

QUEENS PARADE DEVELOPMENT DRAINAGE ASSESSMENT

Bangor Marine Limited

12 June 2024



Doran
CONSULTING
DELIVERING ENGINEERING EXCELLENCE

QUEENS PARADE DEVELOPMENT

DRAINAGE ASSESSMENT

Bangor Marine Limited

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CONTENTS

1.0	INTRODUCTION.....	1
2.0	AIM OF REPORT	3
3.0	PRE-DEVELOPMENT SITE DESCRIPTION	4
4.0	DRAINAGE DESIGN PRINCIPLES	6
5.0	EXISTING DRAINAGE INFRASTRUCTURE	7
6.0	REVIEW OF PLANNING STAGE INFORMATION.....	12
7.0	PROPOSED DRAINAGE STRATEGY	15
8.0	CONCLUSIONS	19

APPENDICES

1.0 INTRODUCTION

- 1.1 Doran Consulting Ltd have been commissioned by Bangor Marine Limited to undertake a Drainage Assessment for the proposed Queen's Parade Development. The existing site is located on the seafront in Bangor, County Down, Northern Ireland.

The proposed development has two distinct areas, the area to the north of Queens Parade and the area to the south. The northern section of the development will provide car parking, open space to include soft and hard landscaped areas, with two pavilion buildings and five shelters. The southern section of the development will offer a range of commercial, leisure, residential and office space and will include a proposed 70/80 bed hotel facing on to the Bangor Marina. Several existing buildings within the site boundary will be demolished. The existing site has an area of approximately 5.458ha.

The Drainage Design Assessment will provide information in accordance with PPS15 Planning and Flood Risk - Annex D.

This report will detail the surface water drainage proposals for the proposed development.

Revision P06 of this report has been updated to include the planning applications highlighted in the image below. Previous versions of the report accounted only for the "Main Planning Permission" site. This revision also incorporates drainage from the playpark and car park site, which is proposed to connect to the system as part of the "Main Site", without requiring any upsizing of the previously proposed outfall pipe discussed in earlier revisions of this report.

From this point forward, the combined extents of these two boundaries will be referred to as "the Site".



Figure 1.1 – Planning Application Boundaries (Google Maps)

2.0 Aim of Report

- 2.1 The aim of this report is to present a summary of the design strategy for the proposed drainage systems which have been undertaken for the project.
- 2.2 This report shall outline the following elements:
- Pre-development site description.
 - Review of existing drainage infrastructure.
 - Review of design principles of proposed drainage systems.
 - Review of planning stage information.
 - Summary of proposed drainage.
 - Review of any significant design development.
- 2.3 This revision (P06) aims to show that the drainage from the playpark and car park site, can connect to the proposed system as part of the “Main Site”, without increasing the size of the the previously proposed outfall pipe discussed in earlier revisions of this report.

3.0 Pre-Development Site Description

- 3.1 The Queens Parade development site is located opposite the marina in Bangor, County Down. The site is located between the Southwell Road, King Street, Main Street and the marina. The Queen's Parade public carriageway runs east to west through the site separating the site into a northern and southern area. Refer to Appendix A for the Site Location Plan.



Figure 3.1 - General Location Map (Google Maps)

- 3.2 The northern section of the site currently comprises the Marine Gardens Car Park and public realm landscaped area. The southern section of the site currently includes car parking, residential (including derelict houses and gardens), retail and commercial and public amenity (grassed area, picnic tables and art pods). The whole site is approximately 5.458ha. On the northern edge of the site sits Bangor Marina. On the north-eastern edge of the site the Marina Car Park, Harbour Offices and a Public Bathroom are located.
- 3.3 Extent of Development
- 3.3.1 The proposed development comprises of mixed use to include the following:
- Marine Gardens as a public open space. The proposal provides for seafront lawns, sculptures, pavilion buildings, shelters, cycle hub, new seating, kiosks, motorcycle parking, disabled parking, lighting, and paving;

- Redevelopment of buildings along Queens Parade to provide a 70/80 bedroom hotel, ground floor retail units and residential properties;
- Covered carpark accessed from the Southwell Road;
- Section of Southwell Road widened and two way from Queens Parade to car park entrance;
- Creation of public open space within the development;
- Pedestrian links from the public open space to Queens Parade;
- Pedestrian links from the public open space to Main Street;
- Redevelopment and refurbishment of commercial properties along Main Street;
- Hotel with restaurant fronting Queens Parade, spa facilities and bar/cafe with views to Marina;
- Business/office space;
- Residential;
- Off-street parking provided behind King Street Mews;
- Entertainment facilities to include a cinema/theatre.

3.4 Topographical Survey

- 3.4.1 A topographical survey of the proposed development site was undertaken by CSS Surveys in August 2014. An additional supplementary survey was completed by CSS in July 2019 to capture additional points along Main Street and the fairground area. The topographical survey is included in Appendix B.
- 3.4.2 A ground surface profile for the existing site was created from the survey data and profile contours at 1.0m intervals were modelled to aide in the assessment of the likely surface water run-off flow regime for the site. Refer to drawing 192042-DC-XX-XX-GA-C-103 in Appendix C for the surface contours and likely surface run-off for the existing site.
- 3.4.3 Based on the contour information the existing site is noted to generally fall towards the marina but more specifically toward the Clandeboye Stream culvert and the Ward Park Stream culverts. These culverts are discussed further in Section 5.1 of this report. From the contour information an indicative ridgeline originating from the southeast corner of the marina to approximately 30m west of the King Street – Main Street junction can be determined.

4.0 Drainage Design Principles

4.1 Drainage Standards

- 4.1.1 All required drainage has been designed in accordance with the following current British Standard: BS EN 752 'Drain and Sewer Systems Outside Buildings'.
- 4.1.2 The design of the drainage systems has also been undertaken in accordance with all relevant local Building Regulations. Best practice guidelines have also been considered, where applicable, such as 'The CIRIA SUDs Manual'.
- 4.1.3 The designed sewerage systems will be constructed in line with the Civil Engineering Specification for the Water Industry – 8th Edition and WRc Sewers for Adoption Northern Ireland 1st Edition, where applicable. Drainage has further been designed and shall be constructed in accordance with all relevant Statutory Authority requirements or conditions and the relevant Employers' Requirements and tender information.
- 4.1.4 Planning Policy Statement (PPS 15).

In Northern Ireland, guidance relating to planning and flood risk is outlined in Planning Policy Statement 15 (PPS 15), published in September 2014.

PPS 15 sets out the Department of the Environment's planning policies to reduce flood risk to people, property and the environment. Due to current understanding with regards to climate change and flood risk, PPS 15 adopts a precautionary approach to decision making.

PPS 15 annex D states that a drainage assessment will be required to facilitate the proper consideration of a planning application for a proposed site where:

- The development comprises of 10 new dwellings or more;
- The development exceeds one hectare;
- Changes of use involving new buildings and/or hard surfacing which exceeds 1,000m² in area; or
- Surface water run-off from the development may adversely impact upon a sensitive area.

4.2 Design Parameters

- 4.2.1 In accordance with the above-named design standards, all surface water drainage conveyance pipework has been sized to accommodate a 1 in 5 year storm event. The system is also designed to retain water below ground, up to and including the 1 in 30 year storm event; i.e. the system is permitted to surcharge but not flood. Exceedance events, those beyond the scope of the proposed system design, shall also be considered.

5.0 Existing Drainage Infrastructure

5.1 DfI Rivers

DfI Rivers have been consulted to determine if any known watercourses would be affected by the proposed development. The response indicated that two watercourses, which are designated within the terms of the Drainage (Northern Ireland) Order 1973, affect the site. The DfI Rivers correspondence can be found in Appendix D1.

The Clondeboy Stream flows along the western boundary of the site and the Ward Park Stream along the eastern boundary of the site. Both culverted watercourses discharge directly into Bangor Marina, along the northern boundary of the proposed development site.

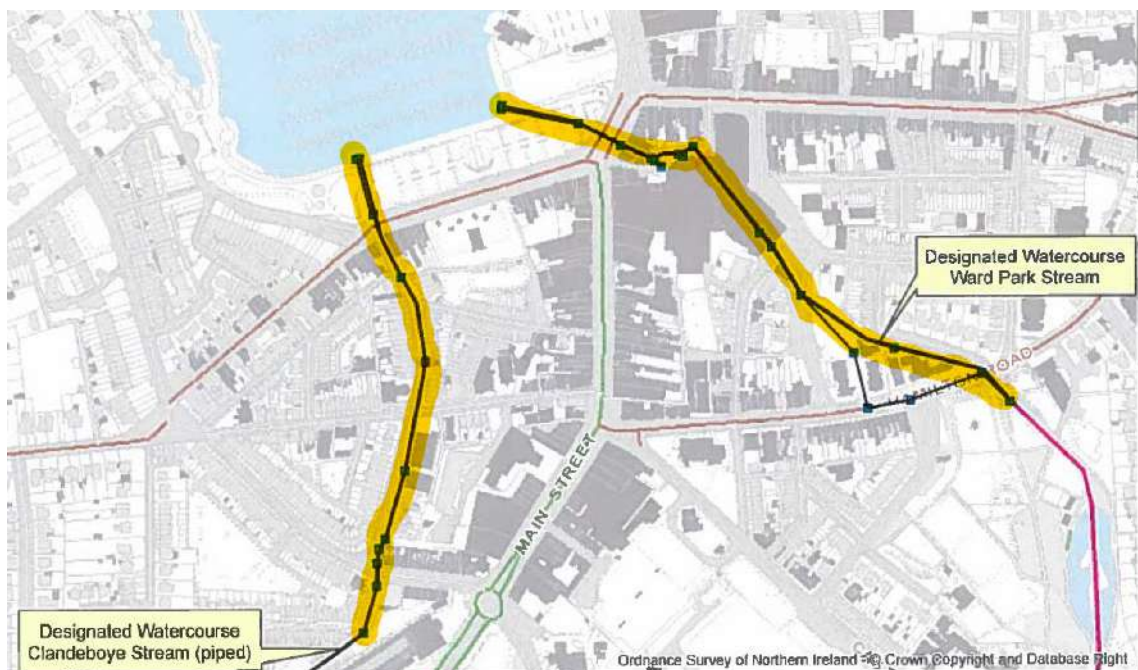


Figure 5.1 – DfI Rivers Culvert Locations

A Schedule 6 Application was submitted, July 2019, to DfI Rivers in respect of a discharge consent for surface water run-off from the development to the existing culverts. The Schedule 6 Consent was received September 2019 with the following comments as outlined below. Refer to Appendix D2 for the Schedule 6 Consent.

- DfI Rivers were unable to consent unrestricted discharge of surface water run-off from the site to the existing Ward Park Stream and Clondeboy Stream. This consent was declined due to both the tidal influence and the probability of fluvial flooding upstream of the discharge location on the Ward Park Stream.

- DfI Rivers granted consent to discharge at the greenfield run-off rate of 10l/s per hectare which in accordance with DfI Rivers methodology equates to discharge of 23.3l/s to the Ward Park Stream and discharge of 16.5l/s to the Clandeboye Stream.

5.2 DfI Rivers flood hazard map

Doran Consulting undertook a review of the DfI Rivers Flood Hazard Maps, included in Appendix E, and comment as follows:

5.2.1 Rivers

The 1:100 year Flood Hazard Map indicates that no fluvial flooding occurs at the proposed development site.

5.2.2 Surface water

The 1:30 year Surface Water Hazard Map indicates surface water flooding along the Southwell Road from King Street to Queens Parade and an area to the east of Southwell Road located within the development site. The topographical survey information indicates these areas to be local low points. The Surface Water Hazard Map shows flooding within the Marina car park to the north of Queens Parade. This is a low lying area located behind the sea wall. This flooding will be mitigated as part of the detailed design of the site drainage. Based on the pre and post development run-off rates a reduction in overall discharge will be provided (see Appendix H).

5.2.3 Coastal

The DfI Flood Maps (NI) indicate that no coastal flooding occurs at the proposed development site. (See Appendix E)

5.3 Northern Ireland Water

Doran Consulting contacted Northern Ireland Water (NI Water) to request information on existing public water and sewerage services within the boundary of the site. A Pre-Development Enquiry (PDE) was submitted to NI Water, July 2019, to determine whether the required capacity was available either within, adjacent or close to the proposed development.

The PDE response, returned August 2019, confirmed that there is no public storm sewer available which can serve the development. The PDE response also identified incapacity in the downstream foul network. The PDE response also stated that connection from the development to the NI Water foul sewer network would require a foul sewer network capacity check to be completed. This check was subsequently undertaken and the NIW response noted that, *'the proposed development is not predicted to cause flooding detriment, new locations of flooding, surcharge detriment or overflow spill detriment as per the threshold levels set by NIW'*.

Refer to Appendix F for the NI Water PDE and Network Capacity Check response including an asset map.

The PDE Service Enquiry Information was consulted in combination with the existing available NI Water Records to identify assets either within, adjacent or close to the proposed development. The records identified:

- An existing 150mm diameter public water main located in Queens Parade, Main Street and King Street. There is an existing 4" diameter public watermain in The Vennel;
- An existing 225mm diameter public combined foul sewer located in The Vennel;
- An existing 600mm diameter public combined foul sewer located in Queens Parade;
- An existing 900mm diameter public combined overflow sewer located in the Marina Promenade;
- The PDE response confirmed that no public storm sewers are available to serve the development.

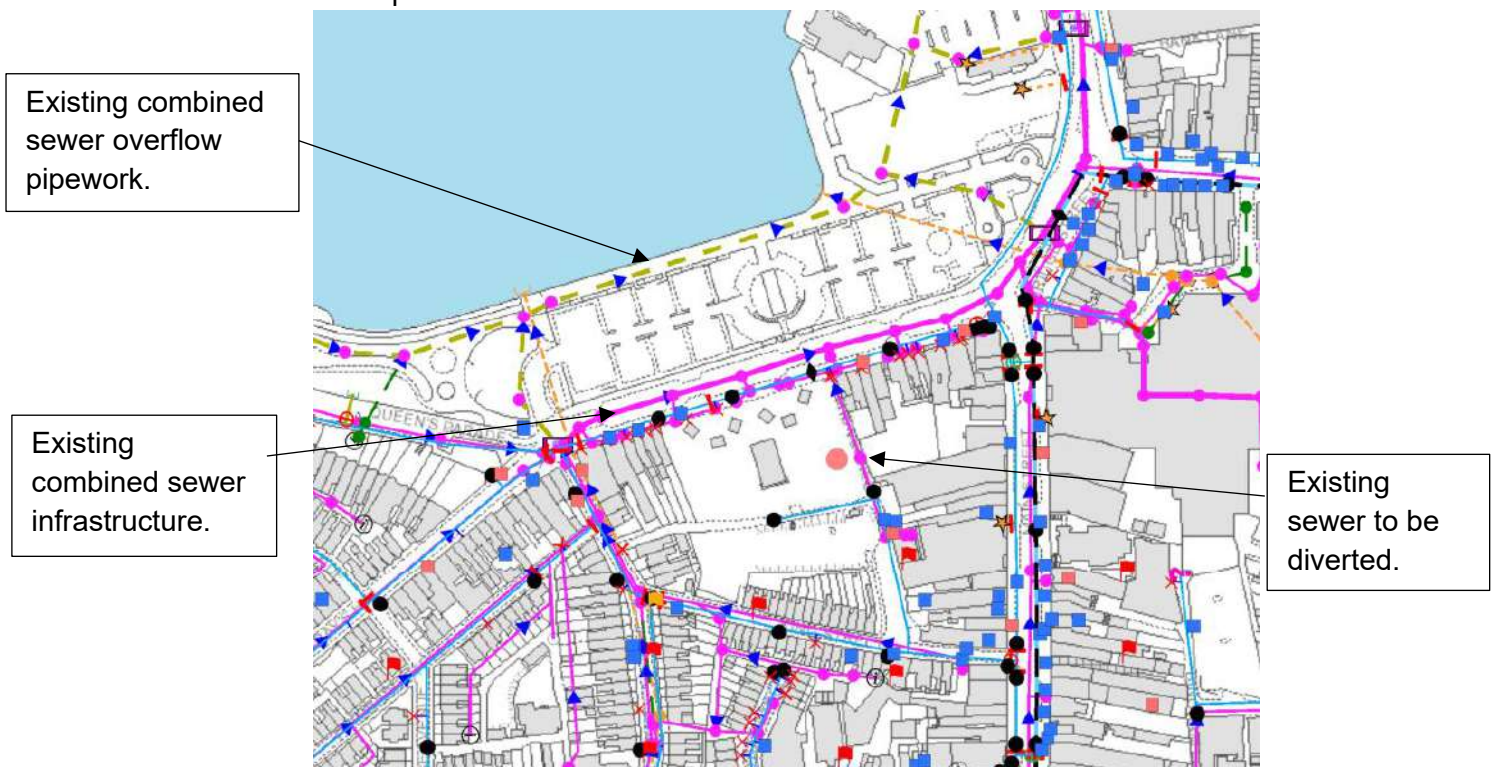


Figure 5.2 – Existing NIW network

Initial discussions with NI Water to review the existing network and the likely storm drainage options for the proposed development, determined that the discharge of surface water run-off from the proposed development to the combined sewer would not be permitted.

A diversion of the combined sewer in The Vennel may be necessary to facilitate the development. This diversion was discussed with NI Water and a divestiture of the combined sewer in The Vennel to private ownership is likely to be acceptable to NI Water with a connection location on Queens Parade to the combined sewer. Any diversion or realignment of sewers to facilitate the development will require a realignment of a public sewer application to be submitted and the change of ownership confirmed with the NI Water Developer Services Adoptions Manager.

5.4 NIEA / DAERA

Discussions with NIEA / DAERA are currently on-going at the time of completing this report. A marine construction licence from DAERA will be required for any works within the inter-tidal zone in Bangor Marina. To discharge storm water to the Bangor Marina a consent to discharge will need to be obtained from NIEA.

5.5 DfI Roads

DfI Roads were contacted to request information on existing highway storm drainage within and adjacent to the boundary of the site. DfI Roads confirmed that no records exist for the site. Refer to Appendix G for DfI Roads correspondence.

5.6 Drainage characteristics of existing site

As noted, the existing site generally falls towards the marina but more specifically toward the Clandeboye Stream and the Ward Park Stream culverts. Based on the ground model it is estimated that 2/3rds of the surface run-off from the site drains west towards the Clandeboye Stream culvert, with the remaining 1/3rd draining east towards the Ward Park Stream.

The surface water run-off from the existing site is generally conveyed by drainage infrastructure to the current NI Water combined sewer system. Surface water to the south of Queens Parade is collected via a gully system that discharges to the combined sewer network. Surface water to the north of Queens Parade drains via a gully and drainage channel system that discharges both directly into the Bangor Marina and into the NI Water combined sewer. Queens Parade drains via a gully system that ultimately discharges to the NI Water combined sewer.

NI Water have a policy of promoting removal of storm water from the combined sewer network wherever possible.

The area of the site is approximately 5.458Ha. As shown in the Site Location Plan drawing in Appendix A the site has previously been developed (brownfield) hard landscaping, soft landscaping and a surface level car park adjacent to Queens Parade.

The existing site run-off and the proposed development run-off are documented in the below sections of the Drainage Design Summary.

5.7 Existing site run-off

The pre-development impermeable/permeable areas for the site are based on the topographical survey data, information obtained from a site visit on 25th June 2019 and a visual assessment from aerial maps. The impervious/pervious areas for the existing site are as follows:

- 90% Impermeable Areas – including existing buildings, roads and hardstanding areas;
- 10% Permeable Areas – grassed and soft landscaped areas.

The modelling of the pre-development surface run-off has been undertaken using *MicroDrainage Storm Sewer Design* by the Modified Rational Method. In accordance with the Sewers for Adoption Northern Ireland, the run-off is calculated to be 868.0 litres per second (l/s). Refer to Appendix H1 for the modelled output.

Storm Event	Storm Flows
1:5 year event	868 l/s
1:30 year event	1245 l/s
1:100 year event	1587 l/s

Table 5.1 – Pre-Development Run-off Values

6.0 Review of Planning Stage Information

6.1 Proposed Drainage Outfall Solutions

Two potential drainage solutions were provided at planning stage. The first option considered an attenuated surface water discharge to the existing DFI culverts within Marine Gardens. Attenuation would be provided via several large capacity underground cellular storage tanks, constructed within Marine Gardens. Flows were proposed to be restricted to both the Clandeboye and Ward Park culverts using vortex flow control chambers. This option was approved in principle by DFI Rivers, via Schedule 6. This option would require considerable drainage infrastructure to be constructed within existing lands owned by Crown Estates.

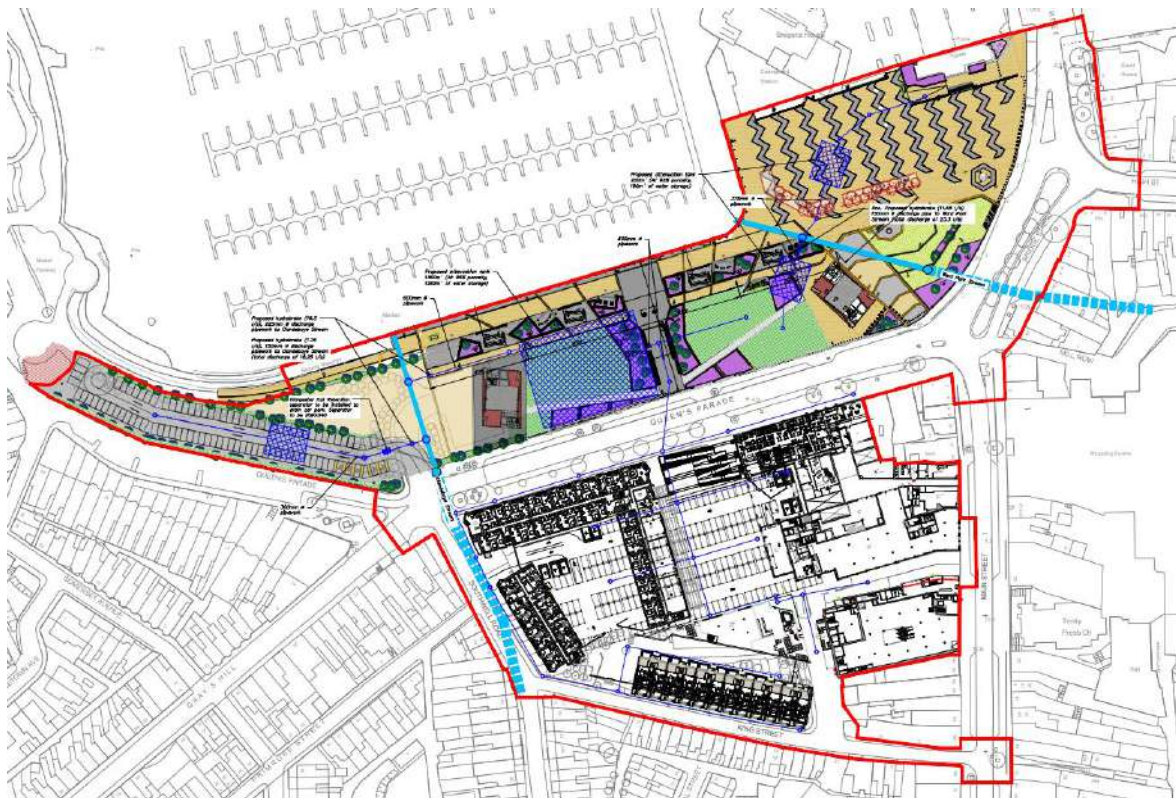


Figure 6.1 – Option 1 Storm Water Outfall (attenuated discharge to DFI culverts)

The second option considered a new dedicated outfall sewer to be constructed, discharging surface water from the development, directly to the Marina. As the outfall would be direct to tidal waters, attenuation would not be required. This option would require additional approvals to be obtained from NIEA in relation to consent to discharge and marine construction licence. This option would also require less considerable drainage infrastructure to be constructed within existing lands owned by Crown Estates.

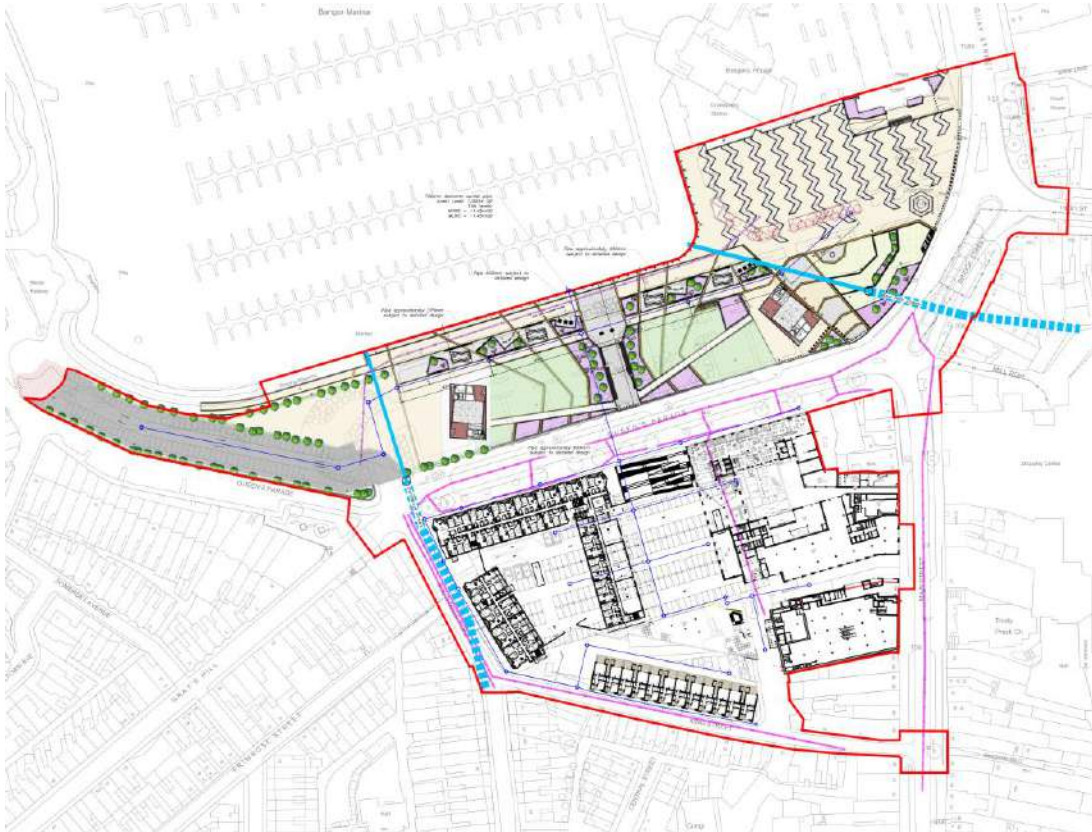


Figure 6.2 – Option 2 Storm Water Outfall (direct discharge to marina)

Both above options have been considered more thoroughly throughout the detailed design phase of the project. Option 2 above is considered to be the most advantageous solution to progress with, due to several factors:

- This solution allows full removal of surface water (generated from across the development site) from the existing NI Combined sewer network, relieving pressure on local sewer infrastructure, wastewater treatment facilities and the helps to mitigate potential local out of sewer flooding. There are NIW Combined Sewer Overspill facilities noted to be present, which are understood to overspill into the existing DFI Rivers Culverts. The removal of surface water from the NI Water and DFI networks should help to mitigate in some way overspill requirements.
- This solution allows full removal of surface water (generated from across the development site) from the existing DFI Rivers Culvert infrastructure, relieving upstream capacity pressures.
- This solution negates the requirement for large underground tanks within Marine Gardens. There were concerns in relation to achieving adequate space to construct such tanks, in relation to both existing and proposed services as well as proposed

planting, hardstandings and buildings. There were also concerns in relation to tidal influence on the tanks and potential buoyancy issues associated with such tanks.

- Maintenance requirements for option 2 are considerably less than option 1 and ownership arrangements are likely to be more logical, with the option 2 system being full aligned with adoptable standards.
- Option 2 reflects an overall more sustainable approach, utilising less construction materials, requiring a shorter installation programme and providing a longer design life.

6.2 Phasing of the Works

In accordance with planning approval, the project shall be constructed in a phased manner, where the public realm elements within Marine Gardens shall be constructed first. This shall require the construction of surface water outfall arrangements within the early phases. As such, the drainage infrastructure constructed within the initial phase of the development shall need to be of adequate scale, level and positioning to accommodate surface water flows from the subsequent phases.

7.0 Proposed Drainage Strategy

7.1 Proposed Drainage Design

A new storm network is proposed to be constructed to drain surface water from the development.

The general surface water system will collect surface run off from the roads and hard standings via trapped road gullies and proprietary drainage channels and drainage kerbs as appropriate. Various forms of drainage channels (typically proprietary type channels or similar approved) will be adopted depending on the area in question.

Channels/drainage kerbs have been selected to be suitable for the load class and environment in which they are located. Suitable access shall be provided for the maintenance and cleaning of the channels/drainage kerbs.

Water shall be drained from the building roofs via rainwater downpipes (RWP's). RWP's will generally be located internally within buildings. Where possible these connections shall discharge directly to external manholes. Consideration shall also be given to the potential use of siphonic drainage across the facility, where the logistics of accommodating multiple RWP downpipes does not permit a gravity solution.

In general, the below ground surface water system will comprise a mixture of uPVC and polypropylene pipework, with precast concrete manholes located at changes in both direction and gradient. Pipework sizes and gradients are selected to ensure that self-cleansing velocities are reached to avoid blockage of the pipes.

The development is proposed across several varying levels, including a podium level (ground floor) and basement level (car park) and Marine Gardens level. In general drainage shall be routed from the podium level down into the basement level, and conveyed northwards towards the Marine Gardens level. Changes in network level shall be accommodated generally using drop manholes or accessible vertical pipework. Upon amalgamation of all drainage from the south of Queens Parade, an outfall sewer shall be routed below the public carriageway (and existing services therein) and ultimately discharged to the marina.

Suitably sized oil separators shall be provided within the surface water network, accommodating the areas at considered risk of hydrocarbon contamination, i.e. areas of car parking and event space.

As discussed within section 6.0. it is proposed that a new storm drainage outfall into the Bangor Marina is to be constructed. This will discharge surface water run-off from the proposed development direct to the Marina, subject to agreement with NIEA. As the discharge shall be to tidal waters, surface water attenuation/restricted flows etc. will not be

required. A new outfall structure shall however be required to be constructed through the existing marina quay wall. The outfall shall be located within the inter-tidal zone and as such will require a marine construction licence to be granted by DAERA. A non-return valve facility shall also be provided within the manhole immediately upstream from the outfall into the marina, to prevent tidal water flowing back into the storm drainage system.

The works are foreseen to be completed across several phases, the initial phase being the construction of the Marine Gardens at the northern end of the site; with subsequent phases expected to consist of the works to the south of Queens Parade.

Refer to Appendix I for a Ground level and Basement level drainage layouts and the 'All Drainage' Layout outlining the location of the proposed new outfall into the Bangor Marina.

The proposed development is an opportunity to bring betterment to the NI Water network through separation of the surface water run-off from the combined sewer network. A new storm sewer network designed to the required standards is likely to mitigate the risk of surface water flooding.

7.2 Proposed development run-off

The post-development impermeable/permeable areas for the site are based on the proposed design drawings. The impervious/pervious areas for the existing site are as follows:

- 77% Impermeable Areas – including existing buildings, roads and hardstanding areas;
- 23% Permeable Areas – grassed and soft landscaped areas.

An additional 10% increase in paved surface area has been assumed across all areas to account for future urban expansion (e.g., property extensions and additional paved surfaces) when designing the drainage system, in accordance with *Sewers for Adoption Northern Ireland – 1st Edition*, Section 2.8

The modelling of the post-development surface run-off has been undertaken using Micro-Drainage Storm Sewer Design and the Modified Rational Method of calculation. Refer to Appendix H2.

Storm Event	Storm Flows
1:5 year event + 10% climate change	514 l/s
1:30 year event + 10% climate change	715 l/s
1:100 year event + 30% climate change	990 l/s

Table 7.1 – Post Development Run-off Values

7.3 Proposed Outfall Tidal Modelling

Hydraulic modelling considering a potential submerged outfall during both Mean Spring Tide and Highest Astronomical Tides has been undertaken to ensure the system is designed to accommodate tidal influence.

Surface water run-off values have been calculated in accordance with Sewers for Adoption Northern Ireland guidelines. The run-off during a Mean Spring Tide is calculated to be 514 litres per second (l/s). Run-off during the Highest Astronomical Tide is calculated to be 514 litres per second (l/s). Refer to Appendix H3 and 4 for the modelled outputs. It is observed that the proposed invert level of the outfall pipe (0.5mOD) is such that high tidal conditions have minimal influence on the discharge rate. It is also noted that the main development is located at considerably higher elevations than the Marina. As such hydraulic head conditions are favourable.

Storm Event	Storm Flows	
	Mean Spring Tide	Highest Astronomical Tide
1:5 year event + 10% climate change	514 l/s	514 l/s
1:30 year event + 10% climate change	715 l/s	715 l/s
1:100 year event + 30% climate change	990 l/s	990 l/s

Table 7.2 – Modelled Flows in Submerged Outfall condition

7.4 Ownership of Proposed Drainage

The drainage system will be constructed to an adoptable standard. It is proposed that the network will be divided as shown in the image below, outlining the anticipated ownership and maintenance responsibilities. Upon completion, it may be offered for adoption by either the council or NI Water. For the maintenance schedule, please refer to Appendix K.

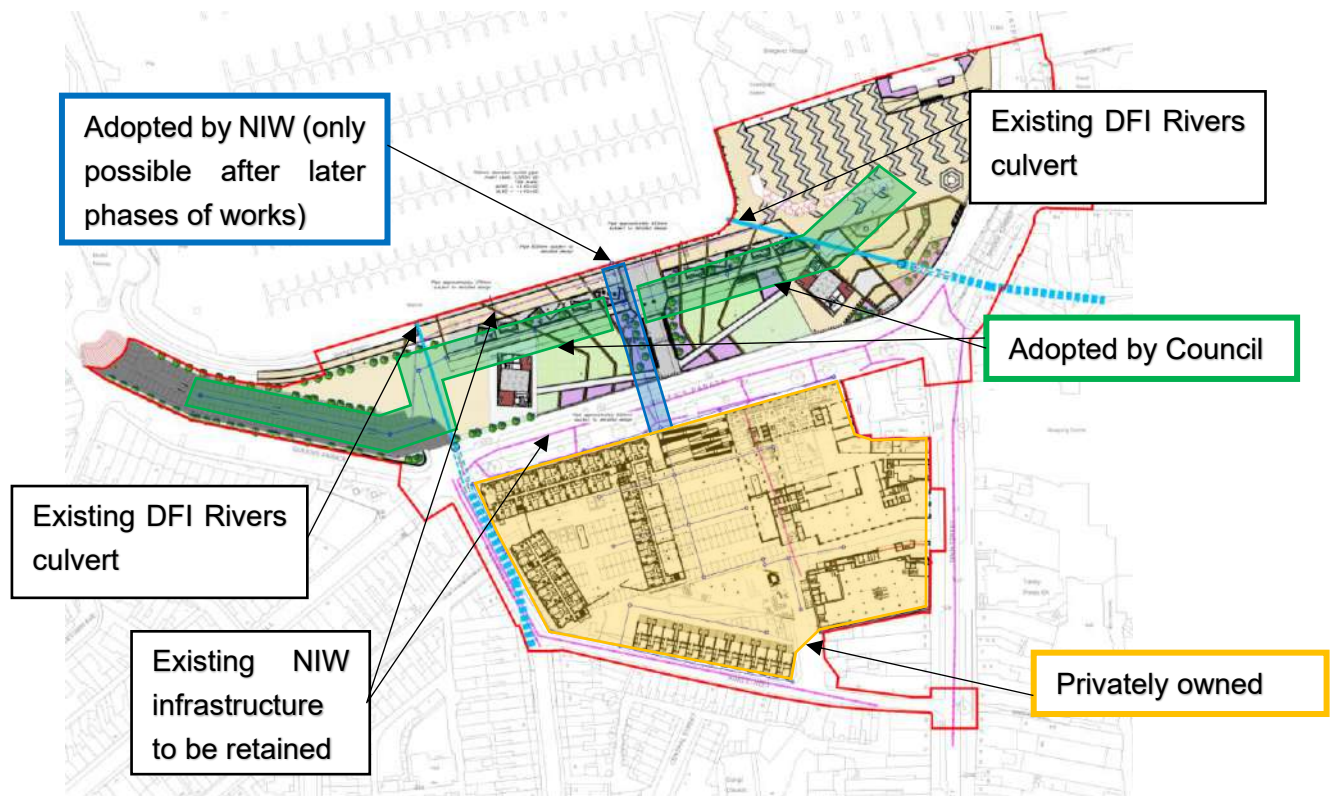


Figure 7.3 – Outline of ownership and maintenance responsibilities

8.0 CONCLUSIONS

The aim of this report has been to present the proposed below ground surface water drainage design strategy for the proposed Queens Parade development, Bangor.

The proposed surface water drainage systems have been designed in strict accordance with the relevant British Standards, Sewers for Adoption guidelines and Building Regulations. The design has resulted in an overall sustainable, innovative and robust proposed drainage solution. The design has sought to bring betterment to local drainage infrastructure and water environments.

Subject to agreement with NIEA / DAERA and obtaining of the necessary permits and licences, it is proposed to discharge surface water from the development directly to Bangor Marina via a new outfall to be constructed within the marina quay wall.

A diversion of the existing combined sewer in The Vennel and divestiture into private ownership is also required for the development.

Assessment of the run-off potential for the pre-development site and the proposed development site shows a general decrease in the surface water run-off post development. The proposed development reduces the area of hardstanding and increases the soft landscaped areas resulting in an overall reduced effective area.

The modelling of the surface water run-off flow rates indicate a potential reduction from 868 l/s pre-development to 514 l/s post development value (Q5 storm event+10%CC).

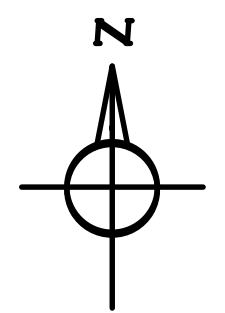
The proposed drainage design reflects the removal of a significant volume of otherwise clean water from the existing NI Water combined sewer infrastructure and existing CSO facilities; and represents considerable environmental betterment.

The inclusion of the playpark and car park drainage within the Site does not require any upsizing of the previously proposed outfall pipe, and the existing proposed outfall arrangement remains suitable for the revised development layout.

APPENDICES

APPENDIX A – Site Location Plan

APPENDIX B – Topographical Survey

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Rev	Rev. Date	Purpose of revision	Drawn	Checked	Approved

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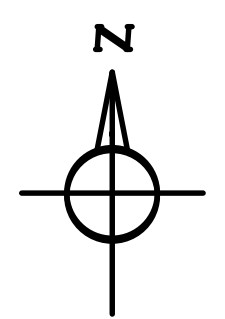
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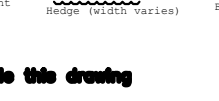
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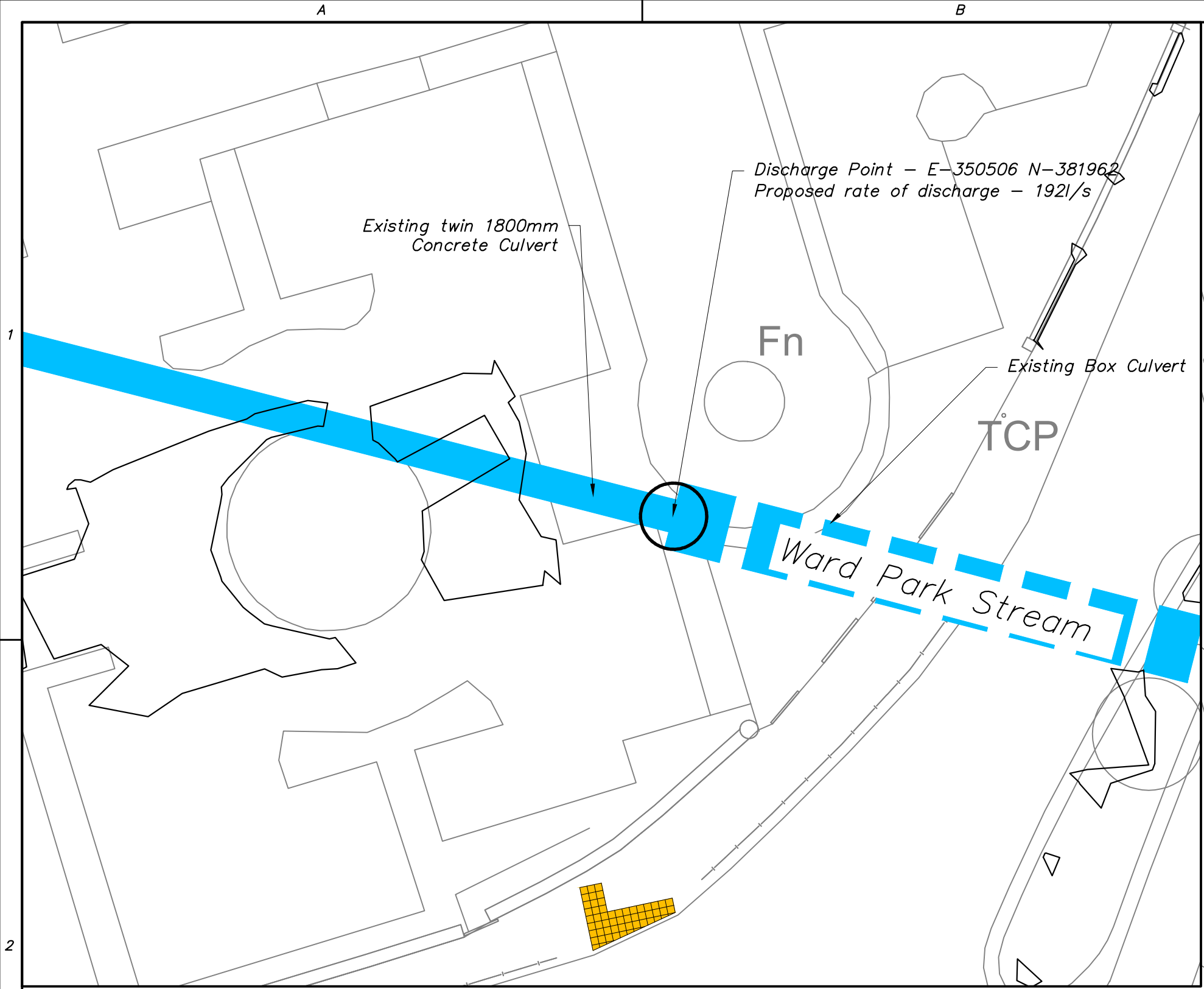
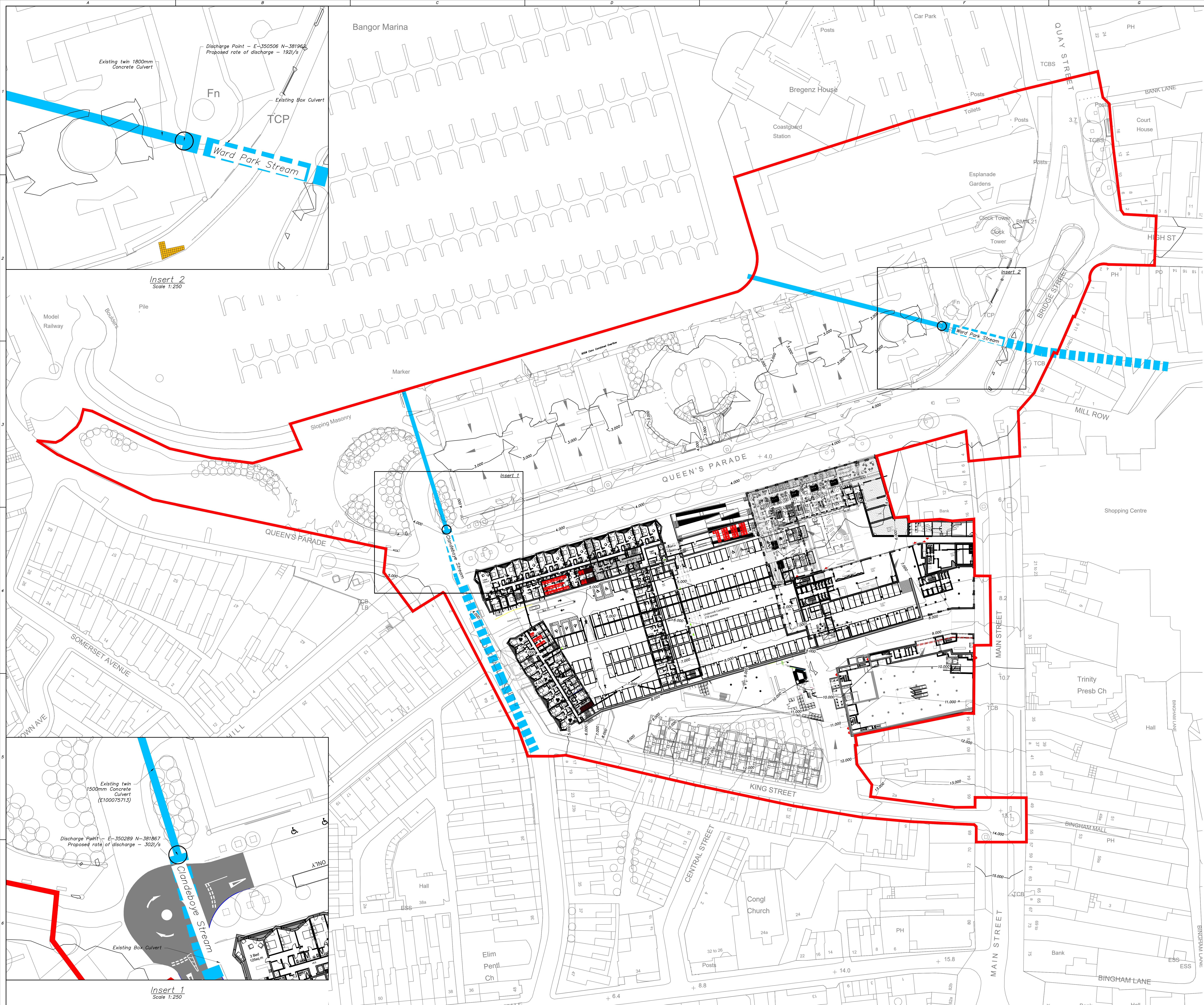
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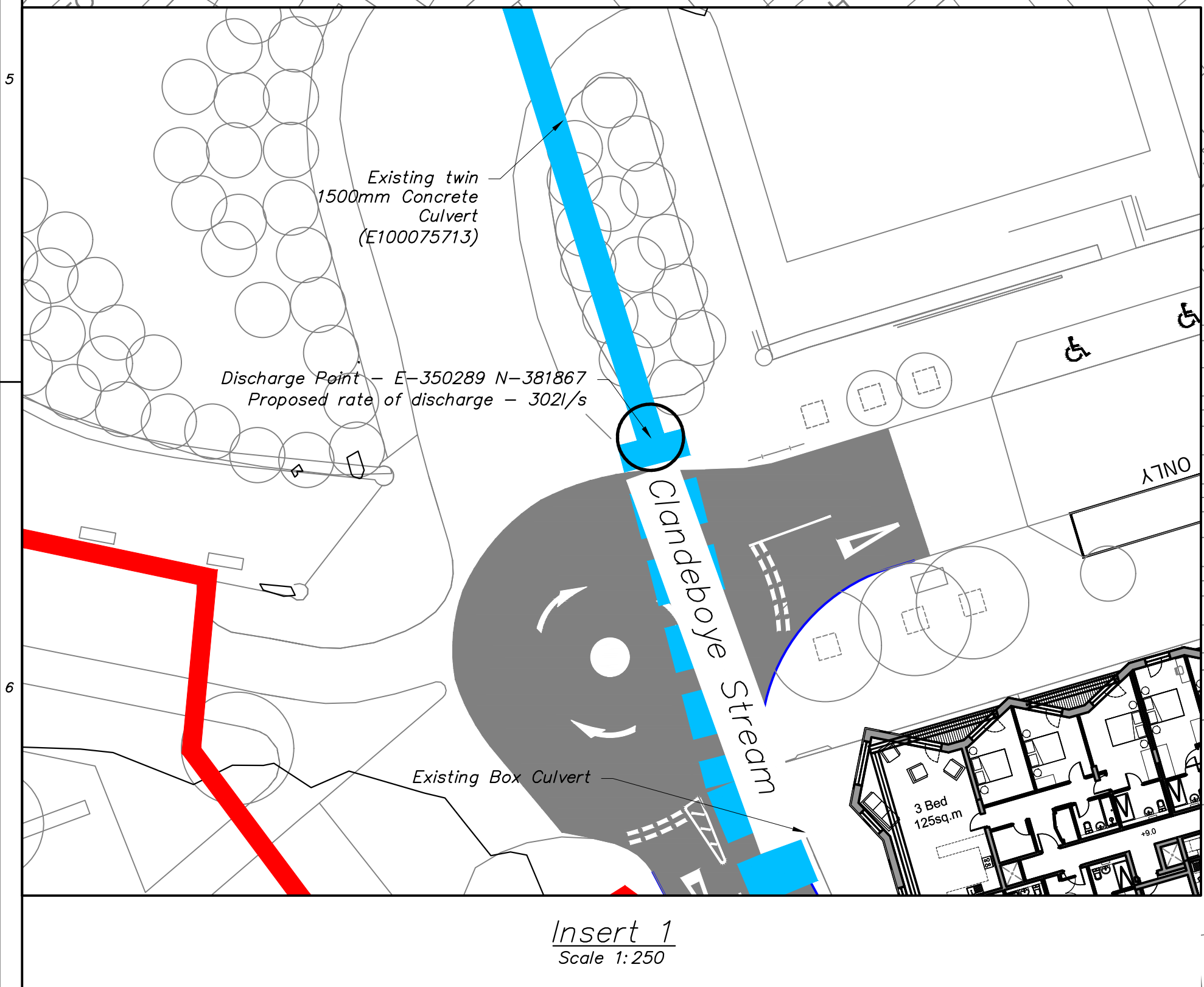


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APPENDIX C – Surface Profile and Contours



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Rev.	Date	By	Check	Details	Appr.
00	22.07.2019	JPS	AC	First Issue	JRL
01	22.11.2019	JPS	AC	Architectural Updates	JRL
02	18.01.2026	JPS	EF	Architectural Updates	AC

- Notes
1. This drawing should be read in conjunction with all relevant Architectural and Engineering drawings.
 2. Contractor to confirm the location and level of any existing obstructions/structures etc., uncovered during the works.
 3. Contractor to confirm the location and level of any existing sewers prior to the commencement of any works. Any discrepancies are to be notified to the engineer immediately.
 4. Contractor to confirm the location of all existing services, buried and overhead, prior to the commencement of the works.
 5. All setting out shall be in accordance with available Architecture drawings. This drawing shall not be used for setting out purposes.
 6. All works to comply with current British Standards, Codes of Practice, and Building Regulations. The Contractor shall verify all information on site and report any discrepancies immediately to the Engineer.

