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Glenveagh Homes

Glenveagh Homes Ltd.
Residential Development, Ennis, Co. Clare

Civil Works Design Report

Proposed Residential Development, Ennis, Co. Clare

Civil Works Design Report

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Table of Contents

Table of Figures

Appendices

Appendix A – Foul Sewer Design and Calculation

Appendix B – Storm Sewer Design and Calculations

Appendix C - Bypass Petrol Interceptor

Appendix D - Irish Water Correspondence

Appendix E - Clare County Council Correspondence

1 INTRODUCTION

TOBIN Consulting Engineers were appointed to provide engineering consultancy services for a proposed residential development off Circular Road in Ennis, Co. Clare.

This report has been prepared to detail the civil works planning submission element of the proposed residential development. This report details the foul & storm drainage design and connection details, watermain design and connection details and the roads design for the development. It should be read in conjunction with the watermain, roads, foul and storm design drawings as outlined and noted herein.
The development will consist of:

1. The construction of 289 no. residential units comprising a mixture of 12 no. 1 bed apartments, 78 no. 2 bed townhouse/duplex units, 165 no. 3 bed dwelling houses, and 34 no. dwelling houses which will have an option of a 3 or 4 bedroom house-type;
2. 2. A 400.7m2 creche/childcare facility;
3. 3. The provision of landscaping, open space and amenity areas, including play/exercise equipment, a linear amenity walkway, informal play areas and local play areas;
4. 4. The provision 2 no. pedestrian connections to the existing public footpath along the N85, 2 no. pedestrian connections into Ballymacaula View Estate, improvements/upgrades to the pedestrian footpaths along Circular Road including an uncontrolled pedestrian crossing and pedestrian footpath provision along part of the Drumbiggle and Cahercalla Roads;
5. 5. All associated infrastructure and services including 1 no. vehicular access point onto Circular Road, car parking and bin storage, lighting, 2 no. ESB substations, drainage and 1 pumping station, boundary treatments at Ballymacaula, Drumbiggle, Circular Road, Ennis, Co. Clare.

An Environmental Impact Assessment Report and a Natura Impact Statement has been prepared in respect of the proposed development.

The following sections of this report outline the P.E.'s and wastewater flow rates, the proposed surface water drainage design, the proposed water main details and the proposed road network design. The site location and proposed development layout are presented in Figure 1 and Figure 2.

Figure 1 - Site Location (Google Maps)

Figure 2 – Proposed Development Layout

2 WASTEWATER DRAINAGE SYSTEM OVERVIEW

The proposed wastewater drainage system for the development will consist of a combination of gravity and pumped discharge to a local gravity foul sewer. All gravity sewers shall be laid under roads and open spaces.

Due to site topography a pumping station is required to service the development. The pumping station is to be located at the lowest point of the developable area in the northern section of the site. It is proposed to provide a pumping station capable of facilitating the proposed development while also allowing for future connection for the 7 no. existing dwellings facing onto the circular road and the small parcel of lands adjoining the applicants site boundary to the south. It is therefore proposed that the onsite pumping station will provide 24-hours storage for approximately 330 no. units and will comply with the requirements of the IW Code of Practice for Wastewater Infrastructure.

A newly constructed rising main will convey foul wastewater to the existing foul sewer network, *circa* 105m to the east of the site entrance.

The foul sewer network was designed using Innovyze MicroDrainage modelling software. Outputs from the foul sewer design can be found in **Appendix A** of this document. The proposed foul sewer network is presented graphically on drawing no. 11269-2101, 2102, 2103 & 2104.

It is proposed that all gravity foul sewer pipes within the network will be thermoplastic structured wall pipes. The maximum proposed gravity pipe diameter is 225mm and the minimum proposed gravity pipe diameter is 150mm. The maximum and minimum gradients shall be 1/21 and 1/200 respectively. All flow velocities within the proposed gravity foul drainage network fall within the limits of 0.75 and 2.5m/sec as set out in Irish Water Code of Practice for Wastewater Infrastructure. All foul sewer designs will be fully vetted by Irish Water prior to receiving an offer to connect.

3 STORM WATER DRAINAGE SYSTEM OVERVIEW

The proposed storm water drainage system has been designed to cater for all surface water runoff from all hard surfaces within the proposed development including roadways, roofs, parking areas etc. The development has been split into 7No. catchment areas.

All storm water generated by the catchment areas will flow by gravity and discharge via an Oil/Petrol Interceptor to 6No. soakaway units and 1No. Infiltration Basin, all strategically located. The storm water in the soakaways will infiltrate into the ground surrounding. The outfall from the infiltration basin will discharge via a hydro-brake manhole to a bio-swale running along the corridor adjacent to the N85 route. The storm water will then discharge to the Claureen River.

The storm sewer network was designed using Innovyze MicroDrainage modelling software. Outputs from the storm sewer design can be found in **Appendix B** of this document. The proposed storm sewer network is presented graphically on drawing no. 11269-2101, 2102, 2103 & 2104.

The maximum storm water pipe diameter is to be 450mm and the minimum proposed pipe diameter is 225mm, with a maximum and minimum gradient of 1/27 and 1/240 respectively. All flow velocities within the network fall within the limits of 0.75 and 3m/sec as set out in "Recommendations for Site Development Works" as published by the Department of Environment. The storm water network and infiltration basin are designed to accommodate the 100-year return period plus an additional 20% to account for the effects of climate change.

4 WATERMAIN OVERVIEW

Details of the watermain arrangement for the proposed development is presented in this report and in drawing no. 11269-2109, 2110 & 2111. It is proposed to connect a 150mm diameter watermain to an existing 350mm asbestos watermain, at the site entrance on the Circular Road. All watermain designs will be fully vetted by Irish Water prior to receiving an offer to connect. The 150mm diameter watermain will be constructed in accordance with Irish Water requirements.

A 150mm diameter watermain will be brought into the site along the main access road. This will service the site along with 100mm diameter watermain spurs into the smaller cluster of houses in line with Irish Water requirements. All watermain designs will be fully vetted by Irish Water prior to receiving a connection offer.

5 ROADS OVERVIEW

Vehicular access to the proposed development will be via an existing gated entrance on the Circular Road. The main access roads within the site are proposed to be 5.5m wide. There are also 7No. 'Homezone' areas proposed where vehicular and pedestrian access is shared. Maximum speed within the development is to be 30km/h, with several traffic calming measures such as raised pedestrian crossings, road narrowing & chicanes, shared surface areas.

There are a number of pedestrians only accesses throughout the proposed development, along the south, west and northwest boundaries. There are 2No. pedestrian accesses proposed at the end of the 'Home zone' areas in the south and southeast corners of the site which will connect pedestrian access from the development to the adjacent Ballymacaula View. There are further pedestrian access points proposed along the western boundary which borders the N85 road. The connections linking to the N85 footpath are connected to a proposed 3m wide shared cycle/pedestrian facility running the full length of the western boundary, stretching approximately 680m within the site. There is also a 3m wide shared cycle/pedestrian facility linking to this facility from the main entrance of the site.

The NTA are looking into the potential of adding a cycle-lane to the N85, that runs alongside the development. Should this be constructed it would enhance the cycling linkages to the surrounding areas.

All footways, shared cycle facilities, shared surface areas and open space areas are interconnected within the site, creating a vast amount of inter-connectivity for the

development. As part of this application, a Traffic and Transport Assessment and Road Safety Audit have been prepared and submitted. Refer to these separate documents for further details.

6 WASTEWATER DRAINAGE DESIGN

6.1 Introduction

It is proposed that the wastewater will flow through the gravity foul sewer network within the development to a pumping station located at the lowest point of the developable area in the northern section of the site. From here it will be pumped via a 110mm HDPE Rising Main to an existing 225mm diameter foul sewer which runs in a south easterly direction on Cahercalla Rd, c.105m east of the site entrance. A new Discharge Manhole is to be constructed at connection location in accordance with Irish Water Standard Detail STD-WW_29. The proposed foul sewer network is presented graphically on drawing nos. 11269-2101, 2102, 2103 & 2104, with drawing nos. 11269-2105 & 2106, showing the foul manhole schedule and drainage schedule respectively.

The pipework for the wastewater drainage system has been designed to provide for six times the dry weather flow in accordance with the Irish Water Code of practice and standard details. The proposed foul sewer networks have been designed using Innovyze MicroDrainage 2018.1.1 modelling software. The results and outputs from the modelling can be found in **Appendix A**.

6.2 Loading Rates

An average rate of 2.7 P.E. per dwelling has been considered for the development to account for the varying unit occupancies. The sewer network has been designed to cater for 6 times the dry weather flow rate. The occupancy per dwelling and peak flow rate figures have been obtained from the Irish Water Codes of Practice as per Wastewater Code of Practice, Appendix C – Gravity Sewer Design Requirements, section 1.2.1 Housing Density & Occupancy.

150 litres per head per day plus an additional 10% allowance to account for infiltration within a new development have been considered in the foul sewer design as per Irish Water Code of Practice for Wastewater Infrastructure - Section 3.6 Hydraulic Design for Gravity Sewers.

6.3 Pumping Station

The pumping station will be designed to be capable of facilitating the proposed development while also allowing for future connection for the 7 no. existing dwellings facing onto the R474, Circular Road and the small parcel of lands adjoining the applicants site boundary to the south.

The pumping station will be designed in accordance with the requirements set out in the Irish Water specification for wastewater systems IW-CDS-5030-03. The pumping station is a minimum of 15.0m from boundary of the nearest dwelling in line with Irish Water guidance and it is designed to cater for 24-hr storage. for *circa* 330 No. dwellings, in accordance with Irish Water requirements.

Therefore:

446 x 330 no. units = 147,180 litres/day = 147.180m^3/day

Therefore, for 24-hour DWF storage of 147.180m^3 capacity is required.

Provide 9.0m long x 7.5m wide x 2.2m deep storage volume (below incoming invert) = 148.5m^3

Therefore 148.5m^3 > 147.18m^3 = OK

Therefore, tank volume required = 148.5m^3 for 24-hour storage

The pumping station location is illustrated on drawing no. 11269-2104 and includes a 5m wide pull in area to allow for an occasional tanker or service vehicles to be parked outside the pumping station. It is estimated that tanker movements to the site would be minimal and subject to the operational efficiencies of the pumping station. However, it would be anticipated that no more than 2 - 4 tanker visits would be required per annum. All designs will be fully vetted by Irish Water prior to Statement of Design Acceptance being received. Typical pump station details can be seen on drawing no. 11269-2130.

6.4 Wastewater Discharge

It is proposed that the pumping station located within the site extents will convey wastewater via a rising main to the existing 225mm diameter foul sewer located on Cahercalla Road. The proposed connection point, as shown on drawing no. 11269-2104, is located c.105m east of the site entrance boundary. A new Discharge Manhole is to be constructed at connection location in accordance with Irish Water Standard Detail STD-WW_29.

A pre-connection enquiry was submitted to Irish Water in relation to the connection of 330 no. units. A confirmation of feasibility letter was received from Irish Water confirming the proposal is feasible subject to minor upgrade works to the wastewater treatment plant. IW note in their response that these specific details relating to the upgrade works required shall be discussed prior to connection application stage. A statement of Design acceptance was also received from Irish Water for the development. All Irish Water correspondence is attached in **Appendix D** of this report.

6.5 Irish Water Correspondence

Following our stage 2 meeting we have had further discussions with Irish Water in relation to the wastewater proposed for the site. The following information has been received regarding the existing IW wastewater treatment plant and the wastewater network:

<u>Wastewater Treatment Plant Assessment:</u>

Irish Water advise that upgrade works at the WWTP will be carried out by Irish Water as part of the Irish Water Capital Investment Plan (CIP). These minor upgrade works consist of the upgrading of the inlet screen at Francis Street and the forward feed pumps. These works, however, do not impact our current residential development. Irish Water has confirmed in their

latest capacity register that there is wastewater treatment capacity to accept the current proposed development.

Wastewater Network Assessment:

The proposed development requires a network extension, a wastewater pumping station and rising main. 24-hour storage and real time controls to limit pumping only if hydraulic issues exist downstream. (The need for controls required will be advised by Irish Water at connection application stage).

The network extension, the WWPS and Rising Main will all be constructed as part of the proposed development and funded by the developer.

The proposed, (PCE 21003780), is to pump wastewater from the site. No upgrades to any existing Irish Water owned pumping station and rising main are required for the proposed development.

Therefore, we are satisfied that the proposed development can be served by Irish Water with its existing capacity and the minor upgrades to be carried out by Irish Water will not impact the serving of the development.

7 STORM WATER DRAINAGE DESIGN

7.1 Introduction

It is proposed to use a Sustainable Urban Drainage Systems, (SuDS) approach to storm water management throughout the site. This overall strategy aims to provide an effective system to mitigate the adverse effect of urban storm water runoff on the environment by reducing runoff rates, volumes and frequency, and reducing pollutant concentrations in surface water and emulate the greenfield runoff rate. The proposed SuDS features in the development are permeable paving on driveways, cellular underground soakaways, petrol interceptors, a hydro-brake flow control, an infiltration basin and bio-swale.

The storm water drainage design has been undertaken using Innovyze MicroDrainage modelling software. The design inputs, results and outputs from the analysis are shown in Appendix B of this report. The analysis considered the 100-year return period plus an additional 20% to account for the effects of climate change.

The proposed residential development has been divided into 7No. catchment areas. 6 of the catchment areas will discharge to soakaways and percolate to the ground. Each soakaway has been strategically located to cater best for the associated catchment area. The 7th catchment area, catering for the northern section of the site, will discharge via gravity to a proposed infiltration basin, where it will both infiltrate to the ground and discharge to a bio-swale at a controlled rate. The bio-swale will in-turn discharge to the Claureen River.

Each soakaway network will also have a 150mm overflow in the case of an emergency. These are strategically located at points to allow the network to back up to a certain level and is connected to the closest network downstream to it.

There is an outfall proposed from the infiltration basin at invert level. Water from the basin will both infiltrate to the ground and flow from this outfall to a hydro brake manhole located alongside it. From here the water will discharge, at a controlled rate, to a bio-swale which runs along the corridor adjacent to the N85 road before discharging to the Claureen River located approximately 265m North of the basin.

All storm water collected in the proposed storm water sewer networks will flow through Oil/Petrol Interceptors and silt traps prior to discharging to the soakaways and infiltration basin which will serve to prevent hydrocarbons and debris entering the ground. The location of the soakaways and infiltration basin are shown graphically on drawing no.s 11269-2101 to 2104. A typical petrol interceptor brochure can be found in **Appendix C**.

7.2 Soakaway (BRE 365)

Storm water from roof run-off and impermeable areas will discharge to 6No. soakaways on the site. The storm water discharges to groundwater and will be off cellular storage for 95% porosity. The soakaways are designed to hold water for the largest storage required over a 48-hour storm period with rainfall depths taken for the 100-year return period + 20% for climate change for sliding durations obtained from Met Eireann.

Soakaway tests were carried out during a site investigation in accordance with BRE Digest 365:2016 to establish the achievable infiltration rates on site. Conventional infiltration rates were used in the MicroDrainage modelling calculations to determine suitable soakaway volumes and invert levels. The infiltration rates were applied to the sides of the soakaways only, omitting the base. Results of the calculations and long sections can be found in **Appendix B**. A Typical Attenuation/Soakaway Unit & Cross Section Detail is shown on drawing no. 11269-2125.

7.3 Kingspan Klargester Bypass Separator

It is proposed to install a Bypass Petrol Interceptor upstream of the connection into each of the proposed soakaways. Locations of the interceptors can be seen graphically on drawing no.s 11269-2101 to 2104. Storm water entering each soakaway will include run-off from the roadways and parking areas throughout the site and therefore may have hydrocarbons within their flow. These hydrocarbon pollutants require removal and are not to be discharged back into the environment. The separator has been sized to cater for roads, footways and driveway areas of each catchment area.

From the selection tables in the separator product brochure, attached in **Appendix C**, and using the drainage area per square meter of each catchment, the following would be required, (or similar products approved):

- Network A – NSBP006
- Network B – NSBP003

- Network C – NSBP003
- Network D – NSBE010
- Network E – NSBE010
- Network F – NSBP006
- Network G – NSPB004

7.4 Infiltration Basin

The storm water drainage strategy proposes to provide an open infiltration basin located towards the northernmost area of the development as can be seen in drawing no. 11269-2103 & 2104 and cross sections on drawing no. 11269-2124.

Storm water is collected from the surrounding catchment area by road gullies and flows via the gravity storm sewer network to the infiltration basin, which lies at the lowest elevation within the development, thus making it ideally located. Prior to discharging to the basin, the storm water will flow through a petrol interceptor and then through a layer of clean crushed stone as per typical detail in drawing no. 11269-2131.

The infiltration basin has been designed to cater for the catchment area and the overflows from each of the soakaways if needed. The basin is relatively shallow at approximately 1.5m deep, designed with 4No. step formations at a 1/4 slope. Which can be seen in the cross-section drawing.

The infiltration basin provides several forms of treatment to the collected water within it. As a result of the size of the basin, much of the bacteria and pollutants that enter the basin settle over time prior to reaching the outfall pipe. Furthermore, infiltration basins can support vegetation and plant life, which provide further pollutant treatment and removal. The plants absorb dissolved pollutants and convert them into less harmful materials. Microorganisms can establish themselves in these basins too which can further treat and breakdown pollutants within the basin. Common pollutants that can be removed or reduced by these processes include bacteria, nitrogen, phosphorus, total suspended solids, oil and particulate matter from vehicles.

Energy from inflowing storm water as it enters the basin is absorbed by a proposed flow spreader, in this case the clean crushed stone and/or any water already in the basin, thus inflowing water does not cause erosion of materials at the base of the basin. The Infiltration basin also provides water quantity control as it retains the runoff and release it into watercourses at a pre-development flow rate.

Inspection of inlet and outlet pipes of infiltration basin should be performed quarterly to ensure there is no clogging, which could result in a build-up of water within the basin. Furthermore, the basin should be inspected for nuisance vegetation quarterly for the first 2-3 years, which should be removed if discovered to maintain a healthy treatment system and establish the marsh. Aquatic vegetation within the basin should be cut back and thinned when necessary.

The basin will need to be checked for erosion, subsidence and sediment accumulation, which will be required to be removed once every 5 to 7 years or when half of the forebay depth is filled with sediment.

The size of the infiltration basin was calculated using Innovyze MicroDrainage modelling software and Site 3D modelling software.

7.5 Storm Water Outfall

Storm water from the infiltration basin shall discharge into the Claureen River via a hydro brake manhole, which will limit the amount of water discharging to the river, and an open channel bioswale. The bioswale, approximately 190m in length, will run along the corridor of the N85 road.

The inlet to the Basin and the swale consists of a perforated outfall pipe wrapped in a geotextile membrane. The pipework will stop a minimum of 2 meters short of the outfall where the storm water will flow through a layer of 100 to 150mm clean crushed stone.

The amount of water discharged from the hydro brake manhole will be determined by using the allowable Greenfield Runoff rate for the developable area of the site – 8.9Ha. At 2 litres per second per hectare this equates to 17.8l/s maximum discharge rate.

The water will flow from the outfall pipe through a layer of clean crushed stone which will prevent debris from entering the bioswale and the river. The water will flow through the stone layer and into a bioswale which will provide further infiltration and storage, from which it will directly enter the Claureen River.

A letter of consent has been obtained from Clare County Council for the laying of the overflow storm sewer along the N85 verge and discharging of the overflow storm water to the Claureen River. Refer to Appendix E.

It is to be noted that all on site storm water storage facilities have been sized to cater for all storm water generated within the site boundary of the development. The existing attenuation areas that are being used for the N85 road drainage are stand alone and separate to the proposed development drainage network. There are no links in the proposed storm water network to the existing N85 drainage attenuation tanks and therefore will not impact on the existing N85 drainage system.

8 WATERMAIN LAYOUT

8.1 General Watermain Layout

The proposed watermain layout for the site is presented graphically in drawing no. 11269-2109, 2110 & 2111. The watermain layout has been designed in accordance with Irish Water Code of Practice for Watermain Infrastructure IW-CDS-5020-03.

It is proposed to connect a 150mm diameter watermain to an existing 350mm asbestos watermain at the site entrance on the R474 Circular Road. All watermain designs will be fully vetted by Irish Water prior to receiving an offer to connect. The 150mm diameter watermain will be constructed and connected in accordance with Irish Water requirements.

The water supply required for the proposed development shall be via a 150mm diameter watermain along the main spine road of the development. A 100mm diameter PE watermain will breach off this spine main to service the clusters of houses/Cul-de-sacs.

In accordance with Local authority/Irish Water standards, a water meter, and Logging Device (Larsen Type) are proposed at the connection into the proposed site. A sluice valve is also proposed to allow for possible disconnection of water meters by the Local Authority/Irish Water.

9 ROADS

All internal roads have been designed in accordance with the requirements of Design Manual for Urban Roads and Streets and the Recommendations for Site Development Works for Housing Areas. Autotrack vehicle swept path analysis has been completed for the proposed site layout for Large Car, Refuse Vehicle and Fire Tender, drawing no. 11269-2115 to 11269-2123 respectively, to ensure the vehicles can safely manoeuvre around the site. In addition, a Road Safety Quality Audit and a TTA incorporating a Mobility Management Plan, has been carried out as required by Clare County Council and is included within the application package.

Road levels for the site have been derived taking cognisance of the existing topography and ground conditions. All roads shall be constructed on a suitable bearing with a road construction makeup as per detail shown on drawing 11269-2131. All roads will include a 1:40 camber from the centre of the road out and the shared-surfaces a 1:40 crossfall from the outside of the road in. Longitudinal gradients of road sections lie between 1:21 and 1:200 to ensure adequate storm water drainage is achieved.

Gullies are located, at a minimum, every 200m^2 with local low points allowing for double gullies as per Recommendations for Site Development Works for Housing Areas to ensure storm water drainage will not be blocked.

The use of shared-surfaces and pedestrian crossing points along with strategically positioned drop kerbs and tactile paving will allow for full linkage for visually impaired and less-able pedestrians while also prioritising pedestrian movements over vehicular movements.

Vehicular access to the proposed development will be from the existing Circular Road, (R474). The proposed access road width is 5.5m with a 2m wide footpath on the left-hand side of the road, entering the site, and a 3m wide shared footpath on the right-hand side which will accommodate cyclists. This shared facility continues to the west of the development, where it will link with another shared facility that stretches the full length of the development along the western boundary, with both accumulating in over 970m of cycle-facility. All footways and shared cycle facilities are interconnected within the site, with links to each block of residential units and/or cul-de-sacs, creating a vast amount of inter-connectivity for the development.

Due to restrictions within the development, it is not feasible to include a cycle path on both sides of the internal roads. It is proposed for cyclist and motorists to share the carriageway where the shared footpath discontinues. This complies with regulations set out in the National Cycle Manual, section 1.7.4 (see figure 3 below) *'shared street'*, due to low volume of traffic and a calm traffic speed of maximum 30km/h to be adopted within the proposed development.

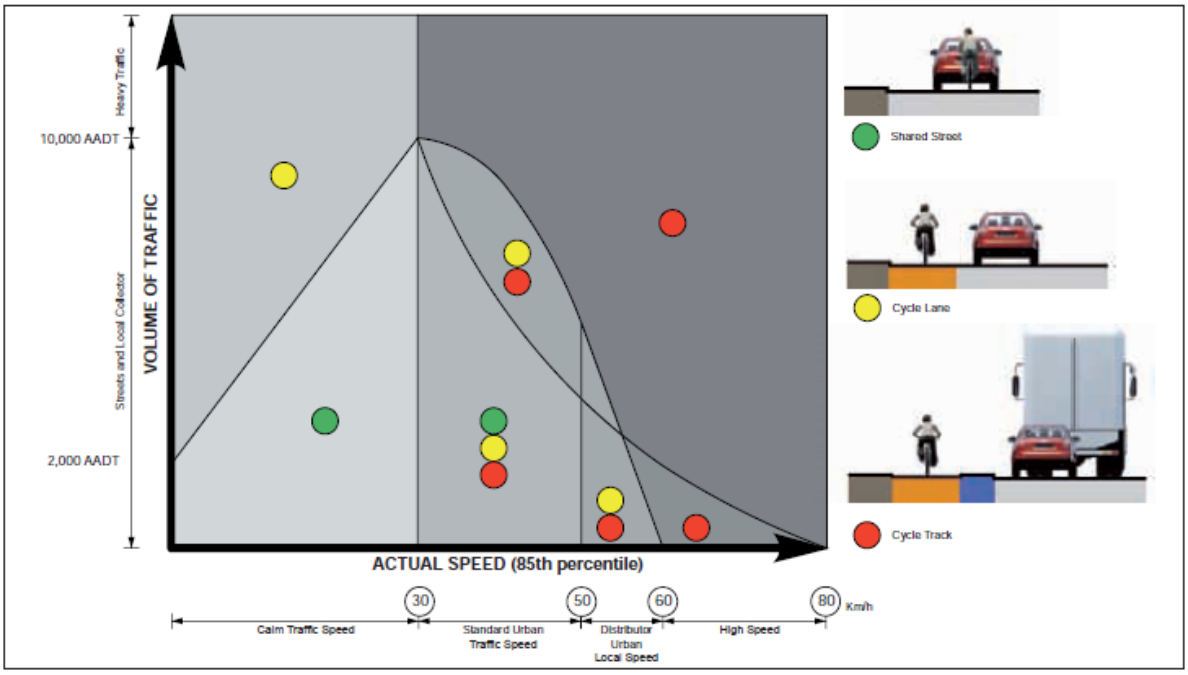


Figure 3 - Guidance Graph for Cycle Environment

A visibility splay of 59m sightlines was also achieved at the proposed site entrance as per Design Manual for Urban Roads and Streets section 4.4.5. The 59m sightlines are required from the design speed of Circular Road – 50km/h. This is for the Stopping Site Distances of forward visibility on bus routes, section 4.4.4 of the Design Manual for Urban Roads.

There are a number of pedestrian accesses only locations throughout the proposed development, along the south, west and northwest boundaries. There are 2No. pedestrian accesses proposed at the end of the 'Home zone' areas in the south and southeast corners of the site which will connect pedestrian access from the development to the adjacent Ballymacaula View. There are further pedestrian access points proposed along the western boundary which borders the N85 road. The connections linking to the N85 footpath are connected to a proposed 3m wide shared cycle/pedestrian facility running the full length of the western boundary, stretching approximately 680m within the site. There is also a 3m wide shared cycle/pedestrian facility linking to this facility from the main entrance of the site.

10 FIRE FIGHTING FLOWS

To meet required fire flow requirements, it is proposed to install a static storage capacity within the site Figure 5 for typical detail. This is being provided as, in general, Irish Water will not guarantee available fire flow within the hydrants located on site. It is proposed to provide an underground storage tank capable of supplying 8 l/s of flow for a 1-hour period. This equates to a minimum volume required for the site of 28,800 litres.

8 l/s is derived from the 'National Guidance Document on the provisions of water for Firefighting – Water UK 3rd Edition'. The tank shall be located within a grassed area and easily accessible by fire tenders and tankers should they need access. An 80mm diameter top up supply for tank will be provided from the main watermain which will include a shut-off valve should the supply need to be switched off for maintenance or in an emergency. The location of the tank is shown graphically on drawing no. 11269-2110

It is noted that in addition to the static storage tank, a significant volume of water will still be available from hydrants located throughout the development. Any specific requirements as requested by the local fire authority when applying for the Fire Certification will be incorporated at the detail design stage.

The above is subject to Irish Water Confirmation of Feasibility response, and should they note that if 8 l/s can be achieved within the network then the above tank may be omitted allowing the development to be serviced by the hydrants solely. Any such omissions will be agreed with the Fire Officer and Irish water in advance.

