

## SOCIAL HOUSING DEVELOPMENT RATHELLEN, FINISKLIN, CO. SLIGO

**Drainage and Watermain Design Report** 





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Prepared by:

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**Sligo County Council** 

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## 1 INTRODUCTION

RPS are the appointed Civil and Structural Engineering advisors for the proposed residential development at Rathellen, Finisklin, Co. Sligo. This project will deliver 39 houses and 24 apartments to Sligo County Council Planning Authority.

New watermain, storm water and foul water networks will be constructed to service the proposed development. The storm water and foul water networks will outfall to Local Authority (LA) and Irish Water (IW) systems within the site. These existing systems are currently crossing the site and will be diverted to accommodate the works. The watermain, storm water and foul water drainage proposals are shown in **Appendix A**. This report addresses the following design streams:

- Foul flows which are dealt with in Section 2 of the report,
- Surface water flows, and infiltration are dealt with in Section 3 of the report, and
- Water supply to the site which is dealt with in Section 4 of the report.

This report should be read in conjunction with the following RPS drawings, being submitted with this planning application:

- SHB3-FIN-CS-RPS-DR- DA001 Watermain Layout
- SHB3-FIN-CS-RPS-DR- DA002 Foul & Storm Water Network Layout

## **1.1 Site Characteristics**

The site is located in Far Finisklin, c 3 km from the centre of Sligo, close to Sligo Port. The adjoining industrial estate and Sligo town are centres of employment. The wider area is well served by schools.

The site area and redline boundary is 2.46 ha. The site is bounded to the north by Far Finisklin road and Sea road to the west. The development site is in an irregular shape and contains an existing nineteenth century period house, Rathellen House, which is derelict, and a number of out-buildings.

The sites highest point is at Rathellen house, from which the site falls gently away from the house to the south eastern boundary. The ground falls gently to the north of the site to the existing access road.



## 2 FOUL FLOWS

## 2.1 Site Background

#### 2.1.1 Existing foul water services

A topographical and underground utility survey was completed by NCW Surveys in May 2021. The survey provides information on service locations, indicative depth, and the nature (type) of the underground service/utility. This information is used to assist with preparing the drainage design for the proposed development.

## 2.2 Foul Sewer Design Procedure

The proposed foul sewerage system was designed using the Wallingford Tables and Microdrainage design software. Wastewater loadings were based on EPA Guidance document, 'Treatment Systems for Small Communities, Business, Leisure Centres and Hotels'.

Drainage calculations submitted in **Appendix B** have been generated by 'Micro Drainage' flow modelling software, and the 'Hydraulic Design for Gravity Sewers' method to Irish Water Code of Practice for Wastewater Infrastructure. Gradients should be selected so that self-cleansing velocities can be maintained under normal operating conditions. The range of flow velocity within the sewers should be between 0.75m/s at low flow and 3m/s, when flowing full.

The proposed foul drainage network will be constructed in accordance with Irish Water Code of Practice for Wastewater Infrastructure, The Building Regulations 'Part H' & the Regional Code of Practice for Drainage Works. The sewers will be compliant with the requirements of the Irish Water Code or Practice for Wastewater Infrastructure and will be from 150mm to 225mm in diameter. Foul sewers within the building plots may be as small as 100mm dia. In accordance with TGH H – Drainage specifications and with Irish Water Code of Practice.

Foul water will outfall to the east of the proposed development to an existing IW manhole on the Sea road. The proposed foul sewerage system will outfall to IW foul sewerage system via existing manhole, See drawing SHB3-FIN-CS-RPS-DR- DA002 in Appendix A.



## 2.3 Foul Services design parameters

The following parameters were used for the basis of design (refer to **Table 2-1**).

#### **Table 2-1 Design Parameters**

Parameters	Values	Reference
Flow Rates	Varies	As per EPA Wastewater Treatment Manual
Peak Flow	6.0 x Dry Weather Flow (DWF) (based on a 10hr working day)	Irish Water Guidelines
Min Velocity	0.75m/s at one-third design flow. Alternatively, as set out in Section B4 of Sewers for adoption	Wastewater Code of Practice &
Pipe Roughness	1.50mm	(Colebrook/White)
Pipe Cover	<ul> <li>1.2m minimum without concrete encasement– light trafficked areas</li> <li>0.6m minimum without concrete encasement – gardens</li> </ul>	Site Development Works for Housing Areas

## 2.4 Pipe and manhole numbering

The manhole numbers define the structure of the network. The foul water manholes are labelled such that labels in the direction of flow are typically in increasing order. F01, F02, etc. is used for foul sewers located inside the site boundary of this development. Existing manholes will be labelled EF01 (refer to Drawing **SHB3-FIN-CS-RPS-DR- DA002 in Appendix A**).

## 2.5 Foul loadings from proposed development

Foul loadings from the proposed development are shown below. The maximum foul flow from the proposed development has been calculated as 1.95 litres/sec. This value is based on a peak factor of 6:

- 446I/day per residential unit (based on 2.7 persons per unit x 150I/person/day, + a 10% increase factor).
- 446l/day/unit x 63 units = 28,098 l/day = 28.1 m3/day;
- 0.325 l/sec Average flow (1 DWF);
- 1.95 l/sec Peak Flow (6 DWF Population between 0 and 750)

The minimum capacity of any sewer in the proposed design is **29.7 litres/sec** as such the design can cater for the proposed developments flow. For detailed output from the foul sewer design refer to **Appendix B.** 

## 2.6 Foul Water Network Connection

RPS completed a Pre-connection enquiry form and submitted this to Irish Water on the 23<sup>rd</sup> March 2021. RPS received feedback from Irish Water on the 12<sup>th</sup> May 2021 via a standard confirmation of feasibility, attached in **Appendix E.** 

The pre connection agreement was based on a gravity connection to the existing foul sewer on the Sea Road. Irish Waters response noted that the proposed connection to the Irish Water wastewater network can be facilitated subject to the upgrade of the existing 150mm dia. foul sewer located on the Sea road. The pipe will be upgraded from a 150mm dia pipe to a 225mm dia pipe and will outfall to the existing foul water network on the Finisklin Road to the south of the development. The upgraded section is shown on **SHB3-FIN-CS-RPS-DR- DA002 in Appendix A.** 



## **3 SURFACE WATER FLOWS**

## 3.1 Site Background

#### 3.1.1 Existing Storm Water Services

The existing site is a greenfield site, as such there is no existing surface water network within the site area, with rainfall discharging directly to the ground. There are no watercourses in the vicinity of the site that can be reached by gravity, due to the site topography.

In light of the fact that there isn't a suitably deep outfall manhole and to comply with criteria 2 of the Greater Dublin Strategic Drainage Study (GDSDS), RPS will store and discharge water on site to a suitably designed infiltration system.

The site is approximately 2.46ha and has a total impermeable area of 0.532ha which is to be drained to the new proposed surface water systems. Storm flows will infiltrate to ground via an appropriately designed infiltration system.

All proposed developments must ensure that SUDS are incorporated into the development. SUDS requires that post development run-off rates be maintained at the equivalent to, or lower than, the predevelopment run-off levels. Thus, the development must be able to retain, within its boundaries, storm water volumes from extreme storm events up to and including a design for a 1 in 100 year storm event, more commonly expressed as a 1.0% AEP (Annual Exceedance Probability), while also allowing for climate change factors (+CC).

Any new development must have physical capacity to retain storm water volumes as directed under the GDSDS and, if necessary, release this attenuated surface water runoff before it enters a natural watercourse or into a public sewer, which ultimately discharges to a water body. This is to ensure the highest possible standard of storm water quality.

The new surface water sewerage system was designed using Innovyze MicroDrainage software which is based on the Wallingford Tables and the Modified Rational Method of storm flow modelling. The rainfall and climate data used in all designs was extracted directly from maps built into the program. The M5-60, R, SAAR, soil infiltration values etc were all derived for the site. Such data is given on the appropriate appendices of this report of MicroDrainage outputs for surface water networks.

Ground investigation infiltration tests were undertaken by Priority Geotechnical to assess the infiltration rate on site. RPS have used an infiltration figure of 135mm per hour for design purposes. This figure was found through infiltration testing on the subject site.

The design shows that the proposed surface water drainage system for this development can use soakaways within the open spaces to drain the site for storm events up to and including a 1 in 100 year event (including an allowance of 20% increase in rainfall intensity for climate change).

## 3.2 Site Specific SUDS Measures

Sustainable Drainage Systems (SuDS) were considered for the site, in line with recommendations of Greater Dublin Strategic Drainage Strategy (GDSDS). SuDS are a method of replicating the natural characteristics of rainfall runoff from any site. The various types of SuDS considered are outlined below.

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- Infiltration Soaking water into the ground. This is the most desirable solution to runoff
  management as it restores the natural hydrological process. Site Investigation confirms infiltration
  rates in this area are suitable for infiltration of a 100 year, 6 hour duration storm event within the
  site. This was determined by site investigation works to carried out by Priority Geotechnical Ltd.
  Infiltration to ground will also be accommodated to the rear of the proposed dwellings using a
  soakaway system design to meet the requirements of BRE 365.
- Conveyance the transfer of surface water runoff from one place to another. Controlled conveyance can provide links between various SuDS components. Conveyance is implemented within this development through the use of landscaped swales. The swales will be placed where appropriate to drain roads next to public open spaces. The swale will be broad and shallow and covered in suitable vegetation to slow water, facilitating sedimentation, filtration through root zones and soil matrix, evapotranspiration and infiltrating into the underlying soil. Excess flows will be conveyed into the stormwater system in periods of high rainfall.
- Detention/Attenuation Attenuation storage tanks are used to create a below-ground void space for the temporary storage of surface water before infiltration, controlled release, or use. In this case, infiltration will be utilised on site. This is achieved using a Geo-cellular storage attenuation system with water infiltrating to ground.

## 3.3 Design Parameters

The following parameters were used for the basis of design in the Innovyze MicroDrainage Module.

Parameters	Values	Reference	
Return Period	30 Year	Wallingford Procedure	
M5-60	17.4	Wallingford Procedure	
Ratio 'R'	0.300	Wallingford Procedure	
Max Rainfall	Paved Areas 50mm/hr Roof Areas 75mm/hr	Wallingford Procedure	
Global Time Entry	5 minutes	Wallingford Procedure	
Minimum Velocity	0.75m/s	Site Development Works for Housing Areas	
Run-Off Co-efficient	Roof Areas 1.0 Paved Areas 0.75	BS EN 16941-1	
Pipe Roughness	0.6mm Concrete / 0.15mm uPVC	Colebrook/White	
Pipe Cover	As per Irish Water Wastewater Code of Practice	Document IW-CDS-5030-03, Irish Water	
Climate Change	20%	Transport Infrastructure Ireland Drainage Systems for National Roads - DN-DNG-03022	

Table 3-1 Design Parameters Road Runoff Surface Network

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#### 3.3.1 **Proposed Storm Water Services**

Storm water generated from new hard landscaping and roofs on site will be directed to an onsite infiltration tank. Prior to entering the infiltration system, the proposed surface water collection networks will outfall to a silt trap manhole and hydrocarbon interceptor. Terraced housing and apartment buildings will incorporate appropriately sized soakaways to rear gardens to capture storm water runoff. The soakaways are to be designed to BRE365 specifications and will infiltrate to ground.

Surface water from trafficked areas will be intercepted by a suitable petrol interceptor prior to entering the infiltration system. In some instances, surface water from trafficked areas will enter landscaped swales.

The proposed storm water sewer system is shown on Drawings **SHB3-FIN-CS-RPS-DR- DA002.** For detailed outputs from the surface water network design, including network details and 100-year storm event simulation results, refer to **Appendix B.** 

## 3.4 Pipe and Manhole Numbering

The manhole numbers define the structure of the network. The surface manholes are labelled such that labels in the direction of flow are typically in increasing order. S01, S02, etc. is used for surface water sewers. Existing manholes will be labelled ES01. The manholes are labelled such that labels in the direction of flow are typically in increasing order. (refer to drawing **SHB3-FIN-CS-RPS-DR- DA002 in Appendix A**).

## 3.5 Hydrocarbon / Oil Interceptor

A hydrocarbon interceptor will be provided prior to the infiltration area. In accordance with the requirements of BS EN 858, 4.1 (b) '(run-off) from impervious areas, e.g., car parks, roads, factory yards areas;' the size of the separator will depend on the design, rainfall intensity and the catchment area draining to the separator.

A Class1 Bypass hydrocarbon Interceptor is proposed prior to surface water entering the infiltration area. It is recommended to use a Kingspan Klargester or equivalent approved surrounded in 300 mm mass concrete. The location of the interceptor is outlined in drawing SHB3-FIN-CS-RPS-DR- DA002, in Appendix A.

The maximum rainwater flow rate  $Q_r$  in l/sec shall be calculated using the equation below in accordance with EN 752-4:

$$Q_r = \Psi.i.A$$

Where,

- i is the rainfall intensity, in litres /sec / hectare.
- A is the area receiving rainfall, measured horizontally, in ha;
- Ψ is a dimensionless coefficient (usually taken as one)

Pollution prevention guidelines (PPG 3) use rainfall intensity equal to 6.5mm/hr which corresponds to the following formula for a bypass separator:

NSB = 0.0018 x A

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Where,

- NSB: Nominal Size of Bypass separator
- A: Catchment Area in m<sup>2</sup>

The impermeable area draining to the proposed bypass separators is approximately  $5320m^2$  which includes all impermeable surfaces on the site.

NSB required:

• 0.0018 x 5320 = 9.576 l/s NSBE015 is suitable

Details of the sizing of the proposed interceptor for NSBE015 is provided in **Appendix D**. The maximum storm water flow that the bypass facility can cater for is 150 l/s. The maximum design flows in the storm system is 115.5 l/s for a 1 in 30yr storm event so the bypass facility has sufficient capacity to cater for this flow.

## 3.6 Infiltration Design

RPS carried out further investigation to assess the possibility for localised infiltration within the site. RPS assessed the groundwater vulnerability of the area complying with TII publication (Road Drainage and the Water Environment – DN-DNG-03065) This document outlines the groundwater protection response matrix for use of permeable drains in road schemes, used in this instance to assess the appropriateness of infiltration within the site.

The Groundwater protection Response Matrix requires the identification of groundwater vulnerability and groundwater resources. GSI data indicates that the area is underlain by a Locally important bedrock aquifer (Figure 3.2 - Bedrock which is Moderately Productive only in Local Zones (LI)) overlain by well-drained soil with a medium subsoil permeability (Figure 3.3 & 3.4). Mapping also shows a high groundwater vulnerability (Figure 3.5).

From the vulnerability rating and aquifer classifications table below (Groundwater Protection Response Matrix) of the TII document shows a resource protection rating of R2(2) for the site. This rating stipulates that certain conditions must be met to allow permeable paving to be incorporated into the design. These are shown in extracts below.

Table 3-2 - Extract from TII Publication: Road Drainage and the Water Environment – DN-DNG-03065

	Source	Resource protection area (aquifer category)							
Vulnerability rating	protection Regional		Regionally Important Aquifer		Locally Important Aquifer			Poor aquifer	
	area	Rk*	Rf	Rg	Lg	Lm	u	Pl	Pu
Extreme: Rock near Surface or karst (X)	R4	R4	R4	R3(2)	R3(2)	R3(1)	R3(1)	R3(1)	R3(1)
Extreme ( E)	R4	R2 (3)	R2 (2)	R3(2)	R3(2)	R2 (2)	RZ (Z)	R2 (1)	R2 (1)
High (H)	R3(2)	R2 (2)	R2 (2)	R2(2)	R2(2)	R2 (2)	R2 (2)	R2 (1)	R2 (1)
Moderate (M)	R3(1)	R2 (1)	R2 (1)			R2 (1)	R2 (1)	R1	R1
Low (L)	R3(1)	R1	R1			R1	R1	R1	R1

\* A small proportion of the country (~0.6%) is underlain by locally important karstic aquifers (Lk); in these areas, the groundwater protection responses for the Rk groundwater protection zone shall apply.

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A rating of R2(2) requires the design to meet the minimum standard of R2(1) and of additional design standards R2(2). As the subsoil is classified as a sandy gravelly CLAY and is underlain by Limestone bedrock, (which is the stratum description provided in the Site Investigation Information provided), Table R2(2) of the TII document requires that a minimum of 2m unsaturated subsoil is required beneath the invert level of the drainage system.

R1	Acceptable subject to minimum design standards in the NRA DMRB and Notes 1 and 2.						
R2							
R2(1)	Acceptable subject to minimum design standards in the NRA DMRB and to meeting the following requirements :						
	1. There is a consistent minimum thickness of 1 m unsaturated subsoil, or 2 m in areas of karstified rock (Rk & Lk), beneath the invert level of the drainage system (Note 1).						
	<ol> <li>During all stages of design particular attention must be paid to the presence of karst features and additional assessments undertaken if required. If karst features are identified response R2 (3) must be applied as a minimum.</li> </ol>						
	<ol> <li>During all stages of design particular attention must be paid to receptors (such as; public wells, group schemes, industrial water supply sources and springs) and additional assessments undertaken if required.</li> </ol>						

R2(2)	Acceptable subject to minimum design standards in the NRA DMRB, meeting requirements 1, 2 and 3 of above and the following additional requirements:					
	4. Where the subsoil is classed using BS5930 as; SAND, GRAVEL SILT (in circumstances where the clay content is <10%) AND/OI is underlain by limestone bedrock, there is a consistent minimum thickness of 2 m unsaturated subsoil beneath the invert level of th drainage system.	or R ie				
	OR					
	There is a minimum consistent unsaturated thickness 1m of "appropriate material" (Note 3) either natural or man-made benea the invert level of the point of discharge.	th				
	<ol> <li>Where a gravel aquifer is present, a consistent minimum thicknes of 3 m unsaturated subsoil beneath the invert level of the drainage system must be present.</li> </ol>	s e				

#### Figure 3-1 - Extract from TII Document DN-DNG-03065

It is the conclusion of the investigation that infiltration to ground is suitable in this location if the minimum requirements as set out above are met. The infiltration rate determined on site at the soakaway location was 0.135m/hr, which is sufficient to allow for a soakaway design.