- Legend
- Existing Box Culvert
 - Existing Twin Culvert
 - Drainage Area A
 - Drainage Area B
 - Direction of surface water flow
 - Site Boundary
 - Contour

PRELIMINARY
DRAWING

Project Title:
Queens Parade Development

Drawing Title:
Surface Water Run-Off
Proposed Drainage Strategy

Client/Architect:	Bangor Marine Limited	Date:	July 2019
Drawn by:	JPS	Scales:	1:500
Checked by:	AC	Sheet Size:	A0
Approved by:	JRL		

Project Number:	192042	Orig:	DC	Zone:	XX	Level:	XX	Type:	GA	Dist:	C	Number:	103	Revision:	02
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Doran
CONSULTING
DELIVERING ENGINEERING EXCELLENCE

Nonwood House
96-102 Great Victoria Street,
Belfast BT2 7BE
T: 028 90335443
F: 028 90335501
E: info@doran.co.uk
W: www.doran.co.uk

APPENDIX D

APPENDIX D1 – Dfl Rivers Correspondence & Asset Information

Asset Management Unit



Department for

Infrastructure

An Roinn

Bonneagair

www.infrastructure-ni.gov.uk

Dfl Rivers
49 Tullywiggan Road
Loughry
Cookstown
BT80 8SG
Tel: 028867 68300

Mr Mark Rafferty
Norwood House
96-102 Great Victoria Street
Belfast
BT2 7BE

Your Ref: 192042
Our Ref: IN1-19-9492
Date: 22 July 2019

Dear Mark

Re: Queens Parade, Bangor

Thank you for your enquiry received 19/07/2019 regarding the above site. The site is affected by a watercourse, which is designated within the terms of the Drainage (Northern Ireland) Order 1973. Please refer to map attached. Designated watercourses are shown delineated in pink. The actual alignment of the watercourse may not be accurately depicted, as re-alignment or culverting work may have been undertaken subsequent to designation. In these circumstances the alignment indicated by the culvert is considered to be more reliable.

It should be emphasised that any information provided is approximate and should be considered as guidance only. Before any works are carried out you should determine the exact position of these services on site.

There may be undesignated watercourses, within or bounding the site, about which we are unaware. Dfl Rivers does not maintain a database of undesignated watercourses, which may be present at the site. In this regard, you are advised to consult with Ordnance Survey, and/or undertake site inspections, etc.

Within the terms of the above mentioned Order you are advised as follows:

1. If during the course of developing a site a watercourse is uncovered which was not previously evident, the Greater Belfast Office at Ravarnet House, Altona Road, LISBURN, BT27 5QB, Tel. 02892606100, must be contacted immediately in order that arrangements may be made for an investigation and direction in respect of any possible actions that may be necessary to maintain its drainage function; moreover

2. Any proposal either temporary or permanent in connection with a development that may impact on the drainage function of any watercourse within the site, now or in the future, such as release of storm water to, culverting, bridging, diverting building, adjacent to and/or over, etc requires prior written consent from the Department. Details of such proposals, together with accompanying drawings, maps and calculations etc must be submitted in advance of any development to the Greater Belfast Office at Ravarnet House, Altona Road, LISBURN, BT27 5QB, Tel. 02892606100. Failure to obtain such a written consent is an offence under the provisions of the above Order, which may lead to prosecution or other statutory action as provided for.

The Department does not accept any liability for loss, injury or damage to any person or property as a result of any inaccuracy in the above information provided. In this regards you are advised to seek the services of qualified competent professional bodies to ascertain the suitability and completeness of the information regarding the location, condition of and responsibility for any buried services at this location.

Future requests regarding the information on the Department's drainage and flood defence infrastructure should continue to be addressed to the DfI Rivers Asset Management Unit at the above address.

Yours sincerely



Robert Keighley
Asset Management Unit

DfI Rivers Infrastructure

Location of Designated Watercourses & Assets managed by DfI Rivers.

MAP COVERAGE - LOCATION



Scale 1:5,000 when plotted at A4

DfI Rivers Infrastructure

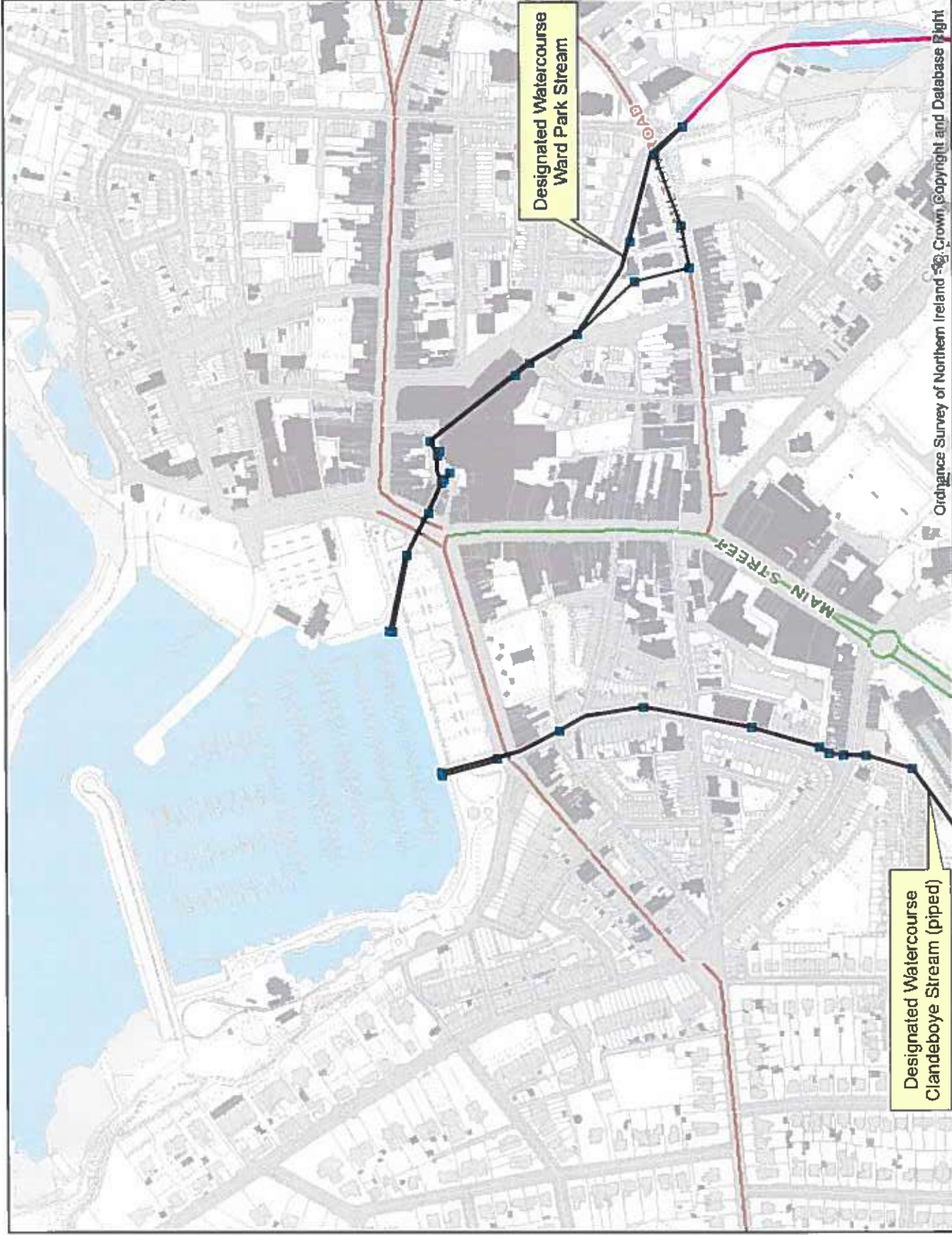
- Watercourses (Designated)
- Network Pipe
- Network Pipe Node
- Flood Defence Structure
- River Level Gauging Station
- River Level Alert Station

NOTES on information shown.

- Any proposals, either temporary or permanent, which involve interference with any watercourse, such as culverting, bridging, diversion, building adjacent to, or discharge of stormwater etc. require the written consent of DfI Rivers. Failure to obtain such written consent is an offence under the provisions of the Drainage (NI) Order 1973, which may lead to prosecution or other statutory action as provided for.
- If during the course of developing a site, a watercourse is uncovered which was not previously evident, DfI Rivers should be notified immediately in order that arrangements may be made for investigation and decision in respect of any action to deal with said watercourse. You are advised to assess the suitability/feasibility of the information provided as DfI Rivers does not accept liability for loss, injury or damage to any person or property caused as a result of any inaccuracy in the information provided.



DfI Rivers Ref.: IN1-19-9492
Publication Date: 22 July 2019



Designated Watercourse (piped)

Designated Watercourse Ward Park Stream

Ordnance Survey of Northern Ireland



Coordinates System: Irish Grid.
Coordinates in metres.
Heights in metres above MSL Belfast.

Compiled & published by the Department for Infrastructure, DfI Rivers, 48 Tullycappan Road, Loughry, Coleraine, County Tyrone, BT60 8SG

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APPENDIX D2 – DfI Rivers Schedule 6

Mark Rafferty
Doran Consulting
96-102 Great Victoria Street
Belfast
BT2 7BE

Ravarnet House
36 Altona Road
Lisburn
BT27 5QB
Tel: 028 9260 6100

Your reference: 192042
Our reference: IN1-19-9361
Date: 16 September 2019

Dear Mark

RE: QUEENS PARADE DEVELOPMENT

Thank you for your correspondence received 16 July 2019 regarding the above. From a drainage aspect my comments are as follows.

The Department for Infrastructure is unable to consent to your proposal to discharge 554 l/s from the site in question under Schedule 6 of the Drainage (Northern Ireland) Order 1973. Consent is declined due to both the tidal influence on the site and the probability of fluvial flooding upstream of your discharge location on the Ward Park Stream.

The Department would however consent to discharge at the greenfield runoff rate of 10 l/s per hectare at the locations noted in your application. In accordance with our methodology this would equate to 23.3 l/s to the Ward Park Stream and 16.5 l/s to the Clandeboy Stream.

In giving its consent the Department would stress that it is your responsibility to ensure:

- That the proposed works do not result in any obstruction to flow arising from a blockage, structural failure, poor workmanship or any other reason.
- There is no restriction or reduction to the watercourse's capacity either during or upon completion of the works.

DfI Rivers may also consider a revised application at the brownfield runoff rate. Brownfield runoff will only be considered if you can prove that the existing runoff is connected directly to the Department's network.

Please note that failure to adhere to the above conditions is a contravention of the Drainage (NI) Order 1973 and may result in legal proceedings. This consent and approval of associated proposals is valid for a period of 12 months from the date of this letter. If the proposals are not substantially completed and any approved discharge not substantially commenced within this 12 month period of time, they should be resubmitted for further appraisal. The applicant should note that any further appraisal may change any consents and approvals already issued.

Applicants should note that in accordance with Paragraph 11 of Schedule 6 of the Drainage (Northern Ireland) Order 1973 any consents/approvals given by the Department under Schedule 6 shall not affect the liability of any applicant to comply with other legislation. The Department for Infrastructure's consent is from a Drainage and flood risk aspect only. It is your responsibility to contact any other parties which may have an interest in your proposals e.g. NIEA, Landowners, Fisheries etc.

Should you require any further information or clarification please contact me at the above address and quote the above reference number.

Yours faithfully

A solid black rectangular box used to redact the signature of Peter Neish.

Peter Neish
Engineering Section

APPENDIX E – DfI Rivers Flood Maps

350000

351200

382400

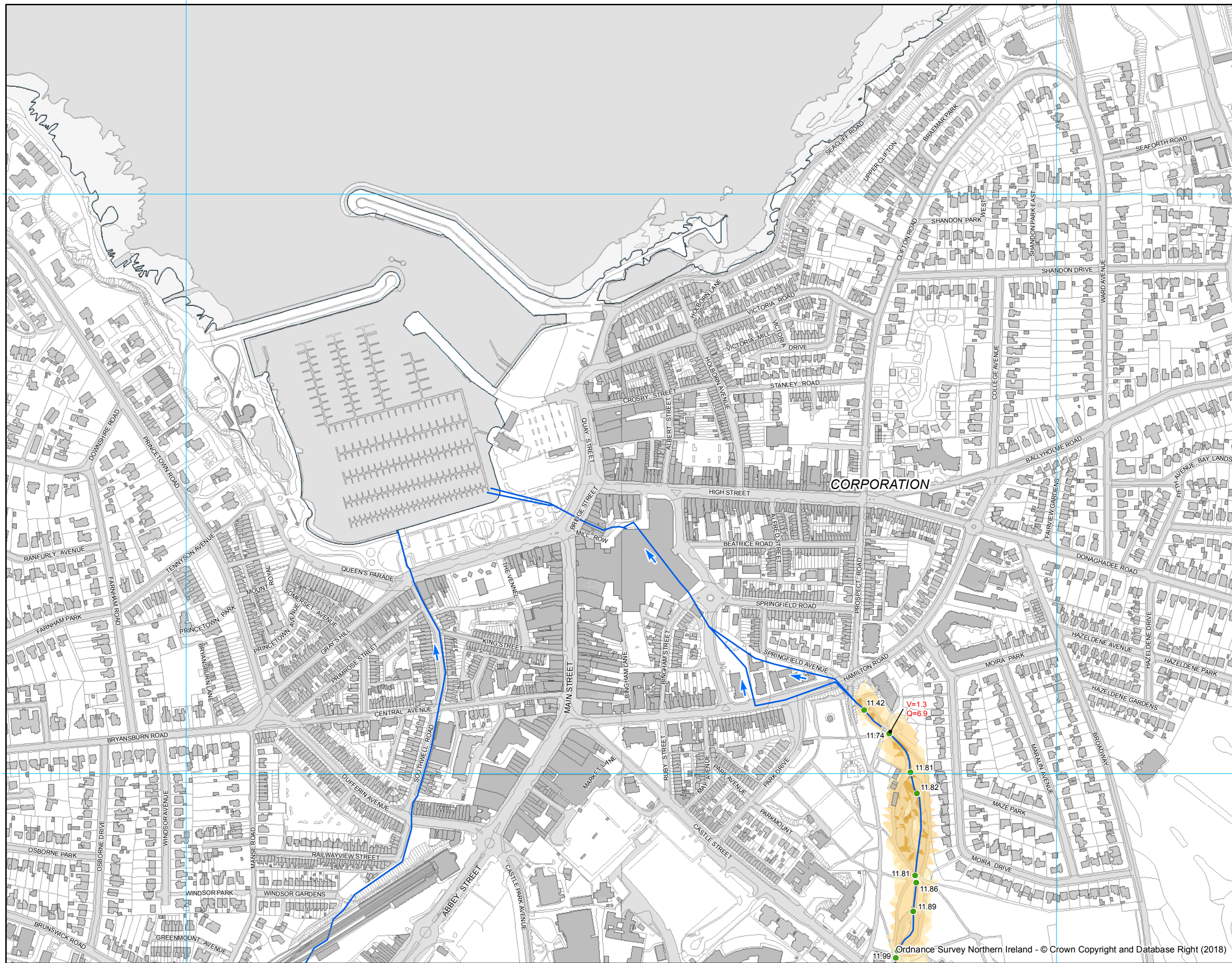
382400

381600

381600

350000

351200

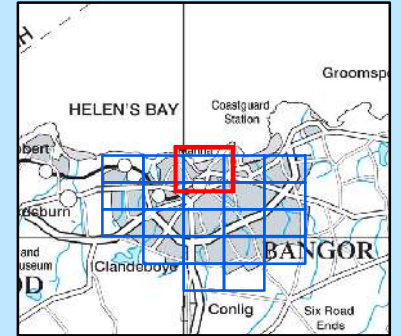


Flood Hazard Depth

Medium Probability

1% chance that a flood of this magnitude or greater will occur in any given year.

Map Type: FLOOD HAZARD
Source: RIVER
Epoch: PRESENT DAY



Scale 1:5,000 when plotted at A3

River Model Status

- Modelled in Detail
- ... Modelled Strategically
- - - Unmodelled
- Flow Direction

"Detailed" Hazard Data

- Depth < 0.3m
- Depth 0.3m - 1.0m
- Depth > 1.0m
- 12.23 River Level (m)
- V=1.2 Velocity (m/s)
- Q=3.4 Discharge (m³/s)

Flood Defence Structures

- Standard of Protection (SoP)
- SoP < 50 yrs
 - 50yrs ≤ SoP < 75 yrs
 - 75yrs ≤ SoP < 100 yrs
 - 100yrs ≤ SoP
 - ✕ Areas protected from river flooding in a 1 in 100 year flood event.

"Indicative" Hazard Data

- ... **"Indicative" Floodplain (1 in 100yrs)

* Estimated using strategic flood models and therefore should only be used to identify general areas prone to flooding and not to determine the hazard to individual properties.

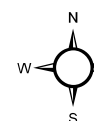
Coordinate System: Irish Grid.
Coordinates in metres.
Heights in metres above MSL Belfast.

Users of this map should refer to the guidance and conditions of use available at the DfI Rivers website.

Map Sheet : 11512SE

Drawing Number : FDM_11512SE

Publication Date: 31st July 2018



0 50 100 200 300 400 500 Metres

1:5,000

348800

351200

383200

383200

381600

381600

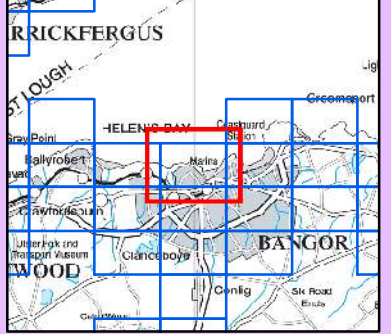


Surface Water Depth

High Probability

3.3% chance that a flood of this magnitude or greater will occur in any given year.

Map Type: FLOOD HAZARD
Source: SURFACE WATER
Epoch: PRESENT DAY



Scale 1:10,000 when plotted at A3

* Surface Water Hazard Data

- Depth < 0.3m
- Depth 0.3m - 1.0m
- Depth > 1.0m

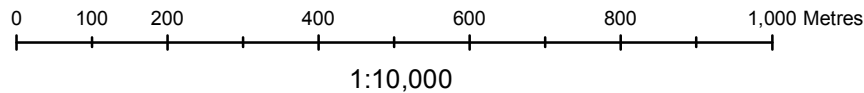
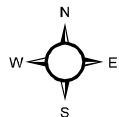
* Estimated using strategic flood models and therefore should only be used to identify general areas prone to flooding and not to determine the hazard to individual properties.

Coordinate System: Irish Grid.
Coordinates in metres.
Heights in metres above MSL Belfast.
Users of this map should refer to the guidance and conditions of use available at the Rivers Agency website.

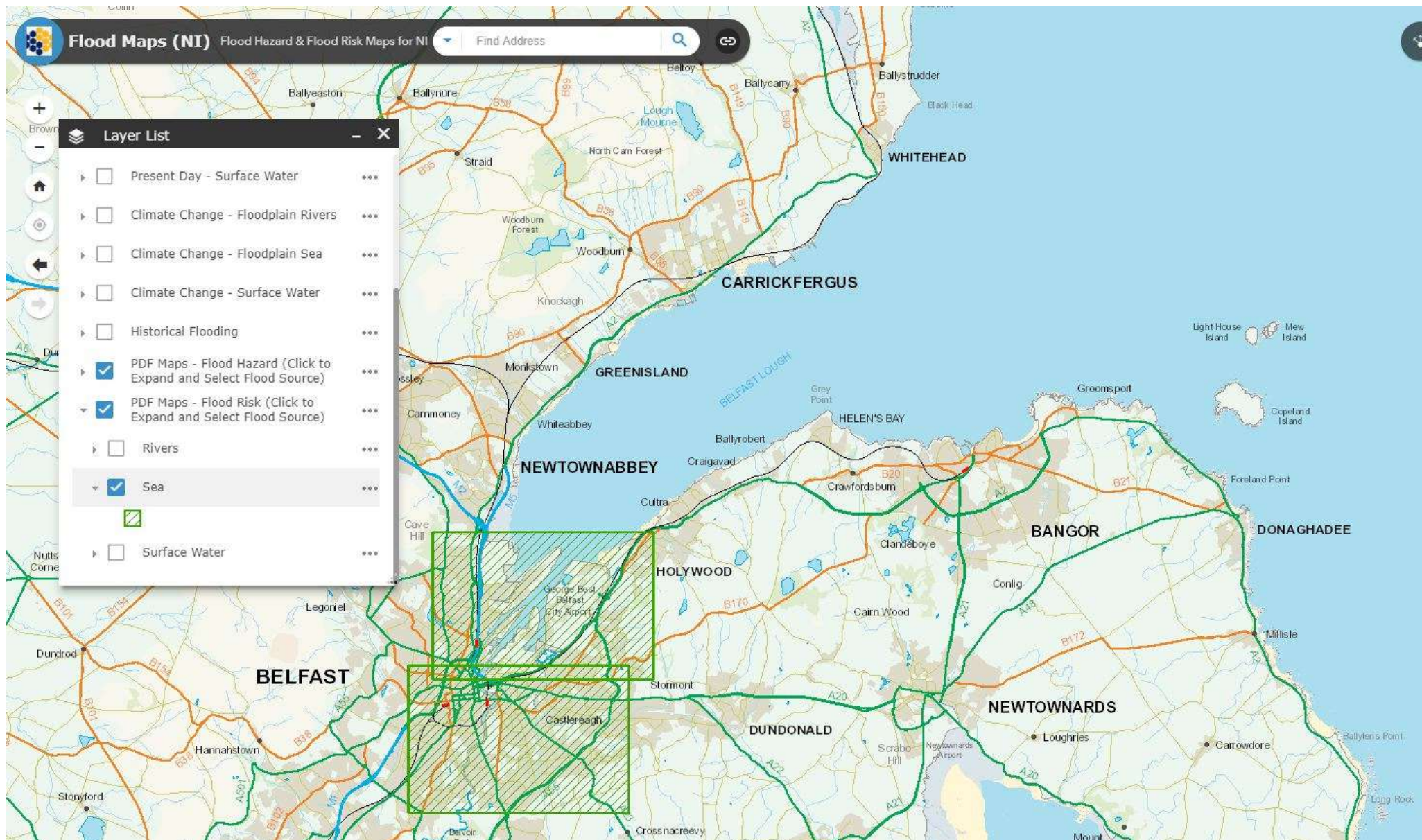


Map Sheet : 11512
Drawing Number : PDH_11512
Publication Date: 18 June 2014

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Compiled and published by Dept. of Agriculture & Rural Development, Rivers Agency, Hydebank, 4 Hospital Road, Belfast, Northern Ireland, BT8 8JP.



APPENDIX F – NI Water PDE Response & Asset Drawing

Northern Ireland Water

Developers Services.
Ballykeel Office
188 Larne Road Link
Ballykeel
Ballymena
BT42 3HA
www.niwater.com



Tel: 03457 440088

Mark Rafferty
Doran Consulting
Norwood House, 96-102 Great Victoria Street
Belfast
Mark.rafferty@doran.co.uk

Email Rachel.moffitt@niwater.com
Your Ref
Our Ref DS20628
Date 20th August 2019

Dear Sir,

RE: PROPOSED DEVELOPMENT AT QUEEN'S PARADE, BANGOR

Thank you for your pre development enquiry (PDE), received 8th July 2019, in respect of the above development of 135 residential units.

Please find enclosed extracts taken from our records, indicating the **approximate** routes of existing public water and sewerage services.

Your attention is drawn to the disclaimer notice on all enclosures.

(i) A **Network Capacity Check** for the Watermain is required.

A watermain Network Capacity Check can be applied for via a letter of application, referencing this PDE. Please include a location map, referencing the development phases (if appropriate) including number of units for each phase and proposed connection points. The onus is on the developer to keep NIW updated of any changes to the development that may have an impact on the results of this NCC. Applications and an accompanying fee of **£1,728.00**, made payable to Northern Ireland Water should be sent to NI Water, DSCT, Ballykeel Office, 188 Larne Road Link, Ballymena, BT42 3HA.

Please note the current turnaround for a Watermain NCC is 3 - 6 months.

(ii) There is a 1200mm diameter public foul sewer located within Quay Street, however there is downstream **incapacity**. **A network Capacity check is required.**

NIW can consider connections where developer can demonstrate (including calculations),

1. Like for like development
2. Extant previously approved development (please provide a copy of NIW planning consultation response)



3. Where the development will offer a reduced loading on the sewer network, which may include storm separation and/or attenuation (may be subject to Article 154)

A foul sewer Network Capacity Check can be applied for via a letter of application, referencing this PDE. Please include a location map, referencing the development phases (if appropriate) including number of units for each phase and proposed connection points. The onus is on the developer to keep NIW updated of any changes to the development that may have an impact on the results of this NCC. Applications and an accompanying deposit of £500.00, made payable to Northern Ireland Water should be sent to NI Water, DSCT, Ballykeel Office, 188 Larne Road Link, Ballymena, BT42 3HA.

Please note the current turnaround for a Foul Sewer NCC is 6 - 18 months.

Your attention is drawn to **Important Note (vii) below regarding construction in close proximity to existing public water and sewerage services**

(iii) There is **no** public storm sewer available which can serve this proposal. As such the applicant should liaise with DFI –Rivers Agency if discharge would be possible to any local watercourses. If this option is not deemed viable the applicant may wish to requisition NI Water to provide a suitable storm outfall sewer, **see Important Note (i) below. Under no circumstances will storm water be permitted to enter a public foul sewer.**

(iv) The receiving Waste Water Treatment facility (North Down WwTW) has sufficient capacity to serve this proposal.

Important Notes

(i) All appropriate application pro forma for both water and sewerage services may be obtained at www.niwater.com, under “Services for Developers” or on request at the above address.

(ii) Where a public foul / storm sewer is indicated as being available, this does **not** infer that all of the lands can be served by gravity and as such it is the responsibility of the applicant to establish if pumping may in part or whole be necessary.

Additionally, where a public foul / storm sewer is located within lands **not** in the applicant’s ownership, the prior formal consent of the private land owner **must** be received by NI Water, **prior** to any “Application to Connect to a Public Sewer” being considered by NI Water.

(iii) Where a public water main is indicated as being available, this infers only that **a minimum pressure of 1.5 BAR or 9 litres/ minute is available at the curtilage of the lands.** On high rise developments it will be the responsibility of the applicant to establish if private boosting of water pressure within the subject lands; ie, **at no cost to NI Water**, will be necessary.

Additionally and as in (ii) above where a public watermain is located within lands **not** in the applicant’s ownership, the prior formal consent of the private land owner **must** be received by NI Water, **prior** to any “Application to Connect to a Public Watermain” being considered by NI Water



(iv) Where drainage systems within any development are intended to be offered to NI Water for adoption; i.e., under an Article 161 Agreement, (or retrospectively under an Article 159 Agreement), foul and storm drainage systems within and serving same **must** be designed and provided using separate systems. More overly storm water attenuation solutions; i.e., specifically the use of oversized storm water pipes, can only be considered on the basis that all other conventional solutions have been explored and eliminated, in co-ordination with the Rivers Agency

Where an Article 161 Agreement will apply, the proposed foul and storm water drainage systems within and serving the development **must** have the formal approval of NI Water, **prior to any application(s) to make connection(s) to the public drainage network(s) being considered.**

Any drainage systems which may **not be offered to NI Water for adoption**; e.g., those serving new schools, hospitals, etc., **must** also be designed and provided on separate foul and storm water systems.

Under no circumstances will storm water be permitted to enter a public foul sewer.

(v) On larger developments and / or where specific network inadequacies already exist, an applicant may as part of a PDE response be required to formally request a public water and / or drainage Network Capacity Check (NCC).

(vi) Where there is an inadequate receiving public foul drainage network and /or waste water treatment capacity, **the applicant will not be permitted to make connection to the public foul drainage network until appropriate upgrading works have been completed. The applicant may also be required to construct a temporary WwTW, with the prior consent of Northern Ireland Environment Agency.** In certain circumstances the applicant may be required to construct **a permanent WwTW, which may or may not be adoptable by NI Water**

(vii) **Building over a public water main is not permitted and only in exceptional circumstances may building over a public sewer be permitted.**

Where realignment of part or all of a public sewer is deemed necessary, this **may** in certain instances be accommodated as part of an Article 161 Agreement. In all other instances formal application to divert a public sewer, together with detailed proposals of same, must be forwarded to the above address.

Current criteria regarding construction in proximity to public water mains and sewers, prohibits any foundations within 4m and 3m either side of same respectively, other than in respect of larger diameter trunk water mains/ sewers, 300mm diameter and above, where a greater minimum clearance of 6m either side of same will be necessary and site specifically requested.

All works associated with the realignment of any public sewer may only be take place **with the prior approval of and at no cost to NI Water**

(viii) Where foul water discharges from sites are other than purely domestic, NI Water - Trade Effluent Section **must** be contacted, in order to establish if a Trade Effluent Agreement may be applicable.

(ix) Grease traps and petrol interceptors **must** be used where appropriate or specifically indicated as being required.

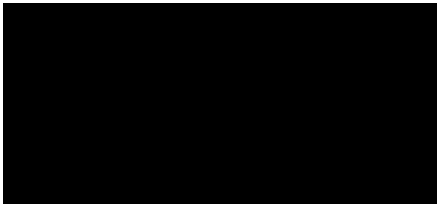


The above information will only be valid for a maximum period of 12 months and should formal approval to make connections to the public water and sewerage networks not have been granted by NI Water within this timescale, a further PDE will require to be submitted to ensure that capacity currently identified as being available to serve this proposal, still exists

Where the Developer proposes to construct sewers serving two or more properties they must enter into an Agreement for Adoption of the Sewers under Article 161 of the Water and Sewerage Services (Northern Ireland) Order 2006 (as amended Water and Sewerage Services Act (Northern Ireland) 2016). They must be designed to meet the criteria as set out in the current Sewers for Adoptions specification. A connection to the public sewer will not be permitted until such times as the Article 161 Agreement has been authorised by NI Water.

If you require any further information on these matters, please contact the undersigned at your convenience

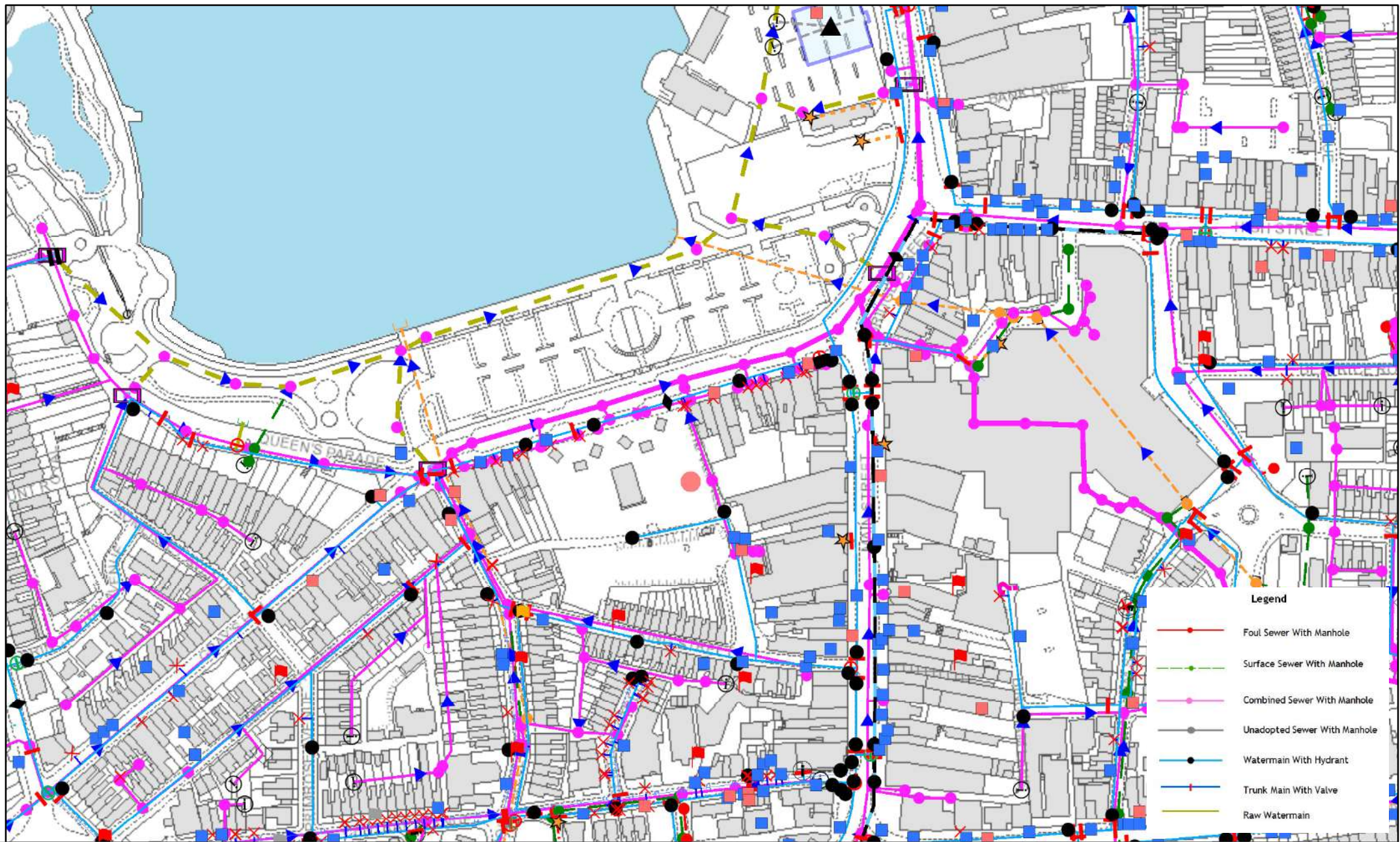
Yours Faithfully,



Rachel Moffitt

Developer Services - Technical Advisor





Service Enquiry Information

Joint

Crown copyright and database rights LPS (OSNI) EMOU (208.1) 2019

Centre X-Y: 350,445 381,890

Scale : 1 : 2500

Title : DS20628

Note : PDE - Queen's Parade, Bangor

Service Enquiry A4 Landscape

Plotted by : Moffitt@WATER

Date : 16 July 2019

Time : 14:19:01

Northern Ireland Water (NIW) Disclaimer:

The position and attributes of NIW infrastructure shown on this map should be regarded as approximate and should not be relied upon. NIW does not accept any liability for loss or damage to any person or property caused as a result of any inaccuracy in the information. For health and safety reasons it is your responsibility to determine the exact location of NIW infrastructure, prior to any excavation work being undertaken and it is recommended that hand dug trial holes are used to determine the precise location.

APPENDIX G – DfI Roads Correspondence

Rafferty, Mark | Doran Consulting

From: Murdock, Fred <Fred.Murdock@infrastructure-ni.gov.uk>
Sent: 24 July 2019 08:18
To: Rafferty, Mark | Doran Consulting
Subject: MT 97308-19 [192042] - Queens Parade Development, Bangor - drainage record request
Attachments: 192042_Dfl Roads_Info request.pdf

Dear Mr Rafferty,
Thank you for your e-mail dated 19 July 2019 regarding a request to show Dfl Roads drainage in the vicinity of Queens Parade, Bangor.
Unfortunately no records exist for this location.
I am sorry that I can be of no more assistance on this occasion.
Regards
Fred Murdock
Deputy section Engineer

From: Rafferty, Mark | Doran Consulting [<mailto:mark.rafferty@doran.co.uk>]
Sent: 19 July 2019 12:14
To: DFI Roads Eastern <DflRoads.Eastern@infrastructure-ni.gov.uk>
Subject: [192042] - Queens Parade Development, Bangor

Good afternoon,

Please find the location plan attached for a development site in Bangor.

Can record maps for the Dfl Roads drainage in the proximity of this site be returned?

Regards,
Mark

Regards

Mark Rafferty
Chartered Civil Engineer

for
Doran Consulting
Norwood House
96 - 102 Great Victoria St
Belfast
BT2 7BE

Phone: 02890 333443
Fax: 02890 235501
Email: mark.rafferty@doran.co.uk
Web: <http://www.doran.co.uk>

This email has been scanned by the Symantec Email Security.cloud service.
For more information please visit <http://www.symanteccloud.com>

APPENDIX H – Run-Off Calculations

APPENDIX H1 – Existing Storm Run-Off Calculations

Doran Consulting Limited		Page 1
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 10:46 File Existing Calc.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes DC PIPES Manhole Sizes DC MHs

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	5	PIMP (%)	85
M5-60 (mm)	15.500	Add Flow / Climate Change (%)	10
Ratio R	0.300	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	200	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	48.464	0.240	201.9	4.945	5.00	0.0	0.600	o	750	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	58.91	5.41	0.000	4.945	0.0	0.0	78.9	1.97	868.4	867.9

Doran Consulting Limited		Page 1
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 10:48 File Existing Calc.MDX	Designed by 814 Checked by	
XP Solutions Network 2020.1.3		

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes DC PIPES Manhole Sizes DC MHs

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	30	PIMP (%)	85
M5-60 (mm)	15.500	Add Flow / Climate Change (%)	10
Ratio R	0.300	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	200	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	48.464	0.240	201.9	4.945	5.00	0.0	0.600	o	900	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	84.53	5.37	0.000	4.945	0.0	0.0	113.2	2.20	1400.4	1245.4

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Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 10:49 File Existing Calc.MDX	Designed by 814 Checked by	
XP Solutions Network 2020.1.3		

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes DC PIPES Manhole Sizes DC MHs

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	100	PIMP (%)	85
M5-60 (mm)	15.500	Add Flow / Climate Change (%)	10
Ratio R	0.300	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	200	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	48.464	0.240	201.9	4.945	5.00	0.0	0.600	o	1050	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	107.74	5.33	0.000	4.945	0.0	0.0	144.3	2.42	2096.8	1587.3

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APPENDIX H2 – Proposed Storm Run-Off Calculations - no tidal events modelled

Doran Consulting Limited		Page 1
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25 File Proposed No Tide.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes DC PIPES Manhole Sizes DC MHs

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	15.600	Add Flow / Climate Change (%)	10
Ratio R	0.300	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	200	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	1.418	4-8	1.740	8-12	0.025

Total Area Contributing (ha) = 3.182

Total Pipe Volume (m³) = 106.078

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	21.043	1.052	20.0	0.295	5.00	0.0	0.600	o	225	Pipe/Conduit	
S1.001	22.150	1.519	14.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S2.000	27.330	0.271	100.9	0.052	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.002	10.573	0.076	139.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.003	2.040	0.014	150.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.004	1.499	0.005	300.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.005	27.313	0.091	300.1	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.006	13.139	0.044	298.6	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL Σ (m)	I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	48.61	5.12	9.775	0.295	0.0	0.0	3.9	2.94	116.9	42.8
S1.001	48.22	5.23	8.723	0.295	0.0	0.0	3.9	3.44	137.0	42.8
S2.000	47.42	5.46	7.550	0.052	0.0	0.0	0.7	1.00	17.7	7.4
S1.002	46.97	5.59	7.129	0.348	0.0	0.0	4.4	1.33	93.9	48.6
S1.003	46.88	5.61	7.053	0.348	0.0	0.0	4.4	1.28	90.6	48.6
S1.004	46.78	5.64	3.803	0.348	0.0	0.0	4.4	0.90	63.8	48.6
S1.005	45.38	6.08	3.798	0.348	0.0	0.0	4.4	1.04	114.9	48.6
S1.006	44.75	6.29	3.707	0.348	0.0	0.0	4.4	1.04	115.2	48.6

Doran Consulting Limited		Page 2
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25 File Proposed No Tide.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S3.000	44.656	0.298	150.0	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
S3.001	35.891	0.239	150.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.007	9.792	0.033	296.7	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S4.000	34.300	0.570	60.2	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.008	22.600	0.185	122.2	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S5.000	46.827	0.255	183.6	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
S6.000	74.456	2.978	25.0	0.102	5.00	0.0	0.600	o	225	Pipe/Conduit	
S6.001	18.936	0.780	24.3	0.028	0.00	0.0	0.600	o	225	Pipe/Conduit	
S7.000	59.039	2.958	20.0	0.147	5.00	0.0	0.600	o	225	Pipe/Conduit	
S6.002	3.748	0.028	133.4	0.004	0.00	0.0	0.600	o	225	Pipe/Conduit	
S6.003	2.367	0.014	166.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S6.004	18.341	0.084	218.3	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S8.000	20.755	0.092	225.0	0.211	5.00	0.0	0.600	o	300	Pipe/Conduit	
S6.005	11.219	0.030	375.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S6.006	2.580	0.009	275.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S6.007	11.655	0.031	375.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S6.008	11.032	0.029	375.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S3.000	45.92	5.91	4.350	0.000	0.0	0.0	0.0	0.82	14.5	0.0
S3.001	43.73	6.64	4.052	0.000	0.0	0.0	0.0	0.82	14.5	0.0
S1.007	43.30	6.80	3.663	0.348	0.0	0.0	4.4	1.05	115.6	48.6
S4.000	47.47	5.44	4.350	0.000	0.0	0.0	0.0	1.30	23.0	0.0
S1.008	42.68	7.03	3.630	0.348	0.0	0.0	4.4	1.64	180.9	48.6
S5.000	45.45	6.06	3.850	0.000	0.0	0.0	0.0	0.74	13.0	0.0
S6.000	47.36	5.47	10.375	0.102	0.0	0.0	1.3	2.63	104.5	14.4
S6.001	46.96	5.59	7.397	0.130	0.0	0.0	1.7	2.67	106.0	18.2
S7.000	47.84	5.33	9.575	0.147	0.0	0.0	1.9	2.94	117.0	21.0
S6.002	46.77	5.65	6.617	0.282	0.0	0.0	3.6	1.13	44.9	39.3
S6.003	46.67	5.68	3.781	0.282	0.0	0.0	3.6	1.21	85.8	39.3
S6.004	45.86	5.93	3.767	0.282	0.0	0.0	3.6	1.22	135.0	39.3
S8.000	47.85	5.33	3.775	0.211	0.0	0.0	2.7	1.04	73.8	30.0
S6.005	45.23	6.13	3.608	0.493	0.0	0.0	6.0	0.93	102.7	66.4
S6.006	45.11	6.17	3.578	0.493	0.0	0.0	6.0	1.09	120.1	66.4
S6.007	44.49	6.38	3.568	0.493	0.0	0.0	6.0	0.93	102.7	66.4
S6.008	43.91	6.58	3.537	0.493	0.0	0.0	6.0	0.93	102.7	66.4

Doran Consulting Limited		Page 3
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25	Designed by 814	
File Proposed No Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S6.009	23.534	0.063	375.0	0.261	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.009	21.815	1.045	20.9	0.514	0.00	0.0	0.600	o	450	Pipe/Conduit	
S9.000	52.403	0.312	168.2	0.085	5.00	0.0	0.600	o	150	Pipe/Conduit	
S9.001	27.362	0.113	241.9	0.051	0.00	0.0	0.600	o	225	Pipe/Conduit	
S10.000	39.193	0.388	100.9	0.052	5.00	0.0	0.600	o	225	Pipe/Conduit	
S10.001	14.856	0.147	100.9	0.019	0.00	0.0	0.600	o	225	Pipe/Conduit	
S10.002	18.323	0.205	89.4	0.023	0.00	0.0	0.600	o	225	Pipe/Conduit	
S10.003	15.685	0.093	167.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S10.004	35.116	0.209	167.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S10.005	35.026	0.145	241.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.010	22.982	0.052	443.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.011	33.055	0.026	1274.4	0.021	0.00	0.0	0.600	o	675	Pipe/Conduit	
S11.000	23.214	0.218	106.6	0.077	5.00	0.0	0.600	o	150	Pipe/Conduit	
S12.000	21.191	0.212	100.0	0.061	5.00	0.0	0.600	o	150	Pipe/Conduit	
S12.001	1.178	0.012	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S13.000	6.026	0.025	241.0	0.415	5.00	0.0	0.600	o	450	Pipe/Conduit	
S13.001	1.825	0.008	228.1	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S13.002	1.640	0.100	16.4	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S13.003	2.274	0.009	252.7	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S6.009	42.88	6.95	3.433	0.754	0.0	0.0	8.7	1.04	166.0	96.2
S1.009	42.46	7.11	3.295	1.615	0.0	0.0	18.6	4.47	710.2	204.3
S9.000	45.23	6.13	2.900	0.085	0.0	0.0	1.0	0.77	13.6	11.5
S9.001	43.63	6.68	2.513	0.136	0.0	0.0	1.6	0.84	33.2	17.7
S10.000	47.26	5.50	3.025	0.052	0.0	0.0	0.7	1.30	51.7	7.4
S10.001	46.62	5.69	2.637	0.072	0.0	0.0	0.9	1.30	51.7	9.9
S10.002	45.91	5.91	2.489	0.095	0.0	0.0	1.2	1.38	55.0	13.0
S10.003	45.10	6.17	2.284	0.095	0.0	0.0	1.2	1.01	40.0	13.0
S10.004	43.41	6.75	2.191	0.095	0.0	0.0	1.2	1.01	40.0	13.0
S10.005	41.58	7.45	1.982	0.095	0.0	0.0	1.2	0.84	33.2	13.0
S1.010	40.77	7.79	0.762	1.846	0.0	0.0	20.4	1.15	325.3	224.3
S1.011	39.07	8.54	0.635	1.867	0.0	0.0	20.4	0.73	259.6	224.3
S11.000	47.62	5.40	2.450	0.077	0.0	0.0	1.0	0.97	17.2	10.9
S12.000	47.78	5.35	2.650	0.061	0.0	0.0	0.8	1.00	17.8	8.7
S12.001	47.71	5.37	2.438	0.061	0.0	0.0	0.8	1.00	17.8	8.7
S13.000	48.76	5.08	2.000	0.415	0.0	0.0	5.5	1.31	207.6	60.2
S13.001	48.68	5.10	1.975	0.415	0.0	0.0	5.5	1.34	213.4	60.2
S13.002	48.66	5.11	1.967	0.415	0.0	0.0	5.5	5.04	801.5	60.2
S13.003	48.55	5.13	1.867	0.415	0.0	0.0	5.5	1.27	202.7	60.2