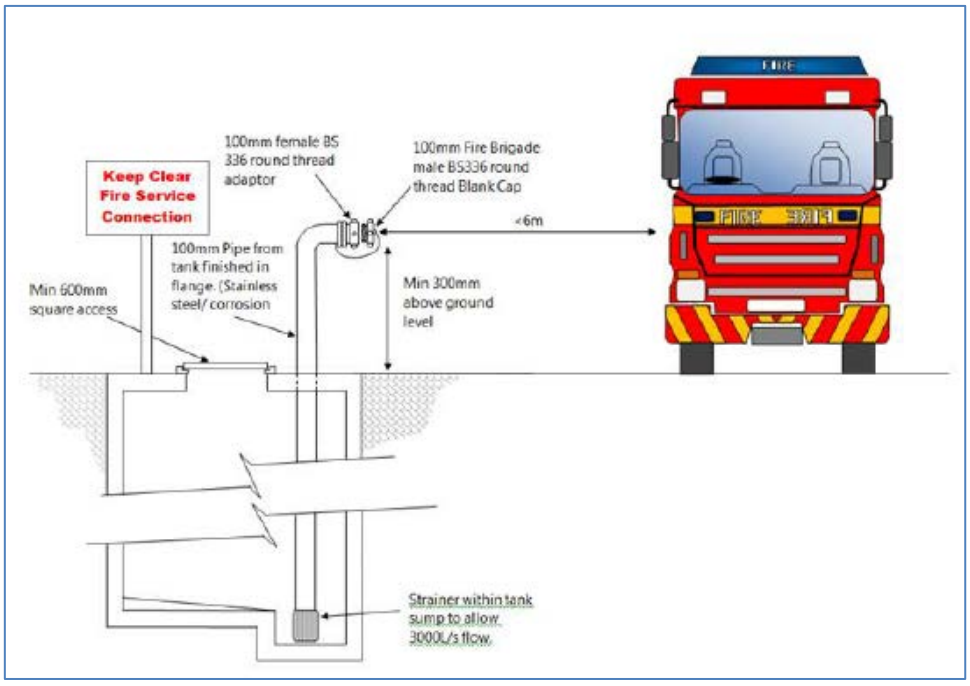


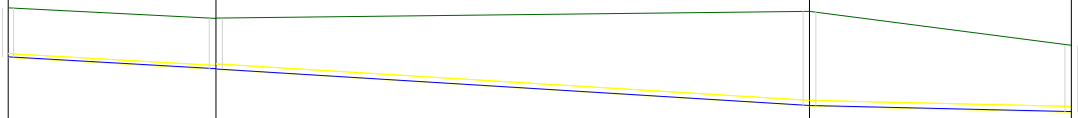
Figure 4 Typical cross section of a below ground static storage tank.

11 CONCLUSION

The Report should be read in conjunction with the associated drawings, layouts, and specifications. We trust that adequate detail has been provided for wastewater drainage layout and storm water drainage layout. Should you require any further detail, we will be happy to meet and supply same, as you may deem appropriate.

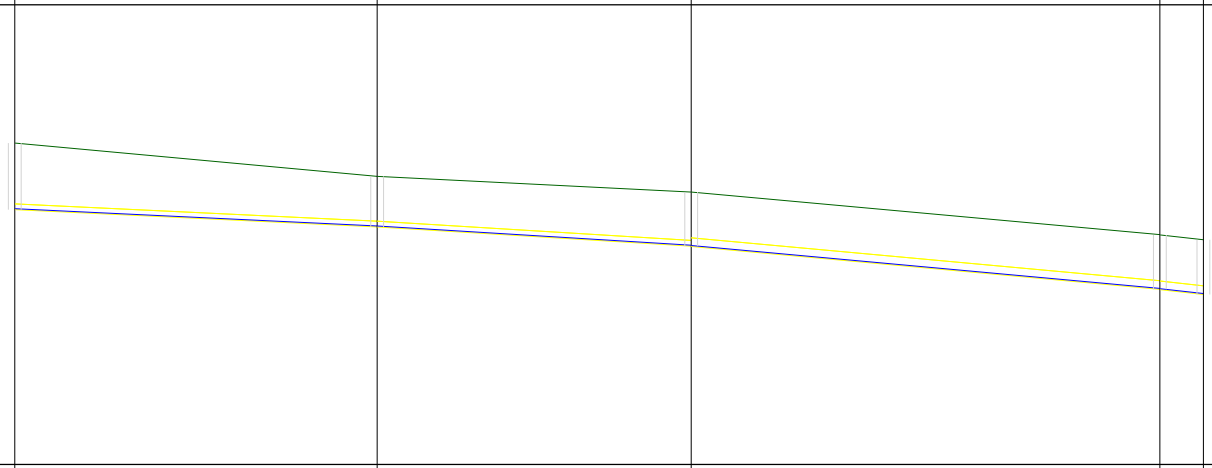
APPENDIX A

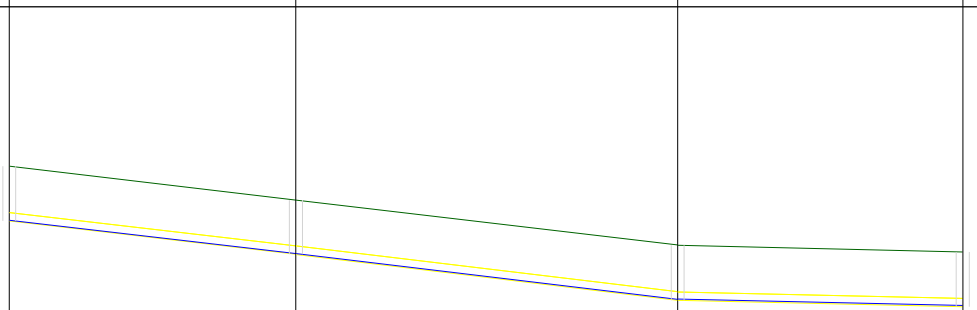
Foul Sewer Network & Calculations

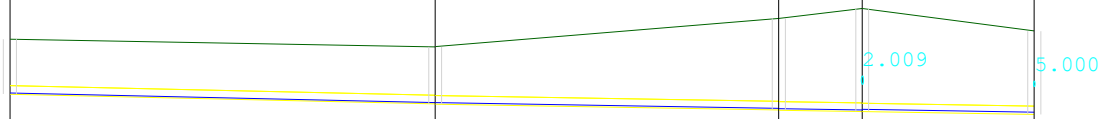
MH Name		F23	FMH25	FMH26	FMH27
Hor Scale 700 Ver Scale 200 Datum (m) 23.000					
PN		1.000	1.001	1.002	
Dia (mm)		100	150	150	
Slope (1:X)		59.9	56.6	149.6	
Cover Level (m)		30.500	30.216	30.402	29.500
Invert Level (m)		29.191 28.870	28.870 27.900	27.900 27.738	
Length (m)		19.236	54.946	24.241	

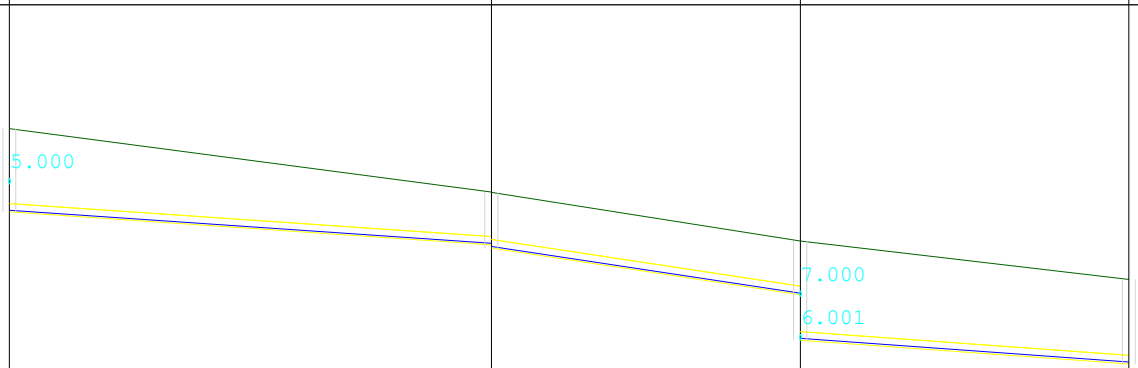
Fairgreen House
Fairgreen Road
Galway

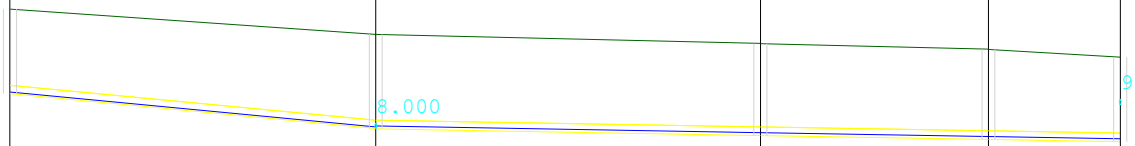
Date 17/06/2022 15:50 | Designed by michael.naughton
File 11269 - FOUL DRAINAGE.MDX | Checked by
Micro Drainage | Network 2018.1.1

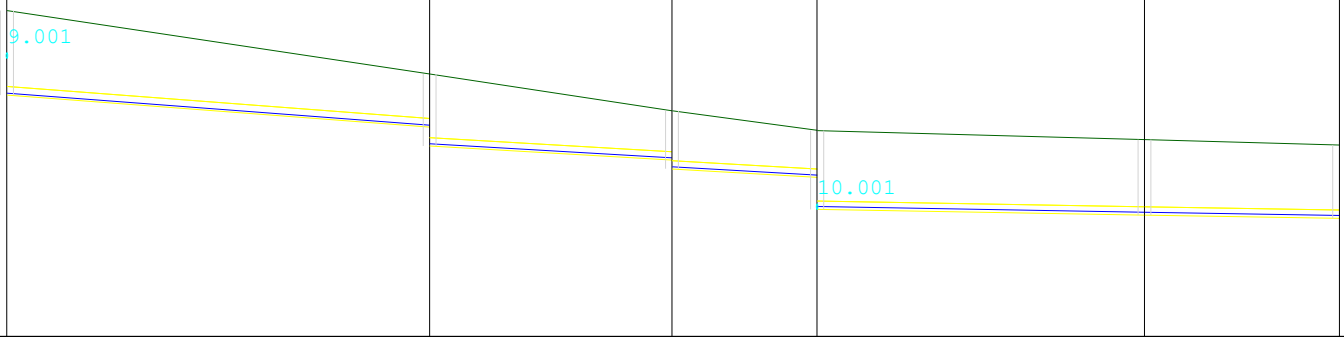
MH Name		FMH27		FMH28		FMH29			FMH31
Hor Scale 700 Ver Scale 200 Datum (m) 21.000									
PN		1.003		1.004		1.005			
Dia (mm)		150		150		225			
Slope (1:X)		73.2		56.4		38.0			
Cover Level (m)		29.500		28.618		28.201		27.067	26.940
Invert Level (m)		27.738	27.280	27.280	26.765	26.765	25.623	25.623	
Length (m)		33.544		29.070		43.386			

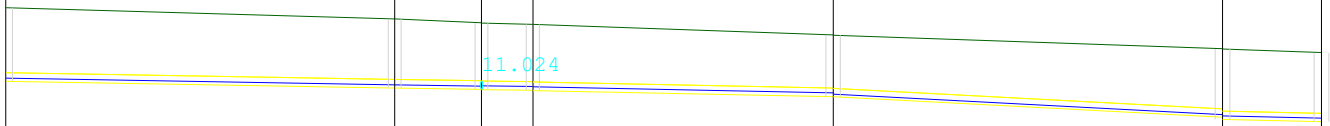
MH Name		FMH31	FMH32	FMH33	FMH34
Hor Scale 700 Ver Scale 200 Datum (m)19.000					
PN		1.007	1.008	1.009	
Dia (mm)		225	225	225	
Slope (1:X)		30.0	29.1	150.0	
Cover Level (m)		26.940	26.040	24.849	24.670
Invert Level (m)		25.489	24.605 24.605	23.390 23.390	23.214
Length (m)		26.524	35.346	26.393	

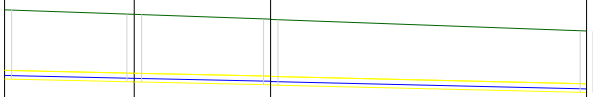
MH Name		FMH34	FMH35		FMH37	FMH38
Hor Scale 700 Ver Scale 200 Datum (m)18.000						
PN		1.010	1.011		1.013	
Dia (mm)		225	225		225	
Slope (1:X)		150.3	200.0		199.1	
Cover Level (m)		24.670	24.464	25.217	25.480	24.881
Invert Level (m)		23.214 22.952	22.952 22.793	22.793 22.754	22.754 22.674	
Length (m)		39.373	31.805		15.927	

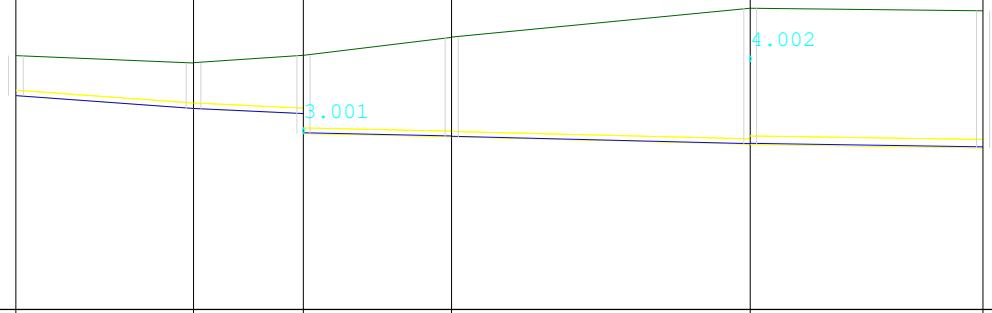
MH Name		FMH38	FMH39	FMH40	FMH41
Hor Scale 700 Ver Scale 200 Datum (m)16.000					
PN		1.014	1.015	1.016	
Dia (mm)		225	225	225	
Slope (1:X)		51.0	23.0	48.0	
Cover Level (m)		24.881	23.197	21.910	20.892
Invert Level (m)		22.674 21.800	21.723 20.480	19.283 18.650	
Length (m)		44.612	28.598	30.406	

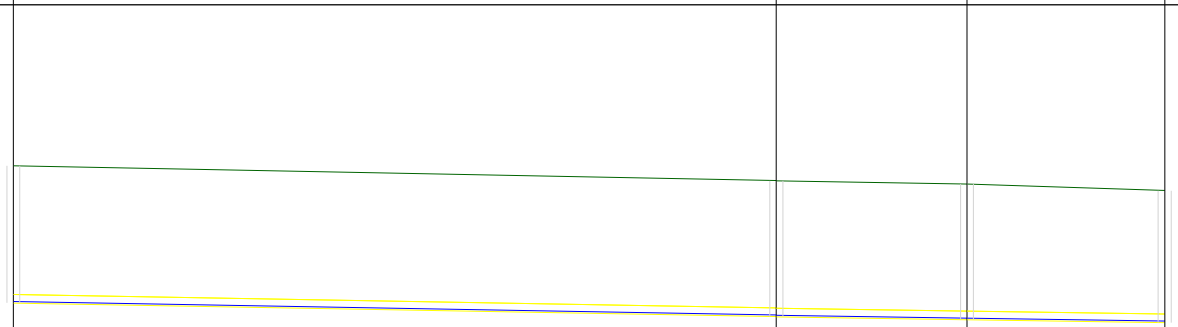
MH Name		FMH41	FMH42	FMH43	FMH43.1	FMH43.2
Hor Scale 700 Ver Scale 200 Datum (m)13.000						
PN		1.017	1.018	1.019	1.020	
Dia (mm)		225	225	225	225	
Slope (1:X)		36.6	200.1	199.1	200.0	
Cover Level (m)		20.892	20.223	19.978	19.826	19.618
Invert Level (m)		18.650 17.726	17.726 17.548	17.548 17.442	17.443 17.382	
Length (m)		33.861	35.610	21.104	12.203	

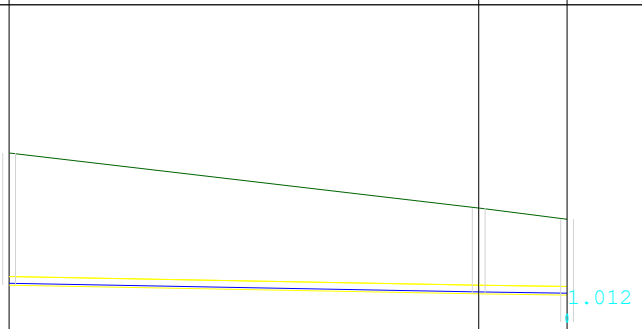
MH Name		FMH43.2	F25	FMH21.5	FMH21.4	FMH21.3	FMH21.2
Hor Scale 700 Ver Scale 200 Datum (m)11.000							
PN		1.021	1.022	1.023	1.024	1.025	
Dia (mm)		225	225	225	225	225	
Slope (1:X)		45.9	60.0	60.0	198.1	200.3	
Cover Level (m)		19.618	17.941	16.963	16.445	16.203	16.057
Invert Level (m)		17.382 16.530	16.034 15.660	15.424 15.200	14.356 14.203	14.203 14.113	
Length (m)		39.128	22.445	13.429	30.309	18.027	

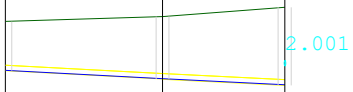
MH Name		FMH21.2			FMH21	F6	F5	F4
Hor Scale 700 Ver Scale 200 Datum (m) 8.000								
PN		1.026			1.029	1.030	1.031	
Dia (mm)		225			225	225	225	
Slope (1:X)		200.0			164.5	65.5	150.0	
Cover Level (m)		16.057	15.758	15.652	15.614	15.329	14.967	14.866
Invert Level (m)		14.113	13.933 / 13.933	13.893 / 13.893	13.869	13.700 / 13.700	13.150 / 13.100	13.039
Length (m)		35.996			27.798	36.039	9.163	

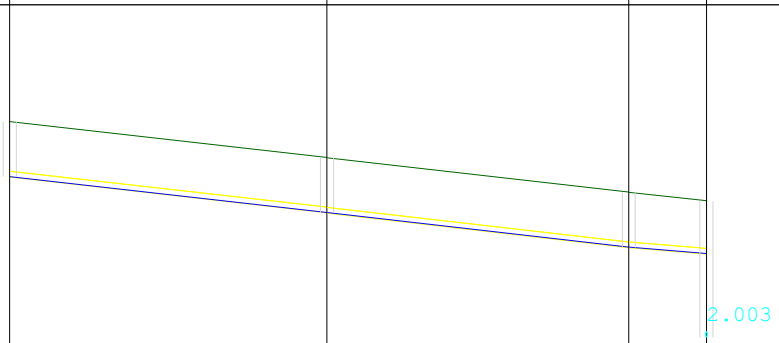
MH Name		F4	FMH22	FMH23	FMH24
Hor Scale 700 Ver Scale 200 Datum (m) 8.000					
PN		1.032	1.033	1.034	
Dia (mm)		225	225	225	
Slope (1:X)		150.2	150.4	149.9	
Cover Level (m)		14.866	14.742	14.612	14.301
Invert Level (m)		13.039 12.959	12.959 12.875	12.875 12.680	
Length (m)		12.014	12.632	29.233	

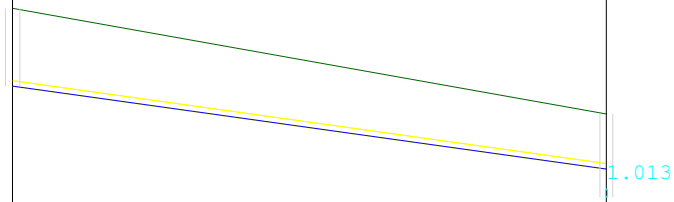
MH Name		F20	F21	F22	F46.1	FMH47	FMH48
Hor Scale 700 Ver Scale 200 Datum (m) 20.000							
PN		2.000	2.001	2.002	2.003	2.004	
Dia (mm)		150	150	150	150	225	
Slope (1:X)		47.7	73.5	148.1	140.7	227.0	
Cover Level (m)		26.715	26.518	26.721	27.198	27.968	27.894
Invert Level (m)		25.650 25.305	25.305 25.167	24.650 24.557	24.557 24.361	24.361 24.266	
Length (m)		16.441	10.179	13.718	27.634	21.563	

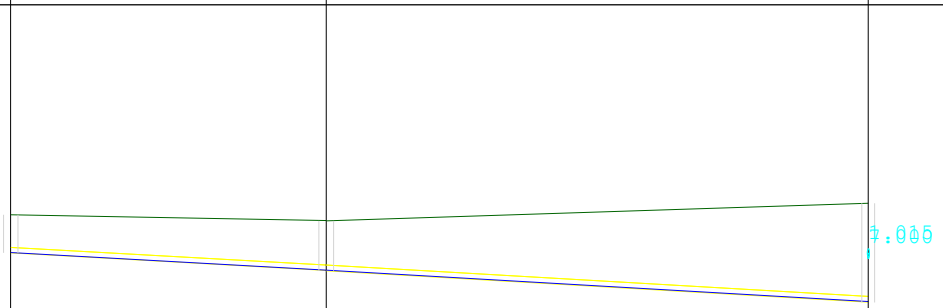
MH Name		FMH48	FMH49	F9	FMH50
Hor Scale 700 Ver Scale 200 Datum (m)20.000					
PN		2.005	2.006	2.007	
Dia (mm)		225	225	225	
Slope (1:X)		194.5	223.5	225.9	
Cover Level (m)		27.894	27.498	27.413	27.238
Invert Level (m)		24.266	23.903 / 23.903	23.824 / 23.824	23.743
Length (m)		70.621	17.659	18.298	

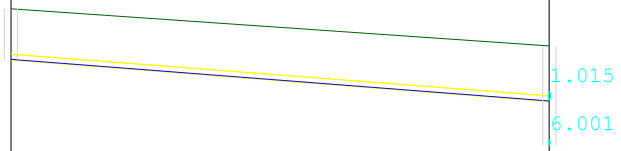
MH Name		FMH50		FMH37
Hor Scale 700 Ver Scale 200 Datum (m)19.000				
PN		2.008		
Dia (mm)		225		
Slope (1:X)		189.0		
Cover Level (m)		27.238	25.781	25.480
Invert Level (m)		23.743 / 23.513	23.513 / 23.474	
Length (m)		43.474		

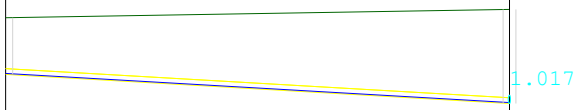
MH Name		F46.3	F46.2	F22
Hor Scale 700 Ver Scale 200 Datum (m) 20.000				
PN		3.000	3.001	
Dia (mm)		150	150	
Slope (1:X)		64.4	69.0	
Cover Level (m)		26.343	26.472	26.721
Invert Level (m)		25.040 24.814	24.814 24.650	
Length (m)		14.549	11.308	

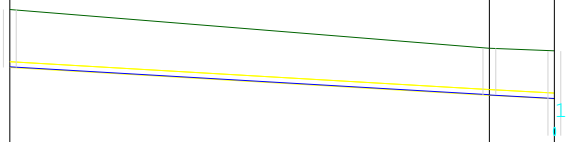
MH Name		FMH44	FMH45		FMH47
Hor Scale 700 Ver Scale 200 Datum (m)21.000					
PN		4.000	4.001		
Dia (mm)		150	150		
Slope (1:X)		30.8	30.5		
Cover Level (m)		30.064	29.108	28.194	27.968
Invert Level (m)		28.600 27.645	27.645 26.728	26.728 26.557	
Length (m)		29.367	27.941		

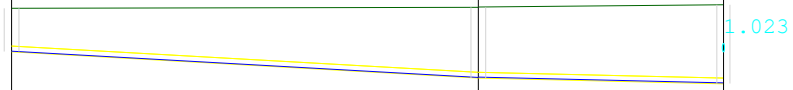
MH Name		F16	FMH38
Hor Scale 700 Ver Scale 200 Datum (m)19.000			
PN		5.000	
Dia (mm)		150	
Slope (1:X)		25.0	
Cover Level (m)		27.677	24.881
Invert Level (m)		25.609	23.410
Length (m)		54.965	

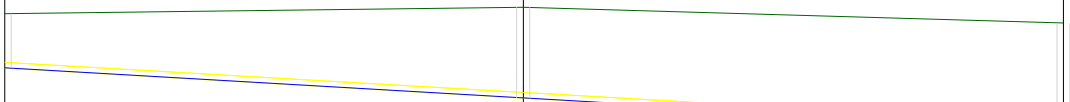
MH Name		F11	F12	FMH40
Hor Scale 700 Ver Scale 200 Datum (m)15.000				
PN		6.000	6.001	
Dia (mm)		150	150	
Slope (1:X)		62.0	60.0	
Cover Level (m)		21.599	21.444	21.910
Invert Level (m)		20.591 20.120	20.120 19.284	
Length (m)		29.201	50.174	

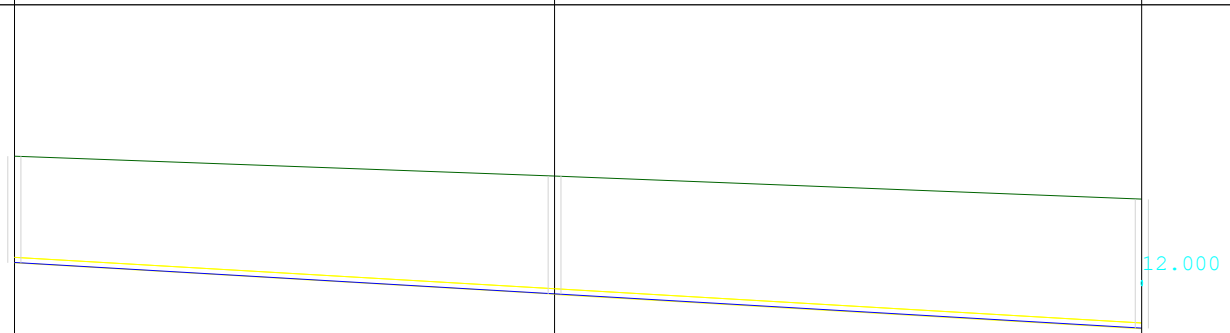
MH Name		FMH40.1	FMH40
Hor Scale 700 Ver Scale 200 Datum (m)15.000			
PN		7.000	
Dia (mm)		150	
Slope (1:X)		45.0	
Cover Level (m)		22.894	21.910
Invert Level (m)		21.544	20.437
Length (m)		49.832	

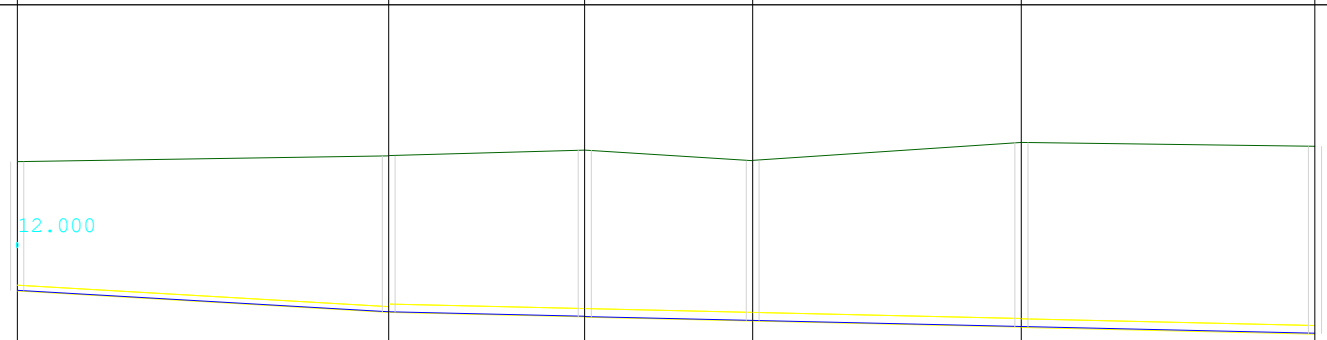
MH Name		F10	FMH42
Hor Scale 700 Ver Scale 200 Datum (m)13.000			
PN		8.000	
Dia (mm)		150	
Slope (1:X)		60.0	
Cover Level (m)		19.996	20.223
Invert Level (m)		18.504	17.727
Length (m)		46.644	