The infiltration system is designed to cater for the 1 in 100-year return period storms with an additional allowance of 20% for climate change, this in accordance with the GDSDS. Using a proprietary infiltration system, with a nominal void ratio of 95%. The typical layout is shown in Drawing **SHB3-FIN-CS-RPS-DR-**

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**DA002 in Appendix A**. A plan area of 275m<sup>2</sup> will be required to accommodate the infiltration area provided a storage capacity of 206.5m<sup>3</sup>.

The maintenance of the infiltration system should be carried out as per the manufacturer's recommendations.

Infiltration design calculations can be found in Appendix C.



Figure 3-2 Aquifer Classification - Bedrock Aquifer

Figure 3-3 - GSI Soil Classification



Figure 3-4 Subsoil Permeability

Figure 3-5 Groundwater vulnerability

#### Figure 3-6 Bedrock Formation



## 3.7 Surface Water Impact Assessment

The management of surface water for the proposed development has been designed to comply with the policies and guidelines outlined in the GDSDS and with the requirements of Sligo County Council. The guidelines require the following 4 main criteria to be provided by the design:

#### 3.7.1 Criterion 1: River Water Quality Protection:

Interception storage of at least 5mm, and preferably 10mm, of rainfall where runoff to the receiving water can be prevented. It is proposed that the overall drainage system, serving this development, will contain a range of surface water treatment methods such as:

- Car parking spaces on site to incorporate a permeable paving system;
- Interception storage and treatment within the site
- All road gullies to be trapped
- Intensive landscaping where possible
- Fuel separator and silt trap prior to entering infiltration area.

#### 3.7.2 Criterion 2: River Regime Protection

Criterion 2 is satisfied by attenuating run-off within an infiltration tank. Appendix C gives MicroDrainage Source Control simulation output showing the soakaway storage volumes required for the 100 year event (including an allowance of 20% increase in rainfall intensity for climate change) with the soakage rate from the tank being controlled by the infiltration rate found for the site. The infiltration tank will have a storage volume of 206.5m<sup>3</sup>. The infiltration system is designed to meet the requirements of the GDSDS.

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## 3.7.3 Criterion 3: Level of Service (flooding) for the site.

There are four sub-criteria for the required level of service, for a new development; as set out in the GDSDS Volume 2, Section 6.3.4 (Table 6.3):

- 3.1 No flooding on site except where planned (30-year high intensity rainfall event);
- 3.2 No internal property flooding (100-year high intensity rainfall event);
- 3.3 No internal property flooding (100-year river event and critical duration for site) and;
- 3.4 No flood routing off site except where specifically planned. (100-year high intensity rainfall event).

#### 3.7.3.1 Sub-Criteria 3.1

The surface water drainage system serving the proposed development has been designed to accommodate the 100-year return period rainfall event (including an allowance of 20% increase in rainfall intensity for climate change) without flooding. Therefore, the system has capacity for the 30-year return period rainfall event without flooding. The performance of the proposed drainage system has been analysed for design rainfall events up to, and including, the 1% Annual Exceedance Probability (AEP) event (including an allowance of 20% increase in rainfall intensity for climate change) using the MicroDrainage Network Design Software, by Innovyze Inc. Refer to **Appendix B** for details of design criteria, calculations, and results. The analyses indicate that no flooding will occur for design rainfall events up to, and including, the 1% AEP.

#### 3.7.3.2 Sub Criteria 3.2

The surface water drainage system serving the proposed development has been designed to accommodate the 100-year return period rainfall event (including an allowance of 20% increase in rainfall intensity for climate change) without flooding. The performance of the proposed drainage system in 100-year return period storm events (incl. 20% climate change allowance) has been analysed – Refer Appendix B for calculations. The analyses show that no flooding will occur in 100-year return period storm events.

#### 3.7.3.3 Sub Criteria 3.3

Details of the potential flood risk associated with the proposed development is outlined in a Site Specific Flood Risk Assessment, which will be submitted under separate cover, as part of this application. The assessment will indicate if there is an apparent risk of internal property flooding.

#### 3.7.3.4 Sub Criteria 3.4

The surface water drainage system serving the proposed development has been designed to accommodate the 100-year return period rainfall event (including an allowance of 20% increase in rainfall intensity for climate change) without flooding, so no flood routing off site will be experienced for such a rainfall event. The performance of the proposed drainage system in 100-year return period storm events (incl. 20% climate change allowance) has been analysed – Refer Appendix B for calculations. The analyses show that no flooding will occur in 100-year return period storm events.

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## 3.7.4 Criterion 4: River flood protection

Infiltration storage is to be provided for the 100-year return period rainfall event (including an allowance of 20% increase in rainfall intensity for climate change). Surface water will infiltrate to ground via an infiltration system designed to meet the requirements of the GDSDS. Refer to **Appendix B** for details of hydraulic modelling calculations of infiltration systems, as carried out using MicroDrainage software by Innovyze Inc.



## 4 WATER SUPPLY / IW PRE CONNECTION ENQUIRY

RPS completed a Pre-connection enquiry form and submitted this to Irish Water on the 23<sup>rd</sup> March 2021. RPS received feedback from Irish Water on the 12<sup>th</sup> May 2021 via a standard confirmation of feasibility, attached in **Appendix E.** 

IW database shows a 180mm HDPE watermain on the Sea Road. NCW topographical survey has captured the location of the watermain. It is proposed to tie into this watermain to provide a watermain feed to the proposed buildings. A sluice valve and water meter will be provided prior to connection to the new building as indicated in drawings in **Appendix A**. The water main layout and details including valves, hydrants, metering etc. will be in accordance with Irish Water's Code of Practice and Standard Details for water infrastructure

A looped watermain will service the site with hydrants used to provide hydrant fire cover. This new watermain will be 150mm diameter PE100 HDPE pipe. Individual houses will have their own connections to the looped watermain via service connections and boundary boxes. Individual service boundary boxes will be of the type to suit Irish Water and to facilitate domestic meter installation. Hydrants are provided for firefighting at locations to ensure that each dwelling is within the required Building Regulations distance of a hydrant.

An underground storage tank for firefighting requirements is proposed for the site. This storage tank will be connected to the watermain and will incorporate an automated level control system. The access requirements for fire fighters will be fully agreed with the Local Area Fire Officer prior to construction. The required supply for firefighting purposes comes from the Water UK document "National guidance document on the provision of water for firefighting" which calls for 20 litres/second for a site with an area of between one and two hectares.

The maximum tank volume will be **72m<sup>3</sup>**, this caters fully for the requirements of the above regulations. This may be reduced pending results from the testing of watermain and existing fire hydrant capacity. The proposed water main layout is shown on drawing No. **SHB3-FIN-CS-RPS-DR- DA001 in Appendix A.** 



## 5 FLOOD RISK ASSESSMENT

A Site-Specific Flood Risk Assessment has been prepared and is submitted under separate cover with this application.

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## Appendix A

**Drainage Layout, Detailed Drawings** 



Foul Se         1.       Al         W       Ini         2.       Al         3.       Fo         3.       Fo         4.       Al         5.       Fo         6.       Ca         7.       St         6.       Ca         7.       St         7.       St         7.       Ca         8.       O         9.       Sa         9.       Sa	wer Notes: Il foul sew /ater Stan frastructure Il pipe mat ode of DS-5030-0 oul sewer welling sha TD-WW-02 Il manhole andard del oncrete be sh Water s eparation o e in accord eparation o e in accord eparation o andard del oncrete be sh Water s eandard del oncrete be sh Water s andard del oncrete be sh Water s ain Notes: Il waterma /ater Star frastructure Il pipe mat /ater Star frastructure Il waterma /ater stand /ater stand	er works dard De e Docume erials sha Practice 3. service of all be in 2. chambe tail STD-V chill and b tail STD-V chill and chill and chai and chai and chai	shall be carried out in accordance with Iris tails and Code of Practice for Wastewat ent CDS-5030-03. all comply with Section 3.13 of the Irish Wat for Wastewater Infrastructure Docume connections and inspection chambers to ear accordance with Irish Water standard det was shall be in accordance with Irish Wat WW-10. edding shall be in accordance with Irish Wat WW-07. th and surround shall be in accordance with detail STD-WW-08. from other services, boundary walls etc. sh I rish Water standard detail STD-WW-05. from trees, shrubs etc. shall be in accordance lard detail STD-WW-06 & 06A. all comply with Section 3.13 of the Irish Wat for Wastewater Infrastructure Docume ers shall be in accordance with Irish Wat WW-10. edding shall be in accordance with Irish Wat WW-07. ch and surround shall be in accordance with WW-07. ch and surround shall be in accordance with etail STD-WW-08. shall be carried out in accordance with Irish etails and Code of Practice for Wat ent CDS-5020-03. all be in compliance with Section 3.9 of Iris ce Document-CDS-5020-03. ice connections and boundary boxes to ear compliance with Irish Water standard det from other services, boundary walls etc. sh I rish Water standard detail STD-W-11. from trees, shrubs etc. shall be in accordance with Irish Water standard detail STD-W-12 & 12A. r valve details Shall be in accordance with Iris STD-W-22 & STD-W-23 respectively. nall be in accordance with Irish Water standard ydrant details shall be in accordance with Iris STD-W-18 & STD-W-19 respectively. mall be in accordance with Irish Water standard ydrant details shall be in accordance with Iris STD-W-30.	shater tent cail ar and and ar ar ar and ar
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General Notes:

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be considered when working with this drawing.

(v) All Levels refer to Ordnance Survey Datum, Malin Head.

provided by others.

W	with Irish Water standard detail STD-WW-06 & 06A.						
<ol> <li>Storm Sewer Notes:         <ol> <li>All pipe materials shall comply with Section 3.13 of the Irish Water Code of Practice for Wastewater Infrastructure Document CDS-5030-03.</li> <li>All manhole chambers shall be in accordance with Irish Water standard detail STD-WW-10.</li> <li>Trench backfill and bedding shall be in accordance with Irish Water standard detail STD-WW-07.</li> <li>Concrete bed, haunch and surround shall be in accordance with Irish Water standard detail STD-WW-08.</li> </ol> </li> <li>Watermain Notes:         <ol> <li>All watermain works shall be carried out in accordance with Irish Water Standard Details and Code of Practice for Water Infrastructure Document CDS-5020-03.</li> <li>All pipe materials shall be in compliance with Section 3.9 of Irish Water Code of Practice Document-CDS-5020-03.</li> <li>Individual water service connections and boundary boxes to each dwelling shall be in compliance with Irish Water standard detail STD-W-02.</li> <li>Separation distances from other services, boundary walls etc. shall be in accordance with Irish Water standard detail STD-W-11.</li> <li>Separation distances from trees, shrubs etc. shall be in accordance with Irish Water standard detail STD-W-12 &amp; 12A.</li> <li>On line and off-line air valve details shall be in accordance with Irish Water standard detail STD-W-22 &amp; STD-W-23 respectively.</li> <li>Sluice valve details shall be in accordance with Irish Water standard detail STD-W-15.</li> <li>On line and off-line hydrant details shall be in accordance with Irish Water standard detail STD-W-18 &amp; STD-W-19 respectively.</li> <li>Scour valve and chamber details shall be in accordance with Irish Water standard detail STD-W-30.</li> </ol> </li> </ol>							
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ED AIR VALVE 22 / STD-W-23)	♦ AV		Title			
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ED THRUST BLOCK		,	3003-FIN-C3-RP3-D			
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	Foul Water Network Details											
<i>l</i> lanhole Name	Cover Level (m)	MH Depth (m)	Pipe Out PN	Pipes In Invert Level (m)	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In Backdrop (mm)					
F01	8.725	0.825	F1.000		7.900	225						
F02	8.825	0.996	F1.001	7.829	7.829	225						
F03	9.400	1.714	F1.002	7.686	7.686	225						
F10	8.000	0.731	F2.000		7.269	225						
F04	8.750	1.602	F1.003	7.524	7.148	225	376					
				7.148								
F11	8.125	0.864	F3.000		7.261	225						
F12	8.000	0.815	F3.001	7.185	7.185	225						
F13	8.150	1.113	F3.002	7.037	7.037	225						
F05	8.025	1.094	F1.004	6.931	6.931	225						
				6.931								
F06	8.025	1.118	F1.005	6.907	6.907	225						
F07	8.025	1.210	F1.006	6.815	6.815	225						
F08	8.000	1.284	F1.007	6.716	6.716	225						
F14	8.375	1.125	F4.000		7.250	225						
F15	8.250	1.162	F4.001	7.088	7.088	225						
F10	8.250	1.685	F1.008	6.565	6.565	225						
				7.077			512					
FOut	8.680	2.139		6.541	OUTFALL							
		Foul wat	er Networ	k - Upgrad	e Details							
				Contraction of the second s		D1 0 1	and the second					

	Four water Network - Opgrade Details										
Manhole Name	Cover Level (m)	MH Depth (m)	Pipe Out PN	Pipes In Invert Level	Pipe Out Invert Level	Pipe Out Diameter	Pipes In Backdrop				
				(m)	(m)	(mm)	(mm)				
FU1	8.680	2.140	FU1.000		6.540	225					
FU2	7.880	1.840	FU1.001	6.040	6.040	225					
FU4	<b>6.950</b>	1.529	FU1.002	5.421	5.421	225					
FU5	6.480	1.620	FU1.003	4.860	4.860	225					
FU6	<mark>6.41</mark> 0	1.745	FU1.004	4.665	4.665	225					
FU	6.360	1.868		4.492	OUTFALL						
			-								

			Stor	m Water N	etwork Det	tails			Gener	al Notes:						
	Manhole (	Cover Level	MH Depth	Pipe Out PN	Pipes In Invert Level	Pipe Out Invert Level	Pipe Out Diameter	Pipes In Backdrop	(i) I	Hard copies, All other forr	, dwf and mats (dw	pdf will fori etc.) are c	m a controlled leemed to be a	issue an unc	of the drawi	ng. sue
	Name	(m)	(m)	£1.000	(m)	(m)	(mm)	(mm)	4	and any wo	rk carried	d out based	I on these files	s is a	t the recipie	nts
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Ì	<b>S03</b>	8.000	1.193	S1.002	6.807	6.807	300			of the un-	dimensio	ned meas	urements, co	mpatil	colpicity with 1	the
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ŀ	S13	8.200	1.194	\$1.008 \$3.000	0.477	7.006	300			nvestigation provided by	and ut others.	tility detail	used in the	desię	in have be	en
	S14	8.125	1.221	\$3.001	6.904	6.904	300		(v)	All Levels re	fer to Ore	dnance Surv	/ey Datum, Ma	lin He	ad.	
ł	S15 S08	8.125	1.290	\$3.002 \$1.007	6.835	6.835	300		Foul S	ewer Notes:						
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ļ	S19	8.825	1.119	S5.000		7.706	300		2.	Code of	Practice	for Wast	ewater Infras	structu	ire Docume	ent
ŀ	S20 S18	8.825 8.825	1.216 1.239	\$5.001 \$4.002	7.609 7.586	7.609 7.586	300 300		3	CDS-5030-0 Foul sewer	3. service (	connections	and inspectio	n cha	mbers to ea	ach
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ŀ	S09	8.500	2.222	S1.008	6.278 6.806	6.278	300	528	4.	All manhole	2. chambe	ers shall be	e in accordan	ce wi	th Irish Wa	iter
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	551	8.500	2.337	51.009	0.205	0.105	500	for Pl	0.	standard det	ail STD-	WW-07.				
ŀ	SINFIN	8.500	2.352 2.390	\$1.010 \$1.011	6.148 6.110	6.148 6.110	300 300		6.	Concrete be rish Water s	ed, haun tandard	ch and surr detail STD-\	ound shall be NW-08.	in a	ccordance w	vith
Ľ	S	8.000	1.951		6.049	OUTFALL			4.	Separation o	distances	from other	services, bour	ndary	walls etc. sh	hall
									5.	Separation c	distances	from trees,	shrubs etc. sh	all be	in accordan	nce
										with Irish Wa	ater stand	lard detail S	STD-WW-06 &	06A.		
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	TS -								4.	Concrete be	ed, haun	ch and surr	ound shall be	in a	ccordance w	vith
								0.00m	<b>ו</b> ו	rish Water s	tandard	detail STD-\	/VVV-08.			
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									9.	Scour valve Water stand	and cha ard detai	mber detail	s shall be in a	accord	ance with Ir	rish
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60m 