Doran Consulting Limited		Page 4
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25 File Proposed No Tide.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S13.004	10.833	0.045	240.7	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S11.001	11.034	0.073	151.2	0.013	0.00	0.0	0.600	o	450	Pipe/Conduit	
S11.002	12.468	0.073	170.8	0.061	0.00	0.0	0.600	o	450	Pipe/Conduit	
S11.003	18.112	0.179	101.2	0.037	0.00	0.0	0.600	o	450	Pipe/Conduit	
S14.000	16.783	0.168	99.9	0.019	5.00	0.0	0.600	o	150	Pipe/Conduit	
S14.001	4.480	0.045	99.6	0.016	0.00	0.0	0.600	o	150	Pipe/Conduit	
S11.004	13.458	0.056	240.3	0.010	0.00	0.0	0.600	o	450	Pipe/Conduit	
S11.005	29.590	0.123	240.6	0.019	0.00	0.0	0.600	o	375	Pipe/Conduit	
S15.000	19.991	0.200	100.0	0.017	5.00	0.0	0.600	o	150	Pipe/Conduit	
S15.001	18.053	0.144	125.4	0.235	0.00	0.0	0.600	o	375	Pipe/Conduit	
S16.000	12.092	0.071	170.3	0.053	5.00	0.0	0.600	o	375	Pipe/Conduit	
S16.001	18.716	0.077	243.1	0.053	0.00	0.0	0.600	o	375	Pipe/Conduit	
S16.002	3.061	0.031	98.7	0.030	0.00	0.0	0.600	o	375	Pipe/Conduit	
S16.003	3.177	0.050	63.5	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S16.004	4.362	0.044	99.1	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S15.002	10.718	0.063	170.1	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S17.000	16.035	0.258	62.2	0.016	5.00	0.0	0.600	o	225	Pipe/Conduit	
S15.003	28.348	0.116	244.4	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S13.004	48.05	5.27	1.858	0.415	0.0	0.0	5.5	1.31	207.7	60.2
S11.001	47.23	5.51	1.813	0.565	0.0	0.0	7.2	1.65	262.6	79.5
S11.002	46.78	5.64	1.739	0.627	0.0	0.0	7.9	1.55	247.0	87.3
S11.003	46.29	5.79	1.666	0.664	0.0	0.0	8.3	2.02	321.4	91.6
S14.000	48.03	5.28	2.000	0.019	0.0	0.0	0.3	1.01	17.8	2.8
S14.001	47.77	5.35	1.832	0.036	0.0	0.0	0.5	1.01	17.8	5.1
S11.004	45.75	5.96	1.487	0.709	0.0	0.0	8.8	1.31	207.9	96.7
S11.005	44.46	6.39	1.431	0.729	0.0	0.0	8.8	1.16	128.5	96.7
S15.000	47.85	5.33	2.950	0.017	0.0	0.0	0.2	1.01	17.8	2.4
S15.001	47.20	5.52	2.675	0.252	0.0	0.0	3.2	1.62	178.6	35.5
S16.000	48.51	5.15	2.000	0.053	0.0	0.0	0.7	1.39	153.0	7.7
S16.001	47.56	5.41	1.854	0.106	0.0	0.0	1.4	1.16	127.9	15.0
S16.002	47.46	5.44	1.777	0.136	0.0	0.0	1.7	1.82	201.4	19.2
S16.003	47.38	5.47	1.746	0.136	0.0	0.0	1.7	2.28	251.4	19.2
S16.004	47.24	5.51	1.696	0.136	0.0	0.0	1.7	1.82	201.0	19.2
S15.002	46.77	5.65	1.653	0.388	0.0	0.0	4.9	1.39	153.1	54.1
S17.000	48.46	5.16	2.000	0.016	0.0	0.0	0.2	1.66	66.1	2.3
S15.003	45.46	6.06	1.590	0.404	0.0	0.0	5.0	1.15	127.5	54.8

Doran Consulting Limited		Page 5
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25 File Proposed No Tide.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S15.004	8.917	0.036	247.7	0.083	0.00	0.0	0.600	o	375	Pipe/Conduit	
S18.000	4.537	0.460	9.9	0.079	5.00	0.0	0.600	o	150	Pipe/Conduit	
S15.005	50.391	0.206	244.6	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.012	17.899	0.030	596.6	0.020	0.00	0.0	0.600	o	750	Pipe/Conduit	
S1.013	2.312	0.004	578.0	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S15.004	45.06	6.19	1.474	0.487	0.0	0.0	5.9	1.15	126.7	65.4
S18.000	48.96	5.02	2.050	0.079	0.0	0.0	1.1	3.23	57.0	11.6
S15.005	42.98	6.91	1.438	0.567	0.0	0.0	6.6	1.15	127.5	72.6
S1.012	38.52	8.81	0.534	3.182	0.0	0.0	33.2	1.14	502.9	365.1
S1.013	38.45	8.84	0.504	3.182	0.0	0.0	33.2	1.16	511.0	365.1

Doran Consulting Limited		Page 6
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25	Designed by 814	
File Proposed No Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
S1	12.000	2.225	Open Manhole	1200	S1.000	9.775	225				
S2	10.300	1.577	Open Manhole	1200	S1.001	8.723	225	S1.000	8.723	225	
S14	8.900	1.350	Open Manhole	1200	S2.000	7.550	150				
S3	9.770	2.641	Open Manhole	1200	S1.002	7.129	300	S1.001	7.204	225	
								S2.000	7.279	150	
S4	9.900	2.847	Open Manhole	1200	S1.003	7.053	300	S1.002	7.053	300	
SD2	9.000	5.197	Open Manhole	1200	S1.004	3.803	300	S1.003	7.040	300	3237
S5	5.000	1.202	Open Manhole	1350	S1.005	3.798	375	S1.004	3.798	300	
S6	5.000	1.293	Open Manhole	1350	S1.006	3.707	375	S1.005	3.707	375	
S15	5.000	0.650	Open Manhole	1200	S3.000	4.350	150				
S16	5.000	0.948	Open Manhole	1200	S3.001	4.052	150	S3.000	4.052	150	
S7	5.000	1.337	Open Manhole	1350	S1.007	3.663	375	S1.006	3.663	375	
								S3.001	3.813	150	
S17	5.000	0.650	Open Manhole	1200	S4.000	4.350	150				
S8	5.000	1.370	Open Manhole	1350	S1.008	3.630	375	S1.007	3.630	375	
								S4.000	3.780	150	
S18	4.500	0.650	Open Manhole	1200	S5.000	3.850	150				
S19	12.600	2.225	Open Manhole	1200	S6.000	10.375	225				
S20	8.200	0.803	Open Manhole	1200	S6.001	7.397	225	S6.000	7.397	225	
S28	11.800	2.225	Open Manhole	1200	S7.000	9.575	225				
S21	8.600	1.983	Open Manhole	1200	S6.002	6.617	225	S6.001	6.617	225	
								S7.000	6.617	225	
SD1	9.000	5.219	Open Manhole	1200	S6.003	3.781	300	S6.002	6.589	225	2733
S22	5.000	1.233	Open Manhole	1800	S6.004	3.767	375	S6.003	3.767	300	
S29	5.000	1.225	Open Manhole	1800	S8.000	3.775	300				
S23	5.000	1.392	Open Manhole	1350	S6.005	3.608	375	S6.004	3.683	375	75
								S8.000	3.683	300	
S24	5.000	1.422	Open Manhole	1350	S6.006	3.578	375	S6.005	3.578	375	
S25	4.500	0.932	Open Manhole	1350	S6.007	3.568	375	S6.006	3.568	375	
S26	4.500	0.963	Open Manhole	1350	S6.008	3.537	375	S6.007	3.537	375	
S27	4.500	1.067	Open Manhole	1350	S6.009	3.433	450	S6.008	3.508	375	
S9	4.500	1.205	Open Manhole	1350	S1.009	3.295	450	S1.008	3.445	375	75
								S5.000	3.595	150	
								S6.009	3.370	450	75
S36	4.400	1.500	Open Manhole	1200	S9.000	2.900	150				
S37	4.250	1.737	Open Manhole	1200	S9.001	2.513	225	S9.000	2.588	150	
S30	4.450	1.425	Open Manhole	1200	S10.000	3.025	225				
S31	4.450	1.813	Open Manhole	1200	S10.001	2.637	225	S10.000	2.637	225	
S32	4.450	1.961	Open Manhole	1200	S10.002	2.489	225	S10.001	2.489	225	
S33	4.400	2.116	Open Manhole	1200	S10.003	2.284	225	S10.002	2.284	225	
S34	4.400	2.209	Open Manhole	1200	S10.004	2.191	225	S10.003	2.191	225	
S35	4.400	2.418	Open Manhole	1200	S10.005	1.982	225	S10.004	1.982	225	
S10	4.400	3.638	Open Manhole	1800	S1.010	0.762	600	S1.009	2.250	450	1338
								S9.001	2.400	225	1263

Doran Consulting Limited		Page 7
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25	Designed by 814	
File Proposed No Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

Manhole Schedules for Storm											
MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
S37	3.800	3.165	Open Manhole	1800	S1.011	0.635	675	S10.005	1.837	225	700
S38	3.800	1.350	Open Manhole	1200	S11.000	2.450	150	S1.010	0.710	600	
S39	4.000	1.350	Open Manhole	1200	S12.000	2.650	150				
S40	3.900	1.462	Junction		S12.001	2.438	150	S12.000	2.438	150	
S41	3.600	1.600	Open Manhole	1350	S13.000	2.000	450				
S42	3.600	1.625	Open Manhole	1350	S13.001	1.975	450	S13.000	1.975	450	
S43	3.650	1.683	Junction		S13.002	1.967	450	S13.001	1.967	450	
S44	3.650	1.783	Junction		S13.003	1.867	450	S13.002	1.867	450	
S45	3.650	1.792	Open Manhole	1350	S13.004	1.858	450	S13.003	1.858	450	
S46	3.900	2.087	Open Manhole	1350	S11.001	1.813	450	S11.000	2.232	150	119
								S12.001	2.426	150	313
								S13.004	1.813	450	
S47	3.900	2.161	Open Manhole	1350	S11.002	1.739	450	S11.001	1.740	450	1
S48	3.850	2.184	Open Manhole	1350	S11.003	1.666	450	S11.002	1.666	450	
S49	3.200	1.200	Open Manhole	1200	S14.000	2.000	150				
S50	3.500	1.668	Open Manhole	1200	S14.001	1.832	150	S14.000	1.832	150	
S51	3.800	2.313	Open Manhole	1350	S11.004	1.487	450	S11.003	1.487	450	
								S14.001	1.787	150	
S52	3.750	2.319	Open Manhole	1350	S11.005	1.431	375	S11.004	1.431	450	
S53	4.000	1.050	Open Manhole	1200	S15.000	2.950	150				
S54	3.675	1.000	Open Manhole	1350	S15.001	2.675	375	S15.000	2.750	150	
S55	4.200	2.200	Open Manhole	1200	S16.000	2.000	375				
S56	3.075	1.221	Open Manhole	1350	S16.001	1.854	375	S16.000	1.929	375	75
S57	3.075	1.298	Open Manhole	1200	S16.002	1.777	375	S16.001	1.777	375	
SFR PI Inlet	3.075	1.329	Junction		S16.003	1.746	375	S16.002	1.746	375	
SFR PI Outlet	3.075	1.379	Junction		S16.004	1.696	375	S16.003	1.696	375	
S58	3.075	1.423	Open Manhole	1350	S15.002	1.653	375	S15.001	2.531	375	878
								S16.004	1.652	375	
S59	3.200	1.200	Open Manhole	1200	S17.000	2.000	225				
S60	3.400	1.810	Open Manhole	1350	S15.003	1.590	375	S15.002	1.590	375	
								S17.000	1.742	225	2
S61	3.750	2.276	Open Manhole	1350	S15.004	1.474	375	S15.003	1.474	375	
S62	3.200	1.150	Open Manhole	1200	S18.000	2.050	150				
S63	3.750	2.312	Junction		S15.005	1.438	375	S15.004	1.438	375	
								S18.000	1.590	150	
S64	3.750	3.216	Open Manhole	1800	S1.012	0.534	750	S1.011	0.609	675	
								S11.005	1.308	375	399
								S15.005	1.232	375	323
S65	3.700	3.196	Open Manhole	2400	S1.013	0.504	750	S1.012	0.504	750	
S	3.700	3.200	Open Manhole	0		OUTFALL		S1.013	0.500	750	

Doran Consulting Limited		Page 8
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25 File Proposed No Tide.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S1	350466.054	381790.264	350466.054	381790.264	Required	
S2	350461.297	381810.762	350461.297	381810.762	Required	
S14	350482.394	381839.657	350482.394	381839.657	Required	
S3	350456.077	381832.288	350456.077	381832.288	Required	
S4	350445.953	381829.239	350445.953	381829.239	Required	
SD2	350445.354	381831.189	350445.354	381831.189	Required	
S5	350444.913	381832.622	350444.913	381832.622	Required	
S6	350418.686	381824.997	350418.686	381824.997	Required	
S15	350492.412	381860.030	350492.412	381860.030	Required	
S16	350449.532	381847.565	350449.532	381847.565	Required	
S7	350415.046	381837.621	350415.046	381837.621	Required	
S17	350445.226	381856.755	350445.226	381856.755	Required	
S8	350412.333	381847.030	350412.333	381847.030	Required	
S18	350451.032	381881.839	350451.032	381881.839	Required	
S19	350454.919	381777.813	350454.919	381777.813	Required	
S20	350382.082	381793.258	350382.082	381793.258	Required	
S28	350446.725	381799.677	350446.725	381799.677	Required	
S21	350388.776	381810.971	350388.776	381810.971	Required	

Doran Consulting Limited		Page 9
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25 File Proposed No Tide.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
SD1	350387.735	381814.572	350387.735	381814.572	Required	
S22	350385.499	381815.348	350385.499	381815.348	Required	
S29	350360.497	381827.494	350360.497	381827.494	Required	
S23	350380.509	381832.997	350380.509	381832.997	Required	
S24	350377.449	381843.791	350377.449	381843.791	Required	
S25	350376.684	381846.255	350376.684	381846.255	Required	
S26	350373.434	381857.447	350373.434	381857.447	Required	
S27	350384.050	381860.447	350384.050	381860.447	Required	
S9	350406.072	381868.745	350406.072	381868.745	Required	
S36	350476.394	381912.323	350476.394	381912.323	Required	
S37	350426.137	381897.479	350426.137	381897.479	Required	
S30	350352.270	381801.758	350352.270	381801.758	Required	
S31	350331.862	381835.219	350331.862	381835.219	Required	
S32	350324.763	381848.269	350324.763	381848.269	Required	
S33	350317.660	381865.159	350317.660	381865.159	Required	
S34	350332.682	381869.669	350332.682	381869.669	Required	
S35	350366.341	381879.680	350366.341	381879.680	Required	
S10	350399.911	381889.673	350399.911	381889.673	Required	

Doran Consulting Limited		Page 10
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25 File Proposed No Tide.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S37	350396.591	381912.414	350396.591	381912.414	Required	
S38	350490.855	381973.319	350490.855	381973.319	Required	
S39	350485.820	381954.909	350485.820	381954.909	Required	
S40	350469.216	381968.077			No Entry	
S41	350475.945	381986.148	350475.945	381986.148	Required	
S42	350477.494	381980.325	350477.494	381980.325	Required	
S43	350475.745	381979.804			No Entry	
S44	350474.177	381979.325			No Entry	
S45	350472.000	381978.669	350472.000	381978.669	Required	
S46	350468.137	381968.548	350468.137	381968.548	Required	
S47	350457.570	381965.368	350457.570	381965.368	Required	
S48	350445.635	381961.763	350445.635	381961.763	Required	
S49	350439.676	381938.821	350439.676	381938.821	Required	
S50	350429.589	381952.234	350429.589	381952.234	Required	
S51	350428.298	381956.524	350428.298	381956.524	Required	
S52	350415.415	381952.632	350415.415	381952.632	Required	
S53	350271.906	381889.973	350271.906	381889.973	Required	
S54	350275.896	381909.563	350275.896	381909.563	Required	

Doran Consulting Limited		Page 11
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25 File Proposed No Tide.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S55	350290.226	381883.339	350290.226	381883.339	Required	
S56	350301.781	381886.901	350301.781	381886.901	Required	
S57	350296.278	381904.790	350296.278	381904.790	Required	
SFR PI Inlet	350295.372	381907.714			No Entry	
SFR PI Outlet	350294.430	381910.748			No Entry	
S58	350293.137	381914.914	350293.137	381914.914	Required	
S59	350307.185	381902.515	350307.185	381902.515	Required	
S60	350303.373	381918.091	350303.373	381918.091	Required	
S61	350330.447	381926.494	350330.447	381926.494	Required	
S62	350340.308	381924.804	350340.308	381924.804	Required	
S63	350338.963	381929.137			No Entry	
S64	350387.090	381944.074	350387.090	381944.074	Required	
S65	350381.945	381961.218	350381.945	381961.218	Required	
S	350381.281	381963.432			No Entry	

Doran Consulting Limited		Page 12
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25 File Proposed No Tide.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	o	225	S1	12.000	9.775	2.000	Open Manhole	1200
S1.001	o	225	S2	10.300	8.723	1.352	Open Manhole	1200
S2.000	o	150	S14	8.900	7.550	1.200	Open Manhole	1200
S1.002	o	300	S3	9.770	7.129	2.341	Open Manhole	1200
S1.003	o	300	S4	9.900	7.053	2.547	Open Manhole	1200
S1.004	o	300	SD2	9.000	3.803	4.897	Open Manhole	1200
S1.005	o	375	S5	5.000	3.798	0.827	Open Manhole	1350
S1.006	o	375	S6	5.000	3.707	0.918	Open Manhole	1350
S3.000	o	150	S15	5.000	4.350	0.500	Open Manhole	1200
S3.001	o	150	S16	5.000	4.052	0.798	Open Manhole	1200
S1.007	o	375	S7	5.000	3.663	0.962	Open Manhole	1350
S4.000	o	150	S17	5.000	4.350	0.500	Open Manhole	1200
S1.008	o	375	S8	5.000	3.630	0.995	Open Manhole	1350
S5.000	o	150	S18	4.500	3.850	0.500	Open Manhole	1200
S6.000	o	225	S19	12.600	10.375	2.000	Open Manhole	1200
S6.001	o	225	S20	8.200	7.397	0.578	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	21.043	20.0	S2	10.300	8.723	1.352	Open Manhole	1200
S1.001	22.150	14.6	S3	9.770	7.204	2.341	Open Manhole	1200
S2.000	27.330	100.9	S3	9.770	7.279	2.341	Open Manhole	1200
S1.002	10.573	139.6	S4	9.900	7.053	2.547	Open Manhole	1200
S1.003	2.040	150.0	SD2	9.000	7.040	1.660	Open Manhole	1200
S1.004	1.499	300.0	S5	5.000	3.798	0.902	Open Manhole	1350
S1.005	27.313	300.1	S6	5.000	3.707	0.918	Open Manhole	1350
S1.006	13.139	298.6	S7	5.000	3.663	0.962	Open Manhole	1350
S3.000	44.656	150.0	S16	5.000	4.052	0.798	Open Manhole	1200
S3.001	35.891	150.0	S7	5.000	3.813	1.037	Open Manhole	1350
S1.007	9.792	296.7	S8	5.000	3.630	0.995	Open Manhole	1350
S4.000	34.300	60.2	S8	5.000	3.780	1.070	Open Manhole	1350
S1.008	22.600	122.2	S9	4.500	3.445	0.680	Open Manhole	1350
S5.000	46.827	183.6	S9	4.500	3.595	0.755	Open Manhole	1350
S6.000	74.456	25.0	S20	8.200	7.397	0.578	Open Manhole	1200
S6.001	18.936	24.3	S21	8.600	6.617	1.758	Open Manhole	1200

Doran Consulting Limited		Page 13
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25	Designed by 814	
File Proposed No Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S7.000	o	225	S28	11.800	9.575	2.000	Open Manhole	1200
S6.002	o	225	S21	8.600	6.617	1.758	Open Manhole	1200
S6.003	o	300	SD1	9.000	3.781	4.919	Open Manhole	1200
S6.004	o	375	S22	5.000	3.767	0.858	Open Manhole	1800
S8.000	o	300	S29	5.000	3.775	0.925	Open Manhole	1800
S6.005	o	375	S23	5.000	3.608	1.017	Open Manhole	1350
S6.006	o	375	S24	5.000	3.578	1.047	Open Manhole	1350
S6.007	o	375	S25	4.500	3.568	0.557	Open Manhole	1350
S6.008	o	375	S26	4.500	3.537	0.588	Open Manhole	1350
S6.009	o	450	S27	4.500	3.433	0.617	Open Manhole	1350
S1.009	o	450	S9	4.500	3.295	0.755	Open Manhole	1350
S9.000	o	150	S36	4.400	2.900	1.350	Open Manhole	1200
S9.001	o	225	S37	4.250	2.513	1.512	Open Manhole	1200
S10.000	o	225	S30	4.450	3.025	1.200	Open Manhole	1200
S10.001	o	225	S31	4.450	2.637	1.588	Open Manhole	1200
S10.002	o	225	S32	4.450	2.489	1.736	Open Manhole	1200
S10.003	o	225	S33	4.400	2.284	1.891	Open Manhole	1200
S10.004	o	225	S34	4.400	2.191	1.984	Open Manhole	1200
S10.005	o	225	S35	4.400	1.982	2.193	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S7.000	59.039	20.0	S21	8.600	6.617	1.758	Open Manhole	1200
S6.002	3.748	133.4	SD1	9.000	6.589	2.186	Open Manhole	1200
S6.003	2.367	166.8	S22	5.000	3.767	0.933	Open Manhole	1800
S6.004	18.341	218.3	S23	5.000	3.683	0.942	Open Manhole	1350
S8.000	20.755	225.0	S23	5.000	3.683	1.017	Open Manhole	1350
S6.005	11.219	375.0	S24	5.000	3.578	1.047	Open Manhole	1350
S6.006	2.580	275.0	S25	4.500	3.568	0.557	Open Manhole	1350
S6.007	11.655	375.0	S26	4.500	3.537	0.588	Open Manhole	1350
S6.008	11.032	375.0	S27	4.500	3.508	0.617	Open Manhole	1350
S6.009	23.534	375.0	S9	4.500	3.370	0.680	Open Manhole	1350
S1.009	21.815	20.9	S10	4.400	2.250	1.700	Open Manhole	1800
S9.000	52.403	168.2	S37	4.250	2.588	1.512	Open Manhole	1200
S9.001	27.362	241.9	S10	4.400	2.400	1.775	Open Manhole	1800
S10.000	39.193	100.9	S31	4.450	2.637	1.588	Open Manhole	1200
S10.001	14.856	100.9	S32	4.450	2.489	1.736	Open Manhole	1200
S10.002	18.323	89.4	S33	4.400	2.284	1.891	Open Manhole	1200
S10.003	15.685	167.9	S34	4.400	2.191	1.984	Open Manhole	1200
S10.004	35.116	167.9	S35	4.400	1.982	2.193	Open Manhole	1200
S10.005	35.026	241.9	S10	4.400	1.837	2.338	Open Manhole	1800

Doran Consulting Limited		Page 14
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25	Designed by 814	
File Proposed No Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.010	o	600	S10	4.400	0.762	3.038	Open Manhole	1800
S1.011	o	675	S37	3.800	0.635	2.490	Open Manhole	1800
S11.000	o	150	S38	3.800	2.450	1.200	Open Manhole	1200
S12.000	o	150	S39	4.000	2.650	1.200	Open Manhole	1200
S12.001	o	150	S40	3.900	2.438	1.312	Junction	
S13.000	o	450	S41	3.600	2.000	1.150	Open Manhole	1350
S13.001	o	450	S42	3.600	1.975	1.175	Open Manhole	1350
S13.002	o	450	S43	3.650	1.967	1.233	Junction	
S13.003	o	450	S44	3.650	1.867	1.333	Junction	
S13.004	o	450	S45	3.650	1.858	1.342	Open Manhole	1350
S11.001	o	450	S46	3.900	1.813	1.637	Open Manhole	1350
S11.002	o	450	S47	3.900	1.739	1.711	Open Manhole	1350
S11.003	o	450	S48	3.850	1.666	1.734	Open Manhole	1350
S14.000	o	150	S49	3.200	2.000	1.050	Open Manhole	1200
S14.001	o	150	S50	3.500	1.832	1.518	Open Manhole	1200
S11.004	o	450	S51	3.800	1.487	1.863	Open Manhole	1350
S11.005	o	375	S52	3.750	1.431	1.944	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.010	22.982	443.0	S37	3.800	0.710	2.490	Open Manhole	1800
S1.011	33.055	1274.4	S64	3.750	0.609	2.466	Open Manhole	1800
S11.000	23.214	106.6	S46	3.900	2.232	1.518	Open Manhole	1350
S12.000	21.191	100.0	S40	3.900	2.438	1.312	Junction	
S12.001	1.178	100.0	S46	3.900	2.426	1.324	Open Manhole	1350
S13.000	6.026	241.0	S42	3.600	1.975	1.175	Open Manhole	1350
S13.001	1.825	228.1	S43	3.650	1.967	1.233	Junction	
S13.002	1.640	16.4	S44	3.650	1.867	1.333	Junction	
S13.003	2.274	252.7	S45	3.650	1.858	1.342	Open Manhole	1350
S13.004	10.833	240.7	S46	3.900	1.813	1.637	Open Manhole	1350
S11.001	11.034	151.2	S47	3.900	1.740	1.710	Open Manhole	1350
S11.002	12.468	170.8	S48	3.850	1.666	1.734	Open Manhole	1350
S11.003	18.112	101.2	S51	3.800	1.487	1.863	Open Manhole	1350
S14.000	16.783	99.9	S50	3.500	1.832	1.518	Open Manhole	1200
S14.001	4.480	99.6	S51	3.800	1.787	1.863	Open Manhole	1350
S11.004	13.458	240.3	S52	3.750	1.431	1.869	Open Manhole	1350
S11.005	29.590	240.6	S64	3.750	1.308	2.067	Open Manhole	1800

Doran Consulting Limited		Page 15
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25	Designed by 814	
File Proposed No Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S15.000	o	150	S53	4.000	2.950	0.900	Open Manhole	1200
S15.001	o	375	S54	3.675	2.675	0.625	Open Manhole	1350
S16.000	o	375	S55	4.200	2.000	1.825	Open Manhole	1200
S16.001	o	375	S56	3.075	1.854	0.846	Open Manhole	1350
S16.002	o	375	S57	3.075	1.777	0.923	Open Manhole	1200
S16.003	o	375	SFR PI Inlet	3.075	1.746	0.954	Junction	
S16.004	o	375	SFR PI Outlet	3.075	1.696	1.004	Junction	
S15.002	o	375	S58	3.075	1.653	1.047	Open Manhole	1350
S17.000	o	225	S59	3.200	2.000	0.975	Open Manhole	1200
S15.003	o	375	S60	3.400	1.590	1.435	Open Manhole	1350
S15.004	o	375	S61	3.750	1.474	1.901	Open Manhole	1350
S18.000	o	150	S62	3.200	2.050	1.000	Open Manhole	1200
S15.005	o	375	S63	3.750	1.438	1.937	Junction	
S1.012	o	750	S64	3.750	0.534	2.466	Open Manhole	1800
S1.013	o	750	S65	3.700	0.504	2.446	Open Manhole	2400

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S15.000	19.991	100.0	S54	3.675	2.750	0.775	Open Manhole	1350
S15.001	18.053	125.4	S58	3.075	2.531	0.169	Open Manhole	1350
S16.000	12.092	170.3	S56	3.075	1.929	0.771	Open Manhole	1350
S16.001	18.716	243.1	S57	3.075	1.777	0.923	Open Manhole	1200
S16.002	3.061	98.7	SFR PI Inlet	3.075	1.746	0.954	Junction	
S16.003	3.177	63.5	SFR PI Outlet	3.075	1.696	1.004	Junction	
S16.004	4.362	99.1	S58	3.075	1.652	1.048	Open Manhole	1350
S15.002	10.718	170.1	S60	3.400	1.590	1.435	Open Manhole	1350
S17.000	16.035	62.2	S60	3.400	1.742	1.433	Open Manhole	1350
S15.003	28.348	244.4	S61	3.750	1.474	1.901	Open Manhole	1350
S15.004	8.917	247.7	S63	3.750	1.438	1.937	Junction	
S18.000	4.537	9.9	S63	3.750	1.590	2.010	Junction	
S15.005	50.391	244.6	S64	3.750	1.232	2.143	Open Manhole	1800
S1.012	17.899	596.6	S65	3.700	0.504	2.446	Open Manhole	2400
S1.013	2.312	578.0	S	3.700	0.500	2.450	Open Manhole	0

Doran Consulting Limited		Page 16
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25	Designed by 814	
File Proposed No Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	Classification	Default	95	0.096	0.091	0.091
	Classification	Default	95	0.039	0.037	0.128
	Classification	Default	95	0.007	0.006	0.135
	Classification	Default	95	0.169	0.161	0.295
1.001	-	-	100	0.000	0.000	0.000
2.000	Classification	Default	95	0.055	0.052	0.052
1.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.000	0.000	0.000
1.005	-	-	100	0.000	0.000	0.000
1.006	-	-	100	0.000	0.000	0.000
3.000	-	-	100	0.000	0.000	0.000
3.001	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.000	0.000	0.000
4.000	-	-	100	0.000	0.000	0.000
1.008	-	-	100	0.000	0.000	0.000
5.000	-	-	100	0.000	0.000	0.000
6.000	Classification	Default	95	0.108	0.102	0.102
6.001	Classification	Default	95	0.007	0.007	0.007
	Classification	Default	95	0.022	0.021	0.028
7.000	Classification	Default	95	0.075	0.071	0.071
	Classification	Default	95	0.080	0.076	0.147
6.002	Classification	Default	95	0.005	0.004	0.004
6.003	-	-	100	0.000	0.000	0.000
6.004	-	-	100	0.000	0.000	0.000
8.000	Classification	Default	95	0.071	0.068	0.068
	Classification	Default	95	0.033	0.032	0.099
	Classification	Default	95	0.006	0.005	0.105
	Classification	Landscaping	50	0.018	0.009	0.114
	Classification	Default	95	0.022	0.021	0.135
	Classification	Default	95	0.071	0.068	0.203
	Classification	Default	95	0.002	0.002	0.205
	Classification	Landscaping	50	0.012	0.006	0.211
6.005	-	-	100	0.000	0.000	0.000
6.006	-	-	100	0.000	0.000	0.000
6.007	-	-	100	0.000	0.000	0.000
6.008	-	-	100	0.000	0.000	0.000
6.009	Classification	Default	95	0.082	0.077	0.077
	Classification	Default	95	0.142	0.135	0.212
	Classification	Landscaping	50	0.032	0.016	0.228
	Classification	Default	95	0.012	0.012	0.240
	Classification	Default	95	0.007	0.007	0.247
	Classification	Landscaping	50	0.008	0.004	0.251
	Classification	Default	95	0.010	0.010	0.261
1.009	Classification	Default	95	0.144	0.137	0.137
	Classification	Default	95	0.210	0.200	0.337
	Classification	Default	95	0.186	0.177	0.514
9.000	Classification	Default	95	0.090	0.085	0.085
9.001	Classification	Default	95	0.054	0.051	0.051
10.000	Classification	Default	95	0.024	0.023	0.023
	Classification	Default	95	0.031	0.029	0.052
10.001	Classification	Default	95	0.020	0.019	0.019
10.002	Classification	Default	95	0.025	0.023	0.023
10.003	-	-	100	0.000	0.000	0.000
10.004	-	-	100	0.000	0.000	0.000
10.005	-	-	100	0.000	0.000	0.000
1.010	-	-	100	0.000	0.000	0.000
1.011	Classification	Default	95	0.022	0.021	0.021
11.000	User	-	100	0.077	0.077	0.077
12.000	Classification	Default	95	0.017	0.016	0.016

Doran Consulting Limited		Page 17
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25	Designed by 814	
File Proposed No Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
	Classification	Default	95	0.047	0.044	0.061
12.001	-	-	100	0.000	0.000	0.000
13.000	Classification	Default	95	0.437	0.415	0.415
13.001	-	-	100	0.000	0.000	0.000
13.002	-	-	100	0.000	0.000	0.000
13.003	-	-	100	0.000	0.000	0.000
13.004	-	-	100	0.000	0.000	0.000
11.001	Classification	Default	95	0.014	0.013	0.013
11.002	User	-	100	0.050	0.050	0.050
	Classification	Default	95	0.013	0.012	0.061
11.003	Classification	Default	95	0.016	0.015	0.015
	Classification	Landscaping	50	0.045	0.022	0.037
14.000	Classification	Landscaping	50	0.039	0.019	0.019
14.001	Classification	Landscaping	50	0.032	0.016	0.016
11.004	Classification	Default	95	0.011	0.010	0.010
11.005	Classification	Landscaping	50	0.027	0.013	0.013
	Classification	Default	95	0.006	0.006	0.019
15.000	Classification	Default	95	0.018	0.017	0.017
15.001	Classification	Default	95	0.235	0.223	0.223
	Classification	Default	95	0.013	0.012	0.235
16.000	Classification	Default	95	0.020	0.019	0.019
	Classification	Landscaping	50	0.068	0.034	0.053
16.001	Classification	Default	95	0.056	0.053	0.053
16.002	Classification	Default	95	0.032	0.030	0.030
16.003	-	-	100	0.000	0.000	0.000
16.004	-	-	100	0.000	0.000	0.000
15.002	-	-	100	0.000	0.000	0.000
17.000	Classification	Landscaping	50	0.033	0.016	0.016
15.003	-	-	100	0.000	0.000	0.000
15.004	Classification	Default	95	0.015	0.014	0.014
	Classification	Default	95	0.059	0.056	0.070
	Classification	Default	95	0.013	0.012	0.083
18.000	Classification	Landscaping	50	0.159	0.079	0.079
15.005	-	-	100	0.000	0.000	0.000
1.012	Classification	Default	95	0.011	0.010	0.010
	Classification	Default	95	0.010	0.010	0.020
1.013	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				3.567	3.182	3.182

Doran Consulting Limited		Page 18
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25 File Proposed No Tide.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

Network Classifications for Storm

PN	USMH Name	Pipe Dia (mm)	Min Cover Depth (m)	Max Cover Depth (m)	Pipe Type	MH Dia (mm)	MH Width (mm)	MH Ring Depth (m)	MH Type
S1.000	S1	225	1.352	2.000	Unclassified	1200	0	2.000	Unclassified
S1.001	S2	225	1.352	2.341	Unclassified	1200	0	1.352	Unclassified
S2.000	S14	150	1.200	2.341	Unclassified	1200	0	1.200	Unclassified
S1.002	S3	300	2.341	2.547	Unclassified	1200	0	2.341	Unclassified
S1.003	S4	300	1.660	2.547	Unclassified	1200	0	2.547	Unclassified
S1.004	SD2	300	0.902	4.897	Unclassified	1200	0	4.897	Unclassified
S1.005	S5	375	0.827	0.918	Unclassified	1350	0	0.827	Unclassified
S1.006	S6	375	0.918	0.962	Unclassified	1350	0	0.918	Unclassified
S3.000	S15	150	0.500	0.798	Unclassified	1200	0	0.500	Unclassified
S3.001	S16	150	0.798	1.037	Unclassified	1200	0	0.798	Unclassified
S1.007	S7	375	0.962	0.995	Unclassified	1350	0	0.962	Unclassified
S4.000	S17	150	0.500	1.070	Unclassified	1200	0	0.500	Unclassified
S1.008	S8	375	0.680	0.995	Unclassified	1350	0	0.995	Unclassified
S5.000	S18	150	0.500	0.755	Unclassified	1200	0	0.500	Unclassified
S6.000	S19	225	0.578	2.000	Unclassified	1200	0	2.000	Unclassified
S6.001	S20	225	0.578	1.758	Unclassified	1200	0	0.578	Unclassified
S7.000	S28	225	1.758	2.000	Unclassified	1200	0	2.000	Unclassified
S6.002	S21	225	1.758	2.186	Unclassified	1200	0	1.758	Unclassified
S6.003	SD1	300	0.933	4.919	Unclassified	1200	0	4.919	Unclassified
S6.004	S22	375	0.858	0.942	Unclassified	1800	0	0.858	Unclassified
S8.000	S29	300	0.925	1.017	Unclassified	1800	0	0.925	Unclassified
S6.005	S23	375	1.017	1.047	Unclassified	1350	0	1.017	Unclassified
S6.006	S24	375	0.557	1.047	Unclassified	1350	0	1.047	Unclassified
S6.007	S25	375	0.557	0.588	Unclassified	1350	0	0.557	Unclassified
S6.008	S26	375	0.588	0.617	Unclassified	1350	0	0.588	Unclassified
S6.009	S27	450	0.617	0.680	Unclassified	1350	0	0.617	Unclassified
S1.009	S9	450	0.755	1.700	Unclassified	1350	0	0.755	Unclassified
S9.000	S36	150	1.350	1.512	Unclassified	1200	0	1.350	Unclassified
S9.001	S37	225	1.512	1.775	Unclassified	1200	0	1.512	Unclassified
S10.000	S30	225	1.200	1.588	Unclassified	1200	0	1.200	Unclassified
S10.001	S31	225	1.588	1.736	Unclassified	1200	0	1.588	Unclassified
S10.002	S32	225	1.736	1.891	Unclassified	1200	0	1.736	Unclassified
S10.003	S33	225	1.891	1.984	Unclassified	1200	0	1.891	Unclassified
S10.004	S34	225	1.984	2.193	Unclassified	1200	0	1.984	Unclassified
S10.005	S35	225	2.193	2.338	Unclassified	1200	0	2.193	Unclassified
S1.010	S10	600	2.490	3.038	Unclassified	1800	0	3.038	Unclassified
S1.011	S37	675	2.466	2.490	Unclassified	1800	0	2.490	Unclassified
S11.000	S38	150	1.200	1.518	Unclassified	1200	0	1.200	Unclassified
S12.000	S39	150	1.200	1.312	Unclassified	1200	0	1.200	Unclassified
S12.001	S40	150	1.312	1.324	Unclassified				Junction
S13.000	S41	450	1.150	1.175	Unclassified	1350	0	1.150	Unclassified
S13.001	S42	450	1.175	1.233	Unclassified	1350	0	1.175	Unclassified
S13.002	S43	450	1.233	1.333	Unclassified				Junction
S13.003	S44	450	1.333	1.342	Unclassified				Junction
S13.004	S45	450	1.342	1.637	Unclassified	1350	0	1.342	Unclassified
S11.001	S46	450	1.637	1.710	Unclassified	1350	0	1.637	Unclassified
S11.002	S47	450	1.711	1.734	Unclassified	1350	0	1.711	Unclassified
S11.003	S48	450	1.734	1.863	Unclassified	1350	0	1.734	Unclassified
S14.000	S49	150	1.050	1.518	Unclassified	1200	0	1.050	Unclassified
S14.001	S50	150	1.518	1.863	Unclassified	1200	0	1.518	Unclassified
S11.004	S51	450	1.863	1.869	Unclassified	1350	0	1.863	Unclassified
S11.005	S52	375	1.944	2.067	Unclassified	1350	0	1.944	Unclassified
S15.000	S53	150	0.775	0.900	Unclassified	1200	0	0.900	Unclassified
S15.001	S54	375	0.169	0.625	Unclassified	1350	0	0.625	Unclassified
S16.000	S55	375	0.771	1.825	Unclassified	1200	0	1.825	Unclassified
S16.001	S56	375	0.846	0.923	Unclassified	1350	0	0.846	Unclassified
S16.002	S57	375	0.923	0.954	Unclassified	1200	0	0.923	Unclassified
S16.003	SFR PI Inlet	375	0.954	1.004	Unclassified				Junction

Doran Consulting Limited		Page 19
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25	Designed by 814	
File Proposed No Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

Network Classifications for Storm

PN	USMH Name	Pipe Dia (mm)	Min Cover Depth (m)	Max Cover Depth (m)	Pipe Type	MH Dia (mm)	MH Width (mm)	MH Ring Depth (m)	MH Type
S16.004	SFR PI Outlet	375	1.004	1.048	Unclassified				Junction
S15.002	S58	375	1.047	1.435	Unclassified	1350	0	1.047	Unclassified
S17.000	S59	225	0.975	1.433	Unclassified	1200	0	0.975	Unclassified
S15.003	S60	375	1.435	1.901	Unclassified	1350	0	1.435	Unclassified
S15.004	S61	375	1.901	1.937	Unclassified	1350	0	1.901	Unclassified
S18.000	S62	150	1.000	2.010	Unclassified	1200	0	1.000	Unclassified
S15.005	S63	375	1.937	2.143	Unclassified				Junction
S1.012	S64	750	2.446	2.466	Unclassified	1800	0	2.466	Unclassified
S1.013	S65	750	2.446	2.450	Unclassified	2400	0	2.446	Unclassified

Surcharged Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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S1.013 S 3.700 0.500 0.000 0 0

Datum (m) 0.826 Offset (mins) 0

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
60	0.000	240	0.000	420	0.000	600	0.000	780	0.000	960	0.000	1140	0.000	1320	0.000
120	0.000	300	0.000	480	0.000	660	0.000	840	0.000	1020	0.000	1200	0.000	1380	0.000
180	0.000	360	0.000	540	0.000	720	0.000	900	0.000	1080	0.000	1260	0.000	1440	0.000

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	10.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1
Number of Input Hydrographs	0	Number of Offline Controls	0
Number of Online Controls	1	Number of Storage Structures	0
		Number of Time/Area Diagrams	0
		Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	15.600	Storm Duration (mins)	30
Ratio R	0.300		

Doran Consulting Limited		Page 20
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25 File Proposed No Tide.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

Online Controls for Storm

Non Return Valve Manhole: S65, DS/PN: S1.013, Volume (m³): 21.4

Doran Consulting Limited		Page 21
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25	Designed by 814	
File Proposed No Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

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

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 10.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 15.700 Cv (Summer) 0.750
 Region Scotland and Ireland Ratio R 0.300 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
 Return Period(s) (years) 1, 5, 30, 100
 Climate Change (%) 10, 10, 10, 30

PN	US/MH		Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level	Surcharged Depth	Flooded Volume
	Name	Storm							(m)	(m)	(m³)
S1.000	S1	15 Winter	1	+10%	100/15 Summer				9.870	-0.130	0.000
S1.001	S2	15 Winter	1	+10%	100/15 Summer				8.810	-0.138	0.000
S2.000	S14	15 Winter	1	+10%	30/15 Summer				7.617	-0.083	0.000
S1.002	S3	15 Winter	1	+10%	5/15 Summer				7.311	-0.118	0.000
S1.003	S4	15 Winter	1	+10%	5/15 Summer				7.268	-0.086	0.000
S1.004	SD2	15 Winter	1	+10%	5/15 Summer				4.010	-0.093	0.000
S1.005	S5	15 Winter	1	+10%	100/15 Summer				3.977	-0.196	0.000
S1.006	S6	15 Winter	1	+10%	100/15 Summer				3.898	-0.184	0.000
S3.000	S15	15 Summer	1	+10%					4.350	-0.150	0.000
S3.001	S16	15 Summer	1	+10%					4.052	-0.150	0.000
S1.007	S7	15 Winter	1	+10%	100/15 Summer				3.858	-0.180	0.000
S4.000	S17	15 Summer	1	+10%					4.350	-0.150	0.000
S1.008	S8	15 Winter	1	+10%					3.768	-0.237	0.000
S5.000	S18	15 Summer	1	+10%					3.850	-0.150	0.000
S6.000	S19	15 Winter	1	+10%					10.430	-0.170	0.000
S6.001	S20	15 Winter	1	+10%	100/15 Summer				7.460	-0.162	0.000
S7.000	S28	15 Winter	1	+10%					9.638	-0.162	0.000
S6.002	S21	15 Winter	1	+10%	1/15 Summer				6.872	0.030	0.000
S6.003	SD1	15 Winter	1	+10%	30/15 Summer				3.966	-0.115	0.000
S6.004	S22	15 Winter	1	+10%	30/15 Summer				3.926	-0.216	0.000
S8.000	S29	15 Winter	1	+10%	30/15 Summer				3.923	-0.152	0.000
S6.005	S23	15 Winter	1	+10%	5/15 Summer				3.882	-0.101	0.000
S6.006	S24	15 Winter	1	+10%	5/15 Summer				3.850	-0.103	0.000
S6.007	S25	15 Winter	1	+10%	5/15 Summer				3.840	-0.103	0.000
S6.008	S26	15 Winter	1	+10%	30/15 Summer				3.805	-0.107	0.000
S6.009	S27	15 Winter	1	+10%	30/15 Summer				3.686	-0.197	0.000
S1.009	S9	15 Winter	1	+10%					3.467	-0.278	0.000
S9.000	S36	15 Winter	1	+10%	5/15 Summer				3.008	-0.042	0.000
S9.001	S37	15 Winter	1	+10%	30/15 Winter				2.630	-0.108	0.000
S10.000	S30	15 Winter	1	+10%					3.082	-0.168	0.000
S10.001	S31	15 Winter	1	+10%	100/15 Winter				2.705	-0.157	0.000

Doran Consulting Limited		Page 22
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25	Designed by 814	
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XP Solutions	Network 2020.1.3	

