.283	1050
S9.007	3.650	173.8	SSW.319	32.650	31.121	1.304	1050
S9.008	36.185	167.0	SSW.318	32.700	30.905	1.570	1200
S9.009	17.895	167.0	SSW.308	32.700	30.798	1.677	1350
S8.008	5.445	167.0	SSW.307	32.350	30.765	1.210	1350
S8.009	33.680	33.1	SSW.305	30.900	29.748	0.777	1350
S7.005	5.415	167.0	SSW.304	30.850	29.368	1.032	1350
S7.006	6.000	22.4	SSW.303	30.850	29.100	1.300	1350
S7.007	1.000	166.7	SSW.302	30.650	29.094	1.106	1350
S7.008	11.850	252.1	SSW.301	30.550	29.047	1.278	1050
S10.000	45.015	150.1	SSW.301	30.550	29.050	1.275	1050
S7.009	3.815	167.0	SSW.204	30.500	29.024	1.251	1050
S5.020	30.955	250.0	SSW.203	30.300	28.811	1.189	1350
S5.021	22.200	250.0	SSW.202	30.150	28.722	1.053	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 DIAM., L*W (mm)
S5.022	o	375	SSW.202	30.150	28.722	1.053	1350
S5.023	o	375	SSW.201	30.100	28.700	1.025	1350
S1.019	o	450	SSW.103	30.050	28.666	0.934	1350
S1.020	o	450	SSW.102	30.050	28.662	0.938	1350
S1.021	o	450	SSW.101	30.050	28.658	0.942	1350
S1.022	o	450	SSW.003	30.290	28.581	1.259	1350
S1.023	o	450	SSW.002	30.230	28.098	1.682	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S5.022	5.400	250.0	SSW.201	30.100	28.700	1.025	1350
S5.023	5.310	250.0	SSW.103	30.050	28.679	0.996	1350
S1.019	1.000	250.0	SSW.102	30.050	28.662	0.938	1350
S1.020	1.000	250.0	SSW.101	30.050	28.658	0.942	1350
S1.021	23.220	300.0	SSW.003	30.290	28.581	1.259	1350
S1.022	144.725	300.0	SSW.002	30.230	28.098	1.682	1350
S1.023	80.520	300.0	SEx SW.001	30.100	27.830	1.820	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.023	SEx SW.001	30.100	27.830	27.830	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Foul Sewage per hectare (l/s)	0.000
PIMP (% impervious)	100	Additional Flow - % of Total Flow	20.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Run Time (mins)	60
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	5
Number of Online Controls	5	Number of Time/Area Diagrams	0
Number of Offline Controls	0		

Synthetic Rainfall Details

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Simulation Criteria for Storm

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	21.500	Storm Duration (mins)	30
Ratio R	0.244		

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Online Controls for Storm

Hydro-Brake® Manhole: SSW.110, DS/PN: S1.013, Volume (m³): 3.5

Design Head (m) 2.000 Hydro-Brake® Type Md4 Invert Level (m) 29.495
Design Flow (l/s) 6.9 Diameter (mm) 80

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.4	1.200	5.5	3.000	8.6	7.000	13.2
0.200	3.5	1.400	5.9	3.500	9.3	7.500	13.7
0.300	3.0	1.600	6.3	4.000	10.0	8.000	14.1
0.400	3.2	1.800	6.7	4.500	10.6	8.500	14.5
0.500	3.5	2.000	7.1	5.000	11.2	9.000	15.0
0.600	3.9	2.200	7.4	5.500	11.7	9.500	15.4
0.800	4.5	2.400	7.7	6.000	12.2		
1.000	5.0	2.600	8.0	6.500	12.7		

Hydro-Brake® Manhole: SSW.217, DS/PN: S5.009, Volume (m³): 3.2

Design Head (m) 2.250 Hydro-Brake® Type Md4 Invert Level (m) 30.390
Design Flow (l/s) 2.9 Diameter (mm) 50

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.1	1.200	2.1	3.000	3.4	7.000	5.2
0.200	0.9	1.400	2.3	3.500	3.6	7.500	5.3
0.300	1.1	1.600	2.5	4.000	3.9	8.000	5.5
0.400	1.2	1.800	2.6	4.500	4.1	8.500	5.7
0.500	1.4	2.000	2.8	5.000	4.4	9.000	5.8
0.600	1.5	2.200	2.9	5.500	4.6	9.500	6.0
0.800	1.7	2.400	3.0	6.000	4.8		
1.000	1.9	2.600	3.1	6.500	5.0		

Hydro-Brake® Manhole: SSW.208, DS/PN: S5.016, Volume (m³): 2.0

Design Head (m) 1.500 Hydro-Brake® Type Md4 Invert Level (m) 29.145
Design Flow (l/s) 6.8 Diameter (mm) 85

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.6	1.200	6.2	3.000	9.8	7.000	14.9
0.200	4.1	1.400	6.7	3.500	10.5	7.500	15.4
0.300	3.5	1.600	7.1	4.000	11.3	8.000	15.9
0.400	3.6	1.800	7.6	4.500	11.9	8.500	16.4
0.500	4.0	2.000	8.0	5.000	12.6	9.000	16.9
0.600	4.4	2.200	8.4	5.500	13.2	9.500	17.4
0.800	5.0	2.400	8.7	6.000	13.8		
1.000	5.6	2.600	9.1	6.500	14.4		

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Hydro-Brake® Manhole: SSW.302, DS/PN: S7.008, Volume (m³): 2.2

Design Head (m) 2.000 Hydro-Brake® Type Md4 Invert Level (m) 29.094
Design Flow (l/s) 9.4 Diameter (mm) 92

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	1.200	7.2	3.000	11.4	7.000	17.5
0.200	5.1	1.400	7.8	3.500	12.3	7.500	18.1
0.300	4.3	1.600	8.3	4.000	13.2	8.000	18.7
0.400	4.3	1.800	8.8	4.500	14.0	8.500	19.2
0.500	4.7	2.000	9.3	5.000	14.7	9.000	19.8
0.600	5.1	2.200	9.8	5.500	15.5	9.500	20.3
0.800	5.9	2.400	10.2	6.000	16.2		
1.000	6.6	2.600	10.6	6.500	16.8		

Hydro-Brake® Manhole: SSW.101, DS/PN: S1.021, Volume (m³): 1.9

Design Head (m) 1.000 Hydro-Brake® Type Md4 Invert Level (m) 28.658
Design Flow (l/s) 28.5 Diameter (mm) 190

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.3	1.200	30.9	3.000	48.7	7.000	74.4
0.200	16.2	1.400	33.3	3.500	52.6	7.500	77.0
0.300	27.7	1.600	35.6	4.000	56.3	8.000	79.6
0.400	31.4	1.800	37.7	4.500	59.7	8.500	82.0
0.500	29.4	2.000	39.8	5.000	62.9	9.000	84.4
0.600	26.8	2.200	41.7	5.500	66.0	9.500	86.7
0.800	26.2	2.400	43.6	6.000	68.9		
1.000	28.3	2.600	45.4	6.500	71.7		

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Storage Structures for Storm

Tank or Pond Manhole: SSW.110, DS/PN: S1.013

Invert Level (m) 29.495

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	321.3	2.000	321.3

Tank or Pond Manhole: SSW.217, DS/PN: S5.009

Invert Level (m) 30.390

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	166.6	2.250	166.6

Tank or Pond Manhole: SSW.208, DS/PN: S5.016

Invert Level (m) 29.145

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	220.0	1.000	220.0

Tank or Pond Manhole: SSW.302, DS/PN: S7.008

Invert Level (m) 29.094

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	650.0	1.000	650.0

Tank or Pond Manhole: SSW.101, DS/PN: S1.021

Invert Level (m) 28.658

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	235.0	1.000	235.0

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

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 100
Climate Change (%) 0

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
S1.000	15 Winter	100	0%	100/15 Summer	100/15 Summer			4
S1.001	15 Winter	100	0%	100/15 Summer				
S1.002	15 Winter	100	0%	100/15 Summer				
S2.000	15 Winter	100	0%	100/15 Summer	100/15 Summer			4
S2.001	15 Winter	100	0%	100/15 Summer				
S1.003	15 Winter	100	0%	100/15 Summer				
S1.004	15 Winter	100	0%	100/15 Summer				
S1.005	15 Winter	100	0%	100/15 Summer				
S1.006	15 Winter	100	0%	100/15 Summer				
S1.007	15 Winter	100	0%	100/15 Summer				
S1.008	15 Winter	100	0%	100/15 Summer				
S1.009	15 Winter	100	0%	100/15 Summer				
S1.010	15 Winter	100	0%					
S1.011	1440 Winter	100	0%	100/15 Summer	100/360 Winter			6
S3.000	15 Winter	100	0%					
S3.001	1440 Winter	100	0%	100/15 Summer				
S1.012	1440 Winter	100	0%	100/15 Summer				
S1.013	1440 Winter	100	0%	100/15 Summer				
S4.000	15 Winter	100	0%	100/15 Summer				
S1.014	15 Winter	100	0%	100/15 Summer	100/15 Winter			1
S1.015	15 Winter	100	0%	100/15 Summer				
S1.016	15 Winter	100	0%	100/15 Summer				
S1.017	15 Winter	100	0%	100/15 Summer				
S1.018	360 Winter	100	0%	100/15 Summer				
S5.000	15 Winter	100	0%	100/15 Summer	100/15 Summer			6
S5.001	15 Winter	100	0%	100/15 Summer				
S5.002	15 Winter	100	0%	100/15 Summer				
S5.003	15 Winter	100	0%	100/15 Summer				
S5.004	15 Winter	100	0%	100/15 Summer				
S5.005	15 Winter	100	0%	100/15 Summer				
S6.000	1440 Winter	100	0%	100/960 Winter				
S5.006	1440 Winter	100	0%	100/15 Summer				
S5.007	1440 Winter	100	0%	100/15 Summer				
S5.008	1440 Winter	100	0%	100/15 Summer				
S5.009	1440 Winter	100	0%	100/15 Summer				
S5.010	15 Winter	100	0%	100/15 Summer				
S5.011	15 Winter	100	0%	100/15 Summer				
S5.012	15 Winter	100	0%	100/15 Summer				

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
S5.013	15 Winter	100	0%	100/15 Summer				
S5.014	960 Winter	100	0%	100/15 Summer				
S5.015	960 Winter	100	0%	100/15 Summer				
S5.016	960 Winter	100	0%	100/15 Summer				
S5.017	15 Winter	100	0%	100/15 Summer				
S5.018	15 Winter	100	0%	100/15 Summer				
S5.019	15 Winter	100	0%	100/15 Summer				
S7.000	15 Winter	100	0%	100/15 Summer				
S7.001	15 Winter	100	0%	100/15 Summer	100/15 Summer			5
S7.002	15 Winter	100	0%	100/15 Summer				
S7.003	15 Winter	100	0%	100/15 Summer				
S7.004	15 Winter	100	0%	100/15 Summer				
S8.000	15 Winter	100	0%	100/15 Summer				
S8.001	15 Winter	100	0%	100/15 Summer				
S8.002	15 Winter	100	0%	100/15 Summer				
S8.003	15 Winter	100	0%					
S8.004	15 Winter	100	0%	100/15 Summer				
S8.005	15 Winter	100	0%	100/15 Summer				
S8.006	15 Winter	100	0%	100/15 Summer				
S8.007	15 Winter	100	0%					
S9.000	15 Winter	100	0%	100/15 Winter				
S9.001	15 Winter	100	0%	100/15 Summer				
S9.002	15 Winter	100	0%	100/15 Summer				
S9.003	15 Winter	100	0%	100/15 Summer				
S9.004	15 Winter	100	0%	100/15 Summer				
S9.005	15 Winter	100	0%	100/15 Summer				
S9.006	15 Winter	100	0%	100/15 Summer				
S9.007	15 Winter	100	0%	100/15 Summer				
S9.008	15 Winter	100	0%	100/15 Summer				
S9.009	15 Winter	100	0%	100/15 Summer				
S8.008	15 Winter	100	0%	100/15 Summer				
S8.009	15 Winter	100	0%	100/15 Winter				
S7.005	15 Winter	100	0%	100/15 Summer				
S7.006	1440 Winter	100	0%	100/15 Summer				
S7.007	1440 Winter	100	0%	100/15 Summer				
S7.008	1440 Winter	100	0%	100/15 Summer				
S10.000	15 Winter	100	0%	100/15 Summer				
S7.009	15 Winter	100	0%	100/15 Summer				
S5.020	15 Winter	100	0%	100/15 Summer				
S5.021	360 Winter	100	0%	100/15 Summer				
S5.022	360 Winter	100	0%	100/15 Summer				
S5.023	360 Winter	100	0%	100/15 Summer				
S1.019	360 Winter	100	0%	100/15 Summer				
S1.020	360 Winter	100	0%	100/15 Summer				
S1.021	360 Winter	100	0%	100/15 Winter				
S1.022	960 Summer	100	0%					
S1.023	360 Summer	100	0%					