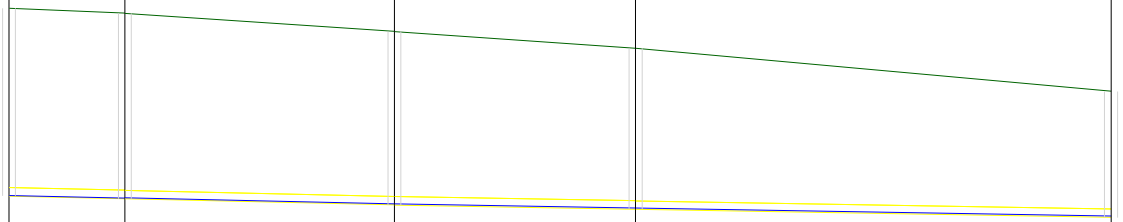
MH Name		FMH43.4		FMH43.2
Hor Scale 700 Ver Scale 200 Datum (m)13.000				
PN		9.000		
Dia (mm)		150		
Slope (1:X)		60.0		
Cover Level (m)		20.723	19.691	19.618
Invert Level (m)		19.190	18.450 / 18.450 / 18.350	
Length (m)		44.389		

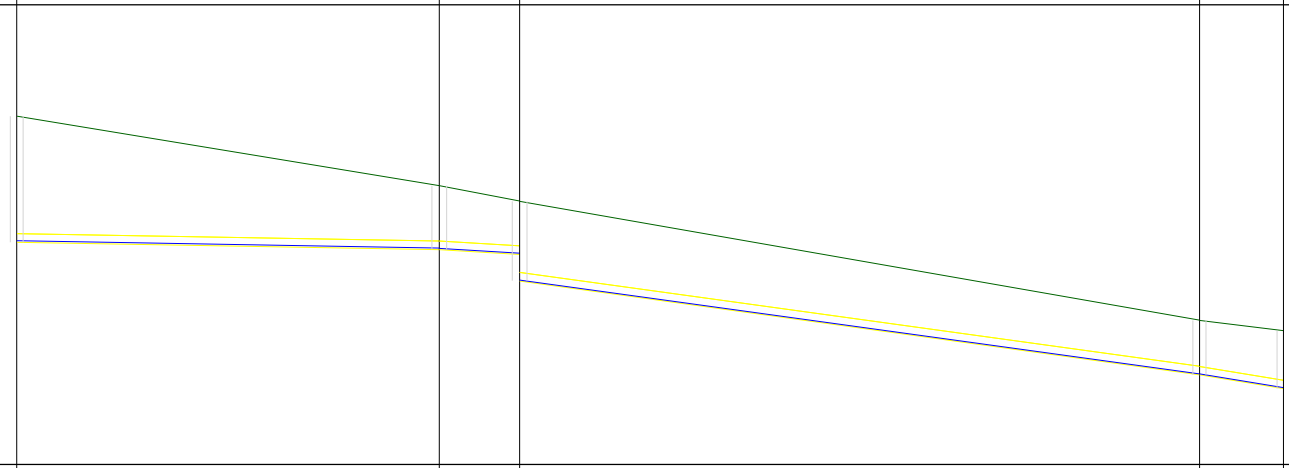
MH Name		F18	F19	FMH21.4
Hor Scale 700 Ver Scale 200 Datum (m) 9.000				
PN		10.000	10.001	
Dia (mm)		150	150	
Slope (1:X)		62.1	147.4	
Cover Level (m)		16.351	16.383	16.445
Invert Level (m)		15.206 14.510	14.510 14.356	
Length (m)		43.202	22.696	

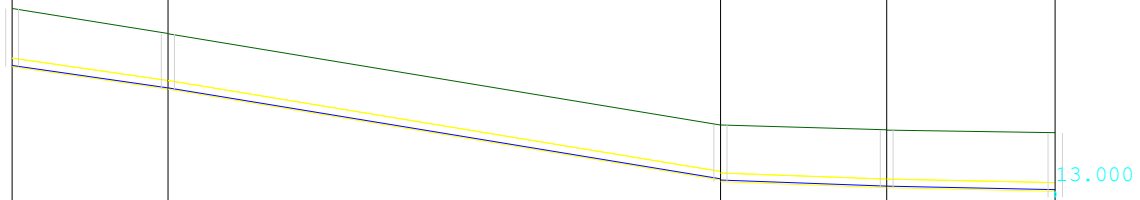
MH Name		F1a	F2a	F3a
Hor Scale 700 Ver Scale 200 Datum (m) 21.000				
PN		11.000	11.001	
Dia (mm)		150	150	
Slope (1:X)		60.0	60.0	
Cover Level (m)		28.400	28.570	28.150
Invert Level (m)		26.961 / 26.161	26.161 / 25.328	
Length (m)		48.000	50.000	

MH Name		F3a	F4a	F5a
Hor Scale 700 Ver Scale 200 Datum (m) 20.000				
PN		11.002	11.003	
Dia (mm)		150	150	
Slope (1:X)		60.0	60.0	
Cover Level (m)		28.150	27.622	27.007
Invert Level (m)		25.328 / 24.495	24.495 / 23.589	
Length (m)		50.000	54.360	

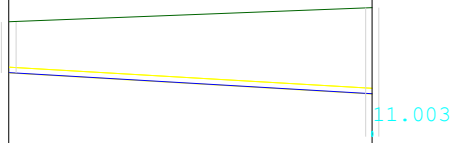
MH Name		F5a	F6a	F7a	F8a	F9a	F10a
Hor Scale 700 Ver Scale 200 Datum (m)19.000							
PN		11.004	11.005	11.006	11.007	11.008	
Dia (mm)		150	225	225	225	225	
Slope (1:X)		60.0	150.0	149.5	150.0	150.2	
Cover Level (m)		27.007	27.164	27.315	27.033	27.514	27.410
Invert Level (m)		23.589	23.016	23.016	22.895	22.895	22.791	22.791	22.625	22.625	22.444	
Length (m)		34.393	18.143	15.548	24.868	27.178	

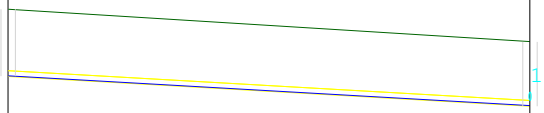
MH Name		F10a	F11a	F17	F12a	F13a
Hor Scale 700 Ver Scale 200 Datum (m)19.000						
PN		11.009	11.010	11.011	11.012	
Dia (mm)		225	225	225	225	
Slope (1:X)		151.0	150.3	199.3	200.1	
Cover Level (m)		27.410	27.278	26.796	26.352	25.212
Invert Level (m)		22.444 22.373	22.373 22.207	22.206 22.094	22.095 21.875	
Length (m)		10.720	24.955	22.321	44.014	

MH Name		F13a		F15a		FMH15
Hor Scale 700 Ver Scale 200 Datum (m)16.000						
PN		11.013		11.015		
Dia (mm)		225		225		
Slope (1:X)		199.5		25.3		
Cover Level (m)		25.212	23.369	22.955	19.809	19.537
Invert Level (m)		21.875	21.679 21.679	21.550 20.850	18.366 18.366	18.002
Length (m)		39.105		62.932		

MH Name		FMH15	FMH16	FMH17	FMH18	F15
Hor Scale 700 Ver Scale 200 Datum (m)11.000						
PN		11.017	11.018	11.019	11.020	
Dia (mm)		225	225	225	225	
Slope (1:X)		24.3	21.2	95.6	159.2	
Cover Level (m)		19.537	18.874	16.460	16.327	16.251
Invert Level (m)		18.002 17.409	17.409 14.996	14.960 14.799	14.799 14.701	
Length (m)		14.423	51.141	15.389	15.602	

MH Name		F15	FMH19	FMH20		F24
Hor Scale 700 Ver Scale 200 Datum (m) 9.000						
PN		11.021	11.022	11.023		
Dia (mm)		225	225	225		
Slope (1:X)		200.2	198.1	199.9		
Cover Level (m)		16.251	15.972	15.936	15.717	15.652
Invert Level (m)		14.548 14.275	14.275 14.230	14.230 14.018	14.018 13.893	
Length (m)		54.653	8.914	42.385		

MH Name		F5.1	F5a
Hor Scale 700 Ver Scale 200 Datum (m)19.000			
PN		12.000	
Dia (mm)		150	
Slope (1:X)		60.0	
Cover Level (m)		26.630	27.007
Invert Level (m)		25.280	24.719
Length (m)		33.636	

MH Name		F13	F15
Hor Scale 700 Ver Scale 200 Datum (m)10.000			
PN		13.000	
Dia (mm)		150	
Slope (1:X)		60.8	
Cover Level (m)		17.114	16.251
Invert Level (m)		15.343	14.548
Length (m)		48.301	

Fairgreen House
Fairgreen Road
Galway

Date 17/06/2022 15:51
File 11269 - FOUL DRAINAGE.MDX

Designed by michael.naughton
Checked by

Micro Drainage | Network 2018.1.1

Manhole Schedules for Foul Network 2

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
F23	30.500	1.309	Open Manhole	1050	1.000	29.191	100				
FMH25	30.216	1.346	Open Manhole	1200	1.001	28.870	150	1.000	28.870	100	
FMH26	30.402	2.502	Open Manhole	1200	1.002	27.900	150	1.001	27.900	150	
FMH27	29.500	1.762	Open Manhole	1200	1.003	27.738	150	1.002	27.738	150	
FMH28	28.618	1.338	Open Manhole	1200	1.004	27.280	150	1.003	27.280	150	
FMH29	28.201	1.436	Open Manhole	1200	1.005	26.765	225	1.004	26.765	150	
FMH30	27.067	1.444	Open Manhole	1200	1.006	25.623	225	1.005	25.623	225	
FMH31	26.940	1.451	Open Manhole	1200	1.007	25.489	225	1.006	25.489	225	
FMH32	26.040	1.435	Open Manhole	1200	1.008	24.605	225	1.007	24.605	225	
FMH33	24.849	1.459	Open Manhole	1200	1.009	23.390	225	1.008	23.390	225	
FMH34	24.670	1.456	Open Manhole	1200	1.010	23.214	225	1.009	23.214	225	
FMH35	24.464	1.513	Open Manhole	1200	1.011	22.952	225	1.010	22.952	225	
FMH36	25.217	2.424	Open Manhole	1200	1.012	22.793	225	1.011	22.793	225	
F20	26.715	1.065	Open Manhole	1350	2.000	25.650	150				
F21	26.518	1.213	Open Manhole	1350	2.001	25.305	150	2.000	25.305	150	
F46.3	26.343	1.303	Open Manhole	1200	3.000	25.040	150				
F46.2	26.472	1.658	Open Manhole	1200	3.001	24.814	150	3.000	24.814	150	
F22	26.721	2.071	Open Manhole	1200	2.002	24.650	150	2.001	25.167	150	517
								3.001	24.650	150	

Manhole Schedules for Foul Network 2

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
F46.1	27.198	2.640	Open Manhole	1200	2.003	24.557	150	2.002	24.557	150	
FMH44	30.064	1.464	Open Manhole	1200	4.000	28.600	150				
FMH45	29.108	1.463	Open Manhole	1200	4.001	27.645	150	4.000	27.645	150	
FMH46	28.194	1.466	Open Manhole	1200	4.002	26.728	150	4.001	26.728	150	
FMH47	27.968	3.607	Open Manhole	1200	2.004	24.361	225	2.003	24.361	150	
								4.002	26.557	150	2121
FMH48	27.894	3.628	Open Manhole	1200	2.005	24.266	225	2.004	24.266	225	
FMH49	27.498	3.595	Open Manhole	1200	2.006	23.903	225	2.005	23.903	225	
F9	27.413	3.589	Open Manhole	1200	2.007	23.824	225	2.006	23.824	225	
FMH50	27.238	3.495	Open Manhole	1200	2.008	23.743	225	2.007	23.743	225	
F8	25.781	2.268	Open Manhole	1200	2.009	23.513	225	2.008	23.513	225	
FMH37	25.480	2.726	Open Manhole	1200	1.013	22.754	225	1.012	22.754	225	
								2.009	23.474	225	720
F16	27.677	2.068	Open Manhole	1350	5.000	25.609	150				
FMH38	24.881	2.207	Open Manhole	1200	1.014	22.674	225	1.013	22.674	225	
								5.000	23.410	150	661
FMH39	23.197	1.474	Open Manhole	1200	1.015	21.723	225	1.014	21.800	225	77
F11	21.599	1.008	Open Manhole	1350	6.000	20.591	150				
F12	21.444	1.324	Open Manhole	1350	6.001	20.120	150	6.000	20.120	150	

Manhole Schedules for Foul Network 2

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
FMH40.1	22.894	1.350	Open Manhole	1200	7.000	21.544	150				
FMH40	21.910	2.627	Open Manhole	1200	1.016	19.283	225	1.015	20.480	225	1197
								6.001	19.284	150	
								7.000	20.437	150	1079
FMH41	20.892	2.242	Open Manhole	1200	1.017	18.650	225	1.016	18.650	225	
F10	19.996	1.492	Open Manhole	1350	8.000	18.504	150				
FMH42	20.223	2.497	Open Manhole	1200	1.018	17.726	225	1.017	17.726	225	
								8.000	17.727	150	
FMH43	19.978	2.430	Open Manhole	1200	1.019	17.548	225	1.018	17.548	225	
FMH43.1	19.826	2.384	Open Manhole	1200	1.020	17.443	225	1.019	17.442	225	
FMH43.4	20.723	1.533	Open Manhole	1200	9.000	19.190	150				
FMH 43.2	19.691	1.241	Open Manhole	1200	9.001	18.450	150	9.000	18.450	150	
FMH43.2	19.618	2.236	Open Manhole	1200	1.021	17.382	225	1.020	17.382	225	
								9.001	18.350	150	893
F25	17.941	1.907	Open Manhole	1200	1.022	16.034	225	1.021	16.530	225	496
FMH21.5	16.963	1.539	Open Manhole	1200	1.023	15.424	225	1.022	15.660	225	236
F18	16.351	1.145	Open Manhole	1350	10.000	15.206	150				
F19	16.383	1.873	Open Manhole	1350	10.001	14.510	150	10.000	14.510	150	
FMH21.4	16.445	2.089	Open Manhole	1200	1.024	14.356	225	1.023	15.200	225	844

Manhole Schedules for Foul Network 2

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
								10.001	14.356	150	
FMH21.3	16.203	2.000	Open Manhole	1200	1.025	14.203	225	1.024	14.203	225	
FMH21.2	16.057	1.944	Open Manhole	1200	1.026	14.113	225	1.025	14.113	225	
FMH21.1	15.758	1.825	Open Manhole	1200	1.027	13.933	225	1.026	13.933	225	
F1a	28.400	1.439	Open Manhole	1200	11.000	26.961	150				
F2a	28.570	2.409	Open Manhole	1200	11.001	26.161	150	11.000	26.161	150	
F3a	28.150	2.822	Open Manhole	1200	11.002	25.328	150	11.001	25.328	150	
F4a	27.622	3.127	Open Manhole	1200	11.003	24.495	150	11.002	24.495	150	
F5.1	26.630	1.350	Open Manhole	1350	12.000	25.280	150				
F5a	27.007	3.418	Open Manhole	1200	11.004	23.589	150	11.003	23.589	150	
								12.000	24.719	150	1130
F6a	27.164	4.148	Open Manhole	1200	11.005	23.016	225	11.004	23.016	150	
F7a	27.315	4.420	Open Manhole	1200	11.006	22.895	225	11.005	22.895	225	
F8a	27.033	4.242	Open Manhole	1200	11.007	22.791	225	11.006	22.791	225	
F9a	27.514	4.889	Open Manhole	1200	11.008	22.625	225	11.007	22.625	225	
F10a	27.410	4.966	Open Manhole	1200	11.009	22.444	225	11.008	22.444	225	
F11a	27.278	4.905	Open Manhole	1200	11.010	22.373	225	11.009	22.373	225	
F17	26.796	4.590	Open Manhole	1200	11.011	22.206	225	11.010	22.207	225	1
F12a	26.352	4.258	Open Manhole	1200	11.012	22.095	225	11.011	22.094	225	

Manhole Schedules for Foul Network 2

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
F13a	25.212	3.337	Open Manhole	1200	11.013	21.875	225	11.012	21.875	225	
F14	23.369	1.690	Open Manhole	1350	11.014	21.679	225	11.013	21.679	225	
F15a	22.955	2.105	Open Manhole	1350	11.015	20.850	225	11.014	21.550	225	700
FMH14	19.809	1.443	Open Manhole	1200	11.016	18.366	225	11.015	18.366	225	
FMH15	19.537	1.535	Open Manhole	1200	11.017	18.002	225	11.016	18.002	225	
FMH16	18.874	1.465	Open Manhole	1200	11.018	17.409	225	11.017	17.409	225	
FMH17	16.460	1.500	Open Manhole	1200	11.019	14.960	225	11.018	14.996	225	36
FMH18	16.327	1.528	Open Manhole	1200	11.020	14.799	225	11.019	14.799	225	
F13	17.114	1.771	Open Manhole	1350	13.000	15.343	150				
F15	16.251	1.703	Open Manhole	1350	11.021	14.548	225	11.020	14.701	225	153
								13.000	14.548	150	
FMH19	15.972	1.697	Open Manhole	1200	11.022	14.275	225	11.021	14.275	225	
FMH20	15.936	1.706	Open Manhole	1200	11.023	14.230	225	11.022	14.230	225	
F7	15.717	1.699	Open Manhole	1350	11.024	14.018	225	11.023	14.018	225	
F24	15.652	1.759	Open Manhole	1200	1.028	13.893	225	1.027	13.893	225	
								11.024	13.893	225	
FMH21	15.614	1.745	Open Manhole	1200	1.029	13.869	225	1.028	13.869	225	
F6	15.329	1.629	Open Manhole	1350	1.030	13.700	225	1.029	13.700	225	
F5	14.967	1.867	Open Manhole	1350	1.031	13.100	225	1.030	13.150	225	50

Manhole Schedules for Foul Network 2

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
F4	14.866	1.827	Open Manhole	1350	1.032	13.039	225	1.031	13.039	225	
FMH22	14.742	1.783	Open Manhole	1350	1.033	12.959	225	1.032	12.959	225	
FMH23	14.612	1.737	Open Manhole	1350	1.034	12.875	225	1.033	12.875	225	
FMH24	14.301	1.621	Open Manhole	1200		OUTFALL		1.034	12.680	225	

PIPELINE SCHEDULES for Foul Network 2

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	100	F23	30.500	29.191	1.209	Open Manhole	1050
1.001	o	150	FMH25	30.216	28.870	1.196	Open Manhole	1200
1.002	o	150	FMH26	30.402	27.900	2.352	Open Manhole	1200
1.003	o	150	FMH27	29.500	27.738	1.612	Open Manhole	1200
1.004	o	150	FMH28	28.618	27.280	1.188	Open Manhole	1200
1.005	o	225	FMH29	28.201	26.765	1.211	Open Manhole	1200
1.006	o	225	FMH30	27.067	25.623	1.219	Open Manhole	1200
1.007	o	225	FMH31	26.940	25.489	1.226	Open Manhole	1200
1.008	o	225	FMH32	26.040	24.605	1.210	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	19.236	59.9	FMH25	30.216	28.870	1.246	Open Manhole	1200
1.001	54.946	56.6	FMH26	30.402	27.900	2.352	Open Manhole	1200
1.002	24.241	149.6	FMH27	29.500	27.738	1.612	Open Manhole	1200
1.003	33.544	73.2	FMH28	28.618	27.280	1.188	Open Manhole	1200
1.004	29.070	56.4	FMH29	28.201	26.765	1.286	Open Manhole	1200
1.005	43.386	38.0	FMH30	27.067	25.623	1.219	Open Manhole	1200
1.006	4.020	30.0	FMH31	26.940	25.489	1.226	Open Manhole	1200
1.007	26.524	30.0	FMH32	26.040	24.605	1.210	Open Manhole	1200
1.008	35.346	29.1	FMH33	24.849	23.390	1.234	Open Manhole	1200

PIPELINE SCHEDULES for Foul Network 2

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.009	o	225	FMH33	24.849	23.390	1.234	Open Manhole	1200
1.010	o	225	FMH34	24.670	23.214	1.231	Open Manhole	1200
1.011	o	225	FMH35	24.464	22.952	1.288	Open Manhole	1200
1.012	o	225	FMH36	25.217	22.793	2.199	Open Manhole	1200
2.000	o	150	F20	26.715	25.650	0.915	Open Manhole	1350
2.001	o	150	F21	26.518	25.305	1.063	Open Manhole	1350
3.000	o	150	F46.3	26.343	25.040	1.153	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.009	26.393	150.0	FMH34	24.670	23.214	1.231	Open Manhole	1200
1.010	39.373	150.3	FMH35	24.464	22.952	1.287	Open Manhole	1200
1.011	31.805	200.0	FMH36	25.217	22.793	2.199	Open Manhole	1200
1.012	7.717	197.9	FMH37	25.480	22.754	2.501	Open Manhole	1200
2.000	16.441	47.7	F21	26.518	25.305	1.063	Open Manhole	1350
2.001	10.179	73.5	F22	26.721	25.167	1.404	Open Manhole	1200
3.000	14.549	64.4	F46.2	26.472	24.814	1.508	Open Manhole	1200

PIPELINE SCHEDULES for Foul Network 2

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
3.001	o	150	F46.2	26.472	24.814	1.508	Open Manhole	1200
2.002	o	150	F22	26.721	24.650	1.921	Open Manhole	1200
2.003	o	150	F46.1	27.198	24.557	2.490	Open Manhole	1200
4.000	o	150	FMH44	30.064	28.600	1.314	Open Manhole	1200
4.001	o	150	FMH45	29.108	27.645	1.313	Open Manhole	1200
4.002	o	150	FMH46	28.194	26.728	1.316	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
3.001	11.308	69.0	F22	26.721	24.650	1.921	Open Manhole	1200
2.002	13.718	148.1	F46.1	27.198	24.557	2.490	Open Manhole	1200
2.003	27.634	140.7	FMH47	27.968	24.361	3.457	Open Manhole	1200
4.000	29.367	30.8	FMH45	29.108	27.645	1.313	Open Manhole	1200
4.001	27.941	30.5	FMH46	28.194	26.728	1.316	Open Manhole	1200
4.002	7.182	42.0	FMH47	27.968	26.557	1.261	Open Manhole	1200

PIPELINE SCHEDULES for Foul Network 2

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
2.004	o	225	FMH47	27.968	24.361	3.382	Open Manhole	1200
2.005	o	225	FMH48	27.894	24.266	3.403	Open Manhole	1200
2.006	o	225	FMH49	27.498	23.903	3.370	Open Manhole	1200
2.007	o	225	F9	27.413	23.824	3.364	Open Manhole	1200
2.008	o	225	FMH50	27.238	23.743	3.270	Open Manhole	1200
2.009	o	225	F8	25.781	23.513	2.043	Open Manhole	1200
1.013	o	225	FMH37	25.480	22.754	2.501	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
2.004	21.563	227.0	FMH48	27.894	24.266	3.403	Open Manhole	1200
2.005	70.621	194.5	FMH49	27.498	23.903	3.370	Open Manhole	1200
2.006	17.659	223.5	F9	27.413	23.824	3.364	Open Manhole	1200
2.007	18.298	225.9	FMH50	27.238	23.743	3.270	Open Manhole	1200
2.008	43.474	189.0	F8	25.781	23.513	2.043	Open Manhole	1200
2.009	8.171	209.5	FMH37	25.480	23.474	1.781	Open Manhole	1200
1.013	15.927	199.1	FMH38	24.881	22.674	1.982	Open Manhole	1200

PIPELINE SCHEDULES for Foul Network 2

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
5.000	o	150	F16	27.677	25.609	1.918	Open Manhole	1350
1.014	o	225	FMH38	24.881	22.674	1.982	Open Manhole	1200
1.015	o	225	FMH39	23.197	21.723	1.249	Open Manhole	1200
6.000	o	150	F11	21.599	20.591	0.858	Open Manhole	1350
6.001	o	150	F12	21.444	20.120	1.174	Open Manhole	1350
7.000	o	150	FMH40.1	22.894	21.544	1.200	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
5.000	54.965	25.0	FMH38	24.881	23.410	1.321	Open Manhole	1200
1.014	44.612	51.0	FMH39	23.197	21.800	1.172	Open Manhole	1200
1.015	28.598	23.0	FMH40	21.910	20.480	1.205	Open Manhole	1200
6.000	29.201	62.0	F12	21.444	20.120	1.174	Open Manhole	1350
6.001	50.174	60.0	FMH40	21.910	19.284	2.476	Open Manhole	1200
7.000	49.832	45.0	FMH40	21.910	20.437	1.323	Open Manhole	1200

PIPELINE SCHEDULES for Foul Network 2

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.016	o	225	FMH40	21.910	19.283	2.402	Open Manhole	1200
1.017	o	225	FMH41	20.892	18.650	2.017	Open Manhole	1200
8.000	o	150	F10	19.996	18.504	1.342	Open Manhole	1350
1.018	o	225	FMH42	20.223	17.726	2.272	Open Manhole	1200
1.019	o	225	FMH43	19.978	17.548	2.205	Open Manhole	1200
1.020	o	225	FMH43.1	19.826	17.443	2.158	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.016	30.406	48.0	FMH41	20.892	18.650	2.017	Open Manhole	1200
1.017	33.861	36.6	FMH42	20.223	17.726	2.272	Open Manhole	1200
8.000	46.644	60.0	FMH42	20.223	17.727	2.346	Open Manhole	1200
1.018	35.610	200.1	FMH43	19.978	17.548	2.205	Open Manhole	1200
1.019	21.104	199.1	FMH43.1	19.826	17.442	2.159	Open Manhole	1200
1.020	12.203	200.0	FMH43.2	19.618	17.382	2.011	Open Manhole	1200

PIPELINE SCHEDULES for Foul Network 2

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
9.000	o	150	FMH43.4	20.723	19.190	1.383	Open Manhole	1200
9.001	o	150	FMH 43.2	19.691	18.450	1.091	Open Manhole	1200
1.021	o	225	FMH43.2	19.618	17.382	2.011	Open Manhole	1200
1.022	o	225	F25	17.941	16.034	1.682	Open Manhole	1200
1.023	o	225	FMH21.5	16.963	15.424	1.314	Open Manhole	1200
10.000	o	150	F18	16.351	15.206	0.995	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
9.000	44.389	60.0	FMH 43.2	19.691	18.450	1.091	Open Manhole	1200
9.001	6.017	60.2	FMH43.2	19.618	18.350	1.118	Open Manhole	1200
1.021	39.128	45.9	F25	17.941	16.530	1.186	Open Manhole	1200
1.022	22.445	60.0	FMH21.5	16.963	15.660	1.078	Open Manhole	1200
1.023	13.429	60.0	FMH21.4	16.445	15.200	1.020	Open Manhole	1200
10.000	43.202	62.1	F19	16.383	14.510	1.723	Open Manhole	1350