100m 

80m



## Appendix B

**Design Calculations** 



**Foul Water Design Calculations** 

RPS (Galway)	Page 1
Lyrr Building, IDA Business & Technology Park	
Mervue	
Galway, Ireland	Mirro
Date 07/02/2022 17:27	Designed by MGB
File SHB3-FIN-CS-RPS-CA-0001.MDX	Checked by DK
Innovyze	Network 2020.1
	FOUL SEWERAGE DESIGN
Desig	n Criteria for Foul - Main
Pipe Size	s STANDARD Manhole Sizes STANDARD
Industrial Flow (l/s/ha) 0.00 Industrial Peak Flow Factor 0.00 Domest Flow Per Person (l/per/day) 150.00 Add Flow / Persons per House 2.70 Minimum D	Domestic (l/s/ha) 0.00 Maximum Backdrop Height (m) 1.500 ic Peak Flow Factor 6.00 Min Design Depth for Optimisation (m) 0.900 Climate Change (%) 0 Min Vel for Auto Design only (m/s) 0.75 Backdrop Height (m) 0.200 Min Slope for Optimisation (1:X) 500 esigned with Level Soffits
Network	Design Table for Foul - Main
PN Length Fall Slope Area (m) (m) (1:X) (ha)	Houses Base k HYD DIA Section Type Auto Flow (l/s) (mm) SECT (mm) Design
F1.000 16.511 0.071 232.6 0.000	) 15 0.0 1.500 o 225 Pipe/Conduit 🔐
F1.001 32.940 0.143 230.4 0.000	) 0 0.0 1.500 o 225 Pipe/Conduit 🔐
F1.002 37.372 0.162 230.7 0.000	) 0 0.0 1.500 o 225 Pipe/Conduit 🔐
F2.000 27.858 0.121 230.2 0.000	) 7 0.0 1.500 o 225 Pipe/Conduit 💣
F1.003 50.202 0.217 231.3 0.000	) 0 0.0 1.500 o 225 Pipe/Conduit 💣
]	Network Results Table
PN US/IL $\Sigma$ Area $\Sigma$ Ba	ise Σ Hse Add Flow P.Dep P.Vel Vel Cap Flow
(m) (na) Flow	,1/S) (1/S) (mm) (m/S) (m/S) (1/S)
F1.000 7.900 0.000	0.0 15 0.0 19 0.26 0.75 29.9 0.4
F1.001 7.829 0.000	0.0 15 0.0 19 0.26 0.75 30.0 0.4
F1.002 /.686 0.000	0.0 15 0.0 19 0.26 0.75 30.0 0.4
F2.000 7.269 0.000	0.0 7 0.0 13 0.20 0.75 30.0 0.2
F1.003 7.148 0.000	0.0 22 0.0 23 0.30 0.75 29.9 0.6
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RPS (Galway)													Page 2
Lyrr Building, IDA Business & Tech	nnology	Park											
Mervue													
Galway, Ireland													Micco
Date 07/02/2022 17:27					Design	ed by MGB							
File SHB3-FIN-CS-RPS-CA-0001.MDX					Checke	d by DK							Dialitatje
Innovyze					Networl	k 2020.1							
			Net	work I	Design	Table for	Foul	– Ma	in				
PN	Length	Fall	Slope	Area	Houses	Base	k	HYD	DIA	Section	Tvpe	Auto	0
	(m)	(m)	(1:X)	(ha)		Flow (l/s)	(mm)	SECT	(mm)		31 -	Desig	gn
F3.00	0 17.594	0.076	5 231.5	0.000	5	0.0	1.500	0	225	Pipe/Con	duit	æ	
F3.00	1 34.219	0.148	3 231.2	0.000	8	0.0	1.500	0	225	Pipe/Con	duit	ď	
F3.00	2 24.275	0.106	5 229.0	0.000	0	0.0	1.500	0	225	Pipe/Con	duit	ð	
F1.00	4 5.640	0.024	235.0	0.000	9	0.0	1.500	0	225	Pipe/Con	duit	æ	
F1.00	5 21.175	0.092	2 230.2	0.000	7	0.0	1.500	0	225	Pipe/Con	duit	e e e e e e e e e e e e e e e e e e e	
F1.00	6 22.944	0.099	231.8	0.000	0	0.0	1.500	0	225	Pipe/Con	duit	ď	
F1.00	7 35.115	0.151	232.6	0.000	0	0.0	1.500	0	225	Pipe/Con	duit	ď	
F4 00	0 37 676	0 162	) 232 G	0 000	11	0 0	1 500	0	225	Pine/Con	duit	<b>_</b> @	
F4.00	1 2.461	0.011	223.7	0.000	0	0.0	1.500	0	225	Pipe/Con	duit	e e e e e e e e e e e e e e e e e e e	
										-		-	
F1.00	8 5.596	0.024	1 231.0	0.000	0	0.0	1.500	0	225	Pipe/Con	duit	ď	
				N	etwork	Results	Table						
	PN U	JS/IL Σ (m)	Area	Σ Bas	se Σ⊞ I/e)	ise Add Flow	wr P.Dej (mm)	p P.Ve	1 Ve ) (m.	el Cap	Flow (1/s	w • \	
		(111)	(114)	FIOW (.	1/3/	(1/3)	(11111)	(111/ 5	) (111)	(1/3)	(1/3	,	
	<b>H</b> 2 000 <b>-</b>	0.01	0 000		0 0	F 0.4	0 1	0 0 1	0 0	75 00 0	0	1	
	F3.000 /	185	0.000		0.0	13 0.0	0 1:	2 0.1	8 U. 5 O	75 29.9 75 29.9	0.	4	
	F3.002 7	.037	0.000		0.0	13 0.0	0 1	8 0.2	5 0	.76 30.1	0.	4	
	F1.004 6	.931	0.000		0.0	44 0.0	0 3	1 0.3	60	.75 29.7	1.	2	
	F1.005 6	.907	0.000		0.0	51 0.0	0 3	4 0.3	90.	.75 30.0	1.	4	
	F1.000 0 F1 007 6	716	0.000		0.0	51 0.0	0 3	4 0.3 4 0.3	8 0.	75 29.9	1 ·	4	
			5.000		J.J	J. U.	5 5	- 0.5		20.0	±•	-	
	F4.000 7	.250	0.000		0.0	11 0.	0 1	7 0.2	4 0	.75 29.9	0.	3	
	F4.001 7	.088	0.000		0.0	11 0.0	0 1	6 0.2	4 0	.77 30.4	0.	3	
	F1.008 6	.565	0.000		0.0	62 0.0	0 3	7 0.4	1 0	.75 30.0	1.	7	
							0		5		- •		
					©1982-2	2020 Inno <sup>.</sup>	vyze						

Mar Puilding, IDA Business & Technology Park         Designed by MGB           Balway, Treland         Checked by DK           Date 07/02/2022 17:27         Checked by DK           File SB3-FIN-CS-RPS-CA-0001.MDX         Checked by DK           Manhole Schedules for Foul - Main           Manhole Schedules for Foul - Main           Mil         Mil<	RPS (Galway)													Page 3
ervue alway, Ireland alee 07/02/2022 17:27 ile SHB3-FIN-CS-RPS-CA-0001.MDX nnovyze Network 2020.1 Mankole Schedules for Foul – Main Main CL (n) Depth Manhole 1200 F1.000 7.900 225 F02 8.625 0.996 Open Manhole 1200 F1.001 7.829 225 F1.001 7.829 225 F03 9.400 1.714 Open Manhole 1200 F1.001 7.829 225 F1.001 7.829 225 F03 9.400 0.731 Open Manhole 1200 F1.002 7.866 225 F1.001 7.866 225 F03 9.400 0.731 Open Manhole 1200 F1.002 7.269 225 F10 8.125 0.864 Open Manhole 1200 F1.003 7.261 225 F10 8.125 0.113 Open Manhole 1200 F1.004 7.289 225 F1.001 7.185 225 F10 8.255 0.113 Open Manhole 1200 F1.006 7.261 225 F10 8.255 0.124 Open Manhole 1200 F1.006 7.259 225 F1.001 7.185 225 F10 8.255 0.124 Open Manhole 1200 F1.006 7.259 225 F1.005 7.185 225 F10 8.255 0.194 Open Manhole 1200 F1.006 7.259 225 F1.005 7.185 225 F10 8.255 0.194 Open Manhole 1200 F1.006 7.259 225 F1.005 6.815 225 F10 8.255 0.124 Open Manhole 1200 F1.006 6.815 225 F1.006 6.716 225 F10 8.255 0.124 Open Manhole 1200 F1.007 6.716 225 F1.006 6.716 225 F10 8.255 0.124 Open Manhole 1200 F1.007 6.716 225 F1.006 6.716 225 F10 8.255 0.125 Open Manhole 1200 F1.007 6.716 225 F1.006 6.716 225 F10 8.255 0.125 Open Manhole 1200 F1.007 6.716 225 F1.006 6.716 225 F10 8.255 0.125 Open Manhole 1200 F1.007 6.716 225 F1.006 6.716 225 F10 8.250 1.25 Open Manhole 1200 F1.007 6.716 225 F1.006 6.716 225 F10 8.250 1.26 Open Manhole 1200 F1.007 7.516 225 F1.007 6.516 225 F10 8.250 1.25 Open Manhole 1200 F1.007 7.516 225 F1.007 7.555 225 F10 8.250 1.6	yrr Building, IDA Bu	sines	s & Te	chnol	ogy Park									
Mail of 27/02/2022 17:27       Designed by MGB Checked by DK       Mit Checked by D	ervue													
Mile         SHB3-FIN-CS-RPS-CA-0001.MDX         Mail         Main or yie         Designed by MGB Checked by DK         Provide         Pipe Sin Lecked by DK         Diameter Level (m)         Pipe Sin Level (m)         Diameter (m)         Backdrop (m)           F01         9.725         0.825         Open Manhole         1200         F1.000         7.800         225         F1.001         7.686         225         F1.001         7.686         225         F1.001         7.686         225         F1.002         7.524         225         376           F10         8.155         0.680         Open Manhole         1200         F1.002         7.686         225         F1.002         7.524         225         376           F10         8.155         0.681         Open Manhole         1200         F1.002         7.085         225         F1.003         7.185         225         F1.003         6.931         225         F1.003         6.931         225         F1.003         6.931         225	alway, Ireland													Micro
Ile SHB3-FIN-CS-RPS-CA-0001.MDX     Checked by DK       Inoryze     Network 2020.1         Manole Schedules for Foul - Main       Manoe CL (m)     MH     MH     MH     PN     Pipe Out (ms)     Diameter     PN     Pipes In (ms)     Diameter     Backdrop (ms)       F01     8.725     0.926     Open Manhole     1200     F1.001     7.900     225     F1.001     7.829     225       F03     9.000     0.731     Open Manhole     1200     F1.002     7.666     225     F1.001     7.829     225       F04     8.751     1.602     Open Manhole     1200     F1.002     7.148     225     7.001     7.185     225       F03     9.000     0.731     Open Manhole     1200     F1.002     7.148     225     7.001     7.185     225       F04     8.751     1.602     Open Manhole     1200     F1.002     7.185     225     7.001     7.185     225       F10     8.125     0.864     Open Manhole     1200     F1.002     7.012     225     7.001     7.185     225       F11     8.000     0.815     Open Manhole     1200     F1.002     7.012     225     F1.003     6.931     225 <td>ate 07/02/2022 17:27</td> <td></td> <td></td> <td></td> <td></td> <td>1</td> <td>Designe</td> <td>ed by MGE</td> <td>3</td> <td></td> <td></td> <td></td> <td></td> <td>Dcainac</td>	ate 07/02/2022 17:27					1	Designe	ed by MGE	3					Dcainac
Mannovyze         Network 2020.1           Mannole Schedules for Foul – Main           Mame         Diff         MH         Depth         Connection         Diam., J.W         PN         Pipe Out Level (n)         Diameter (mm)         PN         Pipe Out Level (n)         PN         Pipe out Level (n)         PN         Pipe In Level (n)         Diameter Level (n)         Diameter (mm)         Backdrop (mm)           F01         8.725         0.825         Open Manhole         1200         F1.000         7.900         225         1.000         7.829         225         F1.001         7.666         225         F1.001         7.682         225         F1.001         7.686         225         F1.002         7.524         225         376           F04         8.750         1.602         Open Manhole         1200         F1.000         7.261         225         F1.000         7.148         225         F1.000         7.148         225         F1.000         7.148         225         F1.001         7.037         225         F1.000         7.148         225         F1.001         7.037         225         F1.001         7.037         225         F1.001         7.037         225         F1.001         F1.006         6.131	ile SHB3-FIN-CS-RPS-C	CA-000	1.MDX			(	Checked	l by DK						שווומע
MH       MH       Drd       MH       NH       NH       NH       NH       PN       PN <t< td=""><td>nnovyze</td><td></td><td></td><td></td><td></td><td>1</td><td>Network</td><td>2020.1</td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	nnovyze					1	Network	2020.1						
Mannele Schedules For Foul - Main           Mannele CL (m)         MH (m)         MH (m)         MH (m)         MH (m)         MH (m)         MH (m)         PN         Pipe Out Level (m)         Diameter (mm)         Pipes In Level (m)         Figes In (mm)         Eackdrop (mm)           F01         8.725         0.825         Open Manhole         1200         F1.000         7.900         225         225         51.000         7.829         225         51.001         7.829         225         51.001         7.686         225         51.001         7.686         225         51.001         7.686         225         51.001         7.686         225         51.001         7.686         225         51.001         7.148         225         51.001         7.524         225         376           F04         8.750         1.602         Open Manhole         1200         F3.000         7.261         225         51.001         7.148         225         51.001         7.037         225         51.001         7.037         225         51.001         7.037         225         51.001         7.037         225         51.001         7.037         225         51.003         6.331         225         51.003         6.331         225							~							
MH NameMH CL (m)MH (m)MH COnnectionMH (m)Pipe Ot (m)Pinvert Invert Level (m)Pipe Tr (m)Diameter Level (m)Pipe Tr (m)Diameter Level (m)Pipe Tr (m)Diameter Level (m)Pipe Tr (m)Diameter Level (m)Diameter (m)Diameter Level (m)Diameter (m)Diameter Level (m)Diameter Level (m)Diameter						Manhole	Schedu	les for	<u>Foul – Ma</u>	<u>ain</u>				
NameCL (n) (n)Depth (n)Connection (n)Diam., L*N (nn)PN Level (n)Diameter (nn)PN Level (n)Diameter (nn) <td></td> <td>МН</td> <td>МН</td> <td>мн</td> <td>МН</td> <td>МН</td> <td></td> <td>Pipe Out</td> <td>,</td> <td> </td> <td>Pipes In</td> <td></td> <td></td> <td></td>		МН	МН	мн	МН	МН		Pipe Out	,		Pipes In			
rm         rm         rm         Level (n)         rm         Level (n)         rm         rmm           F01         8.725         0.825         Open Manhole         1200         F1.000         7.900         225         F1.001         7.829         225         F1.001         7.829         225         F1.001         7.866         225         F1.001         7.666         225         F1.001         7.666         225         F1.001         7.666         225         F1.001         7.666         225         F1.002         7.524         225         376           F04         8.750         0.602         Open Manhole         1200         F1.003         7.148         225         F1.002         7.524         225         376           F10         8.125         0.864         Open Manhole         1200         F3.000         7.261         225         F3.000         7.148         225         F3.000         7.148         225         F3.000         7.148         225         F3.001         7.037         225         F3.002         6.931         225         F3.002         6.931         225         F3.002         6.931         225         F3.002         6.931         225         F3.002         6.931 <td></td> <td>Name</td> <td>CL (m)</td> <td>Depth</td> <td>Connection</td> <td>Diam.,L*W</td> <td>I PN</td> <td>Invert</td> <td>Diameter</td> <td>PN</td> <td>Invert</td> <td>Diameter</td> <td>Backdrop</td> <td></td>		Name	CL (m)	Depth	Connection	Diam.,L*W	I PN	Invert	Diameter	PN	Invert	Diameter	Backdrop	
F01       8.725       0.825       Open Manhole       1200       F1.000       7.900       225       F1.000       7.829       225         F02       8.825       0.996       Open Manhole       1200       F1.001       7.829       225       F1.000       7.829       225         F03       9.400       1.714       Open Manhole       1200       F1.002       7.686       225       F1.001       7.686       225         F09       8.000       0.731       Open Manhole       1200       F2.000       7.269       225       7.524       225       376         F04       8.750       1.602       Open Manhole       1200       F3.000       7.261       225       7.148       225       7.000       7.185       225         F11       8.000       0.815       Open Manhole       1200       F3.000       7.261       225       7.001       7.037       225         F12       8.150       1.113       Open Manhole       1200       F3.002       7.037       225       F3.001       7.037       225         F05       8.025       1.118       Open Manhole       1200       F1.005       6.907       225       F1.004       6.907       22				(m)		(mm)		Level (m)	(mm)	l	Level (m)	(mm)	(mm)	
F11       8.725       0.825       Open Manhole       1200       F1.000       7.900       225         F02       8.825       0.996       Open Manhole       1200       F1.001       7.829       225       F1.001       7.829       225         F03       9.400       1.714       Open Manhole       1200       F1.002       7.686       225       F1.001       7.829       225         F04       8.750       1.602       Open Manhole       1200       F1.003       7.148       225       F1.002       7.524       225         F10       8.125       0.864       Open Manhole       1200       F3.000       7.261       225       225       376         F11       8.000       0.815       Open Manhole       1200       F3.000       7.261       225       53.001       7.185       225         F12       8.150       1.113       Open Manhole       1200       F3.002       7.037       225       F3.001       7.037       225         F05       8.025       1.118       Open Manhole       1200       F1.005       6.931       225       F1.004       6.931       225         F06       8.025       1.210       Open Manhole				+		+	+							
F02       8.825       0.996       Open Manhole       1200       F1.001       7.829       225       F1.000       7.829       225         F03       9.400       1.714       Open Manhole       1200       F1.002       7.686       225       F1.001       7.686       225         F09       8.000       0.731       Open Manhole       1200       F2.000       7.269       225       F1.002       7.524       225         F04       8.750       1.602       Open Manhole       1200       F1.003       7.148       225       F1.002       7.524       225         F10       8.125       0.864       Open Manhole       1200       F3.000       7.261       225       225       7.148       225         F11       8.000       0.815       Open Manhole       1200       F3.001       7.185       225       F3.001       7.037       225         F12       8.150       1.113       Open Manhole       1200       F1.004       6.931       225       F3.002       6.931       225         F06       8.025       1.118       Open Manhole       1200       F1.005       6.907       225       F1.004       6.907       225         F0		F01	8.725	0.825	Open Manhole	1200	F1.000	7.900	) 225					
F03       9.400       1.714       Open Manhole       1200       F1.002       7.686       225       F1.001       7.686       225         F09       8.000       0.731       Open Manhole       1200       F2.000       7.269       225       F1.002       7.524       225         F04       8.750       1.602       Open Manhole       1200       F3.000       7.261       225       F1.002       7.524       225         F10       8.125       0.864       Open Manhole       1200       F3.000       7.261       225       F3.000       7.185       225         F11       8.000       0.815       Open Manhole       1200       F3.002       7.037       225       F3.001       7.037       225         F05       8.025       1.013       Open Manhole       1200       F1.004       6.931       225       F3.002       6.931       225         F06       8.025       1.118       Open Manhole       1200       F1.005       6.907       225       F1.004       6.907       225         F07       8.255       1.210       Open Manhole       1200       F1.006       6.815       225       F1.005       6.815       225 <td< td=""><td></td><td>F02</td><td>8.825</td><td>0.996</td><td>Open Manhole</td><td>1200</td><td>F1.001</td><td>7.829</td><td>) 225</td><td>F1.000</td><td>7.829</td><td>225</td><td></td><td></td></td<>		F02	8.825	0.996	Open Manhole	1200	F1.001	7.829	) 225	F1.000	7.829	225		
F09       8.000       0.731       Open Manhole       1200       F2.000       7.269       225         F04       8.750       1.602       Open Manhole       1200       F1.003       7.148       225       F1.002       7.524       225         F10       8.125       0.864       Open Manhole       1200       F3.000       7.261       225       225       7.524       225         F11       8.000       0.815       Open Manhole       1200       F3.000       7.261       225       7.037       225         F12       8.150       1.113       Open Manhole       1200       F3.002       7.037       225       F3.001       7.037       225         F05       8.025       1.094       Open Manhole       1200       F1.004       6.931       225       F1.003       6.931       225         F06       8.025       1.118       Open Manhole       1200       F1.005       6.907       225       F1.004       6.907       225         F07       8.025       1.210       Open Manhole       1200       F1.007       6.716       225       F1.005       6.815       225         F08       8.000       1.284       Open Manhole       <		F03	9.400	1.714	Open Manhole	1200	F1.002	7.686	5 225	F1.001	7.686	225		
F04       8.750       1.602       Open Manhole       1200       F1.003       7.148       225       F1.002       7.524       225       376         F10       8.125       0.864       Open Manhole       1200       F3.000       7.261       225       F3.000       7.148       225         F11       8.000       0.815       Open Manhole       1200       F3.001       7.185       225       F3.001       7.185       225         F12       8.150       1.113       Open Manhole       1200       F3.002       7.037       225       F3.001       7.037       225         F05       8.025       1.094       Open Manhole       1200       F1.005       6.931       225       F3.002       6.931       225         F06       8.025       1.118       Open Manhole       1200       F1.005       6.907       225       F1.004       6.931       225         F07       8.025       1.118       Open Manhole       1200       F1.007       6.716       225       F1.005       6.815       225         F08       8.000       1.284       Open Manhole       1200       F1.007       6.716       225       F1.006       6.716       225		F09	8.000	0.731	Open Manhole	1200	F2.000	7.269	225	-1 000		0.05	0.5.6	
F10       8.125       0.864       Open Manhole       1200       F3.000       7.261       225         F11       8.000       0.815       Open Manhole       1200       F3.001       7.185       225       F3.000       7.185       225         F12       8.150       1.113       Open Manhole       1200       F3.002       7.037       225       F3.001       7.037       225         F05       8.025       1.094       Open Manhole       1200       F1.004       6.931       225       F1.003       6.931       225         F06       8.025       1.118       Open Manhole       1200       F1.005       6.907       225       F1.004       6.907       225         F07       8.025       1.210       Open Manhole       1200       F1.005       6.907       225       F1.004       6.907       225         F08       8.000       1.284       Open Manhole       1200       F1.007       6.716       225       F1.005       6.815       225         F13       8.375       1.125       Open Manhole       1200       F4.000       7.250       225       F4.000       7.088       225         F14       8.250       1.685		F.04	8.750	1.602	Open Manhole	1200	F1.003	/.148	3 225	F1.002	7.524	225	376	
F10       8.123       0.844       Open Manhole       1200       F3.000       7.261       223         F11       8.000       0.815       Open Manhole       1200       F3.001       7.185       225       F3.000       7.185       225         F12       8.150       1.113       Open Manhole       1200       F3.002       7.037       225       F3.001       7.037       225         F05       8.025       1.094       Open Manhole       1200       F1.004       6.931       225       F1.003       6.931       225         F06       8.025       1.118       Open Manhole       1200       F1.005       6.907       225       F1.004       6.907       225         F07       8.025       1.210       Open Manhole       1200       F1.005       6.907       225       F1.005       6.815       225         F08       8.000       1.284       Open Manhole       1200       F1.007       6.716       225       F1.006       6.716       225         F14       8.250       1.162       Open Manhole       1200       F4.001       7.088       225       F4.001       7.077       225       512         F10       8.250       1.		<b>E</b> 10	0 105	0.004	Open Menhole	1200		7 201	1 005	FZ.000	/.148	225		
F11       5.000       0.615       Open Manhole       1200       F3.001       7.185       225       F3.000       7.185       225         F12       8.150       1.113       Open Manhole       1200       F3.002       7.037       225       F3.001       7.037       225         F05       8.025       1.094       Open Manhole       1200       F1.004       6.931       225       F1.003       6.931       225         F06       8.025       1.118       Open Manhole       1200       F1.005       6.907       225       F1.004       6.931       225         F07       8.025       1.210       Open Manhole       1200       F1.005       6.907       225       F1.004       6.907       225         F08       8.000       1.284       Open Manhole       1200       F1.007       6.716       225       F1.006       6.815       225         F13       8.375       1.125       Open Manhole       1200       F4.000       7.250       225       F1.007       6.565       225         F14       8.250       1.685       Open Manhole       1200       F4.001       7.088       225       F4.000       7.077       225       512		F10	8.125	0.864	Open Manhole	1200	F3.000	7.20	L 220	E2 000	7 105	225		
F12       0.130       1.113       Open Manhole       1200       F3.002       7.037       223       F3.001       7.037       223         F05       8.025       1.094       Open Manhole       1200       F1.004       6.931       225       F1.003       6.931       225         F06       8.025       1.118       Open Manhole       1200       F1.005       6.907       225       F1.004       6.991       225         F07       8.025       1.210       Open Manhole       1200       F1.005       6.907       225       F1.005       6.815       225         F08       8.000       1.284       Open Manhole       1200       F1.007       6.716       225       F1.006       6.716       225         F13       8.375       1.125       Open Manhole       1200       F4.000       7.250       225		F 1 1	0.000	1 113	Open Manhole	1200	F3.001	7.10	7 225	F3.000	7.105	225		
F03       8.025       1.094       Open Manhole       1200       F1.004       0.931       223       F1.003       0.931       223         F06       8.025       1.118       Open Manhole       1200       F1.005       6.907       225       F1.004       6.907       225         F07       8.025       1.210       Open Manhole       1200       F1.005       6.907       225       F1.004       6.907       225         F08       8.000       1.284       Open Manhole       1200       F1.007       6.716       225       F1.006       6.716       225         F13       8.375       1.125       Open Manhole       1200       F4.000       7.250       225		F12	0.130	1 094	Open Manhole	1200	F3.002	6.93	1 225	F3.001	6 931	225		
F06       8.025       1.118       Open Manhole       1200       F1.005       6.907       225       F1.004       6.907       225         F07       8.025       1.210       Open Manhole       1200       F1.006       6.815       225       F1.005       6.815       225         F08       8.000       1.284       Open Manhole       1200       F1.007       6.716       225       F1.006       6.716       225         F13       8.375       1.125       Open Manhole       1200       F4.000       7.250       225       F4.000       7.088       225         F14       8.250       1.162       Open Manhole       1200       F4.001       7.088       225       F4.000       7.088       225         F10       8.250       1.685       Open Manhole       1200       F1.008       6.565       225       F1.007       6.565       225         F10       8.250       1.685       Open Manhole       1200       F1.008       6.565       225       F1.007       6.565       225         F4.001       7.077       225       512		105	0.025	1.054	open nannore	1200	11.004	0.951		F1.005	6 931	225		
F00       F1100       F11100       F11000       F11000       F11001		FOG	8 025	1 118	Open Manhole	1200	F1 005	6 90'	7 225	F1 004	6 907	225		
F08       8.000       1.284       Open Manhole       1200       F1.007       6.716       225       F1.006       6.716       225         F13       8.375       1.125       Open Manhole       1200       F4.000       7.250       225		F07	8.025	1.210	Open Manhole	1200	F1.006	6.81	5 225	F1.005	6.815	225		
F13       8.375       1.125       Open Manhole       1200       F4.000       7.250       225         F14       8.250       1.162       Open Manhole       1200       F4.001       7.088       225       F4.000       7.088       225         F10       8.250       1.685       Open Manhole       1200       F1.008       6.565       225       F1.007       6.565       225         F10       8.250       1.685       Open Manhole       1200       F1.008       6.565       225       F1.007       6.565       225         F4.001       7.077       225       512		F08	8.000	1.284	Open Manhole	1200	F1.007	6.716	5 225	F1.006	6.716	225		
F14       8.250       1.162       Open Manhole       1200       F4.001       7.088       225       F4.000       7.088       225         F10       8.250       1.685       Open Manhole       1200       F1.008       6.565       225       F1.007       6.565       225         F4.001       7.077       225       512		F13	8.375	1.125	Open Manhole	1200	F4.000	7.250	225					
F10       8.250       1.685       Open Manhole       1200       F1.008       6.565       225       F1.007       6.565       225         F4.001       7.077       225       512		F14	8.250	1.162	Open Manhole	1200	F4.001	7.08	3 225	F4.000	7.088	225		
F4.001 7.077 225 512		F10	8.250	1.685	Open Manhole	1200	F1.008	6.56!	5 225	F1.007	6.565	225		
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				1	MH Manhole	Manhol	e Inte	rsection :	Intersectio	on Manho	ole Layou	t		
MH Manhole Manhole Intersection Intersection Manhole Layout				N	ame Easting (m)	Northin (m)	ıg Ea	sting (m)	Northing (m)	Acce	ss (North	1)		
MH Manhole Manhole Intersection Intersection Manhole Layout Name Easting Northing Easting Northing Access (North) (m) (m) (m) (m)					,, F01 567380 99	,, 14 836919 0	970 56	7380 994	<b></b> , 836919 97	10 Reali	red			
MH Manhole Manhole Intersection Intersection Manhole Layout Name Easting Northing Easting Northing Access (North) (m) (m) (m) (m)				1	LOT 301300.33	1 000010.0	.,0 .00	,	556717.91	o nequi	- Cu			
MH       Manhole       Manhole       Intersection       Intersection       Manhole       Layout         Name       Easting       Northing       Easting       Northing       Access       (North)         (m)       (m)       (m)       (m)       (m)         F01       567380.994       836919.970       567380.994       836919.970       Required														