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

PN	US/MH Name	Water Level (m)	Surch'ed Depth (m)	Flooded Volume (m^3)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
S1.000	SSW.123	35.054	1.204	0.000	1.51	0.0		RISK
S1.001	SSW.122	34.655	1.055	0.000	2.31	0.0	121.5	FLOOD RISK
S1.002	SSW.121	34.455	0.877	0.000	1.78	0.0	126.3	SURCHARGED
S2.000	SSW.125	34.306	1.281	0.000	1.28	0.		RISK
S2.001	SSW.124	34.276	1.511	0.000	1.56	0.0	54.3	SURCHARGED
S1.003	SSW.120	34.219	1.384	0.000	1.34	0.0	177.1	SURCHARGED
S1.004	SSW.119	33.976	1.278	0.000	1.80	0.0	173.2	SURCHARGED
S1.005	SSW.118	33.796	1.130	0.000	1.58	0.0	213.7	SURCHARGED
S1.006	SSW.117	33.402	0.902	0.000	2.55	0.0	212.0	SURCHARGED
S1.007	SSW.116	33.111	0.629	0.000	1.99	0.0	210.1	SURCHARGED
S1.008	SSW.115	32.818	0.380	0.000	1.29	0.0	215.6	SURCHARGED
S1.009	SSW.114	32.508	0.252	0.000	2.02	0.0	216.3	SURCHARGED
S1.010	SSW.113	32.183	-0.035	0.000	0.86	0.0	282.0	OK
S1.011	SSW.112	31.598	1.298	0.000	0.28	0.		RISK
S3.000	SSW.127	32.842	-0.133	0.000	0.34	0.0	32.8	OK
S3.001	SSW.126	31.597	0.372	0.000	0.08	0.0	2.3	SURCHARGED
S1.012	SSW.111	31.597	1.647	0.000	0.26	0.0	34.0	SURCHARGED
S1.013	SSW.110	31.596	1.876	0.000	0.27	0.0	7.2	SURCHARGED
S4.000	SSW.109	31.345	1.220	0.000	1.02	0.0	55.6	FLOOD RISK
S1.014	SSW.108	30.901	1.215	0.000	1.62	0.		RISK
S1.015	SSW.107	30.352	0.898	0.000	2.11	0.0	66.6	FLOOD RISK
S1.016	SSW.106	30.143	0.739	0.000	2.13	0.0	67.0	SURCHARGED
S1.017	SSW.105	29.932	0.578	0.000	2.16	0.0	68.1	SURCHARGED
S1.018	SSW.104	29.794	0.415	0.000	0.29	0.0	29.8	SURCHARGED
S5.000	SSW.227	35.317	1.292	0.000	1.64	0.		RISK
S5.001	SSW.226	35.209	1.397	0.000	1.32	0.0	89.5	FLOOD RISK
S5.002	SSW.225	34.078	1.053	0.000	1.86	0.0	82.7	FLOOD RISK
S5.003	SSW.224	33.754	0.830	0.000	1.84	0.0	82.0	SURCHARGED
S5.004	SSW.223	33.431	0.607	0.000	1.87	0.0	83.3	SURCHARGED
S5.005	SSW.222	33.109	0.310	0.000	1.07	0.0	114.4	SURCHARGED
S6.000	SSW.221	33.075	0.250	0.000	0.03	0.0	1.8	SURCHARGED
S5.006	SSW.220	33.074	0.675	0.000	0.12	0.0	17.3	SURCHARGED
S5.007	SSW.219	33.072	1.022	0.000	0.26	0.0	18.4	FLOOD RISK
S5.008	SSW.218	33.070	2.370	0.000	0.31	0.0	18.1	FLOOD RISK
S5.009	SSW.217	33.069	2.454	0.000	0.09	0.0	3.2	FLOOD RISK
S5.010	SSW.216	31.067	0.537	0.000	0.26	0.0	9.7	SURCHARGED
S5.011	SSW.214	31.078	0.696	0.000	0.63	0.0	18.7	SURCHARGED
S5.012	SSW.213	31.087	0.743	0.000	0.80	0.0	23.9	SURCHARGED
S5.013	SSW.212	31.100	0.722	0.000	1.30	0.0	126.1	SURCHARGED
S5.014	SSW.210	30.240	0.540	0.000	0.13	0.0	15.9	SURCHARGED
S5.015	SSW.209	30.236	0.786	0.000	0.28	0.0	15.9	SURCHARGED
S5.016	SSW.208	30.235	0.865	0.000	0.18	0.0	5.6	SURCHARGED
S5.017	SSW.207	30.057	0.745	0.000	1.18	0.0	32.1	SURCHARGED
S5.018	SSW.206	30.026	0.740	0.000	0.95	0.0	28.5	SURCHARGED
S5.019	SSW.205	29.997	0.746	0.000	0.73	0.0	26.0	SURCHARGED
S7.000	SSW.332	31.876	1.051	0.000	0.42	0.0	16.3	FLOOD RISK
S7.001	SSW.331	31.809	1.284	0.000	1.51	0.		RISK
S7.002	SSW.330	31.036	1.061	0.000	2.10	0.0	66.3	FLOOD RISK

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

PN	US/MH Name	Water Level (m)	Surch'ed Depth (m)	Flooded Volume (m^3)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
S7.003	SSW.329	30.903	0.903	0.000	0.99	0.0	81.2	FLOOD RISK
S7.004	SSW.328	30.657	0.932	0.000	1.66	0.0	80.6	FLOOD RISK
S8.000	SSW.316	34.765	0.490	0.000	1.35	0.0	46.4	SURCHARGED
S8.001	SSW.315	34.590	0.415	0.000	1.09	0.0	48.5	SURCHARGED
S8.002	SSW.314	34.500	0.350	0.000	1.38	0.0	119.1	SURCHARGED
S8.003	SSW.313	33.714	-0.086	0.000	0.78	0.0	131.9	OK
S8.004	SSW.312	33.447	0.097	0.000	0.84	0.0	141.0	SURCHARGED
S8.005	SSW.311	33.131	0.231	0.000	0.96	0.0	151.6	SURCHARGED
S8.006	SSW.310	32.755	0.255	0.000	1.92	0.0	151.8	SURCHARGED
S8.007	SSW.309	32.299	-0.101	0.000	0.77	0.0	159.7	OK
S9.000	SSW.327	33.146	0.171	0.000	0.29	0.0	17.7	SURCHARGED
S9.001	SSW.326	33.119	0.544	0.000	0.46	0.0	38.2	SURCHARGED
S9.002	SSW.325	33.042	1.267	0.000	0.74	0.0	25.2	FLOOD RISK
S9.003	SSW.324	33.005	1.299	0.000	1.01	0.0	36.8	FLOOD RISK
S9.004	SSW.323	32.877	1.298	0.000	1.55	0.0	52.0	FLOOD RISK
S9.005	SSW.322	32.628	1.160	0.000	1.58	0.0	49.5	FLOOD RISK
S9.006	SSW.321	32.487	1.079	0.000	1.64	0.0	48.9	FLOOD RISK
S9.007	SSW.320	32.369	1.002	0.000	1.90	0.0	50.2	FLOOD RISK
S9.008	SSW.319	32.256	0.910	0.000	1.52	0.0	57.7	SURCHARGED
S9.009	SSW.318	31.772	0.642	0.000	1.65	0.0	59.4	SURCHARGED
S8.008	SSW.308	31.526	0.354	0.000	2.21	0.0	213.7	SURCHARGED
S8.009	SSW.307	31.236	0.096	0.000	0.81	0.0	253.0	SURCHARGED
S7.005	SSW.305	30.557	0.707	0.000	2.28	0.0	330.2	SURCHARGED
S7.006	SSW.304	30.384	0.567	0.000	0.12	0.0	35.2	SURCHARGED
S7.007	SSW.303	30.383	0.833	0.000	0.26	0.0	35.1	SURCHARGED
S7.008	SSW.302	30.383	1.064	0.000	0.26	0.0	7.3	FLOOD RISK
S10.000	SSW.317	30.439	0.864	0.000	1.15	0.0	46.4	SURCHARGED
S7.009	SSW.301	30.027	0.755	0.000	1.53	0.0	41.8	SURCHARGED
S5.020	SSW.204	29.952	0.717	0.000	1.45	0.0	92.7	SURCHARGED
S5.021	SSW.203	29.794	0.609	0.000	0.36	0.0	39.1	SURCHARGED
S5.022	SSW.202	29.784	0.687	0.000	0.49	0.0	38.9	SURCHARGED
S5.023	SSW.201	29.779	0.704	0.000	0.49	0.0	38.6	SURCHARGED
S1.019	SSW.103	29.775	0.659	0.000	0.51	0.0	67.8	FLOOD RISK
S1.020	SSW.102	29.773	0.661	0.000	0.51	0.0	67.6	FLOOD RISK
S1.021	SSW.101	29.771	0.663	0.000	0.20	0.0	31.3	FLOOD RISK
S1.022	SSW.003	28.706	-0.324	0.000	0.17	0.0	31.2	OK
S1.023	SSW.002	28.226	-0.322	0.000	0.18	0.0	31.2	OK

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Appendix F – Foul Sewer Design Sheets

FOUL SEWERAGE DESIGN

Design Criteria for Foul - Main

Pipe Sizes STANDARD Manhole Sizes STANDARD

Industrial Flow (l/s/ha)	0.00	Add Flow / Climate Change (%)	0
Industrial Peak Flow Factor	0.00	Minimum Backdrop Height (m)	0.200
Flow Per Person (l/per/day)	446.00	Maximum Backdrop Height (m)	1.500
Persons per House	1.00	Min Design Depth for Optimisation (m)	1.200
Domestic (l/s/ha)	0.00	Min Vel for Auto Design only (m/s)	0.75
Domestic Peak Flow Factor	6.00	Min Slope for Optimisation (1:X)	500

Designed with Level Inverts

Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
F1.000	60.405	1.007	60.0	0.000	10	0.0	1.500	o	150
F2.000	55.500	1.257	44.2	0.000	10	0.0	1.500	o	150
F1.001	36.353	0.242	150.0	0.000	0	0.0	1.500	o	225
F1.002	15.295	0.102	150.0	0.000	0	0.0	1.500	o	225
F3.000	46.365	0.773	60.0	0.000	0	0.0	1.500	o	150
F3.001	10.355	0.173	60.0	0.000	0	0.0	1.500	o	150
F1.003	22.860	0.152	150.0	0.000	0	0.0	1.500	o	225
F1.004	5.585	0.037	150.0	0.000	0	0.0	1.500	o	225

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Σ Hse	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F1.000	33.950	0.000	0.0	10	0.0	13	0.40	1.13	20.0	0.3
F2.000	34.200	0.000	0.0	10	0.0	12	0.45	1.32	23.3	0.3
F1.001	32.943	0.000	0.0	20	0.0	20	0.34	0.94	37.2	0.6
F1.002	32.701	0.000	0.0	20	0.0	20	0.34	0.94	37.2	0.6
F3.000	32.950	0.000	0.0	0	0.0	0	0.00	1.13	20.0	0.0
F3.001	32.177	0.000	0.0	0	0.0	0	0.00	1.13	20.0	0.0
F1.003	32.004	0.000	0.0	20	0.0	20	0.34	0.94	37.2	0.6
F1.004	31.852	0.000	0.0	20	0.0	20	0.34	0.94	37.2	0.6

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
F1.005	24.570	0.164	150.0	0.000	0	0.0	1.500	o	225
F1.006	3.480	0.023	150.0	0.000	0	0.0	1.500	o	225
F1.007	3.485	0.023	150.0	0.000	0	0.0	1.500	o	225
F1.008	7.485	0.050	150.0	0.000	0	0.0	1.500	o	225
F1.009	14.955	0.100	150.0	0.000	0	0.0	1.500	o	225
F1.010	3.875	0.026	150.0	0.000	0	0.0	1.500	o	225
F1.011	60.145	1.779	33.8	0.000	0	0.0	1.500	o	225
F4.000	66.485	2.350	28.3	0.000	0	0.0	1.500	o	150
F1.012	3.375	0.050	67.5	0.000	0	0.0	1.500	o	225
F1.013	65.095	0.800	81.4	0.000	0	0.0	1.500	o	225
F1.014	7.020	0.100	70.2	0.000	0	0.0	1.500	o	225
F1.015	7.180	0.050	143.6	0.000	0	0.0	1.500	o	225
F1.016	43.315	0.622	69.6	0.000	0	0.0	1.500	o	225
F5.000	21.405	0.550	38.9	0.000	0	0.0	1.500	o	150
F6.000	18.155	0.303	60.0	0.000	0	0.0	1.500	o	150
F6.001	45.230	0.747	60.5	0.000	0	0.0	1.500	o	225