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

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.37			39.2	OK	
S1.001	S2	0.31			38.8	OK	
S2.000	S14	0.40			6.8	OK	
S1.002	S3	0.67			45.9	OK	
S1.003	S4	0.86			46.3	OK	
S1.004	SD2	0.83			46.1	OK	
S1.005	S5	0.45			45.5	OK	
S1.006	S6	0.50			44.8	OK	
S3.000	S15	0.00			0.0	OK	
S3.001	S16	0.00			0.0	OK	
S1.007	S7	0.53			44.6	OK	
S4.000	S17	0.00			0.0	OK	
S1.008	S8	0.29			44.9	OK	
S5.000	S18	0.00			0.0	OK	
S6.000	S19	0.13			13.3	OK	
S6.001	S20	0.17			16.6	OK	
S7.000	S28	0.17			19.3	OK	
S6.002	S21	1.22			36.6	SURCHARGED	
S6.003	SD1	0.69			36.7	OK	
S6.004	S22	0.32			35.6	OK	
S8.000	S29	0.42			26.8	OK	
S6.005	S23	0.86			59.9	OK	
S6.006	S24	0.70			59.0	OK	
S6.007	S25	0.83			58.4	OK	
S6.008	S26	0.85			58.6	OK	
S6.009	S27	0.60			82.3	OK	
S1.009	S9	0.31			179.2	OK	
S9.000	S36	0.80			10.7	OK	
S9.001	S37	0.53			16.2	OK	
S10.000	S30	0.14			6.8	OK	
S10.001	S31	0.20			9.0	OK	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged
									Level (m)	Depth (m)
S10.002	S32	15 Winter	1	+10%	100/15 Winter				2.563	-0.151
S10.003	S33	15 Winter	1	+10%	100/15 Summer				2.373	-0.137
S10.004	S34	15 Winter	1	+10%	100/15 Summer				2.276	-0.140
S10.005	S35	15 Winter	1	+10%	100/15 Summer				2.076	-0.131
S1.010	S10	15 Winter	1	+10%	5/15 Summer				1.362	0.000
S1.011	S37	15 Winter	1	+10%	1/15 Summer				1.319	0.009
S11.000	S38	15 Winter	1	+10%	30/15 Summer				2.537	-0.063
S12.000	S39	15 Winter	1	+10%	30/15 Summer				2.724	-0.076
S12.001	S40	15 Winter	1	+10%					2.535	-0.053
S13.000	S41	15 Winter	1	+10%	100/15 Summer				2.211	-0.239
S13.001	S42	15 Winter	1	+10%	100/15 Summer				2.182	-0.243
S13.002	S43	15 Winter	1	+10%					2.139	-0.278
S13.003	S44	15 Winter	1	+10%					2.059	-0.258
S13.004	S45	15 Winter	1	+10%	100/15 Summer				2.054	-0.254
S11.001	S46	15 Winter	1	+10%	100/15 Summer				2.022	-0.241
S11.002	S47	15 Winter	1	+10%	30/15 Winter				1.959	-0.230
S11.003	S48	15 Winter	1	+10%	30/15 Winter				1.852	-0.264
S14.000	S49	15 Winter	1	+10%	100/15 Summer				2.040	-0.110
S14.001	S50	15 Winter	1	+10%	30/15 Summer				1.892	-0.090
S11.004	S51	15 Winter	1	+10%	30/15 Summer				1.732	-0.205
S11.005	S52	15 Winter	1	+10%	5/15 Summer				1.688	-0.118
S15.000	S53	15 Winter	1	+10%					2.987	-0.113
S15.001	S54	15 Winter	1	+10%					2.788	-0.262
S16.000	S55	15 Winter	1	+10%	100/15 Summer				2.063	-0.312
S16.001	S56	15 Winter	1	+10%	100/15 Summer				1.941	-0.288
S16.002	S57	15 Winter	1	+10%	100/15 Summer				1.876	-0.276
S16.003	SFR PI Inlet	15 Winter	1	+10%					1.843	-0.278
S16.004	SFR PI Outlet	15 Winter	1	+10%					1.826	-0.245
S15.002	S58	15 Winter	1	+10%	30/15 Summer				1.822	-0.206
S17.000	S59	15 Winter	1	+10%	100/15 Summer				2.028	-0.197
S15.003	S60	15 Winter	1	+10%	30/15 Summer				1.760	-0.205
S15.004	S61	15 Winter	1	+10%	30/15 Summer				1.685	-0.164
S18.000	S62	15 Winter	1	+10%	100/15 Summer				2.101	-0.099
S15.005	S63	15 Winter	1	+10%					1.626	-0.187
S1.012	S64	15 Winter	1	+10%	5/15 Summer				1.284	0.000
S1.013	S65	15 Winter	1	+10%	30/15 Summer				1.074	-0.180

PN	US/MH Name	Flooded		Half Drain		Pipe		Status	Level Exceeded
		Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)			
S10.002	S32	0.000	0.24			11.6		OK	
S10.003	S33	0.000	0.33			11.5		OK	
S10.004	S34	0.000	0.30			11.4		OK	
S10.005	S35	0.000	0.36			11.4		OK	
S1.010	S10	0.000	0.80			201.6		OK	
S1.011	S37	0.000	1.03			198.7	SURCHARGED		
S11.000	S38	0.000	0.62			10.1		OK	
S12.000	S39	0.000	0.47			7.9		OK	
S12.001	S40	0.000	0.74			8.0		OK*	
S13.000	S41	0.000	0.44			54.5		OK	
S13.001	S42	0.000	0.43			54.9		OK	
S13.002	S43	0.000	0.31			55.2		OK*	
S13.003	S44	0.000	0.33			55.1		OK*	
S13.004	S45	0.000	0.37			54.7		OK	
S11.001	S46	0.000	0.43			73.5		OK	

Doran Consulting Limited		Page 24
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25	Designed by 814	
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XP Solutions	Network 2020.1.3	

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

PN	US/MH Name	Flooded		Half Drain		Pipe	Status	Level Exceeded
		Volume (m³)	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)			
S11.002	S47	0.000	0.48		80.5		OK	
S11.003	S48	0.000	0.36		84.7		OK	
S14.000	S49	0.000	0.15		2.5		OK	
S14.001	S50	0.000	0.33		4.4		OK	
S11.004	S51	0.000	0.58		89.5		OK	
S11.005	S52	0.000	0.80		91.2		OK	
S15.000	S53	0.000	0.13		2.2		OK	
S15.001	S54	0.000	0.19		28.7		OK	
S16.000	S55	0.000	0.07		7.0		OK	
S16.001	S56	0.000	0.12		12.9		OK	
S16.002	S57	0.000	0.16		16.4		OK	
S16.003	SFR PI Inlet	0.000	0.15		16.4		OK*	
S16.004	SFR PI Outlet	0.000	0.15		16.3		OK*	
S15.002	S58	0.000	0.42		44.9		OK	
S17.000	S59	0.000	0.04		2.2		OK	
S15.003	S60	0.000	0.41		46.4		OK	
S15.004	S61	0.000	0.60		54.8		OK	
S18.000	S62	0.000	0.25		10.5		OK	
S15.005	S63	0.000	0.49		62.9		OK*	
S1.012	S64	0.000	1.26		337.5		OK	
S1.013	S65	0.000	0.92		338.7		OK	

Doran Consulting Limited		Page 25
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25	Designed by 814	
File Proposed No Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 10.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 15.700 Cv (Summer) 0.750
 Region Scotland and Ireland Ratio R 0.300 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
 Return Period(s) (years) 1, 5, 30, 100
 Climate Change (%) 10, 10, 10, 30

PN	US/MH		Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level	Surcharged Depth	Flooded Volume
	Name	Storm							(m)	(m)	(m³)
S1.000	S1	15 Winter	5	+10%	100/15 Summer				9.896	-0.104	0.000
S1.001	S2	15 Winter	5	+10%	100/15 Summer				8.833	-0.115	0.000
S2.000	S14	15 Winter	5	+10%	30/15 Summer				7.636	-0.064	0.000
S1.002	S3	15 Winter	5	+10%	5/15 Summer				7.479	0.050	0.000
S1.003	S4	15 Winter	5	+10%	5/15 Summer				7.401	0.048	0.000
S1.004	SD2	15 Winter	5	+10%	5/15 Summer				4.158	0.055	0.000
S1.005	S5	15 Winter	5	+10%	100/15 Summer				4.028	-0.145	0.000
S1.006	S6	15 Winter	5	+10%	100/15 Summer				3.954	-0.128	0.000
S3.000	S15	15 Summer	5	+10%					4.350	-0.150	0.000
S3.001	S16	15 Summer	5	+10%					4.052	-0.150	0.000
S1.007	S7	15 Winter	5	+10%	100/15 Summer				3.913	-0.125	0.000
S4.000	S17	15 Summer	5	+10%					4.350	-0.150	0.000
S1.008	S8	15 Winter	5	+10%					3.800	-0.205	0.000
S5.000	S18	15 Summer	5	+10%					3.850	-0.150	0.000
S6.000	S19	15 Winter	5	+10%					10.444	-0.156	0.000
S6.001	S20	15 Winter	5	+10%	100/15 Summer				7.475	-0.146	0.000
S7.000	S28	15 Winter	5	+10%					9.653	-0.147	0.000
S6.002	S21	15 Winter	5	+10%	1/15 Summer				6.959	0.117	0.000
S6.003	SD1	15 Winter	5	+10%	30/15 Summer				4.081	0.000	0.000
S6.004	S22	15 Winter	5	+10%	30/15 Summer				4.038	-0.104	0.000
S8.000	S29	15 Winter	5	+10%	30/15 Summer				4.044	-0.031	0.000
S6.005	S23	15 Winter	5	+10%	5/15 Summer				4.009	0.026	0.000
S6.006	S24	15 Winter	5	+10%	5/15 Summer				3.972	0.019	0.000
S6.007	S25	15 Winter	5	+10%	5/15 Summer				3.951	0.007	0.000
S6.008	S26	15 Winter	5	+10%	30/15 Summer				3.912	0.000	0.000
S6.009	S27	15 Winter	5	+10%	30/15 Summer				3.762	-0.121	0.000
S1.009	S9	15 Winter	5	+10%					3.509	-0.236	0.000
S9.000	S36	15 Winter	5	+10%	5/15 Summer				3.165	0.115	0.000
S9.001	S37	15 Winter	5	+10%	30/15 Winter				2.659	-0.079	0.000
S10.000	S30	15 Winter	5	+10%					3.096	-0.154	0.000
S10.001	S31	15 Winter	5	+10%	100/15 Winter				2.721	-0.140	0.000

Doran Consulting Limited		Page 26
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25	Designed by 814	
File Proposed No Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.56			59.2	OK	
S1.001	S2	0.47			58.7	OK	
S2.000	S14	0.61			10.3	OK	
S1.002	S3	1.00			69.2	SURCHARGED	
S1.003	S4	1.28			69.1	SURCHARGED	
S1.004	SD2	1.22			68.3	SURCHARGED	
S1.005	S5	0.68			67.9	OK	
S1.006	S6	0.73			65.4	OK	
S3.000	S15	0.00			0.0	OK	
S3.001	S16	0.00			0.0	OK	
S1.007	S7	0.78			66.0	OK	
S4.000	S17	0.00			0.0	OK	
S1.008	S8	0.43			65.7	OK	
S5.000	S18	0.00			0.0	OK	
S6.000	S19	0.20			20.1	OK	
S6.001	S20	0.26			25.0	OK	
S7.000	S28	0.26			29.2	OK	
S6.002	S21	1.85			55.2	SURCHARGED	
S6.003	SD1	1.03			54.4	OK	
S6.004	S22	0.48			53.4	OK	
S8.000	S29	0.57			37.0	OK	
S6.005	S23	1.25			86.7	SURCHARGED	
S6.006	S24	1.01			85.5	SURCHARGED	
S6.007	S25	1.22			85.1	SURCHARGED	
S6.008	S26	1.24			85.7	OK	
S6.009	S27	0.87			119.8	OK	
S1.009	S9	0.45			261.1	OK	
S9.000	S36	1.13			15.1	SURCHARGED	
S9.001	S37	0.74			22.9	OK	
S10.000	S30	0.21			10.3	OK	
S10.001	S31	0.30			13.6	OK	

Doran Consulting Limited		Page 27
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25	Designed by 814	
File Proposed No Tide.MDX	Checked by	
XP Solutions		Network 2020.1.3

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
S10.002	S32	15 Winter	5	+10%	100/15 Winter				2.582	-0.132
S10.003	S33	15 Winter	5	+10%	100/15 Summer				2.396	-0.113
S10.004	S34	15 Winter	5	+10%	100/15 Summer				2.299	-0.117
S10.005	S35	15 Winter	5	+10%	100/15 Summer				2.101	-0.106
S1.010	S10	15 Winter	5	+10%	5/15 Summer				1.450	0.088
S1.011	S37	15 Winter	5	+10%	1/15 Summer				1.375	0.065
S11.000	S38	15 Winter	5	+10%	30/15 Summer				2.566	-0.034
S12.000	S39	15 Winter	5	+10%	30/15 Summer				2.746	-0.054
S12.001	S40	15 Winter	5	+10%					2.588	0.000
S13.000	S41	15 Winter	5	+10%	100/15 Summer				2.272	-0.178
S13.001	S42	15 Winter	5	+10%	100/15 Summer				2.241	-0.184
S13.002	S43	15 Winter	5	+10%					2.184	-0.233
S13.003	S44	15 Winter	5	+10%					2.116	-0.201
S13.004	S45	15 Winter	5	+10%	100/15 Summer				2.111	-0.197
S11.001	S46	15 Winter	5	+10%	100/15 Summer				2.081	-0.182
S11.002	S47	15 Winter	5	+10%	30/15 Winter				2.023	-0.166
S11.003	S48	15 Winter	5	+10%	30/15 Winter				1.919	-0.197
S14.000	S49	15 Winter	5	+10%	100/15 Summer				2.049	-0.101
S14.001	S50	15 Winter	5	+10%	30/15 Summer				1.908	-0.074
S11.004	S51	15 Winter	5	+10%	30/15 Summer				1.873	-0.064
S11.005	S52	15 Winter	5	+10%	5/15 Summer				1.831	0.025
S15.000	S53	15 Winter	5	+10%					2.996	-0.104
S15.001	S54	15 Winter	5	+10%					2.815	-0.235
S16.000	S55	15 Winter	5	+10%	100/15 Summer				2.079	-0.296
S16.001	S56	15 Winter	5	+10%	100/15 Summer				1.963	-0.266
S16.002	S57	15 Winter	5	+10%	100/15 Summer				1.901	-0.251
S16.003	SFR PI Inlet	15 Winter	5	+10%					1.880	-0.241
S16.004	SFR PI Outlet	15 Winter	5	+10%					1.873	-0.198
S15.002	S58	15 Winter	5	+10%	30/15 Summer				1.869	-0.159
S17.000	S59	15 Winter	5	+10%	100/15 Summer				2.034	-0.191
S15.003	S60	15 Winter	5	+10%	30/15 Summer				1.818	-0.147
S15.004	S61	15 Winter	5	+10%	30/15 Summer				1.752	-0.097
S18.000	S62	15 Winter	5	+10%	100/15 Summer				2.114	-0.086
S15.005	S63	15 Winter	5	+10%					1.680	-0.133
S1.012	S64	15 Winter	5	+10%	5/15 Summer				1.321	0.037
S1.013	S65	15 Summer	5	+10%	30/15 Summer				1.254	0.000

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S10.002	S32	0.000	0.36			17.6	OK	
S10.003	S33	0.000	0.49			17.4	OK	
S10.004	S34	0.000	0.46			17.3	OK	
S10.005	S35	0.000	0.55			17.2	OK	
S1.010	S10	0.000	1.19			299.9	SURCHARGED	
S1.011	S37	0.000	1.54			297.3	SURCHARGED	
S11.000	S38	0.000	0.93			15.2	OK	
S12.000	S39	0.000	0.72			12.0	OK	
S12.001	S40	0.000	1.05			11.4	SURCHARGED*	
S13.000	S41	0.000	0.66			82.3	OK	
S13.001	S42	0.000	0.64			82.8	OK	
S13.002	S43	0.000	0.47			83.3	OK*	
S13.003	S44	0.000	0.49			83.2	OK*	
S13.004	S45	0.000	0.56			82.7	OK	
S11.001	S46	0.000	0.65			110.0	OK	

Doran Consulting Limited		Page 28
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25	Designed by 814	
File Proposed No Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flooded		Half Drain		Pipe	Status	Level Exceeded
		Volume (m³)	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)	Flow (l/s)		
S11.002	S47	0.000	0.71			120.8	OK	
S11.003	S48	0.000	0.52			124.8	OK	
S14.000	S49	0.000	0.23			3.8	OK	
S14.001	S50	0.000	0.50			6.6	OK	
S11.004	S51	0.000	0.83			128.4	OK	
S11.005	S52	0.000	1.16			131.6	SURCHARGED	
S15.000	S53	0.000	0.20			3.4	OK	
S15.001	S54	0.000	0.29			43.2	OK	
S16.000	S55	0.000	0.10			10.7	OK	
S16.001	S56	0.000	0.18			19.5	OK	
S16.002	S57	0.000	0.24			24.7	OK	
S16.003	SFR PI Inlet	0.000	0.23			24.6	OK*	
S16.004	SFR PI Outlet	0.000	0.23			24.6	OK*	
S15.002	S58	0.000	0.63			67.5	OK	
S17.000	S59	0.000	0.06			3.3	OK	
S15.003	S60	0.000	0.62			69.5	OK	
S15.004	S61	0.000	0.90			81.8	OK	
S18.000	S62	0.000	0.37			15.9	OK	
S15.005	S63	0.000	0.73			93.4	OK*	
S1.012	S64	0.000	1.92			514.0	SURCHARGED	
S1.013	S65	0.000	1.29			474.0	OK	

Doran Consulting Limited		Page 29
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25	Designed by 814	
File Proposed No Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 10.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 15.700 Cv (Summer) 0.750
 Region Scotland and Ireland Ratio R 0.300 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
 Return Period(s) (years) 1, 5, 30, 100
 Climate Change (%) 10, 10, 10, 30

PN	US/MH		Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level	Surcharged Depth	Flooded Volume
	Name	Storm							(m)	(m)	(m³)
S1.000	S1	15 Winter	30	+10%	100/15 Summer				9.932	-0.068	0.000
S1.001	S2	15 Winter	30	+10%	100/15 Summer				8.863	-0.085	0.000
S2.000	S14	15 Winter	30	+10%	30/15 Summer				7.833	0.133	0.000
S1.002	S3	15 Winter	30	+10%	5/15 Summer				7.644	0.215	0.000
S1.003	S4	15 Winter	30	+10%	5/15 Summer				7.482	0.129	0.000
S1.004	SD2	15 Winter	30	+10%	5/15 Summer				4.290	0.187	0.000
S1.005	S5	15 Winter	30	+10%	100/15 Summer				4.159	-0.014	0.000
S1.006	S6	15 Winter	30	+10%	100/15 Summer				4.081	-0.001	0.000
S3.000	S15	15 Summer	30	+10%					4.350	-0.150	0.000
S3.001	S16	15 Summer	30	+10%					4.052	-0.150	0.000
S1.007	S7	15 Winter	30	+10%	100/15 Summer				4.038	0.000	0.000
S4.000	S17	15 Summer	30	+10%					4.350	-0.150	0.000
S1.008	S8	15 Winter	30	+10%					3.840	-0.165	0.000
S5.000	S18	15 Summer	30	+10%					3.850	-0.150	0.000
S6.000	S19	15 Winter	30	+10%					10.459	-0.141	0.000
S6.001	S20	15 Winter	30	+10%	100/15 Summer				7.497	-0.125	0.000
S7.000	S28	15 Winter	30	+10%					9.672	-0.128	0.000
S6.002	S21	15 Winter	30	+10%	1/15 Summer				7.152	0.311	0.000
S6.003	SD1	15 Winter	30	+10%	30/15 Summer				4.414	0.333	0.000
S6.004	S22	15 Winter	30	+10%	30/15 Summer				4.335	0.193	0.000
S8.000	S29	15 Winter	30	+10%	30/15 Summer				4.344	0.269	0.000
S6.005	S23	15 Winter	30	+10%	5/15 Summer				4.293	0.310	0.000
S6.006	S24	15 Winter	30	+10%	5/15 Summer				4.194	0.241	0.000
S6.007	S25	15 Winter	30	+10%	5/15 Summer				4.094	0.151	0.000
S6.008	S26	15 Winter	30	+10%	30/15 Summer				3.995	0.082	0.000
S6.009	S27	15 Winter	30	+10%	30/15 Summer				3.903	0.020	0.000
S1.009	S9	15 Winter	30	+10%					3.563	-0.182	0.000
S9.000	S36	15 Winter	30	+10%	5/15 Summer				3.542	0.492	0.000
S9.001	S37	15 Winter	30	+10%	30/15 Winter				2.742	0.004	0.000
S10.000	S30	15 Winter	30	+10%					3.112	-0.138	0.000
S10.001	S31	15 Winter	30	+10%	100/15 Winter				2.745	-0.116	0.000

Doran Consulting Limited		Page 30
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25 File Proposed No Tide.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.82			87.1	OK	
S1.001	S2	0.69			86.2	OK	
S2.000	S14	0.85			14.3	SURCHARGED	
S1.002	S3	1.45			99.6	SURCHARGED	
S1.003	S4	1.85			99.6	SURCHARGED	
S1.004	SD2	1.77			98.6	SURCHARGED	
S1.005	S5	0.96			96.8	OK	
S1.006	S6	1.02			92.1	OK	
S3.000	S15	0.00			0.0	OK	
S3.001	S16	0.00			0.0	OK	
S1.007	S7	1.06			89.9	OK	
S4.000	S17	0.00			0.0	OK	
S1.008	S8	0.58			89.0	OK	
S5.000	S18	0.00			0.0	OK	
S6.000	S19	0.29			29.5	OK	
S6.001	S20	0.40			37.9	OK	
S7.000	S28	0.38			43.0	OK	
S6.002	S21	2.76			82.6	SURCHARGED	
S6.003	SD1	1.51			80.1	SURCHARGED	
S6.004	S22	0.69			77.4	SURCHARGED	
S8.000	S29	0.77			50.0	SURCHARGED	
S6.005	S23	1.77			123.0	SURCHARGED	
S6.006	S24	1.44			121.9	SURCHARGED	
S6.007	S25	1.76			123.1	SURCHARGED	
S6.008	S26	1.79			123.7	SURCHARGED	
S6.009	S27	1.25			172.5	SURCHARGED	
S1.009	S9	0.65			374.6	OK	
S9.000	S36	1.55			20.6	SURCHARGED	
S9.001	S37	1.03			31.8	SURCHARGED	
S10.000	S30	0.31			15.2	OK	
S10.001	S31	0.46			20.7	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged
									Level (m)	Depth (m)
S10.002	S32	15 Winter	30	+10%	100/15 Winter				2.612	-0.102
S10.003	S33	15 Winter	30	+10%	100/15 Summer				2.436	-0.073
S10.004	S34	15 Winter	30	+10%	100/15 Summer				2.335	-0.081
S10.005	S35	15 Winter	30	+10%	100/15 Summer				2.144	-0.063
S1.010	S10	15 Winter	30	+10%	5/15 Summer				1.899	0.537
S1.011	S37	15 Winter	30	+10%	1/15 Summer				1.733	0.423
S11.000	S38	15 Winter	30	+10%	30/15 Summer				2.748	0.148
S12.000	S39	15 Winter	30	+10%	30/15 Summer				2.860	0.060
S12.001	S40	15 Summer	30	+10%					2.588	0.000
S13.000	S41	15 Winter	30	+10%	100/15 Summer				2.359	-0.091
S13.001	S42	15 Winter	30	+10%	100/15 Summer				2.325	-0.100
S13.002	S43	15 Winter	30	+10%					2.286	-0.131
S13.003	S44	15 Winter	30	+10%					2.283	-0.034
S13.004	S45	15 Winter	30	+10%	100/15 Summer				2.279	-0.029
S11.001	S46	15 Winter	30	+10%	100/15 Summer				2.252	-0.011
S11.002	S47	15 Winter	30	+10%	30/15 Winter				2.210	0.021
S11.003	S48	15 Winter	30	+10%	30/15 Winter				2.153	0.037
S14.000	S49	15 Winter	30	+10%	100/15 Summer				2.102	-0.048
S14.001	S50	15 Winter	30	+10%	30/15 Summer				2.084	0.102
S11.004	S51	15 Winter	30	+10%	30/15 Summer				2.072	0.135
S11.005	S52	15 Winter	30	+10%	5/15 Summer				1.973	0.167
S15.000	S53	15 Winter	30	+10%					3.007	-0.093
S15.001	S54	15 Winter	30	+10%					2.871	-0.179
S16.000	S55	15 Winter	30	+10%	100/15 Summer				2.127	-0.248
S16.001	S56	15 Winter	30	+10%	100/15 Summer				2.116	-0.113
S16.002	S57	15 Winter	30	+10%	100/15 Summer				2.101	-0.051
S16.003	SFR PI Inlet	15 Winter	30	+10%					2.095	-0.026
S16.004	SFR PI Outlet	15 Winter	30	+10%					2.071	0.000
S15.002	S58	15 Winter	30	+10%	30/15 Summer				2.088	0.060
S17.000	S59	15 Winter	30	+10%	100/15 Summer				2.055	-0.170
S15.003	S60	15 Winter	30	+10%	30/15 Summer				2.042	0.077
S15.004	S61	15 Winter	30	+10%	30/15 Summer				1.948	0.099
S18.000	S62	15 Winter	30	+10%	100/15 Summer				2.130	-0.070
S15.005	S63	15 Summer	30	+10%					1.813	0.000
S1.012	S64	15 Winter	30	+10%	5/15 Summer				1.633	0.349
S1.013	S65	15 Winter	30	+10%	30/15 Summer				1.421	0.167

PN	US/MH Name	Flooded		Half Drain		Pipe	Status	Level Exceeded
		Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)		
S10.002	S32	0.000	0.56			27.6	OK	
S10.003	S33	0.000	0.79			27.9	OK	
S10.004	S34	0.000	0.72			27.3	OK	
S10.005	S35	0.000	0.86			26.9	OK	
S1.010	S10	0.000	1.66			418.7	SURCHARGED	
S1.011	S37	0.000	2.14			413.2	SURCHARGED	
S11.000	S38	0.000	1.29			21.1	SURCHARGED	
S12.000	S39	0.000	1.01			16.9	SURCHARGED	
S12.001	S40	0.000	1.49			16.2	SURCHARGED*	
S13.000	S41	0.000	0.97			121.0	OK	
S13.001	S42	0.000	0.94			121.8	OK	
S13.002	S43	0.000	0.68			121.8	OK*	
S13.003	S44	0.000	0.71			120.2	OK*	
S13.004	S45	0.000	0.80			117.9	OK	
S11.001	S46	0.000	0.90			152.5	OK	

Doran Consulting Limited		Page 32
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25	Designed by 814	
File Proposed No Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flooded		Half Drain		Pipe	Status	Level Exceeded
		Volume (m³)	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)	Flow		
S11.002	S47	0.000	0.96			163.0	SURCHARGED	
S11.003	S48	0.000	0.70			167.9	SURCHARGED	
S14.000	S49	0.000	0.34			5.6	OK	
S14.001	S50	0.000	0.72			9.5	SURCHARGED	
S11.004	S51	0.000	1.13			175.0	SURCHARGED	
S11.005	S52	0.000	1.57			178.4	SURCHARGED	
S15.000	S53	0.000	0.30			5.0	OK	
S15.001	S54	0.000	0.54			79.3	OK	
S16.000	S55	0.000	0.14			15.5	OK	
S16.001	S56	0.000	0.26			27.4	OK	
S16.002	S57	0.000	0.36			37.3	OK	
S16.003	SFR PI Inlet	0.000	0.37			39.6	OK*	
S16.004	SFR PI Outlet	0.000	0.39			41.5	SURCHARGED*	
S15.002	S58	0.000	0.92			98.2	SURCHARGED	
S17.000	S59	0.000	0.08			4.8	OK	
S15.003	S60	0.000	0.91			101.5	SURCHARGED	
S15.004	S61	0.000	1.32			120.2	SURCHARGED	
S18.000	S62	0.000	0.55			23.4	OK	
S15.005	S63	0.000	1.07			136.1	SURCHARGED*	
S1.012	S64	0.000	2.68			716.0	SURCHARGED	
S1.013	S65	0.000	1.95			714.9	SURCHARGED	

Doran Consulting Limited		Page 33
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25	Designed by 814	
File Proposed No Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 10.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 15.700 Cv (Summer) 0.750
 Region Scotland and Ireland Ratio R 0.300 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
 Return Period(s) (years) 1, 5, 30, 100
 Climate Change (%) 10, 10, 10, 30

PN	US/MH		Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level	Surcharged Depth	Flooded Volume
	Name	Storm							(m)	(m)	(m³)
S1.000	S1	15 Winter	100	+30%	100/15 Summer				10.558	0.558	0.000
S1.001	S2	15 Winter	100	+30%	100/15 Summer				9.233	0.285	0.000
S2.000	S14	15 Winter	100	+30%	30/15 Summer				8.301	0.601	0.000
S1.002	S3	15 Winter	100	+30%	5/15 Summer				7.919	0.491	0.000
S1.003	S4	15 Winter	100	+30%	5/15 Summer				7.623	0.270	0.000
S1.004	SD2	15 Winter	100	+30%	5/15 Summer				4.679	0.576	0.000
S1.005	S5	15 Winter	100	+30%	100/15 Summer				4.391	0.218	0.000
S1.006	S6	15 Winter	100	+30%	100/15 Summer				4.225	0.143	0.000
S3.000	S15	15 Summer	100	+30%					4.350	-0.150	0.000
S3.001	S16	15 Winter	100	+30%					4.100	-0.102	0.000
S1.007	S7	15 Winter	100	+30%	100/15 Summer				4.105	0.067	0.000
S4.000	S17	15 Summer	100	+30%					4.350	-0.150	0.000
S1.008	S8	15 Winter	100	+30%					3.901	-0.104	0.000
S5.000	S18	15 Summer	100	+30%					3.850	-0.150	0.000
S6.000	S19	15 Winter	100	+30%					10.482	-0.118	0.000
S6.001	S20	15 Winter	100	+30%	100/15 Summer				7.810	0.188	0.000
S7.000	S28	15 Winter	100	+30%					9.700	-0.100	0.000
S6.002	S21	15 Winter	100	+30%	1/15 Summer				7.541	0.699	0.000
S6.003	SD1	15 Winter	100	+30%	30/15 Summer				5.158	1.077	0.000
S6.004	S22	15 Winter	100	+30%	30/15 Summer				4.951	0.809	0.000
S8.000	S29	15 Winter	100	+30%	30/15 Summer				4.967	0.892	0.000
S6.005	S23	15 Winter	100	+30%	5/15 Summer				4.863	0.881	0.000
S6.006	S24	15 Winter	100	+30%	5/15 Summer				4.646	0.693	0.000
S6.007	S25	15 Winter	100	+30%	5/15 Summer				4.430	0.487	0.000
S6.008	S26	15 Winter	100	+30%	30/15 Summer				4.219	0.306	0.000
S6.009	S27	15 Winter	100	+30%	30/15 Summer				4.028	0.145	0.000
S1.009	S9	15 Winter	100	+30%					3.648	-0.097	0.000
S9.000	S36	15 Winter	100	+30%	5/15 Summer				4.384	1.334	0.000
S9.001	S37	15 Winter	100	+30%	30/15 Winter				2.865	0.127	0.000
S10.000	S30	15 Winter	100	+30%					3.136	-0.114	0.000
S10.001	S31	15 Winter	100	+30%	100/15 Winter				2.873	0.011	0.000

Doran Consulting Limited		Page 34
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25	Designed by 814	
File Proposed No Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	1.12			118.7	SURCHARGED	
S1.001	S2	0.93			116.8	SURCHARGED	
S2.000	S14	1.18			19.9	SURCHARGED	
S1.002	S3	1.98			136.2	SURCHARGED	
S1.003	S4	2.52			136.0	SURCHARGED	
S1.004	SD2	2.44			136.1	SURCHARGED	
S1.005	S5	1.34			134.7	SURCHARGED	
S1.006	S6	1.50			135.0	SURCHARGED	
S3.000	S15	0.00			0.0	OK	
S3.001	S16	0.04			0.5	OK	
S1.007	S7	1.59			134.8	SURCHARGED	
S4.000	S17	0.00			0.0	OK	
S1.008	S8	0.87			134.6	OK	
S5.000	S18	0.00			0.0	OK	
S6.000	S19	0.44			45.2	OK	
S6.001	S20	0.58			55.5	SURCHARGED	
S7.000	S28	0.58			65.8	OK	
S6.002	S21	4.02			120.0	SURCHARGED	
S6.003	SD1	2.23			118.0	SURCHARGED	
S6.004	S22	1.03			114.6	FLOOD RISK	
S8.000	S29	1.07			69.0	FLOOD RISK	
S6.005	S23	2.61			181.0	FLOOD RISK	
S6.006	S24	2.14			181.9	SURCHARGED	
S6.007	S25	2.60			182.0	FLOOD RISK	
S6.008	S26	2.63			181.8	FLOOD RISK	
S6.009	S27	1.84			254.0	SURCHARGED	
S1.009	S9	0.96			554.0	OK	
S9.000	S36	2.14			28.6	FLOOD RISK	
S9.001	S37	1.46			45.2	SURCHARGED	
S10.000	S30	0.47			23.2	OK	
S10.001	S31	0.70			31.8	SURCHARGED	

Doran Consulting Limited		Page 35
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25	Designed by 814	
File Proposed No Tide.MDX	Checked by	
XP Solutions		Network 2020.1.3

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
S10.002	S32	15 Winter	100	+30%	100/15 Winter				2.839	0.125
S10.003	S33	15 Winter	100	+30%	100/15 Summer				2.793	0.283
S10.004	S34	15 Winter	100	+30%	100/15 Summer				2.750	0.334
S10.005	S35	15 Winter	100	+30%	100/15 Summer				2.672	0.465
S1.010	S10	15 Winter	100	+30%	5/15 Summer				2.596	1.234
S1.011	S37	15 Winter	100	+30%	1/15 Summer				2.245	0.934
S11.000	S38	15 Winter	100	+30%	30/15 Summer				3.448	0.848
S12.000	S39	15 Winter	100	+30%	30/15 Summer				3.334	0.534
S12.001	S40	15 Summer	100	+30%					2.588	0.000
S13.000	S41	15 Winter	100	+30%	100/15 Summer				3.057	0.607
S13.001	S42	15 Winter	100	+30%	100/15 Summer				3.025	0.600
S13.002	S43	15 Summer	100	+30%					2.417	0.000
S13.003	S44	15 Summer	100	+30%					2.317	0.000
S13.004	S45	15 Winter	100	+30%	100/15 Summer				2.992	0.684
S11.001	S46	15 Winter	100	+30%	100/15 Summer				2.956	0.693
S11.002	S47	15 Winter	100	+30%	30/15 Winter				2.855	0.666
S11.003	S48	15 Winter	100	+30%	30/15 Winter				2.732	0.616
S14.000	S49	15 Winter	100	+30%	100/15 Summer				2.640	0.490
S14.001	S50	15 Winter	100	+30%	30/15 Summer				2.618	0.636
S11.004	S51	15 Winter	100	+30%	30/15 Summer				2.602	0.665
S11.005	S52	15 Winter	100	+30%	5/15 Summer				2.462	0.656
S15.000	S53	15 Winter	100	+30%					3.022	-0.078
S15.001	S54	15 Winter	100	+30%					2.936	-0.114
S16.000	S55	15 Winter	100	+30%	100/15 Summer				2.800	0.425
S16.001	S56	15 Winter	100	+30%	100/15 Summer				2.791	0.562
S16.002	S57	15 Winter	100	+30%	100/15 Summer				2.771	0.619
S16.003	SFR PI Inlet	15 Summer	100	+30%					2.121	0.000
S16.004	SFR PI Outlet	15 Summer	100	+30%					2.071	0.000
S15.002	S58	15 Winter	100	+30%	30/15 Summer				2.754	0.726
S17.000	S59	15 Winter	100	+30%	100/15 Summer				2.679	0.454
S15.003	S60	15 Winter	100	+30%	30/15 Summer				2.668	0.703
S15.004	S61	15 Winter	100	+30%	30/15 Summer				2.529	0.680
S18.000	S62	15 Winter	100	+30%	100/15 Summer				2.543	0.343
S15.005	S63	15 Summer	100	+30%					1.813	0.000
S1.012	S64	15 Winter	100	+30%	5/15 Summer				2.017	0.733
S1.013	S65	15 Winter	100	+30%	30/15 Summer				1.615	0.361

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S10.002	S32	0.000	0.83			40.8	SURCHARGED	
S10.003	S33	0.000	1.05			37.0	SURCHARGED	
S10.004	S34	0.000	0.88			33.1	SURCHARGED	
S10.005	S35	0.000	1.16			36.5	SURCHARGED	
S1.010	S10	0.000	2.40			604.7	SURCHARGED	
S1.011	S37	0.000	3.11			600.6	SURCHARGED	
S11.000	S38	0.000	1.59			25.9	SURCHARGED	
S12.000	S39	0.000	1.35			22.6	SURCHARGED	
S12.001	S40	0.000	1.88			20.4	SURCHARGED*	
S13.000	S41	0.000	1.31			162.8	SURCHARGED	
S13.001	S42	0.000	1.21			156.3	SURCHARGED	
S13.002	S43	0.000	0.87			154.3	SURCHARGED*	
S13.003	S44	0.000	0.89			150.8	SURCHARGED*	
S13.004	S45	0.000	0.95			139.8	SURCHARGED	
S11.001	S46	0.000	1.09			184.5	SURCHARGED	

Doran Consulting Limited		Page 36
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:25	Designed by 814	
File Proposed No Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flooded		Half Drain		Pipe	Status	Level Exceeded
		Volume (m³)	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)	Flow		
S11.002	S47	0.000	1.20			202.4	SURCHARGED	
S11.003	S48	0.000	0.89			212.3	SURCHARGED	
S14.000	S49	0.000	0.45			7.4	SURCHARGED	
S14.001	S50	0.000	0.85			11.3	SURCHARGED	
S11.004	S51	0.000	1.40			217.6	SURCHARGED	
S11.005	S52	0.000	1.92			218.2	SURCHARGED	
S15.000	S53	0.000	0.46			7.6	OK	
S15.001	S54	0.000	0.82			121.5	OK	
S16.000	S55	0.000	0.17			18.4	SURCHARGED	
S16.001	S56	0.000	0.31			33.4	FLOOD RISK	
S16.002	S57	0.000	0.44			45.1	SURCHARGED	
S16.003	SFR PI Inlet	0.000	0.43			46.3	SURCHARGED*	
S16.004	SFR PI Outlet	0.000	0.47			50.4	SURCHARGED*	
S15.002	S58	0.000	1.27			135.7	SURCHARGED	
S17.000	S59	0.000	0.12			6.9	SURCHARGED	
S15.003	S60	0.000	1.20			134.6	SURCHARGED	
S15.004	S61	0.000	1.77			160.5	SURCHARGED	
S18.000	S62	0.000	0.73			31.1	SURCHARGED	
S15.005	S63	0.000	1.40			178.9	SURCHARGED*	
S1.012	S64	0.000	3.70			988.9	SURCHARGED	
S1.013	S65	0.000	2.70			990.4	SURCHARGED	

APPENDIX H3 – Proposed Storm Run-Off Calculations - Mean Spring Tide (MST)

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes DC PIPES Manhole Sizes DC MHs

FSR Rainfall Model - Scotland and Ireland			
Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	15.600	Add Flow / Climate Change (%)	10
Ratio R	0.300	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	200	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	1.418	4-8	1.740	8-12	0.025

Total Area Contributing (ha) = 3.182

Total Pipe Volume (m³) = 106.078

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	21.043	1.052	20.0	0.295	5.00	0.0	0.600	o	225	Pipe/Conduit	
S1.001	22.150	1.519	14.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S2.000	27.330	0.271	100.9	0.052	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.002	10.573	0.076	139.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.003	2.040	0.014	150.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.004	1.499	0.005	300.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.005	27.313	0.091	300.1	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.006	13.139	0.044	298.6	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL Σ (m)	I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	48.61	5.12	9.775	0.295	0.0	0.0	3.9	2.94	116.9	42.8
S1.001	48.22	5.23	8.723	0.295	0.0	0.0	3.9	3.44	137.0	42.8
S2.000	47.42	5.46	7.550	0.052	0.0	0.0	0.7	1.00	17.7	7.4
S1.002	46.97	5.59	7.129	0.348	0.0	0.0	4.4	1.33	93.9	48.6
S1.003	46.88	5.61	7.053	0.348	0.0	0.0	4.4	1.28	90.6	48.6
S1.004	46.78	5.64	3.803	0.348	0.0	0.0	4.4	0.90	63.8	48.6
S1.005	45.38	6.08	3.798	0.348	0.0	0.0	4.4	1.04	114.9	48.6
S1.006	44.75	6.29	3.707	0.348	0.0	0.0	4.4	1.04	115.2	48.6

Doran Consulting Limited		Page 2
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38 File Proposed Spring Tide.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S3.000	44.656	0.298	150.0	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
S3.001	35.891	0.239	150.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.007	9.792	0.033	296.7	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S4.000	34.300	0.570	60.2	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.008	22.600	0.185	122.2	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S5.000	46.827	0.255	183.6	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
S6.000	74.456	2.978	25.0	0.102	5.00	0.0	0.600	o	225	Pipe/Conduit	
S6.001	18.936	0.780	24.3	0.028	0.00	0.0	0.600	o	225	Pipe/Conduit	
S7.000	59.039	2.958	20.0	0.147	5.00	0.0	0.600	o	225	Pipe/Conduit	
S6.002	3.748	0.028	133.4	0.004	0.00	0.0	0.600	o	225	Pipe/Conduit	
S6.003	2.367	0.014	166.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S6.004	18.341	0.084	218.3	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S8.000	20.755	0.092	225.0	0.211	5.00	0.0	0.600	o	300	Pipe/Conduit	
S6.005	11.219	0.030	375.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S6.006	2.580	0.009	275.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S6.007	11.655	0.031	375.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S6.008	11.032	0.029	375.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S3.000	45.92	5.91	4.350	0.000	0.0	0.0	0.0	0.82	14.5	0.0
S3.001	43.73	6.64	4.052	0.000	0.0	0.0	0.0	0.82	14.5	0.0
S1.007	43.30	6.80	3.663	0.348	0.0	0.0	4.4	1.05	115.6	48.6
S4.000	47.47	5.44	4.350	0.000	0.0	0.0	0.0	1.30	23.0	0.0
S1.008	42.68	7.03	3.630	0.348	0.0	0.0	4.4	1.64	180.9	48.6
S5.000	45.45	6.06	3.850	0.000	0.0	0.0	0.0	0.74	13.0	0.0
S6.000	47.36	5.47	10.375	0.102	0.0	0.0	1.3	2.63	104.5	14.4
S6.001	46.96	5.59	7.397	0.130	0.0	0.0	1.7	2.67	106.0	18.2
S7.000	47.84	5.33	9.575	0.147	0.0	0.0	1.9	2.94	117.0	21.0
S6.002	46.77	5.65	6.617	0.282	0.0	0.0	3.6	1.13	44.9	39.3
S6.003	46.67	5.68	3.781	0.282	0.0	0.0	3.6	1.21	85.8	39.3
S6.004	45.86	5.93	3.767	0.282	0.0	0.0	3.6	1.22	135.0	39.3
S8.000	47.85	5.33	3.775	0.211	0.0	0.0	2.7	1.04	73.8	30.0
S6.005	45.23	6.13	3.608	0.493	0.0	0.0	6.0	0.93	102.7	66.4
S6.006	45.11	6.17	3.578	0.493	0.0	0.0	6.0	1.09	120.1	66.4
S6.007	44.49	6.38	3.568	0.493	0.0	0.0	6.0	0.93	102.7	66.4
S6.008	43.91	6.58	3.537	0.493	0.0	0.0	6.0	0.93	102.7	66.4

Doran Consulting Limited		Page 3
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38	Designed by 814	
File Proposed Spring Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S6.009	23.534	0.063	375.0	0.261	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.009	21.815	1.045	20.9	0.514	0.00	0.0	0.600	o	450	Pipe/Conduit	
S9.000	52.403	0.312	168.2	0.085	5.00	0.0	0.600	o	150	Pipe/Conduit	
S9.001	27.362	0.113	241.9	0.051	0.00	0.0	0.600	o	225	Pipe/Conduit	
S10.000	39.193	0.388	100.9	0.052	5.00	0.0	0.600	o	225	Pipe/Conduit	
S10.001	14.856	0.147	100.9	0.019	0.00	0.0	0.600	o	225	Pipe/Conduit	
S10.002	18.323	0.205	89.4	0.023	0.00	0.0	0.600	o	225	Pipe/Conduit	
S10.003	15.685	0.093	167.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S10.004	35.116	0.209	167.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S10.005	35.026	0.145	241.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.010	22.982	0.052	443.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.011	33.055	0.026	1274.4	0.021	0.00	0.0	0.600	o	675	Pipe/Conduit	
S11.000	23.214	0.218	106.6	0.077	5.00	0.0	0.600	o	150	Pipe/Conduit	
S12.000	21.191	0.212	100.0	0.061	5.00	0.0	0.600	o	150	Pipe/Conduit	
S12.001	1.178	0.012	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S13.000	6.026	0.025	241.0	0.415	5.00	0.0	0.600	o	450	Pipe/Conduit	
S13.001	1.825	0.008	228.1	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S13.002	1.640	0.100	16.4	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S13.003	2.274	0.009	252.7	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S6.009	42.88	6.95	3.433	0.754	0.0	0.0	8.7	1.04	166.0	96.2
S1.009	42.46	7.11	3.295	1.615	0.0	0.0	18.6	4.47	710.2	204.3
S9.000	45.23	6.13	2.900	0.085	0.0	0.0	1.0	0.77	13.6	11.5
S9.001	43.63	6.68	2.513	0.136	0.0	0.0	1.6	0.84	33.2	17.7
S10.000	47.26	5.50	3.025	0.052	0.0	0.0	0.7	1.30	51.7	7.4
S10.001	46.62	5.69	2.637	0.072	0.0	0.0	0.9	1.30	51.7	9.9
S10.002	45.91	5.91	2.489	0.095	0.0	0.0	1.2	1.38	55.0	13.0
S10.003	45.10	6.17	2.284	0.095	0.0	0.0	1.2	1.01	40.0	13.0
S10.004	43.41	6.75	2.191	0.095	0.0	0.0	1.2	1.01	40.0	13.0
S10.005	41.58	7.45	1.982	0.095	0.0	0.0	1.2	0.84	33.2	13.0
S1.010	40.77	7.79	0.762	1.846	0.0	0.0	20.4	1.15	325.3	224.3
S1.011	39.07	8.54	0.635	1.867	0.0	0.0	20.4	0.73	259.6	224.3
S11.000	47.62	5.40	2.450	0.077	0.0	0.0	1.0	0.97	17.2	10.9
S12.000	47.78	5.35	2.650	0.061	0.0	0.0	0.8	1.00	17.8	8.7
S12.001	47.71	5.37	2.438	0.061	0.0	0.0	0.8	1.00	17.8	8.7
S13.000	48.76	5.08	2.000	0.415	0.0	0.0	5.5	1.31	207.6	60.2
S13.001	48.68	5.10	1.975	0.415	0.0	0.0	5.5	1.34	213.4	60.2
S13.002	48.66	5.11	1.967	0.415	0.0	0.0	5.5	5.04	801.5	60.2
S13.003	48.55	5.13	1.867	0.415	0.0	0.0	5.5	1.27	202.7	60.2