RPS (Galway)									Page 4
Lyrr Building, IDA Business & Technol	ogy	Park							
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		ľ	lanhole	e Sc	chedules for	Foul – Mai	<u>n</u>		
N	MH Iame	Manhole Easting (m)	Manho Northi (m)	le .ng	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)	
	F02	567372.754	836905.	661	567372.754	836905.661	Required	1	
	F03	567374.173	836872.	752	567374.173	836872.752	Required		
	F09	567404.163	836835.	866	567404.163	836835.866	Required		
	F04	567376.309	836835.	441	567376.309	836835.441	Required		
	F10	567296.772	836878.	125	567296.772	836878.125	Required	•	
	F11	567313.875	836882.	256	567313.875	836882.256	Required		
	F12	567321.444	836848.	885	567321.444	836848.885	Required		
	F05	567327.144	836825.	288	567327.144	836825.288	Required		
	F06	567323.003	836821.	460	567323.003	836821.460	Required		
	F07	567302.465	836816.	303	567302.465	836816.303	Required		
	F08	567280.128	836811.	063	567280.128	836811.063	Required	ę	
				©19	982-2020 Inn	ovvze			

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	U Man	hala	Manhala	- Intomacat	ion T.	tongoation	Manhala	Tavaut	
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	(1	m)	(m)	(m)	5	(m)			
	12 56720	0 212 03	26741 0	19 567200	212	026741 010	Doguirod	1	
E E	12 20/20	0.212 03	50/41.0	110 207300.	212	030/41.010	Required		
F	14 56729	91.101 83	36777.5	567291.	101	836777.575	Required		
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F	10 56728	88.705 83	36777.0	567288.	.705	836777.011	Required	$-1^{\prime}$	
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А	rea Summ	marv for	Foul - Main			
-		- 1 -				
	Pipe	Gross	Pipe Total			
	Number	Area (ha)	(ha)			
	1.000	0.000	0.000			
	1.001	0.000	0.000			
	1.002	0.000	0.000			
	2.000	0.000	0.000			
	1.003	0.000	0.000			
	3.000	0.000	0.000			
	3.001	0.000	0.000			
	3.002	0.000	0.000			
	1.004	0.000	0.000			
	1.005	0.000	0.000			
	1.006	0.000	0.000			
	1.007	0.000	0.000			
	4.000	0.000	0.000			
	4.001	0.000	0.000			
	1.000	0.000 Total	0.000 Total			
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Error Elou	ing out f	Fall Date	sile fer Feul	Mos	-	
<u>FIEE FIOW</u>	ing Outi	Lall Dela	alls for four	L – Ma.		
Outfall C	Dutfall C.	. Level I.	Level Min	D,L	W	
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			(,			
F1.008	FOut	8.680	6.541 6.540	0 0	0	

Lyrr Building, IDA Business & Technology Park         Image: Comparison of the second of the sec	RPS (Galway)		Page 7
Nervue Galaxy, Ireland Date 07/02/2022 17:27 File SUBS-FIN-CS-RES-CA-0001.MEX Innovyza Network Z021.1 Checked by DE Checked by DE Che	Lyrr Building, IDA Business & Technology Park		
Galway, Ireland       Designed by MGB         File SHB3-FIN-C3-RES-CA-0001.MDX       Designed by MGB         Innovy20       Retwork 2020.1         Numetric Runoff Conff 0.750 Monhole Realless Conff (Global) 0.300 Inter Confficient 0.800 Resel Meduation Pactor 1.000 Youl Severe per heater (J/3) 0.000 Files per Person per Day (J/per/day) 0.000 Ris Start Level (min) 0 Additional Files - 6 of Tatal Files 0.000 Ris There (min) 1         Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagnams 0 Number of Offline Controls 0 Number of Time/Area Diagnams 0 Number of Offline Controls 0 Number of Real Time Controls 0 Number of Stard Level (pars) 1         Rainfall Model       PER M5-60 (mu) 17.400 Cv (Gummer) 0.750 Returns Period (years) 100 Notice R 0.300 Cv (Wirter) 0.400 Returns) 100 Notice R 0.300 Cv (Wirter) 0.400 Returns) 2.000 Returns Period (years) 100 Notice R 0.300 Cv (Wirter) 0.400 Returns) 2.000 Returns Period (years) 100 Notice R 0.300 Cv (Wirter) 0.400 Returns) 2.000 Returns Period (years) 100 Notice R 0.300 Cv (Wirter) 0.400 Returns Period (years) 100 Notice R 0.300 Cv (Wirter) 0.400 Returns Period (years) 100 Notice R 0.300 Cv (Wirter) 0.400 Returns Period (years) 100 Notice R 0.300 Cv (Wirter) 0.400 Returns Period (years) 100 Notice R 0.300 Cv (Wirter) 0.400 Returns Period (years) 100 Notice R 0.300 Cv (Wirter) 0.400 Returns Period (years) 100 Notice R 0.300 Cv (Wirter) 0.400 Returns Period (years) 100 Notice R 0.300 Cv (Wirter) 0.400 Returns Period (years) 100 Notice R 0.300 Cv (Wirter) 0.400 Returns Period (years) 100 Notice R 0.300 Cv (Wirter) 0.400 Returns Period R 0.300 Returns Period R 0.400 Returns Period R 0.300 Re	Mervue		
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Simulation Criteria for Foul - Main         Volumetric Runoff Coeff (0.750 Manhole Readloss Coeff (Global) 0.500 Toes presson per Day (U/per/day) 0.000         Area: Sectart (mins)       0 Additional Flow * 100 for total Flow 0.000 Tokes presson per Day (U/per/day) 0.000         Mot Start Level (mm)       0 MADD Factor * 100 /hs Storage 2.000 Output Interval (mins) 1         Number of Input Hydrographs 0 Number of Storage Structures 0 Number of Time/Area Diagrams 0         Number of Colline Controls 0 Number of Storage Structures 0 Number of Real Time Controls 0         Number of Colline Controls 0 Number of Storage Structures 0 Number of Colline Controls 0         Rainfall Model       108 M5-60 (mm) 17.400 Cv (Summer) 0.750         Return Period (years)       100 Ratio R 0.500 Cv (Summer) 0.364         Region Scotland and Ireland Profile Type Summer Storm Duration (mins)       30	Innovyze	Network 2020.1	
<pre>Volumetric Runoff Coeff 0.750 Manhole Headloss Coeff (Global) 0.500 Inlet Coefficient 0.800 Areal Reduction Factor 1.000 Foul Sever heterse (1/s) 0.000 Flow per Day (1/per/day) 0.000 Hot Start funns) 0 Additional Flow % of Total Flow 0.000 Run Time (mins) 1 Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Real Time/Area Diagrams 0 Number of Online Controls 0 Number of Storage Structures 0 Number of Real Time (mins) 1 Rainfall Model FSR M5-60 (mm) 17,400 Cv (Summer) 0.750 Return Period (years) 100 Ratio R 0.300 Cr (Winter) 0.840 Region Scotland and Treland Profile Type Summer Storm Duration (mins) 30 </pre>	Simulat	ion Criteria for Foul - Main	
Synthetic Rainfall Details Rainfall Model FSR M5-60 (mm) 17.400 Cv (Summer) 0.750 Return Period (years) 100 Ratio R 0.300 Cv (Winter) 0.840 Region Scotland and Ireland Profile Type Summer Storm Duration (mins) 30	Volumetric Runoff Coeff 0.750 Manhole Head Areal Reduction Factor 1.000 Foul Sewar Hot Start (mins) 0 Additional Flo Hot Start Level (mm) 0 MADD Facto Number of Input Hydrographs 0 Nu Number of Online Controls 0 Numb	dloss Coeff (Global) 0.500Inlet Coefficcient 0.800ge per hectare (l/s) 0.000 Flow per Person per Day (l/per/day) 0.000ow - % of Total Flow 0.000Run Time (mins) 60or * 10m³/ha Storage 2.000Output Interval (mins) 1umber of Offline Controls 0 Number of Time/Area Diagrams 0ber of Storage Structures 0 Number of Real Time Controls 0	) ) -
Rainfall Model FSR M5-60 (mm) 17.400 Cv (Summer) 0.750 Return Period (years) 100 Ratio R 0.300 Cv (Winter) 0.840 Region Scotland and Ireland Profile Type Summer Storm Duration (mins) 30	Syn	thetic Rainfall Details	
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**Storm Water Design Calculations** 