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Σ Hse	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F1.005	31.815	0.000	0.0	20	0.0	20	0.34	0.94	37.2	0.6
F1.006	31.651	0.000	0.0	20	0.0	20	0.34	0.94	37.2	0.6
F1.007	31.628	0.000	0.0	20	0.0	20	0.34	0.94	37.2	0.6
F1.008	31.605	0.000	0.0	20	0.0	20	0.34	0.94	37.2	0.6
F1.009	31.555	0.000	0.0	20	0.0	20	0.34	0.94	37.2	0.6
F1.010	31.455	0.000	0.0	20	0.0	20	0.34	0.94	37.2	0.6
F1.011	31.429	0.000	0.0	20	0.0	15	0.58	1.98	78.6	0.6
F4.000	32.000	0.000	0.0	0	0.0	0	0.00	1.65	29.2	0.0
F1.012	29.650	0.000	0.0	20	0.0	17	0.45	1.40	55.6	0.6
F1.013	29.600	0.000	0.0	20	0.0	18	0.42	1.27	50.6	0.6
F1.014	28.800	0.000	0.0	20	0.0	17	0.45	1.37	54.5	0.6
F1.015	28.700	0.000	0.0	20	0.0	20	0.35	0.96	38.1	0.6
F1.016	28.650	0.000	0.0	20	0.0	17	0.45	1.38	54.7	0.6
F5.000	32.300	0.000	0.0	0	0.0	0	0.00	1.41	24.9	0.0
F6.000	33.450	0.000	0.0	0	0.0	0	0.00	1.13	20.0	0.0
F6.001	33.147	0.000	0.0	0	0.0	0	0.00	1.48	58.7	0.0

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
F6.002	3.615	0.100	36.2	0.000	0	0.0	1.500	o	225
F6.003	3.665	0.100	36.7	0.000	0	0.0	1.500	o	225
F6.004	41.340	0.450	91.9	0.000	0	0.0	1.500	o	225
F5.001	3.475	0.100	34.8	0.000	0	0.0	1.500	o	225
F5.002	16.345	0.300	54.5	0.000	0	0.0	1.500	o	225
F5.003	26.215	0.300	87.4	0.000	0	0.0	1.500	o	225
F5.004	5.810	0.100	58.1	0.000	0	0.0	1.500	o	225
F5.005	5.985	0.050	119.7	0.000	0	0.0	1.500	o	225
F5.006	72.510	1.525	47.5	0.000	0	0.0	1.500	o	225
F7.000	48.392	0.807	60.0	0.000	0	0.0	1.500	o	150
F5.007	20.600	0.300	68.7	0.000	0	0.0	1.500	o	225
F5.008	5.835	0.050	116.7	0.000	0	0.0	1.500	o	225
F5.009	5.375	0.050	107.5	0.000	0	0.0	1.500	o	225
F5.010	18.300	0.511	35.8	0.000	0	0.0	1.500	o	225
F8.000	50.480	1.300	38.8	0.000	0	0.0	1.500	o	150
F8.001	42.395	0.275	154.2	0.000	0	0.0	1.500	o	225

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Σ Hse	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F6.002	32.400	0.000	0.0	0	0.0	0	0.00	1.91	76.0	0.0
F6.003	32.300	0.000	0.0	0	0.0	0	0.00	1.90	75.5	0.0
F6.004	32.200	0.000	0.0	0	0.0	0	0.00	1.20	47.6	0.0
F5.001	31.750	0.000	0.0	0	0.0	0	0.00	1.95	77.6	0.0
F5.002	31.650	0.000	0.0	0	0.0	0	0.00	1.56	61.9	0.0
F5.003	31.350	0.000	0.0	0	0.0	0	0.00	1.23	48.8	0.0
F5.004	31.050	0.000	0.0	0	0.0	0	0.00	1.51	59.9	0.0
F5.005	30.950	0.000	0.0	0	0.0	0	0.00	1.05	41.7	0.0
F5.006	30.900	0.000	0.0	0	0.0	0	0.00	1.67	66.3	0.0
F7.000	30.182	0.000	0.0	0	0.0	0	0.00	1.13	20.0	0.0
F5.007	29.375	0.000	0.0	0	0.0	0	0.00	1.39	55.1	0.0
F5.008	29.075	0.000	0.0	0	0.0	0	0.00	1.06	42.2	0.0
F5.009	29.025	0.000	0.0	0	0.0	0	0.00	1.11	44.0	0.0
F5.010	28.975	0.000	0.0	0	0.0	0	0.00	1.92	76.4	0.0
F8.000	31.250	0.000	0.0	0	0.0	0	0.00	1.41	24.9	0.0
F8.001	29.950	0.000	0.0	0	0.0	0	0.00	0.92	36.7	0.0

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
F8.002	40.495	0.275	147.3	0.000	0	0.0	1.500	o	225
F8.003	3.835	0.025	153.4	0.000	0	0.0	1.500	o	225
F8.004	3.835	0.025	153.4	0.000	0	0.0	1.500	o	225
F8.005	43.350	0.300	144.5	0.000	0	0.0	1.500	o	225
F8.006	7.330	0.222	33.0	0.000	0	0.0	1.500	o	225
F9.000	24.475	0.408	60.0	0.000	0	0.0	1.500	o	150
F9.001	27.865	0.464	60.0	0.000	0	0.0	1.500	o	150
F9.002	8.255	0.138	60.0	0.000	0	0.0	1.500	o	150
F9.003	21.015	0.140	150.0	0.000	0	0.0	1.500	o	150
F9.004	23.270	0.155	150.0	0.000	0	0.0	1.500	o	150
F9.005	12.140	0.081	150.0	0.000	0	0.0	1.500	o	150
F9.006	7.315	0.049	150.0	0.000	0	0.0	1.500	o	150
F9.007	35.886	0.239	150.0	0.000	0	0.0	1.500	o	150
F9.008	20.075	0.134	150.0	0.000	0	0.0	1.500	o	150
F10.000	17.640	0.294	60.0	0.000	0	0.0	1.500	o	150
F10.001	3.755	0.063	60.0	0.000	0	0.0	1.500	o	150
F10.002	3.115	0.052	60.0	0.000	0	0.0	1.500	o	150
F10.003	54.905	0.915	60.0	0.000	0	0.0	1.500	o	150

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Σ Hse	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F8.002	29.675	0.000	0.0	0	0.0	0	0.00	0.95	37.6	0.0
F8.003	29.400	0.000	0.0	0	0.0	0	0.00	0.93	36.8	0.0
F8.004	29.375	0.000	0.0	0	0.0	0	0.00	0.93	36.8	0.0
F8.005	29.350	0.000	0.0	0	0.0	0	0.00	0.95	37.9	0.0
F8.006	29.050	0.000	0.0	0	0.0	0	0.00	2.00	79.6	0.0
F9.000	32.450	0.000	0.0	0	0.0	0	0.00	1.13	20.0	0.0
F9.001	32.042	0.000	0.0	0	0.0	0	0.00	1.13	20.0	0.0
F9.002	31.578	0.000	0.0	0	0.0	0	0.00	1.13	20.0	0.0
F9.003	31.440	0.000	0.0	0	0.0	0	0.00	0.71	12.6	0.0
F9.004	31.300	0.000	0.0	0	0.0	0	0.00	0.71	12.6	0.0
F9.005	31.145	0.000	0.0	0	0.0	0	0.00	0.71	12.6	0.0
F9.006	31.064	0.000	0.0	0	0.0	0	0.00	0.71	12.6	0.0
F9.007	31.015	0.000	0.0	0	0.0	0	0.00	0.71	12.6	0.0
F9.008	30.776	0.000	0.0	0	0.0	0	0.00	0.71	12.6	0.0
F10.000	33.700	0.000	0.0	0	0.0	0	0.00	1.13	20.0	0.0
F10.001	33.406	0.000	0.0	0	0.0	0	0.00	1.13	20.0	0.0
F10.002	33.343	0.000	0.0	0	0.0	0	0.00	1.13	20.0	0.0
F10.003	33.292	0.000	0.0	0	0.0	0	0.00	1.13	20.0	0.0

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
F10.004	7.820	0.052	150.0	0.000	0	0.0	1.500	o	225
F10.005	8.540	0.057	150.0	0.000	0	0.0	1.500	o	225
F10.006	15.495	0.467	33.2	0.000	0	0.0	1.500	o	225
F10.007	36.620	0.300	122.1	0.000	0	0.0	1.500	o	225
F10.008	14.830	0.600	24.7	0.000	0	0.0	1.500	o	225
F9.009	5.085	0.212	24.0	0.000	0	0.0	1.500	o	225
F9.010	4.865	0.203	24.0	0.000	0	0.0	1.500	o	225
F9.011	18.215	0.759	24.0	0.000	0	0.0	1.500	o	225
F11.000	36.765	0.613	60.0	0.000	0	0.0	1.500	o	150
F11.001	3.655	0.158	23.1	0.000	0	0.0	1.500	o	150
F9.012	8.950	0.373	24.0	0.000	0	0.0	1.500	o	225
F9.013	6.675	0.178	37.4	0.000	0	0.0	1.500	o	225
F8.007	54.612	0.364	150.0	0.000	0	0.0	1.500	o	225
F5.011	27.780	0.185	150.0	0.000	0	0.0	1.500	o	225
F5.012	21.685	0.145	150.0	0.000	0	0.0	1.500	o	225

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Σ Hse	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F10.004	32.377	0.000	0.0	0	0.0	0	0.00	0.94	37.2	0.0
F10.005	32.324	0.000	0.0	0	0.0	0	0.00	0.94	37.2	0.0
F10.006	32.267	0.000	0.0	0	0.0	0	0.00	2.00	79.4	0.0
F10.007	31.800	0.000	0.0	0	0.0	0	0.00	1.04	41.3	0.0
F10.008	31.500	0.000	0.0	0	0.0	0	0.00	2.31	92.0	0.0
F9.009	30.642	0.000	0.0	0	0.0	0	0.00	2.35	93.4	0.0
F9.010	30.430	0.000	0.0	0	0.0	0	0.00	2.35	93.4	0.0
F9.011	30.227	0.000	0.0	0	0.0	0	0.00	2.35	93.4	0.0
F11.000	30.150	0.000	0.0	0	0.0	0	0.00	1.13	20.0	0.0
F11.001	29.537	0.000	0.0	0	0.0	0	0.00	1.83	32.3	0.0
F9.012	29.379	0.000	0.0	0	0.0	0	0.00	2.35	93.4	0.0
F9.013	29.006	0.000	0.0	0	0.0	0	0.00	1.88	74.8	0.0
F8.007	28.828	0.000	0.0	0	0.0	0	0.00	0.94	37.2	0.0
F5.011	28.464	0.000	0.0	0	0.0	0	0.00	0.94	37.2	0.0
F5.012	28.278	0.000	0.0	0	0.0	0	0.00	0.94	37.2	0.0

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
F5.013	4.385	0.029	150.0	0.000	0	0.0	1.500	o	225
F5.014	4.330	0.077	56.3	0.000	0	0.0	1.500	o	225
F1.017	13.580	0.045	300.0	0.000	0	0.0	1.500	o	300
F1.018	112.003	0.373	300.0	0.000	0	0.0	1.500	o	300
F1.019	55.555	0.185	300.0	0.000	0	0.0	1.500	o	300
F1.020	78.790	0.263	300.0	0.000	0	0.0	1.500	o	300
F1.021	15.290	0.051	300.0	0.000	0	0.0	1.500	o	300
F1.022	50.820	0.169	300.0	0.000	0	0.0	1.500	o	300
F1.023	11.650	0.039	300.0	0.000	0	0.0	1.500	o	300