PIPELINE SCHEDULES for Foul Network 2

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
10.001	o	150	F19	16.383	14.510	1.723	Open Manhole	1350
1.024	o	225	FMH21.4	16.445	14.356	1.864	Open Manhole	1200
1.025	o	225	FMH21.3	16.203	14.203	1.775	Open Manhole	1200
1.026	o	225	FMH21.2	16.057	14.113	1.719	Open Manhole	1200
1.027	o	225	FMH21.1	15.758	13.933	1.600	Open Manhole	1200
11.000	o	150	F1a	28.400	26.961	1.289	Open Manhole	1200
11.001	o	150	F2a	28.570	26.161	2.259	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
10.001	22.696	147.4	FMH21.4	16.445	14.356	1.939	Open Manhole	1200
1.024	30.309	198.1	FMH21.3	16.203	14.203	1.775	Open Manhole	1200
1.025	18.027	200.3	FMH21.2	16.057	14.113	1.719	Open Manhole	1200
1.026	35.996	200.0	FMH21.1	15.758	13.933	1.600	Open Manhole	1200
1.027	8.026	200.7	F24	15.652	13.893	1.534	Open Manhole	1200
11.000	48.000	60.0	F2a	28.570	26.161	2.259	Open Manhole	1200
11.001	50.000	60.0	F3a	28.150	25.328	2.672	Open Manhole	1200

PIPELINE SCHEDULES for Foul Network 2

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
11.002	o	150	F3a	28.150	25.328	2.672	Open Manhole	1200
11.003	o	150	F4a	27.622	24.495	2.977	Open Manhole	1200
12.000	o	150	F5.1	26.630	25.280	1.200	Open Manhole	1350
11.004	o	150	F5a	27.007	23.589	3.268	Open Manhole	1200
11.005	o	225	F6a	27.164	23.016	3.923	Open Manhole	1200
11.006	o	225	F7a	27.315	22.895	4.195	Open Manhole	1200
11.007	o	225	F8a	27.033	22.791	4.016	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
11.002	50.000	60.0	F4a	27.622	24.495	2.977	Open Manhole	1200
11.003	54.360	60.0	F5a	27.007	23.589	3.268	Open Manhole	1200
12.000	33.636	60.0	F5a	27.007	24.719	2.138	Open Manhole	1200
11.004	34.393	60.0	F6a	27.164	23.016	3.998	Open Manhole	1200
11.005	18.143	150.0	F7a	27.315	22.895	4.195	Open Manhole	1200
11.006	15.548	149.5	F8a	27.033	22.791	4.017	Open Manhole	1200
11.007	24.868	150.0	F9a	27.514	22.625	4.664	Open Manhole	1200

PIPELINE SCHEDULES for Foul Network 2

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
11.008	o	225	F9a	27.514	22.625	4.664	Open Manhole	1200
11.009	o	225	F10a	27.410	22.444	4.741	Open Manhole	1200
11.010	o	225	F11a	27.278	22.373	4.680	Open Manhole	1200
11.011	o	225	F17	26.796	22.206	4.365	Open Manhole	1200
11.012	o	225	F12a	26.352	22.095	4.032	Open Manhole	1200
11.013	o	225	F13a	25.212	21.875	3.112	Open Manhole	1200
11.014	o	225	F14	23.369	21.679	1.465	Open Manhole	1350
11.015	o	225	F15a	22.955	20.850	1.880	Open Manhole	1350
11.016	o	225	FMH14	19.809	18.366	1.218	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
11.008	27.178	150.2	F10a	27.410	22.444	4.741	Open Manhole	1200
11.009	10.720	151.0	F11a	27.278	22.373	4.680	Open Manhole	1200
11.010	24.955	150.3	F17	26.796	22.207	4.364	Open Manhole	1200
11.011	22.321	199.3	F12a	26.352	22.094	4.033	Open Manhole	1200
11.012	44.014	200.1	F13a	25.212	21.875	3.112	Open Manhole	1200
11.013	39.105	199.5	F14	23.369	21.679	1.465	Open Manhole	1350
11.014	7.446	57.7	F15a	22.955	21.550	1.180	Open Manhole	1350
11.015	62.932	25.3	FMH14	19.809	18.366	1.218	Open Manhole	1200
11.016	7.766	21.3	FMH15	19.537	18.002	1.310	Open Manhole	1200

PIPELINE SCHEDULES for Foul Network 2

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
11.017	o	225	FMH15	19.537	18.002	1.310	Open Manhole	1200
11.018	o	225	FMH16	18.874	17.409	1.240	Open Manhole	1200
11.019	o	225	FMH17	16.460	14.960	1.275	Open Manhole	1200
11.020	o	225	FMH18	16.327	14.799	1.303	Open Manhole	1200
13.000	o	150	F13	17.114	15.343	1.621	Open Manhole	1350
11.021	o	225	F15	16.251	14.548	1.478	Open Manhole	1350
11.022	o	225	FMH19	15.972	14.275	1.472	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
11.017	14.423	24.3	FMH16	18.874	17.409	1.240	Open Manhole	1200
11.018	51.141	21.2	FMH17	16.460	14.996	1.239	Open Manhole	1200
11.019	15.389	95.6	FMH18	16.327	14.799	1.303	Open Manhole	1200
11.020	15.602	159.2	F15	16.251	14.701	1.325	Open Manhole	1350
13.000	48.301	60.8	F15	16.251	14.548	1.553	Open Manhole	1350
11.021	54.653	200.2	FMH19	15.972	14.275	1.472	Open Manhole	1200
11.022	8.914	198.1	FMH20	15.936	14.230	1.481	Open Manhole	1200

PIPELINE SCHEDULES for Foul Network 2

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
11.023	o	225	FMH20	15.936	14.230	1.481	Open Manhole	1200
11.024	o	225	F7	15.717	14.018	1.473	Open Manhole	1350
1.028	o	225	F24	15.652	13.893	1.534	Open Manhole	1200
1.029	o	225	FMH21	15.614	13.869	1.520	Open Manhole	1200
1.030	o	225	F6	15.329	13.700	1.404	Open Manhole	1350
1.031	o	225	F5	14.967	13.100	1.642	Open Manhole	1350
1.032	o	225	F4	14.866	13.039	1.602	Open Manhole	1350
1.033	o	225	FMH22	14.742	12.959	1.558	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
11.023	42.385	199.9	F7	15.717	14.018	1.474	Open Manhole	1350
11.024	5.332	42.5	F24	15.652	13.893	1.534	Open Manhole	1200
1.028	4.756	200.0	FMH21	15.614	13.869	1.520	Open Manhole	1200
1.029	27.798	164.5	F6	15.329	13.700	1.404	Open Manhole	1350
1.030	36.039	65.5	F5	14.967	13.150	1.592	Open Manhole	1350
1.031	9.163	150.0	F4	14.866	13.039	1.602	Open Manhole	1350
1.032	12.014	150.2	FMH22	14.742	12.959	1.558	Open Manhole	1350
1.033	12.632	150.4	FMH23	14.612	12.875	1.512	Open Manhole	1350

PIPELINE SCHEDULES for Foul Network 2

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.034	o	225	FMH23	14.612	12.875	1.512	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.034	29.233	149.9	FMH24	14.301	12.680	1.396	Open Manhole	1200

Setting Out Information - Site Coordinates (Foul Network 2)

PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Layout (North)
1.000	F23	1050		532021.057	676737.367	
1.001	FMH25	1200		532035.427	676750.155	
1.002	FMH26	1200		532071.595	676708.791	
1.003	FMH27	1200		532089.900	676724.683	
1.004	FMH28	1200		532102.214	676755.885	
1.005	FMH29	1200		532088.504	676781.519	
1.006	FMH30	1200		532048.696	676798.774	
1.007	FMH31	1200		532048.620	676802.793	

Setting Out Information - Site Coordinates (Foul Network 2)

PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Layout (North)
1.008	FMH32	1200		532058.526	676827.398	
1.009	FMH33	1200		532071.370	676860.328	
1.010	FMH34	1200		532095.973	676850.776	
1.011	FMH35	1200		532132.704	676836.597	
1.012	FMH36	1200		532149.529	676809.607	
2.000	F20	1350		532135.735	676603.643	
2.001	F21	1350		532148.073	676614.509	
3.000	F46.3	1200		532170.060	676631.195	

Setting Out Information - Site Coordinates (Foul Network 2)

PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Layout (North)
3.001	F46.2	1200		532163.055	676618.444	
2.002	F22	1200		532152.920	676623.461	
2.003	F46.1	1200		532141.088	676630.404	
4.000	FMH44	1200		532079.324	676697.839	
4.001	FMH45	1200		532098.484	676675.584	
4.002	FMH46	1200		532116.531	676654.253	
2.004	FMH47	1200		532123.122	676651.401	
2.005	FMH48	1200		532139.036	676665.952	

Setting Out Information - Site Coordinates (Foul Network 2)

PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Layout (North)
2.006	FMH49	1200		532165.123	676731.578	
2.007	F9	1200		532179.193	676742.249	
2.008	FMH50	1200		532178.510	676760.534	
2.009	F8	1200		532157.571	676798.634	
1.013	FMH37	1200		532156.701	676806.758	
5.000	F16	1350		532189.012	676774.015	
1.014	FMH38	1200		532161.882	676821.819	
1.015	FMH39	1200		532176.332	676864.026	

Setting Out Information - Site Coordinates (Foul Network 2)

PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Layout (North)
6.000	F11	1350		532097.271	676898.778	
6.001	F12	1350		532124.534	676888.316	
7.000	FMH40.1	1200		532224.187	676896.711	
1.016	FMH40	1200		532174.528	676892.568	
1.017	FMH41	1200		532172.032	676922.871	
8.000	F10	1350		532216.249	676960.712	
1.018	FMH42	1200		532169.782	676956.657	
1.019	FMH43	1200		532134.287	676953.790	

Setting Out Information - Site Coordinates (Foul Network 2)

PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Layout (North)
1.020	FMH43.1	1200		532114.559	676961.285	
9.000	FMH43.4	1200		532082.030	676926.267	
9.001	FMH 43.2	1200		532098.064	676967.658	
1.021	FMH43.2	1200		532104.079	676967.538	
1.022	F25	1200		532117.680	677004.226	
1.023	FMH21.5	1200		532125.483	677025.272	
10.000	F18	1350		532199.309	677029.490	
10.001	F19	1350		532156.264	677025.812	

Setting Out Information - Site Coordinates (Foul Network 2)

PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Layout (North)
1.024	FMH21.4	1200		532135.278	677034.457	
1.025	FMH21.3	1200		532145.569	677062.966	
1.026	FMH21.2	1200		532145.852	677080.990	
1.027	FMH21.1	1200		532163.201	677112.530	
11.000	F1a	1200		532333.254	676869.561	
11.001	F2a	1200		532312.561	676826.250	
11.002	F3a	1200		532294.830	676779.499	
11.003	F4a	1200		532277.099	676732.749	

Setting Out Information - Site Coordinates (Foul Network 2)

PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Layout (North)
12.000	F5.1	1350		532245.762	676650.522	
11.004	F5a	1200		532257.916	676681.886	
11.005	F6a	1200		532225.807	676694.210	
11.006	F7a	1200		532208.843	676700.642	
11.007	F8a	1200		532214.098	676715.275	
11.008	F9a	1200		532201.902	676736.947	
11.009	F10a	1200		532210.758	676762.641	
11.010	F11a	1200		532219.930	676768.188	

Setting Out Information - Site Coordinates (Foul Network 2)

PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Layout (North)
11.011	F17	1200		532228.010	676791.799	
11.012	F12a	1200		532235.256	676812.911	
11.013	F13a	1200		532248.065	676855.020	
11.014	F14	1350		532244.690	676893.979	
11.015	F15a	1350		532249.238	676899.874	
11.016	FMH14	1200		532244.053	676962.593	
11.017	FMH15	1200		532248.262	676969.119	
11.018	FMH16	1200		532247.024	676983.488	

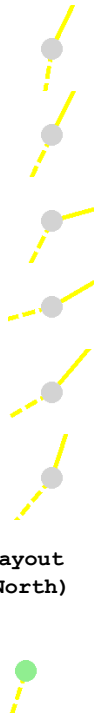
Setting Out Information - Site Coordinates (Foul Network 2)

PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Layout (North)
11.019	FMH17	1200		532225.920	677030.071	
11.020	FMH18	1200		532219.517	677044.065	
13.000	F13	1350		532171.259	677060.312	
11.021	F15	1350		532219.555	677059.667	
11.022	FMH19	1200		532219.689	677114.319	
11.023	FMH20	1200		532212.113	677119.017	
11.024	F7	1350		532169.733	677119.657	
1.028	F24	1200		532164.460	677120.456	

Setting Out Information - Site Coordinates (Foul Network 2)

PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Layout (North)
1.029	FMH21	1200		532165.207	677125.154	
1.030	F6	1350		532177.286	677150.191	
1.031	F5	1350		532193.367	677182.444	
1.032	F4	1350		532202.200	677184.877	
1.033	FMH22	1350		532212.578	677190.931	
1.034	FMH23	1350		532220.675	677200.626	

PN	DSMH Name	Dia/Len (mm)	Width (mm)	DS Easting (m)	DS Northing (m)	Layout (North)
1.034	FMH24	1200		532229.682	677228.436	

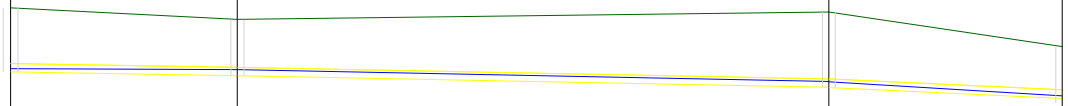


APPENDIX B

Storm Sewer Network & Calculations

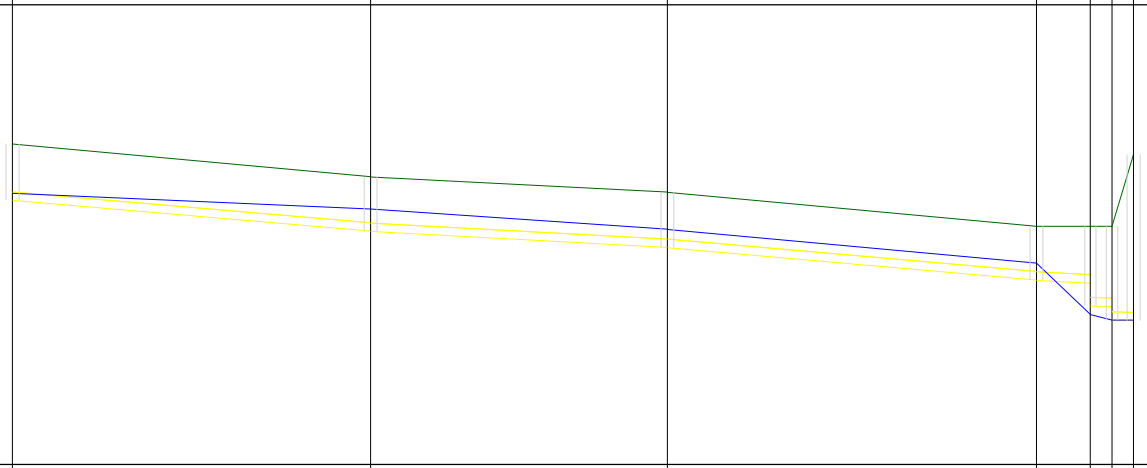
Fairgreen House
Fairgreen Road
Galway

Date 12/07/2022 11:03 | Designed by michael.naughton
File 11269 - SOAKAWAY A.MDX | Checked by
Micro Drainage | Network 2018.1.1

MH Name		S21	SMH 30	SMH 31	SMH 32
Hor Scale 700 Ver Scale 200 Datum (m) 23.000					
PN		1.000	1.001	1.002	
Dia (mm)		225	225	225	
Slope (1:X)		199.9	177.8	75.1	
Cover Level (m)		30.500	30.190	30.386	29.469
Invert Level (m)		28.805	28.700 / 28.700	28.392 / 28.392	28.104
Length (m)		20.989	54.752	21.616	

Fairgreen House
Fairgreen Road
Galway

Date 12/07/2022 11:03 | Designed by michael.naughton
File 11269 - SOAKAWAY A.MDX | Checked by
Micro Drainage | Network 2018.1.1

MH Name		SMH 32	SMH 33	SMH 34			SMH 36
Hor Scale 700 Ver Scale 200 Datum (m)21.000							
PN		1.003	1.004	1.005			
Dia (mm)		225	225	225			
Slope (1:X)		40.4	63.9	39.7			
Cover Level (m)		29.469	28.601	28.195	27.294		29.193
Invert Level (m)		27.980	27.160 / 27.160	26.730 / 26.730	25.870 / 25.870		
Length (m)		33.143	27.480	34.153			

Manhole Schedules for Surface Network 6

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S21	30.500	1.695	Open Manhole	1350	1.000	28.805	225				
SMH 30	30.190	1.490	Open Manhole	1200	1.001	28.700	225	1.000	28.700	225	
SMH 31	30.386	1.994	Open Manhole	1200	1.002	28.392	225	1.001	28.392	225	
SMH 32	29.469	1.489	Open Manhole	1200	1.003	27.980	225	1.002	28.104	225	124
SMH 33	28.601	1.441	Open Manhole	1200	1.004	27.160	225	1.003	27.160	225	
SMH 34	28.195	1.465	Open Manhole	1200	1.005	26.730	225	1.004	26.730	225	
SMH 35	27.294	1.424	Open Manhole	1200	1.006	25.870	225	1.005	25.870	225	
8	27.294	2.104	Open Manhole	1050	1.007	25.190	225	1.006	25.790	225	600
9	27.294	2.479	Open Manhole	1050	1.008	24.815	225	1.007	25.170	225	355
SMH 36	29.193	4.398	Open Manhole	1200		OUTFALL		1.008	24.795	225	

PIPELINE SCHEDULES for Surface Network 6

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	225	S21	30.500	28.805	1.470	Open Manhole	1350
1.001	o	225	SMH 30	30.190	28.700	1.265	Open Manhole	1200
1.002	o	225	SMH 31	30.386	28.392	1.769	Open Manhole	1200
1.003	o	225	SMH 32	29.469	27.980	1.264	Open Manhole	1200
1.004	o	225	SMH 33	28.601	27.160	1.216	Open Manhole	1200
1.005	o	225	SMH 34	28.195	26.730	1.240	Open Manhole	1200
1.006	o	225	SMH 35	27.294	25.870	1.199	Open Manhole	1200
1.007	o	225	8	27.294	25.190	1.879	Open Manhole	1050
1.008	o	225	9	27.294	24.815	2.254	Open Manhole	1050

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	20.989	199.9	SMH 30	30.190	28.700	1.265	Open Manhole	1200
1.001	54.752	177.8	SMH 31	30.386	28.392	1.769	Open Manhole	1200
1.002	21.616	75.1	SMH 32	29.469	28.104	1.140	Open Manhole	1200
1.003	33.143	40.4	SMH 33	28.601	27.160	1.216	Open Manhole	1200
1.004	27.480	63.9	SMH 34	28.195	26.730	1.240	Open Manhole	1200
1.005	34.153	39.7	SMH 35	27.294	25.870	1.199	Open Manhole	1200
1.006	4.999	62.5	8	27.294	25.790	1.279	Open Manhole	1050
1.007	2.000	100.0	9	27.294	25.170	1.899	Open Manhole	1050
1.008	2.000	100.0	SMH 36	29.193	24.795	4.173	Open Manhole	1200

Area Summary for Surface Network 6

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.024	0.024	0.024
1.001	-	-	100	0.071	0.071	0.071
1.002	-	-	100	0.037	0.037	0.037
1.003	-	-	100	0.048	0.048	0.048
1.004	-	-	100	0.055	0.055	0.055
1.005	-	-	100	0.059	0.059	0.059
1.006	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.000	0.000	0.000
1.008	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.294	0.294	0.294

Free Flowing Outfall Details for Surface Network 6

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.008	SMH 36	29.193	24.795	24.900	1200	0

Simulation Criteria for Surface Network 6

Volumetric Runoff Coeff	0.900	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	17.000	Cv (Summer)	0.900
Return Period (years)	1	Ratio R	0.283	Cv (Winter)	0.840
Region	Scotland and Ireland	Profile Type	Summer	Storm Duration (mins)	30

Online Controls for Surface Network 6

Pump Manhole: 9, DS/PN: 1.008, Volume (m³): 2.2

Invert Level (m) 24.815

Depth (m)	Flow (l/s)
1.000	0.0000

Storage Structures for Surface Network 6

Cellular Storage Manhole: 8, DS/PN: 1.007

Invert Level (m) 24.815 Infiltration Coefficient Side (m/hr) 0.07200 Porosity 0.95
Infiltration Coefficient Base (m/hr) 0.00000 Safety Factor 2.0

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	300.0	300.0	1.200	300.0	396.0	1.300	0.0	396.0

Manhole Headloss for Surface Network 6

PN	US/MH Name	US/MH Headloss
1.000	S21	0.500
1.001	SMH 30	0.500
1.002	SMH 31	0.500
1.003	SMH 32	0.500
1.004	SMH 33	0.500
1.005	SMH 34	0.500
1.006	SMH 35	0.500
1.007	8	0.500
1.008	9	0.500

Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 6

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 17.000 Cv (Summer) 0.900
Region Scotland and Ireland Ratio R 0.283 Cv (Winter) 0.900

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 30, 100
Climate Change (%) 10, 20

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	S21	15 Summer	100	+20%	100/15 Summer				29.094	0.064	0.000	0.30		10.0	SURCHARGED

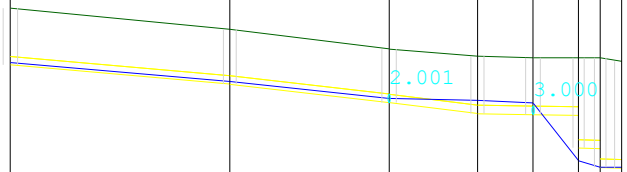
Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 6

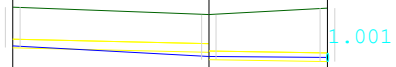
PN	US/MH Name	Level Exceeded
1.000	S21	

Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 6

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)
1.001	SMH 30	15 Summer	100	+20%	100/15 Summer				29.077	0.152	0.000	1.05		39.1
1.002	SMH 31	15 Summer	100	+20%	100/15 Summer				28.828	0.211	0.000	0.87		47.4
1.003	SMH 32	15 Summer	100	+20%	100/15 Summer				28.668	0.463	0.000	0.78		60.1
1.004	SMH 33	15 Summer	100	+20%	30/15 Summer				28.279	0.894	0.000	1.20		72.7
1.005	SMH 34	15 Summer	100	+20%	30/15 Summer				27.667	0.712	0.000	1.18		91.8
1.006	SMH 35	15 Summer	100	+20%	30/15 Summer				26.429	0.334	0.000	2.31		92.0
1.007	8	8640 Summer	100	+20%	30/1440 Summer				25.808	0.393	0.000	0.14		4.1
1.008	9	8640 Summer	100	+20%	30/240 Summer				25.873	0.833	0.000	0.00		0.0

PN	US/MH Name	Status	Level Exceeded
1.001	SMH 30	SURCHARGED	
1.002	SMH 31	SURCHARGED	
1.003	SMH 32	SURCHARGED	
1.004	SMH 33	SURCHARGED	
1.005	SMH 34	SURCHARGED	
1.006	SMH 35	SURCHARGED	
1.007	8	SURCHARGED	
1.008	9	SURCHARGED	

MH Name		S11	SMH 52.1					S13
Hor Scale 700 Ver Scale 200 Datum (m)20.000								
PN		1.000	1.001					
Dia (mm)		225	225					
Slope (1:X)		39.8	30.2					
Cover Level (m)		27.704	27.144	26.620	26.432	26.387		26.293
Invert Level (m)		26.200 25.690	25.690 25.201	25.201 24.910	24.910 24.884	24.884		
Length (m)		20.312	14.749					

MH Name		S18	S19	S20
Hor Scale 700 Ver Scale 200 Datum (m) 20.000				
PN		2.000	2.001	
Dia (mm)		225	225	
Slope (1:X)		150.1	199.5	
Cover Level (m)		26.645	26.444	26.620
Invert Level (m)		25.571 25.450	25.255 25.200	
Length (m)		18.160	10.975	

MH Name		SMH 52.3	S12
Hor Scale 700 Ver Scale 200 Datum (m) 20.000			
PN		3.000	
Dia (mm)		225	
Slope (1:X)		199.4	
Cover Level (m)		26.304	26.387
Invert Level (m)		24.932	24.884
Length (m)		9.572	

Manhole Schedules for Surface Network 5

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S11	27.704	1.504	Open Manhole	1350	1.000	26.200	225				
SMH 52.1	27.144	1.454	Open Manhole	1200	1.001	25.690	225	1.000	25.690	225	
S18	26.645	1.074	Open Manhole	1350	2.000	25.571	225				
S19	26.444	1.189	Open Manhole	1350	2.001	25.255	225	2.000	25.450	225	195
S20	26.620	1.420	Open Manhole	1350	1.002	25.201	225	1.001	25.201	225	
								2.001	25.200	225	
SMH 52.2	26.432	1.522	Open Manhole	1200	1.003	24.910	225	1.002	24.910	225	
SMH 52.3	26.304	1.372	Open Manhole	1200	3.000	24.932	225				
S12	26.387	1.503	Open Manhole	1350	1.004	24.884	225	1.003	24.884	225	
								3.000	24.884	225	
9	26.387	2.387	Open Manhole	1050	1.005	24.000	225	1.004	24.863	225	863
10	26.387	2.899	Open Manhole	1050	1.006	23.488	225	1.005	23.980	225	492
S13	26.293	2.825	Open Manhole	1350		OUTFALL		1.006	23.468	225	

PIPELINE SCHEDULES for Surface Network 5

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	225	S11	27.704	26.200	1.279	Open Manhole	1350
1.001	o	225	SMH 52.1	27.144	25.690	1.229	Open Manhole	1200
2.000	o	225	S18	26.645	25.571	0.849	Open Manhole	1350
2.001	o	225	S19	26.444	25.255	0.964	Open Manhole	1350
1.002	o	225	S20	26.620	25.201	1.194	Open Manhole	1350
1.003	o	225	SMH 52.2	26.432	24.910	1.297	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	20.312	39.8	SMH 52.1	27.144	25.690	1.229	Open Manhole	1200
1.001	14.749	30.2	S20	26.620	25.201	1.194	Open Manhole	1350
2.000	18.160	150.1	S19	26.444	25.450	0.769	Open Manhole	1350
2.001	10.975	199.5	S20	26.620	25.200	1.195	Open Manhole	1350
1.002	8.182	28.1	SMH 52.2	26.432	24.910	1.297	Open Manhole	1200
1.003	5.139	197.7	S12	26.387	24.884	1.278	Open Manhole	1350

PIPELINE SCHEDULES for Surface Network 5

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
3.000	o	225	SMH 52.3	26.304	24.932	1.147	Open Manhole	1200
1.004	o	225	S12	26.387	24.884	1.278	Open Manhole	1350
1.005	o	225	9	26.387	24.000	2.162	Open Manhole	1050
1.006	o	225	10	26.387	23.488	2.674	Open Manhole	1050

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
3.000	9.572	199.4	S12	26.387	24.884	1.278	Open Manhole	1350
1.004	4.219	199.9	9	26.387	24.863	1.299	Open Manhole	1050
1.005	2.000	100.0	10	26.387	23.980	2.182	Open Manhole	1050
1.006	2.000	100.0	S13	26.293	23.468	2.600	Open Manhole	1350

Area Summary for Surface Network 5

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.043	0.043	0.043
1.001	-	-	100	0.014	0.014	0.014
2.000	-	-	100	0.014	0.014	0.014
2.001	-	-	100	0.011	0.011	0.011
1.002	-	-	100	0.014	0.014	0.014
1.003	-	-	100	0.017	0.017	0.017
3.000	-	-	100	0.028	0.028	0.028
1.004	-	-	100	0.000	0.000	0.000
1.005	-	-	100	0.000	0.000	0.000
1.006	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.141	0.141	0.141

Free Flowing Outfall Details for Surface Network 5

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.006	S13	26.293	23.468	23.500	1350	0