RPS (Galway)		Page 1
Lyrr Building, IDA Business & Technology Park		
Mervue		
Galway, Ireland		Micro
Date 07/02/2022 17:26	Designed by MGB	
File SHB3-FIN-CS-RPS-CA-0001.MDX	Checked by DK	Diamage
Innovyze	Network 2020.1	
STORM SEWER DES	IGN by the Modified Rational Method	
Dea	sign Criteria for Storm	
Pipe Size	s STANDARD Manhole Sizes STANDARD	
FSR Rain Return Period (years) 30 M5-60 (mm) 17.400 Ratio R 0.300 Maximum Rainfall (mm/hr) 50 Add F Maximum Time of Concentration (mins) 30 Min De <u>Time</u>	<pre>fall Model - Scotland and Ireland Foul Sewage (1/s/ha) 0.000 Maximum Backdrop Height (m) /olumetric Runoff Coeff. 0.750 Min Design Depth for Optimisation (m)</pre>	) 1.500 ) 0.900 ) 1.00 ) 500
	Time         Area         Time         Area           (mins)         (ha)         (mins)         (ha)           0-4         0.291         4-8         0.241	
Total	Area Contributing (ha) = 0.532	
Tota	al Pipe Volume (m³) = 31.882	
Netwo	rk Design Table for Storm	
PN Length Fall Slope I.Area (m) (m) (1:X) (ha)	T.E. Base k HYD DIA Section Type Auto (mins) Flow (l/s) (mm) SECT (mm) Design	
<u>]</u>	Network Results Table	
PN Rain T.C. US/IL Σ (mm/hr) (mins) (m)	I.Area Σ Base Foul Add Flow Vel Cap Flow (ha) Flow (l/s) (l/s) (l/s) (m/s) (l/s) (l/s)	
	©1982-2020 Innovyze	

RPS (Galway)														Page 2
Lyrr Building, IDA Busines:	s & Tech	nology	Parl	k										
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							1 2020.1							
					Networ	rk Desi	gn Table i	Eor St	corm					
	PN	Length	Fall	Slope	e I.Area	T.E.	Base	k	HYD D	AI	Sectio	on Typ	e Auto	
		(m)	(m)	(1:X)	(ha)	(mins)	Flow (l/s)	(mm)	SECT (1	mm)			Design	
	S1 000	38 911	0 23	3 167 -	0 036	1 00	0 0	0 600	0	300	Pine/(	Condui	+ _@	
	S1.000	32.364	0.142	2 228.5	5 0.035	4.00 0.00	0.0	0.600	0	300	Pipe/0	Condui <sup>.</sup>	t 🖷	
	S1.002	21.586	0.093	3 231.8	3 0.017	0.00	0.0	0.600	0	300	Pipe/0	Condui	t <mark>n</mark> ff	
	S1.003	25.037	0.093	3 268.9	0.022	0.00	0.0	0.600	0	300	Pipe/0	Condui	t 편	
	S1.004	3.212	0.02	1 155.2	2 0.052	0.00	0.0	0.600	0	300	Pipe/0	Condui	t 💣	
	c2 000	26 205	0 01	2 1 1 2 1		4 00	0.0	0 000		200	Dire /	Conderd	+ _ <b>0</b>	
	SZ.000	20.385	0.21.	3 IZ3.5 N 229 (	0.045	4.00	0.0	0.600	0	300	Pipe/(	Condui	с <mark>б</mark> " +Ф	
	S2.001	2.949	0.04	B 61.4	1 0.039	0.00	0.0	0.600	0	300	Pipe/	Condui	- U t 🖻	
											1		•	
	S1.005	32.980	0.123	3 268.3	3 0.012	0.00	0.0	0.600	0	300	Pipe/0	Condui	t 🕂	
	S1.006	30.393	0.12	5 244.0	0.036	0.00	0.0	0.600	0	300	Pipe/0	Condui	t 🕂	
	\$3.000	17.044	0.10	2 167.1	0.012	4.00	0.0	0.600	0	300	Pipe/(	Condui	+ 🔗	
		1,0011	0.10.			1.00	0.0	0.000	0		1 1007	oonaar	- <b>0</b>	
					N	etwork	Results T	able						
	PI	N Ra	ain	T.C.	US/IL Σ	I.Area	$\Sigma$ Base	Foul	Add Flo	w	Vel	Cap	Flow	
		(mm	/hr)	(mins)	(m)	(ha)	Flow (l/s)	(l/s)	(l/s)	(	(m/s)	(1/s)	(l/s)	
	S1 (	000 5	0.00	4.53	7.181	0.036	0.0	0.0	Ο	. 0	1.21	85.8	4.9	
	S1.0	001 5	0.00	5.06	6.948	0.072	0.0	0.0	0	.0	1.04	73.2	9.7	
										0	1.03	72.7	12.0	
	S1.(	002 5	0.00	5.41	6.807	0.089	0.0	0.0	0.	• •				
	S1.0 S1.0	002 5 003 5	0.00 0.00	5.41 5.84	6.807 6.714	0.089 0.110	0.0	0.0 0.0	0.	.0	0.95	67.4	14.9	
	S1.( S1.( S1.(	002 5 003 5 004 5	0.00 0.00 0.00	5.41 5.84 5.89	6.807 6.714 6.621	0.089 0.110 0.162	0.0 0.0 0.0	0.0 0.0 0.0	0.	.0	0.95 1.26	67.4 89.0	14.9 21.9	
	S1.0 S1.0 S1.0	002     5       003     5       004     5	0.00	5.41 5.84 5.89	6.807 6.714 6.621	0.089 0.110 0.162	0.0 0.0 0.0	0.0 0.0 0.0	0	.0	0.95	67.4 89.0	14.9 21.9	
	S1.0 S1.0 S1.0 S2.0	002         5           003         5           004         5           000         5           001         5	0.00 0.00 0.00	5.41 5.84 5.89 4.31	6.807 6.714 6.621 7.041 6.828	0.089 0.110 0.162 0.045	0.0 0.0 0.0	0.0 0.0 0.0	0.	.0	0.95 1.26 1.41	67.4 89.0 99.8	14.9 21.9 6.1	
	\$1.0 \$1.0 \$1.0 \$2.0 \$2.0 \$2.0	002       5         003       5         004       5         000       5         001       5         002       5	0.00 0.00 0.00 0.00 0.00	5.41 5.84 5.89 4.31 4.98 5.00	6.807 6.714 6.621 7.041 6.828 6.648	0.089 0.110 0.162 0.045 0.108 0.147		0.0 0.0 0.0 0.0 0.0	0.0000000000000000000000000000000000000	.0	0.95 1.26 1.41 1.03 2.01	67.4 89.0 99.8 73.1	14.9 21.9 6.1 14.6 19.9	
	S1.0 S1.0 S1.0 S2.0 S2.0 S2.0	002       5         003       5         004       5         000       5         001       5         002       5	0.00 0.00 0.00 0.00 0.00 0.00	5.41 5.84 5.89 4.31 4.98 5.00	6.807 6.714 6.621 7.041 6.828 6.648	0.089 0.110 0.162 0.045 0.108 0.147	0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0		.0 .0 .0 .0	0.95 1.26 1.41 1.03 2.01	67.4 89.0 99.8 73.1 142.0	14.9 21.9 6.1 14.6 19.9	
	\$1.0 \$1.0 \$1.0 \$2.0 \$2.0 \$2.0 \$2.0 \$1.0	002         5           003         5           004         5           000         5           001         5           002         5           003         5	0.00 0.00 0.00 0.00 0.00 0.00 0.00	5.41 5.84 5.89 4.31 4.98 5.00 6.46	6.807 6.714 6.621 7.041 6.828 6.648 6.600	0.089 0.110 0.162 0.045 0.108 0.147 0.322	0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0		.0 .0 .0 .0 .0	0.95 1.26 1.41 1.03 2.01	67.4 89.0 99.8 73.1 142.0 67.5	14.9 21.9 6.1 14.6 19.9 43.5	
	S1.0 S1.0 S2.0 S2.0 S2.0 S1.0 S1.0 S1.0	002         5           003         5           004         5           000         5           001         5           002         5           003         5           004         5           005         5           006         5	0.00 0.00 0.00 0.00 0.00 0.00 0.00	5.41 5.84 5.89 4.31 4.98 5.00 6.46 6.97	6.807 6.714 6.621 7.041 6.828 6.648 6.600 6.477	0.089 0.110 0.162 0.045 0.108 0.147 0.322 0.358	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0		. 0 . 0 . 0 . 0 . 0	0.95 1.26 1.41 1.03 2.01 0.96 1.00	67.4 89.0 99.8 73.1 142.0 67.5 70.8	14.9 21.9 6.1 14.6 19.9 43.5 48.4	
	S1.0 S1.0 S2.0 S2.0 S2.0 S1.0 S1.0 S1.0	002     5       003     5       004     5       000     5       001     5       002     5       005     5       006     5	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0	5.41 5.84 5.89 4.31 4.98 5.00 6.46 6.97	6.807 6.714 6.621 7.041 6.828 6.648 6.600 6.477	0.089 0.110 0.162 0.045 0.108 0.147 0.322 0.358		0.0 0.0 0.0 0.0 0.0 0.0 0.0		.0 .0 .0 .0 .0	0.95 1.26 1.41 1.03 2.01 0.96 1.00	67.4 89.0 99.8 73.1 142.0 67.5 70.8	14.9 21.9 6.1 14.6 19.9 43.5 48.4	

RPS (Galway)													Page 3
yrr Building, IDA Business	& Tech	nology	Parl	ĸ									
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Date 07/02/2022 17:26						Designe	ed by MGB						
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Innovyze						Networl	< 2020.1						I
					Networ	k Desi	gn Table :	Eor St	lorm				
	DN	Ionath	<b>F</b> -11	Slope	TArea		Pago	ŀ	גדת חעים	Soat	ion Turn	a Auto	
	PN	(m)	raii (m)	(1:X)	(ha)	(mins)	Flow (1/s)	(mm)	SECT (mm	)	топ тур	Design	
		(,	()	( ,	()	(,		(/	,	•			
	S3.001	16.590	0.069	9 240.4	1 0.010	0.00	0.0	0.600	o 30	0 Pipe	/Condui	t 💣	
	53.002	19.932	0.08.	3 240.1	0.021	0.00	0.0	0.600	0 30	0 Pipe	e/Condui	t 😈	
	S1.007	17.876	0.074	4 241.1	0.010	0.00	0.0	0.600	o 30	0 Pipe	/Condui	t 💣	
	S4.000	38.532	0.47	5 81.1	0.029	4.00	0.0	0.600	0 30	0 Pipe	/Conduit	- <u>a</u>	
	S4.001	4.166	0.120	34.7	0.035	0.00	0.0	0.600	o 30	0 Pipe	/Condui	t 🗗	
												_	
	S5.000	15.181	0.09	7 156.5	5 0.006	4.00	0.0	0.600	o <u>30</u>	0 Pipe	/Conduit	t 👸	
	53.001	J.J0Z	0.02.	) 242.1	0.023	0.00	0.0	0.000	0 50	o ribe	:/ CONQUE		
	S4.002	38.358	0.780	49.2	2 0.000	0.00	0.0	0.600	o 30	0 Pipe	/Condui	t 💣	
	C1 000	2 401	0 011		1 0 0 2 0	0 00	0.0	0 0 0 0	- 20		Conduid		
	51.008	3.491	0.01:	> 232.1	0.029	0.00	0.0	0.600	0 30	0 Pipe	e/Condui	c 🛄	
					N	etwork	Results T	able					
	PI	N Ra	in	т.С.	us/IL S	I.Area	Σ Base	Foul	Add Flow	Vel	Сар	Flow	
		(mm	/hr)	(mins)	(m)	(ha)	Flow (1/s)	(1/s)	(1/s)	(m/s)	(1/s)	(1/s)	
	c3 (	0.01 5											
		JUI 5	0.00	4.51	6.904	0.022	0.0	0.0	0.0	1.01	71.4	2.9	
	s3.0	)01 5 )02 5	0.00	4.51 4.84	6.904 6.835	0.022 0.043	0.0	0.0	0.0	1.01 1.01	71.4 71.4	2.9 5.8	
	s3.(	001 5	0.00	4.51	6.904 6.835	0.022	0.0	0.0	0.0	1.01	71.4 71.4	2.9 5.8	
	s3.0 s1.0	001 5 002 5 007 5	0.00	4.51 4.84 7.26	6.904 6.835 6.352	0.022 0.043 0.410	0.0 0.0 0.0	0.0 0.0	0.0 0.0	1.01 1.01 1.01	71.4 71.4 71.3	2.9 5.8 55.6	
	s3.0 s1.0 s4.0	001     51       002     51       007     51       0007     51       0000     51	0.00 0.00 0.00	4.51 4.84 7.26 4.37	6.904 6.835 6.352 8.181	0.022 0.043 0.410 0.029	0.0 0.0 0.0	0.0 0.0 0.0	0.0 0.0 0.0	1.01 1.01 1.01 1.75	71.4 71.4 71.3 123.5	2.9 5.8 55.6 3.9	
	s3.0 s3.0 s1.0 s4.0 s4.0	001     51       002     51       007     51       000     51       000     51       000     51       000     51       000     51	0.00 0.00 0.00 0.00	4.51 4.84 7.26 4.37 4.39	6.904 6.835 6.352 8.181 7.706	0.022 0.043 0.410 0.029 0.063	0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0	1.01 1.01 1.01 1.75 2.68	71.4 71.4 71.3 123.5 189.3	2.9 5.8 55.6 3.9 8.5	
	S3.0 S3.0 S1.0 S4.0 S4.0	JOI         50           JOZ         50           JOO         50	0.00	4.51 4.84 7.26 4.37 4.39 4.20	6.904 6.835 6.352 8.181 7.706 7.706	0.022 0.043 0.410 0.029 0.063	0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0	1.01 1.01 1.01 1.75 2.68	71.4 71.4 71.3 123.5 189.3 88 7	2.9 5.8 55.6 3.9 8.5	
	s3.( s3.( s4.( s4.( s4.( s5.( s5.(	J01         5           J02         5           J07         5           J000         5           J01         5	0.00 0.00 0.00 0.00 0.00 0.00	4.51 4.84 7.26 4.37 4.39 4.20 4.29	6.904 6.835 6.352 8.181 7.706 7.706 7.609	0.022 0.043 0.410 0.029 0.063 0.006 0.029	0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0	1.01 1.01 1.01 1.75 2.68 1.25 1.00	71.4 71.4 71.3 123.5 189.3 88.7 71.0	2.9 5.8 55.6 3.9 8.5 0.8 3.9	
	s3.( s3.( s4.( s4.( s5.( s5.(	J01         5           J02         5           J007         5           J000         5           J01         5           J000         5           J000         5           J000         5           J001         5           J001         5	0.00 0.00 0.00 0.00 0.00 0.00	4.51 4.84 7.26 4.37 4.39 4.20 4.29	6.904 6.835 6.352 8.181 7.706 7.706 7.609	0.022 0.043 0.410 0.029 0.063 0.006 0.029	0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0	1.01 1.01 1.01 1.75 2.68 1.25 1.00	71.4 71.4 71.3 123.5 189.3 88.7 71.0	2.9 5.8 55.6 3.9 8.5 0.8 3.9	
	s3.( s3.( s4.( s4.( s5.( s5.( s5.( s4.(	J01         5           J02         5           J007         5           J000         5           J001         5           J001         5           J000         5           J001         5           J001         5           J001         5           J001         5           J001         5           J001         5	0.00 0.00 0.00 0.00 0.00 0.00 0.00	4.51 4.84 7.26 4.37 4.39 4.20 4.29 4.68	6.904 6.835 6.352 8.181 7.706 7.706 7.609 7.586	0.022 0.043 0.410 0.029 0.063 0.006 0.029 0.092	0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0	1.01 1.01 1.01 1.75 2.68 1.25 1.00 2.25	71.4 71.3 123.5 189.3 88.7 71.0 158.9	2.9 5.8 55.6 3.9 8.5 0.8 3.9 12.5	
	s3.( s3.( s4.( s4.( s5.( s5.( s4.( s5.( s4.( s1.()	J01     50       J02     50       J007     50       J000     50       J001     50       J000     50       J001     50       J002     50       J002     50       J002     50       J003     50	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0	4.51 4.84 7.26 4.37 4.39 4.20 4.29 4.68 7.32	6.904 6.835 6.352 8.181 7.706 7.706 7.609 7.586 6.278	0.022 0.043 0.410 0.029 0.063 0.006 0.029 0.092 0.092	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0	1.01 1.01 1.01 1.75 2.68 1.25 1.00 2.25	71.4 71.3 123.5 189.3 88.7 71.0 158.9 72.5	2.9 5.8 55.6 3.9 8.5 0.8 3.9 12.5 72.0	