Doran Consulting Limited		Page 4
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38 File Proposed Spring Tide.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S13.004	10.833	0.045	240.7	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S11.001	11.034	0.073	151.2	0.013	0.00	0.0	0.600	o	450	Pipe/Conduit	
S11.002	12.468	0.073	170.8	0.061	0.00	0.0	0.600	o	450	Pipe/Conduit	
S11.003	18.112	0.179	101.2	0.037	0.00	0.0	0.600	o	450	Pipe/Conduit	
S14.000	16.783	0.168	99.9	0.019	5.00	0.0	0.600	o	150	Pipe/Conduit	
S14.001	4.480	0.045	99.6	0.016	0.00	0.0	0.600	o	150	Pipe/Conduit	
S11.004	13.458	0.056	240.3	0.010	0.00	0.0	0.600	o	450	Pipe/Conduit	
S11.005	29.590	0.123	240.6	0.019	0.00	0.0	0.600	o	375	Pipe/Conduit	
S15.000	19.991	0.200	100.0	0.017	5.00	0.0	0.600	o	150	Pipe/Conduit	
S15.001	18.053	0.144	125.4	0.235	0.00	0.0	0.600	o	375	Pipe/Conduit	
S16.000	12.092	0.071	170.3	0.053	5.00	0.0	0.600	o	375	Pipe/Conduit	
S16.001	18.716	0.077	243.1	0.053	0.00	0.0	0.600	o	375	Pipe/Conduit	
S16.002	3.061	0.031	98.7	0.030	0.00	0.0	0.600	o	375	Pipe/Conduit	
S16.003	3.177	0.050	63.5	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S16.004	4.362	0.044	99.1	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S15.002	10.718	0.063	170.1	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S17.000	16.035	0.258	62.2	0.016	5.00	0.0	0.600	o	225	Pipe/Conduit	
S15.003	28.348	0.116	244.4	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S13.004	48.05	5.27	1.858	0.415	0.0	0.0	5.5	1.31	207.7	60.2
S11.001	47.23	5.51	1.813	0.565	0.0	0.0	7.2	1.65	262.6	79.5
S11.002	46.78	5.64	1.739	0.627	0.0	0.0	7.9	1.55	247.0	87.3
S11.003	46.29	5.79	1.666	0.664	0.0	0.0	8.3	2.02	321.4	91.6
S14.000	48.03	5.28	2.000	0.019	0.0	0.0	0.3	1.01	17.8	2.8
S14.001	47.77	5.35	1.832	0.036	0.0	0.0	0.5	1.01	17.8	5.1
S11.004	45.75	5.96	1.487	0.709	0.0	0.0	8.8	1.31	207.9	96.7
S11.005	44.46	6.39	1.431	0.729	0.0	0.0	8.8	1.16	128.5	96.7
S15.000	47.85	5.33	2.950	0.017	0.0	0.0	0.2	1.01	17.8	2.4
S15.001	47.20	5.52	2.675	0.252	0.0	0.0	3.2	1.62	178.6	35.5
S16.000	48.51	5.15	2.000	0.053	0.0	0.0	0.7	1.39	153.0	7.7
S16.001	47.56	5.41	1.854	0.106	0.0	0.0	1.4	1.16	127.9	15.0
S16.002	47.46	5.44	1.777	0.136	0.0	0.0	1.7	1.82	201.4	19.2
S16.003	47.38	5.47	1.746	0.136	0.0	0.0	1.7	2.28	251.4	19.2
S16.004	47.24	5.51	1.696	0.136	0.0	0.0	1.7	1.82	201.0	19.2
S15.002	46.77	5.65	1.653	0.388	0.0	0.0	4.9	1.39	153.1	54.1
S17.000	48.46	5.16	2.000	0.016	0.0	0.0	0.2	1.66	66.1	2.3
S15.003	45.46	6.06	1.590	0.404	0.0	0.0	5.0	1.15	127.5	54.8

Doran Consulting Limited		Page 5
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38 File Proposed Spring Tide.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S15.004	8.917	0.036	247.7	0.083	0.00	0.0	0.600	o	375	Pipe/Conduit	
S18.000	4.537	0.460	9.9	0.079	5.00	0.0	0.600	o	150	Pipe/Conduit	
S15.005	50.391	0.206	244.6	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.012	17.899	0.030	596.6	0.020	0.00	0.0	0.600	o	750	Pipe/Conduit	
S1.013	2.312	0.004	578.0	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S15.004	45.06	6.19	1.474	0.487	0.0	0.0	5.9	1.15	126.7	65.4
S18.000	48.96	5.02	2.050	0.079	0.0	0.0	1.1	3.23	57.0	11.6
S15.005	42.98	6.91	1.438	0.567	0.0	0.0	6.6	1.15	127.5	72.6
S1.012	38.52	8.81	0.534	3.182	0.0	0.0	33.2	1.14	502.9	365.1
S1.013	38.45	8.84	0.504	3.182	0.0	0.0	33.2	1.16	511.0	365.1

Doran Consulting Limited		Page 6
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38	Designed by 814	
File Proposed Spring Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
S1	12.000	2.225	Open Manhole	1200	S1.000	9.775	225				
S2	10.300	1.577	Open Manhole	1200	S1.001	8.723	225	S1.000	8.723	225	
S14	8.900	1.350	Open Manhole	1200	S2.000	7.550	150				
S3	9.770	2.641	Open Manhole	1200	S1.002	7.129	300	S1.001	7.204	225	
								S2.000	7.279	150	
S4	9.900	2.847	Open Manhole	1200	S1.003	7.053	300	S1.002	7.053	300	
SD2	9.000	5.197	Open Manhole	1200	S1.004	3.803	300	S1.003	7.040	300	3237
S5	5.000	1.202	Open Manhole	1350	S1.005	3.798	375	S1.004	3.798	300	
S6	5.000	1.293	Open Manhole	1350	S1.006	3.707	375	S1.005	3.707	375	
S15	5.000	0.650	Open Manhole	1200	S3.000	4.350	150				
S16	5.000	0.948	Open Manhole	1200	S3.001	4.052	150	S3.000	4.052	150	
S7	5.000	1.337	Open Manhole	1350	S1.007	3.663	375	S1.006	3.663	375	
								S3.001	3.813	150	
S17	5.000	0.650	Open Manhole	1200	S4.000	4.350	150				
S8	5.000	1.370	Open Manhole	1350	S1.008	3.630	375	S1.007	3.630	375	
								S4.000	3.780	150	
S18	4.500	0.650	Open Manhole	1200	S5.000	3.850	150				
S19	12.600	2.225	Open Manhole	1200	S6.000	10.375	225				
S20	8.200	0.803	Open Manhole	1200	S6.001	7.397	225	S6.000	7.397	225	
S28	11.800	2.225	Open Manhole	1200	S7.000	9.575	225				
S21	8.600	1.983	Open Manhole	1200	S6.002	6.617	225	S6.001	6.617	225	
								S7.000	6.617	225	
SD1	9.000	5.219	Open Manhole	1200	S6.003	3.781	300	S6.002	6.589	225	2733
S22	5.000	1.233	Open Manhole	1800	S6.004	3.767	375	S6.003	3.767	300	
S29	5.000	1.225	Open Manhole	1800	S8.000	3.775	300				
S23	5.000	1.392	Open Manhole	1350	S6.005	3.608	375	S6.004	3.683	375	75
								S8.000	3.683	300	
S24	5.000	1.422	Open Manhole	1350	S6.006	3.578	375	S6.005	3.578	375	
S25	4.500	0.932	Open Manhole	1350	S6.007	3.568	375	S6.006	3.568	375	
S26	4.500	0.963	Open Manhole	1350	S6.008	3.537	375	S6.007	3.537	375	
S27	4.500	1.067	Open Manhole	1350	S6.009	3.433	450	S6.008	3.508	375	
S9	4.500	1.205	Open Manhole	1350	S1.009	3.295	450	S1.008	3.445	375	75
								S5.000	3.595	150	
								S6.009	3.370	450	75
S36	4.400	1.500	Open Manhole	1200	S9.000	2.900	150				
S37	4.250	1.737	Open Manhole	1200	S9.001	2.513	225	S9.000	2.588	150	
S30	4.450	1.425	Open Manhole	1200	S10.000	3.025	225				
S31	4.450	1.813	Open Manhole	1200	S10.001	2.637	225	S10.000	2.637	225	
S32	4.450	1.961	Open Manhole	1200	S10.002	2.489	225	S10.001	2.489	225	
S33	4.400	2.116	Open Manhole	1200	S10.003	2.284	225	S10.002	2.284	225	
S34	4.400	2.209	Open Manhole	1200	S10.004	2.191	225	S10.003	2.191	225	
S35	4.400	2.418	Open Manhole	1200	S10.005	1.982	225	S10.004	1.982	225	
S10	4.400	3.638	Open Manhole	1800	S1.010	0.762	600	S1.009	2.250	450	1338
								S9.001	2.400	225	1263

Manhole Schedules for Storm											
MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
S37	3.800	3.165	Open Manhole	1800	S1.011	0.635	675	S10.005	1.837	225	700
S38	3.800	1.350	Open Manhole	1200	S11.000	2.450	150	S1.010	0.710	600	
S39	4.000	1.350	Open Manhole	1200	S12.000	2.650	150				
S40	3.900	1.462	Junction		S12.001	2.438	150	S12.000	2.438	150	
S41	3.600	1.600	Open Manhole	1350	S13.000	2.000	450				
S42	3.600	1.625	Open Manhole	1350	S13.001	1.975	450	S13.000	1.975	450	
S43	3.650	1.683	Junction		S13.002	1.967	450	S13.001	1.967	450	
S44	3.650	1.783	Junction		S13.003	1.867	450	S13.002	1.867	450	
S45	3.650	1.792	Open Manhole	1350	S13.004	1.858	450	S13.003	1.858	450	
S46	3.900	2.087	Open Manhole	1350	S11.001	1.813	450	S11.000	2.232	150	119
								S12.001	2.426	150	313
								S13.004	1.813	450	
S47	3.900	2.161	Open Manhole	1350	S11.002	1.739	450	S11.001	1.740	450	1
S48	3.850	2.184	Open Manhole	1350	S11.003	1.666	450	S11.002	1.666	450	
S49	3.200	1.200	Open Manhole	1200	S14.000	2.000	150				
S50	3.500	1.668	Open Manhole	1200	S14.001	1.832	150	S14.000	1.832	150	
S51	3.800	2.313	Open Manhole	1350	S11.004	1.487	450	S11.003	1.487	450	
								S14.001	1.787	150	
S52	3.750	2.319	Open Manhole	1350	S11.005	1.431	375	S11.004	1.431	450	
S53	4.000	1.050	Open Manhole	1200	S15.000	2.950	150				
S54	3.675	1.000	Open Manhole	1350	S15.001	2.675	375	S15.000	2.750	150	
S55	4.200	2.200	Open Manhole	1200	S16.000	2.000	375				
S56	3.075	1.221	Open Manhole	1350	S16.001	1.854	375	S16.000	1.929	375	75
S57	3.075	1.298	Open Manhole	1200	S16.002	1.777	375	S16.001	1.777	375	
SFR PI Inlet	3.075	1.329	Junction		S16.003	1.746	375	S16.002	1.746	375	
SFR PI Outlet	3.075	1.379	Junction		S16.004	1.696	375	S16.003	1.696	375	
S58	3.075	1.423	Open Manhole	1350	S15.002	1.653	375	S15.001	2.531	375	878
								S16.004	1.652	375	
S59	3.200	1.200	Open Manhole	1200	S17.000	2.000	225				
S60	3.400	1.810	Open Manhole	1350	S15.003	1.590	375	S15.002	1.590	375	
								S17.000	1.742	225	2
S61	3.750	2.276	Open Manhole	1350	S15.004	1.474	375	S15.003	1.474	375	
S62	3.200	1.150	Open Manhole	1200	S18.000	2.050	150				
S63	3.750	2.312	Junction		S15.005	1.438	375	S15.004	1.438	375	
								S18.000	1.590	150	
S64	3.750	3.216	Open Manhole	1800	S1.012	0.534	750	S1.011	0.609	675	
								S11.005	1.308	375	399
								S15.005	1.232	375	323
S65	3.700	3.196	Open Manhole	2400	S1.013	0.504	750	S1.012	0.504	750	
S	3.700	3.200	Open Manhole	0		OUTFALL		S1.013	0.500	750	

Doran Consulting Limited		Page 8
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38 File Proposed Spring Tide.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S1	350466.054	381790.264	350466.054	381790.264	Required	
S2	350461.297	381810.762	350461.297	381810.762	Required	
S14	350482.394	381839.657	350482.394	381839.657	Required	
S3	350456.077	381832.288	350456.077	381832.288	Required	
S4	350445.953	381829.239	350445.953	381829.239	Required	
SD2	350445.354	381831.189	350445.354	381831.189	Required	
S5	350444.913	381832.622	350444.913	381832.622	Required	
S6	350418.686	381824.997	350418.686	381824.997	Required	
S15	350492.412	381860.030	350492.412	381860.030	Required	
S16	350449.532	381847.565	350449.532	381847.565	Required	
S7	350415.046	381837.621	350415.046	381837.621	Required	
S17	350445.226	381856.755	350445.226	381856.755	Required	
S8	350412.333	381847.030	350412.333	381847.030	Required	
S18	350451.032	381881.839	350451.032	381881.839	Required	
S19	350454.919	381777.813	350454.919	381777.813	Required	
S20	350382.082	381793.258	350382.082	381793.258	Required	
S28	350446.725	381799.677	350446.725	381799.677	Required	
S21	350388.776	381810.971	350388.776	381810.971	Required	

Doran Consulting Limited		Page 9
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38 File Proposed Spring Tide.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

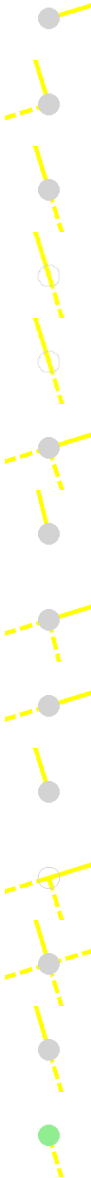
Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
SD1	350387.735	381814.572	350387.735	381814.572	Required	
S22	350385.499	381815.348	350385.499	381815.348	Required	
S29	350360.497	381827.494	350360.497	381827.494	Required	
S23	350380.509	381832.997	350380.509	381832.997	Required	
S24	350377.449	381843.791	350377.449	381843.791	Required	
S25	350376.684	381846.255	350376.684	381846.255	Required	
S26	350373.434	381857.447	350373.434	381857.447	Required	
S27	350384.050	381860.447	350384.050	381860.447	Required	
S9	350406.072	381868.745	350406.072	381868.745	Required	
S36	350476.394	381912.323	350476.394	381912.323	Required	
S37	350426.137	381897.479	350426.137	381897.479	Required	
S30	350352.270	381801.758	350352.270	381801.758	Required	
S31	350331.862	381835.219	350331.862	381835.219	Required	
S32	350324.763	381848.269	350324.763	381848.269	Required	
S33	350317.660	381865.159	350317.660	381865.159	Required	
S34	350332.682	381869.669	350332.682	381869.669	Required	
S35	350366.341	381879.680	350366.341	381879.680	Required	
S10	350399.911	381889.673	350399.911	381889.673	Required	

Doran Consulting Limited		Page 10
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38 File Proposed Spring Tide.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S37	350396.591	381912.414	350396.591	381912.414	Required	
S38	350490.855	381973.319	350490.855	381973.319	Required	
S39	350485.820	381954.909	350485.820	381954.909	Required	
S40	350469.216	381968.077			No Entry	
S41	350475.945	381986.148	350475.945	381986.148	Required	
S42	350477.494	381980.325	350477.494	381980.325	Required	
S43	350475.745	381979.804			No Entry	
S44	350474.177	381979.325			No Entry	
S45	350472.000	381978.669	350472.000	381978.669	Required	
S46	350468.137	381968.548	350468.137	381968.548	Required	
S47	350457.570	381965.368	350457.570	381965.368	Required	
S48	350445.635	381961.763	350445.635	381961.763	Required	
S49	350439.676	381938.821	350439.676	381938.821	Required	
S50	350429.589	381952.234	350429.589	381952.234	Required	
S51	350428.298	381956.524	350428.298	381956.524	Required	
S52	350415.415	381952.632	350415.415	381952.632	Required	
S53	350271.906	381889.973	350271.906	381889.973	Required	
S54	350275.896	381909.563	350275.896	381909.563	Required	

Manhole Schedules for Storm						
MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S55	350290.226	381883.339	350290.226	381883.339	Required	
S56	350301.781	381886.901	350301.781	381886.901	Required	
S57	350296.278	381904.790	350296.278	381904.790	Required	
SFR PI Inlet	350295.372	381907.714			No Entry	
SFR PI Outlet	350294.430	381910.748			No Entry	
S58	350293.137	381914.914	350293.137	381914.914	Required	
S59	350307.185	381902.515	350307.185	381902.515	Required	
S60	350303.373	381918.091	350303.373	381918.091	Required	
S61	350330.447	381926.494	350330.447	381926.494	Required	
S62	350340.308	381924.804	350340.308	381924.804	Required	
S63	350338.963	381929.137			No Entry	
S64	350387.090	381944.074	350387.090	381944.074	Required	
S65	350381.945	381961.218	350381.945	381961.218	Required	
S	350381.281	381963.432			No Entry	

Doran Consulting Limited		Page 12
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38 File Proposed Spring Tide.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	o	225	S1	12.000	9.775	2.000	Open Manhole	1200
S1.001	o	225	S2	10.300	8.723	1.352	Open Manhole	1200
S2.000	o	150	S14	8.900	7.550	1.200	Open Manhole	1200
S1.002	o	300	S3	9.770	7.129	2.341	Open Manhole	1200
S1.003	o	300	S4	9.900	7.053	2.547	Open Manhole	1200
S1.004	o	300	SD2	9.000	3.803	4.897	Open Manhole	1200
S1.005	o	375	S5	5.000	3.798	0.827	Open Manhole	1350
S1.006	o	375	S6	5.000	3.707	0.918	Open Manhole	1350
S3.000	o	150	S15	5.000	4.350	0.500	Open Manhole	1200
S3.001	o	150	S16	5.000	4.052	0.798	Open Manhole	1200
S1.007	o	375	S7	5.000	3.663	0.962	Open Manhole	1350
S4.000	o	150	S17	5.000	4.350	0.500	Open Manhole	1200
S1.008	o	375	S8	5.000	3.630	0.995	Open Manhole	1350
S5.000	o	150	S18	4.500	3.850	0.500	Open Manhole	1200
S6.000	o	225	S19	12.600	10.375	2.000	Open Manhole	1200
S6.001	o	225	S20	8.200	7.397	0.578	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	21.043	20.0	S2	10.300	8.723	1.352	Open Manhole	1200
S1.001	22.150	14.6	S3	9.770	7.204	2.341	Open Manhole	1200
S2.000	27.330	100.9	S3	9.770	7.279	2.341	Open Manhole	1200
S1.002	10.573	139.6	S4	9.900	7.053	2.547	Open Manhole	1200
S1.003	2.040	150.0	SD2	9.000	7.040	1.660	Open Manhole	1200
S1.004	1.499	300.0	S5	5.000	3.798	0.902	Open Manhole	1350
S1.005	27.313	300.1	S6	5.000	3.707	0.918	Open Manhole	1350
S1.006	13.139	298.6	S7	5.000	3.663	0.962	Open Manhole	1350
S3.000	44.656	150.0	S16	5.000	4.052	0.798	Open Manhole	1200
S3.001	35.891	150.0	S7	5.000	3.813	1.037	Open Manhole	1350
S1.007	9.792	296.7	S8	5.000	3.630	0.995	Open Manhole	1350
S4.000	34.300	60.2	S8	5.000	3.780	1.070	Open Manhole	1350
S1.008	22.600	122.2	S9	4.500	3.445	0.680	Open Manhole	1350
S5.000	46.827	183.6	S9	4.500	3.595	0.755	Open Manhole	1350
S6.000	74.456	25.0	S20	8.200	7.397	0.578	Open Manhole	1200
S6.001	18.936	24.3	S21	8.600	6.617	1.758	Open Manhole	1200

Doran Consulting Limited		Page 13
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38 File Proposed Spring Tide.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd	Diam	MH	C.Level	I.Level	D.Depth	MH	MH DIAM., L*W
	Sect	(mm)	Name	(m)	(m)	(m)	Connection	(mm)
S7.000	o	225	S28	11.800	9.575	2.000	Open Manhole	1200
S6.002	o	225	S21	8.600	6.617	1.758	Open Manhole	1200
S6.003	o	300	SD1	9.000	3.781	4.919	Open Manhole	1200
S6.004	o	375	S22	5.000	3.767	0.858	Open Manhole	1800
S8.000	o	300	S29	5.000	3.775	0.925	Open Manhole	1800
S6.005	o	375	S23	5.000	3.608	1.017	Open Manhole	1350
S6.006	o	375	S24	5.000	3.578	1.047	Open Manhole	1350
S6.007	o	375	S25	4.500	3.568	0.557	Open Manhole	1350
S6.008	o	375	S26	4.500	3.537	0.588	Open Manhole	1350
S6.009	o	450	S27	4.500	3.433	0.617	Open Manhole	1350
S1.009	o	450	S9	4.500	3.295	0.755	Open Manhole	1350
S9.000	o	150	S36	4.400	2.900	1.350	Open Manhole	1200
S9.001	o	225	S37	4.250	2.513	1.512	Open Manhole	1200
S10.000	o	225	S30	4.450	3.025	1.200	Open Manhole	1200
S10.001	o	225	S31	4.450	2.637	1.588	Open Manhole	1200
S10.002	o	225	S32	4.450	2.489	1.736	Open Manhole	1200
S10.003	o	225	S33	4.400	2.284	1.891	Open Manhole	1200
S10.004	o	225	S34	4.400	2.191	1.984	Open Manhole	1200
S10.005	o	225	S35	4.400	1.982	2.193	Open Manhole	1200

Downstream Manhole

PN	Length	Slope	MH	C.Level	I.Level	D.Depth	MH	MH DIAM., L*W
	(m)	(1:X)	Name	(m)	(m)	(m)	Connection	(mm)
S7.000	59.039	20.0	S21	8.600	6.617	1.758	Open Manhole	1200
S6.002	3.748	133.4	SD1	9.000	6.589	2.186	Open Manhole	1200
S6.003	2.367	166.8	S22	5.000	3.767	0.933	Open Manhole	1800
S6.004	18.341	218.3	S23	5.000	3.683	0.942	Open Manhole	1350
S8.000	20.755	225.0	S23	5.000	3.683	1.017	Open Manhole	1350
S6.005	11.219	375.0	S24	5.000	3.578	1.047	Open Manhole	1350
S6.006	2.580	275.0	S25	4.500	3.568	0.557	Open Manhole	1350
S6.007	11.655	375.0	S26	4.500	3.537	0.588	Open Manhole	1350
S6.008	11.032	375.0	S27	4.500	3.508	0.617	Open Manhole	1350
S6.009	23.534	375.0	S9	4.500	3.370	0.680	Open Manhole	1350
S1.009	21.815	20.9	S10	4.400	2.250	1.700	Open Manhole	1800
S9.000	52.403	168.2	S37	4.250	2.588	1.512	Open Manhole	1200
S9.001	27.362	241.9	S10	4.400	2.400	1.775	Open Manhole	1800
S10.000	39.193	100.9	S31	4.450	2.637	1.588	Open Manhole	1200
S10.001	14.856	100.9	S32	4.450	2.489	1.736	Open Manhole	1200
S10.002	18.323	89.4	S33	4.400	2.284	1.891	Open Manhole	1200
S10.003	15.685	167.9	S34	4.400	2.191	1.984	Open Manhole	1200
S10.004	35.116	167.9	S35	4.400	1.982	2.193	Open Manhole	1200
S10.005	35.026	241.9	S10	4.400	1.837	2.338	Open Manhole	1800

Doran Consulting Limited		Page 14
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38 File Proposed Spring Tide.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.010	o	600	S10	4.400	0.762	3.038	Open Manhole	1800
S1.011	o	675	S37	3.800	0.635	2.490	Open Manhole	1800
S11.000	o	150	S38	3.800	2.450	1.200	Open Manhole	1200
S12.000	o	150	S39	4.000	2.650	1.200	Open Manhole	1200
S12.001	o	150	S40	3.900	2.438	1.312	Junction	
S13.000	o	450	S41	3.600	2.000	1.150	Open Manhole	1350
S13.001	o	450	S42	3.600	1.975	1.175	Open Manhole	1350
S13.002	o	450	S43	3.650	1.967	1.233	Junction	
S13.003	o	450	S44	3.650	1.867	1.333	Junction	
S13.004	o	450	S45	3.650	1.858	1.342	Open Manhole	1350
S11.001	o	450	S46	3.900	1.813	1.637	Open Manhole	1350
S11.002	o	450	S47	3.900	1.739	1.711	Open Manhole	1350
S11.003	o	450	S48	3.850	1.666	1.734	Open Manhole	1350
S14.000	o	150	S49	3.200	2.000	1.050	Open Manhole	1200
S14.001	o	150	S50	3.500	1.832	1.518	Open Manhole	1200
S11.004	o	450	S51	3.800	1.487	1.863	Open Manhole	1350
S11.005	o	375	S52	3.750	1.431	1.944	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.010	22.982	443.0	S37	3.800	0.710	2.490	Open Manhole	1800
S1.011	33.055	1274.4	S64	3.750	0.609	2.466	Open Manhole	1800
S11.000	23.214	106.6	S46	3.900	2.232	1.518	Open Manhole	1350
S12.000	21.191	100.0	S40	3.900	2.438	1.312	Junction	
S12.001	1.178	100.0	S46	3.900	2.426	1.324	Open Manhole	1350
S13.000	6.026	241.0	S42	3.600	1.975	1.175	Open Manhole	1350
S13.001	1.825	228.1	S43	3.650	1.967	1.233	Junction	
S13.002	1.640	16.4	S44	3.650	1.867	1.333	Junction	
S13.003	2.274	252.7	S45	3.650	1.858	1.342	Open Manhole	1350
S13.004	10.833	240.7	S46	3.900	1.813	1.637	Open Manhole	1350
S11.001	11.034	151.2	S47	3.900	1.740	1.710	Open Manhole	1350
S11.002	12.468	170.8	S48	3.850	1.666	1.734	Open Manhole	1350
S11.003	18.112	101.2	S51	3.800	1.487	1.863	Open Manhole	1350
S14.000	16.783	99.9	S50	3.500	1.832	1.518	Open Manhole	1200
S14.001	4.480	99.6	S51	3.800	1.787	1.863	Open Manhole	1350
S11.004	13.458	240.3	S52	3.750	1.431	1.869	Open Manhole	1350
S11.005	29.590	240.6	S64	3.750	1.308	2.067	Open Manhole	1800

Doran Consulting Limited		Page 15
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38 File Proposed Spring Tide.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S15.000	o	150	S53	4.000	2.950	0.900	Open Manhole	1200
S15.001	o	375	S54	3.675	2.675	0.625	Open Manhole	1350
S16.000	o	375	S55	4.200	2.000	1.825	Open Manhole	1200
S16.001	o	375	S56	3.075	1.854	0.846	Open Manhole	1350
S16.002	o	375	S57	3.075	1.777	0.923	Open Manhole	1200
S16.003	o	375	SFR PI Inlet	3.075	1.746	0.954	Junction	
S16.004	o	375	SFR PI Outlet	3.075	1.696	1.004	Junction	
S15.002	o	375	S58	3.075	1.653	1.047	Open Manhole	1350
S17.000	o	225	S59	3.200	2.000	0.975	Open Manhole	1200
S15.003	o	375	S60	3.400	1.590	1.435	Open Manhole	1350
S15.004	o	375	S61	3.750	1.474	1.901	Open Manhole	1350
S18.000	o	150	S62	3.200	2.050	1.000	Open Manhole	1200
S15.005	o	375	S63	3.750	1.438	1.937	Junction	
S1.012	o	750	S64	3.750	0.534	2.466	Open Manhole	1800
S1.013	o	750	S65	3.700	0.504	2.446	Open Manhole	2400

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S15.000	19.991	100.0	S54	3.675	2.750	0.775	Open Manhole	1350
S15.001	18.053	125.4	S58	3.075	2.531	0.169	Open Manhole	1350
S16.000	12.092	170.3	S56	3.075	1.929	0.771	Open Manhole	1350
S16.001	18.716	243.1	S57	3.075	1.777	0.923	Open Manhole	1200
S16.002	3.061	98.7	SFR PI Inlet	3.075	1.746	0.954	Junction	
S16.003	3.177	63.5	SFR PI Outlet	3.075	1.696	1.004	Junction	
S16.004	4.362	99.1	S58	3.075	1.652	1.048	Open Manhole	1350
S15.002	10.718	170.1	S60	3.400	1.590	1.435	Open Manhole	1350
S17.000	16.035	62.2	S60	3.400	1.742	1.433	Open Manhole	1350
S15.003	28.348	244.4	S61	3.750	1.474	1.901	Open Manhole	1350
S15.004	8.917	247.7	S63	3.750	1.438	1.937	Junction	
S18.000	4.537	9.9	S63	3.750	1.590	2.010	Junction	
S15.005	50.391	244.6	S64	3.750	1.232	2.143	Open Manhole	1800
S1.012	17.899	596.6	S65	3.700	0.504	2.446	Open Manhole	2400
S1.013	2.312	578.0	S	3.700	0.500	2.450	Open Manhole	0

Doran Consulting Limited		Page 16
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38	Designed by 814	
File Proposed Spring Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	Classification	Default	95	0.096	0.091	0.091
	Classification	Default	95	0.039	0.037	0.128
	Classification	Default	95	0.007	0.006	0.135
	Classification	Default	95	0.169	0.161	0.295
1.001	-	-	100	0.000	0.000	0.000
2.000	Classification	Default	95	0.055	0.052	0.052
1.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.000	0.000	0.000
1.005	-	-	100	0.000	0.000	0.000
1.006	-	-	100	0.000	0.000	0.000
3.000	-	-	100	0.000	0.000	0.000
3.001	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.000	0.000	0.000
4.000	-	-	100	0.000	0.000	0.000
1.008	-	-	100	0.000	0.000	0.000
5.000	-	-	100	0.000	0.000	0.000
6.000	Classification	Default	95	0.108	0.102	0.102
6.001	Classification	Default	95	0.007	0.007	0.007
	Classification	Default	95	0.022	0.021	0.028
7.000	Classification	Default	95	0.075	0.071	0.071
	Classification	Default	95	0.080	0.076	0.147
6.002	Classification	Default	95	0.005	0.004	0.004
6.003	-	-	100	0.000	0.000	0.000
6.004	-	-	100	0.000	0.000	0.000
8.000	Classification	Default	95	0.071	0.068	0.068
	Classification	Default	95	0.033	0.032	0.099
	Classification	Default	95	0.006	0.005	0.105
	Classification	Landscaping	50	0.018	0.009	0.114
	Classification	Default	95	0.022	0.021	0.135
	Classification	Default	95	0.071	0.068	0.203
	Classification	Default	95	0.002	0.002	0.205
	Classification	Landscaping	50	0.012	0.006	0.211
6.005	-	-	100	0.000	0.000	0.000
6.006	-	-	100	0.000	0.000	0.000
6.007	-	-	100	0.000	0.000	0.000
6.008	-	-	100	0.000	0.000	0.000
6.009	Classification	Default	95	0.082	0.077	0.077
	Classification	Default	95	0.142	0.135	0.212
	Classification	Landscaping	50	0.032	0.016	0.228
	Classification	Default	95	0.012	0.012	0.240
	Classification	Default	95	0.007	0.007	0.247
	Classification	Landscaping	50	0.008	0.004	0.251
	Classification	Default	95	0.010	0.010	0.261
1.009	Classification	Default	95	0.144	0.137	0.137
	Classification	Default	95	0.210	0.200	0.337
	Classification	Default	95	0.186	0.177	0.514
9.000	Classification	Default	95	0.090	0.085	0.085
9.001	Classification	Default	95	0.054	0.051	0.051
10.000	Classification	Default	95	0.024	0.023	0.023
	Classification	Default	95	0.031	0.029	0.052
10.001	Classification	Default	95	0.020	0.019	0.019
10.002	Classification	Default	95	0.025	0.023	0.023
10.003	-	-	100	0.000	0.000	0.000
10.004	-	-	100	0.000	0.000	0.000
10.005	-	-	100	0.000	0.000	0.000
1.010	-	-	100	0.000	0.000	0.000
1.011	Classification	Default	95	0.022	0.021	0.021
11.000	User	-	100	0.077	0.077	0.077
12.000	Classification	Default	95	0.017	0.016	0.016

Doran Consulting Limited		Page 17
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38	Designed by 814	
File Proposed Spring Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
	Classification	Default	95	0.047	0.044	0.061
12.001	-	-	100	0.000	0.000	0.000
13.000	Classification	Default	95	0.437	0.415	0.415
13.001	-	-	100	0.000	0.000	0.000
13.002	-	-	100	0.000	0.000	0.000
13.003	-	-	100	0.000	0.000	0.000
13.004	-	-	100	0.000	0.000	0.000
11.001	Classification	Default	95	0.014	0.013	0.013
11.002	User	-	100	0.050	0.050	0.050
	Classification	Default	95	0.013	0.012	0.061
11.003	Classification	Default	95	0.016	0.015	0.015
	Classification	Landscaping	50	0.045	0.022	0.037
14.000	Classification	Landscaping	50	0.039	0.019	0.019
14.001	Classification	Landscaping	50	0.032	0.016	0.016
11.004	Classification	Default	95	0.011	0.010	0.010
11.005	Classification	Landscaping	50	0.027	0.013	0.013
	Classification	Default	95	0.006	0.006	0.019
15.000	Classification	Default	95	0.018	0.017	0.017
15.001	Classification	Default	95	0.235	0.223	0.223
	Classification	Default	95	0.013	0.012	0.235
16.000	Classification	Default	95	0.020	0.019	0.019
	Classification	Landscaping	50	0.068	0.034	0.053
16.001	Classification	Default	95	0.056	0.053	0.053
16.002	Classification	Default	95	0.032	0.030	0.030
16.003	-	-	100	0.000	0.000	0.000
16.004	-	-	100	0.000	0.000	0.000
15.002	-	-	100	0.000	0.000	0.000
17.000	Classification	Landscaping	50	0.033	0.016	0.016
15.003	-	-	100	0.000	0.000	0.000
15.004	Classification	Default	95	0.015	0.014	0.014
	Classification	Default	95	0.059	0.056	0.070
	Classification	Default	95	0.013	0.012	0.083
18.000	Classification	Landscaping	50	0.159	0.079	0.079
15.005	-	-	100	0.000	0.000	0.000
1.012	Classification	Default	95	0.011	0.010	0.010
	Classification	Default	95	0.010	0.010	0.020
1.013	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				3.567	3.182	3.182

Doran Consulting Limited		Page 18
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38 File Proposed Spring Tide.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

Network Classifications for Storm

PN	USMH Name	Pipe Dia (mm)	Min Cover Depth (m)	Max Cover Depth (m)	Pipe Type	MH Dia (mm)	MH Width (mm)	MH Ring Depth (m)	MH Type
S1.000	S1	225	1.352	2.000	Unclassified	1200	0	2.000	Unclassified
S1.001	S2	225	1.352	2.341	Unclassified	1200	0	1.352	Unclassified
S2.000	S14	150	1.200	2.341	Unclassified	1200	0	1.200	Unclassified
S1.002	S3	300	2.341	2.547	Unclassified	1200	0	2.341	Unclassified
S1.003	S4	300	1.660	2.547	Unclassified	1200	0	2.547	Unclassified
S1.004	SD2	300	0.902	4.897	Unclassified	1200	0	4.897	Unclassified
S1.005	S5	375	0.827	0.918	Unclassified	1350	0	0.827	Unclassified
S1.006	S6	375	0.918	0.962	Unclassified	1350	0	0.918	Unclassified
S3.000	S15	150	0.500	0.798	Unclassified	1200	0	0.500	Unclassified
S3.001	S16	150	0.798	1.037	Unclassified	1200	0	0.798	Unclassified
S1.007	S7	375	0.962	0.995	Unclassified	1350	0	0.962	Unclassified
S4.000	S17	150	0.500	1.070	Unclassified	1200	0	0.500	Unclassified
S1.008	S8	375	0.680	0.995	Unclassified	1350	0	0.995	Unclassified
S5.000	S18	150	0.500	0.755	Unclassified	1200	0	0.500	Unclassified
S6.000	S19	225	0.578	2.000	Unclassified	1200	0	2.000	Unclassified
S6.001	S20	225	0.578	1.758	Unclassified	1200	0	0.578	Unclassified
S7.000	S28	225	1.758	2.000	Unclassified	1200	0	2.000	Unclassified
S6.002	S21	225	1.758	2.186	Unclassified	1200	0	1.758	Unclassified
S6.003	SD1	300	0.933	4.919	Unclassified	1200	0	4.919	Unclassified
S6.004	S22	375	0.858	0.942	Unclassified	1800	0	0.858	Unclassified
S8.000	S29	300	0.925	1.017	Unclassified	1800	0	0.925	Unclassified
S6.005	S23	375	1.017	1.047	Unclassified	1350	0	1.017	Unclassified
S6.006	S24	375	0.557	1.047	Unclassified	1350	0	1.047	Unclassified
S6.007	S25	375	0.557	0.588	Unclassified	1350	0	0.557	Unclassified
S6.008	S26	375	0.588	0.617	Unclassified	1350	0	0.588	Unclassified
S6.009	S27	450	0.617	0.680	Unclassified	1350	0	0.617	Unclassified
S1.009	S9	450	0.755	1.700	Unclassified	1350	0	0.755	Unclassified
S9.000	S36	150	1.350	1.512	Unclassified	1200	0	1.350	Unclassified
S9.001	S37	225	1.512	1.775	Unclassified	1200	0	1.512	Unclassified
S10.000	S30	225	1.200	1.588	Unclassified	1200	0	1.200	Unclassified
S10.001	S31	225	1.588	1.736	Unclassified	1200	0	1.588	Unclassified
S10.002	S32	225	1.736	1.891	Unclassified	1200	0	1.736	Unclassified
S10.003	S33	225	1.891	1.984	Unclassified	1200	0	1.891	Unclassified
S10.004	S34	225	1.984	2.193	Unclassified	1200	0	1.984	Unclassified
S10.005	S35	225	2.193	2.338	Unclassified	1200	0	2.193	Unclassified
S1.010	S10	600	2.490	3.038	Unclassified	1800	0	3.038	Unclassified
S1.011	S37	675	2.466	2.490	Unclassified	1800	0	2.490	Unclassified
S11.000	S38	150	1.200	1.518	Unclassified	1200	0	1.200	Unclassified
S12.000	S39	150	1.200	1.312	Unclassified	1200	0	1.200	Unclassified
S12.001	S40	150	1.312	1.324	Unclassified				Junction
S13.000	S41	450	1.150	1.175	Unclassified	1350	0	1.150	Unclassified
S13.001	S42	450	1.175	1.233	Unclassified	1350	0	1.175	Unclassified
S13.002	S43	450	1.233	1.333	Unclassified				Junction
S13.003	S44	450	1.333	1.342	Unclassified				Junction
S13.004	S45	450	1.342	1.637	Unclassified	1350	0	1.342	Unclassified
S11.001	S46	450	1.637	1.710	Unclassified	1350	0	1.637	Unclassified
S11.002	S47	450	1.711	1.734	Unclassified	1350	0	1.711	Unclassified
S11.003	S48	450	1.734	1.863	Unclassified	1350	0	1.734	Unclassified
S14.000	S49	150	1.050	1.518	Unclassified	1200	0	1.050	Unclassified
S14.001	S50	150	1.518	1.863	Unclassified	1200	0	1.518	Unclassified
S11.004	S51	450	1.863	1.869	Unclassified	1350	0	1.863	Unclassified
S11.005	S52	375	1.944	2.067	Unclassified	1350	0	1.944	Unclassified
S15.000	S53	150	0.775	0.900	Unclassified	1200	0	0.900	Unclassified
S15.001	S54	375	0.169	0.625	Unclassified	1350	0	0.625	Unclassified
S16.000	S55	375	0.771	1.825	Unclassified	1200	0	1.825	Unclassified
S16.001	S56	375	0.846	0.923	Unclassified	1350	0	0.846	Unclassified
S16.002	S57	375	0.923	0.954	Unclassified	1200	0	0.923	Unclassified
S16.003	SFR PI Inlet	375	0.954	1.004	Unclassified				Junction

Doran Consulting Limited		Page 19
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38	Designed by 814	
File Proposed Spring Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

Network Classifications for Storm

PN	USMH Name	Pipe Dia (mm)	Min Cover Depth (m)	Max Cover Depth (m)	Pipe Type	MH Dia (mm)	MH Width (mm)	MH Ring Depth (m)	MH Type
S16.004	SFR PI Outlet	375	1.004	1.048	Unclassified				Junction
S15.002	S58	375	1.047	1.435	Unclassified	1350	0	1.047	Unclassified
S17.000	S59	225	0.975	1.433	Unclassified	1200	0	0.975	Unclassified
S15.003	S60	375	1.435	1.901	Unclassified	1350	0	1.435	Unclassified
S15.004	S61	375	1.901	1.937	Unclassified	1350	0	1.901	Unclassified
S18.000	S62	150	1.000	2.010	Unclassified	1200	0	1.000	Unclassified
S15.005	S63	375	1.937	2.143	Unclassified				Junction
S1.012	S64	750	2.446	2.466	Unclassified	1800	0	2.466	Unclassified
S1.013	S65	750	2.446	2.450	Unclassified	2400	0	2.446	Unclassified

Surcharged Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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S1.013 S 3.700 0.500 0.000 0 0

Datum (m) 0.826 Offset (mins) 0

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
60	0.000	240	0.000	420	0.000	600	0.000	780	0.000	960	0.000	1140	0.000	1320	0.000
120	0.000	300	0.000	480	0.000	660	0.000	840	0.000	1020	0.000	1200	0.000	1380	0.000
180	0.000	360	0.000	540	0.000	720	0.000	900	0.000	1080	0.000	1260	0.000	1440	0.000

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	10.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1
Number of Input Hydrographs	0	Number of Offline Controls	0
Number of Online Controls	1	Number of Storage Structures	0
		Number of Time/Area Diagrams	0
		Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	15.600	Storm Duration (mins)	30
Ratio R	0.300		

Doran Consulting Limited		Page 20
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38 File Proposed Spring Tide.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

Online Controls for Storm

Non Return Valve Manhole: S65, DS/PN: S1.013, Volume (m³): 21.4

Doran Consulting Limited		Page 21
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38 File Proposed Spring Tide.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

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

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 10.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 15.700 Cv (Summer) 0.750
 Region Scotland and Ireland Ratio R 0.300 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
 Return Period(s) (years) 1, 5, 30, 100
 Climate Change (%) 10, 10, 10, 30

PN	US/MH		Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level	Surcharged Depth	Flooded Volume
	Name	Storm							(m)	(m)	(m³)
S1.000	S1	15 Winter	1	+10%	100/15 Summer				9.870	-0.130	0.000
S1.001	S2	15 Winter	1	+10%	100/15 Summer				8.810	-0.138	0.000
S2.000	S14	15 Winter	1	+10%	30/15 Summer				7.617	-0.083	0.000
S1.002	S3	15 Winter	1	+10%	5/15 Summer				7.311	-0.118	0.000
S1.003	S4	15 Winter	1	+10%	5/15 Summer				7.268	-0.086	0.000
S1.004	SD2	15 Winter	1	+10%	5/15 Summer				4.010	-0.093	0.000
S1.005	S5	15 Winter	1	+10%	100/15 Summer				3.977	-0.196	0.000
S1.006	S6	15 Winter	1	+10%	100/15 Summer				3.898	-0.184	0.000
S3.000	S15	15 Summer	1	+10%					4.350	-0.150	0.000
S3.001	S16	15 Summer	1	+10%					4.052	-0.150	0.000
S1.007	S7	15 Winter	1	+10%	100/15 Summer				3.858	-0.180	0.000
S4.000	S17	15 Summer	1	+10%					4.350	-0.150	0.000
S1.008	S8	15 Winter	1	+10%					3.768	-0.237	0.000
S5.000	S18	15 Summer	1	+10%					3.850	-0.150	0.000
S6.000	S19	15 Winter	1	+10%					10.430	-0.170	0.000
S6.001	S20	15 Winter	1	+10%	100/15 Summer				7.460	-0.162	0.000
S7.000	S28	15 Winter	1	+10%					9.638	-0.162	0.000
S6.002	S21	15 Winter	1	+10%	1/15 Summer				6.872	0.030	0.000
S6.003	SD1	15 Winter	1	+10%	30/15 Summer				3.966	-0.115	0.000
S6.004	S22	15 Winter	1	+10%	30/15 Summer				3.926	-0.216	0.000
S8.000	S29	15 Winter	1	+10%	30/15 Summer				3.923	-0.152	0.000
S6.005	S23	15 Winter	1	+10%	5/15 Summer				3.882	-0.101	0.000
S6.006	S24	15 Winter	1	+10%	5/15 Summer				3.850	-0.103	0.000
S6.007	S25	15 Winter	1	+10%	5/15 Summer				3.840	-0.103	0.000
S6.008	S26	15 Winter	1	+10%	30/15 Summer				3.805	-0.107	0.000
S6.009	S27	15 Winter	1	+10%	30/15 Summer				3.686	-0.197	0.000
S1.009	S9	15 Winter	1	+10%					3.467	-0.278	0.000
S9.000	S36	15 Winter	1	+10%	5/15 Summer				3.008	-0.042	0.000
S9.001	S37	15 Winter	1	+10%	30/15 Winter				2.630	-0.108	0.000
S10.000	S30	15 Winter	1	+10%					3.082	-0.168	0.000
S10.001	S31	15 Winter	1	+10%	100/15 Winter				2.705	-0.157	0.000

Doran Consulting Limited		Page 22
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38	Designed by 814	
File Proposed Spring Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

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

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.37			39.2	OK	
S1.001	S2	0.31			38.8	OK	
S2.000	S14	0.40			6.8	OK	
S1.002	S3	0.67			45.9	OK	
S1.003	S4	0.86			46.3	OK	
S1.004	SD2	0.83			46.1	OK	
S1.005	S5	0.45			45.5	OK	
S1.006	S6	0.50			44.8	OK	
S3.000	S15	0.00			0.0	OK	
S3.001	S16	0.00			0.0	OK	
S1.007	S7	0.53			44.6	OK	
S4.000	S17	0.00			0.0	OK	
S1.008	S8	0.29			44.9	OK	
S5.000	S18	0.00			0.0	OK	
S6.000	S19	0.13			13.3	OK	
S6.001	S20	0.17			16.6	OK	
S7.000	S28	0.17			19.3	OK	
S6.002	S21	1.22			36.6	SURCHARGED	
S6.003	SD1	0.69			36.7	OK	
S6.004	S22	0.32			35.6	OK	
S8.000	S29	0.42			26.8	OK	
S6.005	S23	0.86			59.9	OK	
S6.006	S24	0.70			59.0	OK	
S6.007	S25	0.83			58.4	OK	
S6.008	S26	0.85			58.6	OK	
S6.009	S27	0.60			82.3	OK	
S1.009	S9	0.31			179.2	OK	
S9.000	S36	0.80			10.7	OK	
S9.001	S37	0.53			16.2	OK	
S10.000	S30	0.14			6.8	OK	
S10.001	S31	0.20			9.0	OK	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged
									Level (m)	Depth (m)
S10.002	S32	15 Winter	1	+10%	100/15 Winter				2.563	-0.151
S10.003	S33	15 Winter	1	+10%	100/15 Summer				2.373	-0.137
S10.004	S34	15 Winter	1	+10%	100/15 Summer				2.276	-0.140
S10.005	S35	15 Winter	1	+10%	100/15 Summer				2.076	-0.131
S1.010	S10	15 Winter	1	+10%	5/15 Summer				1.362	0.000
S1.011	S37	15 Winter	1	+10%	1/15 Summer				1.319	0.009
S11.000	S38	15 Winter	1	+10%	30/15 Summer				2.537	-0.063
S12.000	S39	15 Winter	1	+10%	30/15 Summer				2.724	-0.076
S12.001	S40	15 Winter	1	+10%					2.535	-0.053
S13.000	S41	15 Winter	1	+10%	100/15 Summer				2.211	-0.239
S13.001	S42	15 Winter	1	+10%	100/15 Summer				2.182	-0.243
S13.002	S43	15 Winter	1	+10%					2.139	-0.278
S13.003	S44	15 Winter	1	+10%					2.059	-0.258
S13.004	S45	15 Winter	1	+10%	100/15 Summer				2.054	-0.254
S11.001	S46	15 Winter	1	+10%	100/15 Summer				2.022	-0.241
S11.002	S47	15 Winter	1	+10%	30/15 Winter				1.959	-0.230
S11.003	S48	15 Winter	1	+10%	30/15 Winter				1.852	-0.264
S14.000	S49	15 Winter	1	+10%	100/15 Summer				2.040	-0.110
S14.001	S50	15 Winter	1	+10%	30/15 Summer				1.892	-0.090
S11.004	S51	15 Winter	1	+10%	30/15 Summer				1.732	-0.205
S11.005	S52	15 Winter	1	+10%	5/15 Summer				1.688	-0.118
S15.000	S53	15 Winter	1	+10%					2.987	-0.113
S15.001	S54	15 Winter	1	+10%					2.788	-0.262
S16.000	S55	15 Winter	1	+10%	100/15 Summer				2.063	-0.312
S16.001	S56	15 Winter	1	+10%	100/15 Summer				1.941	-0.288
S16.002	S57	15 Winter	1	+10%	100/15 Summer				1.876	-0.276
S16.003	SFR PI Inlet	15 Winter	1	+10%					1.843	-0.278
S16.004	SFR PI Outlet	15 Winter	1	+10%					1.826	-0.245
S15.002	S58	15 Winter	1	+10%	30/15 Summer				1.822	-0.206
S17.000	S59	15 Winter	1	+10%	100/15 Summer				2.028	-0.197
S15.003	S60	15 Winter	1	+10%	30/15 Summer				1.760	-0.205
S15.004	S61	15 Winter	1	+10%	30/15 Summer				1.685	-0.164
S18.000	S62	15 Winter	1	+10%	100/15 Summer				2.101	-0.099
S15.005	S63	15 Winter	1	+10%					1.626	-0.187
S1.012	S64	15 Winter	1	+10%	5/15 Summer				1.284	0.000
S1.013	S65	15 Winter	1	+10%	30/15 Summer				1.074	-0.180