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Σ Hse	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F5.013	28.134	0.000	0.0	0	0.0	0	0.00	0.94	37.2	0.0
F5.014	28.105	0.000	0.0	0	0.0	0	0.00	1.53	60.9	0.0
F1.017	28.028	0.000	0.0	20	0.0	22	0.26	0.80	56.4	0.6
F1.018	27.982	0.000	0.0	20	0.0	22	0.26	0.80	56.4	0.6
F1.019	27.609	0.000	0.0	20	0.0	22	0.26	0.80	56.4	0.6
F1.020	27.424	0.000	0.0	20	0.0	22	0.26	0.80	56.4	0.6
F1.021	27.161	0.000	0.0	20	0.0	22	0.26	0.80	56.4	0.6
F1.022	27.110	0.000	0.0	20	0.0	22	0.26	0.80	56.4	0.6
F1.023	26.941	0.000	0.0	20	0.0	22	0.26	0.80	56.4	0.6

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Manhole Schedules for Foul - Main

MH Name	MH CL (m)	MH Depth (m)	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
FFS.118	35.000	1.050	1050	F1.000	33.950	150				
FFS.119	35.250	1.050	1050	F2.000	34.200	150				
FFS.117	35.050	2.107	1200	F1.001	32.943	225	F1.000	32.943	150	
							F2.000	32.943	150	
FFS.116	34.800	2.099	1200	F1.002	32.701	225	F1.001	32.701	225	
FFS.121	34.300	1.350	1050	F3.000	32.950	150				
FFS.120	34.615	2.438	1200	F3.001	32.177	150	F3.000	32.177	150	
FFS.115	34.700	2.696	1200	F1.003	32.004	225	F1.002	32.599	225	594
							F3.001	32.004	150	
FFS.114	34.520	2.668	1200	F1.004	31.852	225	F1.003	31.852	225	
FFS.113	34.515	2.700	1200	F1.005	31.815	225	F1.004	31.815	225	
FFS.112	34.350	2.699	1200	F1.006	31.651	225	F1.005	31.651	225	
FFS.111	34.315	2.687	1200	F1.007	31.628	225	F1.006	31.628	225	
FFS.110	34.300	2.695	1200	F1.008	31.605	225	F1.007	31.605	225	
FFS.109	34.250	2.695	1200	F1.009	31.555	225	F1.008	31.555	225	
FFS.108	33.600	2.145	1200	F1.010	31.455	225	F1.009	31.455	225	
FFS.107	33.500	2.071	1200	F1.011	31.429	225	F1.010	31.429	225	
FFS.120	33.850	1.850	1200	F4.000	32.000	150				
FFS.106	31.500	1.850	1200	F1.012	29.650	225	F1.011	29.650	225	
							F4.000	29.650	150	
FFS.105	31.450	1.850	1200	F1.013	29.600	225	F1.012	29.600	225	
FFS.104	30.650	1.850	1200	F1.014	28.800	225	F1.013	28.800	225	
FFS.103	30.550	1.850	1200	F1.015	28.700	225	F1.014	28.700	225	
FFS.102	30.500	1.850	1200	F1.016	28.650	225	F1.015	28.650	225	
FFS.216	34.150	1.850	1200	F5.000	32.300	150				
FFS.221	35.300	1.850	1200	F6.000	33.450	150				
FFS.220	35.500	2.353	1200	F6.001	33.147	225	F6.000	33.147	150	
FFS.219	34.250	1.850	1200	F6.002	32.400	225	F6.001	32.400	225	
FFS.218	34.150	1.850	1200	F6.003	32.300	225	F6.002	32.300	225	
FFS.217	34.050	1.850	1200	F6.004	32.200	225	F6.003	32.200	225	
FFS.215	33.600	1.850	1200	F5.001	31.750	225	F5.000	31.750	150	
							F6.004	31.750	225	
FFS.214	33.500	1.850	1200	F5.002	31.650	225	F5.001	31.650	225	
FFS.213	33.100	1.750	1200	F5.003	31.350	225	F5.002	31.350	225	
FFS.212	32.800	1.750	1200	F5.004	31.050	225	F5.003	31.050	225	
FFS.211	32.700	1.750	1200	F5.005	30.950	225	F5.004	30.950	225	
FFS.210	32.650	1.750	1200	F5.006	30.900	225	F5.005	30.900	225	
FFS.222	31.600	1.418	1050	F7.000	30.182	150				
FFS.208	31.125	1.750	1200	F5.007	29.375	225	F5.006	29.375	225	
							F7.000	29.375	150	
FFS.207	30.825	1.750	1200	F5.008	29.075	225	F5.007	29.075	225	
FFS.206	30.775	1.750	1200	F5.009	29.025	225	F5.008	29.025	225	
FFS.205	30.725	1.750	1200	F5.010	28.975	225	F5.009	28.975	225	
FFS.331	32.300	1.050	1050	F8.000	31.250	150				
FFS.330	31.800	1.850	1200	F8.001	29.950	225	F8.000	29.950	150	
FFS.329	31.525	1.850	1200	F8.002	29.675	225	F8.001	29.675	225	

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Manhole Schedules for Foul - Main

MH Name	MH CL (m)	MH Depth (m)	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
FFS.328	31.250	1.850	1200	F8.003	29.400	225	F8.002	29.400	225	
FFS.327	31.225	1.850	1200	F8.004	29.375	225	F8.003	29.375	225	
FFS.326	31.200	1.850	1200	F8.005	29.350	225	F8.004	29.350	225	
FFS.325	30.900	1.850	1200	F8.006	29.050	225	F8.005	29.050	225	
FFS.324	34.250	1.800	1200	F9.000	32.450	150				
FFS.323	34.000	1.958	1200	F9.001	32.042	150	F9.000	32.042	150	
FFS.322	33.250	1.672	1200	F9.002	31.578	150	F9.001	31.578	150	
FFS.321	33.250	1.810	1200	F9.003	31.440	150	F9.002	31.440	150	
FFS.320	33.000	1.700	1200	F9.004	31.300	150	F9.003	31.300	150	
FFS.319	32.650	1.505	1050	F9.005	31.145	150	F9.004	31.145	150	
FFS.318	32.650	1.586	1050	F9.006	31.064	150	F9.005	31.064	150	
FFS.317	32.650	1.635	1050	F9.007	31.015	150	F9.006	31.015	150	
FFS.316	32.750	1.974	1200	F9.008	30.776	150	F9.007	30.776	150	
FFS.315	35.550	1.850	1200	F10.000	33.700	150				
FFS.314	35.450	2.044	1200	F10.001	33.406	150	F10.000	33.406	150	
FFS.313	35.400	2.057	1200	F10.002	33.343	150	F10.001	33.343	150	
FFS.312	35.375	2.083	1200	F10.003	33.292	150	F10.002	33.292	150	
FFS.311	35.000	2.623	1200	F10.004	32.377	225	F10.003	32.377	150	
FFS.310	34.600	2.276	1200	F10.005	32.324	225	F10.004	32.324	225	
FFS.309	34.150	1.883	1200	F10.006	32.267	225	F10.005	32.267	225	
FFS.308	33.650	1.850	1200	F10.007	31.800	225	F10.006	31.800	225	
FFS.307	33.350	1.850	1200	F10.008	31.500	225	F10.007	31.500	225	
FFS.306	32.700	2.058	1200	F9.009	30.642	225	F9.008	30.642	150	
							F10.008	30.900	225	258
FFS.305	32.500	2.070	1200	F9.010	30.430	225	F9.009	30.430	225	
FFS.304	32.300	2.073	1200	F9.011	30.227	225	F9.010	30.227	225	
FFS.332	32.000	1.850	1200	F11.000	30.150	150				
FFS.331	31.550	2.013	1200	F11.001	29.537	150	F11.000	29.537	150	
FFS.303	31.350	1.971	1200	F9.012	29.379	225	F9.011	29.468	225	89
							F11.001	29.379	150	
FFS.302	30.900	1.894	1200	F9.013	29.006	225	F9.012	29.006	225	
FFS.301	30.850	2.022	1200	F8.007	28.828	225	F8.006	28.828	225	
							F9.013	28.828	225	
FFS.204	30.550	2.086	1200	F5.011	28.464	225	F5.010	28.464	225	
							F8.007	28.464	225	
FFS.203	30.350	2.072	1200	F5.012	28.278	225	F5.011	28.278	225	
FFS.202	30.150	2.016	1200	F5.013	28.134	225	F5.012	28.134	225	
FFS.201	30.100	1.995	1200	F5.014	28.105	225	F5.013	28.105	225	
FFS.101	30.050	2.022	1200	F1.017	28.028	300	F1.016	28.028	225	
							F5.014	28.028	225	
FFS.007	30.000	2.018	1200	F1.018	27.982	300	F1.017	27.982	300	
FFS.006	30.150	2.541	1200	F1.019	27.609	300	F1.018	27.609	300	
FFS.005	30.140	2.716	1200	F1.020	27.424	300	F1.019	27.424	300	
FFS.004	30.210	3.049	1200	F1.021	27.161	300	F1.020	27.161	300	
FFS.003	29.810	2.700	1200	F1.022	27.110	300	F1.021	27.110	300	
FFS.002	28.850	1.909	1200	F1.023	26.941	300	F1.022	26.941	300	

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Manhole Schedules for Foul - Main

MH Name	MH CL (m)	MH Depth (m)	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
FEx FS.001	28.630	1.728	0		OUTFALL		F1.023	26.902	300	

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PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
F1.000	o	150	FFS.118	35.000	33.950	0.900	1050
F2.000	o	150	FFS.119	35.250	34.200	0.900	1050
F1.001	o	225	FFS.117	35.050	32.943	1.882	1200
F1.002	o	225	FFS.116	34.800	32.701	1.874	1200
F3.000	o	150	FFS.121	34.300	32.950	1.200	1050
F3.001	o	150	FFS.120	34.615	32.177	2.288	1200
F1.003	o	225	FFS.115	34.700	32.004	2.471	1200
F1.004	o	225	FFS.114	34.520	31.852	2.443	1200
F1.005	o	225	FFS.113	34.515	31.815	2.475	1200
F1.006	o	225	FFS.112	34.350	31.651	2.474	1200
F1.007	o	225	FFS.111	34.315	31.628	2.462	1200
F1.008	o	225	FFS.110	34.300	31.605	2.470	1200
F1.009	o	225	FFS.109	34.250	31.555	2.470	1200
F1.010	o	225	FFS.108	33.600	31.455	1.920	1200
F1.011	o	225	FFS.107	33.500	31.429	1.846	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
F1.000	60.405	60.0	FFS.117	35.050	32.943	1.957	1200
F2.000	55.500	44.2	FFS.117	35.050	32.943	1.957	1200
F1.001	36.353	150.0	FFS.116	34.800	32.701	1.874	1200
F1.002	15.295	150.0	FFS.115	34.700	32.599	1.876	1200
F3.000	46.365	60.0	FFS.120	34.615	32.177	2.288	1200
F3.001	10.355	60.0	FFS.115	34.700	32.004	2.546	1200
F1.003	22.860	150.0	FFS.114	34.520	31.852	2.443	1200
F1.004	5.585	150.0	FFS.113	34.515	31.815	2.475	1200
F1.005	24.570	150.0	FFS.112	34.350	31.651	2.474	1200
F1.006	3.480	150.0	FFS.111	34.315	31.628	2.462	1200
F1.007	3.485	150.0	FFS.110	34.300	31.605	2.470	1200
F1.008	7.485	150.0	FFS.109	34.250	31.555	2.470	1200
F1.009	14.955	150.0	FFS.108	33.600	31.455	1.920	1200
F1.010	3.875	150.0	FFS.107	33.500	31.429	1.846	1200
F1.011	60.145	33.8	FFS.106	31.500	29.650	1.625	1200