RPS (Galway)													Page 4
Lyrr Building, IDA Business & Techn	ology Pa	rk											
Mervue													
Galway, Ireland													Micro
Date 07/02/2022 17:26				Designe	ed by M	IGB							Dcainago
File SHB3-FIN-CS-RPS-CA-0001.MDX				Checked	d by DK								Diamage
Innovyze				Networł	c 2020.	1							
			Networ	rk Desi	gn Tabl	le f	or St	orm					
PN 3	Length Fal	.l Slope	I.Area	T.E.	Base		k	HYD	DIA	Sect	ion Tvr	e Auto	
	(m) (m	) (1:X)	(ha)	(mins)	Flow (1	/s)	(mm)	SECT	(mm)			Design	
S1 009	3 491 0 0	15 232 7	0 000	0 00		0 0	0 600	0	300	Pine	/Condui	+ 🚨	
s1.009 S1.010	8.871 0.0	38 233.4	0.000	0.00		0.0	0.600	0	300	Pipe,	/Condui	t 🗗	
S1.011	6.842 0.0	61 112.2	0.000	0.00		0.0	0.600	0	300	Pipe,	/Condui	t 🗗	
			NT		Decult	а <b>Т</b> а	- h l -						
			IN	etwork	Result	S Ic	able						
PN	Rain	T.C.	US/IL Σ	I.Area	Σ Base	e	Foul	Add F	low	Vel	Cap	Flow	
	(mm/hr)	(mins)	(m)	(ha)	Flow (1	/s)	(l/s)	(1/s	5)	(m/s)	(1/s)	(1/s)	
S1.00	09 50.00	7.38	6.163	0.532	(	0.0	0.0		0.0	1.03	72.5	72.0	
S1.01	10 50.00	7.52	6.148	0.532	(	0.0	0.0		0.0	1.02	72.4	72.0	
S1.01	11 50.00	7.60	6.110	0.532	(	0.0	0.0		0.0	1.48	104.9	72.0	

SS & Te	echnol	ogy Park									
01 MDY											
ע 10											
01 MDY	$a_{1}a_{2}a_{3}a_{4}a_{5}a_{4}a_{5}a_{5}a_{5}a_{5}a_{5}a_{5}a_{5}a_{5$										Mirro
01 MDY				Designe	ed by MGB						Drainar
OT . DDV				Checked	l by DK						
				Network		ł.					
			Manh	ole Sch	nedules fo	or Storm					
мн	MH	МН	МН		Pipe Out			Pipes In			
CL (m)	Depth	Connection	Diam.,L*W	N PN	Invert	Diameter	PN	Invert	Diameter	Backdrop	
	(m)		(mm)		Level (m)	(mm)		Level (m)	(mm)	(mm)	
8.375	1.194	Open Manhole	1200	) S1.000	7.181	300					
8.250	1.302	Open Manhole	1200	S1.001	6.948	300	S1.000	6.948	300		
8.000	1.193	Open Manhole	1200	) S1.002	6.807	300	S1.001	6.807	300		
8.025	1.311	Open Manhole	1200	) S1.003	6.714	300	S1.002	6.714	300		
8.025	1.404	Open Manhole	1200	S1.004	6.621	300	S1.003	6.621	300		
8.010	0.969	Open Manhole	1200	s2.000	7.041	300					
8.820	1.992	Open Manhole	1200	S2.001	6.828	300	S2.000	6.828	300		
8.025	1.377	Open Manhole	1200	s2.002	6.648	300	S2.001	6.648	300		
8.025	1.425	Open Manhole	1200	S1.005	6.600	300	S1.004	6.600	300		
							S2.002	6.600	300		
8.150	1.673	Open Manhole	1200	S1.006	6.477	300	S1.005	6.477	300		
8.200	1.194	Open Manhole	1200	S3.000	7.006	300					
8.125	1.221	Open Manhole	1200	s3.001	6.904	300	S3.000	6.904	300		
8.125	1.290	Open Manhole	1200	s3.002	6.835	300	s3.001	6.835	300		
8.000	1.648	Open Manhole	1200	s1.007	6.352	300	S1.006	6.352	300		
							s3.002	6.752	300	400	
9.300	1.119	Open Manhole	1200	s4.000	8.181	300					
8.825	1.119	Open Manhole	1200	s4.001	7.706	300	\$4.000	7.706	300		
8.825	1.119	Open Manhole	1200	s5.000	7.706	300					
8.825	1.216	Open Manhole	1200	s5.001	7.609	300	s5.000	7.609	300		
8.825	1.239	Open Manhole	1200	s4.002	7.586	300	\$4.001	7.586	300		
		-					S5.001	7.586	300		
8.500	2.222	Open Manhole	1200	s1.008	6.278	300	s1.007	6.278	300		
							S4.002	6.806	300	528	
8.500	2.337	Open Manhole	1200	51.009	6,163	300	\$1.008	6.263	300	100	
	,		1200		0.100	300		5.205	500	100	
	<ul> <li>MH CL (m)</li> <li>8.375 8.250 8.000</li> <li>8.000</li> <li>8.025</li> <li>8.025</li> <li>8.025</li> <li>8.025</li> <li>8.025</li> <li>8.150</li> <li>8.125</li> <li>8.125</li></ul>	MH CL (m)         MH Depth (m)           8.375         1.194           8.250         1.302           8.000         1.193           8.025         1.311           8.025         1.311           8.025         1.404           8.025         1.404           8.025         1.404           8.025         1.425           8.025         1.425           8.025         1.425           8.025         1.425           8.025         1.425           8.025         1.421           8.025         1.221           8.125         1.220           8.125         1.290           8.000         1.648           9.300         1.119           8.825         1.119           8.825         1.216           8.825         1.239           8.825         1.239           8.500         2.222           8.500         2.337	MH CL (m)         MH Depth (m)         MH Connection           8.375         1.194         Open Manhole           8.375         1.302         Open Manhole           8.250         1.302         Open Manhole           8.000         1.193         Open Manhole           8.000         1.193         Open Manhole           8.025         1.311         Open Manhole           8.025         1.404         Open Manhole           8.025         1.425         Open Manhole           8.025         1.425         Open Manhole           8.125         1.221         Open Manhole           8.125         1.221         Open Manhole           8.125         1.220         Open Manhole           8.125         1.219         Open Manhole           8.825         1.119         Open Manhole           8.825	MAIN         MH CL (m)         MH Depth (m)         MH Connection         MH Diam., L*W (mm)           8.375         1.194         Open Manhole         1200           8.375         1.194         Open Manhole         1200           8.375         1.302         Open Manhole         1200           8.000         1.193         Open Manhole         1200           8.000         1.193         Open Manhole         1200           8.001         0.969         Open Manhole         1200           8.025         1.404         Open Manhole         1200           8.025         1.425         Open Manhole         1200           8.820         1.992         Open Manhole         1200           8.025         1.425         Open Manhole         1200           8.820         1.992         Open Manhole         1200           8.150         1.673         Open Manhole         1200           8.125         1.220         Open Manhole         1200 <tr< td=""><td>MANNOLE         Scr           MH CL (m)         MH Depth (m)         MH Connection         MH Diam., L*W (mm)         PN           8.375         1.194         Open Manhole         1200         \$1.000           8.375         1.194         Open Manhole         1200         \$1.000           8.250         1.302         Open Manhole         1200         \$1.000           8.000         1.193         Open Manhole         1200         \$1.002           8.025         1.311         Open Manhole         1200         \$1.004           8.025         1.311         Open Manhole         1200         \$2.002           8.025         1.311         Open Manhole         1200         \$2.001           8.025         1.317         Open Manhole         1200         \$2.002           8.820         1.992         Open Manhole         1200         \$2.002           8.025         1.377         Open Manhole         1200         \$1.006           8.200         1.194         Open Manhole         1200         \$3.000           8.150         1.673         Open Manhole         1200         \$3.001           8.125         1.290         Open Manhole         1200         \$3.00</td><td>MH         MH         MH         Connection         MH         MH         Pipe Out           2         8.375         1.194         Open Manhole         1200         \$1.000         7.181           2         8.375         1.302         Open Manhole         1200         \$1.001         6.948           3         8.000         1.193         Open Manhole         1200         \$1.002         6.807           4         8.025         1.311         Open Manhole         1200         \$1.003         6.714           5         8.010         0.969         Open Manhole         1200         \$2.000         7.041           4         8.025         1.404         Open Manhole         1200         \$2.001         6.828           8.010         0.969         Open Manhole         1200         \$2.001         6.828           8.025         1.425         Open Manhole         1200         \$2.002         6.648           8.025         1.425         Open Manhole         1200         \$1.005         6.600           7         8.150         1.673         Open Manhole         1200         \$1.007         6.352           8.125         1.220         Open Manhole         1</td><td>MANNOLE         Schedules         for         Storm           MH         MH         Connection         MH         Diam., L*W (mm)         PN         Pipe Out Level (m)         Diameter (mm)           8.375         1.194         Open Manhole         1200         \$1.000         7.181         300           8.375         1.302         Open Manhole         1200         \$1.001         6.948         300           8.000         1.193         Open Manhole         1200         \$1.002         6.807         300           8.025         1.311         Open Manhole         1200         \$1.004         6.621         300           8.025         1.404         Open Manhole         1200         \$2.000         7.041         300           8.025         1.425         Open Manhole         1200         \$2.002         6.648         300           8.025         1.425         Open Manhole         1200         \$1.005         6.600         300           8.025         1.425         Open Manhole         1200         \$1.006         6.477         300           8.150         1.673         Open Manhole         1200         \$3.002         6.835         300           8.125</td><td>Mannole         Schedules         For         Storm           MH         MH         Depth (m)         MH         Connection         Diam., L*W (mm)         PN         Pipe Out Level (m)         Diameter (mm)         PN           8.375         1.194         Open Manhole         1200         \$1.000         7.181         300           8.250         1.302         Open Manhole         1200         \$1.001         6.948         300         \$1.001           8.000         1.193         Open Manhole         1200         \$1.002         6.807         300         \$1.002           8.001         1.93         Open Manhole         1200         \$1.004         6.621         300         \$1.002           8.025         1.311         Open Manhole         1200         \$2.000         7.041         300         \$1.002           8.025         1.404         Open Manhole         1200         \$2.001         6.828         300         \$2.000           8.025         1.377         Open Manhole         1200         \$1.005         6.600         300         \$1.005           8.025         1.425         Open Manhole         1200         \$3.001         6.904         300         \$3.001</td><td>MH         MH         MH         CL (m)         Depth (m)         MH         Diam., L*W         PN         Pipe Out Invert         Diameter Level (m)         PN         Pipes In Invert           8.375         1.194         Open Manhole         1200         \$1.000         7.181         300           2         8.250         1.302         Open Manhole         1200         \$1.001         6.948         300         \$1.001         6.948           8         0.001         1.93         Open Manhole         1200         \$1.002         6.807         300         \$1.002         6.144           8.025         1.410         Open Manhole         1200         \$1.004         6.621         300         \$1.002         6.714           8.025         1.404         Open Manhole         1200         \$2.000         7.041         300         \$1.003         6.621           8.802         1.992         Open Manhole         1200         \$2.001         6.428         300         \$2.000         6.648           8.025         1.425         Open Manhole         1200         \$1.005         6.600         300         \$1.004         6.600           8.125         1.221         Open Manhole         1200</td><td>MH         MH         MH         MH         Pipe Out (mm)         Invert         Diameter Level (m)         Pipes In (mm)         Pipes In Level (m)         Pipes In (mm)           8.375         1.194         Open Manhole         1200         \$1.000         6.948         300         \$1.001         6.948         300           8.000         1.193         Open Manhole         1200         \$1.002         6.807         300         \$1.002         6.714         300           8.025         1.301         Open Manhole         1200         \$2.000         7.041         300         \$1.003         6.621         300           8.025         1.425         Open Manhole         1200         \$2.002         6.648         300         \$2.002         6.600         300         \$1.004         6.600         300           8.025         1.425         Open Manhole         1200         \$1.006         &lt;</td><td>MR         MH         MH         Diam., L*W         PN         Pipe Out Invert         Diameter (mm)         PN         Pipes In Level (m)         Diameter (mm)         PN         Pipes In Level (m)         Diameter (mm)         PN         Pipes In Level (m)         Diameter (mm)         Backdrop (mm)           8.375         1.194         Open Manhole         1200         \$1.000         7.181         300         1.000         6.948         300         \$1.001         6.807         300         \$1.001         6.807         300         \$1.002         6.114         300         \$1.002         6.114         300         \$1.002         6.114         300         \$1.002         6.114         300         \$1.002         6.114         300         \$1.002         6.114         300         \$1.002         6.114         300         \$1.002         6.114         300         \$1.002         6.114         300         \$1.002         6.114         300         \$1.002         6.121         300         \$1.002         6.114         300         \$1.002         6.621         300         \$1.003         6.621         300         \$1.004         6.621         300         \$1.005         6.600         300         \$1.004         6.600         300         \$1.005</td></tr<>	MANNOLE         Scr           MH CL (m)         MH Depth (m)         MH Connection         MH Diam., L*W (mm)         PN           8.375         1.194         Open Manhole         1200         \$1.000           8.375         1.194         Open Manhole         1200         \$1.000           8.250         1.302         Open Manhole         1200         \$1.000           8.000         1.193         Open Manhole         1200         \$1.002           8.025         1.311         Open Manhole         1200         \$1.004           8.025         1.311         Open Manhole         1200         \$2.002           8.025         1.311         Open Manhole         1200         \$2.001           8.025         1.317         Open Manhole         1200         \$2.002           8.820         1.992         Open Manhole         1200         \$2.002           8.025         1.377         Open Manhole         1200         \$1.006           8.200         1.194         Open Manhole         1200         \$3.000           8.150         1.673         Open Manhole         1200         \$3.001           8.125         1.290         Open Manhole         1200         \$3.00	MH         MH         MH         Connection         MH         MH         Pipe Out           2         8.375         1.194         Open Manhole         1200         \$1.000         7.181           2         8.375         1.302         Open Manhole         1200         \$1.001         6.948           3         8.000         1.193         Open Manhole         1200         \$1.002         6.807           4         8.025         1.311         Open Manhole         1200         \$1.003         6.714           5         8.010         0.969         Open Manhole         1200         \$2.000         7.041           4         8.025         1.404         Open Manhole         1200         \$2.001         6.828           8.010         0.969         Open Manhole         1200         \$2.001         6.828           8.025         1.425         Open Manhole         1200         \$2.002         6.648           8.025         1.425         Open Manhole         1200         \$1.005         6.600           7         8.150         1.673         Open Manhole         1200         \$1.007         6.352           8.125         1.220         Open Manhole         1	MANNOLE         Schedules         for         Storm           MH         MH         Connection         MH         Diam., L*W (mm)         PN         Pipe Out Level (m)         Diameter (mm)           8.375         1.194         Open Manhole         1200         \$1.000         7.181         300           8.375         1.302         Open Manhole         1200         \$1.001         6.948         300           8.000         1.193         Open Manhole         1200         \$1.002         6.807         300           8.025         1.311         Open Manhole         1200         \$1.004         6.621         300           8.025         1.404         Open Manhole         1200         \$2.000         7.041         300           8.025         1.425         Open Manhole         1200         \$2.002         6.648         300           8.025         1.425         Open Manhole         1200         \$1.005         6.600         300           8.025         1.425         Open Manhole         1200         \$1.006         6.477         300           8.150         1.673         Open Manhole         1200         \$3.002         6.835         300           8.125	Mannole         Schedules         For         Storm           MH         MH         Depth (m)         MH         Connection         Diam., L*W (mm)         PN         Pipe Out Level (m)         Diameter (mm)         PN           8.375         1.194         Open Manhole         1200         \$1.000         7.181         300           8.250         1.302         Open Manhole         1200         \$1.001         6.948         300         \$1.001           8.000         1.193         Open Manhole         1200         \$1.002         6.807         300         \$1.002           8.001         1.93         Open Manhole         1200         \$1.004         6.621         300         \$1.002           8.025         1.311         Open Manhole         1200         \$2.000         7.041         300         \$1.002           8.025         1.404         Open Manhole         1200         \$2.001         6.828         300         \$2.000           8.025         1.377         Open Manhole         1200         \$1.005         6.600         300         \$1.005           8.025         1.425         Open Manhole         1200         \$3.001         6.904         300         \$3.001	MH         MH         MH         CL (m)         Depth (m)         MH         Diam., L*W         PN         Pipe Out Invert         Diameter Level (m)         PN         Pipes In Invert           8.375         1.194         Open Manhole         1200         \$1.000         7.181         300           2         8.250         1.302         Open Manhole         1200         \$1.001         6.948         300         \$1.001         6.948           8         0.001         1.93         Open Manhole         1200         \$1.002         6.807         300         \$1.002         6.144           8.025         1.410         Open Manhole         1200         \$1.004         6.621         300         \$1.002         6.714           8.025         1.404         Open Manhole         1200         \$2.000         7.041         300         \$1.003         6.621           8.802         1.992         Open Manhole         1200         \$2.001         6.428         300         \$2.000         6.648           8.025         1.425         Open Manhole         1200         \$1.005         6.600         300         \$1.004         6.600           8.125         1.221         Open Manhole         1200	MH         MH         MH         MH         Pipe Out (mm)         Invert         Diameter Level (m)         Pipes In (mm)         Pipes In Level (m)         Pipes In (mm)           8.375         1.194         Open Manhole         1200         \$1.000         6.948         300         \$1.001         6.948         300           8.000         1.193         Open Manhole         1200         \$1.002         6.807         300         \$1.002         6.714         300           8.025         1.301         Open Manhole         1200         \$2.000         7.041         300         \$1.003         6.621         300           8.025         1.425         Open Manhole         1200         \$2.002         6.648         300         \$2.002         6.600         300         \$1.004         6.600         300           8.025         1.425         Open Manhole         1200         \$1.006         <	MR         MH         MH         Diam., L*W         PN         Pipe Out Invert         Diameter (mm)         PN         Pipes In Level (m)         Diameter (mm)         PN         Pipes In Level (m)         Diameter (mm)         PN         Pipes In Level (m)         Diameter (mm)         Backdrop (mm)           8.375         1.194         Open Manhole         1200         \$1.000         7.181         300         1.000         6.948         300         \$1.001         6.807         300         \$1.001         6.807         300         \$1.002         6.114         300         \$1.002         6.114         300         \$1.002         6.114         300         \$1.002         6.114         300         \$1.002         6.114         300         \$1.002         6.114         300         \$1.002         6.114         300         \$1.002         6.114         300         \$1.002         6.114         300         \$1.002         6.114         300         \$1.002         6.121         300         \$1.002         6.114         300         \$1.002         6.621         300         \$1.003         6.621         300         \$1.004         6.621         300         \$1.005         6.600         300         \$1.004         6.600         300         \$1.005