PN	US/MH Name	Flooded		Half Drain		Pipe		Status	Level Exceeded
		Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)			
S10.002	S32	0.000	0.24			11.6		OK	
S10.003	S33	0.000	0.33			11.5		OK	
S10.004	S34	0.000	0.30			11.4		OK	
S10.005	S35	0.000	0.36			11.4		OK	
S1.010	S10	0.000	0.80			201.6		OK	
S1.011	S37	0.000	1.03			198.7	SURCHARGED		
S11.000	S38	0.000	0.62			10.1		OK	
S12.000	S39	0.000	0.47			7.9		OK	
S12.001	S40	0.000	0.74			8.0		OK*	
S13.000	S41	0.000	0.44			54.5		OK	
S13.001	S42	0.000	0.43			54.9		OK	
S13.002	S43	0.000	0.31			55.2		OK*	
S13.003	S44	0.000	0.33			55.1		OK*	
S13.004	S45	0.000	0.37			54.7		OK	
S11.001	S46	0.000	0.43			73.5		OK	

Doran Consulting Limited		Page 24
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38	Designed by 814	
File Proposed Spring Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

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

PN	US/MH Name	Flooded		Half Drain		Pipe	Status	Level Exceeded
		Volume (m³)	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)			
S11.002	S47	0.000	0.48		80.5		OK	
S11.003	S48	0.000	0.36		84.7		OK	
S14.000	S49	0.000	0.15		2.5		OK	
S14.001	S50	0.000	0.33		4.4		OK	
S11.004	S51	0.000	0.58		89.5		OK	
S11.005	S52	0.000	0.80		91.2		OK	
S15.000	S53	0.000	0.13		2.2		OK	
S15.001	S54	0.000	0.19		28.7		OK	
S16.000	S55	0.000	0.07		7.0		OK	
S16.001	S56	0.000	0.12		12.9		OK	
S16.002	S57	0.000	0.16		16.4		OK	
S16.003	SFR PI Inlet	0.000	0.15		16.4		OK*	
S16.004	SFR PI Outlet	0.000	0.15		16.3		OK*	
S15.002	S58	0.000	0.42		44.9		OK	
S17.000	S59	0.000	0.04		2.2		OK	
S15.003	S60	0.000	0.41		46.4		OK	
S15.004	S61	0.000	0.60		54.8		OK	
S18.000	S62	0.000	0.25		10.5		OK	
S15.005	S63	0.000	0.49		62.9		OK*	
S1.012	S64	0.000	1.26		337.5		OK	
S1.013	S65	0.000	0.92		338.7		OK	

Doran Consulting Limited		Page 25
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38 File Proposed Spring Tide.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 10.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 15.700 Cv (Summer) 0.750
 Region Scotland and Ireland Ratio R 0.300 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
 Return Period(s) (years) 1, 5, 30, 100
 Climate Change (%) 10, 10, 10, 30

PN	US/MH		Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level	Surcharged Depth	Flooded Volume
	Name	Storm							(m)	(m)	(m³)
S1.000	S1	15 Winter	5	+10%	100/15 Summer				9.896	-0.104	0.000
S1.001	S2	15 Winter	5	+10%	100/15 Summer				8.833	-0.115	0.000
S2.000	S14	15 Winter	5	+10%	30/15 Summer				7.636	-0.064	0.000
S1.002	S3	15 Winter	5	+10%	5/15 Summer				7.479	0.050	0.000
S1.003	S4	15 Winter	5	+10%	5/15 Summer				7.401	0.048	0.000
S1.004	SD2	15 Winter	5	+10%	5/15 Summer				4.158	0.055	0.000
S1.005	S5	15 Winter	5	+10%	100/15 Summer				4.028	-0.145	0.000
S1.006	S6	15 Winter	5	+10%	100/15 Summer				3.954	-0.128	0.000
S3.000	S15	15 Summer	5	+10%					4.350	-0.150	0.000
S3.001	S16	15 Summer	5	+10%					4.052	-0.150	0.000
S1.007	S7	15 Winter	5	+10%	100/15 Summer				3.913	-0.125	0.000
S4.000	S17	15 Summer	5	+10%					4.350	-0.150	0.000
S1.008	S8	15 Winter	5	+10%					3.800	-0.205	0.000
S5.000	S18	15 Summer	5	+10%					3.850	-0.150	0.000
S6.000	S19	15 Winter	5	+10%					10.444	-0.156	0.000
S6.001	S20	15 Winter	5	+10%	100/15 Summer				7.475	-0.146	0.000
S7.000	S28	15 Winter	5	+10%					9.653	-0.147	0.000
S6.002	S21	15 Winter	5	+10%	1/15 Summer				6.959	0.117	0.000
S6.003	SD1	15 Winter	5	+10%	30/15 Summer				4.081	0.000	0.000
S6.004	S22	15 Winter	5	+10%	30/15 Summer				4.038	-0.104	0.000
S8.000	S29	15 Winter	5	+10%	30/15 Summer				4.044	-0.031	0.000
S6.005	S23	15 Winter	5	+10%	5/15 Summer				4.009	0.026	0.000
S6.006	S24	15 Winter	5	+10%	5/15 Summer				3.972	0.019	0.000
S6.007	S25	15 Winter	5	+10%	5/15 Summer				3.951	0.007	0.000
S6.008	S26	15 Winter	5	+10%	30/15 Summer				3.912	0.000	0.000
S6.009	S27	15 Winter	5	+10%	30/15 Summer				3.762	-0.121	0.000
S1.009	S9	15 Winter	5	+10%					3.509	-0.236	0.000
S9.000	S36	15 Winter	5	+10%	5/15 Summer				3.165	0.115	0.000
S9.001	S37	15 Winter	5	+10%	30/15 Winter				2.659	-0.079	0.000
S10.000	S30	15 Winter	5	+10%					3.096	-0.154	0.000
S10.001	S31	15 Winter	5	+10%	100/15 Winter				2.721	-0.140	0.000

Doran Consulting Limited		Page 26
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38	Designed by 814	
File Proposed Spring Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.56			59.2	OK	
S1.001	S2	0.47			58.7	OK	
S2.000	S14	0.61			10.3	OK	
S1.002	S3	1.00			69.2	SURCHARGED	
S1.003	S4	1.28			69.1	SURCHARGED	
S1.004	SD2	1.22			68.3	SURCHARGED	
S1.005	S5	0.68			67.9	OK	
S1.006	S6	0.73			65.4	OK	
S3.000	S15	0.00			0.0	OK	
S3.001	S16	0.00			0.0	OK	
S1.007	S7	0.78			66.0	OK	
S4.000	S17	0.00			0.0	OK	
S1.008	S8	0.43			65.7	OK	
S5.000	S18	0.00			0.0	OK	
S6.000	S19	0.20			20.1	OK	
S6.001	S20	0.26			25.0	OK	
S7.000	S28	0.26			29.2	OK	
S6.002	S21	1.85			55.2	SURCHARGED	
S6.003	SD1	1.03			54.4	OK	
S6.004	S22	0.48			53.4	OK	
S8.000	S29	0.57			37.0	OK	
S6.005	S23	1.25			86.7	SURCHARGED	
S6.006	S24	1.01			85.5	SURCHARGED	
S6.007	S25	1.22			85.1	SURCHARGED	
S6.008	S26	1.24			85.7	OK	
S6.009	S27	0.87			119.8	OK	
S1.009	S9	0.45			261.1	OK	
S9.000	S36	1.13			15.1	SURCHARGED	
S9.001	S37	0.74			22.9	OK	
S10.000	S30	0.21			10.3	OK	
S10.001	S31	0.30			13.6	OK	

Doran Consulting Limited		Page 27
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38	Designed by 814	
File Proposed Spring Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged
									Level (m)	Depth (m)
S10.002	S32	15 Winter	5	+10%	100/15 Winter				2.582	-0.132
S10.003	S33	15 Winter	5	+10%	100/15 Summer				2.396	-0.113
S10.004	S34	15 Winter	5	+10%	100/15 Summer				2.299	-0.117
S10.005	S35	15 Winter	5	+10%	100/15 Summer				2.101	-0.106
S1.010	S10	15 Winter	5	+10%	5/15 Summer				1.450	0.088
S1.011	S37	15 Winter	5	+10%	1/15 Summer				1.375	0.065
S11.000	S38	15 Winter	5	+10%	30/15 Summer				2.566	-0.034
S12.000	S39	15 Winter	5	+10%	30/15 Summer				2.746	-0.054
S12.001	S40	15 Winter	5	+10%					2.588	0.000
S13.000	S41	15 Winter	5	+10%	100/15 Summer				2.272	-0.178
S13.001	S42	15 Winter	5	+10%	100/15 Summer				2.241	-0.184
S13.002	S43	15 Winter	5	+10%					2.184	-0.233
S13.003	S44	15 Winter	5	+10%					2.116	-0.201
S13.004	S45	15 Winter	5	+10%	100/15 Summer				2.111	-0.197
S11.001	S46	15 Winter	5	+10%	100/15 Summer				2.081	-0.182
S11.002	S47	15 Winter	5	+10%	30/15 Winter				2.023	-0.166
S11.003	S48	15 Winter	5	+10%	30/15 Winter				1.919	-0.197
S14.000	S49	15 Winter	5	+10%	100/15 Summer				2.049	-0.101
S14.001	S50	15 Winter	5	+10%	30/15 Summer				1.908	-0.074
S11.004	S51	15 Winter	5	+10%	30/15 Summer				1.873	-0.064
S11.005	S52	15 Winter	5	+10%	5/15 Summer				1.831	0.025
S15.000	S53	15 Winter	5	+10%					2.996	-0.104
S15.001	S54	15 Winter	5	+10%					2.815	-0.235
S16.000	S55	15 Winter	5	+10%	100/15 Summer				2.079	-0.296
S16.001	S56	15 Winter	5	+10%	100/15 Summer				1.963	-0.266
S16.002	S57	15 Winter	5	+10%	100/15 Summer				1.901	-0.251
S16.003	SFR PI Inlet	15 Winter	5	+10%					1.880	-0.241
S16.004	SFR PI Outlet	15 Winter	5	+10%					1.873	-0.198
S15.002	S58	15 Winter	5	+10%	30/15 Summer				1.869	-0.159
S17.000	S59	15 Winter	5	+10%	100/15 Summer				2.034	-0.191
S15.003	S60	15 Winter	5	+10%	30/15 Summer				1.818	-0.147
S15.004	S61	15 Winter	5	+10%	30/15 Summer				1.752	-0.097
S18.000	S62	15 Winter	5	+10%	100/15 Summer				2.114	-0.086
S15.005	S63	15 Winter	5	+10%					1.680	-0.133
S1.012	S64	15 Winter	5	+10%	5/15 Summer				1.321	0.037
S1.013	S65	15 Summer	5	+10%	30/15 Summer				1.254	0.000

PN	US/MH Name	Flooded		Half Drain		Pipe	Status	Level Exceeded
		Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)		
S10.002	S32	0.000	0.36			17.6	OK	
S10.003	S33	0.000	0.49			17.4	OK	
S10.004	S34	0.000	0.46			17.3	OK	
S10.005	S35	0.000	0.55			17.2	OK	
S1.010	S10	0.000	1.19			299.9	SURCHARGED	
S1.011	S37	0.000	1.54			297.3	SURCHARGED	
S11.000	S38	0.000	0.93			15.2	OK	
S12.000	S39	0.000	0.72			12.0	OK	
S12.001	S40	0.000	1.05			11.4	SURCHARGED*	
S13.000	S41	0.000	0.66			82.3	OK	
S13.001	S42	0.000	0.64			82.8	OK	
S13.002	S43	0.000	0.47			83.3	OK*	
S13.003	S44	0.000	0.49			83.2	OK*	
S13.004	S45	0.000	0.56			82.7	OK	
S11.001	S46	0.000	0.65			110.0	OK	

Doran Consulting Limited		Page 28
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38 File Proposed Spring Tide.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flooded		Half Drain		Pipe Flow (l/s)	Status	Level Exceeded
		Volume (m³)	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)			
S11.002	S47	0.000	0.71		120.8	OK		
S11.003	S48	0.000	0.52		124.8	OK		
S14.000	S49	0.000	0.23		3.8	OK		
S14.001	S50	0.000	0.50		6.6	OK		
S11.004	S51	0.000	0.83		128.4	OK		
S11.005	S52	0.000	1.16		131.6	SURCHARGED		
S15.000	S53	0.000	0.20		3.4	OK		
S15.001	S54	0.000	0.29		43.2	OK		
S16.000	S55	0.000	0.10		10.7	OK		
S16.001	S56	0.000	0.18		19.5	OK		
S16.002	S57	0.000	0.24		24.7	OK		
S16.003	SFR PI Inlet	0.000	0.23		24.6	OK*		
S16.004	SFR PI Outlet	0.000	0.23		24.6	OK*		
S15.002	S58	0.000	0.63		67.5	OK		
S17.000	S59	0.000	0.06		3.3	OK		
S15.003	S60	0.000	0.62		69.5	OK		
S15.004	S61	0.000	0.90		81.8	OK		
S18.000	S62	0.000	0.37		15.9	OK		
S15.005	S63	0.000	0.73		93.4	OK*		
S1.012	S64	0.000	1.92		514.0	SURCHARGED		
S1.013	S65	0.000	1.29		474.0	OK		

Doran Consulting Limited		Page 29
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38	Designed by 814	
File Proposed Spring Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 10.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 15.700 Cv (Summer) 0.750
 Region Scotland and Ireland Ratio R 0.300 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
 Return Period(s) (years) 1, 5, 30, 100
 Climate Change (%) 10, 10, 10, 30

PN	US/MH		Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level	Surcharged Depth	Flooded Volume
	Name	Storm							(m)	(m)	(m³)
S1.000	S1	15 Winter	30	+10%	100/15 Summer				9.932	-0.068	0.000
S1.001	S2	15 Winter	30	+10%	100/15 Summer				8.863	-0.085	0.000
S2.000	S14	15 Winter	30	+10%	30/15 Summer				7.833	0.133	0.000
S1.002	S3	15 Winter	30	+10%	5/15 Summer				7.644	0.215	0.000
S1.003	S4	15 Winter	30	+10%	5/15 Summer				7.482	0.129	0.000
S1.004	SD2	15 Winter	30	+10%	5/15 Summer				4.290	0.187	0.000
S1.005	S5	15 Winter	30	+10%	100/15 Summer				4.159	-0.014	0.000
S1.006	S6	15 Winter	30	+10%	100/15 Summer				4.081	-0.001	0.000
S3.000	S15	15 Summer	30	+10%					4.350	-0.150	0.000
S3.001	S16	15 Summer	30	+10%					4.052	-0.150	0.000
S1.007	S7	15 Winter	30	+10%	100/15 Summer				4.038	0.000	0.000
S4.000	S17	15 Summer	30	+10%					4.350	-0.150	0.000
S1.008	S8	15 Winter	30	+10%					3.840	-0.165	0.000
S5.000	S18	15 Summer	30	+10%					3.850	-0.150	0.000
S6.000	S19	15 Winter	30	+10%					10.459	-0.141	0.000
S6.001	S20	15 Winter	30	+10%	100/15 Summer				7.497	-0.125	0.000
S7.000	S28	15 Winter	30	+10%					9.672	-0.128	0.000
S6.002	S21	15 Winter	30	+10%	1/15 Summer				7.152	0.311	0.000
S6.003	SD1	15 Winter	30	+10%	30/15 Summer				4.414	0.333	0.000
S6.004	S22	15 Winter	30	+10%	30/15 Summer				4.335	0.193	0.000
S8.000	S29	15 Winter	30	+10%	30/15 Summer				4.344	0.269	0.000
S6.005	S23	15 Winter	30	+10%	5/15 Summer				4.293	0.310	0.000
S6.006	S24	15 Winter	30	+10%	5/15 Summer				4.194	0.241	0.000
S6.007	S25	15 Winter	30	+10%	5/15 Summer				4.094	0.151	0.000
S6.008	S26	15 Winter	30	+10%	30/15 Summer				3.995	0.082	0.000
S6.009	S27	15 Winter	30	+10%	30/15 Summer				3.903	0.020	0.000
S1.009	S9	15 Winter	30	+10%					3.563	-0.182	0.000
S9.000	S36	15 Winter	30	+10%	5/15 Summer				3.542	0.492	0.000
S9.001	S37	15 Winter	30	+10%	30/15 Winter				2.742	0.004	0.000
S10.000	S30	15 Winter	30	+10%					3.112	-0.138	0.000
S10.001	S31	15 Winter	30	+10%	100/15 Winter				2.745	-0.116	0.000

Doran Consulting Limited		Page 30
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38	Designed by 814	
File Proposed Spring Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.82			87.1	OK	
S1.001	S2	0.69			86.2	OK	
S2.000	S14	0.85			14.3	SURCHARGED	
S1.002	S3	1.45			99.6	SURCHARGED	
S1.003	S4	1.85			99.6	SURCHARGED	
S1.004	SD2	1.77			98.6	SURCHARGED	
S1.005	S5	0.96			96.8	OK	
S1.006	S6	1.02			92.1	OK	
S3.000	S15	0.00			0.0	OK	
S3.001	S16	0.00			0.0	OK	
S1.007	S7	1.06			89.9	OK	
S4.000	S17	0.00			0.0	OK	
S1.008	S8	0.58			89.0	OK	
S5.000	S18	0.00			0.0	OK	
S6.000	S19	0.29			29.5	OK	
S6.001	S20	0.40			37.9	OK	
S7.000	S28	0.38			43.0	OK	
S6.002	S21	2.76			82.6	SURCHARGED	
S6.003	SD1	1.51			80.1	SURCHARGED	
S6.004	S22	0.69			77.4	SURCHARGED	
S8.000	S29	0.77			50.0	SURCHARGED	
S6.005	S23	1.77			123.0	SURCHARGED	
S6.006	S24	1.44			121.9	SURCHARGED	
S6.007	S25	1.76			123.1	SURCHARGED	
S6.008	S26	1.79			123.7	SURCHARGED	
S6.009	S27	1.25			172.5	SURCHARGED	
S1.009	S9	0.65			374.6	OK	
S9.000	S36	1.55			20.6	SURCHARGED	
S9.001	S37	1.03			31.8	SURCHARGED	
S10.000	S30	0.31			15.2	OK	
S10.001	S31	0.46			20.7	OK	

Doran Consulting Limited		Page 31
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38	Designed by 814	
File Proposed Spring Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
S10.002	S32	15 Winter	30	+10%	100/15 Winter				2.612	-0.102
S10.003	S33	15 Winter	30	+10%	100/15 Summer				2.436	-0.073
S10.004	S34	15 Winter	30	+10%	100/15 Summer				2.335	-0.081
S10.005	S35	15 Winter	30	+10%	100/15 Summer				2.144	-0.063
S1.010	S10	15 Winter	30	+10%	5/15 Summer				1.899	0.537
S1.011	S37	15 Winter	30	+10%	1/15 Summer				1.733	0.423
S11.000	S38	15 Winter	30	+10%	30/15 Summer				2.748	0.148
S12.000	S39	15 Winter	30	+10%	30/15 Summer				2.860	0.060
S12.001	S40	15 Summer	30	+10%					2.588	0.000
S13.000	S41	15 Winter	30	+10%	100/15 Summer				2.359	-0.091
S13.001	S42	15 Winter	30	+10%	100/15 Summer				2.325	-0.100
S13.002	S43	15 Winter	30	+10%					2.286	-0.131
S13.003	S44	15 Winter	30	+10%					2.283	-0.034
S13.004	S45	15 Winter	30	+10%	100/15 Summer				2.279	-0.029
S11.001	S46	15 Winter	30	+10%	100/15 Summer				2.252	-0.011
S11.002	S47	15 Winter	30	+10%	30/15 Winter				2.210	0.021
S11.003	S48	15 Winter	30	+10%	30/15 Winter				2.153	0.037
S14.000	S49	15 Winter	30	+10%	100/15 Summer				2.102	-0.048
S14.001	S50	15 Winter	30	+10%	30/15 Summer				2.084	0.102
S11.004	S51	15 Winter	30	+10%	30/15 Summer				2.072	0.135
S11.005	S52	15 Winter	30	+10%	5/15 Summer				1.973	0.167
S15.000	S53	15 Winter	30	+10%					3.007	-0.093
S15.001	S54	15 Winter	30	+10%					2.871	-0.179
S16.000	S55	15 Winter	30	+10%	100/15 Summer				2.127	-0.248
S16.001	S56	15 Winter	30	+10%	100/15 Summer				2.116	-0.113
S16.002	S57	15 Winter	30	+10%	100/15 Summer				2.101	-0.051
S16.003	SFR PI Inlet	15 Winter	30	+10%					2.095	-0.026
S16.004	SFR PI Outlet	15 Winter	30	+10%					2.071	0.000
S15.002	S58	15 Winter	30	+10%	30/15 Summer				2.088	0.060
S17.000	S59	15 Winter	30	+10%	100/15 Summer				2.055	-0.170
S15.003	S60	15 Winter	30	+10%	30/15 Summer				2.042	0.077
S15.004	S61	15 Winter	30	+10%	30/15 Summer				1.948	0.099
S18.000	S62	15 Winter	30	+10%	100/15 Summer				2.130	-0.070
S15.005	S63	15 Summer	30	+10%					1.813	0.000
S1.012	S64	15 Winter	30	+10%	5/15 Summer				1.633	0.349
S1.013	S65	15 Winter	30	+10%	30/15 Summer				1.421	0.167

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S10.002	S32	0.000	0.56			27.6	OK	
S10.003	S33	0.000	0.79			27.9	OK	
S10.004	S34	0.000	0.72			27.3	OK	
S10.005	S35	0.000	0.86			26.9	OK	
S1.010	S10	0.000	1.66			418.7	SURCHARGED	
S1.011	S37	0.000	2.14			413.2	SURCHARGED	
S11.000	S38	0.000	1.29			21.1	SURCHARGED	
S12.000	S39	0.000	1.01			16.9	SURCHARGED	
S12.001	S40	0.000	1.49			16.2	SURCHARGED*	
S13.000	S41	0.000	0.97			121.0	OK	
S13.001	S42	0.000	0.94			121.8	OK	
S13.002	S43	0.000	0.68			121.8	OK*	
S13.003	S44	0.000	0.71			120.2	OK*	
S13.004	S45	0.000	0.80			117.9	OK	
S11.001	S46	0.000	0.90			152.5	OK	

Doran Consulting Limited		Page 32
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38 File Proposed Spring Tide.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flooded		Half Drain		Pipe Flow (l/s)	Status	Level Exceeded
		Volume (m³)	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)			
S11.002	S47	0.000	0.96		163.0	SURCHARGED		
S11.003	S48	0.000	0.70		167.9	SURCHARGED		
S14.000	S49	0.000	0.34		5.6	OK		
S14.001	S50	0.000	0.72		9.5	SURCHARGED		
S11.004	S51	0.000	1.13		175.0	SURCHARGED		
S11.005	S52	0.000	1.57		178.4	SURCHARGED		
S15.000	S53	0.000	0.30		5.0	OK		
S15.001	S54	0.000	0.54		79.3	OK		
S16.000	S55	0.000	0.14		15.5	OK		
S16.001	S56	0.000	0.26		27.4	OK		
S16.002	S57	0.000	0.36		37.3	OK		
S16.003	SFR PI Inlet	0.000	0.37		39.6	OK*		
S16.004	SFR PI Outlet	0.000	0.39		41.5	SURCHARGED*		
S15.002	S58	0.000	0.92		98.2	SURCHARGED		
S17.000	S59	0.000	0.08		4.8	OK		
S15.003	S60	0.000	0.91		101.5	SURCHARGED		
S15.004	S61	0.000	1.32		120.2	SURCHARGED		
S18.000	S62	0.000	0.55		23.4	OK		
S15.005	S63	0.000	1.07		136.1	SURCHARGED*		
S1.012	S64	0.000	2.68		716.0	SURCHARGED		
S1.013	S65	0.000	1.95		714.9	SURCHARGED		

Doran Consulting Limited		Page 33
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38 File Proposed Spring Tide.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 10.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 15.700 Cv (Summer) 0.750
 Region Scotland and Ireland Ratio R 0.300 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
 Return Period(s) (years) 1, 5, 30, 100
 Climate Change (%) 10, 10, 10, 30

PN	US/MH		Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level	Surcharged Depth	Flooded Volume
	Name	Storm							(m)	(m)	(m³)
S1.000	S1	15 Winter	100	+30%	100/15 Summer				10.558	0.558	0.000
S1.001	S2	15 Winter	100	+30%	100/15 Summer				9.233	0.285	0.000
S2.000	S14	15 Winter	100	+30%	30/15 Summer				8.301	0.601	0.000
S1.002	S3	15 Winter	100	+30%	5/15 Summer				7.919	0.491	0.000
S1.003	S4	15 Winter	100	+30%	5/15 Summer				7.623	0.270	0.000
S1.004	SD2	15 Winter	100	+30%	5/15 Summer				4.679	0.576	0.000
S1.005	S5	15 Winter	100	+30%	100/15 Summer				4.391	0.218	0.000
S1.006	S6	15 Winter	100	+30%	100/15 Summer				4.225	0.143	0.000
S3.000	S15	15 Summer	100	+30%					4.350	-0.150	0.000
S3.001	S16	15 Winter	100	+30%					4.100	-0.102	0.000
S1.007	S7	15 Winter	100	+30%	100/15 Summer				4.105	0.067	0.000
S4.000	S17	15 Summer	100	+30%					4.350	-0.150	0.000
S1.008	S8	15 Winter	100	+30%					3.901	-0.104	0.000
S5.000	S18	15 Summer	100	+30%					3.850	-0.150	0.000
S6.000	S19	15 Winter	100	+30%					10.482	-0.118	0.000
S6.001	S20	15 Winter	100	+30%	100/15 Summer				7.810	0.188	0.000
S7.000	S28	15 Winter	100	+30%					9.700	-0.100	0.000
S6.002	S21	15 Winter	100	+30%	1/15 Summer				7.541	0.699	0.000
S6.003	SD1	15 Winter	100	+30%	30/15 Summer				5.158	1.077	0.000
S6.004	S22	15 Winter	100	+30%	30/15 Summer				4.951	0.809	0.000
S8.000	S29	15 Winter	100	+30%	30/15 Summer				4.967	0.892	0.000
S6.005	S23	15 Winter	100	+30%	5/15 Summer				4.863	0.881	0.000
S6.006	S24	15 Winter	100	+30%	5/15 Summer				4.646	0.693	0.000
S6.007	S25	15 Winter	100	+30%	5/15 Summer				4.430	0.487	0.000
S6.008	S26	15 Winter	100	+30%	30/15 Summer				4.219	0.306	0.000
S6.009	S27	15 Winter	100	+30%	30/15 Summer				4.028	0.145	0.000
S1.009	S9	15 Winter	100	+30%					3.648	-0.097	0.000
S9.000	S36	15 Winter	100	+30%	5/15 Summer				4.384	1.334	0.000
S9.001	S37	15 Winter	100	+30%	30/15 Winter				2.865	0.127	0.000
S10.000	S30	15 Winter	100	+30%					3.136	-0.114	0.000
S10.001	S31	15 Winter	100	+30%	100/15 Winter				2.873	0.011	0.000

Doran Consulting Limited		Page 34
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38	Designed by 814	
File Proposed Spring Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	1.12			118.7	SURCHARGED	
S1.001	S2	0.93			116.8	SURCHARGED	
S2.000	S14	1.18			19.9	SURCHARGED	
S1.002	S3	1.98			136.2	SURCHARGED	
S1.003	S4	2.52			136.0	SURCHARGED	
S1.004	SD2	2.44			136.1	SURCHARGED	
S1.005	S5	1.34			134.7	SURCHARGED	
S1.006	S6	1.50			135.0	SURCHARGED	
S3.000	S15	0.00			0.0	OK	
S3.001	S16	0.04			0.5	OK	
S1.007	S7	1.59			134.8	SURCHARGED	
S4.000	S17	0.00			0.0	OK	
S1.008	S8	0.87			134.6	OK	
S5.000	S18	0.00			0.0	OK	
S6.000	S19	0.44			45.2	OK	
S6.001	S20	0.58			55.5	SURCHARGED	
S7.000	S28	0.58			65.8	OK	
S6.002	S21	4.02			120.0	SURCHARGED	
S6.003	SD1	2.23			118.0	SURCHARGED	
S6.004	S22	1.03			114.6	FLOOD RISK	
S8.000	S29	1.07			69.0	FLOOD RISK	
S6.005	S23	2.61			181.0	FLOOD RISK	
S6.006	S24	2.14			181.9	SURCHARGED	
S6.007	S25	2.60			182.0	FLOOD RISK	
S6.008	S26	2.63			181.8	FLOOD RISK	
S6.009	S27	1.84			254.0	SURCHARGED	
S1.009	S9	0.96			554.0	OK	
S9.000	S36	2.14			28.6	FLOOD RISK	
S9.001	S37	1.46			45.2	SURCHARGED	
S10.000	S30	0.47			23.2	OK	
S10.001	S31	0.70			31.8	SURCHARGED	

Doran Consulting Limited		Page 35
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38	Designed by 814	
File Proposed Spring Tide.MDX	Checked by	
XP Solutions	Network 2020.1.3	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
S10.002	S32	15 Winter	100	+30%	100/15 Winter				2.839	0.125
S10.003	S33	15 Winter	100	+30%	100/15 Summer				2.793	0.283
S10.004	S34	15 Winter	100	+30%	100/15 Summer				2.750	0.334
S10.005	S35	15 Winter	100	+30%	100/15 Summer				2.672	0.465
S1.010	S10	15 Winter	100	+30%	5/15 Summer				2.596	1.234
S1.011	S37	15 Winter	100	+30%	1/15 Summer				2.245	0.934
S11.000	S38	15 Winter	100	+30%	30/15 Summer				3.448	0.848
S12.000	S39	15 Winter	100	+30%	30/15 Summer				3.334	0.534
S12.001	S40	15 Summer	100	+30%					2.588	0.000
S13.000	S41	15 Winter	100	+30%	100/15 Summer				3.057	0.607
S13.001	S42	15 Winter	100	+30%	100/15 Summer				3.025	0.600
S13.002	S43	15 Summer	100	+30%					2.417	0.000
S13.003	S44	15 Summer	100	+30%					2.317	0.000
S13.004	S45	15 Winter	100	+30%	100/15 Summer				2.992	0.684
S11.001	S46	15 Winter	100	+30%	100/15 Summer				2.956	0.693
S11.002	S47	15 Winter	100	+30%	30/15 Winter				2.855	0.666
S11.003	S48	15 Winter	100	+30%	30/15 Winter				2.732	0.616
S14.000	S49	15 Winter	100	+30%	100/15 Summer				2.640	0.490
S14.001	S50	15 Winter	100	+30%	30/15 Summer				2.618	0.636
S11.004	S51	15 Winter	100	+30%	30/15 Summer				2.602	0.665
S11.005	S52	15 Winter	100	+30%	5/15 Summer				2.462	0.656
S15.000	S53	15 Winter	100	+30%					3.022	-0.078
S15.001	S54	15 Winter	100	+30%					2.936	-0.114
S16.000	S55	15 Winter	100	+30%	100/15 Summer				2.800	0.425
S16.001	S56	15 Winter	100	+30%	100/15 Summer				2.791	0.562
S16.002	S57	15 Winter	100	+30%	100/15 Summer				2.771	0.619
S16.003	SFR PI Inlet	15 Summer	100	+30%					2.121	0.000
S16.004	SFR PI Outlet	15 Summer	100	+30%					2.071	0.000
S15.002	S58	15 Winter	100	+30%	30/15 Summer				2.754	0.726
S17.000	S59	15 Winter	100	+30%	100/15 Summer				2.679	0.454
S15.003	S60	15 Winter	100	+30%	30/15 Summer				2.668	0.703
S15.004	S61	15 Winter	100	+30%	30/15 Summer				2.529	0.680
S18.000	S62	15 Winter	100	+30%	100/15 Summer				2.543	0.343
S15.005	S63	15 Summer	100	+30%					1.813	0.000
S1.012	S64	15 Winter	100	+30%	5/15 Summer				2.017	0.733
S1.013	S65	15 Winter	100	+30%	30/15 Summer				1.615	0.361

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S10.002	S32	0.000	0.83			40.8	SURCHARGED	
S10.003	S33	0.000	1.05			37.0	SURCHARGED	
S10.004	S34	0.000	0.88			33.1	SURCHARGED	
S10.005	S35	0.000	1.16			36.5	SURCHARGED	
S1.010	S10	0.000	2.40			604.7	SURCHARGED	
S1.011	S37	0.000	3.11			600.6	SURCHARGED	
S11.000	S38	0.000	1.59			25.9	SURCHARGED	
S12.000	S39	0.000	1.35			22.6	SURCHARGED	
S12.001	S40	0.000	1.88			20.4	SURCHARGED*	
S13.000	S41	0.000	1.31			162.8	SURCHARGED	
S13.001	S42	0.000	1.21			156.3	SURCHARGED	
S13.002	S43	0.000	0.87			154.3	SURCHARGED*	
S13.003	S44	0.000	0.89			150.8	SURCHARGED*	
S13.004	S45	0.000	0.95			139.8	SURCHARGED	
S11.001	S46	0.000	1.09			184.5	SURCHARGED	

Doran Consulting Limited		Page 36
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:38 File Proposed Spring Tide.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flooded		Half Drain		Pipe Flow (l/s)	Status	Level Exceeded
		Volume (m³)	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)			
S11.002	S47	0.000	1.20		202.4	SURCHARGED		
S11.003	S48	0.000	0.89		212.3	SURCHARGED		
S14.000	S49	0.000	0.45		7.4	SURCHARGED		
S14.001	S50	0.000	0.85		11.3	SURCHARGED		
S11.004	S51	0.000	1.40		217.6	SURCHARGED		
S11.005	S52	0.000	1.92		218.2	SURCHARGED		
S15.000	S53	0.000	0.46		7.6	OK		
S15.001	S54	0.000	0.82		121.5	OK		
S16.000	S55	0.000	0.17		18.4	SURCHARGED		
S16.001	S56	0.000	0.31		33.4	FLOOD RISK		
S16.002	S57	0.000	0.44		45.1	SURCHARGED		
S16.003	SFR PI Inlet	0.000	0.43		46.3	SURCHARGED*		
S16.004	SFR PI Outlet	0.000	0.47		50.4	SURCHARGED*		
S15.002	S58	0.000	1.27		135.7	SURCHARGED		
S17.000	S59	0.000	0.12		6.9	SURCHARGED		
S15.003	S60	0.000	1.20		134.6	SURCHARGED		
S15.004	S61	0.000	1.77		160.5	SURCHARGED		
S18.000	S62	0.000	0.73		31.1	SURCHARGED		
S15.005	S63	0.000	1.40		178.9	SURCHARGED*		
S1.012	S64	0.000	3.70		988.9	SURCHARGED		
S1.013	S65	0.000	2.70		990.4	SURCHARGED		

APPENDIX H4 – Proposed Storm Run-Off Calculations - Highest Astronomical Tide (HAT)

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes DC PIPES Manhole Sizes DC MHs

FSR Rainfall Model - Scotland and Ireland					
Return Period (years)	2	PIMP (%)	100		
M5-60 (mm)	15.600	Add Flow / Climate Change (%)	10		
Ratio R	0.300	Minimum Backdrop Height (m)	0.000		
Maximum Rainfall (mm/hr)	200	Maximum Backdrop Height (m)	0.000		
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200		
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00		
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500		

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	1.418	4-8	1.740	8-12	0.025

Total Area Contributing (ha) = 3.182

Total Pipe Volume (m³) = 106.078

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	21.043	1.052	20.0	0.295	5.00	0.0	0.600	o	225	Pipe/Conduit	
S1.001	22.150	1.519	14.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S2.000	27.330	0.271	100.9	0.052	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.002	10.573	0.076	139.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.003	2.040	0.014	150.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.004	1.499	0.005	300.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.005	27.313	0.091	300.1	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.006	13.139	0.044	298.6	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL Σ (m)	I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	48.61	5.12	9.775	0.295	0.0	0.0	3.9	2.94	116.9	42.8
S1.001	48.22	5.23	8.723	0.295	0.0	0.0	3.9	3.44	137.0	42.8
S2.000	47.42	5.46	7.550	0.052	0.0	0.0	0.7	1.00	17.7	7.4
S1.002	46.97	5.59	7.129	0.348	0.0	0.0	4.4	1.33	93.9	48.6
S1.003	46.88	5.61	7.053	0.348	0.0	0.0	4.4	1.28	90.6	48.6
S1.004	46.78	5.64	3.803	0.348	0.0	0.0	4.4	0.90	63.8	48.6
S1.005	45.38	6.08	3.798	0.348	0.0	0.0	4.4	1.04	114.9	48.6
S1.006	44.75	6.29	3.707	0.348	0.0	0.0	4.4	1.04	115.2	48.6

Doran Consulting Limited		Page 2
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:41 File Proposed HAT.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S3.000	44.656	0.298	150.0	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
S3.001	35.891	0.239	150.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.007	9.792	0.033	296.7	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S4.000	34.300	0.570	60.2	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.008	22.600	0.185	122.2	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S5.000	46.827	0.255	183.6	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
S6.000	74.456	2.978	25.0	0.102	5.00	0.0	0.600	o	225	Pipe/Conduit	
S6.001	18.936	0.780	24.3	0.028	0.00	0.0	0.600	o	225	Pipe/Conduit	
S7.000	59.039	2.958	20.0	0.147	5.00	0.0	0.600	o	225	Pipe/Conduit	
S6.002	3.748	0.028	133.4	0.004	0.00	0.0	0.600	o	225	Pipe/Conduit	
S6.003	2.367	0.014	166.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S6.004	18.341	0.084	218.3	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S8.000	20.755	0.092	225.0	0.211	5.00	0.0	0.600	o	300	Pipe/Conduit	
S6.005	11.219	0.030	375.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S6.006	2.580	0.009	275.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S6.007	11.655	0.031	375.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S6.008	11.032	0.029	375.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S3.000	45.92	5.91	4.350	0.000	0.0	0.0	0.0	0.82	14.5	0.0
S3.001	43.73	6.64	4.052	0.000	0.0	0.0	0.0	0.82	14.5	0.0
S1.007	43.30	6.80	3.663	0.348	0.0	0.0	4.4	1.05	115.6	48.6
S4.000	47.47	5.44	4.350	0.000	0.0	0.0	0.0	1.30	23.0	0.0
S1.008	42.68	7.03	3.630	0.348	0.0	0.0	4.4	1.64	180.9	48.6
S5.000	45.45	6.06	3.850	0.000	0.0	0.0	0.0	0.74	13.0	0.0
S6.000	47.36	5.47	10.375	0.102	0.0	0.0	1.3	2.63	104.5	14.4
S6.001	46.96	5.59	7.397	0.130	0.0	0.0	1.7	2.67	106.0	18.2
S7.000	47.84	5.33	9.575	0.147	0.0	0.0	1.9	2.94	117.0	21.0
S6.002	46.77	5.65	6.617	0.282	0.0	0.0	3.6	1.13	44.9	39.3
S6.003	46.67	5.68	3.781	0.282	0.0	0.0	3.6	1.21	85.8	39.3
S6.004	45.86	5.93	3.767	0.282	0.0	0.0	3.6	1.22	135.0	39.3
S8.000	47.85	5.33	3.775	0.211	0.0	0.0	2.7	1.04	73.8	30.0
S6.005	45.23	6.13	3.608	0.493	0.0	0.0	6.0	0.93	102.7	66.4
S6.006	45.11	6.17	3.578	0.493	0.0	0.0	6.0	1.09	120.1	66.4
S6.007	44.49	6.38	3.568	0.493	0.0	0.0	6.0	0.93	102.7	66.4
S6.008	43.91	6.58	3.537	0.493	0.0	0.0	6.0	0.93	102.7	66.4

Doran Consulting Limited		Page 3
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:41 File Proposed HAT.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S6.009	23.534	0.063	375.0	0.261	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.009	21.815	1.045	20.9	0.514	0.00	0.0	0.600	o	450	Pipe/Conduit	
S9.000	52.403	0.312	168.2	0.085	5.00	0.0	0.600	o	150	Pipe/Conduit	
S9.001	27.362	0.113	241.9	0.051	0.00	0.0	0.600	o	225	Pipe/Conduit	
S10.000	39.193	0.388	100.9	0.052	5.00	0.0	0.600	o	225	Pipe/Conduit	
S10.001	14.856	0.147	100.9	0.019	0.00	0.0	0.600	o	225	Pipe/Conduit	
S10.002	18.323	0.205	89.4	0.023	0.00	0.0	0.600	o	225	Pipe/Conduit	
S10.003	15.685	0.093	167.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S10.004	35.116	0.209	167.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S10.005	35.026	0.145	241.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.010	22.982	0.052	443.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.011	33.055	0.026	1274.4	0.021	0.00	0.0	0.600	o	675	Pipe/Conduit	
S11.000	23.214	0.218	106.6	0.077	5.00	0.0	0.600	o	150	Pipe/Conduit	
S12.000	21.191	0.212	100.0	0.061	5.00	0.0	0.600	o	150	Pipe/Conduit	
S12.001	1.178	0.012	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S13.000	6.026	0.025	241.0	0.415	5.00	0.0	0.600	o	450	Pipe/Conduit	
S13.001	1.825	0.008	228.1	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S13.002	1.640	0.100	16.4	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S13.003	2.274	0.009	252.7	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S6.009	42.88	6.95	3.433	0.754	0.0	0.0	8.7	1.04	166.0	96.2
S1.009	42.46	7.11	3.295	1.615	0.0	0.0	18.6	4.47	710.2	204.3
S9.000	45.23	6.13	2.900	0.085	0.0	0.0	1.0	0.77	13.6	11.5
S9.001	43.63	6.68	2.513	0.136	0.0	0.0	1.6	0.84	33.2	17.7
S10.000	47.26	5.50	3.025	0.052	0.0	0.0	0.7	1.30	51.7	7.4
S10.001	46.62	5.69	2.637	0.072	0.0	0.0	0.9	1.30	51.7	9.9
S10.002	45.91	5.91	2.489	0.095	0.0	0.0	1.2	1.38	55.0	13.0
S10.003	45.10	6.17	2.284	0.095	0.0	0.0	1.2	1.01	40.0	13.0
S10.004	43.41	6.75	2.191	0.095	0.0	0.0	1.2	1.01	40.0	13.0
S10.005	41.58	7.45	1.982	0.095	0.0	0.0	1.2	0.84	33.2	13.0
S1.010	40.77	7.79	0.762	1.846	0.0	0.0	20.4	1.15	325.3	224.3
S1.011	39.07	8.54	0.635	1.867	0.0	0.0	20.4	0.73	259.6	224.3
S11.000	47.62	5.40	2.450	0.077	0.0	0.0	1.0	0.97	17.2	10.9
S12.000	47.78	5.35	2.650	0.061	0.0	0.0	0.8	1.00	17.8	8.7
S12.001	47.71	5.37	2.438	0.061	0.0	0.0	0.8	1.00	17.8	8.7
S13.000	48.76	5.08	2.000	0.415	0.0	0.0	5.5	1.31	207.6	60.2
S13.001	48.68	5.10	1.975	0.415	0.0	0.0	5.5	1.34	213.4	60.2
S13.002	48.66	5.11	1.967	0.415	0.0	0.0	5.5	5.04	801.5	60.2
S13.003	48.55	5.13	1.867	0.415	0.0	0.0	5.5	1.27	202.7	60.2

Doran Consulting Limited		Page 4
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:41 File Proposed HAT.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S13.004	10.833	0.045	240.7	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S11.001	11.034	0.073	151.2	0.013	0.00	0.0	0.600	o	450	Pipe/Conduit	
S11.002	12.468	0.073	170.8	0.061	0.00	0.0	0.600	o	450	Pipe/Conduit	
S11.003	18.112	0.179	101.2	0.037	0.00	0.0	0.600	o	450	Pipe/Conduit	
S14.000	16.783	0.168	99.9	0.019	5.00	0.0	0.600	o	150	Pipe/Conduit	
S14.001	4.480	0.045	99.6	0.016	0.00	0.0	0.600	o	150	Pipe/Conduit	
S11.004	13.458	0.056	240.3	0.010	0.00	0.0	0.600	o	450	Pipe/Conduit	
S11.005	29.590	0.123	240.6	0.019	0.00	0.0	0.600	o	375	Pipe/Conduit	
S15.000	19.991	0.200	100.0	0.017	5.00	0.0	0.600	o	150	Pipe/Conduit	
S15.001	18.053	0.144	125.4	0.235	0.00	0.0	0.600	o	375	Pipe/Conduit	
S16.000	12.092	0.071	170.3	0.053	5.00	0.0	0.600	o	375	Pipe/Conduit	
S16.001	18.716	0.077	243.1	0.053	0.00	0.0	0.600	o	375	Pipe/Conduit	
S16.002	3.061	0.031	98.7	0.030	0.00	0.0	0.600	o	375	Pipe/Conduit	
S16.003	3.177	0.050	63.5	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S16.004	4.362	0.044	99.1	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S15.002	10.718	0.063	170.1	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S17.000	16.035	0.258	62.2	0.016	5.00	0.0	0.600	o	225	Pipe/Conduit	
S15.003	28.348	0.116	244.4	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S13.004	48.05	5.27	1.858	0.415	0.0	0.0	5.5	1.31	207.7	60.2
S11.001	47.23	5.51	1.813	0.565	0.0	0.0	7.2	1.65	262.6	79.5
S11.002	46.78	5.64	1.739	0.627	0.0	0.0	7.9	1.55	247.0	87.3
S11.003	46.29	5.79	1.666	0.664	0.0	0.0	8.3	2.02	321.4	91.6
S14.000	48.03	5.28	2.000	0.019	0.0	0.0	0.3	1.01	17.8	2.8
S14.001	47.77	5.35	1.832	0.036	0.0	0.0	0.5	1.01	17.8	5.1
S11.004	45.75	5.96	1.487	0.709	0.0	0.0	8.8	1.31	207.9	96.7
S11.005	44.46	6.39	1.431	0.729	0.0	0.0	8.8	1.16	128.5	96.7
S15.000	47.85	5.33	2.950	0.017	0.0	0.0	0.2	1.01	17.8	2.4
S15.001	47.20	5.52	2.675	0.252	0.0	0.0	3.2	1.62	178.6	35.5
S16.000	48.51	5.15	2.000	0.053	0.0	0.0	0.7	1.39	153.0	7.7
S16.001	47.56	5.41	1.854	0.106	0.0	0.0	1.4	1.16	127.9	15.0
S16.002	47.46	5.44	1.777	0.136	0.0	0.0	1.7	1.82	201.4	19.2
S16.003	47.38	5.47	1.746	0.136	0.0	0.0	1.7	2.28	251.4	19.2
S16.004	47.24	5.51	1.696	0.136	0.0	0.0	1.7	1.82	201.0	19.2
S15.002	46.77	5.65	1.653	0.388	0.0	0.0	4.9	1.39	153.1	54.1
S17.000	48.46	5.16	2.000	0.016	0.0	0.0	0.2	1.66	66.1	2.3
S15.003	45.46	6.06	1.590	0.404	0.0	0.0	5.0	1.15	127.5	54.8