Simulation Criteria for Surface Network 5

Volumetric Runoff Coeff	0.900	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	17.000	Cv (Summer)	0.900
Return Period (years)	1	Ratio R	0.283	Cv (Winter)	0.840
Region	Scotland and Ireland	Profile Type	Summer	Storm Duration (mins)	30

Online Controls for Surface Network 5

Pump Manhole: 10, DS/PN: 1.006, Volume (m³): 2.5

Invert Level (m) 23.488

Depth (m)	Flow (l/s)
1.000	0.0000

Storage Structures for Surface Network 5

Cellular Storage Manhole: 9, DS/PN: 1.005

Invert Level (m) 23.488 Infiltration Coefficient Side (m/hr) 0.07200 Porosity 0.95
Infiltration Coefficient Base (m/hr) 0.00000 Safety Factor 2.0

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	120.0	120.0	1.600	120.0	190.4	1.700	0.0	190.4

Manhole Headloss for Surface Network 5

PN	US/MH Name	US/MH Headloss
1.000	S11	0.500
1.001	SMH 52.1	0.500
2.000	S18	0.500
2.001	S19	0.500
1.002	S20	0.500
1.003	SMH 52.2	0.500
3.000	SMH 52.3	0.500
1.004	S12	0.500
1.005	9	0.500
1.006	10	0.500

Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 5

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 17.000 Cv (Summer) 0.900
Region Scotland and Ireland Ratio R 0.283 Cv (Winter) 0.900

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 30, 100
Climate Change (%) 10, 20

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	S11	15 Summer	100	+20%					26.279	-0.146	0.000	0.27		19.9	OK

Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 5

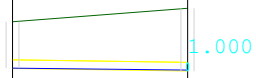
PN	US/MH Name	Level Exceeded
1.000	S11	

Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 5

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)
1.001	SMH 52.1	15 Summer	100	+20%					25.779	-0.136	0.000	0.32		27.1
2.000	S18	15 Summer	100	+20%					25.633	-0.163	0.000	0.17		6.4
2.001	S19	15 Summer	100	+20%	100/15 Summer				25.495	0.015	0.000	0.37		11.3
1.002	S20	15 Summer	100	+20%	100/15 Summer				25.479	0.053	0.000	0.55		41.9
1.003	SMH 52.2	15 Summer	100	+20%	30/15 Summer				25.390	0.255	0.000	1.81		48.9
3.000	SMH 52.3	15 Summer	100	+20%	30/15 Summer				25.284	0.127	0.000	0.41		12.3
1.004	S12	15 Summer	100	+20%	30/15 Summer				25.268	0.159	0.000	2.37		60.7
1.005	9	5760 Summer	100	+20%	30/2160 Summer				24.571	0.346	0.000	0.12		3.5
1.006	10	5760 Summer	100	+20%	30/360 Summer				24.635	0.922	0.000	0.00		0.0

PN	US/MH Name	Status	Level Exceeded
1.001	SMH 52.1	OK	
2.000	S18	OK	
2.001	S19	SURCHARGED	
1.002	S20	SURCHARGED	
1.003	SMH 52.2	SURCHARGED	
3.000	SMH 52.3	SURCHARGED	
1.004	S12	SURCHARGED	
1.005	9	SURCHARGED	
1.006	10	SURCHARGED	

MH Name		SC 1	SC 2				SC 4
Hor Scale 700 Ver Scale 200 Datum (m) 20.000							
PN		1.000	1.001				
Dia (mm)		225	225				
Slope (1:X)		199.0	228.8				
Cover Level (m)		27.179	27.359	27.479			27.479
Invert Level (m)		25.800 25.690	25.690 25.613	25.613			
Length (m)		21.892	17.615				

MH Name		SC 2.1	SC 2
Hor Scale 700 Ver Scale 200 Datum (m) 20.000			
PN		2.000	
Dia (mm)		225	
Slope (1:X)		218.8	
Cover Level (m)		26.998	27.359
Invert Level (m)		25.764	25.690
Length (m)		16.192	

Fairgreen House
Fairgreen Road
Galway

Date 12/07/2022 12:05
File 11269 - SOAKAWAY C.MDX

Designed by michael.naughton
Checked by

Micro Drainage | Network 2018.1.1

Manhole Schedules for Surface Network 4

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SC 1	27.179	1.379	Open Manhole	1200	1.000	25.800	225				
SC 2.1	26.998	1.234	Open Manhole	1200	2.000	25.764	225				
SC 2	27.359	1.669	Open Manhole	1200	1.001	25.690	225	1.000	25.690	225	
								2.000	25.690	225	
SC 3	27.479	1.866	Open Manhole	1200	1.002	25.613	225	1.001	25.613	225	
5	27.479	2.499	Open Manhole	1050	1.003	24.980	225	1.002	25.580	225	600
6	27.479	2.874	Open Manhole	1050	1.004	24.605	225	1.003	24.960	225	355
SC 4	27.479	2.894	Open Manhole	1200		OUTFALL		1.004	24.585	225	

PIPELINE SCHEDULES for Surface Network 4

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	225	SC 1	27.179	25.800	1.154	Open Manhole	1200
2.000	o	225	SC 2.1	26.998	25.764	1.009	Open Manhole	1200
1.001	o	225	SC 2	27.359	25.690	1.444	Open Manhole	1200
1.002	o	225	SC 3	27.479	25.613	1.641	Open Manhole	1200
1.003	o	225	5	27.479	24.980	2.274	Open Manhole	1050
1.004	o	225	6	27.479	24.605	2.649	Open Manhole	1050

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	21.892	199.0	SC 2	27.359	25.690	1.444	Open Manhole	1200
2.000	16.192	218.8	SC 2	27.359	25.690	1.444	Open Manhole	1200
1.001	17.615	228.8	SC 3	27.479	25.613	1.641	Open Manhole	1200
1.002	4.021	121.9	5	27.479	25.580	1.674	Open Manhole	1050
1.003	2.000	100.0	6	27.479	24.960	2.294	Open Manhole	1050
1.004	2.000	100.0	SC 4	27.479	24.585	2.669	Open Manhole	1200

Area Summary for Surface Network 4

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.081	0.081	0.081
2.000	-	-	100	0.030	0.030	0.030
1.001	-	-	100	0.021	0.021	0.021
1.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.132	0.132	0.132

Free Flowing Outfall Details for Surface Network 4

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.004	SC 4	27.479	24.585	0.000	1200	0

Simulation Criteria for Surface Network 4

Volumetric Runoff Coeff	0.900	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	17.000	Cv (Summer)	0.900
Return Period (years)	1	Ratio R	0.283	Cv (Winter)	0.840
Region	Scotland and Ireland	Profile Type	Summer	Storm Duration (mins)	30

Online Controls for Surface Network 4

Pump Manhole: 6, DS/PN: 1.004, Volume (m³): 2.5

Invert Level (m) 24.605

Depth (m)	Flow (l/s)
1.000	0.0000

Storage Structures for Surface Network 4

Cellular Storage Manhole: 5, DS/PN: 1.003

Invert Level (m) 24.605 Infiltration Coefficient Side (m/hr) 0.07801 Porosity 0.95
Infiltration Coefficient Base (m/hr) 0.00000 Safety Factor 2.0

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	190.0	190.0	1.200	190.0	259.6	1.300	0.0	259.6

Manhole Headloss for Surface Network 4

PN	US/MH Name	US/MH Headloss
1.000	SC 1	0.000
2.000	SC 2.1	0.000
1.001	SC 2	0.000
1.002	SC 3	0.000
1.003	5	0.000
1.004	6	0.000

Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 4

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 17.000 Cv (Summer) 0.900
Region Scotland and Ireland Ratio R 0.283 Cv (Winter) 0.900

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 30, 100
Climate Change (%) 10, 20

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	SC 1 15	Summer	100	+20%	30/15	Summer			26.308	0.283	0.000	1.01		33.8	SURCHARGED

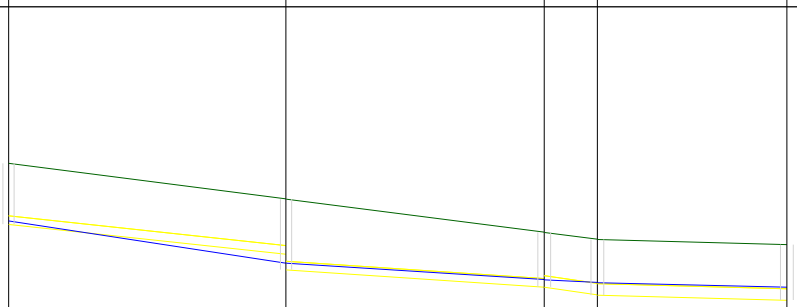
Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 4

PN	US/MH Name	Level Exceeded
1.000	SC 1	

Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 4

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)
2.000	SC 2.1	15 Summer	100	+20%	30/15 Summer				26.213	0.224	0.000	0.40		12.4
1.001	SC 2	15 Summer	100	+20%	30/15 Summer				26.190	0.275	0.000	1.74		53.4
1.002	SC 3	15 Summer	100	+20%	30/15 Summer				25.941	0.103	0.000	1.80		53.7
1.003	5	7200 Summer	100	+20%	100/2160 Summer				25.267	0.062	0.000	0.12		3.4
1.004	6	7200 Summer	100	+20%	30/720 Summer				25.377	0.547	0.000	0.00		0.0

PN	US/MH Name	Status	Level Exceeded
2.000	SC 2.1	SURCHARGED	
1.001	SC 2	SURCHARGED	
1.002	SC 3	SURCHARGED	
1.003	5	SURCHARGED	
1.004	6	SURCHARGED	

MH Name		SD 1	SD 2		SD 4	SD 5
Hor Scale 800 Ver Scale 200 Datum (m) 22.000						
PN		1.000	1.001		1.003	
Dia (mm)		225	225		300	
Slope (1:X)		37.2	59.4		143.3	
Cover Level (m)		30.013	29.066	28.187	28.004	27.862
Invert Level (m)		28.400 27.610	27.200 26.740	26.740	26.530 26.390	
Length (m)		29.356	27.310		20.056	

Fairgreen House
Fairgreen Road
Galway

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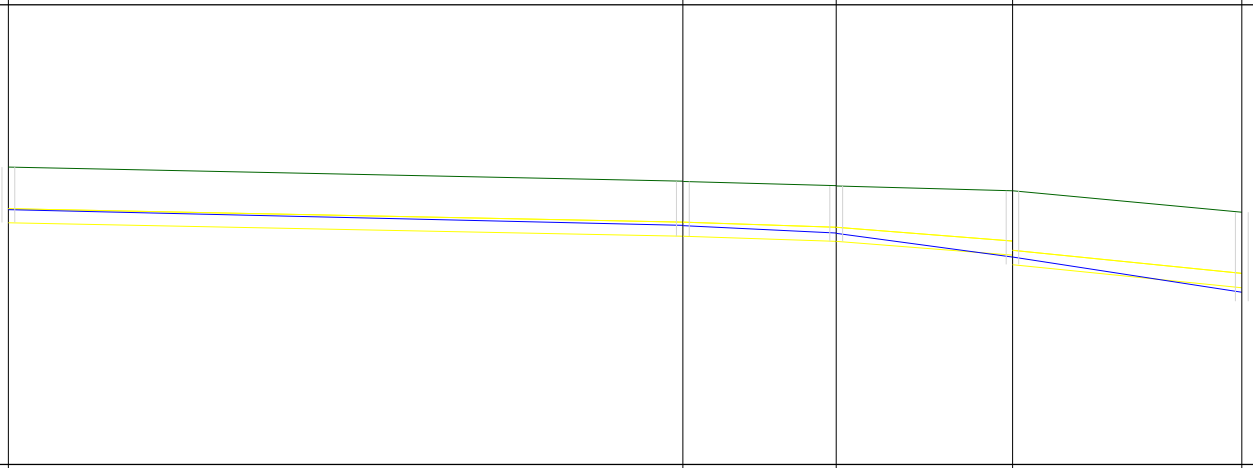
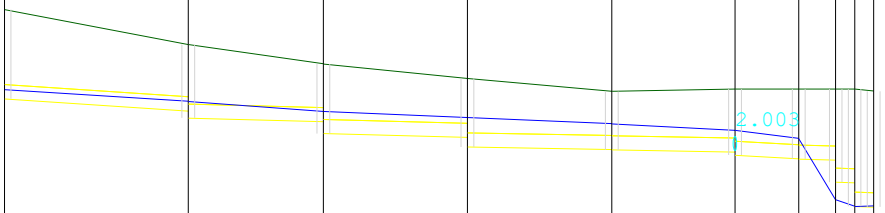
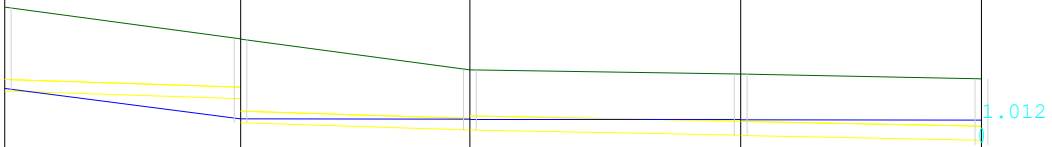
MH Name		SD 5	SD 6	SD 7	SD 8	SD 9
Hor Scale 800 Ver Scale 200 Datum (m) 20.000						
PN		1.004	1.005	1.006	1.007	
Dia (mm)		375	375	375	375	
Slope (1:X)		200.5	117.5	50.5	39.5	
Cover Level (m)		27.862	27.483	27.366	27.237	26.666
Invert Level (m)		26.390 / 26.034	26.034 / 25.896	25.896 / 25.527	25.284 / 24.670	
Length (m)		71.374	16.209	18.651	24.273	

MH Name		SD 9	SD 10	SD 11	SD 12	SD 13				SD 16
Hor Scale 800 Ver Scale 200 Datum (m)18.000										
PN		1.008	1.009	1.010	1.011	1.012				
Dia (mm)		375	375	375	375	375				
Slope (1:X)		60.2	148.9	149.4	201.0	200.2				
Cover Level (m)		26.666	25.741	25.231	24.848	24.502	24.566	24.566		24.509
Invert Level (m)		24.308 23.985	23.796 23.700	23.392 23.290	23.032 22.956	22.956 22.891	22.815 22.715	22.715		
Length (m)		19.432	14.297	15.242	15.275	13.014				

MH Name		SD 17	SD 18	SD 19	SD 20	SD 14
Hor Scale 800 Ver Scale 200 Datum (m)19.000						
PN		2.000	2.001	2.002	2.003	
Dia (mm)		300	300	375	375	
Slope (1:X)		119.9	120.1	200.4	200.5	
Cover Level (m)		26.465	25.620	24.804	24.694	24.566
Invert Level (m)		24.248 24.040	23.412 23.210	23.210 23.067	23.067 22.940	
Length (m)		24.948	24.265	28.651	25.469	

Fairgreen House
Fairgreen Road
Galway

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Manhole Schedules for Surface Network 2

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SD 1	30.013	1.613	Open Manhole	1200	1.000	28.400	225				
SD 2	29.066	1.866	Open Manhole	1200	1.001	27.200	225	1.000	27.610	225	410
SD 3	28.187	1.447	Open Manhole	1350	1.002	26.740	300	1.001	26.740	225	
SD 4	28.004	1.474	Open Manhole	1350	1.003	26.530	300	1.002	26.530	300	
SD 5	27.862	1.472	Open Manhole	1350	1.004	26.390	375	1.003	26.390	300	
SD 6	27.483	1.449	Open Manhole	1350	1.005	26.034	375	1.004	26.034	375	
SD 7	27.366	1.470	Open Manhole	1350	1.006	25.896	375	1.005	25.896	375	
SD 8	27.237	1.953	Open Manhole	1350	1.007	25.284	375	1.006	25.527	375	243
SD 9	26.666	2.358	Open Manhole	1350	1.008	24.308	375	1.007	24.670	375	362
SD 10	25.741	1.945	Open Manhole	1350	1.009	23.796	375	1.008	23.985	375	189
SD 11	25.231	1.839	Open Manhole	1350	1.010	23.392	375	1.009	23.700	375	308
SD 12	24.848	1.816	Open Manhole	1350	1.011	23.032	375	1.010	23.290	375	258
SD 13	24.502	1.546	Open Manhole	1350	1.012	22.956	375	1.011	22.956	375	
SD 17	26.465	2.217	Open Manhole	1350	2.000	24.248	300				
SD 18	25.620	2.208	Open Manhole	1350	2.001	23.412	300	2.000	24.040	300	628
SD 19	24.804	1.594	Open Manhole	1350	2.002	23.210	375	2.001	23.210	300	
SD 20	24.694	1.627	Open Manhole	1350	2.003	23.067	375	2.002	23.067	375	
SD 14	24.566	1.751	Open Manhole	1350	1.013	22.815	375	1.012	22.891	375	76
								2.003	22.940	375	125

Manhole Schedules for Surface Network 2

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SD 15	24.566	1.851	Open Manhole	1350	1.014	22.715	375	1.013	22.715	375	
20	24.566	2.466	Open Manhole	1350	1.015	22.100	375	1.014	22.689	375	589
21	24.566	3.102	Open Manhole	1350	1.016	21.464	375	1.015	22.080	375	616
SD 16	24.509	3.065	Open Manhole	1350		OUTFALL		1.016	21.444	375	

PIPELINE SCHEDULES for Surface Network 2

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	225	SD 1	30.013	28.400	1.388	Open Manhole	1200
1.001	o	225	SD 2	29.066	27.200	1.641	Open Manhole	1200
1.002	o	300	SD 3	28.187	26.740	1.147	Open Manhole	1350
1.003	o	300	SD 4	28.004	26.530	1.174	Open Manhole	1350
1.004	o	375	SD 5	27.862	26.390	1.097	Open Manhole	1350
1.005	o	375	SD 6	27.483	26.034	1.074	Open Manhole	1350
1.006	o	375	SD 7	27.366	25.896	1.095	Open Manhole	1350
1.007	o	375	SD 8	27.237	25.284	1.578	Open Manhole	1350
1.008	o	375	SD 9	26.666	24.308	1.983	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	29.356	37.2	SD 2	29.066	27.610	1.231	Open Manhole	1200
1.001	27.310	59.4	SD 3	28.187	26.740	1.222	Open Manhole	1350
1.002	5.630	26.8	SD 4	28.004	26.530	1.174	Open Manhole	1350
1.003	20.056	143.3	SD 5	27.862	26.390	1.172	Open Manhole	1350
1.004	71.374	200.5	SD 6	27.483	26.034	1.074	Open Manhole	1350
1.005	16.209	117.5	SD 7	27.366	25.896	1.095	Open Manhole	1350
1.006	18.651	50.5	SD 8	27.237	25.527	1.335	Open Manhole	1350
1.007	24.273	39.5	SD 9	26.666	24.670	1.621	Open Manhole	1350
1.008	19.432	60.2	SD 10	25.741	23.985	1.381	Open Manhole	1350

PIPELINE SCHEDULES for Surface Network 2

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.009	o	375	SD 10	25.741	23.796	1.570	Open Manhole	1350
1.010	o	375	SD 11	25.231	23.392	1.464	Open Manhole	1350
1.011	o	375	SD 12	24.848	23.032	1.441	Open Manhole	1350
1.012	o	375	SD 13	24.502	22.956	1.171	Open Manhole	1350
2.000	o	300	SD 17	26.465	24.248	1.917	Open Manhole	1350
2.001	o	300	SD 18	25.620	23.412	1.908	Open Manhole	1350
2.002	o	375	SD 19	24.804	23.210	1.219	Open Manhole	1350
2.003	o	375	SD 20	24.694	23.067	1.252	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.009	14.297	148.9	SD 11	25.231	23.700	1.156	Open Manhole	1350
1.010	15.242	149.4	SD 12	24.848	23.290	1.183	Open Manhole	1350
1.011	15.275	201.0	SD 13	24.502	22.956	1.171	Open Manhole	1350
1.012	13.014	200.2	SD 14	24.566	22.891	1.300	Open Manhole	1350
2.000	24.948	119.9	SD 18	25.620	24.040	1.280	Open Manhole	1350
2.001	24.265	120.1	SD 19	24.804	23.210	1.294	Open Manhole	1350
2.002	28.651	200.4	SD 20	24.694	23.067	1.252	Open Manhole	1350
2.003	25.469	200.5	SD 14	24.566	22.940	1.251	Open Manhole	1350

PIPELINE SCHEDULES for Surface Network 2

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.013	o	375	SD 14	24.566	22.815	1.376	Open Manhole	1350
1.014	o	375	SD 15	24.566	22.715	1.476	Open Manhole	1350
1.015	o	375	20	24.566	22.100	2.091	Open Manhole	1350
1.016	o	375	21	24.566	21.464	2.727	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.013	6.744	67.4	SD 15	24.566	22.715	1.476	Open Manhole	1350
1.014	3.919	150.1	20	24.566	22.689	1.502	Open Manhole	1350
1.015	2.000	100.0	21	24.566	22.080	2.111	Open Manhole	1350
1.016	2.000	100.0	SD 16	24.509	21.444	2.690	Open Manhole	1350

Area Summary for Surface Network 2

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.086	0.086	0.086
1.001	-	-	100	0.086	0.086	0.086
1.002	-	-	100	0.034	0.034	0.034
1.003	-	-	100	0.025	0.025	0.025
1.004	-	-	100	0.172	0.172	0.172
1.005	-	-	100	0.016	0.016	0.016
1.006	-	-	100	0.054	0.054	0.054
1.007	-	-	100	0.018	0.018	0.018
1.008	-	-	100	0.026	0.026	0.026
1.009	-	-	100	0.043	0.043	0.043
1.010	-	-	100	0.017	0.017	0.017
1.011	-	-	100	0.025	0.025	0.025
1.012	-	-	100	0.026	0.026	0.026
2.000	-	-	100	0.034	0.034	0.034
2.001	-	-	100	0.023	0.023	0.023
2.002	-	-	100	0.031	0.031	0.031
2.003	-	-	100	0.042	0.042	0.042
1.013	-	-	100	0.000	0.000	0.000
1.014	-	-	100	0.000	0.000	0.000
1.015	-	-	100	0.000	0.000	0.000
1.016	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.758	0.758	0.758

Free Flowing Outfall Details for Surface Network 2

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.016	SD 16	24.509	21.444	0.000	1350	0

Simulation Criteria for Surface Network 2

Volumetric Runoff Coeff	0.900	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	17.000	Cv (Summer)	0.900
Return Period (years)	1	Ratio R	0.283	Cv (Winter)	0.840
Region	Scotland and Ireland	Profile Type	Summer	Storm Duration (mins)	30

Online Controls for Surface Network 2

Pump Manhole: 21, DS/PN: 1.016, Volume (m³): 4.5

Invert Level (m) 21.464

Depth (m)	Flow (l/s)
1.000	0.0000

Storage Structures for Surface Network 2

Cellular Storage Manhole: 20, DS/PN: 1.015

Invert Level (m) 21.464 Infiltration Coefficient Side (m/hr) 0.07801 Porosity 0.95
Infiltration Coefficient Base (m/hr) 0.00000 Safety Factor 2.0

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	650.0	650.0	1.600	650.0	818.0	1.700	0.0	818.0

Manhole Headloss for Surface Network 2

PN	US/MH Name	US/MH Headloss
1.000	SD 1	0.500
1.001	SD 2	0.500
1.002	SD 3	0.500
1.003	SD 4	0.500
1.004	SD 5	0.500
1.005	SD 6	0.500
1.006	SD 7	0.500
1.007	SD 8	0.500
1.008	SD 9	0.500
1.009	SD 10	0.500
1.010	SD 11	0.500
1.011	SD 12	0.500
1.012	SD 13	0.500
2.000	SD 17	0.500
2.001	SD 18	0.500
2.002	SD 19	0.500
2.003	SD 20	0.500
1.013	SD 14	0.500
1.014	SD 15	0.500
1.015	20	0.500
1.016	21	0.500

Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 17.000 Cv (Summer) 0.900
Region Scotland and Ireland Ratio R 0.283 Cv (Winter) 0.900

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 30, 100
Climate Change (%) 10, 20

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	SD 1 15	Summer	100	+20%					28.513	-0.112	0.000	0.50		39.9	OK

Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Level Exceeded
1.000	SD 1	

Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

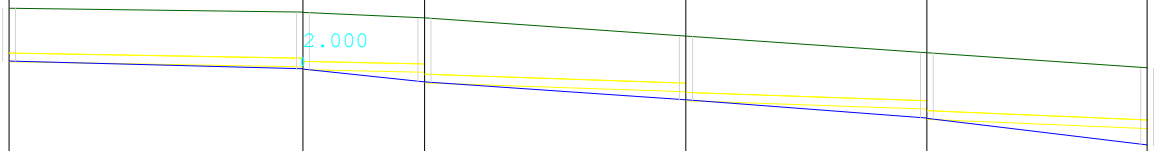
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)
1.001	SD 2	15 Summer	100	+20%	100/15 Summer				27.962	0.537	0.000	1.18		74.3
1.002	SD 3	15 Summer	100	+20%	100/15 Summer				27.314	0.274	0.000	0.78		90.0
1.003	SD 4	15 Summer	100	+20%	30/15 Summer				27.192	0.362	0.000	1.24		100.2
1.004	SD 5	15 Summer	100	+20%	100/15 Summer				26.994	0.229	0.000	1.22		162.4
1.005	SD 6	15 Summer	100	+20%	100/15 Summer				26.429	0.020	0.000	1.11		161.7
1.006	SD 7	15 Summer	100	+20%					26.143	-0.128	0.000	0.74		173.3
1.007	SD 8	15 Summer	100	+20%					25.508	-0.151	0.000	0.65		177.7
1.008	SD 9	30 Summer	100	+20%	100/15 Summer				24.970	0.287	0.000	0.84		180.2
1.009	SD 10	30 Summer	100	+20%	30/15 Summer				24.750	0.579	0.000	1.55		188.2
1.010	SD 11	30 Summer	100	+20%	30/15 Summer				24.520	0.753	0.000	1.53		190.9
1.011	SD 12	30 Summer	100	+20%	30/15 Summer				24.280	0.873	0.000	1.82		195.9
1.012	SD 13	30 Summer	100	+20%	30/15 Summer				24.031	0.700	0.000	1.88		201.3
2.000	SD 17	15 Summer	100	+20%					24.332	-0.216	0.000	0.17		15.6
2.001	SD 18	30 Summer	100	+20%	100/15 Summer				23.830	0.118	0.000	0.27		24.5
2.002	SD 19	30 Summer	100	+20%	100/15 Summer				23.811	0.226	0.000	0.23		29.1
2.003	SD 20	30 Summer	100	+20%	30/15 Summer				23.794	0.352	0.000	0.36		44.2
1.013	SD 14	30 Summer	100	+20%	30/15 Summer				23.770	0.580	0.000	1.90		235.0
1.014	SD 15	30 Summer	100	+20%	30/15 Summer				23.407	0.317	0.000	2.57		235.2
1.015	20	10080 Summer	100	+20%	30/10080 Summer				22.783	0.308	0.000	0.20		17.7
1.016	21	10080 Summer	100	+20%	30/720 Summer				22.909	1.070	0.000	0.10		8.9

Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Status	Level Exceeded
1.001	SD 2	SURCHARGED	
1.002	SD 3	SURCHARGED	
1.003	SD 4	SURCHARGED	
1.004	SD 5	SURCHARGED	
1.005	SD 6	SURCHARGED	
1.006	SD 7	OK	
1.007	SD 8	OK	
1.008	SD 9	SURCHARGED	
1.009	SD 10	SURCHARGED	
1.010	SD 11	SURCHARGED	
1.011	SD 12	SURCHARGED	
1.012	SD 13	SURCHARGED	
2.000	SD 17	OK	
2.001	SD 18	SURCHARGED	
2.002	SD 19	SURCHARGED	
2.003	SD 20	SURCHARGED	
1.013	SD 14	SURCHARGED	
1.014	SD 15	SURCHARGED	
1.015	20	SURCHARGED	
1.016	21	SURCHARGED	