RPS (Galway)													Page 6
Lyrr Building, IDA	A Business	& Tec	chnolo	gy Park									
Mervue													
Galway, Ireland													Mirro
Date 07/02/2022 17:	:26				De	signed		Dcainago					
File SHB3-FIN-CS-RE	PS-CA-0001	.MDX			Ch	ecked	by DK						Drainiage
Innovyze					Ne	twork	2020.1						
					Manhol	e Sche	dules fo	r Storm					
					<u>Hanno r</u>	<u>e bene</u>	dures re	<u>i beorm</u>					
	MH	МН	MH	МН	мн		Pipe Out			Pipes In			
	Name	CL (m)	Depth	Connection	Diam.,L*W	PN	Invert	Diameter	PN	Invert	Diameter	Backdrop	
			(m)		(mm)		Level (m	) (mm)		Level (m)	(mm)	(mm)	
	SINF IN	8 500	2 352	Open Manhole	1200	S1 010	6 14	8 300	S1 009	6 148	300		
	SINF	8.500	2.390	Open Manhole	1200	S1.011	6.11	0 300	S1.010	6,110	300		
	S	8.000	1.951	Open Manhole	0	01.011	OUTFAL	L	s1.011	6.049	300		
			м	J Manhala	Manholo	Tato	reaction	Intorcoctic	on Manh		+		
			Nar	ne Easting	Northine	g Ea	sting	Northing	Acce	ess (North	1)		
				(m)	(m)	-	(m)	(m)					
				s01 567301.39	6 836741.3	48 56	7301.396	836741.34	48 Requi	ired			
				502 567291 86	6 836779 1	08 56	7291 866	836779 10	)8 Reaut	ired			
				502 507251.00	0 000770.1	00 00	/291.000	000770.10	Jo nequi				
										1			
				\$03 567284.01	4 836810.5	05 56	7284.014	836810.50	)5 Requi	ired	_		
				S04 567305.04	7 836815.3	59 56	7305.047	836815.35	59 Requi	ired			
				\$05 567329.34	5 836821.3	99 56	7329.345	836821.39	99 Requi	ired			
					0 000011.0		.010	000011.00	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				
				S10 567398.33	9 836834.1	96 56	/398.339	836834.19	96 Requi	ired			
				S11 567371.96	5 836833.4	34 56	7371.965	836833.43	34 Requi	ired			
											-		
					 ⊜1	982-20	20 Innor						

RPS (Galway)								Page 7
Lyrr Building, IDA Business & Techno	ology i	Park						
Mervue								
Galway, Ireland								Micco
Date 07/02/2022 17:26			Des	igned by MGB				
File SHB3-FIN-CS-RPS-CA-0001.MDX			Che	cked by DK				Diamaye
Innovyze			Net	work 2020.1				I
			N 1 1		<u></u>			
			Manhole	Schedules I	or Storm			
	MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)	
	S12	567331.583	836825.133	1 567331.583	836825.131	Required		
	S06	567328.693	836824.544	4 567328.693	836824.544	Required		
	S07	567321.166	836856.654	4 567321.166	836856.654	Required	l'	
	S13	567288.734	836850.31	7 567288.734	836850.317	Required	ľ,	
	S14	567284.604	836866.853	3 567284.604	836866.853	Required	1	
	S15	567295.590	836879.285	5 567295.590	836879.285	Required		
	S08	567314.265	836886.253	3 567314.265	836886.253	Required		
	S16	567373.101	836864.309	9 567373.101	836864.309	Required		
	S17	567371.251	836902.79	7 567371.251	836902.797	Required	<b>_</b>	
	S19	567379.613	836920.440	567379.613	836920.440	Required	1 •	
	S20	567372.381	836907.092	2 567372.381	836907.092	Required		
			©19	82-2020 Inno	vvze		-	

RPS (Galway)							Page 8
Lyrr Building, IDA Business & Technology	Park						
Mervue							
Galway, Ireland							Micro
Date 07/02/2022 17:26		Desi	gned by MGE	5			
File SHB3-FIN-CS-RPS-CA-0001.MDX		Chec	cked by DK				Diamage
Innovyze		Netw	ork 2020.1				·
		Manhole	Schedules f	or Storm			
MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)	
S18	3 567367.444	836904.489	567367.444	836904.489	Required		
S05	9 567330.966	836892.625	567330.966	836892.625	Required	- de-	
SPI	567330.202	836896.032	567330.202	836896.032	Required		
SINF IN	1 567329.437	836899.438	567329.437	836899.438	Required		
SINE	567334.341	836906.830	567334.341	836906.830	Required	a de la companya de l	
S	567338.449	836912.301			No Entry		
		@198					

RPS (Galway)								Page 9
Lyrr Building, IDA Business & Tec	hnolog	gy Park						
Mervue								
Galway. Ireland								
Data 07/02/2022 17:26			Designed by	MCD				 MICIO
Date 07/02/2022 17:20			Designed by	МGВ				Drainage
File SHB3-FIN-CS-RPS-CA-0001.MDX			Checked by I	DK				 brainage
Innovyze			Network 2020	0.1				
			Area Summary	for	Storm			
	Pipe	PIMP	PIMP	PIMP	Gross	Imp.	Pipe Total	
	Number	Туре	Name	(%)	Area (ha)	Area (ha)	(ha)	
	1.000	Classification	Permeable Pavement	60	0.009	0.006	0.006	
		Classification	pavement	75	0.019	0.014	0.020	
		Classification	Pitched Roof	90	0.018	0.016	0.036	
	1.001	Classification	Permeable Pavement	60	0.008	0.005	0.005	
		Classification	pavement	75	0.028	0.021	0.025	
		Classification	Pitched Roof	90	0.011	0.010	0.035	
	1.002	Classification	pavement	75	0.020	0.015	0.015	
		Classification	pavement	75	0.003	0.002	0.017	
	1.003	Classification	Pitched Roof	90	0.017	0.015	0.015	
		Classification	Pitched Roof	90	0.004	0.003	0.019	
		Classification	Pitched Roof	90	0.004	0.003	0.022	
	1.004	Classification	Permeable Pavement	60	0.027	0.016	0.016	
		Classification	Permeable Pavement	60	0.027	0.016	0.032	
		Classification	pavement	75	0.019	0.014	0.046	
		Classification	Pitched Roof	90	0.006	0.006	0.052	
	2.000	Classification	pavement	75	0.016	0.012	0.012	
		Classification	Permeable Pavement	60	0.023	0.014	0.026	
		Classification	Pitched Roof	90	0.014	0.013	0.039	
		Classification	Pitched Roof	90	0.007	0.006	0.045	
	2.001	Classification	Permeable Pavement	60	0.013	0.008	0.008	
		Classification	Permeable Pavement	60	0.008	0.005	0.013	
		Classification	pavement	75	0.007	0.005	0.018	
		Classification	pavement	75	0.023	0.017	0.035	
		Classification	Permeable Pavement	60	0.014	0.008	0.043	
		Classification	Pitched Roof	90	0.008	0.007	0.051	
		Classification	Pitched Roof	90	0.006	0.005	0.056	
		Classification	Pitched Roof	90	0.008	0.007	0.063	
	2.002	Classification	Permeable Pavement	60	0.029	0.018	0.018	
		Classification	Permeable Pavement	60	0.009	0.005	0.023	
		Classification	pavement	75	0.014	0.010	0.034	
		Classification	Pitched Roof	90	0.006	0.005	0.039	
	1.005	Classification	pavement	75	0.011	0.008	0.008	
		Classification	pavement	75	0.006	0.004	0.012	
	1.006	Classification	Permeable Pavement	60	0.012	0.007	0.007	
		Classification	pavement	75	0.019	0.014	0.022	
			©1982-2020 1	Innov	vvze			

RPS (Galway)							Page 10
Lyrr Building, IDA Business & Technol	ogy Park						
Mervue							
Galway, Ireland							Micco
$D_{ate} = 0.7/0.2/2022 + 17.26$		Designed by	MGB				
		Designed by	MGD				Drainage
File SHB3-FIN-CS-RPS-CA-0001.MDX		Checked by I	JK				
Innovyze		Network 2020	0.1				
		Area Summary	for	Storm			
Bin		DTMD	DTMD	Gross	Tmp	Pipe Total	
F 10		P IMP Namo	(%)	GIOSS	Imp. Aroa (ba)	/ba)	
Nulle	ат туре	Name	(3)	Area (IIa)	Area (IIa)	(IId)	
	Classification	Pitched Roof	90	0.008	0.007	0.029	
	Classification	Pitched Roof	90	0.008	0.007	0.036	
3.0	0 Classification	Pitched Roof	90	0.008	0.007	0.007	
	Classification	Permeable Pavement	60	0.008	0.005	0.012	
3.0	)1 Classification	Pitched Roof	90	0.005	0.005	0.005	
	Classification	Pitched Roof	90	0.005	0.005	0.010	
3.0	)2 Classification	Permeable Pavement	60	0.014	0.008	0.008	
	Classification	pavement	75	0.018	0.013	0.021	
1.0	)7 Classification	Permeable Pavement	60	0.005	0.003	0.003	
	Classification	pavement	75	0.009	0.007	0.010	
4.0	)0 Classification	Permeable Pavement	60	0.013	0.008	0.008	
	Classification	pavement	75	0.014	0.011	0.018	
	Classification	Pitched Roof	90	0.011	0.010	0.029	
4.0	)1 Classification	Permeable Pavement	60	0.021	0.012	0.012	
	Classification	pavement	75	0.018	0.014	0.026	
	Classification	Pitched Boof	90	0.010	0.009	0.035	
5.0	0 Classification	pavement	75	0 008	0 006	0,006	
5.0	)1 Classification	pavement	75	0.023	0.017	0.017	
	Classification	Pitched Roof	90	0.007	0.006	0.023	
4.0	)2 –	_	100	0.000	0.000	0.000	
1 0	)8 Classification	Pitched Boof	90	0 032	0 029	0 029	
1 0	)9 –		100	0.000	0.000	0 000	
1 0		_	100	0 000	0.000	0 000	
1.0		_	100	0.000	0.000	0.000	
1.0			100	Total	Total	Total	
				0 716	0 532	0 532	
				0.710	0.002	0.002	
	Free	Flowing Outfall	Deta	ils for S	Storm		
	Outfall	Outfall C. Level I	. Leve	el Min	D,L W		
	Pipe Number	Name (m)	(m)	I. Level (m)	1 (mm) (mm	)	
	S1.011	S 8.000	6.04	49 6.000	0 0	0	
		©1982-2020 1	Innov	vyze			

RPS (Galway)			Page 11
Lyrr Building, IDA Business & Technology Park			
Mervue			
Galway, Ireland			Mirro
Date 07/02/2022 17:26	Designed by MGB		Drainage
File SHB3-FIN-CS-RPS-CA-0001.MDX	Checked by DK		bidinage
Innovyze	Network 2020.1		
<u>S</u>	Simulation Criteria for Storm		
Volumetric Runoff Coeff 0.750 Manhole Areal Reduction Factor 1.000 Foul Hot Start (mins) 0 Additiona Hot Start Level (mm) 0 MADD Number of Input Hydrographs 0 Number of Online Controls 0	Headloss Coeff (Global) 0.500 Sewage per hectare (l/s) 0.000 Flow per 1 Flow - % of Total Flow 0.000 Factor * 10m <sup>3</sup> /ha Storage 2.000 Number of Offline Controls 0 Number of Number of Storage Structures 1 Number of	Inlet Coeffiecient 0.800 Person per Day (l/per/day) 0.000 Run Time (mins) 60 Output Interval (mins) 1 of Time/Area Diagrams 0 of Real Time Controls 0	
	Synthetic Rainfall Details		
Rainfall Model Return Period (years) Region Scotlan	FSR M5-60 (mm) 17.400 100 Ratio R 0.300 nd and Ireland Profile Type Summer Storm	Cv (Summer) 0.750 Cv (Winter) 0.840 Duration (mins) 30	

RPS (Galway)		Page 12
Lyrr Building, IDA Business & Technology Park		
Mervue		
Galway, Ireland		Mirro
Date 07/02/2022 17:26	Designed by MGB	
File SHB3-FIN-CS-RPS-CA-0001.MDX	Checked by DK	Diamage
Innovyze	Network 2020.1	
Stor	age Structures for Storm	
Infiltration	Basin Manhole: SINF, DS/PN: S1.011	
Invert Level (m) Infiltration Coefficient Base (m/hr) 0.	5.310 Infiltration Coefficient Side (m/hr) 0.13500 Porosity 0.95 13500 Safety Factor 2.0	
Depth (m) Area (m	2) Depth (m) Area (m <sup>2</sup> ) Depth (m) Area (m <sup>2</sup> )	
0.000 275	.0 0.800 275.0 0.801 0.0	
	©1982-2020 Innovyze	

RPS (Galway)											Page 13	
Lyrr Building, II	DA Business & Technology Par	k										٦
Mervue												
Galway, Ireland											Micco	
Date 07/02/2022 1	7:26		Desid	ned by	MGB							
File SHB3-FIN-CS-I	RPS-CA-0001.MDX		Check	ed by	DK						Drainage	-
Innovyze			Netwo	ork 202	0.1							-
	Summary of	Critical R	esults	s by Ma	ximum Lev	el (Ra	ink 1) fo	or Storm				
			<u> </u>		a							
	Areal Reduction Factor 1 000	Manhole Head	Simu Noss C	neff (Gl	<u>obal)</u> 0 500	n	MADD Fact	tor * 10m³/ł	ha Storage	2 000		
	Hot Start (mins) 0	Foul Sewad	le per 1	hectare	(1/s) 0.000	0	ILIDD I GO	Inlet Coe	effiecient	0.800		
	Hot Start Level (mm) 0 A	Additional Flo	ow – %	of Total	Flow 0.000	0 Flow j	per Perso	n per Day (1	l/per/day)	0.000		
				6 0661	Control 1	0 Normali						
	Number of Input Hydro Number of Online Co	ographs U N optrols O Num	umber c ber of	Storage	structures	0 Numb	er of Tim	ne/Area Diag al Time Cont	rams U			
		511CI 015 0 1Vulu	DCI UI	bcorage	Derdeedres	1 IVUIIIL	VCI OI INCO		1015 0			
		2	Synthet	ic Rainf	all Details	5						
	Rainfall M	odel		FSR M	5-60 (mm) 1	7.100 C	Cv (Summer	.) 0.750				
	Ree	gion Scotland	and Ir	eland	Ratio R	0.300 C	Cv (Winter	c) 0.840				
	Margin for F	lood Risk War	ning (n	nm) 300.	0 DTS Statu	is ON	Inertia S	tatus OFF				
	5	Analysis	Timest	ep Fin	e DVD Statu	ıs OFF						
	Profile(s)							Summe	er and Winte	er		
	Duration(s) (mins)	15, 30, 60,	120,	180, 240	, 360, 480,	600, 7	720, 960,	1440, 2160,	2880, 432	0,		
								5760, 7200,	8640, 100	80		
	Return Period(s) (years)								1, 30, 1	00		
	Climate Change (%)								20, 20, .	20		
	- 6			Water	Surcharged	,			Half Drain	Pipe		
	S/MH	First (Y)	US/CL	Level	Depth	Flow /	Maximum	Discharge	Time	Flow	<b>6</b> + - +	
PN N	lame Event	F100d	(m)	(m)	(m)	Cap.	VOI (m <sup>3</sup> )	VOI (m <sup>3</sup> )	(mins)	(1/5)	Status	
S1.000	S01 15 minute 100 year Winter I+	20%	8.375	7.591	0.110	0.19	0.458	7.050		15.2	SURCHARGED	
S1.001	S02 15 minute 100 year Winter I+	20%	8.250	7.580	0.332	0.36	3.377	13.959		24.2	SURCHARGED	
\$1.002	S03 15 minute 100 year Winter I+	20%	8.000	7.560	0.454	0.42	3.049	17.226		26.8	SURCHARGED	
S1.003 S1.004	S04 15 minute 100 year Winter I+	205 202	8.025	7.540 7.515	0.52/	0.51	2.3/0	∠⊥.401 31 510		30.5	SUKCHAKGED	
S1.004	S10 15 minute 100 year Winter I+	20% 20%	8 010	7.515	0.393	0.07	2.091	SI.JIU 8 719		18 5	SURCHARGED	
\$2.000	S11 15 minute 100 year Winter I+	208	8 820	7 553	0.225	0.21	2 591	20 985		32 5	SURCHARGED	
S2.001	S12 15 minute 100 year Winter T+	20%	8.025	7.516	0.568	0.65	3.806	28.576		39.7	SURCHARGED	
S1 005	S06 15 minute 100 year Winter T+	20%	8.025	7.506	0 606	1 11	1 285	62 501		68 9	SURCHARGED	
S1.005	S07 15 minute 100 year Winter I+	20%	8.150	7.349	0.572	1.17	3.227	69.546		75.7	SURCHARGED	
	-											
			©1982	2-2020	Innovyze							