Doran Consulting Limited		Page 5
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:41 File Proposed HAT.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S15.004	8.917	0.036	247.7	0.083	0.00	0.0	0.600	o	375	Pipe/Conduit	
S18.000	4.537	0.460	9.9	0.079	5.00	0.0	0.600	o	150	Pipe/Conduit	
S15.005	50.391	0.206	244.6	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.012	17.899	0.030	596.6	0.020	0.00	0.0	0.600	o	750	Pipe/Conduit	
S1.013	2.312	0.004	578.0	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S15.004	45.06	6.19	1.474	0.487	0.0	0.0	5.9	1.15	126.7	65.4
S18.000	48.96	5.02	2.050	0.079	0.0	0.0	1.1	3.23	57.0	11.6
S15.005	42.98	6.91	1.438	0.567	0.0	0.0	6.6	1.15	127.5	72.6
S1.012	38.52	8.81	0.534	3.182	0.0	0.0	33.2	1.14	502.9	365.1
S1.013	38.45	8.84	0.504	3.182	0.0	0.0	33.2	1.16	511.0	365.1

Doran Consulting Limited		Page 6
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:41 File Proposed HAT.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
S1	12.000	2.225	Open Manhole	1200	S1.000	9.775	225				
S2	10.300	1.577	Open Manhole	1200	S1.001	8.723	225	S1.000	8.723	225	
S14	8.900	1.350	Open Manhole	1200	S2.000	7.550	150				
S3	9.770	2.641	Open Manhole	1200	S1.002	7.129	300	S1.001	7.204	225	
								S2.000	7.279	150	
S4	9.900	2.847	Open Manhole	1200	S1.003	7.053	300	S1.002	7.053	300	
SD2	9.000	5.197	Open Manhole	1200	S1.004	3.803	300	S1.003	7.040	300	3237
S5	5.000	1.202	Open Manhole	1350	S1.005	3.798	375	S1.004	3.798	300	
S6	5.000	1.293	Open Manhole	1350	S1.006	3.707	375	S1.005	3.707	375	
S15	5.000	0.650	Open Manhole	1200	S3.000	4.350	150				
S16	5.000	0.948	Open Manhole	1200	S3.001	4.052	150	S3.000	4.052	150	
S7	5.000	1.337	Open Manhole	1350	S1.007	3.663	375	S1.006	3.663	375	
								S3.001	3.813	150	
S17	5.000	0.650	Open Manhole	1200	S4.000	4.350	150				
S8	5.000	1.370	Open Manhole	1350	S1.008	3.630	375	S1.007	3.630	375	
								S4.000	3.780	150	
S18	4.500	0.650	Open Manhole	1200	S5.000	3.850	150				
S19	12.600	2.225	Open Manhole	1200	S6.000	10.375	225				
S20	8.200	0.803	Open Manhole	1200	S6.001	7.397	225	S6.000	7.397	225	
S28	11.800	2.225	Open Manhole	1200	S7.000	9.575	225				
S21	8.600	1.983	Open Manhole	1200	S6.002	6.617	225	S6.001	6.617	225	
								S7.000	6.617	225	
SD1	9.000	5.219	Open Manhole	1200	S6.003	3.781	300	S6.002	6.589	225	2733
S22	5.000	1.233	Open Manhole	1800	S6.004	3.767	375	S6.003	3.767	300	
S29	5.000	1.225	Open Manhole	1800	S8.000	3.775	300				
S23	5.000	1.392	Open Manhole	1350	S6.005	3.608	375	S6.004	3.683	375	75
								S8.000	3.683	300	
S24	5.000	1.422	Open Manhole	1350	S6.006	3.578	375	S6.005	3.578	375	
S25	4.500	0.932	Open Manhole	1350	S6.007	3.568	375	S6.006	3.568	375	
S26	4.500	0.963	Open Manhole	1350	S6.008	3.537	375	S6.007	3.537	375	
S27	4.500	1.067	Open Manhole	1350	S6.009	3.433	450	S6.008	3.508	375	
S9	4.500	1.205	Open Manhole	1350	S1.009	3.295	450	S1.008	3.445	375	75
								S5.000	3.595	150	
								S6.009	3.370	450	75
S36	4.400	1.500	Open Manhole	1200	S9.000	2.900	150				
S37	4.250	1.737	Open Manhole	1200	S9.001	2.513	225	S9.000	2.588	150	
S30	4.450	1.425	Open Manhole	1200	S10.000	3.025	225				
S31	4.450	1.813	Open Manhole	1200	S10.001	2.637	225	S10.000	2.637	225	
S32	4.450	1.961	Open Manhole	1200	S10.002	2.489	225	S10.001	2.489	225	
S33	4.400	2.116	Open Manhole	1200	S10.003	2.284	225	S10.002	2.284	225	
S34	4.400	2.209	Open Manhole	1200	S10.004	2.191	225	S10.003	2.191	225	
S35	4.400	2.418	Open Manhole	1200	S10.005	1.982	225	S10.004	1.982	225	
S10	4.400	3.638	Open Manhole	1800	S1.010	0.762	600	S1.009	2.250	450	1338
								S9.001	2.400	225	1263

Doran Consulting Limited		Page 8
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:41 File Proposed HAT.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S1	350466.054	381790.264	350466.054	381790.264	Required	
S2	350461.297	381810.762	350461.297	381810.762	Required	
S14	350482.394	381839.657	350482.394	381839.657	Required	
S3	350456.077	381832.288	350456.077	381832.288	Required	
S4	350445.953	381829.239	350445.953	381829.239	Required	
SD2	350445.354	381831.189	350445.354	381831.189	Required	
S5	350444.913	381832.622	350444.913	381832.622	Required	
S6	350418.686	381824.997	350418.686	381824.997	Required	
S15	350492.412	381860.030	350492.412	381860.030	Required	
S16	350449.532	381847.565	350449.532	381847.565	Required	
S7	350415.046	381837.621	350415.046	381837.621	Required	
S17	350445.226	381856.755	350445.226	381856.755	Required	
S8	350412.333	381847.030	350412.333	381847.030	Required	
S18	350451.032	381881.839	350451.032	381881.839	Required	
S19	350454.919	381777.813	350454.919	381777.813	Required	
S20	350382.082	381793.258	350382.082	381793.258	Required	
S28	350446.725	381799.677	350446.725	381799.677	Required	
S21	350388.776	381810.971	350388.776	381810.971	Required	

Doran Consulting Limited		Page 9
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:41 File Proposed HAT.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
SD1	350387.735	381814.572	350387.735	381814.572	Required	
S22	350385.499	381815.348	350385.499	381815.348	Required	
S29	350360.497	381827.494	350360.497	381827.494	Required	
S23	350380.509	381832.997	350380.509	381832.997	Required	
S24	350377.449	381843.791	350377.449	381843.791	Required	
S25	350376.684	381846.255	350376.684	381846.255	Required	
S26	350373.434	381857.447	350373.434	381857.447	Required	
S27	350384.050	381860.447	350384.050	381860.447	Required	
S9	350406.072	381868.745	350406.072	381868.745	Required	
S36	350476.394	381912.323	350476.394	381912.323	Required	
S37	350426.137	381897.479	350426.137	381897.479	Required	
S30	350352.270	381801.758	350352.270	381801.758	Required	
S31	350331.862	381835.219	350331.862	381835.219	Required	
S32	350324.763	381848.269	350324.763	381848.269	Required	
S33	350317.660	381865.159	350317.660	381865.159	Required	
S34	350332.682	381869.669	350332.682	381869.669	Required	
S35	350366.341	381879.680	350366.341	381879.680	Required	
S10	350399.911	381889.673	350399.911	381889.673	Required	

Doran Consulting Limited		Page 10
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:41 File Proposed HAT.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S37	350396.591	381912.414	350396.591	381912.414	Required	
S38	350490.855	381973.319	350490.855	381973.319	Required	
S39	350485.820	381954.909	350485.820	381954.909	Required	
S40	350469.216	381968.077			No Entry	
S41	350475.945	381986.148	350475.945	381986.148	Required	
S42	350477.494	381980.325	350477.494	381980.325	Required	
S43	350475.745	381979.804			No Entry	
S44	350474.177	381979.325			No Entry	
S45	350472.000	381978.669	350472.000	381978.669	Required	
S46	350468.137	381968.548	350468.137	381968.548	Required	
S47	350457.570	381965.368	350457.570	381965.368	Required	
S48	350445.635	381961.763	350445.635	381961.763	Required	
S49	350439.676	381938.821	350439.676	381938.821	Required	
S50	350429.589	381952.234	350429.589	381952.234	Required	
S51	350428.298	381956.524	350428.298	381956.524	Required	
S52	350415.415	381952.632	350415.415	381952.632	Required	
S53	350271.906	381889.973	350271.906	381889.973	Required	
S54	350275.896	381909.563	350275.896	381909.563	Required	

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S55	350290.226	381883.339	350290.226	381883.339	Required	
S56	350301.781	381886.901	350301.781	381886.901	Required	
S57	350296.278	381904.790	350296.278	381904.790	Required	
SFR PI Inlet	350295.372	381907.714			No Entry	
SFR PI Outlet	350294.430	381910.748			No Entry	
S58	350293.137	381914.914	350293.137	381914.914	Required	
S59	350307.185	381902.515	350307.185	381902.515	Required	
S60	350303.373	381918.091	350303.373	381918.091	Required	
S61	350330.447	381926.494	350330.447	381926.494	Required	
S62	350340.308	381924.804	350340.308	381924.804	Required	
S63	350338.963	381929.137			No Entry	
S64	350387.090	381944.074	350387.090	381944.074	Required	
S65	350381.945	381961.218	350381.945	381961.218	Required	
S	350381.281	381963.432			No Entry	

Doran Consulting Limited		Page 12
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:41 File Proposed HAT.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	o	225	S1	12.000	9.775	2.000	Open Manhole	1200
S1.001	o	225	S2	10.300	8.723	1.352	Open Manhole	1200
S2.000	o	150	S14	8.900	7.550	1.200	Open Manhole	1200
S1.002	o	300	S3	9.770	7.129	2.341	Open Manhole	1200
S1.003	o	300	S4	9.900	7.053	2.547	Open Manhole	1200
S1.004	o	300	SD2	9.000	3.803	4.897	Open Manhole	1200
S1.005	o	375	S5	5.000	3.798	0.827	Open Manhole	1350
S1.006	o	375	S6	5.000	3.707	0.918	Open Manhole	1350
S3.000	o	150	S15	5.000	4.350	0.500	Open Manhole	1200
S3.001	o	150	S16	5.000	4.052	0.798	Open Manhole	1200
S1.007	o	375	S7	5.000	3.663	0.962	Open Manhole	1350
S4.000	o	150	S17	5.000	4.350	0.500	Open Manhole	1200
S1.008	o	375	S8	5.000	3.630	0.995	Open Manhole	1350
S5.000	o	150	S18	4.500	3.850	0.500	Open Manhole	1200
S6.000	o	225	S19	12.600	10.375	2.000	Open Manhole	1200
S6.001	o	225	S20	8.200	7.397	0.578	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	21.043	20.0	S2	10.300	8.723	1.352	Open Manhole	1200
S1.001	22.150	14.6	S3	9.770	7.204	2.341	Open Manhole	1200
S2.000	27.330	100.9	S3	9.770	7.279	2.341	Open Manhole	1200
S1.002	10.573	139.6	S4	9.900	7.053	2.547	Open Manhole	1200
S1.003	2.040	150.0	SD2	9.000	7.040	1.660	Open Manhole	1200
S1.004	1.499	300.0	S5	5.000	3.798	0.902	Open Manhole	1350
S1.005	27.313	300.1	S6	5.000	3.707	0.918	Open Manhole	1350
S1.006	13.139	298.6	S7	5.000	3.663	0.962	Open Manhole	1350
S3.000	44.656	150.0	S16	5.000	4.052	0.798	Open Manhole	1200
S3.001	35.891	150.0	S7	5.000	3.813	1.037	Open Manhole	1350
S1.007	9.792	296.7	S8	5.000	3.630	0.995	Open Manhole	1350
S4.000	34.300	60.2	S8	5.000	3.780	1.070	Open Manhole	1350
S1.008	22.600	122.2	S9	4.500	3.445	0.680	Open Manhole	1350
S5.000	46.827	183.6	S9	4.500	3.595	0.755	Open Manhole	1350
S6.000	74.456	25.0	S20	8.200	7.397	0.578	Open Manhole	1200
S6.001	18.936	24.3	S21	8.600	6.617	1.758	Open Manhole	1200

Doran Consulting Limited		Page 13
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:41 File Proposed HAT.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S7.000	o	225	S28	11.800	9.575	2.000	Open Manhole	1200
S6.002	o	225	S21	8.600	6.617	1.758	Open Manhole	1200
S6.003	o	300	SD1	9.000	3.781	4.919	Open Manhole	1200
S6.004	o	375	S22	5.000	3.767	0.858	Open Manhole	1800
S8.000	o	300	S29	5.000	3.775	0.925	Open Manhole	1800
S6.005	o	375	S23	5.000	3.608	1.017	Open Manhole	1350
S6.006	o	375	S24	5.000	3.578	1.047	Open Manhole	1350
S6.007	o	375	S25	4.500	3.568	0.557	Open Manhole	1350
S6.008	o	375	S26	4.500	3.537	0.588	Open Manhole	1350
S6.009	o	450	S27	4.500	3.433	0.617	Open Manhole	1350
S1.009	o	450	S9	4.500	3.295	0.755	Open Manhole	1350
S9.000	o	150	S36	4.400	2.900	1.350	Open Manhole	1200
S9.001	o	225	S37	4.250	2.513	1.512	Open Manhole	1200
S10.000	o	225	S30	4.450	3.025	1.200	Open Manhole	1200
S10.001	o	225	S31	4.450	2.637	1.588	Open Manhole	1200
S10.002	o	225	S32	4.450	2.489	1.736	Open Manhole	1200
S10.003	o	225	S33	4.400	2.284	1.891	Open Manhole	1200
S10.004	o	225	S34	4.400	2.191	1.984	Open Manhole	1200
S10.005	o	225	S35	4.400	1.982	2.193	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S7.000	59.039	20.0	S21	8.600	6.617	1.758	Open Manhole	1200
S6.002	3.748	133.4	SD1	9.000	6.589	2.186	Open Manhole	1200
S6.003	2.367	166.8	S22	5.000	3.767	0.933	Open Manhole	1800
S6.004	18.341	218.3	S23	5.000	3.683	0.942	Open Manhole	1350
S8.000	20.755	225.0	S23	5.000	3.683	1.017	Open Manhole	1350
S6.005	11.219	375.0	S24	5.000	3.578	1.047	Open Manhole	1350
S6.006	2.580	275.0	S25	4.500	3.568	0.557	Open Manhole	1350
S6.007	11.655	375.0	S26	4.500	3.537	0.588	Open Manhole	1350
S6.008	11.032	375.0	S27	4.500	3.508	0.617	Open Manhole	1350
S6.009	23.534	375.0	S9	4.500	3.370	0.680	Open Manhole	1350
S1.009	21.815	20.9	S10	4.400	2.250	1.700	Open Manhole	1800
S9.000	52.403	168.2	S37	4.250	2.588	1.512	Open Manhole	1200
S9.001	27.362	241.9	S10	4.400	2.400	1.775	Open Manhole	1800
S10.000	39.193	100.9	S31	4.450	2.637	1.588	Open Manhole	1200
S10.001	14.856	100.9	S32	4.450	2.489	1.736	Open Manhole	1200
S10.002	18.323	89.4	S33	4.400	2.284	1.891	Open Manhole	1200
S10.003	15.685	167.9	S34	4.400	2.191	1.984	Open Manhole	1200
S10.004	35.116	167.9	S35	4.400	1.982	2.193	Open Manhole	1200
S10.005	35.026	241.9	S10	4.400	1.837	2.338	Open Manhole	1800

Doran Consulting Limited		Page 14
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:41 File Proposed HAT.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.010	o	600	S10	4.400	0.762	3.038	Open Manhole	1800
S1.011	o	675	S37	3.800	0.635	2.490	Open Manhole	1800
S11.000	o	150	S38	3.800	2.450	1.200	Open Manhole	1200
S12.000	o	150	S39	4.000	2.650	1.200	Open Manhole	1200
S12.001	o	150	S40	3.900	2.438	1.312	Junction	
S13.000	o	450	S41	3.600	2.000	1.150	Open Manhole	1350
S13.001	o	450	S42	3.600	1.975	1.175	Open Manhole	1350
S13.002	o	450	S43	3.650	1.967	1.233	Junction	
S13.003	o	450	S44	3.650	1.867	1.333	Junction	
S13.004	o	450	S45	3.650	1.858	1.342	Open Manhole	1350
S11.001	o	450	S46	3.900	1.813	1.637	Open Manhole	1350
S11.002	o	450	S47	3.900	1.739	1.711	Open Manhole	1350
S11.003	o	450	S48	3.850	1.666	1.734	Open Manhole	1350
S14.000	o	150	S49	3.200	2.000	1.050	Open Manhole	1200
S14.001	o	150	S50	3.500	1.832	1.518	Open Manhole	1200
S11.004	o	450	S51	3.800	1.487	1.863	Open Manhole	1350
S11.005	o	375	S52	3.750	1.431	1.944	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.010	22.982	443.0	S37	3.800	0.710	2.490	Open Manhole	1800
S1.011	33.055	1274.4	S64	3.750	0.609	2.466	Open Manhole	1800
S11.000	23.214	106.6	S46	3.900	2.232	1.518	Open Manhole	1350
S12.000	21.191	100.0	S40	3.900	2.438	1.312	Junction	
S12.001	1.178	100.0	S46	3.900	2.426	1.324	Open Manhole	1350
S13.000	6.026	241.0	S42	3.600	1.975	1.175	Open Manhole	1350
S13.001	1.825	228.1	S43	3.650	1.967	1.233	Junction	
S13.002	1.640	16.4	S44	3.650	1.867	1.333	Junction	
S13.003	2.274	252.7	S45	3.650	1.858	1.342	Open Manhole	1350
S13.004	10.833	240.7	S46	3.900	1.813	1.637	Open Manhole	1350
S11.001	11.034	151.2	S47	3.900	1.740	1.710	Open Manhole	1350
S11.002	12.468	170.8	S48	3.850	1.666	1.734	Open Manhole	1350
S11.003	18.112	101.2	S51	3.800	1.487	1.863	Open Manhole	1350
S14.000	16.783	99.9	S50	3.500	1.832	1.518	Open Manhole	1200
S14.001	4.480	99.6	S51	3.800	1.787	1.863	Open Manhole	1350
S11.004	13.458	240.3	S52	3.750	1.431	1.869	Open Manhole	1350
S11.005	29.590	240.6	S64	3.750	1.308	2.067	Open Manhole	1800

Doran Consulting Limited		Page 15
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:41 File Proposed HAT.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S15.000	o	150	S53	4.000	2.950	0.900	Open Manhole	1200
S15.001	o	375	S54	3.675	2.675	0.625	Open Manhole	1350
S16.000	o	375	S55	4.200	2.000	1.825	Open Manhole	1200
S16.001	o	375	S56	3.075	1.854	0.846	Open Manhole	1350
S16.002	o	375	S57	3.075	1.777	0.923	Open Manhole	1200
S16.003	o	375	SFR PI Inlet	3.075	1.746	0.954	Junction	
S16.004	o	375	SFR PI Outlet	3.075	1.696	1.004	Junction	
S15.002	o	375	S58	3.075	1.653	1.047	Open Manhole	1350
S17.000	o	225	S59	3.200	2.000	0.975	Open Manhole	1200
S15.003	o	375	S60	3.400	1.590	1.435	Open Manhole	1350
S15.004	o	375	S61	3.750	1.474	1.901	Open Manhole	1350
S18.000	o	150	S62	3.200	2.050	1.000	Open Manhole	1200
S15.005	o	375	S63	3.750	1.438	1.937	Junction	
S1.012	o	750	S64	3.750	0.534	2.466	Open Manhole	1800
S1.013	o	750	S65	3.700	0.504	2.446	Open Manhole	2400

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S15.000	19.991	100.0	S54	3.675	2.750	0.775	Open Manhole	1350
S15.001	18.053	125.4	S58	3.075	2.531	0.169	Open Manhole	1350
S16.000	12.092	170.3	S56	3.075	1.929	0.771	Open Manhole	1350
S16.001	18.716	243.1	S57	3.075	1.777	0.923	Open Manhole	1200
S16.002	3.061	98.7	SFR PI Inlet	3.075	1.746	0.954	Junction	
S16.003	3.177	63.5	SFR PI Outlet	3.075	1.696	1.004	Junction	
S16.004	4.362	99.1	S58	3.075	1.652	1.048	Open Manhole	1350
S15.002	10.718	170.1	S60	3.400	1.590	1.435	Open Manhole	1350
S17.000	16.035	62.2	S60	3.400	1.742	1.433	Open Manhole	1350
S15.003	28.348	244.4	S61	3.750	1.474	1.901	Open Manhole	1350
S15.004	8.917	247.7	S63	3.750	1.438	1.937	Junction	
S18.000	4.537	9.9	S63	3.750	1.590	2.010	Junction	
S15.005	50.391	244.6	S64	3.750	1.232	2.143	Open Manhole	1800
S1.012	17.899	596.6	S65	3.700	0.504	2.446	Open Manhole	2400
S1.013	2.312	578.0	S	3.700	0.500	2.450	Open Manhole	0

Doran Consulting Limited		Page 16
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:41	Designed by 814	
File Proposed HAT.MDX	Checked by	
XP Solutions	Network 2020.1.3	

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	Classification	Default	95	0.096	0.091	0.091
	Classification	Default	95	0.039	0.037	0.128
	Classification	Default	95	0.007	0.006	0.135
	Classification	Default	95	0.169	0.161	0.295
1.001	-	-	100	0.000	0.000	0.000
2.000	Classification	Default	95	0.055	0.052	0.052
1.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.000	0.000	0.000
1.005	-	-	100	0.000	0.000	0.000
1.006	-	-	100	0.000	0.000	0.000
3.000	-	-	100	0.000	0.000	0.000
3.001	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.000	0.000	0.000
4.000	-	-	100	0.000	0.000	0.000
1.008	-	-	100	0.000	0.000	0.000
5.000	-	-	100	0.000	0.000	0.000
6.000	Classification	Default	95	0.108	0.102	0.102
6.001	Classification	Default	95	0.007	0.007	0.007
	Classification	Default	95	0.022	0.021	0.028
7.000	Classification	Default	95	0.075	0.071	0.071
	Classification	Default	95	0.080	0.076	0.147
6.002	Classification	Default	95	0.005	0.004	0.004
6.003	-	-	100	0.000	0.000	0.000
6.004	-	-	100	0.000	0.000	0.000
8.000	Classification	Default	95	0.071	0.068	0.068
	Classification	Default	95	0.033	0.032	0.099
	Classification	Default	95	0.006	0.005	0.105
	Classification	Landscaping	50	0.018	0.009	0.114
	Classification	Default	95	0.022	0.021	0.135
	Classification	Default	95	0.071	0.068	0.203
	Classification	Default	95	0.002	0.002	0.205
	Classification	Landscaping	50	0.012	0.006	0.211
6.005	-	-	100	0.000	0.000	0.000
6.006	-	-	100	0.000	0.000	0.000
6.007	-	-	100	0.000	0.000	0.000
6.008	-	-	100	0.000	0.000	0.000
6.009	Classification	Default	95	0.082	0.077	0.077
	Classification	Default	95	0.142	0.135	0.212
	Classification	Landscaping	50	0.032	0.016	0.228
	Classification	Default	95	0.012	0.012	0.240
	Classification	Default	95	0.007	0.007	0.247
	Classification	Landscaping	50	0.008	0.004	0.251
	Classification	Default	95	0.010	0.010	0.261
1.009	Classification	Default	95	0.144	0.137	0.137
	Classification	Default	95	0.210	0.200	0.337
	Classification	Default	95	0.186	0.177	0.514
9.000	Classification	Default	95	0.090	0.085	0.085
9.001	Classification	Default	95	0.054	0.051	0.051
10.000	Classification	Default	95	0.024	0.023	0.023
	Classification	Default	95	0.031	0.029	0.052
10.001	Classification	Default	95	0.020	0.019	0.019
10.002	Classification	Default	95	0.025	0.023	0.023
10.003	-	-	100	0.000	0.000	0.000
10.004	-	-	100	0.000	0.000	0.000
10.005	-	-	100	0.000	0.000	0.000
1.010	-	-	100	0.000	0.000	0.000
1.011	Classification	Default	95	0.022	0.021	0.021
11.000	User	-	100	0.077	0.077	0.077
12.000	Classification	Default	95	0.017	0.016	0.016

Doran Consulting Limited		Page 17
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:41 File Proposed HAT.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
	Classification	Default	95	0.047	0.044	0.061
12.001	-	-	100	0.000	0.000	0.000
13.000	Classification	Default	95	0.437	0.415	0.415
13.001	-	-	100	0.000	0.000	0.000
13.002	-	-	100	0.000	0.000	0.000
13.003	-	-	100	0.000	0.000	0.000
13.004	-	-	100	0.000	0.000	0.000
11.001	Classification	Default	95	0.014	0.013	0.013
11.002	User	-	100	0.050	0.050	0.050
	Classification	Default	95	0.013	0.012	0.061
11.003	Classification	Default	95	0.016	0.015	0.015
	Classification	Landscaping	50	0.045	0.022	0.037
14.000	Classification	Landscaping	50	0.039	0.019	0.019
14.001	Classification	Landscaping	50	0.032	0.016	0.016
11.004	Classification	Default	95	0.011	0.010	0.010
11.005	Classification	Landscaping	50	0.027	0.013	0.013
	Classification	Default	95	0.006	0.006	0.019
15.000	Classification	Default	95	0.018	0.017	0.017
15.001	Classification	Default	95	0.235	0.223	0.223
	Classification	Default	95	0.013	0.012	0.235
16.000	Classification	Default	95	0.020	0.019	0.019
	Classification	Landscaping	50	0.068	0.034	0.053
16.001	Classification	Default	95	0.056	0.053	0.053
16.002	Classification	Default	95	0.032	0.030	0.030
16.003	-	-	100	0.000	0.000	0.000
16.004	-	-	100	0.000	0.000	0.000
15.002	-	-	100	0.000	0.000	0.000
17.000	Classification	Landscaping	50	0.033	0.016	0.016
15.003	-	-	100	0.000	0.000	0.000
15.004	Classification	Default	95	0.015	0.014	0.014
	Classification	Default	95	0.059	0.056	0.070
	Classification	Default	95	0.013	0.012	0.083
18.000	Classification	Landscaping	50	0.159	0.079	0.079
15.005	-	-	100	0.000	0.000	0.000
1.012	Classification	Default	95	0.011	0.010	0.010
	Classification	Default	95	0.010	0.010	0.020
1.013	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				3.567	3.182	3.182

Doran Consulting Limited		Page 18
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:41 File Proposed HAT.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

Network Classifications for Storm

PN	USMH Name	Pipe Dia (mm)	Min Cover Depth (m)	Max Cover Depth (m)	Pipe Type	MH Dia (mm)	MH Width (mm)	MH Ring Depth (m)	MH Type
S1.000	S1	225	1.352	2.000	Unclassified	1200	0	2.000	Unclassified
S1.001	S2	225	1.352	2.341	Unclassified	1200	0	1.352	Unclassified
S2.000	S14	150	1.200	2.341	Unclassified	1200	0	1.200	Unclassified
S1.002	S3	300	2.341	2.547	Unclassified	1200	0	2.341	Unclassified
S1.003	S4	300	1.660	2.547	Unclassified	1200	0	2.547	Unclassified
S1.004	SD2	300	0.902	4.897	Unclassified	1200	0	4.897	Unclassified
S1.005	S5	375	0.827	0.918	Unclassified	1350	0	0.827	Unclassified
S1.006	S6	375	0.918	0.962	Unclassified	1350	0	0.918	Unclassified
S3.000	S15	150	0.500	0.798	Unclassified	1200	0	0.500	Unclassified
S3.001	S16	150	0.798	1.037	Unclassified	1200	0	0.798	Unclassified
S1.007	S7	375	0.962	0.995	Unclassified	1350	0	0.962	Unclassified
S4.000	S17	150	0.500	1.070	Unclassified	1200	0	0.500	Unclassified
S1.008	S8	375	0.680	0.995	Unclassified	1350	0	0.995	Unclassified
S5.000	S18	150	0.500	0.755	Unclassified	1200	0	0.500	Unclassified
S6.000	S19	225	0.578	2.000	Unclassified	1200	0	2.000	Unclassified
S6.001	S20	225	0.578	1.758	Unclassified	1200	0	0.578	Unclassified
S7.000	S28	225	1.758	2.000	Unclassified	1200	0	2.000	Unclassified
S6.002	S21	225	1.758	2.186	Unclassified	1200	0	1.758	Unclassified
S6.003	SD1	300	0.933	4.919	Unclassified	1200	0	4.919	Unclassified
S6.004	S22	375	0.858	0.942	Unclassified	1800	0	0.858	Unclassified
S8.000	S29	300	0.925	1.017	Unclassified	1800	0	0.925	Unclassified
S6.005	S23	375	1.017	1.047	Unclassified	1350	0	1.017	Unclassified
S6.006	S24	375	0.557	1.047	Unclassified	1350	0	1.047	Unclassified
S6.007	S25	375	0.557	0.588	Unclassified	1350	0	0.557	Unclassified
S6.008	S26	375	0.588	0.617	Unclassified	1350	0	0.588	Unclassified
S6.009	S27	450	0.617	0.680	Unclassified	1350	0	0.617	Unclassified
S1.009	S9	450	0.755	1.700	Unclassified	1350	0	0.755	Unclassified
S9.000	S36	150	1.350	1.512	Unclassified	1200	0	1.350	Unclassified
S9.001	S37	225	1.512	1.775	Unclassified	1200	0	1.512	Unclassified
S10.000	S30	225	1.200	1.588	Unclassified	1200	0	1.200	Unclassified
S10.001	S31	225	1.588	1.736	Unclassified	1200	0	1.588	Unclassified
S10.002	S32	225	1.736	1.891	Unclassified	1200	0	1.736	Unclassified
S10.003	S33	225	1.891	1.984	Unclassified	1200	0	1.891	Unclassified
S10.004	S34	225	1.984	2.193	Unclassified	1200	0	1.984	Unclassified
S10.005	S35	225	2.193	2.338	Unclassified	1200	0	2.193	Unclassified
S1.010	S10	600	2.490	3.038	Unclassified	1800	0	3.038	Unclassified
S1.011	S37	675	2.466	2.490	Unclassified	1800	0	2.490	Unclassified
S11.000	S38	150	1.200	1.518	Unclassified	1200	0	1.200	Unclassified
S12.000	S39	150	1.200	1.312	Unclassified	1200	0	1.200	Unclassified
S12.001	S40	150	1.312	1.324	Unclassified				Junction
S13.000	S41	450	1.150	1.175	Unclassified	1350	0	1.150	Unclassified
S13.001	S42	450	1.175	1.233	Unclassified	1350	0	1.175	Unclassified
S13.002	S43	450	1.233	1.333	Unclassified				Junction
S13.003	S44	450	1.333	1.342	Unclassified				Junction
S13.004	S45	450	1.342	1.637	Unclassified	1350	0	1.342	Unclassified
S11.001	S46	450	1.637	1.710	Unclassified	1350	0	1.637	Unclassified
S11.002	S47	450	1.711	1.734	Unclassified	1350	0	1.711	Unclassified
S11.003	S48	450	1.734	1.863	Unclassified	1350	0	1.734	Unclassified
S14.000	S49	150	1.050	1.518	Unclassified	1200	0	1.050	Unclassified
S14.001	S50	150	1.518	1.863	Unclassified	1200	0	1.518	Unclassified
S11.004	S51	450	1.863	1.869	Unclassified	1350	0	1.863	Unclassified
S11.005	S52	375	1.944	2.067	Unclassified	1350	0	1.944	Unclassified
S15.000	S53	150	0.775	0.900	Unclassified	1200	0	0.900	Unclassified
S15.001	S54	375	0.169	0.625	Unclassified	1350	0	0.625	Unclassified
S16.000	S55	375	0.771	1.825	Unclassified	1200	0	1.825	Unclassified
S16.001	S56	375	0.846	0.923	Unclassified	1350	0	0.846	Unclassified
S16.002	S57	375	0.923	0.954	Unclassified	1200	0	0.923	Unclassified
S16.003	SFR PI Inlet	375	0.954	1.004	Unclassified				Junction

Network Classifications for Storm

PN	USMH Name	Pipe Dia (mm)	Min Cover Depth (m)	Max Cover Depth (m)	Pipe Type	MH Dia (mm)	MH Width (mm)	MH Ring Depth (m)	MH Type
S16.004	SFR PI Outlet	375	1.004	1.048	Unclassified				Junction
S15.002	S58	375	1.047	1.435	Unclassified	1350	0	1.047	Unclassified
S17.000	S59	225	0.975	1.433	Unclassified	1200	0	0.975	Unclassified
S15.003	S60	375	1.435	1.901	Unclassified	1350	0	1.435	Unclassified
S15.004	S61	375	1.901	1.937	Unclassified	1350	0	1.901	Unclassified
S18.000	S62	150	1.000	2.010	Unclassified	1200	0	1.000	Unclassified
S15.005	S63	375	1.937	2.143	Unclassified				Junction
S1.012	S64	750	2.446	2.466	Unclassified	1800	0	2.466	Unclassified
S1.013	S65	750	2.446	2.450	Unclassified	2400	0	2.446	Unclassified

Surcharged Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
------------------------	-----------------	-----------------	-----------------	------------------------	-------------	-----------

S1.013S0.3700.5000.00000

Datum (m) 0.826 Offset (mins) 0

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
60	0.000	240	0.000	420	0.000	600	0.000	780	0.000	960	0.000	1140	0.000
120	0.000	300	0.000	480	0.000	660	0.000	840	0.000	1020	0.000	1200	0.000
180	0.000	360	0.000	540	0.000	720	0.000	900	0.000	1080	0.000	1260	0.000
												1440	0.000

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	10.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	15.600	Storm Duration (mins)	30
Ratio R	0.300		

Doran Consulting Limited		Page 20
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:41 File Proposed HAT.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

Online Controls for Storm

Non Return Valve Manhole: S65, DS/PN: S1.013, Volume (m³): 21.4

Doran Consulting Limited		Page 21
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:41 File Proposed HAT.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

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

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 10.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 15.700 Cv (Summer) 0.750
 Region Scotland and Ireland Ratio R 0.300 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
 Return Period(s) (years) 1, 5, 30, 100
 Climate Change (%) 10, 10, 10, 30

PN	US/MH		Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level	Surcharged Depth	Flooded Volume
	Name	Storm							(m)	(m)	(m³)
S1.000	S1	15 Winter	1	+10%	100/15 Summer				9.870	-0.130	0.000
S1.001	S2	15 Winter	1	+10%	100/15 Summer				8.810	-0.138	0.000
S2.000	S14	15 Winter	1	+10%	30/15 Summer				7.617	-0.083	0.000
S1.002	S3	15 Winter	1	+10%	5/15 Summer				7.311	-0.118	0.000
S1.003	S4	15 Winter	1	+10%	5/15 Summer				7.268	-0.086	0.000
S1.004	SD2	15 Winter	1	+10%	5/15 Summer				4.010	-0.093	0.000
S1.005	S5	15 Winter	1	+10%	100/15 Summer				3.977	-0.196	0.000
S1.006	S6	15 Winter	1	+10%	100/15 Summer				3.898	-0.184	0.000
S3.000	S15	15 Summer	1	+10%					4.350	-0.150	0.000
S3.001	S16	15 Summer	1	+10%					4.052	-0.150	0.000
S1.007	S7	15 Winter	1	+10%	100/15 Summer				3.858	-0.180	0.000
S4.000	S17	15 Summer	1	+10%					4.350	-0.150	0.000
S1.008	S8	15 Winter	1	+10%					3.768	-0.237	0.000
S5.000	S18	15 Summer	1	+10%					3.850	-0.150	0.000
S6.000	S19	15 Winter	1	+10%					10.430	-0.170	0.000
S6.001	S20	15 Winter	1	+10%	100/15 Summer				7.460	-0.162	0.000
S7.000	S28	15 Winter	1	+10%					9.638	-0.162	0.000
S6.002	S21	15 Winter	1	+10%	1/15 Summer				6.872	0.030	0.000
S6.003	SD1	15 Winter	1	+10%	30/15 Summer				3.966	-0.115	0.000
S6.004	S22	15 Winter	1	+10%	30/15 Summer				3.926	-0.216	0.000
S8.000	S29	15 Winter	1	+10%	30/15 Summer				3.923	-0.152	0.000
S6.005	S23	15 Winter	1	+10%	5/15 Summer				3.882	-0.101	0.000
S6.006	S24	15 Winter	1	+10%	5/15 Summer				3.850	-0.103	0.000
S6.007	S25	15 Winter	1	+10%	5/15 Summer				3.840	-0.103	0.000
S6.008	S26	15 Winter	1	+10%	30/15 Summer				3.805	-0.107	0.000
S6.009	S27	15 Winter	1	+10%	30/15 Summer				3.686	-0.197	0.000
S1.009	S9	15 Winter	1	+10%					3.467	-0.278	0.000
S9.000	S36	15 Winter	1	+10%	5/15 Summer				3.008	-0.042	0.000
S9.001	S37	15 Winter	1	+10%	30/15 Winter				2.630	-0.108	0.000
S10.000	S30	15 Winter	1	+10%					3.082	-0.168	0.000
S10.001	S31	15 Winter	1	+10%	100/15 Winter				2.705	-0.157	0.000

Doran Consulting Limited		Page 22
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:41 File Proposed HAT.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

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

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.37			39.2	OK	
S1.001	S2	0.31			38.8	OK	
S2.000	S14	0.40			6.8	OK	
S1.002	S3	0.67			45.9	OK	
S1.003	S4	0.86			46.3	OK	
S1.004	SD2	0.83			46.1	OK	
S1.005	S5	0.45			45.5	OK	
S1.006	S6	0.50			44.8	OK	
S3.000	S15	0.00			0.0	OK	
S3.001	S16	0.00			0.0	OK	
S1.007	S7	0.53			44.6	OK	
S4.000	S17	0.00			0.0	OK	
S1.008	S8	0.29			44.9	OK	
S5.000	S18	0.00			0.0	OK	
S6.000	S19	0.13			13.3	OK	
S6.001	S20	0.17			16.6	OK	
S7.000	S28	0.17			19.3	OK	
S6.002	S21	1.22			36.6	SURCHARGED	
S6.003	SD1	0.69			36.7	OK	
S6.004	S22	0.32			35.6	OK	
S8.000	S29	0.42			26.8	OK	
S6.005	S23	0.86			59.9	OK	
S6.006	S24	0.70			59.0	OK	
S6.007	S25	0.83			58.4	OK	
S6.008	S26	0.85			58.6	OK	
S6.009	S27	0.60			82.3	OK	
S1.009	S9	0.31			179.2	OK	
S9.000	S36	0.80			10.7	OK	
S9.001	S37	0.53			16.2	OK	
S10.000	S30	0.14			6.8	OK	
S10.001	S31	0.20			9.0	OK	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged
									Level (m)	Depth (m)
S10.002	S32	15 Winter	1	+10%	100/15 Winter				2.563	-0.151
S10.003	S33	15 Winter	1	+10%	100/15 Summer				2.373	-0.137
S10.004	S34	15 Winter	1	+10%	100/15 Summer				2.276	-0.140
S10.005	S35	15 Winter	1	+10%	100/15 Summer				2.076	-0.131
S1.010	S10	15 Winter	1	+10%	5/15 Summer				1.362	0.000
S1.011	S37	15 Winter	1	+10%	1/15 Summer				1.319	0.009
S11.000	S38	15 Winter	1	+10%	30/15 Summer				2.537	-0.063
S12.000	S39	15 Winter	1	+10%	30/15 Summer				2.724	-0.076
S12.001	S40	15 Winter	1	+10%					2.535	-0.053
S13.000	S41	15 Winter	1	+10%	100/15 Summer				2.211	-0.239
S13.001	S42	15 Winter	1	+10%	100/15 Summer				2.182	-0.243
S13.002	S43	15 Winter	1	+10%					2.139	-0.278
S13.003	S44	15 Winter	1	+10%					2.059	-0.258
S13.004	S45	15 Winter	1	+10%	100/15 Summer				2.054	-0.254
S11.001	S46	15 Winter	1	+10%	100/15 Summer				2.022	-0.241
S11.002	S47	15 Winter	1	+10%	30/15 Winter				1.959	-0.230
S11.003	S48	15 Winter	1	+10%	30/15 Winter				1.852	-0.264
S14.000	S49	15 Winter	1	+10%	100/15 Summer				2.040	-0.110
S14.001	S50	15 Winter	1	+10%	30/15 Summer				1.892	-0.090
S11.004	S51	15 Winter	1	+10%	30/15 Summer				1.732	-0.205
S11.005	S52	15 Winter	1	+10%	5/15 Summer				1.688	-0.118
S15.000	S53	15 Winter	1	+10%					2.987	-0.113
S15.001	S54	15 Winter	1	+10%					2.788	-0.262
S16.000	S55	15 Winter	1	+10%	100/15 Summer				2.063	-0.312
S16.001	S56	15 Winter	1	+10%	100/15 Summer				1.941	-0.288
S16.002	S57	15 Winter	1	+10%	100/15 Summer				1.876	-0.276
S16.003	SFR PI Inlet	15 Winter	1	+10%					1.843	-0.278
S16.004	SFR PI Outlet	15 Winter	1	+10%					1.826	-0.245
S15.002	S58	15 Winter	1	+10%	30/15 Summer				1.822	-0.206
S17.000	S59	15 Winter	1	+10%	100/15 Summer				2.028	-0.197
S15.003	S60	15 Winter	1	+10%	30/15 Summer				1.760	-0.205
S15.004	S61	15 Winter	1	+10%	30/15 Summer				1.685	-0.164
S18.000	S62	15 Winter	1	+10%	100/15 Summer				2.101	-0.099
S15.005	S63	15 Winter	1	+10%					1.626	-0.187
S1.012	S64	15 Winter	1	+10%	5/15 Summer				1.284	0.000
S1.013	S65	15 Winter	1	+10%	30/15 Summer				1.074	-0.180

PN	US/MH Name	Flooded		Half Drain		Pipe		Status	Level Exceeded
		Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)			
S10.002	S32	0.000	0.24			11.6		OK	
S10.003	S33	0.000	0.33			11.5		OK	
S10.004	S34	0.000	0.30			11.4		OK	
S10.005	S35	0.000	0.36			11.4		OK	
S1.010	S10	0.000	0.80			201.6		OK	
S1.011	S37	0.000	1.03			198.7	SURCHARGED		
S11.000	S38	0.000	0.62			10.1		OK	
S12.000	S39	0.000	0.47			7.9		OK	
S12.001	S40	0.000	0.74			8.0		OK*	
S13.000	S41	0.000	0.44			54.5		OK	
S13.001	S42	0.000	0.43			54.9		OK	
S13.002	S43	0.000	0.31			55.2		OK*	
S13.003	S44	0.000	0.33			55.1		OK*	
S13.004	S45	0.000	0.37			54.7		OK	
S11.001	S46	0.000	0.43			73.5		OK	

Doran Consulting Limited		Page 24
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:41 File Proposed HAT.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

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

PN	US/MH Name	Flooded		Half Drain		Pipe Flow (l/s)	Status	Level Exceeded
		Volume (m³)	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)			
S11.002	S47	0.000	0.48		80.5	OK		
S11.003	S48	0.000	0.36		84.7	OK		
S14.000	S49	0.000	0.15		2.5	OK		
S14.001	S50	0.000	0.33		4.4	OK		
S11.004	S51	0.000	0.58		89.5	OK		
S11.005	S52	0.000	0.80		91.2	OK		
S15.000	S53	0.000	0.13		2.2	OK		
S15.001	S54	0.000	0.19		28.7	OK		
S16.000	S55	0.000	0.07		7.0	OK		
S16.001	S56	0.000	0.12		12.9	OK		
S16.002	S57	0.000	0.16		16.4	OK		
S16.003	SFR PI Inlet	0.000	0.15		16.4	OK*		
S16.004	SFR PI Outlet	0.000	0.15		16.3	OK*		
S15.002	S58	0.000	0.42		44.9	OK		
S17.000	S59	0.000	0.04		2.2	OK		
S15.003	S60	0.000	0.41		46.4	OK		
S15.004	S61	0.000	0.60		54.8	OK		
S18.000	S62	0.000	0.25		10.5	OK		
S15.005	S63	0.000	0.49		62.9	OK*		
S1.012	S64	0.000	1.26		337.5	OK		
S1.013	S65	0.000	0.92		338.7	OK		

Doran Consulting Limited		Page 25
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:41 File Proposed HAT.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 10.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 15.700 Cv (Summer) 0.750
 Region Scotland and Ireland Ratio R 0.300 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
 Return Period(s) (years) 1, 5, 30, 100
 Climate Change (%) 10, 10, 10, 30

PN	US/MH		Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level	Surcharged Depth	Flooded Volume
	Name	Storm							(m)	(m)	(m³)
S1.000	S1	15 Winter	5	+10%	100/15 Summer				9.896	-0.104	0.000
S1.001	S2	15 Winter	5	+10%	100/15 Summer				8.833	-0.115	0.000
S2.000	S14	15 Winter	5	+10%	30/15 Summer				7.636	-0.064	0.000
S1.002	S3	15 Winter	5	+10%	5/15 Summer				7.479	0.050	0.000
S1.003	S4	15 Winter	5	+10%	5/15 Summer				7.401	0.048	0.000
S1.004	SD2	15 Winter	5	+10%	5/15 Summer				4.158	0.055	0.000
S1.005	S5	15 Winter	5	+10%	100/15 Summer				4.028	-0.145	0.000
S1.006	S6	15 Winter	5	+10%	100/15 Summer				3.954	-0.128	0.000
S3.000	S15	15 Summer	5	+10%					4.350	-0.150	0.000
S3.001	S16	15 Summer	5	+10%					4.052	-0.150	0.000
S1.007	S7	15 Winter	5	+10%	100/15 Summer				3.913	-0.125	0.000
S4.000	S17	15 Summer	5	+10%					4.350	-0.150	0.000
S1.008	S8	15 Winter	5	+10%					3.800	-0.205	0.000
S5.000	S18	15 Summer	5	+10%					3.850	-0.150	0.000
S6.000	S19	15 Winter	5	+10%					10.444	-0.156	0.000
S6.001	S20	15 Winter	5	+10%	100/15 Summer				7.475	-0.146	0.000
S7.000	S28	15 Winter	5	+10%					9.653	-0.147	0.000
S6.002	S21	15 Winter	5	+10%	1/15 Summer				6.959	0.117	0.000
S6.003	SD1	15 Winter	5	+10%	30/15 Summer				4.081	0.000	0.000
S6.004	S22	15 Winter	5	+10%	30/15 Summer				4.038	-0.104	0.000
S8.000	S29	15 Winter	5	+10%	30/15 Summer				4.044	-0.031	0.000
S6.005	S23	15 Winter	5	+10%	5/15 Summer				4.009	0.026	0.000
S6.006	S24	15 Winter	5	+10%	5/15 Summer				3.972	0.019	0.000
S6.007	S25	15 Winter	5	+10%	5/15 Summer				3.951	0.007	0.000
S6.008	S26	15 Winter	5	+10%	30/15 Summer				3.912	0.000	0.000
S6.009	S27	15 Winter	5	+10%	30/15 Summer				3.762	-0.121	0.000
S1.009	S9	15 Winter	5	+10%					3.509	-0.236	0.000
S9.000	S36	15 Winter	5	+10%	5/15 Summer				3.165	0.115	0.000
S9.001	S37	15 Winter	5	+10%	30/15 Winter				2.659	-0.079	0.000
S10.000	S30	15 Winter	5	+10%					3.096	-0.154	0.000
S10.001	S31	15 Winter	5	+10%	100/15 Winter				2.721	-0.140	0.000