Fairgreen House
Fairgreen Road
Galway

Date 12/07/2022 17:00 | Designed by michael.naughton
File 11269 - SOAKAWAY E.MDX | Checked by
Micro Drainage | Network 2018.1.1

MH Name		SE 1	SE 2	SE 3	SE 4	SE 5	SE 6
Hor Scale 700 Ver Scale 200 Datum (m) 20.000							
PN		1.000	1.001	1.002	1.003	1.004	
Dia (mm)		225	225	225	225	225	
Slope (1:X)		200.0	150.1	100.0	100.0	80.3	
Cover Level (m)		27.542	27.435	27.287	26.804	26.362	25.960
Invert Level (m)		26.130 → 25.994	25.915 → 25.840	25.572 → 25.330	25.093 → 24.870	24.605 → 24.351	
Length (m)		27.205	11.257	24.200	22.305	20.389	

Fairgreen House
Fairgreen Road
Galway

Date 12/07/2022 17:00 | Designed by michael.naughton
File 11269 - SOAKAWAY E.MDX | Checked by
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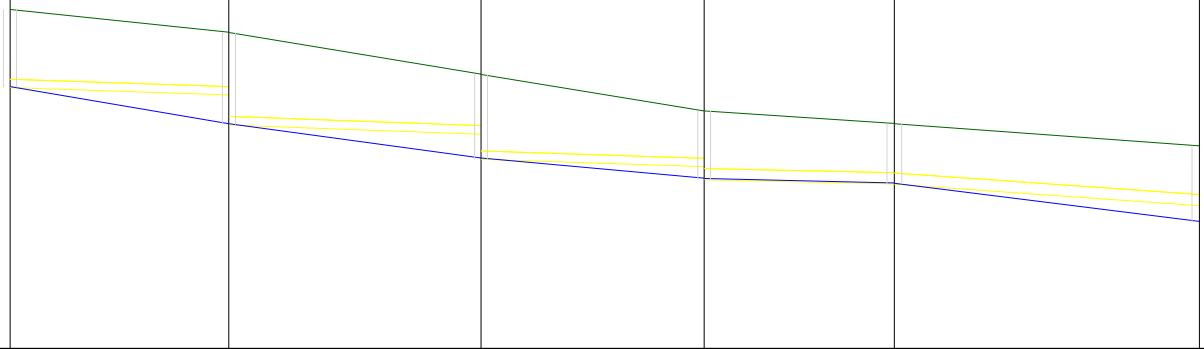
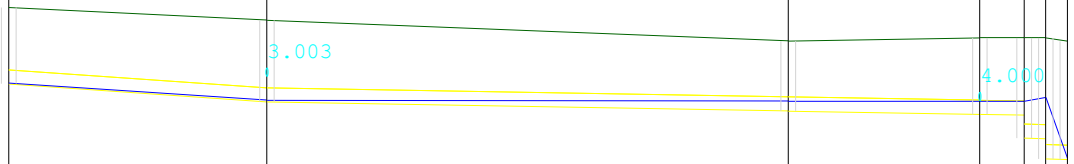
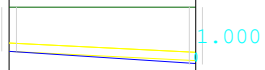
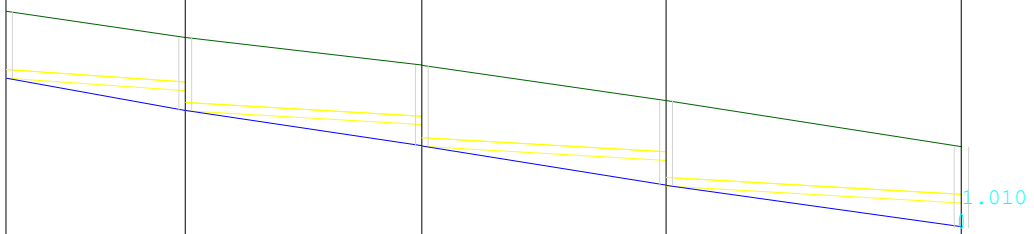
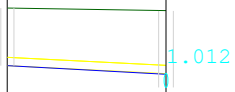
MH Name		SE 6	SE 7	SE 8	SE 9	SE 10	SE 11
Hor Scale 700 Ver Scale 200 Datum (m)17.000							
PN		1.005	1.006	1.007	1.008	1.009	
Dia (mm)		225	225	225	300	300	
Slope (1:X)		102.8	94.5	103.8	149.1	49.5	
Cover Level (m)		25.960	25.356	24.248	23.280	22.942	22.350
Invert Level (m)		23.897	23.700	22.910	22.663	21.999	21.800	21.458	21.340	21.340	20.770	
Length (m)		20.261	23.340	20.659	17.593	28.238	

MH Name		SE 11	SE 12	SE 13			SE 15
Hor Scale 700 Ver Scale 200 Datum (m)14.000							
PN		1.010	1.011	1.012			
Dia (mm)		375	375	375			
Slope (1:X)		50.1	200.0	194.9			
Cover Level (m)		22.350	22.011	21.463	21.554		21.461
Invert Level (m)		20.332 19.855	19.855 19.614	19.614 19.523	19.523		
Length (m)		23.893	48.261	17.732			

MH Name		SE 2.1	SE 2
Hor Scale 700 Ver Scale 200 Datum (m) 21.000			
PN		2.000	
Dia (mm)		225	
Slope (1:X)		70.0	
Cover Level (m)		27.433	27.435
Invert Level (m)		26.260	26.013
Length (m)		17.292	

MH Name		SE 12.2.1	SE 12.2	SE 12.3	SE 12.4	SE 12
Hor Scale 700 Ver Scale 200 Datum (m)17.000						
PN		3.000	3.001	3.002	3.003	
Dia (mm)		225	225	225	225	
Slope (1:X)		50.0	60.0	60.0	59.9	
Cover Level (m)		25.604	24.908	24.173	23.234	22.011
Invert Level (m)		23.832 / 23.500	22.965 / 22.600	22.027 / 21.650	20.981 / 20.525	
Length (m)		16.598	21.894	22.607	27.335	

MH Name		SE 14.1	SE 14
Hor Scale 700 Ver Scale 200 Datum (m)14.000			
PN		4.000	
Dia (mm)		225	
Slope (1:X)		67.4	
Cover Level (m)		21.628	21.554
Invert Level (m)		20.100	19.882
Length (m)		14.684	

Manhole Schedules for Surface Network 5

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SE 1	27.542	1.412	Open Manhole	1200	1.000	26.130	225				
SE 2.1	27.433	1.173	Open Manhole	1350	2.000	26.260	225				
SE 2	27.435	1.520	Open Manhole	1200	1.001	25.915	225	1.000	25.994	225	79
								2.000	26.013	225	98
SE 3	27.287	1.715	Open Manhole	1200	1.002	25.572	225	1.001	25.840	225	268
SE 4	26.804	1.711	Open Manhole	1200	1.003	25.093	225	1.002	25.330	225	237
SE 5	26.362	1.757	Open Manhole	1200	1.004	24.605	225	1.003	24.870	225	265
SE 6	25.960	2.063	Open Manhole	1200	1.005	23.897	225	1.004	24.351	225	454
SE 7	25.356	2.446	Open Manhole	1200	1.006	22.910	225	1.005	23.700	225	790
SE 8	24.248	2.249	Open Manhole	1200	1.007	21.999	225	1.006	22.663	225	664
SE 9	23.280	1.822	Open Manhole	1200	1.008	21.458	300	1.007	21.800	225	267
SE 10	22.942	1.602	Open Manhole	1350	1.009	21.340	300	1.008	21.340	300	
SE 11	22.350	2.018	Open Manhole	1350	1.010	20.332	375	1.009	20.770	300	363
SE 12.2.1	25.604	1.772	Open Manhole	1200	3.000	23.832	225				
SE 12.2	24.908	1.943	Open Manhole	1200	3.001	22.965	225	3.000	23.500	225	535
SE 12.3	24.173	2.146	Open Manhole	1200	3.002	22.027	225	3.001	22.600	225	573
SE 12.4	23.234	2.253	Open Manhole	1200	3.003	20.981	225	3.002	21.650	225	669
SE 12	22.011	2.156	Open Manhole	1350	1.011	19.855	375	1.010	19.855	375	
								3.003	20.525	225	520

Manhole Schedules for Surface Network 5

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SE 13	21.463	1.849	Open Manhole	1350	1.012	19.614	375	1.011	19.614	375	
SE 14.1	21.628	1.528	Open Manhole	1200	4.000	20.100	225				
SE 14	21.554	2.031	Open Manhole	1350	1.013	19.523	375	1.012	19.523	375	
								4.000	19.882	225	209
21	21.554	2.654	Open Manhole	1350	1.014	18.900	375	1.013	19.502	375	602
22	21.554	3.202	Open Manhole	1350	1.015	18.352	375	1.014	18.880	375	528
SE 15	21.461	3.129	Open Manhole	1350		OUTFALL		1.015	18.332	375	

PIPELINE SCHEDULES for Surface Network 5

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	225	SE 1	27.542	26.130	1.187	Open Manhole	1200
2.000	o	225	SE 2.1	27.433	26.260	0.948	Open Manhole	1350
1.001	o	225	SE 2	27.435	25.915	1.295	Open Manhole	1200
1.002	o	225	SE 3	27.287	25.572	1.490	Open Manhole	1200
1.003	o	225	SE 4	26.804	25.093	1.486	Open Manhole	1200
1.004	o	225	SE 5	26.362	24.605	1.532	Open Manhole	1200
1.005	o	225	SE 6	25.960	23.897	1.838	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	27.205	200.0	SE 2	27.435	25.994	1.216	Open Manhole	1200
2.000	17.292	70.0	SE 2	27.435	26.013	1.197	Open Manhole	1200
1.001	11.257	150.1	SE 3	27.287	25.840	1.222	Open Manhole	1200
1.002	24.200	100.0	SE 4	26.804	25.330	1.249	Open Manhole	1200
1.003	22.305	100.0	SE 5	26.362	24.870	1.267	Open Manhole	1200
1.004	20.389	80.3	SE 6	25.960	24.351	1.384	Open Manhole	1200
1.005	20.261	102.8	SE 7	25.356	23.700	1.431	Open Manhole	1200

PIPELINE SCHEDULES for Surface Network 5

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.006	o	225	SE 7	25.356	22.910	2.221	Open Manhole	1200
1.007	o	225	SE 8	24.248	21.999	2.024	Open Manhole	1200
1.008	o	300	SE 9	23.280	21.458	1.522	Open Manhole	1200
1.009	o	300	SE 10	22.942	21.340	1.302	Open Manhole	1350
1.010	o	375	SE 11	22.350	20.332	1.643	Open Manhole	1350
3.000	o	225	SE 12.2.1	25.604	23.832	1.547	Open Manhole	1200
3.001	o	225	SE 12.2	24.908	22.965	1.718	Open Manhole	1200
3.002	o	225	SE 12.3	24.173	22.027	1.921	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.006	23.340	94.5	SE 8	24.248	22.663	1.360	Open Manhole	1200
1.007	20.659	103.8	SE 9	23.280	21.800	1.255	Open Manhole	1200
1.008	17.593	149.1	SE 10	22.942	21.340	1.302	Open Manhole	1350
1.009	28.238	49.5	SE 11	22.350	20.770	1.280	Open Manhole	1350
1.010	23.893	50.1	SE 12	22.011	19.855	1.781	Open Manhole	1350
3.000	16.598	50.0	SE 12.2	24.908	23.500	1.183	Open Manhole	1200
3.001	21.894	60.0	SE 12.3	24.173	22.600	1.348	Open Manhole	1200
3.002	22.607	60.0	SE 12.4	23.234	21.650	1.359	Open Manhole	1200

PIPELINE SCHEDULES for Surface Network 5

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
3.003	o	225	SE 12.4	23.234	20.981	2.028	Open Manhole	1200
1.011	o	375	SE 12	22.011	19.855	1.781	Open Manhole	1350
1.012	o	375	SE 13	21.463	19.614	1.474	Open Manhole	1350
4.000	o	225	SE 14.1	21.628	20.100	1.303	Open Manhole	1200
1.013	o	375	SE 14	21.554	19.523	1.656	Open Manhole	1350
1.014	o	375	21	21.554	18.900	2.279	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
3.003	27.335	59.9	SE 12	22.011	20.525	1.261	Open Manhole	1350
1.011	48.261	200.0	SE 13	21.463	19.614	1.474	Open Manhole	1350
1.012	17.732	194.9	SE 14	21.554	19.523	1.656	Open Manhole	1350
4.000	14.684	67.4	SE 14	21.554	19.882	1.447	Open Manhole	1350
1.013	4.106	195.5	21	21.554	19.502	1.677	Open Manhole	1350
1.014	2.000	100.0	22	21.554	18.880	2.299	Open Manhole	1350

PIPELINE SCHEDULES for Surface Network 5

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.015	o	375	22	21.554	18.352	2.827	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.015	2.000	100.0	SE 15	21.461	18.332	2.754	Open Manhole	1350

Area Summary for Surface Network 5

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.060	0.060	0.060
2.000	-	-	100	0.000	0.000	0.000
1.001	-	-	100	0.031	0.031	0.031
1.002	-	-	100	0.055	0.055	0.055
1.003	-	-	100	0.032	0.032	0.032
1.004	-	-	100	0.052	0.052	0.052
1.005	-	-	100	0.050	0.050	0.050
1.006	-	-	100	0.045	0.045	0.045
1.007	-	-	100	0.056	0.056	0.056
1.008	-	-	100	0.023	0.023	0.023
1.009	-	-	100	0.033	0.033	0.033
1.010	-	-	100	0.040	0.040	0.040
3.000	-	-	100	0.000	0.000	0.000
3.001	-	-	100	0.054	0.054	0.054
3.002	-	-	100	0.048	0.048	0.048
3.003	-	-	100	0.046	0.046	0.046
1.011	-	-	100	0.077	0.077	0.077
1.012	-	-	100	0.000	0.000	0.000
4.000	-	-	100	0.045	0.045	0.045
1.013	-	-	100	0.000	0.000	0.000
1.014	-	-	100	0.000	0.000	0.000
1.015	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.747	0.747	0.747

Free Flowing Outfall Details for Surface Network 5

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.015	SE 15	21.461	18.332	0.000	1350	0

Simulation Criteria for Surface Network 5

Volumetric Runoff Coeff	0.900	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	17.000	Cv (Summer)	0.900
Return Period (years)	1	Ratio R	0.283	Cv (Winter)	0.840
Region	Scotland and Ireland	Profile Type	Summer	Storm Duration (mins)	30

Online Controls for Surface Network 5

Pump Manhole: 22, DS/PN: 1.015, Volume (m³): 4.7

Invert Level (m) 18.352

Depth (m)	Flow (l/s)
1.000	0.0000

Storage Structures for Surface Network 5

Cellular Storage Manhole: 21, DS/PN: 1.014

Invert Level (m) 18.352 Infiltration Coefficient Side (m/hr) 0.07801 Porosity 0.95
Infiltration Coefficient Base (m/hr) 0.00000 Safety Factor 2.0

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	480.0	480.0	1.600	480.0	665.6	1.700	0.0	665.6

Manhole Headloss for Surface Network 5

PN	US/MH Name	US/MH Headloss
1.000	SE 1	0.500
2.000	SE 2.1	0.500
1.001	SE 2	0.500
1.002	SE 3	0.500
1.003	SE 4	0.500
1.004	SE 5	0.500
1.005	SE 6	0.500
1.006	SE 7	0.500
1.007	SE 8	0.500
1.008	SE 9	0.500
1.009	SE 10	0.500
1.010	SE 11	0.500
3.000	SE 12.2.1	0.500
3.001	SE 12.2	0.500
3.002	SE 12.3	0.500
3.003	SE 12.4	0.500
1.011	SE 12	0.500
1.012	SE 13	0.500
4.000	SE 14.1	0.500
1.013	SE 14	0.500
1.014	21	0.500
1.015	22	0.500

Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 5

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 17.000 Cv (Summer) 0.900
Region Scotland and Ireland Ratio R 0.283 Cv (Winter) 0.900

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

Profile(s) Summer and Winter
Duration(s) (mins) 7200, 10080
Return Period(s) (years) 30, 100
Climate Change (%) 10, 20

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	SE 1	7200 Summer	100	+20%					26.153	-0.202	0.000	0.02		0.8	OK
2.000	SE 2.1	10080 Winter	30	+10%					26.260	-0.225	0.000	0.00		0.0	OK

Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 5

PN	US/MH Name	Level Exceeded
1.000	SE 1	
2.000	SE 2.1	

Fairgreen House
Fairgreen Road
Galway

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Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 5

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)
1.001	SE 2	7200 Summer	100	+20%					25.942	-0.198	0.000	0.03		1.2
1.002	SE 3	7200 Summer	100	+20%					25.601	-0.196	0.000	0.04		1.9
1.003	SE 4	7200 Summer	100	+20%					25.125	-0.193	0.000	0.05		2.4
1.004	SE 5	7200 Summer	100	+20%					24.640	-0.190	0.000	0.06		3.1
1.005	SE 6	7200 Summer	100	+20%					23.939	-0.183	0.000	0.08		3.7
1.006	SE 7	7200 Summer	100	+20%					22.955	-0.180	0.000	0.09		4.3
1.007	SE 8	7200 Summer	100	+20%					22.048	-0.176	0.000	0.11		5.1
1.008	SE 9	7200 Summer	100	+20%					21.509	-0.249	0.000	0.07		5.4
1.009	SE 10	7200 Summer	100	+20%					21.379	-0.261	0.000	0.04		5.8
1.010	SE 11	7200 Summer	100	+20%					20.372	-0.335	0.000	0.03		6.4
3.000	SE 12.2.1	10080 Winter	30	+10%					23.832	-0.225	0.000	0.00		0.0
3.001	SE 12.2	7200 Summer	100	+20%					22.977	-0.213	0.000	0.01		0.7
3.002	SE 12.3	7200 Summer	100	+20%					22.050	-0.202	0.000	0.02		1.4
3.003	SE 12.4	7200 Summer	100	+20%					21.007	-0.199	0.000	0.03		2.0
1.011	SE 12	10080 Summer	100	+20%					19.927	-0.303	0.000	0.06		7.3
1.012	SE 13	10080 Summer	100	+20%					19.924	-0.065	0.000	0.06		7.3
4.000	SE 14.1	7200 Summer	100	+20%					20.111	-0.214	0.000	0.01		0.6
1.013	SE 14	10080 Summer	100	+20%	100/7200 Summer				19.923	0.025	0.000	0.10		7.8
1.014	21	10080 Summer	100	+20%	30/7200 Summer				19.923	0.648	0.000	0.05		4.4
1.015	22	10080 Summer	100	+20%	30/7200 Summer				20.055	1.328	0.000	0.00		0.0

Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 5

PN	US/MH Name	Status	Level Exceeded
1.001	SE 2	OK	
1.002	SE 3	OK	
1.003	SE 4	OK	
1.004	SE 5	OK	
1.005	SE 6	OK	
1.006	SE 7	OK	
1.007	SE 8	OK	
1.008	SE 9	OK	
1.009	SE 10	OK	
1.010	SE 11	OK	
3.000	SE 12.2.1	OK	
3.001	SE 12.2	OK	
3.002	SE 12.3	OK	
3.003	SE 12.4	OK	
1.011	SE 12	OK	
1.012	SE 13	OK	
4.000	SE 14.1	OK	
1.013	SE 14	SURCHARGED	
1.014	21	SURCHARGED	
1.015	22	SURCHARGED	

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Fairgreen Road
Galway

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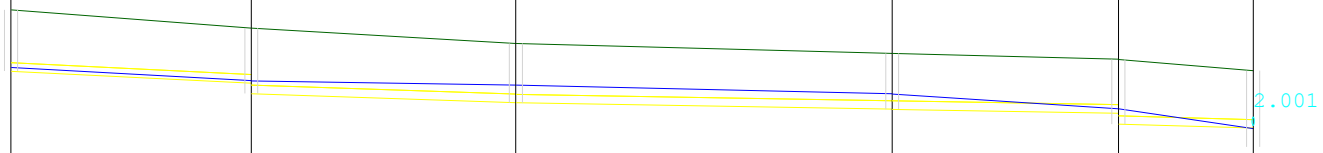
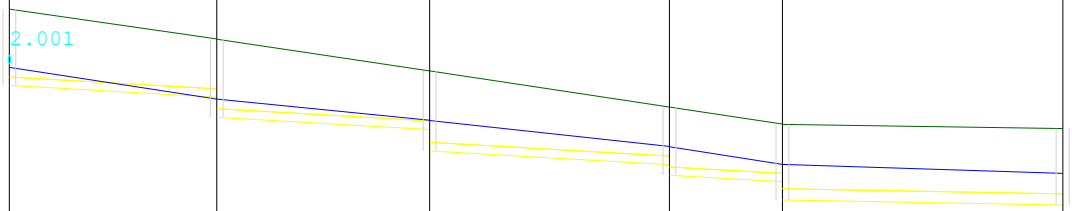
MH Name		SF 1	SF 2	SF 3	SF 4	SF 5	SF 6
Hor Scale 700 Ver Scale 200 Datum (m)13.000							
PN		1.000	1.001	1.002	1.003	1.004	
Dia (mm)		225	225	225	225	225	
Slope (1:X)		70.0	100.0	200.2	199.4	120.0	
Cover Level (m)		21.157	20.674	20.267	20.004	19.850	19.547
Invert Level (m)		19.537	19.219 18.945	18.700 18.700	18.526 18.526	18.421 18.134	18.030
Length (m)		22.244	24.491	34.839	20.935	12.480	

MH Name		SF 6	SF 7	SF 8	SF 9	SF 10	SF 11
Hor Scale 700 Ver Scale 200 Datum (m)11.000							
PN		1.005	1.006	1.007	1.008	1.009	
Dia (mm)		225	225	225	225	300	
Slope (1:X)		60.0	60.1	59.8	60.4	190.0	
Cover Level (m)		19.547	18.757	17.916	16.955	16.502	16.388
Invert Level (m)		17.530 17.210	16.688 16.360	15.801 15.430	15.153 14.980	14.500 14.363	
Length (m)		19.202	19.704	22.197	10.449	25.954	

Fairgreen House
Fairgreen Road
Galway

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File 11269 - SOAKAWAY F.MDX | Checked by
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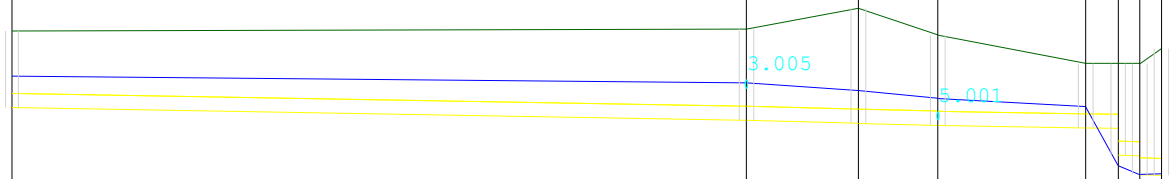
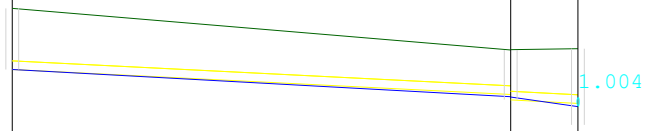
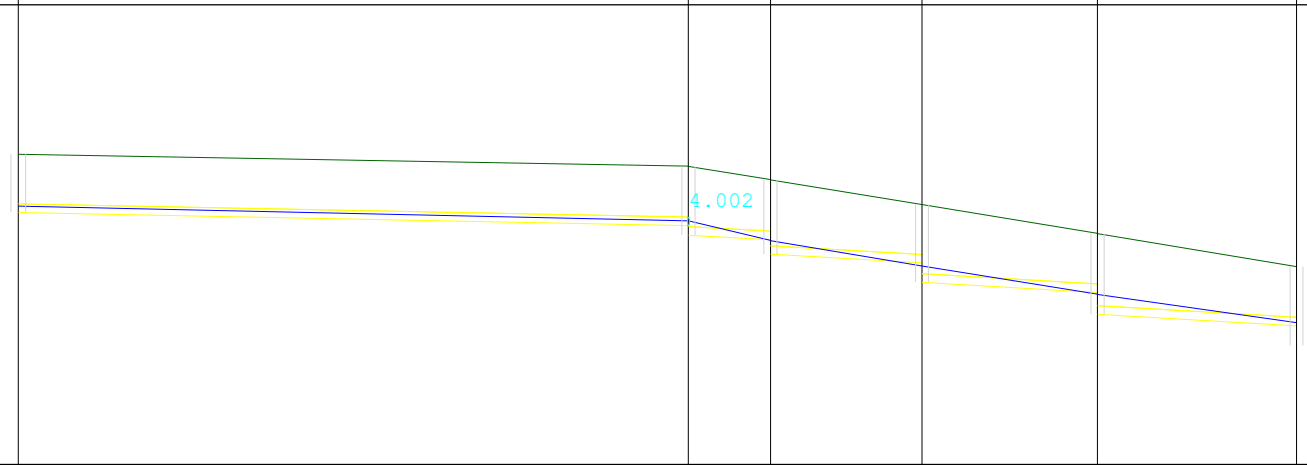
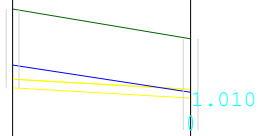
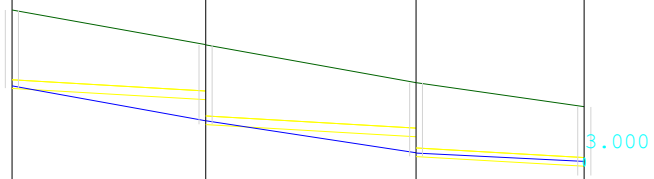
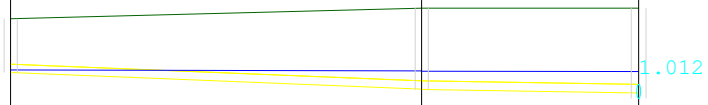
MH Name		SF 11	SF 12		SF 14				SF 16
Hor Scale 700 Ver Scale 200 Datum (m) 9.000									
PN		1.010	1.011		1.013				
Dia (mm)		375	375		375				
Slope (1:X)		200.0	132.8		200.0				
Cover Level (m)		16.388	16.439	16.990	16.280	15.527			15.925
Invert Level (m)		14.363	14.023	14.023 / 13.945	13.945 / 13.892	13.892	13.824	13.824	
Length (m)		67.995	10.362		13.677				

MH Name		SF 6.1		SF 6
Hor Scale 700 Ver Scale 200 Datum (m)13.000				
PN		2.000		
Dia (mm)		225		
Slope (1:X)		69.3		
Cover Level (m)		20.621	19.520	19.547
Invert Level (m)		19.000	18.334 18.200 18.100	
Length (m)		46.141		

MH Name		SF 20.1		SF 21	SF 22	SF 23	SF 24
Hor Scale 700 Ver Scale 200 Datum (m)12.000							
PN		3.000		3.002	3.003	3.004	
Dia (mm)		225		225	225	225	
Slope (1:X)		174.7		59.9	60.0	60.0	
Cover Level (m)		20.201	19.882	19.527	18.869	18.106	17.231
Invert Level (m)		18.665	18.310 18.062	17.935 17.559	17.325 16.816	16.545 15.968	15.661
Length (m)		62.028		14.019	16.253	18.430	

MH Name		SF 24	SF 12
Hor Scale 700 Ver Scale 200 Datum (m)10.000			
PN		3.005	
Dia (mm)		225	
Slope (1:X)		59.9	
Cover Level (m)		17.231	16.439
Invert Level (m)		15.145	14.870
Length (m)		16.480	