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PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
F4.000	o	150	FFS.120	33.850	32.000	1.700	1200
F1.012	o	225	FFS.106	31.500	29.650	1.625	1200
F1.013	o	225	FFS.105	31.450	29.600	1.625	1200
F1.014	o	225	FFS.104	30.650	28.800	1.625	1200
F1.015	o	225	FFS.103	30.550	28.700	1.625	1200
F1.016	o	225	FFS.102	30.500	28.650	1.625	1200
F5.000	o	150	FFS.216	34.150	32.300	1.700	1200
F6.000	o	150	FFS.221	35.300	33.450	1.700	1200
F6.001	o	225	FFS.220	35.500	33.147	2.128	1200
F6.002	o	225	FFS.219	34.250	32.400	1.625	1200
F6.003	o	225	FFS.218	34.150	32.300	1.625	1200
F6.004	o	225	FFS.217	34.050	32.200	1.625	1200
F5.001	o	225	FFS.215	33.600	31.750	1.625	1200
F5.002	o	225	FFS.214	33.500	31.650	1.625	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
F4.000	66.485	28.3	FFS.106	31.500	29.650	1.700	1200
F1.012	3.375	67.5	FFS.105	31.450	29.600	1.625	1200
F1.013	65.095	81.4	FFS.104	30.650	28.800	1.625	1200
F1.014	7.020	70.2	FFS.103	30.550	28.700	1.625	1200
F1.015	7.180	143.6	FFS.102	30.500	28.650	1.625	1200
F1.016	43.315	69.6	FFS.101	30.050	28.028	1.797	1200
F5.000	21.405	38.9	FFS.215	33.600	31.750	1.700	1200
F6.000	18.155	60.0	FFS.220	35.500	33.147	2.203	1200
F6.001	45.230	60.5	FFS.219	34.250	32.400	1.625	1200
F6.002	3.615	36.2	FFS.218	34.150	32.300	1.625	1200
F6.003	3.665	36.7	FFS.217	34.050	32.200	1.625	1200
F6.004	41.340	91.9	FFS.215	33.600	31.750	1.625	1200
F5.001	3.475	34.8	FFS.214	33.500	31.650	1.625	1200
F5.002	16.345	54.5	FFS.213	33.100	31.350	1.525	1200

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PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
F5.003	o	225	FFS.213	33.100	31.350	1.525	1200
F5.004	o	225	FFS.212	32.800	31.050	1.525	1200
F5.005	o	225	FFS.211	32.700	30.950	1.525	1200
F5.006	o	225	FFS.210	32.650	30.900	1.525	1200
F7.000	o	150	FFS.222	31.600	30.182	1.268	1050
F5.007	o	225	FFS.208	31.125	29.375	1.525	1200
F5.008	o	225	FFS.207	30.825	29.075	1.525	1200
F5.009	o	225	FFS.206	30.775	29.025	1.525	1200
F5.010	o	225	FFS.205	30.725	28.975	1.525	1200
F8.000	o	150	FFS.331	32.300	31.250	0.900	1050
F8.001	o	225	FFS.330	31.800	29.950	1.625	1200
F8.002	o	225	FFS.329	31.525	29.675	1.625	1200
F8.003	o	225	FFS.328	31.250	29.400	1.625	1200
F8.004	o	225	FFS.327	31.225	29.375	1.625	1200
F8.005	o	225	FFS.326	31.200	29.350	1.625	1200
F8.006	o	225	FFS.325	30.900	29.050	1.625	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
F5.003	26.215	87.4	FFS.212	32.800	31.050	1.525	1200
F5.004	5.810	58.1	FFS.211	32.700	30.950	1.525	1200
F5.005	5.985	119.7	FFS.210	32.650	30.900	1.525	1200
F5.006	72.510	47.5	FFS.208	31.125	29.375	1.525	1200
F7.000	48.392	60.0	FFS.208	31.125	29.375	1.600	1200
F5.007	20.600	68.7	FFS.207	30.825	29.075	1.525	1200
F5.008	5.835	116.7	FFS.206	30.775	29.025	1.525	1200
F5.009	5.375	107.5	FFS.205	30.725	28.975	1.525	1200
F5.010	18.300	35.8	FFS.204	30.550	28.464	1.861	1200
F8.000	50.480	38.8	FFS.330	31.800	29.950	1.700	1200
F8.001	42.395	154.2	FFS.329	31.525	29.675	1.625	1200
F8.002	40.495	147.3	FFS.328	31.250	29.400	1.625	1200
F8.003	3.835	153.4	FFS.327	31.225	29.375	1.625	1200
F8.004	3.835	153.4	FFS.326	31.200	29.350	1.625	1200
F8.005	43.350	144.5	FFS.325	30.900	29.050	1.625	1200
F8.006	7.330	33.0	FFS.301	30.850	28.828	1.797	1200

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PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
F9.000	o	150	FFS.324	34.250	32.450	1.650	1200
F9.001	o	150	FFS.323	34.000	32.042	1.808	1200
F9.002	o	150	FFS.322	33.250	31.578	1.522	1200
F9.003	o	150	FFS.321	33.250	31.440	1.660	1200
F9.004	o	150	FFS.320	33.000	31.300	1.550	1200
F9.005	o	150	FFS.319	32.650	31.145	1.355	1050
F9.006	o	150	FFS.318	32.650	31.064	1.436	1050
F9.007	o	150	FFS.317	32.650	31.015	1.485	1050
F9.008	o	150	FFS.316	32.750	30.776	1.824	1200
F10.000	o	150	FFS.315	35.550	33.700	1.700	1200
F10.001	o	150	FFS.314	35.450	33.406	1.894	1200
F10.002	o	150	FFS.313	35.400	33.343	1.907	1200
F10.003	o	150	FFS.312	35.375	33.292	1.933	1200
F10.004	o	225	FFS.311	35.000	32.377	2.398	1200
F10.005	o	225	FFS.310	34.600	32.324	2.051	1200
F10.006	o	225	FFS.309	34.150	32.267	1.658	1200
F10.007	o	225	FFS.308	33.650	31.800	1.625	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
F9.000	24.475	60.0	FFS.323	34.000	32.042	1.808	1200
F9.001	27.865	60.0	FFS.322	33.250	31.578	1.522	1200
F9.002	8.255	60.0	FFS.321	33.250	31.440	1.660	1200
F9.003	21.015	150.0	FFS.320	33.000	31.300	1.550	1200
F9.004	23.270	150.0	FFS.319	32.650	31.145	1.355	1050
F9.005	12.140	150.0	FFS.318	32.650	31.064	1.436	1050
F9.006	7.315	150.0	FFS.317	32.650	31.015	1.485	1050
F9.007	35.886	150.0	FFS.316	32.750	30.776	1.824	1200
F9.008	20.075	150.0	FFS.306	32.700	30.642	1.908	1200
F10.000	17.640	60.0	FFS.314	35.450	33.406	1.894	1200
F10.001	3.755	60.0	FFS.313	35.400	33.343	1.907	1200
F10.002	3.115	60.0	FFS.312	35.375	33.292	1.933	1200
F10.003	54.905	60.0	FFS.311	35.000	32.377	2.473	1200
F10.004	7.820	150.0	FFS.310	34.600	32.324	2.051	1200
F10.005	8.540	150.0	FFS.309	34.150	32.267	1.658	1200
F10.006	15.495	33.2	FFS.308	33.650	31.800	1.625	1200
F10.007	36.620	122.1	FFS.307	33.350	31.500	1.625	1200

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PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
F10.008	o	225	FFS.307	33.350	31.500	1.625	1200
F9.009	o	225	FFS.306	32.700	30.642	1.833	1200
F9.010	o	225	FFS.305	32.500	30.430	1.845	1200
F9.011	o	225	FFS.304	32.300	30.227	1.848	1200
F11.000	o	150	FFS.332	32.000	30.150	1.700	1200
F11.001	o	150	FFS.331	31.550	29.537	1.863	1200
F9.012	o	225	FFS.303	31.350	29.379	1.746	1200
F9.013	o	225	FFS.302	30.900	29.006	1.669	1200
F8.007	o	225	FFS.301	30.850	28.828	1.797	1200
F5.011	o	225	FFS.204	30.550	28.464	1.861	1200
F5.012	o	225	FFS.203	30.350	28.278	1.847	1200
F5.013	o	225	FFS.202	30.150	28.134	1.791	1200
F5.014	o	225	FFS.201	30.100	28.105	1.770	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
F10.008	14.830	24.7	FFS.306	32.700	30.900	1.575	1200
F9.009	5.085	24.0	FFS.305	32.500	30.430	1.845	1200
F9.010	4.865	24.0	FFS.304	32.300	30.227	1.848	1200
F9.011	18.215	24.0	FFS.303	31.350	29.468	1.657	1200
F11.000	36.765	60.0	FFS.331	31.550	29.537	1.863	1200
F11.001	3.655	23.1	FFS.303	31.350	29.379	1.821	1200
F9.012	8.950	24.0	FFS.302	30.900	29.006	1.669	1200
F9.013	6.675	37.4	FFS.301	30.850	28.828	1.797	1200
F8.007	54.612	150.0	FFS.204	30.550	28.464	1.861	1200
F5.011	27.780	150.0	FFS.203	30.350	28.278	1.847	1200
F5.012	21.685	150.0	FFS.202	30.150	28.134	1.791	1200
F5.013	4.385	150.0	FFS.201	30.100	28.105	1.770	1200
F5.014	4.330	56.3	FFS.101	30.050	28.028	1.797	1200

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PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
F1.017	o	300	FFS.101	30.050	28.028	1.722	1200
F1.018	o	300	FFS.007	30.000	27.982	1.718	1200
F1.019	o	300	FFS.006	30.150	27.609	2.241	1200
F1.020	o	300	FFS.005	30.140	27.424	2.416	1200
F1.021	o	300	FFS.004	30.210	27.161	2.749	1200
F1.022	o	300	FFS.003	29.810	27.110	2.400	1200
F1.023	o	300	FFS.002	28.850	26.941	1.609	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
F1.017	13.580	300.0	FFS.007	30.000	27.982	1.718	1200
F1.018	112.003	300.0	FFS.006	30.150	27.609	2.241	1200
F1.019	55.555	300.0	FFS.005	30.140	27.424	2.416	1200
F1.020	78.790	300.0	FFS.004	30.210	27.161	2.749	1200
F1.021	15.290	300.0	FFS.003	29.810	27.110	2.400	1200
F1.022	50.820	300.0	FFS.002	28.850	26.941	1.609	1200
F1.023	11.650	300.0	FEx FS.001	28.630	26.902	1.428	0

Free Flowing Outfall Details for Foul - Main

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
F1.023	FEx FS.001	28.630	26.902	26.900	0	0

Simulation Criteria for Foul - Main

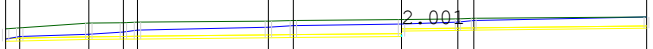
Volumetric Runoff Coeff	0.750	Foul Sewage per hectare (l/s)	0.000
PIMP (% impervious)	100	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Run Time (mins)	60
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1

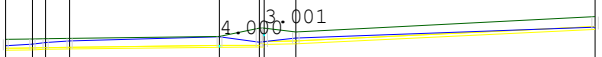
Number of Input Hydrographs	0	Number of Storage Structures	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0		

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Appendix G – Storm Water Longitudinal Sections

Denis O'Sullivan & Associates		Page 1
Unit 5, Joyce House Barrack Square Ballincollig, Co. Cork	Countess Road Killarney Co. Kerry	
Date 01/04/2026 File SW MODEL.MDX	Designed By S.O.'Grady Checked By	
Micro Drainage	Network W.12.4	

MH Name	SSW.113			SSW.118		SSW.120		SSW.123	
Hor Scale 1600 Ver Scale 1000 Datum (m)10.000									
PN				S1.005		S1.003		S1.000	
Dia (mm)				375		375		300	
Slope (1:X)				166.9		167.1		146.3	
Cover Level (m)	33.500	34.250	34.300	34.500		34.700	34.800	35.050	
Invert Level (m)		31.881 32.063	32.107	32.125	32.291	32.323 32.460	33.198 33.278	33.300	33.550
Length (m)				27.705		22.895		36.580	

MH Name	SSW.104				SSW.108			SSW.113	
Hor Scale 1600 Ver Scale 1000 Datum (m)8.000									
PN					S1.014			S1.010	
Dia (mm)					225			375	
Slope (1:X)					136.7			33.0	
Cover Level (m)	30.500				30.900	32.000	31.500	33.500	
Invert Level (m)				29.229	29.461	29.495	29.925	29.925	31.843
Length (m)					31.710			63.315	

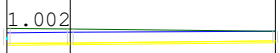
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MH Name	SSW.003	SSW.101	SSW.104	
Hor Scale 1600 Ver Scale 1000 Datum (m) 7.000		5.023		
PN		S1.021	S1.018	
Dia (mm)		450	300	
Slope (1:X)		300.0	104.9	
Cover Level (m)	30.290	30.050	30.500	
Invert Level (m)		28.581 / 28.658	28.666 / 29.079	
Length (m)		23.220	43.305	

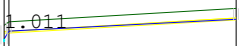
MH Name	SSW.002	SSW.003	
Hor Scale 1600 Ver Scale 1000 Datum (m) 6.000			
PN		S1.022	
Dia (mm)		450	
Slope (1:X)		300.0	
Cover Level (m)	30.230	30.290	
Invert Level (m)		28.098 / 28.581	
Length (m)		144.725	