RPS (Galway)											F	Page 14
Lyrr Building,	IDA Bu	siness & Technology Park										
Mervue												
Galway, Ireland	ł											Micco
Date 07/02/2022	2 17:26			Design	ed by	MGB						
File SHB3-FIN-C	CS-RPS-C	CA-0001.MDX		Checke	d bv D	К						Digiligra
Innovyze				Networ	$\frac{1}{k}$ 2020	.1						
		Cummary of Cri	tigal De		hu Mau	imum Louro	1 (Dan	k 1) for	C+orm			
		Summary of Cfl	LICAL RE	suits .	by Max	Inum Leve.	I (Rafi	<u>K I) IOI</u>	SLOLI			
					Weter	Gunchenned				Nalf Drain	Dime	
			First (V		T.ovol	Depth	Flow /	Mavimum	Discharge	Time	Flow	
PN	Name	Event	Flood	(m)	(m)	(m)	Cap.	Vol (m <sup>3</sup> )	Vol (m <sup>3</sup> )	(mins)	(1/s)	Status
				. ,	. ,		• • •				( ) = )	
S3.000	S13	15 minute 100 year Winter I+20%		8.200	7.182	-0.124	0.07	0.194	2.330		5.2	OK
S3.001	S14	15 minute 100 year Winter I+20%		8.125	7.180	-0.024	0.14	1.162	4.194		8.5	OK OK
\$3.002	S15	15 minute 100 year Winter I+20%		8.125	7.177	0.042	0.25	1.421	8.325		15.8	SURCHARGED
S1.007	S08	15 minute 100 year Winter I+20%		8.000	7.171	0.518	1.45	4.307	79.804		88.7	SURCHARGED
S4.000	S16	15 minute 100 year Winter I+20%		9.300	8.247	-0.234	0.11	0.069	5.550		12.7	OK
S4.001	S17										~ ~ ~	OK OK
S5.000		15 minute 100 year Winter I+20%		8.825	7.823	-0.183	0.32	0.227	12.267		28.0	, UN
CE 001	S19	15 minute 100 year Winter I+20% 15 minute 100 year Summer I+20%		8.825 8.825	7.823 7.747	-0.183 -0.259	0.32 0.04	0.227	12.267		28.0	OK OK
55.001	S19 S20	15 minute 100 year Winter I+20% 15 minute 100 year Summer I+20% 15 minute 100 year Summer I+20%		8.825 8.825 8.825	7.823 7.747 7.714	-0.183 -0.259 -0.195	0.32 0.04 0.27	0.227 0.041 0.238	12.267 1.073 5.060		28.0 2.8 13.0	OK OK OK
S4.002	S19 S20 S18	15 minute 100 year Winter I+20% 15 minute 100 year Summer I+20% 15 minute 100 year Summer I+20% 15 minute 100 year Winter I+20%		8.825 8.825 8.825 8.825 8.825	7.823 7.747 7.714 7.694	-0.183 -0.259 -0.195 -0.192	0.32 0.04 0.27 0.28	0.227 0.041 0.238 0.198	12.267 1.073 5.060 17.934		28.0 2.8 13.0 40.5	OK OK OK
\$3.001 \$4.002 \$1.008	\$19 \$20 \$18 \$09	15 minute 100 year Winter I+20% 15 minute 100 year Summer I+20% 15 minute 100 year Summer I+20% 15 minute 100 year Winter I+20% 15 minute 100 year Winter I+20%		8.825 8.825 8.825 8.825 8.825 8.500	7.823 7.747 7.714 7.694 7.036	-0.183 -0.259 -0.195 -0.192 0.458	0.32 0.04 0.27 0.28 2.32	0.227 0.041 0.238 0.198 2.318	12.267 1.073 5.060 17.934 103.356		28.0 2.8 13.0 40.5 115.6	OK OK OK SURCHARGED

8.500 6.609

8.500 6.080

0.161 2.09

-0.330 0.00 202.000

0.677

103.368

0.000

115.5 SURCHARGED

OK

304 0.0

S1.010 SINF IN 15 minute 100 year Winter I+20%

S1.011

SINF 240 minute 100 year Winter I+20%



## Appendix C

Surface Water Infiltration Design Output and Sizing

RPS (Galway)							Page 1
Lyrr Building, IDA	Business	•					
Mervue							
Galway, Ireland							Mirro
Date 07/02/2022 17:	29	De	esigned	by MGB			Drainago
File SHB3-FIN-CS-RP	S-CA-0002	. Ch	necked	by DK			Diamage
Innovyze		So	ource C	ontrol 20	020.1		
		-					
Summary	of Results	for	100 ye	ar Retur	n Perio	d (+20%)	
	Half r	rain	Time •	810 minutes	3		
	narr b	1 4 1 1	11mc • .	Jio minace.			
	Storm M	lax	Max	Max	Max	Status	
	Event Le	evel I (m)	Depth In (m)	filtration (1/s)	(m <sup>3</sup> )		
		()	()	(1/3)	(		
15	min Summer 5.	.600 (	0.339	5.5	88.6	O K	
30	min Summer 5	.113 ( .814 (	0.452	5.7 5.8	144.6	0 K	
120	min Summer 5.	.898 (	0.637	5.9	166.5	0 K	
180	min Summer 5.	.929 (	0.668	5.9	174.4	O K	
240	min Summer 5.	.937 (	0.676	5.9	176.5	ОК	
480	min Summer 5. min Summer 5.	.934 ( .924 (	0.673	5.9	173.3	O K	
600	min Summer 5.	.912 (	0.651	5.9	170.1	0 K	
720	min Summer 5.	.898 (	0.637	5.9	166.5	O K	
960	min Summer 5.	.868 ( .803 (	0.607	5.8	158.5	ОК	
2160	min Summer 5.	.707 (	0.446	5.6	116.5	0 K	
2880	min Summer 5.	.618 (	0.357	5.6	93.3	O K	
4320	min Summer 5.	.475 (	0.214	5.4	56.0	ОК	
7200	min Summer 5.	.325 (	0.118	5.2	16.7	0 K	
8640	min Summer 5.	.309 (	0.048	5.0	12.4	0 K	
10080	min Summer 5.	.304 (	0.043	4.5	11.1	ОК	
15	min winter 5.	.643 (	0.382	5.0	99.7	ΟK	
	Storm		Pain	Floodod T	imo-Poak		
	Event		(mm/hr)	Volume	(mins)		
				(m³)			
	15 min Su	mmer	94.309	0.0	2.2		
	30 min Su	mmer	64.057	0.0	36		
	60 min Su	mmer	40.867	0.0	64		
	120 min Su	mmer	25.429	0.0	122		
	240 min Su	mmer	15.577	0.0	234		
	360 min Su	mmer	11.645	0.0	292		
	480 min Su	mmer	9.462	0.0	356		
	720 min Su	mmer	8.050 7.052	0.0	424 494		
	960 min Su	mmer	5.721	0.0	630		
	1440 min Su	mmer	4.260	0.0	908		
	2160 min Su 2880 min Su	mmer mmer	3.170	0.0	1300 1676		
	4320 min Su	mmer	1.906	0.0	2384		
	5760 min Su	mmer	1.542	0.0	3056		
	7200 min Su	mmer	1.308	0.0	3680		
	10080 min Su	mmer	1.019	0.0	4392 5120		
	15 min Wi	nter	94.309	0.0	22		
	<u></u>	000	2020 -	2201-1-1-1			
	©1	20Z-	ZUZU II	movyze			

RPS (Galway)						Page 2
Lyrr Building, IDA Business	•••					
Mervue						
Galway, Ireland						Micro
Date 07/02/2022 17:29		Designed	l by MGB			Dcainago
File SHB3-FIN-CS-RPS-CA-0002		Checked	by DK			Diamage
Innovyze		Source C	Control 2	020.1		
Summary of Result	ts fo	or 100 ye	ear Retur	n Perio	d (+20%)	
Storm	Max	Max	Max	Max	Status	
Event	Level	L Depth In	nfiltration	n Volume		
	(111)	(111)	(1/3)	(111 )		
30 min Winter	5.772	2 0.511	5.	7 133.4	O K	
60 min Winter	5.889	9 0.628	5.	3 164.2	ОК	
120 min Winter 180 min Winter	5.992	5 0.774	6.1	) 202.1	ОК	
240 min Winter	6.051	1 0.790	6.0	206.5	O K	
360 min Winter	6.049	9 0.788	6.	205.9	O K	
480 min Winter	6.035	5 0.774	6.0	202.1	O K	
720 min Winter	0.UI 5.99	5 0.734	6.1	) 191.7	OK	
960 min Winter	5.945	5 0.684	5.1	9 178.7	0 K	
1440 min Winter	5.840	0.579	5.	3 151.2	O K	
2160 min Winter	5.68	7 0.426	5.0	5 111.4	0 K	
4320 min Winter	5.363	4 0.293 3 0.102	5.3	3 26.5	0 K	
5760 min Winter	5.30	7 0.046	4.	3 12 <b>.</b> 1	0 K	
7200 min Winter	5.300	0.039	4.3	1 10.3	O K	
8640 min Winter	5.295	5 0.034	3.0	5 9.0	0 K	
10000 MIN WINCEL	J.292	2 0.031	J.,	2 0.0	N U	
Stor	m F	Rain	Flooded 1	'ime-Peak		
Lven	L	(1111)	(m <sup>3</sup> )	(mins)		
			( )			
30 min	Winte	r 64.057	0.0	36		
60 min 120 min	Winte	r 40.867 r 25.429	0.0	64 120		
180 min	Winte	r 19.116	0.0	178		
240 min	Winte	r 15.577	0.0	234		
360 min	Winte	r 11.645	0.0	336		
480 min 600 min	Winte Winte	r 9.462 r 8.050	0.0	380 459		
720 min	Winte	r 7.052	0.0	536		
960 min	Winte	r 5.721	0.0	688		
1440 min	Winte	r 4.260	0.0	980		
2160 min 2880 min	Winte Winte	r 3.1/0 r 2.568	0.0	1388 1760		
4320 min	Winte	r 1.906	0.0	2420		
	Winte	r 1.542	0.0	2936		
5760 min		r 1.308	0.0	3672		
5760 min 7200 min	Winte	1 1 1 1 0		1 1 0 0		
5760 min 7200 min 8640 min 10080 min	Winte Winte Winte	r 1.143 r 1.019	0.0	4408 5080		
5760 min 7200 min 8640 min 10080 min	Winte Winte Winte	r 1.143 r 1.019	0.0	4408 5080		
5760 min 7200 min 8640 min 10080 min	Winte Winte Winte	r 1.143 r 1.019	0.0 0.0	4408 5080		
5760 min 7200 min 8640 min 10080 min	Winte Winte Winte	r 1.143 r 1.019	0.0 0.0	4408 5080		
5760 min 7200 min 8640 min 10080 min	Winte Winte Winte	r 1.143 r 1.019	0.0 0.0	4408 5080		
5760 min 7200 min 8640 min 10080 min	Winte Winte Winte	r 1.143 r 1.019	0.0	4408 5080		
5760 min 7200 min 8640 min 10080 min	Winte Winte Winte	r 1.143 r 1.019	0.0	4408 5080		

RPS (Galway)		Page 3
Lyrr Building, IDA Business		
Mervue		
Galway, Ireland		Mirro
Date 07/02/2022 17:29	Designed by MGB	Dcainago
File SHB3-FIN-CS-RPS-CA-0002	Checked by DK	Diamage
Innovyze	Source Control 2020.1	

#### Model Details

Storage is Online Cover Level (m) 8.000

#### Infiltration Basin Structure

Invert Level (m) 5.261 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.13500 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.13500

#### Depth (m) Area (m<sup>2</sup>) Depth (m) Area (m<sup>2</sup>) Depth (m) Area (m<sup>2</sup>)

0.000 275	5.0 0	.800 2	275.0	0.801	0.0
-----------	-------	--------	-------	-------	-----



## Appendix D

Hydrocarbon Interceptor – Brochure

# **Bypass** NSB RANGE

#### **APPLICATION**

Bypass separators are used when it is considered an acceptable risk not to provide full treatment, for very high flows, and are used, for example, where the risk of a large spillage and heavy rainfall occurring at the same time is small, e.g.

- Surface car parks.
- Roadways.
- Lightly contaminated commercial areas.

#### PERFORMANCE

Klargester were one of the first UK manufacturers to have separators tested to EN 858-1. Klargester have now added the NSB bypass range to their portfolio of certified and tested models. The NSB number denotes the maximum flow at which the separator treats liquids. The British Standards Institute (BSI) tested the required range of Kingspan Klargester Bypass separators and certified their performance in relation to their flow and process performance assessing the effluent gualities to the requirements of EN 858-1. Klargester bypass separator designs follow the parameters determined during the testing of the required range of bypass separators.

Each bypass separator design includes the necessary volume requirements for:

- Oil separation capacity. Oil storage volume. .
- Silt storage capacity. **.**

The unit is designed to treat 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). Flows generated by higher rainfall rates will pass through part of the separator and bypass the main separation chamber.

.

Coalescer.

Class I separators are designed to achieve a concentration of 5mg/litre of oil under standard test conditions.

#### **FEATURES**

- Light and easy to install.
- Inclusive of silt storage volume.
- Fitted inlet/outlet connectors.
- н. Vent points within necks.
- Oil alarm system available (required by EN 858-1 and PPG3).

ire less

- н. Extension access shafts for deep inverts.
- Maintenance from ground level.
- GRP or rotomoulded construction (subject to model). н.

To specify a nominal size bypass separator, the following information is needed:-

- The calculated flow rate for the drainage area served. Our designs are based on the assumption that any interconnecting pipework fitted elsewhere on site does not impede flow into or out of the separator and that the flow is not pumped.
- The drain invert inlet depth.
- Pipework type, size and orientation.

#### STANDARD DRAINAGE UNIT FLOW PEAK FLOW STORAGE UNIT UNIT DIA. ACCESS BASE TO BASE TO STANDARD MIN. INLET NOMINAL CAPACITY (litres) INLET INVERT FALL ACROSS (l/s) RATE (I/s) AREA (m<sup>2</sup>) LENGTH (mm) (mm) SHAFT OUTLET INVERT PIPEWORK OIL SIZE DIA. (mm) INVERT DIA SILT (mm) (mm) (mm) NSBP003 NSBP004 NSBP006 NSBE010 NSBF015 NSBE020 NSBE025 NSBE030 NSBE040 NSBE050 NSBF075 NSBF100 NSBE125

SIZES AND SPECIFICATIONS

Rotomoulded chamber construction GRP chamber construction \* Some units have more than one access shaft – diameter of largest shown.



## Appendix E

Irish Water – Confirmation of Feasibility



Padraig Mac Giolla Bhride

RPS Lyrr 2 IDA Bus & Technology Park Mervue Galway H91 H9CK

12 May 2021

**Uisce Éireann** Bosca OP 448 Oifig Sheach ad ta na Cathrach Theas Cathair Chorcaí

**Iri sh Wa ter** PO Box 448, South City Delivery Office, Cork City.

www.water.ie

### Re: CDS21001920 pre-connection enquiry - Subject to contract | Contract denied Connection for Housing Development of 60 unit(s) at Rathellen, Fininklin Road, Sligo

Dear Sir/Madam,

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

SERVICE	OUTCOME OF PRE-CONNECTION ENQUIRY <u>THIS IS NOT A CONNECTION OFFER. YOU MUST APPLY FOR A</u> <u>CONNECTION(S) TO THE IRISH WATER NETWORK(S) IF YOU WISH</u> <u>TO PROCEED.</u>				
Water Connection	Feasible without infrastructure upgrade by Irish Water				
Wastewater Connection	Feasible Subject to upgrades				
SITE SPECIFIC COMMENTS					
Water Connection	Please note while flows in excess of your required demand may be achieved in the Irish Water network and could be utilised, Irish Water cannot guarantee a flow rate to meet your requirement. To guarantee a flow to meet your requirements, you should provide adequate storage capacity within your development.				
Wastewater Connection	The existing 150mm dia. foul sewer located adjacent to the site does not have sufficient capacity to accommodate the proposed development. A new 225mm dia. foul sewer will be required to serve the proposed development, the distance from the nearest point of the proposed development's red line boundary to the existing Irish Water owned foul sewer (located to the south) is approx. 170m. Please note Irish Water perform all connection related				

Stiúrthóirí / Directors: Cathal Marley (Chairman), Niall Gleeson, Eamon Gallen, Yvonne Harris, Brendan Murphy, Maria O'Dwyer

Oifig Chláraithe / Registered Office: Teach Colvill, 24-26 Sráid Thalbóid, Baile Átha Cliath 1, D01 NP86 / Colvill House, 24-26 Talbot Street, Dublin 1, D01 NP86 Is cuideachta ghníomhaíochta ainmnithe atá faoi theorainn scaireanna é Uisce Éireann / Irish Water is a designated activity company, limited by shares. Uimhir Chláraithe in Éirinn / Registered in Ireland No.: 530363

IW-HP-BUS

works including network extensions in the public road, this will be funded by the Developer.

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.
- 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 <a href="https://www.water.ie/connections/get-connected/">https://www.water.ie/connections/get-connected/</a>
- 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 <a href="https://www.water.ie/connections/information/connection-charges/">https://www.water.ie/connections/information/connection-charges/</a>
- 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 Cormac Healy from the design team by email to corhealy@water.ie For further information, visit **www.water.ie/connections.** 

Yours sincerely,

vonne Massis

Yvonne Harris Head of Customer Operations