MH Name		SF 17	SF 18	SF 19	SF 20
Hor Scale 700 Ver Scale 200 Datum (m)14.000					
PN		4.000	4.001	4.002	
Dia (mm)		225	225	225	
Slope (1:X)		60.0	59.9	59.9	
Cover Level (m)		22.447	21.526	20.522	19.882
Invert Level (m)		20.375 20.076	19.419 19.094	18.570 18.310	
Length (m)		17.927	19.478	15.573	

MH Name		SF 14.2	SF 14.1	SF 14
Hor Scale 700 Ver Scale 200 Datum (m) 9.000				
PN		5.000	5.001	
Dia (mm)		225	225	
Slope (1:X)		85.1	209.2	
Cover Level (m)		16.000	16.281	16.280
Invert Level (m)		14.575 / 14.128	14.128 / 14.032	
Length (m)		38.052	20.081	

Fairgreen House
Fairgreen Road
Galway

Date 12/07/2022 18:37
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Manhole Schedules for Surface Network 6

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SF 1	21.157	1.620	Open Manhole	1200	1.000	19.537	225				
SF 2	20.674	1.729	Open Manhole	1200	1.001	18.945	225	1.000	19.219	225	274
SF 3	20.267	1.567	Open Manhole	1200	1.002	18.700	225	1.001	18.700	225	
SF 4	20.004	1.478	Open Manhole	1200	1.003	18.526	225	1.002	18.526	225	
SF 5	19.850	1.716	Open Manhole	1200	1.004	18.134	225	1.003	18.421	225	287
SF 6.1	20.621	1.621	Open Manhole	1200	2.000	19.000	225				
SF 6.2	19.520	1.320	Open Manhole	1200	2.001	18.200	225	2.000	18.334	225	134
SF 6	19.547	2.017	Open Manhole	1200	1.005	17.530	225	1.004	18.030	225	500
								2.001	18.100	225	570
SF 7	18.757	2.069	Open Manhole	1200	1.006	16.688	225	1.005	17.210	225	522
SF 8	17.916	2.115	Open Manhole	1200	1.007	15.801	225	1.006	16.360	225	559
SF 9	16.955	1.802	Open Manhole	1200	1.008	15.153	225	1.007	15.430	225	277
SF 10	16.502	2.002	Open Manhole	1200	1.009	14.500	300	1.008	14.980	225	405
SF 11	16.388	2.025	Open Manhole	1200	1.010	14.363	375	1.009	14.363	300	
SF 20.1	20.201	1.536	Open Manhole	1350	3.000	18.665	225				
SF 17	22.447	2.072	Open Manhole	1200	4.000	20.375	225				
SF 18	21.526	2.107	Open Manhole	1200	4.001	19.419	225	4.000	20.076	225	657
SF 19	20.522	1.952	Open Manhole	1200	4.002	18.570	225	4.001	19.094	225	524
SF 20	19.882	1.820	Open Manhole	1200	3.001	18.062	225	3.000	18.310	225	248

Manhole Schedules for Surface Network 6

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
								4.002	18.310	225	248
SF 21	19.527	1.968	Open Manhole	1200	3.002	17.559	225	3.001	17.935	225	376
SF 22	18.869	2.053	Open Manhole	1200	3.003	16.816	225	3.002	17.325	225	509
SF 23	18.106	2.138	Open Manhole	1200	3.004	15.968	225	3.003	16.545	225	577
SF 24	17.231	2.086	Open Manhole	1200	3.005	15.145	225	3.004	15.661	225	516
SF 12	16.439	2.416	Open Manhole	1350	1.011	14.023	375	1.010	14.023	375	
								3.005	14.870	225	697
SF 13	16.990	3.045	Open Manhole	1350	1.012	13.945	375	1.011	13.945	375	
SF 14.2	16.000	1.425	Open Manhole	1200	5.000	14.575	225				
SF 14.1	16.281	2.153	Open Manhole	1200	5.001	14.128	225	5.000	14.128	225	
SF 14	16.280	2.388	Open Manhole	1350	1.013	13.892	375	1.012	13.892	375	
								5.001	14.032	225	
SF 15	15.527	1.703	Open Manhole	1350	1.014	13.824	375	1.013	13.824	375	
29	15.527	2.427	Open Manhole	1350	1.015	13.100	375	1.014	13.809	375	709
30	15.527	2.943	Open Manhole	1350	1.016	12.584	450	1.015	13.080	375	421
SF 16	15.925	3.361	Open Manhole	1350		OUTFALL		1.016	12.564	450	

PIPELINE SCHEDULES for Surface Network 6

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	225	SF 1	21.157	19.537	1.395	Open Manhole	1200
1.001	o	225	SF 2	20.674	18.945	1.504	Open Manhole	1200
1.002	o	225	SF 3	20.267	18.700	1.342	Open Manhole	1200
1.003	o	225	SF 4	20.004	18.526	1.253	Open Manhole	1200
1.004	o	225	SF 5	19.850	18.134	1.491	Open Manhole	1200
2.000	o	225	SF 6.1	20.621	19.000	1.396	Open Manhole	1200
2.001	o	225	SF 6.2	19.520	18.200	1.095	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	22.244	70.0	SF 2	20.674	19.219	1.230	Open Manhole	1200
1.001	24.491	100.0	SF 3	20.267	18.700	1.342	Open Manhole	1200
1.002	34.839	200.2	SF 4	20.004	18.526	1.253	Open Manhole	1200
1.003	20.935	199.4	SF 5	19.850	18.421	1.204	Open Manhole	1200
1.004	12.480	120.0	SF 6	19.547	18.030	1.292	Open Manhole	1200
2.000	46.141	69.3	SF 6.2	19.520	18.334	0.961	Open Manhole	1200
2.001	6.224	62.2	SF 6	19.547	18.100	1.222	Open Manhole	1200

PIPELINE SCHEDULES for Surface Network 6

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.005	o	225	SF 6	19.547	17.530	1.792	Open Manhole	1200
1.006	o	225	SF 7	18.757	16.688	1.844	Open Manhole	1200
1.007	o	225	SF 8	17.916	15.801	1.890	Open Manhole	1200
1.008	o	225	SF 9	16.955	15.153	1.577	Open Manhole	1200
1.009	o	300	SF 10	16.502	14.500	1.702	Open Manhole	1200
1.010	o	375	SF 11	16.388	14.363	1.650	Open Manhole	1200
3.000	o	225	SF 20.1	20.201	18.665	1.311	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.005	19.202	60.0	SF 7	18.757	17.210	1.322	Open Manhole	1200
1.006	19.704	60.1	SF 8	17.916	16.360	1.331	Open Manhole	1200
1.007	22.197	59.8	SF 9	16.955	15.430	1.300	Open Manhole	1200
1.008	10.449	60.4	SF 10	16.502	14.980	1.297	Open Manhole	1200
1.009	25.954	190.0	SF 11	16.388	14.363	1.725	Open Manhole	1200
1.010	67.995	200.0	SF 12	16.439	14.023	2.041	Open Manhole	1350
3.000	62.028	174.7	SF 20	19.882	18.310	1.347	Open Manhole	1200

PIPELINE SCHEDULES for Surface Network 6

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
4.000	o	225	SF 17	22.447	20.375	1.847	Open Manhole	1200
4.001	o	225	SF 18	21.526	19.419	1.882	Open Manhole	1200
4.002	o	225	SF 19	20.522	18.570	1.727	Open Manhole	1200
3.001	o	225	SF 20	19.882	18.062	1.595	Open Manhole	1200
3.002	o	225	SF 21	19.527	17.559	1.743	Open Manhole	1200
3.003	o	225	SF 22	18.869	16.816	1.828	Open Manhole	1200
3.004	o	225	SF 23	18.106	15.968	1.913	Open Manhole	1200
3.005	o	225	SF 24	17.231	15.145	1.861	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
4.000	17.927	60.0	SF 18	21.526	20.076	1.225	Open Manhole	1200
4.001	19.478	59.9	SF 19	20.522	19.094	1.203	Open Manhole	1200
4.002	15.573	59.9	SF 20	19.882	18.310	1.347	Open Manhole	1200
3.001	7.594	59.8	SF 21	19.527	17.935	1.367	Open Manhole	1200
3.002	14.019	59.9	SF 22	18.869	17.325	1.319	Open Manhole	1200
3.003	16.253	60.0	SF 23	18.106	16.545	1.336	Open Manhole	1200
3.004	18.430	60.0	SF 24	17.231	15.661	1.345	Open Manhole	1200
3.005	16.480	59.9	SF 12	16.439	14.870	1.344	Open Manhole	1350

PIPELINE SCHEDULES for Surface Network 6

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.011	o	375	SF 12	16.439	14.023	2.041	Open Manhole	1350
1.012	o	375	SF 13	16.990	13.945	2.670	Open Manhole	1350
5.000	o	225	SF 14.2	16.000	14.575	1.200	Open Manhole	1200
5.001	o	225	SF 14.1	16.281	14.128	1.928	Open Manhole	1200
1.013	o	375	SF 14	16.280	13.892	2.013	Open Manhole	1350
1.014	o	375	SF 15	15.527	13.824	1.328	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.011	10.362	132.8	SF 13	16.990	13.945	2.670	Open Manhole	1350
1.012	7.358	138.8	SF 14	16.280	13.892	2.013	Open Manhole	1350
5.000	38.052	85.1	SF 14.1	16.281	14.128	1.928	Open Manhole	1200
5.001	20.081	209.2	SF 14	16.280	14.032	2.023	Open Manhole	1350
1.013	13.677	200.0	SF 15	15.527	13.824	1.328	Open Manhole	1350
1.014	3.018	199.9	29	15.527	13.809	1.344	Open Manhole	1350

PIPELINE SCHEDULES for Surface Network 6

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.015	o	375	29	15.527	13.100	2.052	Open Manhole	1350
1.016	o	450	30	15.527	12.584	2.493	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.015	2.000	100.0	30	15.527	13.080	2.072	Open Manhole	1350
1.016	2.000	100.0	SF 16	15.925	12.564	2.911	Open Manhole	1350

Area Summary for Surface Network 6

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.067	0.067	0.067
1.001	-	-	100	0.041	0.041	0.041
1.002	-	-	100	0.026	0.026	0.026
1.003	-	-	100	0.061	0.061	0.061
1.004	-	-	100	0.051	0.051	0.051
2.000	-	-	100	0.000	0.000	0.000
2.001	-	-	100	0.028	0.028	0.028
1.005	-	-	100	0.018	0.018	0.018
1.006	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.039	0.039	0.039
1.008	-	-	100	0.086	0.086	0.086
1.009	-	-	100	0.028	0.028	0.028
1.010	-	-	100	0.000	0.000	0.000
3.000	-	-	100	0.103	0.103	0.103
4.000	-	-	100	0.035	0.035	0.035
4.001	-	-	100	0.031	0.031	0.031
4.002	-	-	100	0.000	0.000	0.000
3.001	-	-	100	0.063	0.063	0.063
3.002	-	-	100	0.000	0.000	0.000
3.003	-	-	100	0.014	0.014	0.014
3.004	-	-	100	0.021	0.021	0.021
3.005	-	-	100	0.029	0.029	0.029
1.011	-	-	100	0.007	0.007	0.007
1.012	-	-	100	0.000	0.000	0.000
5.000	-	-	100	0.032	0.032	0.032
5.001	-	-	100	0.000	0.000	0.000
1.013	-	-	100	0.000	0.000	0.000

Area Summary for Surface Network 6

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.014	-	-	100	0.000	0.000	0.000
1.015	-	-	100	0.000	0.000	0.000
1.016	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.780	0.780	0.780

Free Flowing Outfall Details for Surface Network 6

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.016	SF 16	15.925	12.564	0.000	1350	0

Simulation Criteria for Surface Network 6

Volumetric Runoff Coeff	0.900	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	17.000	Cv (Summer)	0.900
Return Period (years)	1	Ratio R	0.283	Cv (Winter)	0.840
Region	Scotland and Ireland	Profile Type	Summer	Storm Duration (mins)	30

Online Controls for Surface Network 6

Pump Manhole: 30, DS/PN: 1.016, Volume (m³): 4.3

Invert Level (m) 12.584

Depth (m)	Flow (l/s)
1.000	0.0000

Storage Structures for Surface Network 6

Cellular Storage Manhole: 29, DS/PN: 1.015

Invert Level (m) 12.584 Infiltration Coefficient Side (m/hr) 0.07801 Porosity 0.95
Infiltration Coefficient Base (m/hr) 0.00000 Safety Factor 2.0

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	480.0	480.0	1.600	480.0	665.6	1.700	0.0	665.6

Manhole Headloss for Surface Network 6

PN	US/MH Name	US/MH Headloss
1.000	SF 1	0.500
1.001	SF 2	0.500
1.002	SF 3	0.500
1.003	SF 4	0.500
1.004	SF 5	0.500
2.000	SF 6.1	0.500
2.001	SF 6.2	0.500
1.005	SF 6	0.500
1.006	SF 7	0.500
1.007	SF 8	0.500
1.008	SF 9	0.500
1.009	SF 10	0.500
1.010	SF 11	0.500
3.000	SF 20.1	0.500
4.000	SF 17	0.500
4.001	SF 18	0.500
4.002	SF 19	0.500
3.001	SF 20	0.500
3.002	SF 21	0.500
3.003	SF 22	0.500
3.004	SF 23	0.500
3.005	SF 24	0.500
1.011	SF 12	0.500
1.012	SF 13	0.500
5.000	SF 14.2	0.500
5.001	SF 14.1	0.500
1.013	SF 14	0.500

Manhole Headloss for Surface Network 6

PN	US/MH Name	US/MH Headloss
1.014	SF 15	0.500
1.015	29	0.500
1.016	30	0.500

Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 6

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 17.000 Cv (Summer) 0.900
Region Scotland and Ireland Ratio R 0.283 Cv (Winter) 0.900

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 30, 100
Climate Change (%) 10, 20

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	SF 1 15	Summer	100	+20%	100/15 Summer				19.839	0.077	0.000	0.52		29.7	SURCHARGED

Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 6

PN	US/MH Name	Level Exceeded
1.000	SF 1	

Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 6

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)
1.001	SF 2	15 Summer	100	+20%	30/15 Summer				19.778	0.608	0.000	0.80		38.5
1.002	SF 3	15 Summer	100	+20%	30/15 Summer				19.617	0.692	0.000	1.34		46.3
1.003	SF 4	15 Summer	100	+20%	30/15 Summer				19.308	0.557	0.000	2.04		67.9
1.004	SF 5	30 Summer	100	+20%	30/15 Summer				18.941	0.582	0.000	2.03		82.8
2.000	SF 6.1	2160 Winter	30	+10%					19.000	-0.225	0.000	0.00		0.0
2.001	SF 6.2	30 Summer	100	+20%	100/15 Summer				18.605	0.180	0.000	0.30		13.2
1.005	SF 6	30 Summer	100	+20%	30/15 Summer				18.601	0.846	0.000	1.53		92.7
1.006	SF 7	30 Summer	100	+20%	30/15 Summer				18.019	1.106	0.000	1.37		83.2
1.007	SF 8	30 Summer	100	+20%	30/15 Summer				17.440	1.414	0.000	1.50		92.4
1.008	SF 9	30 Summer	100	+20%	30/15 Summer				16.653	1.275	0.000	1.99		111.9
1.009	SF 10	30 Summer	100	+20%	30/15 Summer				15.991	1.191	0.000	1.62		117.1
1.010	SF 11	30 Summer	100	+20%	30/15 Summer				15.657	0.919	0.000	0.87		115.5
3.000	SF 20.1	15 Summer	100	+20%	100/15 Summer				19.114	0.224	0.000	1.13		43.0
4.000	SF 17	15 Summer	100	+20%					20.454	-0.146	0.000	0.27		16.2
4.001	SF 18	15 Summer	100	+20%					19.536	-0.108	0.000	0.53		32.2
4.002	SF 19	15 Summer	100	+20%					18.689	-0.106	0.000	0.54		32.1
3.001	SF 20	15 Summer	100	+20%	30/15 Summer				18.626	0.339	0.000	1.90		95.6
3.002	SF 21	15 Summer	100	+20%	30/15 Summer				18.161	0.377	0.000	1.62		95.2
3.003	SF 22	15 Summer	100	+20%	30/15 Summer				17.565	0.524	0.000	1.61		95.8
3.004	SF 23	30 Summer	100	+20%	30/15 Summer				16.929	0.736	0.000	1.59		96.1
3.005	SF 24	30 Summer	100	+20%	30/15 Summer				16.178	0.808	0.000	1.69		101.2
1.011	SF 12	30 Summer	100	+20%	30/15 Summer				15.410	1.012	0.000	1.96		214.6
1.012	SF 13	30 Summer	100	+20%	30/15 Summer				15.108	0.788	0.000	2.00		214.7
5.000	SF 14.2	30 Summer	100	+20%	100/15 Summer				14.842	0.042	0.000	0.26		13.8
5.001	SF 14.1	30 Summer	100	+20%	30/15 Summer				14.822	0.469	0.000	0.41		13.3

Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 6

PN	US/MH Name	Status	Level Exceeded
1.001	SF 2	SURCHARGED	
1.002	SF 3	SURCHARGED	
1.003	SF 4	SURCHARGED	
1.004	SF 5	SURCHARGED	
2.000	SF 6.1	OK	
2.001	SF 6.2	SURCHARGED	
1.005	SF 6	SURCHARGED	
1.006	SF 7	SURCHARGED	
1.007	SF 8	SURCHARGED	
1.008	SF 9	SURCHARGED	
1.009	SF 10	SURCHARGED	
1.010	SF 11	SURCHARGED	
3.000	SF 20.1	SURCHARGED	
4.000	SF 17	OK	
4.001	SF 18	OK	
4.002	SF 19	OK	
3.001	SF 20	SURCHARGED	
3.002	SF 21	SURCHARGED	
3.003	SF 22	SURCHARGED	
3.004	SF 23	SURCHARGED	
3.005	SF 24	SURCHARGED	
1.011	SF 12	SURCHARGED	
1.012	SF 13	SURCHARGED	
5.000	SF 14.2	SURCHARGED	

Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 6

PN	US/MH Name	Status	Level Exceeded
5.001	SF 14.1	SURCHARGED	

Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 6

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)
1.013	SF 14	30 Summer	100	+20%	30/15 Summer				14.807	0.540	0.000	2.07		221.8
1.014	SF 15	30 Summer	100	+20%	30/15 Summer				14.485	0.287	0.000	2.67		221.7
1.015	29	8640 Summer	100	+20%	30/720 Summer				14.394	0.919	0.000	0.09		7.8
1.016	30	8640 Summer	100	+20%	30/120 Summer				14.396	1.362	0.000	0.00		0.0

PN	US/MH Name	Status	Level Exceeded
1.013	SF 14	SURCHARGED	
1.014	SF 15	SURCHARGED	
1.015	29	SURCHARGED	
1.016	30	SURCHARGED	

Fairgreen House
Fairgreen Road
Galway

Date 20/07/2022 18:27
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MH Name	SG 7	SG 6	SG 5		SG 3	SG 2	SG 1	
Hor Scale 500 Ver Scale 200 Datum (m)10.000				2.003				
PN		1.005	1.004		1.002	1.001	1.000	
Dia (mm)		300	300		225	225	225	
Slope (1:X)		199.8	203.0		242.1	145.6	195.1	
Cover Level (m)	15.325	15.603	15.666	15.740	15.957	16.008	16.273	
Invert Level (m)	13.044	13.188	13.188	13.220	13.220	13.276	14.315	14.490	14.490	14.550	14.550	14.820	
Length (m)		28.765	6.497		42.360	8.737	52.674	

MH Name	Basin Inlet			SG 12	SG 11	SG 10	SG 9	SG 8	SG 7	
Hor Scale 500 Ver Scale 200 Datum (m)8.000										
PN				1.011	1.010	1.009	1.008	1.007	1.006	
Dia (mm)				300	300	300	300	300	300	
Slope (1:X)				60.0	60.0	198.7	200.6	198.0	200.4	
Cover Level (m)	12.011	12.011	11.833	13.704	14.631	14.740	14.860	14.963	15.325	
Invert Level (m)	10.651	10.676	10.676	10.706	10.706	11.200	12.046	12.704	12.703	12.755	12.755	12.811	12.811	12.868	12.868	13.044	
Length (m)				29.663	39.489	10.331	11.231	11.287	35.271	

Fairgreen House
Fairgreen Road
Galway

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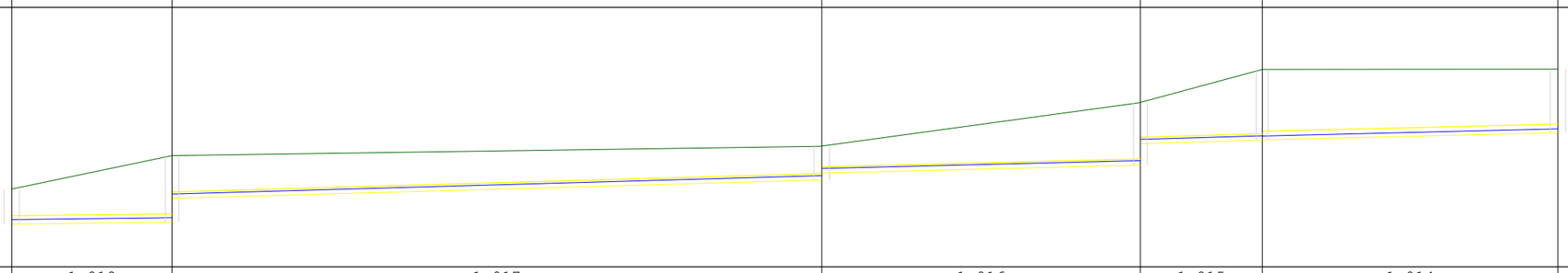
MH Name		SG 18	SG 17	SG 16	SG 15	Basin Outlet	Basin Inlet	
	Hor Scale 500 Ver Scale 200 Datum (m) 5.000							
PN			1.018	1.017	1.016	1.015	1.014	
Dia (mm)			300	225	225	225	300	
Slope (1:X)			200.1	88.1	100.0	80.1	100.0	
Cover Level (m)		7.752	8.942	9.277	10.824	12.000	12.011	
Invert Level (m)			6.511	6.582 / 7.433	8.087	8.324	8.606 / 9.365	9.500 / 9.500 / 9.762	
Length (m)			14.208	57.588	28.249	10.808	26.202	

MH Name		S2		SG 18	
	Hor Scale 500 Ver Scale 200 Datum (m) 2.000				
PN				1.019	
Dia (mm)				300	
Slope (1:X)				200.5	
Cover Level (m)		7.752	7.752	7.752	
Invert Level (m)			6.425	6.425 / 6.511	
Length (m)				17.241	

MH Name	SG 5	SG 5.4	SG 5.3	SG 5.2	SG 5.1	
Hor Scale 500 Ver Scale 200 Datum (m)10.000						
PN		2.003	2.002	2.001	2.000	
Dia (mm)		225	225	225	225	
Slope (1:X)		73.6	117.7	148.4	147.3	
Cover Level (m)	15.666	15.795	16.083	16.224	16.293	
Invert Level (m)	14.259	14.361 14.361	14.654 14.654	14.775 14.775	14.868	
Length (m)		7.436	34.497	17.958	13.703	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Surface Network 4

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	1	Maximum Time of Concentration (mins)	30	Add Flow / Climate Change (%)	0	Min Vel for Auto Design only (m/s)	1.00		
M5-60 (mm)	17.000	Foul Sewage (l/s/ha)	0.000	Minimum Backdrop Height (m)	0.010	Min Slope for Optimisation (1:X)	500		
Ratio R	0.283	Volumetric Runoff Coeff.	0.900	Maximum Backdrop Height (m)	1.500				
Maximum Rainfall (mm/hr)	50	PIMP (%)	100	Min Design Depth for Optimisation (m)	1.200				

Designed with Level Soffits

Time Area Diagram for Surface Network 4

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.023	4-8	0.279	8-12	0.096

Total Area Contributing (ha) = 0.398

Total Pipe Volume (m^3) = 28.306

Network Design Table for Surface Network 4

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	52.674	0.270	195.1	0.063	5.00	0.0	0.600	o	225	Pipe/Conduit	
1.001	8.737	0.060	145.6	0.040	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.002	42.360	0.175	242.1	0.078	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.003	5.602	0.056	100.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
2.000	13.703	0.093	147.3	0.015	5.00	0.0	0.600	o	225	Pipe/Conduit	
2.001	17.958	0.121	148.4	0.024	0.00	0.0	0.600	o	225	Pipe/Conduit	
2.002	34.497	0.293	117.7	0.027	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	39.75	5.94	14.820	0.063	0.0	0.0	0.0	0.93	37.1	8.1
1.001	39.40	6.08	14.550	0.103	0.0	0.0	0.0	1.08	43.0	13.2
1.002	37.39	6.92	14.490	0.181	0.0	0.0	0.0	0.84	33.2	22.0
1.003	37.23	6.99	13.276	0.181	0.0	0.0	0.0	1.31	52.0	22.0
2.000	41.77	5.21	14.868	0.015	0.0	0.0	0.0	1.07	42.7	2.0
2.001	40.97	5.49	14.775	0.039	0.0	0.0	0.0	1.07	42.6	5.2
2.002	39.68	5.97	14.654	0.066	0.0	0.0	0.0	1.20	47.9	8.5

Network Design Table for Surface Network 4

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
2.003	7.436	0.101	73.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.004	6.497	0.032	203.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.005	28.765	0.144	199.8	0.041	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.006	35.271	0.176	200.4	0.034	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.007	11.287	0.057	198.0	0.025	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.008	11.231	0.056	200.6	0.013	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.009	10.331	0.052	198.7	0.014	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.010	39.489	0.658	60.0	0.024	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.011	29.663	0.494	60.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.012	5.952	0.030	198.4	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.013	5.035	0.025	201.4	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.014	26.202	0.262	100.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.015	10.808	0.135	80.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.016	28.249	0.282	100.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.017	57.588	0.654	88.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.018	14.208	0.071	200.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.019	17.241	0.086	200.5	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.020	2.000	0.010	200.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
2.003	39.47	6.05	14.361	0.066	0.0	0.0	0.0	1.53	60.7	8.5
1.004	37.01	7.09	13.220	0.247	0.0	0.0	0.0	1.10	77.7	29.7
1.005	36.10	7.52	13.188	0.288	0.0	0.0	0.0	1.11	78.4	33.8
1.006	35.05	8.05	13.044	0.322	0.0	0.0	0.0	1.11	78.2	36.7
1.007	34.74	8.22	12.868	0.347	0.0	0.0	0.0	1.11	78.7	39.2
1.008	34.43	8.39	12.811	0.360	0.0	0.0	0.0	1.11	78.2	40.3
1.009	34.15	8.55	12.755	0.374	0.0	0.0	0.0	1.11	78.6	41.5
1.010	33.58	8.87	12.704	0.398	0.0	0.0	0.0	2.03	143.7	43.4
1.011	33.18	9.11	11.200	0.398	0.0	0.0	0.0	2.03	143.7	43.4
1.012	33.03	9.20	10.706	0.398	0.0	0.0	0.0	1.11	78.6	43.4
1.013	32.91	9.28	10.676	0.398	0.0	0.0	0.0	1.10	78.1	43.4
1.014	32.47	9.56	9.762	0.398	0.0	0.0	0.0	1.57	111.1	43.4
1.015	32.27	9.68	9.500	0.398	0.0	0.0	0.0	1.46	58.2	43.4
1.016	31.73	10.04	8.606	0.398	0.0	0.0	0.0	1.31	52.0	43.4
1.017	30.75	10.73	8.087	0.398	0.0	0.0	0.0	1.39	55.4	43.4
1.018	30.47	10.94	6.582	0.398	0.0	0.0	0.0	1.11	78.3	43.4
1.019	30.13	11.20	6.511	0.398	0.0	0.0	0.0	1.11	78.2	43.4
1.020	30.09	11.23	6.425	0.398	0.0	0.0	0.0	1.11	78.3	43.4