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MH Name	SEx SW.001	SSW.002	
Hor Scale 1600 Ver Scale 1000 Datum (m) 6.000			
PN		S1.023	
Dia (mm)		450	
Slope (1:X)		300.0	
Cover Level (m)	30.100	30.230	
Invert Level (m)	27.830	28.098	
Length (m)		80.520	

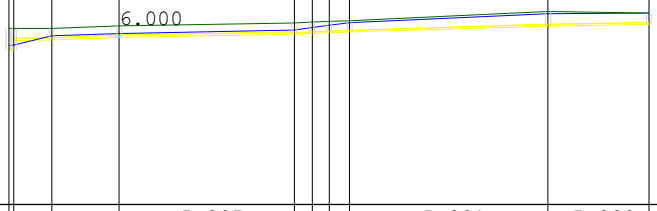
MH Name	SSW.120		SSW.125	
Hor Scale 1600 Ver Scale 1000 Datum (m) 11.000				
PN			S2.000	
Dia (mm)			225	
Slope (1:X)			167.0	
Cover Level (m)	34.700	34.600	34.300	
Invert Level (m)		32.460 32.540	32.540	32.800
Length (m)			43.415	

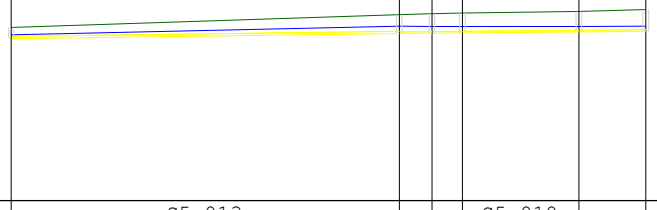
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MH Name	SSW.111	SSW.127	
Hor Scale 1600 Ver Scale 1000 Datum (m) 9.000			
PN		S3.000	
Dia (mm)		225	
Slope (1:X)		27.5	
Cover Level (m)	32.000	34.250	
Invert Level (m)		31.000	32.750
Length (m)		48.090	

MH Name	SSW.108	SSW.109	
Hor Scale 1600 Ver Scale 1000 Datum (m) 7.000			
PN		S4.000	
Dia (mm)		225	
Slope (1:X)		80.2	
Cover Level (m)	30.900	31.400	
Invert Level (m)		29.500	29.900
Length (m)		32.075	

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MH Name	SSW.217			SSW.222			SSW.226	SSW.227	
Hor Scale 1600 Ver Scale 1000 Datum (m)10.000									
PN				S5.005			S5.001	S5.000	
Dia (mm)				300			225	225	
Slope (1:X)				92.8			53.4	100.0	
Cover Level (m)	33.250	33.250	33.600	34.000			35.500	35.300	
Invert Level (m)		31.750	31.750	32.100	32.100	32.500	32.800	33.587	33.587	33.800
Length (m)				37.100			42.000	21.350	

MH Name	SSW.210		SSW.212			SSW.216		
Hor Scale 1600 Ver Scale 1000 Datum (m)8.000								
PN			S5.013			S5.010		
Dia (mm)			300			225		
Slope (1:X)			121.3			167.0		
Cover Level (m)	30.900		32.600	32.700	32.800	33.000	33.250	
Invert Level (m)		29.400	30.077	30.119	30.157	30.157	30.305	30.305	30.390
Length (m)			82.120			24.670		

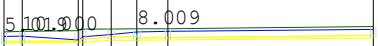
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MH Name	SSW.103		SSW.203	SSW.204					
Hor Scale 1600 Ver Scale 1000 Datum (m) 7.000		1.018			7.009				
PN			S5.021	S5.020					
Dia (mm)			375	300					
Slope (1:X)			250.0	250.0					
Cover Level (m)	30.050		30.300	30.500	30.700		30.900	30.900	
Invert Level (m)			28.722 28.811	28.811 28.934	28.934 29.026		29.145	29.150 29.400	
Length (m)			22.200	30.955					

MH Name	SSW.220	SSW.221	
Hor Scale 1600 Ver Scale 1000 Datum (m) 10.000		5.005	
PN		S6.000	
Dia (mm)		225	
Slope (1:X)		48.9	
Cover Level (m)	33.600	34.100	
Invert Level (m)		32.100 32.600	
Length (m)		24.470	

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MH Name	SSW.329		SSW.331	SSW.332	
Hor Scale 1600 Ver Scale 1000 Datum (m) 8.000					
PN			S7.001	S7.000	
Dia (mm)			225	225	
Slope (1:X)			154.7	166.1	
Cover Level (m)	31.200		31.800	32.100	
Invert Level (m)		29.750	30.300	30.300	30.600
Length (m)			85.100	49.840	

MH Name	SSW.204						SSW.329	
Hor Scale 1600 Ver Scale 1000 Datum (m) 7.000								
PN							S7.003	
Dia (mm)							300	
Slope (1:X)							158.2	
Cover Level (m)	30.500		30.650	30.850		30.925	31.200	
Invert Level (m)			29.047 29.094	29.368		29.425	29.425 29.700	
Length (m)							43.495	

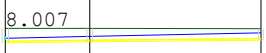
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MH Name	SSW.307						SSW.314			
Hor Scale 1600 Ver Scale 1000 Datum (m)10.000			9.009							
PN							S8.002			
Dia (mm)							300			
Slope (1:X)							147.4			
Cover Level (m)	32.350		33.550		34.100	34.550	35.000	35.350	35.450	35.550
Invert Level (m)		31.250	32.100	32.200	32.600	33.050	33.500	33.500	33.850	33.950	33.950	34.050
Length (m)							51.600			

MH Name	SSW.305	SSW.307	
Hor Scale 1600 Ver Scale 1000 Datum (m)8.000		7.004	
PN		S8.009	
Dia (mm)		375	
Slope (1:X)		33.1	
Cover Level (m)	30.900	32.350	
Invert Level (m)		29.748 30.765	
Length (m)		33.680	

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MH Name	SSW.319			SSW.323	SSW.324		SSW.326	SSW.327	
Hor Scale 1600 Ver Scale 1000 Datum (m) 10.000									
PN				S9.004	S9.003		S9.001	S9.000	
Dia (mm)				225	225		225	225	
Slope (1:X)				200.0	166.7		34.6	60.9	
Cover Level (m)	32.650	32.650	32.650	33.050	33.050	33.050	33.850	34.250	
Invert Level (m)		31.183	31.183 31.243	31.243 31.355	31.355 31.481	31.550	31.550 32.350	32.350 32.750	
Length (m)				22.260	21.010		27.680	24.345	

MH Name	SSW.308		SSW.319	
Hor Scale 1600 Ver Scale 1000 Datum (m) 9.000				
PN			S9.008	
Dia (mm)			225	
Slope (1:X)			167.0	
Cover Level (m)	32.700	32.700	32.650	
Invert Level (m)		30.798 30.905	30.905 31.121	
Length (m)			36.185	

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MH Name	SSW.301	SSW.317	
Hor Scale 1600 Ver Scale 1000 Datum (m) 7.000		7.008	
PN		S10.000	
Dia (mm)		225	
Slope (1:X)		150.1	
Cover Level (m)	30.550	30.850	
Invert Level (m)		29.050	29.350
Length (m)		45.015	

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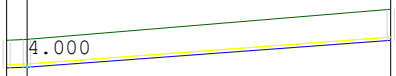
Appendix H – Foul Sewer Longitudinal Sections

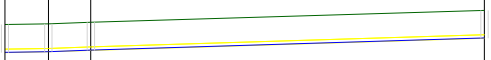
Denis O'Sullivan & Associates		Page 1
Unit 5, Joyce House Barrack Square Ballincollig, Co. Cork	Countess Rd Killarney Co. Kerry	
Date 01/04/2026 File FS MODEL.MDX	Designed By S.O.'Grady Checked By	
Micro Drainage	Network W.12.4	

MH Name	FFS.115	FFS.116	FFS.117	FFS.118	
Hor Scale 1250 Ver Scale 500 Datum (m)22.000		3.001		2.000	
PN		F1.002	F1.001	F1.000	
Dia (mm)		225	225	150	
Slope (1:X)		150.0	150.0	60.0	
Cover Level (m)	34.700	34.800	35.050	35.000	
Invert Level (m)		32.599 32.701	32.701 32.943	32.943 33.950	
Length (m)		15.295	36.353	60.405	

MH Name	FFS.107					FFS.113		FFS.115	
Hor Scale 1250 Ver Scale 500 Datum (m)22.000								3.001	
PN						F1.005		F1.003	
Dia (mm)						225		225	
Slope (1:X)						150.0		150.0	
Cover Level (m)	33.500		34.250	34.300		34.515	34.520	34.700	
Invert Level (m)		31.455	31.555	31.605		31.651 31.815	31.852	31.852 32.004	
Length (m)						24.570		22.860	

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MH Name	FFS.105		FFS.107	
Hor Scale 1250 Ver Scale 500 Datum (m)20.000				
PN			F1.011	
Dia (mm)			225	
Slope (1:X)			33.8	
Cover Level (m)	31.450		33.500	
Invert Level (m)			29.650	31.429
Length (m)			60.145	

MH Name	FFS.102			FFS.105	
Hor Scale 1250 Ver Scale 500 Datum (m)19.000					
PN				F1.013	
Dia (mm)				225	
Slope (1:X)				81.4	
Cover Level (m)	30.500	30.550	30.650	31.450	
Invert Level (m)		28.700	28.800	28.800	29.600
Length (m)				65.095	

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MH Name	FFS.007		FFS.102	
Hor Scale 1250 Ver Scale 500 Datum (m)18.000		5.014		
PN			F1.016	
Dia (mm)			225	
Slope (1:X)			69.6	
Cover Level (m)	30.000	30.050	30.500	
Invert Level (m)		27.982 28.028	28.028	28.650
Length (m)			43.315	

MH Name	FFS.006	FFS.007	
Hor Scale 1250 Ver Scale 500 Datum (m)17.000			
PN		F1.018	
Dia (mm)		300	
Slope (1:X)		300.0	
Cover Level (m)	30.150	30.000	
Invert Level (m)		27.609 27.982	
Length (m)		112.003	

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MH Name	FFS.005	FFS.006	
Hor Scale 1250 Ver Scale 500 Datum (m)17.000			
PN		F1.019	
Dia (mm)		300	
Slope (1:X)		300.0	
Cover Level (m)	30.140	30.150	
Invert Level (m)		27.424	27.609
Length (m)		55.555	

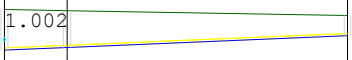
MH Name	FFS.003	FFS.004	FFS.005	
Hor Scale 1250 Ver Scale 500 Datum (m)17.000				
PN		F1.021	F1.020	
Dia (mm)		300	300	
Slope (1:X)		300.0	300.0	
Cover Level (m)	29.810	30.210	30.140	
Invert Level (m)		27.110	27.161 27.161	27.424
Length (m)		15.290	78.790	

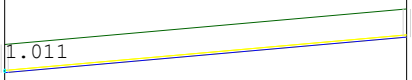
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MH Name	FEx FS.001		FFS.003	
Hor Scale 1250 Ver Scale 500 Datum (m)17.000				
PN			F1.022	
Dia (mm)			300	
Slope (1:X)			300.0	
Cover Level (m)	28.630	28.850	29.810	
Invert Level (m)		26.902 26.941	26.941 27.110	
Length (m)			50.820	

MH Name	FFS.117	FFS.119	
Hor Scale 1250 Ver Scale 500 Datum (m)23.000		1.000	
PN		F2.000	
Dia (mm)		150	
Slope (1:X)		44.2	
Cover Level (m)	35.050	35.250	
Invert Level (m)		32.943 34.200	
Length (m)		55.500	

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MH Name	FFS.115		FFS.121	
Hor Scale 1250 Ver Scale 500 Datum (m)22.000				
PN			F3.000	
Dia (mm)			150	
Slope (1:X)			60.0	
Cover Level (m)	34.700	34.615	34.300	
Invert Level (m)		32.004 32.177	32.177 32.950	
Length (m)			46.365	

MH Name	FFS.106	FFS.120	
Hor Scale 1250 Ver Scale 500 Datum (m)20.000			
PN		F4.000	
Dia (mm)		150	
Slope (1:X)		28.3	
Cover Level (m)	31.500	33.850	
Invert Level (m)		29.650 32.000	
Length (m)		66.485	

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MH Name	FFS.210			FFS.213	FFS.214		FFS.216	
Hor Scale 1250 Ver Scale 500 Datum (m)21.000							6.004	
PN				F5.003	F5.002		F5.000	
Dia (mm)				225	225		150	
Slope (1:X)				87.4	54.5		38.9	
Cover Level (m)	32.650	32.700	32.800	33.100	33.500		34.150	
Invert Level (m)		30.950	31.050	31.050	31.350	31.650	31.750	32.300
Length (m)				26.215	16.345		21.405	