Doran Consulting Limited		Page 26
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:41 File Proposed HAT.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.56			59.2	OK	
S1.001	S2	0.47			58.7	OK	
S2.000	S14	0.61			10.3	OK	
S1.002	S3	1.00			69.2	SURCHARGED	
S1.003	S4	1.28			69.1	SURCHARGED	
S1.004	SD2	1.22			68.3	SURCHARGED	
S1.005	S5	0.68			67.9	OK	
S1.006	S6	0.73			65.4	OK	
S3.000	S15	0.00			0.0	OK	
S3.001	S16	0.00			0.0	OK	
S1.007	S7	0.78			66.0	OK	
S4.000	S17	0.00			0.0	OK	
S1.008	S8	0.43			65.7	OK	
S5.000	S18	0.00			0.0	OK	
S6.000	S19	0.20			20.1	OK	
S6.001	S20	0.26			25.0	OK	
S7.000	S28	0.26			29.2	OK	
S6.002	S21	1.85			55.2	SURCHARGED	
S6.003	SD1	1.03			54.4	OK	
S6.004	S22	0.48			53.4	OK	
S8.000	S29	0.57			37.0	OK	
S6.005	S23	1.25			86.7	SURCHARGED	
S6.006	S24	1.01			85.5	SURCHARGED	
S6.007	S25	1.22			85.1	SURCHARGED	
S6.008	S26	1.24			85.7	OK	
S6.009	S27	0.87			119.8	OK	
S1.009	S9	0.45			261.1	OK	
S9.000	S36	1.13			15.1	SURCHARGED	
S9.001	S37	0.74			22.9	OK	
S10.000	S30	0.21			10.3	OK	
S10.001	S31	0.30			13.6	OK	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged
									Level (m)	Depth (m)
S10.002	S32	15 Winter	5	+10%	100/15 Winter				2.582	-0.132
S10.003	S33	15 Winter	5	+10%	100/15 Summer				2.396	-0.113
S10.004	S34	15 Winter	5	+10%	100/15 Summer				2.299	-0.117
S10.005	S35	15 Winter	5	+10%	100/15 Summer				2.101	-0.106
S1.010	S10	15 Winter	5	+10%	5/15 Summer				1.450	0.088
S1.011	S37	15 Winter	5	+10%	1/15 Summer				1.375	0.065
S11.000	S38	15 Winter	5	+10%	30/15 Summer				2.566	-0.034
S12.000	S39	15 Winter	5	+10%	30/15 Summer				2.746	-0.054
S12.001	S40	15 Winter	5	+10%					2.588	0.000
S13.000	S41	15 Winter	5	+10%	100/15 Summer				2.272	-0.178
S13.001	S42	15 Winter	5	+10%	100/15 Summer				2.241	-0.184
S13.002	S43	15 Winter	5	+10%					2.184	-0.233
S13.003	S44	15 Winter	5	+10%					2.116	-0.201
S13.004	S45	15 Winter	5	+10%	100/15 Summer				2.111	-0.197
S11.001	S46	15 Winter	5	+10%	100/15 Summer				2.081	-0.182
S11.002	S47	15 Winter	5	+10%	30/15 Winter				2.023	-0.166
S11.003	S48	15 Winter	5	+10%	30/15 Winter				1.919	-0.197
S14.000	S49	15 Winter	5	+10%	100/15 Summer				2.049	-0.101
S14.001	S50	15 Winter	5	+10%	30/15 Summer				1.908	-0.074
S11.004	S51	15 Winter	5	+10%	30/15 Summer				1.873	-0.064
S11.005	S52	15 Winter	5	+10%	5/15 Summer				1.831	0.025
S15.000	S53	15 Winter	5	+10%					2.996	-0.104
S15.001	S54	15 Winter	5	+10%					2.815	-0.235
S16.000	S55	15 Winter	5	+10%	100/15 Summer				2.079	-0.296
S16.001	S56	15 Winter	5	+10%	100/15 Summer				1.963	-0.266
S16.002	S57	15 Winter	5	+10%	100/15 Summer				1.901	-0.251
S16.003	SFR PI Inlet	15 Winter	5	+10%					1.880	-0.241
S16.004	SFR PI Outlet	15 Winter	5	+10%					1.873	-0.198
S15.002	S58	15 Winter	5	+10%	30/15 Summer				1.869	-0.159
S17.000	S59	15 Winter	5	+10%	100/15 Summer				2.034	-0.191
S15.003	S60	15 Winter	5	+10%	30/15 Summer				1.818	-0.147
S15.004	S61	15 Winter	5	+10%	30/15 Summer				1.752	-0.097
S18.000	S62	15 Winter	5	+10%	100/15 Summer				2.114	-0.086
S15.005	S63	15 Winter	5	+10%					1.680	-0.133
S1.012	S64	15 Winter	5	+10%	5/15 Summer				1.321	0.037
S1.013	S65	15 Summer	5	+10%	30/15 Summer				1.254	0.000

PN	US/MH Name	Flooded		Half Drain		Pipe	Status	Level Exceeded
		Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)		
S10.002	S32	0.000	0.36			17.6	OK	
S10.003	S33	0.000	0.49			17.4	OK	
S10.004	S34	0.000	0.46			17.3	OK	
S10.005	S35	0.000	0.55			17.2	OK	
S1.010	S10	0.000	1.19			299.9	SURCHARGED	
S1.011	S37	0.000	1.54			297.3	SURCHARGED	
S11.000	S38	0.000	0.93			15.2	OK	
S12.000	S39	0.000	0.72			12.0	OK	
S12.001	S40	0.000	1.05			11.4	SURCHARGED*	
S13.000	S41	0.000	0.66			82.3	OK	
S13.001	S42	0.000	0.64			82.8	OK	
S13.002	S43	0.000	0.47			83.3	OK*	
S13.003	S44	0.000	0.49			83.2	OK*	
S13.004	S45	0.000	0.56			82.7	OK	
S11.001	S46	0.000	0.65			110.0	OK	

Doran Consulting Limited		Page 28
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:41 File Proposed HAT.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flooded		Half Drain		Pipe Flow (l/s)	Status	Level Exceeded
		Volume (m³)	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)			
S11.002	S47	0.000	0.71		120.8	OK		
S11.003	S48	0.000	0.52		124.8	OK		
S14.000	S49	0.000	0.23		3.8	OK		
S14.001	S50	0.000	0.50		6.6	OK		
S11.004	S51	0.000	0.83		128.4	OK		
S11.005	S52	0.000	1.16		131.6	SURCHARGED		
S15.000	S53	0.000	0.20		3.4	OK		
S15.001	S54	0.000	0.29		43.2	OK		
S16.000	S55	0.000	0.10		10.7	OK		
S16.001	S56	0.000	0.18		19.5	OK		
S16.002	S57	0.000	0.24		24.7	OK		
S16.003	SFR PI Inlet	0.000	0.23		24.6	OK*		
S16.004	SFR PI Outlet	0.000	0.23		24.6	OK*		
S15.002	S58	0.000	0.63		67.5	OK		
S17.000	S59	0.000	0.06		3.3	OK		
S15.003	S60	0.000	0.62		69.5	OK		
S15.004	S61	0.000	0.90		81.8	OK		
S18.000	S62	0.000	0.37		15.9	OK		
S15.005	S63	0.000	0.73		93.4	OK*		
S1.012	S64	0.000	1.92		514.0	SURCHARGED		
S1.013	S65	0.000	1.29		474.0	OK		

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 10.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 15.700 Cv (Summer) 0.750
 Region Scotland and Ireland Ratio R 0.300 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
 Return Period(s) (years) 1, 5, 30, 100
 Climate Change (%) 10, 10, 10, 30

										Water	Surcharged	Flooded
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)	Volume (m³)	
S1.000	S1	15 Winter	30	+10%	100/15 Summer				9.932	-0.068	0.000	
S1.001	S2	15 Winter	30	+10%	100/15 Summer				8.863	-0.085	0.000	
S2.000	S14	15 Winter	30	+10%	30/15 Summer				7.833	0.133	0.000	
S1.002	S3	15 Winter	30	+10%	5/15 Summer				7.644	0.215	0.000	
S1.003	S4	15 Winter	30	+10%	5/15 Summer				7.482	0.129	0.000	
S1.004	SD2	15 Winter	30	+10%	5/15 Summer				4.290	0.187	0.000	
S1.005	S5	15 Winter	30	+10%	100/15 Summer				4.159	-0.014	0.000	
S1.006	S6	15 Winter	30	+10%	100/15 Summer				4.081	-0.001	0.000	
S3.000	S15	15 Summer	30	+10%					4.350	-0.150	0.000	
S3.001	S16	15 Summer	30	+10%					4.052	-0.150	0.000	
S1.007	S7	15 Winter	30	+10%	100/15 Summer				4.038	0.000	0.000	
S4.000	S17	15 Summer	30	+10%					4.350	-0.150	0.000	
S1.008	S8	15 Winter	30	+10%					3.840	-0.165	0.000	
S5.000	S18	15 Summer	30	+10%					3.850	-0.150	0.000	
S6.000	S19	15 Winter	30	+10%					10.459	-0.141	0.000	
S6.001	S20	15 Winter	30	+10%	100/15 Summer				7.497	-0.125	0.000	
S7.000	S28	15 Winter	30	+10%					9.672	-0.128	0.000	
S6.002	S21	15 Winter	30	+10%	1/15 Summer				7.152	0.311	0.000	
S6.003	SD1	15 Winter	30	+10%	30/15 Summer				4.414	0.333	0.000	
S6.004	S22	15 Winter	30	+10%	30/15 Summer				4.335	0.193	0.000	
S8.000	S29	15 Winter	30	+10%	30/15 Summer				4.344	0.269	0.000	
S6.005	S23	15 Winter	30	+10%	5/15 Summer				4.293	0.310	0.000	
S6.006	S24	15 Winter	30	+10%	5/15 Summer				4.194	0.241	0.000	
S6.007	S25	15 Winter	30	+10%	5/15 Summer				4.094	0.151	0.000	
S6.008	S26	15 Winter	30	+10%	30/15 Summer				3.995	0.082	0.000	
S6.009	S27	15 Winter	30	+10%	30/15 Summer				3.903	0.020	0.000	
S1.009	S9	15 Winter	30	+10%					3.563	-0.182	0.000	
S9.000	S36	15 Winter	30	+10%	5/15 Summer				3.542	0.492	0.000	
S9.001	S37	15 Winter	30	+10%	30/15 Winter				2.742	0.004	0.000	
S10.000	S30	15 Winter	30	+10%					3.112	-0.138	0.000	
S10.001	S31	15 Winter	30	+10%	100/15 Winter				2.745	-0.116	0.000	

Doran Consulting Limited		Page 30
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:41 File Proposed HAT.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.82			87.1	OK	
S1.001	S2	0.69			86.2	OK	
S2.000	S14	0.85			14.3	SURCHARGED	
S1.002	S3	1.45			99.6	SURCHARGED	
S1.003	S4	1.85			99.6	SURCHARGED	
S1.004	SD2	1.77			98.6	SURCHARGED	
S1.005	S5	0.96			96.8	OK	
S1.006	S6	1.02			92.1	OK	
S3.000	S15	0.00			0.0	OK	
S3.001	S16	0.00			0.0	OK	
S1.007	S7	1.06			89.9	OK	
S4.000	S17	0.00			0.0	OK	
S1.008	S8	0.58			89.0	OK	
S5.000	S18	0.00			0.0	OK	
S6.000	S19	0.29			29.5	OK	
S6.001	S20	0.40			37.9	OK	
S7.000	S28	0.38			43.0	OK	
S6.002	S21	2.76			82.6	SURCHARGED	
S6.003	SD1	1.51			80.1	SURCHARGED	
S6.004	S22	0.69			77.4	SURCHARGED	
S8.000	S29	0.77			50.0	SURCHARGED	
S6.005	S23	1.77			123.0	SURCHARGED	
S6.006	S24	1.44			121.9	SURCHARGED	
S6.007	S25	1.76			123.1	SURCHARGED	
S6.008	S26	1.79			123.7	SURCHARGED	
S6.009	S27	1.25			172.5	SURCHARGED	
S1.009	S9	0.65			374.6	OK	
S9.000	S36	1.55			20.6	SURCHARGED	
S9.001	S37	1.03			31.8	SURCHARGED	
S10.000	S30	0.31			15.2	OK	
S10.001	S31	0.46			20.7	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged
									Level (m)	Depth (m)
S10.002	S32	15 Winter	30	+10%	100/15 Winter				2.612	-0.102
S10.003	S33	15 Winter	30	+10%	100/15 Summer				2.436	-0.073
S10.004	S34	15 Winter	30	+10%	100/15 Summer				2.335	-0.081
S10.005	S35	15 Winter	30	+10%	100/15 Summer				2.144	-0.063
S1.010	S10	15 Winter	30	+10%	5/15 Summer				1.899	0.537
S1.011	S37	15 Winter	30	+10%	1/15 Summer				1.733	0.423
S11.000	S38	15 Winter	30	+10%	30/15 Summer				2.748	0.148
S12.000	S39	15 Winter	30	+10%	30/15 Summer				2.860	0.060
S12.001	S40	15 Summer	30	+10%					2.588	0.000
S13.000	S41	15 Winter	30	+10%	100/15 Summer				2.359	-0.091
S13.001	S42	15 Winter	30	+10%	100/15 Summer				2.325	-0.100
S13.002	S43	15 Winter	30	+10%					2.286	-0.131
S13.003	S44	15 Winter	30	+10%					2.283	-0.034
S13.004	S45	15 Winter	30	+10%	100/15 Summer				2.279	-0.029
S11.001	S46	15 Winter	30	+10%	100/15 Summer				2.252	-0.011
S11.002	S47	15 Winter	30	+10%	30/15 Winter				2.210	0.021
S11.003	S48	15 Winter	30	+10%	30/15 Winter				2.153	0.037
S14.000	S49	15 Winter	30	+10%	100/15 Summer				2.102	-0.048
S14.001	S50	15 Winter	30	+10%	30/15 Summer				2.084	0.102
S11.004	S51	15 Winter	30	+10%	30/15 Summer				2.072	0.135
S11.005	S52	15 Winter	30	+10%	5/15 Summer				1.973	0.167
S15.000	S53	15 Winter	30	+10%					3.007	-0.093
S15.001	S54	15 Winter	30	+10%					2.871	-0.179
S16.000	S55	15 Winter	30	+10%	100/15 Summer				2.127	-0.248
S16.001	S56	15 Winter	30	+10%	100/15 Summer				2.116	-0.113
S16.002	S57	15 Winter	30	+10%	100/15 Summer				2.101	-0.051
S16.003	SFR PI Inlet	15 Winter	30	+10%					2.095	-0.026
S16.004	SFR PI Outlet	15 Winter	30	+10%					2.071	0.000
S15.002	S58	15 Winter	30	+10%	30/15 Summer				2.088	0.060
S17.000	S59	15 Winter	30	+10%	100/15 Summer				2.055	-0.170
S15.003	S60	15 Winter	30	+10%	30/15 Summer				2.042	0.077
S15.004	S61	15 Winter	30	+10%	30/15 Summer				1.948	0.099
S18.000	S62	15 Winter	30	+10%	100/15 Summer				2.130	-0.070
S15.005	S63	15 Summer	30	+10%					1.813	0.000
S1.012	S64	15 Winter	30	+10%	5/15 Summer				1.633	0.349
S1.013	S65	15 Winter	30	+10%	30/15 Summer				1.421	0.167

PN	US/MH Name	Flooded		Half Drain		Pipe	Status	Level Exceeded
		Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)		
S10.002	S32	0.000	0.56			27.6	OK	
S10.003	S33	0.000	0.79			27.9	OK	
S10.004	S34	0.000	0.72			27.3	OK	
S10.005	S35	0.000	0.86			26.9	OK	
S1.010	S10	0.000	1.66			418.7	SURCHARGED	
S1.011	S37	0.000	2.14			413.2	SURCHARGED	
S11.000	S38	0.000	1.29			21.1	SURCHARGED	
S12.000	S39	0.000	1.01			16.9	SURCHARGED	
S12.001	S40	0.000	1.49			16.2	SURCHARGED*	
S13.000	S41	0.000	0.97			121.0	OK	
S13.001	S42	0.000	0.94			121.8	OK	
S13.002	S43	0.000	0.68			121.8	OK*	
S13.003	S44	0.000	0.71			120.2	OK*	
S13.004	S45	0.000	0.80			117.9	OK	
S11.001	S46	0.000	0.90			152.5	OK	

Doran Consulting Limited		Page 32
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:41 File Proposed HAT.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flooded		Half Drain		Pipe Flow (l/s)	Status	Level Exceeded
		Volume (m³)	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)			
S11.002	S47	0.000	0.96		163.0	SURCHARGED		
S11.003	S48	0.000	0.70		167.9	SURCHARGED		
S14.000	S49	0.000	0.34		5.6	OK		
S14.001	S50	0.000	0.72		9.5	SURCHARGED		
S11.004	S51	0.000	1.13		175.0	SURCHARGED		
S11.005	S52	0.000	1.57		178.4	SURCHARGED		
S15.000	S53	0.000	0.30		5.0	OK		
S15.001	S54	0.000	0.54		79.3	OK		
S16.000	S55	0.000	0.14		15.5	OK		
S16.001	S56	0.000	0.26		27.4	OK		
S16.002	S57	0.000	0.36		37.3	OK		
S16.003	SFR PI Inlet	0.000	0.37		39.6	OK*		
S16.004	SFR PI Outlet	0.000	0.39		41.5	SURCHARGED*		
S15.002	S58	0.000	0.92		98.2	SURCHARGED		
S17.000	S59	0.000	0.08		4.8	OK		
S15.003	S60	0.000	0.91		101.5	SURCHARGED		
S15.004	S61	0.000	1.32		120.2	SURCHARGED		
S18.000	S62	0.000	0.55		23.4	OK		
S15.005	S63	0.000	1.07		136.1	SURCHARGED*		
S1.012	S64	0.000	2.68		716.0	SURCHARGED		
S1.013	S65	0.000	1.95		714.9	SURCHARGED		

Doran Consulting Limited		Page 33
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:41 File Proposed HAT.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 10.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 15.700 Cv (Summer) 0.750
 Region Scotland and Ireland Ratio R 0.300 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
 Return Period(s) (years) 1, 5, 30, 100
 Climate Change (%) 10, 10, 10, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged	Flooded
									Level (m)	Depth (m)	Volume (m³)
S1.000	S1	15 Winter	100	+30%	100/15 Summer				10.558	0.558	0.000
S1.001	S2	15 Winter	100	+30%	100/15 Summer				9.233	0.285	0.000
S2.000	S14	15 Winter	100	+30%	30/15 Summer				8.301	0.601	0.000
S1.002	S3	15 Winter	100	+30%	5/15 Summer				7.919	0.491	0.000
S1.003	S4	15 Winter	100	+30%	5/15 Summer				7.623	0.270	0.000
S1.004	SD2	15 Winter	100	+30%	5/15 Summer				4.679	0.576	0.000
S1.005	S5	15 Winter	100	+30%	100/15 Summer				4.391	0.218	0.000
S1.006	S6	15 Winter	100	+30%	100/15 Summer				4.225	0.143	0.000
S3.000	S15	15 Summer	100	+30%					4.350	-0.150	0.000
S3.001	S16	15 Winter	100	+30%					4.100	-0.102	0.000
S1.007	S7	15 Winter	100	+30%	100/15 Summer				4.105	0.067	0.000
S4.000	S17	15 Summer	100	+30%					4.350	-0.150	0.000
S1.008	S8	15 Winter	100	+30%					3.901	-0.104	0.000
S5.000	S18	15 Summer	100	+30%					3.850	-0.150	0.000
S6.000	S19	15 Winter	100	+30%					10.482	-0.118	0.000
S6.001	S20	15 Winter	100	+30%	100/15 Summer				7.810	0.188	0.000
S7.000	S28	15 Winter	100	+30%					9.700	-0.100	0.000
S6.002	S21	15 Winter	100	+30%	1/15 Summer				7.541	0.699	0.000
S6.003	SD1	15 Winter	100	+30%	30/15 Summer				5.158	1.077	0.000
S6.004	S22	15 Winter	100	+30%	30/15 Summer				4.951	0.809	0.000
S8.000	S29	15 Winter	100	+30%	30/15 Summer				4.967	0.892	0.000
S6.005	S23	15 Winter	100	+30%	5/15 Summer				4.863	0.881	0.000
S6.006	S24	15 Winter	100	+30%	5/15 Summer				4.646	0.693	0.000
S6.007	S25	15 Winter	100	+30%	5/15 Summer				4.430	0.487	0.000
S6.008	S26	15 Winter	100	+30%	30/15 Summer				4.219	0.306	0.000
S6.009	S27	15 Winter	100	+30%	30/15 Summer				4.028	0.145	0.000
S1.009	S9	15 Winter	100	+30%					3.648	-0.097	0.000
S9.000	S36	15 Winter	100	+30%	5/15 Summer				4.384	1.334	0.000
S9.001	S37	15 Winter	100	+30%	30/15 Winter				2.865	0.127	0.000
S10.000	S30	15 Winter	100	+30%					3.136	-0.114	0.000
S10.001	S31	15 Winter	100	+30%	100/15 Winter				2.873	0.011	0.000

Doran Consulting Limited		Page 34
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:41 File Proposed HAT.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	1.12			118.7	SURCHARGED	
S1.001	S2	0.93			116.8	SURCHARGED	
S2.000	S14	1.18			19.9	SURCHARGED	
S1.002	S3	1.98			136.2	SURCHARGED	
S1.003	S4	2.52			136.0	SURCHARGED	
S1.004	SD2	2.44			136.1	SURCHARGED	
S1.005	S5	1.34			134.7	SURCHARGED	
S1.006	S6	1.50			135.0	SURCHARGED	
S3.000	S15	0.00			0.0	OK	
S3.001	S16	0.04			0.5	OK	
S1.007	S7	1.59			134.8	SURCHARGED	
S4.000	S17	0.00			0.0	OK	
S1.008	S8	0.87			134.6	OK	
S5.000	S18	0.00			0.0	OK	
S6.000	S19	0.44			45.2	OK	
S6.001	S20	0.58			55.5	SURCHARGED	
S7.000	S28	0.58			65.8	OK	
S6.002	S21	4.02			120.0	SURCHARGED	
S6.003	SD1	2.23			118.0	SURCHARGED	
S6.004	S22	1.03			114.6	FLOOD RISK	
S8.000	S29	1.07			69.0	FLOOD RISK	
S6.005	S23	2.61			181.0	FLOOD RISK	
S6.006	S24	2.14			181.9	SURCHARGED	
S6.007	S25	2.60			182.0	FLOOD RISK	
S6.008	S26	2.63			181.8	FLOOD RISK	
S6.009	S27	1.84			254.0	SURCHARGED	
S1.009	S9	0.96			554.0	OK	
S9.000	S36	2.14			28.6	FLOOD RISK	
S9.001	S37	1.46			45.2	SURCHARGED	
S10.000	S30	0.47			23.2	OK	
S10.001	S31	0.70			31.8	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged
									Level (m)	Depth (m)
S10.002	S32	15 Winter	100	+30%	100/15 Winter				2.839	0.125
S10.003	S33	15 Winter	100	+30%	100/15 Summer				2.793	0.283
S10.004	S34	15 Winter	100	+30%	100/15 Summer				2.750	0.334
S10.005	S35	15 Winter	100	+30%	100/15 Summer				2.672	0.465
S1.010	S10	15 Winter	100	+30%	5/15 Summer				2.596	1.234
S1.011	S37	15 Winter	100	+30%	1/15 Summer				2.245	0.934
S11.000	S38	15 Winter	100	+30%	30/15 Summer				3.448	0.848
S12.000	S39	15 Winter	100	+30%	30/15 Summer				3.334	0.534
S12.001	S40	15 Summer	100	+30%					2.588	0.000
S13.000	S41	15 Winter	100	+30%	100/15 Summer				3.057	0.607
S13.001	S42	15 Winter	100	+30%	100/15 Summer				3.025	0.600
S13.002	S43	15 Summer	100	+30%					2.417	0.000
S13.003	S44	15 Summer	100	+30%					2.317	0.000
S13.004	S45	15 Winter	100	+30%	100/15 Summer				2.992	0.684
S11.001	S46	15 Winter	100	+30%	100/15 Summer				2.956	0.693
S11.002	S47	15 Winter	100	+30%	30/15 Winter				2.855	0.666
S11.003	S48	15 Winter	100	+30%	30/15 Winter				2.732	0.616
S14.000	S49	15 Winter	100	+30%	100/15 Summer				2.640	0.490
S14.001	S50	15 Winter	100	+30%	30/15 Summer				2.618	0.636
S11.004	S51	15 Winter	100	+30%	30/15 Summer				2.602	0.665
S11.005	S52	15 Winter	100	+30%	5/15 Summer				2.462	0.656
S15.000	S53	15 Winter	100	+30%					3.022	-0.078
S15.001	S54	15 Winter	100	+30%					2.936	-0.114
S16.000	S55	15 Winter	100	+30%	100/15 Summer				2.800	0.425
S16.001	S56	15 Winter	100	+30%	100/15 Summer				2.791	0.562
S16.002	S57	15 Winter	100	+30%	100/15 Summer				2.771	0.619
S16.003	SFR PI Inlet	15 Summer	100	+30%					2.121	0.000
S16.004	SFR PI Outlet	15 Summer	100	+30%					2.071	0.000
S15.002	S58	15 Winter	100	+30%	30/15 Summer				2.754	0.726
S17.000	S59	15 Winter	100	+30%	100/15 Summer				2.679	0.454
S15.003	S60	15 Winter	100	+30%	30/15 Summer				2.668	0.703
S15.004	S61	15 Winter	100	+30%	30/15 Summer				2.529	0.680
S18.000	S62	15 Winter	100	+30%	100/15 Summer				2.543	0.343
S15.005	S63	15 Summer	100	+30%					1.813	0.000
S1.012	S64	15 Winter	100	+30%	5/15 Summer				2.017	0.733
S1.013	S65	15 Winter	100	+30%	30/15 Summer				1.615	0.361

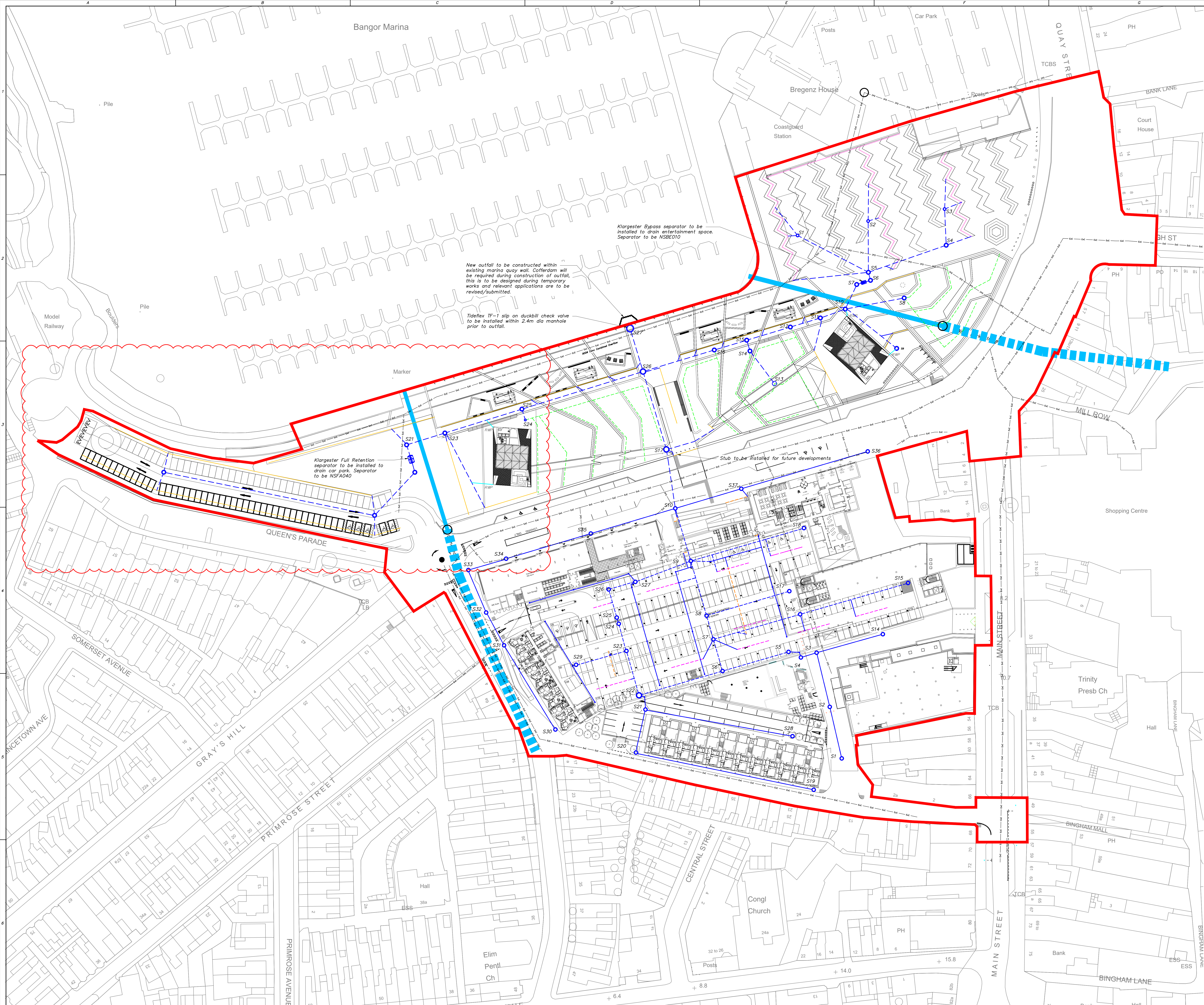
PN	US/MH Name	Flooded		Half Drain		Pipe	Status	Level Exceeded
		Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)		
S10.002	S32	0.000	0.83			40.8	SURCHARGED	
S10.003	S33	0.000	1.05			37.0	SURCHARGED	
S10.004	S34	0.000	0.88			33.1	SURCHARGED	
S10.005	S35	0.000	1.16			36.5	SURCHARGED	
S1.010	S10	0.000	2.40			604.7	SURCHARGED	
S1.011	S37	0.000	3.11			600.6	SURCHARGED	
S11.000	S38	0.000	1.59			25.9	SURCHARGED	
S12.000	S39	0.000	1.35			22.6	SURCHARGED	
S12.001	S40	0.000	1.88			20.4	SURCHARGED*	
S13.000	S41	0.000	1.31			162.8	SURCHARGED	
S13.001	S42	0.000	1.21			156.3	SURCHARGED	
S13.002	S43	0.000	0.87			154.3	SURCHARGED*	
S13.003	S44	0.000	0.89			150.8	SURCHARGED*	
S13.004	S45	0.000	0.95			139.8	SURCHARGED	
S11.001	S46	0.000	1.09			184.5	SURCHARGED	

Doran Consulting Limited		Page 36
Norwood House 96 -102 Great Victoria Street BELFAST BT2 7BE		
Date 16/01/2026 11:41 File Proposed HAT.MDX	Designed by 814 Checked by	
XP Solutions	Network 2020.1.3	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flooded		Half Drain		Pipe Flow (l/s)	Status	Level Exceeded
		Volume (m³)	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)			
S11.002	S47	0.000	1.20		202.4	SURCHARGED		
S11.003	S48	0.000	0.89		212.3	SURCHARGED		
S14.000	S49	0.000	0.45		7.4	SURCHARGED		
S14.001	S50	0.000	0.85		11.3	SURCHARGED		
S11.004	S51	0.000	1.40		217.6	SURCHARGED		
S11.005	S52	0.000	1.92		218.2	SURCHARGED		
S15.000	S53	0.000	0.46		7.6	OK		
S15.001	S54	0.000	0.82		121.5	OK		
S16.000	S55	0.000	0.17		18.4	SURCHARGED		
S16.001	S56	0.000	0.31		33.4	FLOOD RISK		
S16.002	S57	0.000	0.44		45.1	SURCHARGED		
S16.003	SFR PI Inlet	0.000	0.43		46.3	SURCHARGED*		
S16.004	SFR PI Outlet	0.000	0.47		50.4	SURCHARGED*		
S15.002	S58	0.000	1.27		135.7	SURCHARGED		
S17.000	S59	0.000	0.12		6.9	SURCHARGED		
S15.003	S60	0.000	1.20		134.6	SURCHARGED		
S15.004	S61	0.000	1.77		160.5	SURCHARGED		
S18.000	S62	0.000	0.73		31.1	SURCHARGED		
S15.005	S63	0.000	1.40		178.9	SURCHARGED*		
S1.012	S64	0.000	3.70		988.9	SURCHARGED		
S1.013	S65	0.000	2.70		990.4	SURCHARGED		

APPENDIX I – Draft Storm Drainage Plans



Rev.	Date	By	Check	Details	Appr.
00	22.07.2019	JPS	AC	First Issue	IRL
01	22.11.2019	JPS	AC	Architectural Updates	IRL
02	12.10.2020	MKP	MBR	Attenuation systems sized	IRL
03	23.11.2023	TGH	MBR	Layout amended. Notes amended.	IRL
04	29.03.2024	EF	AC	Foul drainage added to public realm area	IRL
05	20.09.2024	MJS	EF	Drainage updated to suit revised layout	IRL
06	24.09.2024	MJS	EF	Drainage revised to align with updated Architect's layout	IRL
07	19.01.2026	ITJO	EF	Drainage revised to align with updated Architect's layout	AC

Notes

- This drawing should be read in conjunction with all relevant Architectural and Engineering drawings.
- Contractor to confirm the location and level of any existing obstructions/structures etc., uncovered during the works.
- Contractor to confirm the location and level of any existing sewers prior to the commencement of any works. Any discrepancies are to be notified to the engineer immediately.
- Contractor to confirm the location of all existing services, buried and overhead, prior to the commencement of the works.
- All setting out shall be in accordance with available Architecture drawings. This drawing shall not be used for setting out purposes.
- All works to comply with current British Standards, Codes of Practice, and Building Regulations. The Contractor shall verify all information on site and report any discrepancies immediately to the Engineer.
- All attenuation storage volumes noted are subject to change upon completion of the detailed design.
- Surface water drainage system to be developed further during detailed design.

Legend

- Existing Box Culvert
- Existing Twin Culvert
- Proposed Storm Drainage (Ground Level)
- Proposed Storm Drainage (Basement)
- Proposed Drainage Channel (Ground Level)
- Proposed Drainage Channel (Basement)
- Site Boundary

PRELIMINARY
DRAWING

Project Title:
Queens Parade Development

Drawing Title:
Drainage Plan (All Drainage)
Surface Water Run-Off

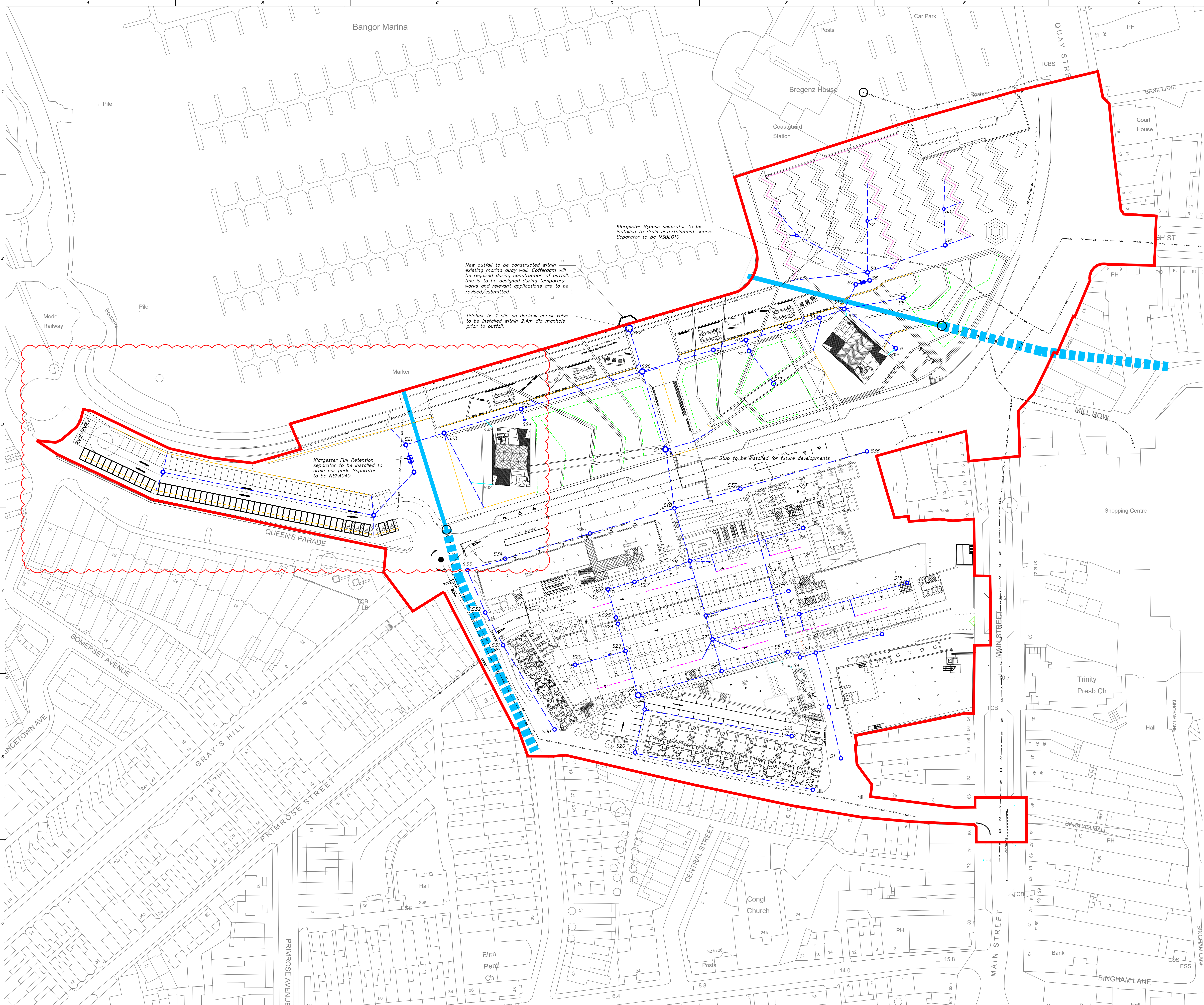
Client/Architect:	Bangor Marine Limited	Date:	July 2019
Drawn by:	JPS	Checked by:	AC
Checked by:	AC	Approved by:	IRL
Approved by:	IRL	Sheet Size:	A0

Project Number:	192042	Orig:	DC	Zone:	XX	Level:	XX	Type:	GA	Drawn:	C	Number:	105	Revision:	07
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Rev.	Date	By	Check	Details	Appr.
00	23.11.2020	TGH	AC	First Issue	IRL
01	17.09.2024	MJS	EF	Drainage updated to suit revised layout	IRL
02	24.09.2024	MJS	EF	Drainage revised to align with updated Architect's layout	IRL
03	19.01.2026	ITJG	EF	Drainage revised to align with updated Architect's layout	AC

- Notes**
- This drawing should be read in conjunction with all relevant Architectural and Engineering drawings.
 - Contractor to confirm the location and level of any existing obstructions/structures etc., uncovered during the works.
 - Contractor to confirm the location and level of any existing sewers prior to the commencement of any works. Any discrepancies are to be notified to the engineer immediately.
 - Contractor to confirm the location of all existing services, buried and overhead, prior to the commencement of the works.
 - All setting out shall be in accordance with available Architecture drawings. This drawing shall not be used for setting out purposes.
 - All works to comply with current British Standards, Codes of Practice, and Building Regulations. The Contractor shall verify all information on site and report any discrepancies immediately to the Engineer
 - All attenuation storage volumes noted are subject to change upon completion of the detailed design.
 - Surface water drainage system to be developed further during detailed design

- Legend**
- Existing Box Culvert
 - Existing Twin Culvert
 - Proposed Storm Drainage (Ground Level)
 - Proposed Storm Drainage (Basement)
 - Proposed Drainage Channel (Ground Level)
 - Proposed Drainage Channel (Basement)
 - Site Boundary

**PRELIMINARY
DRAWING**

Project Title:
Queens Parade Development

Drawing Title:
Drainage Plan (Basement Level)
Surface Water Run-Off

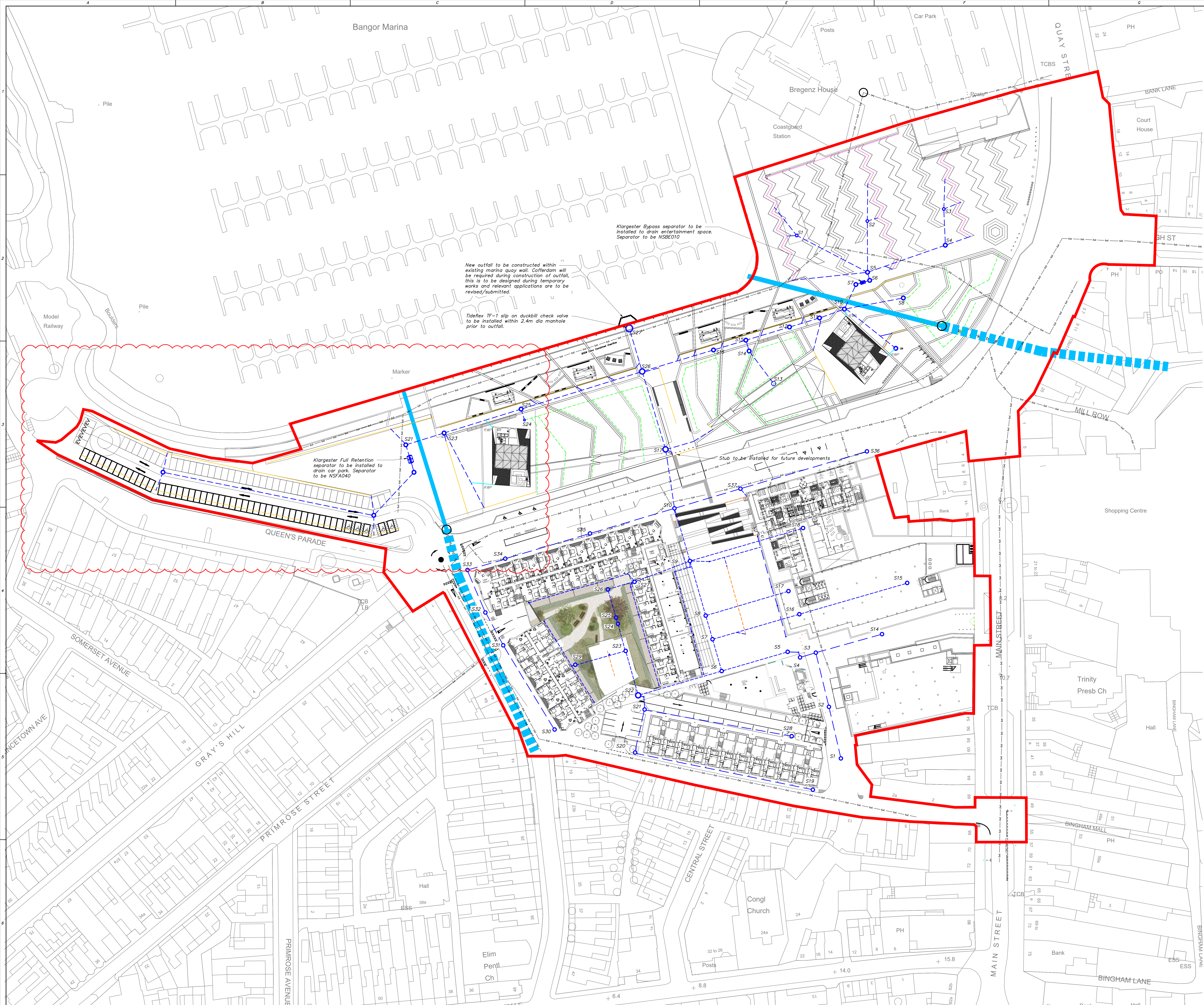
Client/Architect:	Bangor Marine Limited	Date:	Nov 2020
Drawn by:	TGH	Scales:	1:500
Checked by:	AC	Sheet Size:	A0
Approved by:	IRL		

Project Number:	192042	Orig:	DC	Zone:	XX	Lead:	XX	Type:	GA	Drawn By:	C	Number:	106	Revision:	03
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Rev.	Date	By	Check	Details	Appr.
00	23.11.2020	TGH	AC	First Issue	IRL
01	29.03.2023	EF	AC	First drainage added to public realm area	IRL
02	17.09.2024	MJS	EF	Drainage updated to suit revised layout	IRL
03	24.09.2024	MJS	EF	Drainage revised to align with updated Architect's layout	IRL
04	19.01.2026	ITG	EF	Drainage revised to align with updated Architect's layout	AC

- Notes**
- This drawing should be read in conjunction with all relevant Architectural and Engineering drawings.
 - Contractor to confirm the location and level of any existing obstructions/structures etc., uncovered during the works.
 - Contractor to confirm the location and level of any existing sewers prior to the commencement of any works. Any discrepancies are to be notified to the engineer immediately.
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 - All attenuation storage volumes noted are subject to change upon completion of the detailed design.
 - Surface water drainage system to be developed further during detailed design

- Legend**
- Existing Box Culvert
 - Existing Twin Culvert
 - Proposed Storm Drainage (Ground Level)
 - Proposed Storm Drainage (Basement)
 - Proposed Drainage Channel (Ground Level)
 - Proposed Drainage Channel (Basement)
 - Site Boundary

**PRELIMINARY
DRAWING**

Project Title:
Queens Parade Development

Drawing Title:
Drainage Plan (Ground Level)
Surface Water Run-Off

Client/Architect:	Bangor Marine Limited	Date:	Nov 2020
Drawn by:	TGH	Scales:	1:500
Checked by:	AC	Sheet Size:	A0
Approved by:	IRL		

Project Number:	192042	Orig:	DC	Zone:	XX	Level:	XX	Type:	GA	Drawn By:	C	Number:	107	Revision:	04
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APPENDIX K – Maintenance Schedule

Drainage Component	Maintenance Activity	Regularity	Date of Inspection/ Maintenance	Inspected/ Maintained by	Details of Inspection/Maintenance and any other Comments
Gullies	Litter and debris removal	Monthly (or as required)			
	Jet cleaning	Six monthly or after significant storm event			
Drainage Channels	Litter and debris removal	Monthly (or as required)			
	Jet cleaning along channels	Six monthly or after significant storm event			
	Assess channels (including sumps) for any evidence of blockage	Six monthly or after significant storm event			
Petrol Interceptor	Physically inspect the integrity of the separator and any mechanical parts	Six monthly or after significant storm event			
	Assess the depth of accumulated oil and silt	Six monthly or after significant storm event			
	Service all electrical equipment such as alarms and separator management systems	Six monthly or after significant storm event			
	Check the condition of any coalescing device and replace it if necessary	Six monthly or after significant storm event			
Tideflex Valve	Check for trapped debris and litter.	Annually			
Silt Pits	Assess the depth of accumulated oil and silt	Monthly or after significant storm event			
	Remove accumulated silt from bases of pits and dispose of in appropriate manner.	Six monthly or after significant storm event			

Filter Strips / French Drains	Litter and debris removal	Monthly (or as required)			
	Grass cutting – maintain a suitably low grass height	Monthly (during growing season)			
	Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)			
	Inspect filter strip surface to identify evidence of erosion, compaction, ponding, sedimentation and contamination (eg oils)	Six monthly			
	Check filter strip surface for even gradients	Six monthly			
	Inspect gravel trench for clogging	Six monthly			
	Check for poor vegetation growth due to lack of sunlight or dropping of leaf litter, and cut back adjacent vegetation where possible	Annually			
	Re-seed areas of poor vegetation growth. Alter plant types to better suit conditions, if require	Annually			
	Repair erosion or other damage by re-turfing or reseeding	As required			
	Re-level uneven surfaces and reinstate design levels	As required			
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface	As required			