Manhole Schedules for Surface Network 4

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SG 1	16.273	1.453	Open Manhole	1350	1.000	14.820	225				
SG 2	16.008	1.458	Open Manhole	1200	1.001	14.550	225	1.000	14.550	225	
SG 3	15.957	1.467	Open Manhole	1350	1.002	14.490	225	1.001	14.490	225	
SG 4	15.740	2.464	Open Manhole	1200	1.003	13.276	225	1.002	14.315	225	1039
SG 5.1	16.293	1.425	Open Manhole	1200	2.000	14.868	225				
SG 5.2	16.224	1.449	Open Manhole	1200	2.001	14.775	225	2.000	14.775	225	
SG 5.3	16.083	1.429	Open Manhole	1200	2.002	14.654	225	2.001	14.654	225	
SG 5.4	15.795	1.434	Open Manhole	1200	2.003	14.361	225	2.002	14.361	225	
SG 5	15.666	2.446	Open Manhole	1200	1.004	13.220	300	1.003	13.220	225	
								2.003	14.259	225	964
SG 6	15.603	2.415	Open Manhole	1200	1.005	13.188	300	1.004	13.188	300	
SG 7	15.325	2.281	Open Manhole	1200	1.006	13.044	300	1.005	13.044	300	
SG 8	14.963	2.095	Open Manhole	1200	1.007	12.868	300	1.006	12.868	300	
SG 9	14.860	2.049	Open Manhole	1200	1.008	12.811	300	1.007	12.811	300	
SG 10	14.740	1.985	Open Manhole	1200	1.009	12.755	300	1.008	12.755	300	
SG 11	14.631	1.928	Open Manhole	1350	1.010	12.704	300	1.009	12.703	300	
SG 12	13.704	2.504	Open Manhole	1500	1.011	11.200	300	1.010	12.046	300	846
SG 13	11.833	1.127	Open Manhole	1500	1.012	10.706	300	1.011	10.706	300	
SG 14	12.011	1.335	Open Manhole	1350	1.013	10.676	300	1.012	10.676	300	
Basin Inlet	12.011	2.249	Open Manhole	1350	1.014	9.762	300	1.013	10.651	300	889
Basin Outlet	12.000	2.500	Open Manhole	1050	1.015	9.500	225	1.014	9.500	300	
SG 15	10.824	2.218	Open Manhole	1200	1.016	8.606	225	1.015	9.365	225	759
SG 16	9.277	1.190	Open Manhole	1350	1.017	8.087	225	1.016	8.324	225	237
SG 17	8.942	2.360	Open Manhole	1200	1.018	6.582	300	1.017	7.433	225	776
SG 18	7.752	1.241	Open Manhole	1350	1.019	6.511	300	1.018	6.511	300	
25	7.752	1.327	Open Manhole	1050	1.020	6.425	300	1.019	6.425	300	
S2	7.752	1.337	Open Manhole	1350		OUTFALL		1.020	6.415	300	

PIPELINE SCHEDULES for Surface Network 4

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	225	SG 1	16.273	14.820	1.228	Open Manhole	1350
1.001	o	225	SG 2	16.008	14.550	1.233	Open Manhole	1200
1.002	o	225	SG 3	15.957	14.490	1.242	Open Manhole	1350
1.003	o	225	SG 4	15.740	13.276	2.239	Open Manhole	1200
2.000	o	225	SG 5.1	16.293	14.868	1.200	Open Manhole	1200
2.001	o	225	SG 5.2	16.224	14.775	1.224	Open Manhole	1200
2.002	o	225	SG 5.3	16.083	14.654	1.204	Open Manhole	1200
2.003	o	225	SG 5.4	15.795	14.361	1.209	Open Manhole	1200
1.004	o	300	SG 5	15.666	13.220	2.146	Open Manhole	1200
1.005	o	300	SG 6	15.603	13.188	2.115	Open Manhole	1200
1.006	o	300	SG 7	15.325	13.044	1.981	Open Manhole	1200
1.007	o	300	SG 8	14.963	12.868	1.795	Open Manhole	1200
1.008	o	300	SG 9	14.860	12.811	1.749	Open Manhole	1200
1.009	o	300	SG 10	14.740	12.755	1.685	Open Manhole	1200
1.010	o	300	SG 11	14.631	12.704	1.627	Open Manhole	1350
1.011	o	300	SG 12	13.704	11.200	2.204	Open Manhole	1500
1.012	o	300	SG 13	11.833	10.706	0.827	Open Manhole	1500
1.013	o	300	SG 14	12.011	10.676	1.035	Open Manhole	1350
1.014	o	300	Basin Inlet	12.011	9.762	1.949	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	52.674	195.1	SG 2	16.008	14.550	1.233	Open Manhole	1200
1.001	8.737	145.6	SG 3	15.957	14.490	1.242	Open Manhole	1350
1.002	42.360	242.1	SG 4	15.740	14.315	1.200	Open Manhole	1200
1.003	5.602	100.0	SG 5	15.666	13.220	2.221	Open Manhole	1200
2.000	13.703	147.3	SG 5.2	16.224	14.775	1.224	Open Manhole	1200
2.001	17.958	148.4	SG 5.3	16.083	14.654	1.204	Open Manhole	1200
2.002	34.497	117.7	SG 5.4	15.795	14.361	1.209	Open Manhole	1200
2.003	7.436	73.6	SG 5	15.666	14.259	1.182	Open Manhole	1200
1.004	6.497	203.0	SG 6	15.603	13.188	2.115	Open Manhole	1200
1.005	28.765	199.8	SG 7	15.325	13.044	1.981	Open Manhole	1200
1.006	35.271	200.4	SG 8	14.963	12.868	1.795	Open Manhole	1200
1.007	11.287	198.0	SG 9	14.860	12.811	1.749	Open Manhole	1200
1.008	11.231	200.6	SG 10	14.740	12.755	1.685	Open Manhole	1200
1.009	10.331	198.7	SG 11	14.631	12.703	1.628	Open Manhole	1350
1.010	39.489	60.0	SG 12	13.704	12.046	1.358	Open Manhole	1500
1.011	29.663	60.0	SG 13	11.833	10.706	0.827	Open Manhole	1500
1.012	5.952	198.4	SG 14	12.011	10.676	1.035	Open Manhole	1350
1.013	5.035	201.4	Basin Inlet	12.011	10.651	1.060	Open Manhole	1350
1.014	26.202	100.0	Basin Outlet	12.000	9.500	2.200	Open Manhole	1050

PIPELINE SCHEDULES for Surface Network 4

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.015	o	225	Basin Outlet	12.000	9.500	2.275	Open Manhole	1050
1.016	o	225	SG 15	10.824	8.606	1.993	Open Manhole	1200
1.017	o	225	SG 16	9.277	8.087	0.965	Open Manhole	1350
1.018	o	300	SG 17	8.942	6.582	2.060	Open Manhole	1200
1.019	o	300	SG 18	7.752	6.511	0.941	Open Manhole	1350
1.020	o	300	25	7.752	6.425	1.027	Open Manhole	1050

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.015	10.808	80.1	SG 15	10.824	9.365	1.234	Open Manhole	1200
1.016	28.249	100.0	SG 16	9.277	8.324	0.728	Open Manhole	1350
1.017	57.588	88.1	SG 17	8.942	7.433	1.284	Open Manhole	1200
1.018	14.208	200.1	SG 18	7.752	6.511	0.941	Open Manhole	1350
1.019	17.241	200.5	25	7.752	6.425	1.027	Open Manhole	1050
1.020	2.000	200.0	S2	7.752	6.415	1.037	Open Manhole	1350

Area Summary for Surface Network 4

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.063	0.063	0.063
1.001	-	-	100	0.040	0.040	0.040
1.002	-	-	100	0.078	0.078	0.078
1.003	-	-	100	0.000	0.000	0.000
2.000	-	-	100	0.015	0.015	0.015
2.001	-	-	100	0.024	0.024	0.024
2.002	-	-	100	0.027	0.027	0.027
2.003	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.000	0.000	0.000
1.005	-	-	100	0.041	0.041	0.041
1.006	-	-	100	0.034	0.034	0.034
1.007	-	-	100	0.025	0.025	0.025
1.008	-	-	100	0.013	0.013	0.013
1.009	-	-	100	0.014	0.014	0.014
1.010	-	-	100	0.024	0.024	0.024
1.011	-	-	100	0.000	0.000	0.000
1.012	-	-	100	0.000	0.000	0.000
1.013	-	-	100	0.000	0.000	0.000
1.014	-	-	100	0.000	0.000	0.000
1.015	-	-	100	0.000	0.000	0.000
1.016	-	-	100	0.000	0.000	0.000
1.017	-	-	100	0.000	0.000	0.000
1.018	-	-	100	0.000	0.000	0.000
1.019	-	-	100	0.000	0.000	0.000
1.020	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.398	0.398	0.398

Free Flowing Outfall Details for Surface Network 4

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.020	S2	7.752	6.415	6.415	1350	0

Simulation Criteria for Surface Network 4

Volumetric Runoff Coeff 0.900 Hot Start Level (mm) 0 Additional Flow - % of Total Flow 0.000 Flow per Person per Day (l/per/day) 0.000
Areal Reduction Factor 1.000 Manhole Headloss Coeff (Global) 0.500 MADD Factor * 10m³/ha Storage 2.000 Run Time (mins) 60
Hot Start (mins) 0 Foul Sewage per hectare (l/s) 0.000 Inlet Coeffiecient 0.800 Output Interval (mins) 1

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

Synthetic Rainfall Details

Rainfall Model FSR Region Scotland and Ireland Ratio R 0.283
Return Period (years) 1 M5-60 (mm) 17.000 Profile Type Summer

Synthetic Rainfall Details

Cv (Summer) 0.900 Cv (Winter) 0.840 Storm Duration (mins) 30

Online Controls for Surface Network 4

Hydro-Brake® Optimum Manhole: SG 15, DS/PN: 1.016, Volume (m³): 2.9

Unit Reference	MD-SHE-0158-1200-1000-1200	Objective	Minimise upstream storage	Invert Level (m)	8.606
Design Head (m)	1.000	Application	Surface	Minimum Outlet Pipe Diameter (mm)	225
Design Flow (l/s)	12.0	Sump Available	Yes	Suggested Manhole Diameter (mm)	1200
Flush-Flo™	Calculated	Diameter (mm)	158		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	12.0	Flush-Flo™	0.312	12.0	Kick-Flo®	0.687	10.1	Mean Flow over Head Range	-	10.2

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	5.7	0.500	11.6	1.200	13.1	2.000	16.7	3.000	20.2	5.000	25.8	7.000	30.4	9.000	34.3
0.200	11.6	0.600	11.1	1.400	14.1	2.200	17.4	3.500	21.8	5.500	27.0	7.500	31.4	9.500	35.2
0.300	12.0	0.800	10.8	1.600	15.0	2.400	18.2	4.000	23.2	6.000	28.2	8.000	32.4		
0.400	11.8	1.000	12.0	1.800	15.8	2.600	18.9	4.500	24.6	6.500	29.3	8.500	33.4		

Storage Structures for Surface Network 4

Infiltration Basin Manhole: Basin Inlet, DS/PN: 1.014

Invert Level (m) 9.500 Infiltration Coefficient Side (m/hr) 0.07800 Porosity 1.00
Infiltration Coefficient Base (m/hr) 0.00000 Safety Factor 2.0

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	214.0	0.500	338.0	1.000	590.0	1.500	790.0

Swale Manhole: 25, DS/PN: 1.020

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

Infiltration Coefficient Base (m/hr) 0.00000 Porosity 1.00 Length (m) 143.7 Cap Volume Depth (m) 0.300
Infiltration Coefficient Side (m/hr) 0.07800 Invert Level (m) 6.425 Side Slope (1:X) 3.0 Cap Infiltration Depth (m) 0.300
Safety Factor 2.0 Base Width (m) 0.3 Slope (1:X) 200.0 Include Swale Volume Yes

Manhole Headloss for Surface Network 4

PN	US/MH Name	US/MH Headloss
1.000	SG 1	0.500
1.001	SG 2	0.500
1.002	SG 3	0.500
1.003	SG 4	0.500
2.000	SG 5.1	0.500
2.001	SG 5.2	0.500
2.002	SG 5.3	0.500
2.003	SG 5.4	0.500
1.004	SG 5	0.500
1.005	SG 6	0.500
1.006	SG 7	0.500
1.007	SG 8	0.500
1.008	SG 9	0.500
1.009	SG 10	0.500
1.010	SG 11	0.500
1.011	SG 12	0.500
1.012	SG 13	0.500
1.013	SG 14	0.500
1.014	Basin Inlet	0.500
1.015	Basin Outlet	0.500
1.016	SG 15	0.500
1.017	SG 16	0.500
1.018	SG 17	0.500
1.019	SG 18	0.500
1.020	25	0.500

Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 4

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 17.000 Cv (Summer) 0.900
Region Scotland and Ireland Ratio R 0.283 Cv (Winter) 0.900

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 30, 100
Climate Change (%) 10, 20

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	SG 1	15 Summer	100	+20%	30/15 Summer				15.542	0.497	0.000	0.72		25.7	SURCHARGED	
1.001	SG 2	15 Summer	100	+20%	30/15 Summer				15.407	0.632	0.000	1.11		38.3	SURCHARGED	
1.002	SG 3	15 Summer	100	+20%	30/15 Summer				15.335	0.620	0.000	2.10		66.4	SURCHARGED	
1.003	SG 4	30 Summer	100	+20%	30/15 Summer				14.484	0.983	0.000	1.91		63.7	SURCHARGED	
2.000	SG 5.1	15 Summer	100	+20%					14.934	-0.159	0.000	0.19		6.9	OK	
2.001	SG 5.2	15 Summer	100	+20%					14.889	-0.111	0.000	0.50		19.2	OK	
2.002	SG 5.3	15 Summer	100	+20%					14.799	-0.080	0.000	0.71		32.0	OK	
2.003	SG 5.4	15 Summer	100	+20%					14.503	-0.082	0.000	0.72		32.4	OK	
1.004	SG 5	30 Summer	100	+20%	30/15 Summer				14.292	0.772	0.000	1.54		85.0	SURCHARGED	
1.005	SG 6	30 Summer	100	+20%	30/15 Summer				14.179	0.691	0.000	1.33		94.2	SURCHARGED	
1.006	SG 7	30 Summer	100	+20%	30/15 Summer				13.922	0.578	0.000	1.41		101.3	SURCHARGED	
1.007	SG 8	30 Summer	100	+20%	30/15 Summer				13.568	0.400	0.000	1.74		106.6	SURCHARGED	
1.008	SG 9	30 Summer	100	+20%	30/15 Summer				13.385	0.274	0.000	1.78		109.4	SURCHARGED	
1.009	SG 10	30 Summer	100	+20%	30/15 Summer				13.192	0.137	0.000	1.83		112.3	SURCHARGED	
1.010	SG 11	30 Summer	100	+20%					12.924	-0.080	0.000	0.88		117.5	OK	
1.011	SG 12	30 Summer	100	+20%	100/15 Summer				11.759	0.259	0.000	0.89		116.1	SURCHARGED	
1.012	SG 13	30 Summer	100	+20%	30/15 Summer				11.364	0.358	0.000	2.12		116.1	SURCHARGED	
1.013	SG 14	30 Summer	100	+20%	30/15 Summer				11.151	0.175	0.000	2.24		115.9	SURCHARGED	
1.014	Basin Inlet	240 Summer	100	+20%					10.002	-0.060	0.000	0.26		25.9	OK	
1.015	Basin Outlet	240 Summer	100	+20%	30/120 Summer				10.012	0.287	0.000	0.39		19.3	SURCHARGED	
1.016	SG 15	240 Summer	100	+20%	30/60 Summer				9.999	1.168	0.000	0.29		13.9	SURCHARGED	
1.017	SG 16	240 Summer	100	+20%					8.164	-0.147	0.000	0.26		13.9	OK	
1.018	SG 17	240 Summer	100	+20%					6.676	-0.206	0.000	0.21		13.9	OK	
1.019	SG 18	240 Summer	100	+20%					6.603	-0.208	0.000	0.21		13.9	OK	
1.020	25	240 Summer	100	+20%					6.527	-0.198	0.000	0.26		13.8	OK	

APPENDIX C

Kingspan Klargester Separation Product Brochure

Klargester Bypass Separators

NSB RANGE

Concentration Less Than

5 MG/L

Bypass separators are used when it is considered an acceptable risk to not provide full treatment for very high flows, such as where the risk of a large spillage and heavy rainfall occurring at the same time is small. Typical applications include surface carparks, roadways and lightly contaminated commercial areas.

Product Benefits

- Light and easy to install.
- Inclusive of silt storage volume.
- Fitted inlet/outlet connectors.
- Vent points within necks.
- Oil alarm system available (required by EN 858-1 and PPG3).
- Extension access shafts for deep inverts.
- Maintenance from ground level.
- GRP or polyethylene construction (subject to model).

Performance & Compliance

› Fully compliant and tested to EN 858-1.

› Bypass separators are tested by British standards institute (BSI).

› Certified flow and process performance assessing effluent qualities to the requirements of EN 858-1.

› The unit is designed to treat the 'first flush' - 10% of peak flow. The calculated drainage areas served by each separator are indicated according to the formula given by PPG3 NSB = 0.0018A(m2).

› Class I separators are designed to achieve a concentration of less than 5mg per litre.

Technical Specifications

Model Reference	Flow (l/s)	Peak Flow Rate (l/s)	Drainage Area(m^2) Based on UK rainwater flow	Storage Capacity (Ltrs)		Length (mm)	Diameter (mm)	Access Shaft Diameter (mm)	Base Inlet Invert (mm)	Base to Outlet Invert (mm)	Standard Fall Across (mm)	Min Inlet Invert (mm)	Standard Pipework Diameter (mm)**
				Silt	Oil								
Polyethylene Chamber Construction													
NSBP003	3	30	1670	300	45	1700	1350	600	1420	1320	100	500	160
NSBP004	4.5	45	2500	450	60	1700	1350	600	1420	1320	100	500	160
NSBP006	6	60	3335	600	90	1700	1350	600	1420	1320	100	500	160
GRP Chamber Construction													
NSBE010	10	100	5560	1000	150	2069	1220	750	1450	1350	100	700	315
NSBE015	15	150	8335	1500	225	2947	1220	750	1450	1350	100	700	315
NSBE020	20	200	11111	2000	300	3893	1220	750	1450	1350	100	700	375
NSBE025	25	250	13890	2500	375	3575	1420	750	1680	1580	100	700	375
NSBE030	30	300	16670	3000	450	4265	1420	750	1680	1580	100	700	450
NSBE040	40	400	22222	4000	600	3230	1920	600	2185	2035	150	1000	500
NSBE050	50	500	27778	5000	750	3960	1920	600	2185	2035	150	1000	600
NSBE075	75	750	41667	7500	1125	5841	1920	600	2235	2035	200	950	675
NSBE100	100	1000	55556	10000	1500	7661	1920	600	2235	2035	200	950	750
NSBE125	125	1250	69444	12500	1875	9548	1920	600	2235	2035	200	950	750

** Some units have more than one access shaft – diameter of largest shown | ** Larger pipework available on request.*

Klargester Forecourt Separators

Expert Technical Advice

Forecourt separators are used to intercept hydrocarbon pollutants such as petroleum and oil to prevent their entry to the drainage system. Typical applications include petrol filling station forecourts and car breaker yards.

Performance and Compliance

- Operation ensures that the flow cannot exit the unit without first passing through the coalescer assembly.
- In normal operation, the forecourt separator has sufficient capacity to provide storage for separated pollutants within the main chamber, but is also able to contain up to 7,600 litres of pollutant arising from the spillage of a fuel delivery tanker compartment on the petrol forecourt.
- The separator has been designed with an automatic closure device to ensure that oil cannot exit the separator in the event of a major spillage, consequently the separator should be emptied immediately.

Installation

- The unit should be installed on a suitable concrete base slab and surrounded with concrete or pea gravel backfill.
- If the separator is to be installed within a trafficked area, then a suitable cover slab must be designed to ensure that loads are not transmitted to the unit.
- The separator should be installed and vented in accordance with Health and Safety Guidance Note HS(G)41 for filling stations.
- Subject to Local Authority requirements.

Technical Specifications

Separator Class	Backfill Type	Total Capacity (Ltrs)	Drainage Area (m^2)	Peak Flow Rate (L/s)	Length (mm)	Diameter (mm)	Access Shaft Diameter (mm)	Base Inlet Invert (mm)	Base to Outlet Invert (mm)	Standard Fall Across (mm)	Min Inlet Invert (mm)	Standard Pipework Diameter (mm)	Empty Weight (kg)
I/II	Concrete	10000	835	15	3915	2020	600	2180	2130	50	600	160	620
I/II	Concrete	10000	1115	20	3915	2020	600	2180	2130	50	600	200	620

Fuel & Oil Separator Alarms

British European Standard EN 858-1 and Environment Agency Pollution Prevention Guideline PPG3 requires that all separators are to be fitted with an oil level alarm system. It should be installed and calibrated by a suitably qualified technician so that it will respond to an alarm condition when the separator requires emptying.

Product Benefits

- Easily fitted to existing tanks.
- Excellent operational range.
- Visual and audible alarm.
- Additional telemetry option.

APPENDIX D

Irish Water Correspondence

Andy Kotze
Block S, Eastpoint Business Park
Alfie Byrne Road
Dublin 3
Co. Dublin
D03H3F4

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

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

www.water.ie

26 November 2021

Re: CDS21003780 pre-connection enquiry - Subject to contract | Contract denied

Connection for Housing Development of 330 unit(s) at Golf Links Road, Ennis, Clare

Dear Sir/Madam,

Irish Water has reviewed your pre-connection enquiry in relation to a Water & Wastewater connection at Golf Links Road, Ennis, Clare (the **Premises**). Based upon the details you have provided with your pre-connection enquiry and on our desk top analysis of the capacity currently available in the Irish Water network(s) as assessed by Irish Water, we wish to advise you that your proposed connection to the Irish Water network(s) can be facilitated at this moment in time.

SERVICE	**OUTCOME OF PRE-CONNECTION ENQUIRY** **THIS IS NOT A CONNECTION OFFER. YOU MUST APPLY FOR A CONNECTION(S) TO THE IRISH WATER NETWORK(S) IF YOU WISH TO PROCEED.**
Water Connection	Feasible without infrastructure upgrade by Irish Water
Wastewater Connection	Feasible Subject to upgrades
SITE SPECIFIC COMMENTS	
Water Connection	There is sufficient capacity in the Irish Water assets to facilitate the proposed development.
Wastewater Connection	Feasible subject to minor upgrades at the WWTP. WW network extension required with likely upgrades of the existing Irish Water owned pumping station and rising main also required. Further details can be discussed prior to connection application stage.

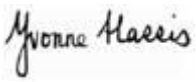
The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this development shall comply with the Irish Water Connections and Developer Services Standard Details and Codes of Practice that are available on the Irish Water website. Irish Water reserves the right to supplement these requirements with Codes of Practice and these will be issued with the connection agreement.

General Notes:

1) The initial assessment referred to above is carried out taking into account water demand and wastewater discharge volumes and infrastructure details on the date of the assessment. **The availability of capacity may change at any date after this assessment.**
2) This feedback does not constitute a contract in whole or in part to provide a connection to any Irish Water infrastructure. All feasibility assessments are subject to the constraints of the Irish Water Capital Investment Plan.
3) The feedback provided is subject to a Connection Agreement/contract being signed at a later date.
4) A Connection Agreement will be required to commencing the connection works associated with the enquiry this can be applied for at https://www.water.ie/connections/get-connected/
5) A Connection Agreement cannot be issued until all statutory approvals are successfully in place.
6) Irish Water Connection Policy/ Charges can be found at https://www.water.ie/connections/information/connection-charges/
7) Please note the Confirmation of Feasibility does not extend to your fire flow requirements.
8) Irish Water is not responsible for the management or disposal of storm water or ground waters. You are advised to contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges
9) To access Irish Water Maps email datarequests@water.ie
10) All works to the Irish Water infrastructure, including works in the Public Space, shall have to be carried out by Irish Water.

If you have any further questions, please contact Shane Mcmanus from the design team by email to shane.mcmanus@water.ie For further information, visit **www.water.ie/connections.**

Yours sincerely,



Yvonne Harris

Head of Customer Operations

Andy Kotze
Block S, Eastpoint Business Park
Alfie Byrne Road
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Dublin D03H3F4

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
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Cathair Chorcaí

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

www.water.ie

15 August 2022

Re: Design Submission for Golf Links Road, Ennis, Clare (the "Development") (the "Design Submission") / Connection Reference No: CDS21003780

Dear Andy Kotze,

Many thanks for your recent Design Submission.

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

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

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

If you have any further questions, please contact your Irish Water representative:
Name: Shane McManus
Email: shane.mcmanus@water.ie

Yours sincerely,

Yvonne Harris

Yvonne Harris
Head of Customer Operations

Appendix A

Document Title & Revision

- [Proposed Water Main Layout Sheet No. 1 of 3 11269-2109 P02]
- [Proposed Water Main Layout Sheet No. 2 of 3 11269-2110 P02]
- [Proposed Water Main Layout Sheet No. 3 of 3 11269-2111 P02]

- [Proposed Drainage Layout Sheet No. 1 of 4 11269-2101 P02]
- [Proposed Drainage Layout Sheet No. 2 of 4 11269-2102 P02]
- [Proposed Drainage Layout Sheet No. 3 of 4 11269-2103 P02]
- [Proposed Drainage Layout Sheet No. 4 of 4 11269-2104 P01]
- [Proposed Foul Manhole Schedule 11269-2105 P01]
- [Proposed Foul Drainage Schedule 11269-2106 P01]

Standard Details/Code of Practice Exemption:
NOT USED

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

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

APPENDIX E

Clare County Council Correspondence

COMHAIRLE CONTAE AN CHLÁIR | CLARE COUNTY COUNCIL

1st December 2021

Tobin Consulting Engineers,

Fairgreen House,

Fairgreen Road,

Galway.

Attn: Mr Richard Daly, Project Engineer

RE: Glenveagh Homes Ltd. for revised planning application under the Large Scale Residential Development (LSRD) Process on the former Abadair site Planning Ref 18/811 at Golflinks Rd, Ennis & Ancillary Storm Water Outfall.

Dear Richard,

Regarding the recent meeting with Clare County Council and the proposed development of 286 residential units and a creche, this letter is to confirm that Clare County Council has no objection, in principle, to your proposal that the ancillary main surface water outfall is to be constructed in the road verge area along the eastern side of the N85 between the northern extremity of the development site and the River Claureen.

It is noted that the proposed outfall is to facilitate a run- off rate to the river Claureen from the development site which will not exceed the current pre- development run off rate of the land in question.

This consent is conditional on the following:

- Confirmation of planning consent of the proposed development as a whole
- Full compliance with any planning conditions and ancillary surface water management requirements
- Securing separate approval under the Council's Road Opening Licensing requirements and full compliance with all conditions incorporated therein
- Implementation of a pre- construction services survey and structural investigation to establish details of potential constraints, to be carried out in full consultation with the Council
- Provision of full indemnification to the Council
- That all statutory requirements are adhered to

Roinn na Bóithre agus Taistil
An Stiúrthóireacht Forbairt Fhisiceach
Áras Contae an Chláir, Bóthar Nua, Inis, Co. an Chláir, V95 DXP2

Roads and Transportation Department
Physical Development Directorate
Áras Contae an Chláir, New Road, Ennis, Co. Clare, V95 DXP2

☎ 065 6846333 ✉ roads@clarecoco.ie 🌍 www.clarecoco.ie

- That all relevant environmental screenings are carried out

Trusting this is of assistance,

Yours Sincerely,

Anne O'Sullivan

Anne O'Sullivan

Senior Executive Engineer, Roads & Transportation

CC: John Leahy , Senior Engineer, Roads & Transportation

Eamon O'Dea , SEE Ennis MD

www.tobin.ie

TOBIN Consulting Engineers

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