MH Name	FFS.205			FFS.208	FFS.210	
Hor Scale 1250 Ver Scale 500 Datum (m)19.000					7.000	
PN				F5.007	F5.006	
Dia (mm)				225	225	
Slope (1:X)				68.7	47.5	
Cover Level (m)	30.725	30.775	30.825	31.125	32.650	
Invert Level (m)		29.025	29.075	29.075 29.375	29.375 30.900	
Length (m)				20.600	72.510	

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MH Name	FFS.101			FFS.203	FFS.204	FFS.205	
Hor Scale 1250 Ver Scale 500 Datum (m) 18.000				1.016		8.007	
PN				F5.012	F5.011	F5.010	
Dia (mm)				225	225	225	
Slope (1:X)				150.0	150.0	35.8	
Cover Level (m)	30.050			30.350	30.550	30.725	
Invert Level (m)				28.134 28.278	28.278 28.464	28.464 28.975	
Length (m)				21.685	27.780	18.300	

MH Name	FFS.215	FFS.217			FFS.220	FFS.221	
Hor Scale 1250 Ver Scale 500 Datum (m) 22.000		5.000					
PN		F6.004			F6.001	F6.000	
Dia (mm)		225			225	150	
Slope (1:X)		91.9			60.5	60.0	
Cover Level (m)	33.600	34.050			35.500	35.300	
Invert Level (m)		31.750 32.200			32.400 33.147	33.147 33.450	
Length (m)		41.340			45.230	18.155	

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MH Name	FFS.208	FFS.222	
Hor Scale 1250 Ver Scale 500 Datum (m)19.000			
PN		F7.000	
Dia (mm)		150	
Slope (1:X)		60.0	
Cover Level (m)	31.125	31.600	
Invert Level (m)		29.375	30.182
Length (m)		48.392	

MH Name	FFS.329	FFS.330	FFS.331	
Hor Scale 1250 Ver Scale 500 Datum (m)19.000				
PN		F8.001	F8.000	
Dia (mm)		225	150	
Slope (1:X)		154.2	38.8	
Cover Level (m)	31.525	31.800	32.300	
Invert Level (m)		29.675	29.950	29.950	31.250
Length (m)		42.395	50.480	

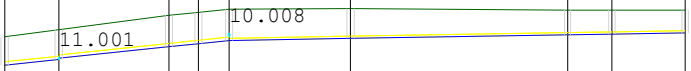
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MH Name	FFS.301		FFS.326			FFS.329	
Hor Scale 1250 Ver Scale 500 Datum (m)19.000		9.013					
PN			F8.005			F8.002	
Dia (mm)			225			225	
Slope (1:X)			144.5			147.3	
Cover Level (m)	30.850	30.900	31.200			31.525	
Invert Level (m)		29.050	29.050	29.350		29.400	29.675
Length (m)			43.350			40.495	

MH Name	FFS.204	FFS.301	
Hor Scale 1250 Ver Scale 500 Datum (m)18.000		5.010	9.013
PN		F8.007	
Dia (mm)		225	
Slope (1:X)		150.0	
Cover Level (m)	30.550	30.850	
Invert Level (m)		28.464	28.828
Length (m)		54.612	

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MH Name	FFS.319	FFS.320	FFS.321		FFS.323	FFS.324	
Hor Scale 1250 Ver Scale 500 Datum (m)21.000							
PN		F9.004	F9.003		F9.001	F9.000	
Dia (mm)		150	150		150	150	
Slope (1:X)		150.0	150.0		60.0	60.0	
Cover Level (m)	32.650	33.000	33.250	33.250	34.000	34.250	
Invert Level (m)		31.145 31.300	31.300 31.440	31.578	31.578 32.042	32.042 32.450	
Length (m)		23.270	21.015		27.865	24.475	

MH Name	FFS.302		FFS.304			FFS.316	FFS.317			
Hor Scale 1250 Ver Scale 500 Datum (m)19.000										
PN			F9.011			F9.008	F9.007			
Dia (mm)			225			150	150			
Slope (1:X)			24.0			150.0	150.0			
Cover Level (m)	30.900	31.350	32.300	32.500	32.700	32.750	32.650	32.650	32.650	
Invert Level (m)		29.379 29.468	30.227	30.430	30.642	30.642 30.776	30.776 31.015	31.064	31.064 31.145	
Length (m)			18.215			20.075	35.886			

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MH Name	FFS.301		
Hor Scale 1250 Ver Scale 500 Datum (m)18.000		8.006	
PN			
Dia (mm)			
Slope (1:X)			
Cover Level (m)	30.850	30.900	
Invert Level (m)		29.006	
Length (m)			

MH Name	FFS.308	FFS.309			FFS.312			FFS.315	
Hor Scale 1250 Ver Scale 500 Datum (m)22.000									
PN		F10.006			F10.003			F10.000	
Dia (mm)		225			150			150	
Slope (1:X)		33.2			60.0			60.0	
Cover Level (m)	33.650	34.150	34.600	35.000	35.375			35.550	
Invert Level (m)		31.800 32.267	32.324	32.377	32.377 33.292			33.406 33.700	
Length (m)		15.495			54.905			17.640	

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MH Name	FFS.306		FFS.308	
Hor Scale 1250 Ver Scale 500 Datum (m)21.000		9.008		
PN			F10.007	
Dia (mm)			225	
Slope (1:X)			122.1	
Cover Level (m)	32.700	33.350	33.650	
Invert Level (m)		30.900 31.500	31.500 31.800	
Length (m)			36.620	

MH Name	FFS.303		FFS.332	
Hor Scale 1250 Ver Scale 500 Datum (m)19.000		9.011		
PN			F11.000	
Dia (mm)			150	
Slope (1:X)			60.0	
Cover Level (m)	31.350		32.000	
Invert Level (m)			29.537 30.150	
Length (m)			36.765	

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Appendix J – Hydrobrake Details

Hydro-Brake® Optimum

Reduce Storage Needs

Product Summary

The Hydro-Brake® Optimum Vortex Flow Control is a versatile, self-activating device with a unique geometry designed to harness the energy of vortex flow.

The Hydro-Brake® Optimum is used to maximize savings on new construction projects by minimizing stormwater detention volumes. Also an economical retrofit solution, the Hydro-Brake® Optimum can be installed in over-discharging ponds and catch basins to restrict the outflow without requiring the construction of additional detention volumes.

With large openings that guard against blockages and an installation base upwards of 25,000 units, the Hydro-Brake® is a trusted and proven solution used to reduce the rate of stormwater runoff.

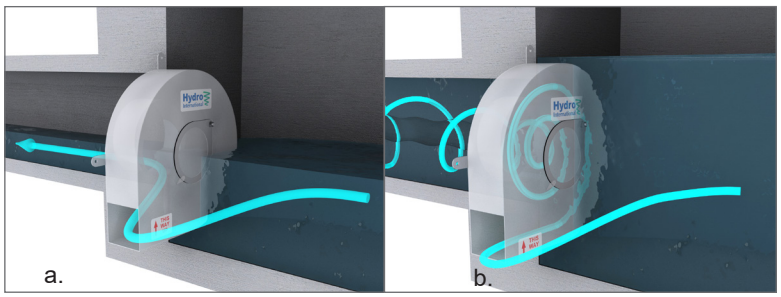


Fig.1 The Hydro-Brake® operates like (a) a large orifice under low flow conditions, and (b) a small orifice under higher flow / higher head conditions when a vortex air core forms within the device and throttles the flow.

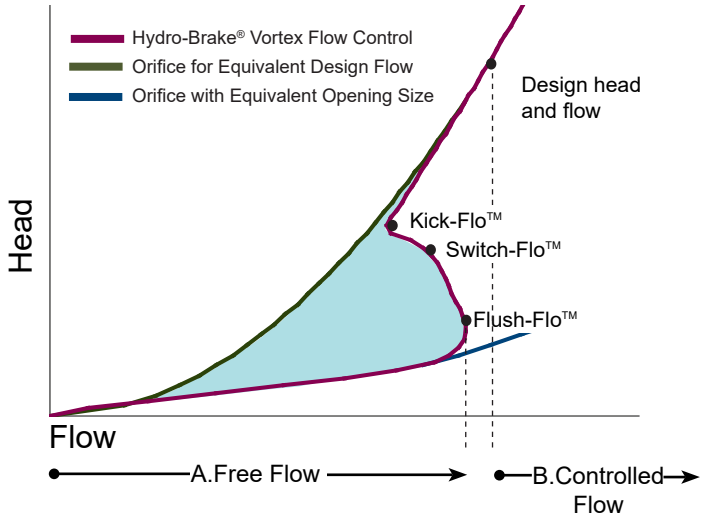


Fig.2 The characteristic of the Hydro-Brake® vs. an equivalent orifice.

The Hydro-Brake® Vortex Flow Control optimizes flow control to allow for higher discharge rates at lower heads than conventional flow control options. The head/discharge curves shown below illustrate the behavior of a Hydro-Brake® Vortex Flow Control compared to an orifice (Fig.2).

How it Works

Reduce Storage Volumes by 40%



The Hydro-Brake® Optimum operates on simple fluid hydraulics. Flow enters the volute tangentially through the inlet. Under low flow conditions, the Hydro-Brake® Optimum acts as a large orifice and water passes directly from the inlet to the outlet (Fig.1a).

As flow increases and reaches the Flush-Flo™ point, high peripheral velocities initiate the throttling action. As head increases, the valve approaches the Switch-Flo™ and Kick-Flo™ points and an air-filled core starts to form in the volute. As head continues to increase, the air core fully stabilizes and the valve discharge is throttled to that of a smaller orifice (Fig.1b).

Benefits

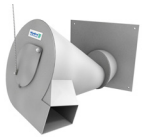
- Reduced stormwater storage volumes by up to 40%
- Up to 50% savings in project storage costs
- Self-activating with no moving parts or power requirements
- Available in wall-mounted or floor-mounted geometries
- Area of opening is 3-6 times larger than the equivalent orifice
- Virtually maintenance free
- Proven performance with over 25,000 installations worldwide

Stormwater Solutions

→ hydro-int.com/hydro-brake

Sizing & Design

Three series of Hydro-Brake® Optimum Vortex Flow Controls are available to suit various applications and design constraints. Refer to the Hydro-Brake® Optimum Design Chart for typical sizing guidelines.

Series	S Series	V Series	C Series
Typical Geometry			
Models	SH STH SXH SMH SMXH	SV SXV SMV	C CX CH
Typical Applications	• Flow control at the inlet of the storm drain system • Outlet flow control for stormwater detention systems	• Erosion control & energy dissipation • Roof runoff control for “Blue Roof” detention schemes	• Outlet flow control for flood dams and levees • Outlet flow control for stormwater detention systems
Typical Mount Style	Wall Mount	Downspout/Roof Mount Floor Mount Pipe Mount	Floor Mount
Typical Diameter Range*	2 - 16 in (5 - 41 cm)	2 - 16 in (5 - 41 cm)	3 - 20 in (7.5 - 51 cm)
Typical Flow Range**	0.05 - 5.6 cfs (1 - 157 L/s)	0.05 - 6.0 cfs (1 - 174 L/s)	0.18 - 14.3 cfs (5.3 - 405 L/s)

**Listed diameter ranges are typical guidelines only. Hydro-Brake® Optimum Vortex Flow Controls can be manufactured to any specified diameter up to 6'.*
***Flow ranges listed are for 4' - 6.5' of head.*
Contact Hydro International for site-specific sizing and design requirements.

Optional Design Accessories

Pivoting Bypass Door



For maintenance access to the outlet pipe.

Curved Backplate



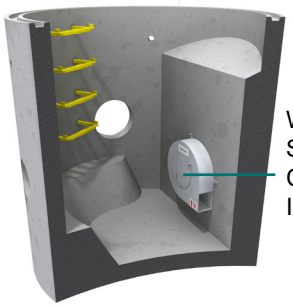
To allow for flush-mounting to the wall of a round manhole.

Vortex Suppressor Pipe

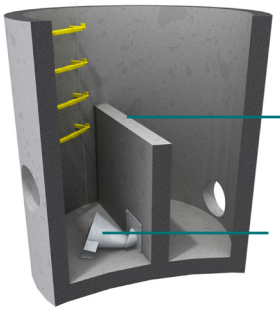


To eliminate air core for emergency bypass.

Typical Chamber Configurations

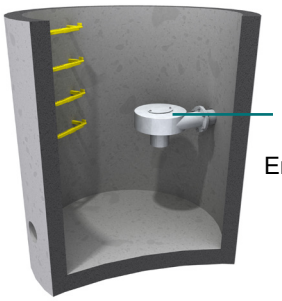


Wall Mounted SXH Model for Catch Basin Inlet Control



Large Storm Bypass Weir

Floor Mounted CH Model for Small Storm Flow Control



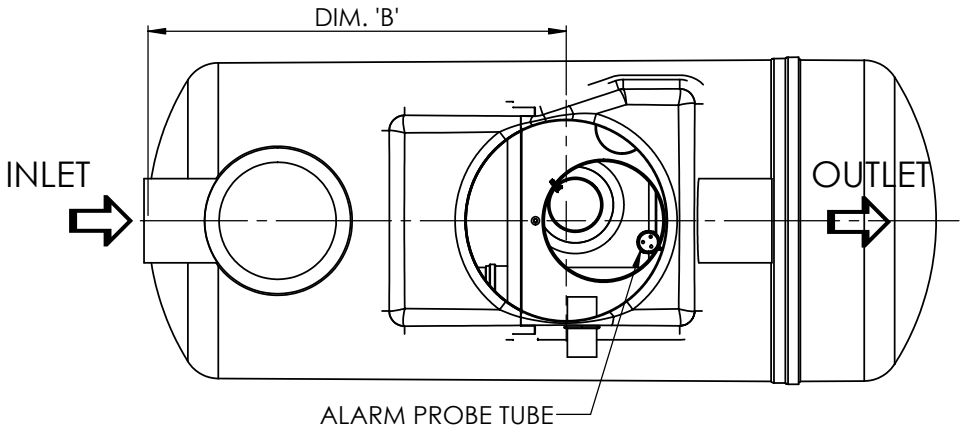
Pipe Mounted SXV Model for Energy & Velocity Dissipation

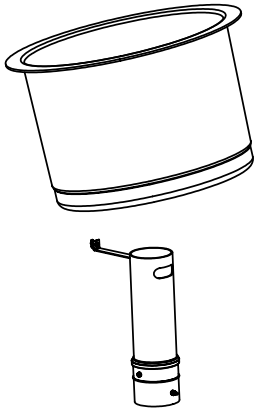
Hydro International®

Hydro International, 94 Hutchins Drive, Portland, ME 04102
Tel: (207) 756-6200
Email: stormwaterinquiry@hydro-int.com
Web: www.hydro-int.com/hydro-brake

HB_SS_A_2203

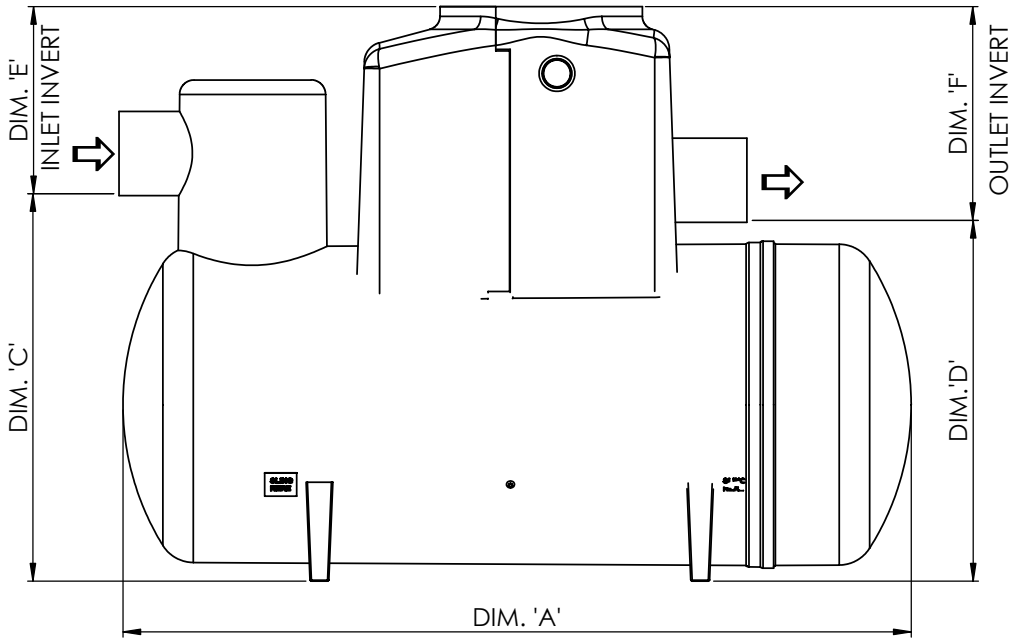
Appendix K – Petrol Interceptor Details

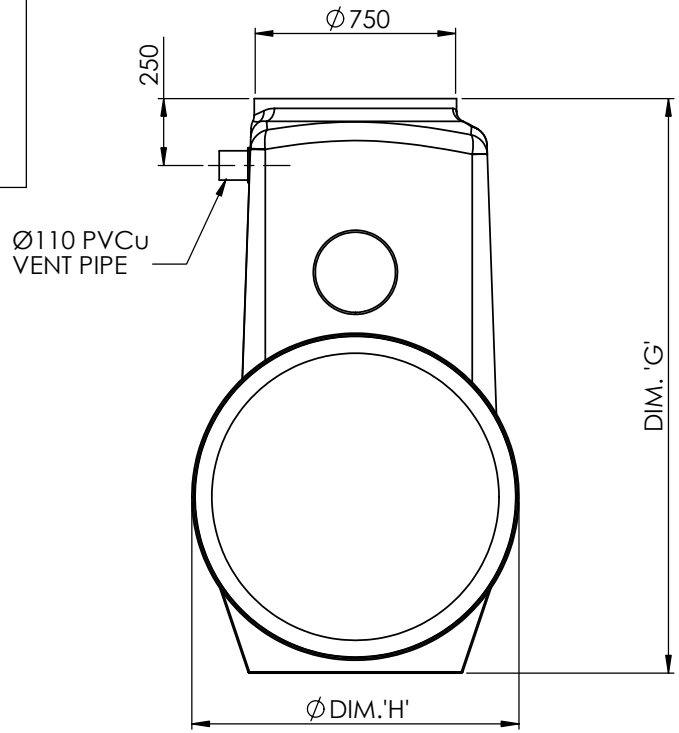




EXTENSION PARTS (IF REQUIRED) INCLUDED IN PRODUCT CODE

NOTES
1. UNITS ARE SUPPLIED WITH THE STANDARD (MINIMUM) PIPEWORK SIZE, AND ORIENTATION SHOWN ON THE DRAWING. THE STANDARD EN858-1 STATES MINIMUM CONNECTION SIZES, UNITS ORDERED WITH DIFFERENT SIZE CONNECTIONS MAY NOT BE FULLY COMPLIANT WITH THE STANDARD. PLEASE CONSULT OUR SALES DEPARTMENT FOR DETAILS OF AVAILABLE OPTIONS, BUT PLEASE NOTE WE DO NOT ALTER INTERNAL PIPEWORK.
2. ALL UNITS SUPPLIED ARE CLASS 1 AND INCLUDE A COALESCER.
3. EXTENSION PARTS FOR DEEPER INVERTS CAN BE PROVIDED FOR ON SITE ASSEMBLY.
4. ALL UNITS REQUIRE APPROPRIATE CONCRETE BASE, COVER AND FRAME TO SUIT APPLIED LOADINGS.
5. THIS DRAWING SHOULD BE USED FOR DIMENSIONAL INFORMATION ONLY.
6. A Ø76mm TUBE IS SUPPLIED TO HOUSE AN OIL ALARM PROBE.





UNIT	NOMINAL FLOW (l/sec.)	DIM.'A'	DIM.'B'	DIM.'C'	DIM.'D'	DIM.'E'	DIM.'F'	DIM.'G'	DIM.'H'	STD. PIPE Ø	APPROX. EMPTY WEIGHT (kg)	FALL ACROSS UNIT
NSBE010	10.0	2070	1095	1450	1350	700	800	2150	1220	315	160	100
NSBE015	15.0	2950	1560	1450	1350	700	800	2150	1220	315	200	100
NSBE020	20.0	3893	2016	1450	1350	700	800	2150	1220	375	220	100
NSBE025	25.0	3575	1900	1680	1580	700	800	2380	1420	375	300	100
NSBE030	30.0	4265	2263	1680	1580	700	800	2380	1420	450	325	100

Please check with Kingspan Environmental that this drawing is the latest issue

Issue	Date	Drawn by	Approved by	Description
05	24.06.13	T.Kelly		CC1131 - Case Feet Changed
04	13.02.13	T.Kelly		CC981 Phase 2 - NSBE025 & 030 Added

Material : Various	Tolerance :
Finish :	Thickness : n/a
Weight :	Surface Area :

Drawing : DS1155

NSBE010 - NSBE030 Bypass Separators

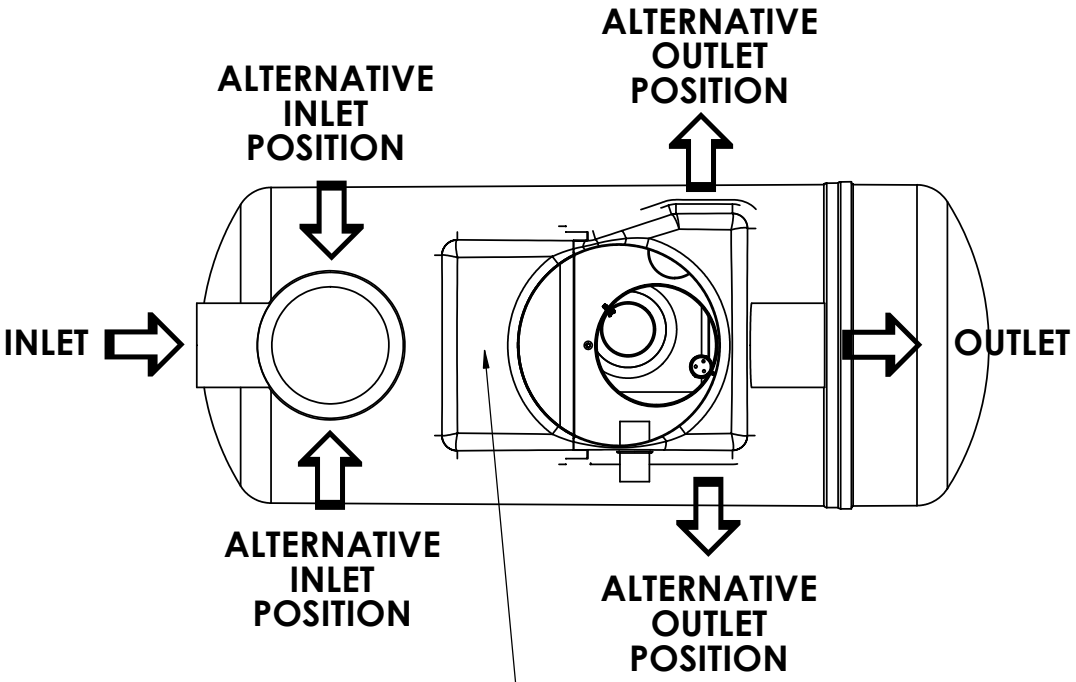
All dimensions in mm

Scale: Not to scale

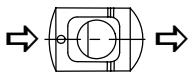
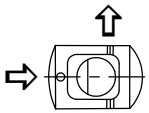
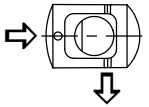
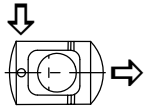
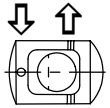
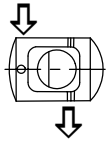
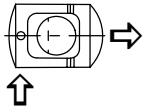
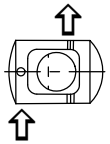
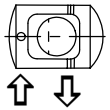
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Please Note:-
Due to the physically small size of the NSBE010, the inlet pipe, all orientation options, is fitted directly into this turret.

Pipe Orientation Options		
OPTION A 	OPTION B 	OPTION C 
OPTION D 	OPTION E 	OPTION F 
OPTION G 	OPTION H 	OPTION K 

Material : Various	Tolerance (unless stated) :	**Drawing : DS1155**	Page 2 of 2
Finish :	Thickness : n/a		
Weight : 229.91 Kg	Surface Area : m²	NSBE010 - 030 BYPASS SEPARATORS	
Modelled By :			

All Dimensions In mm | Scale: Do Not Scale | Third Angle Projection

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