

## **Port of Waterford Company**

Proposed Offshore Renewable Energy Capable Terminal on a 250m Wharf Extension and Ancillary Operational Support Infrastructure

> Port of Waterford Belview Co. Kilkenny

**Engineering Report** 

Job No.: W20088 Date: September 2025

#### **Contents Amendment Records**

**Document: Engineering Report: Planning** 

**Project:** Proposed Offshore Renewable Energy Capable Terminal on a 250m

Wharf Extension and Ancillary Operational Support Infrastructure

Client: Port of Waterford Company

Job Number: W20088

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#### **Revision Record**

Revision	Date	Description	Prepared By	Checked By	Approved By
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#### 1.0 INTRODUCTION

Port of Waterford Company propose to undertake development at Belview Port, County Kilkenny. The proposed development will comprise an Offshore Renewable Energy (ORE) Capable Terminal located on a c. 250m quay extension, land reclamation and ancillary operational support infrastructure located downstream of the existing port development at Belview Port.

As part of the development a biodiversity enhancement area to the northeast of the main development site is proposed.

The planning application is accompanied by an Environmental Impact Assessment Report and a Natura Impact Statement.

The gross total development area is c. 8ha and is located partly on land and partly in the nearshore area of the coastal planning authority, Kilkenny County Council, at Port of Waterford, Belview, Co. Kilkenny.

The Proposed Development will comprise of:

- A c. 250-metre extension to the existing wharves at the container and bulk handling terminal at Belview Port, as a continuation of the existing wharves and comprising a reinforced concrete suspended deck supported on reinforced concrete beams and steel piles socketed into bedrock below the bed of the Lower River Suir Special Area of Conservation ('SAC') and partly on land with a retaining structure to the rear
- Land reclamation, covering an area of c.1.3ha primarily using imported quarried rock and, if suitable, treated dredged material, retained by the wharf structure and a rock armoured embankment beneath the wharf and to the downstream end of the development
- Two separate quayside ORE Operator support facilities located at the downstream area of the Port, supported on piled foundations, comprising warehousing, workshop buildings, berthing pontoons, yard areas, fuel enclosures and crane installations
- A three-storey administrative office and staff facilities building located in the downstream area of the Port and supported on piled foundations, and associated car parking to the east of the railway bridge crossing
- A three-storey administrative office and staff facilities building located on the north side of the Rosslare-Limerick railway line and supported on piled foundations, and associated car parking
- Associated underground services, water supply and drainage to include a pumped rising main to discharge foul water from the development to the Uisce Eireann network
- An electricity substation to replace the existing substation
- Additional lighting and lighting pylons
- Relocation of existing weighbridges and security cabin
- Partial demolition of both the existing downstream ramp and the existing dolphin to facilitate the development
- Minor works to the existing quay to facilitate structural interfacing between existing and proposed structures



- Roof-mounted solar photovoltaic ('PV') panels
- Biodiversity Enhancement Area (c. 1.8ha) located to the north east of the wharf extension in existing agricultural wet grassland that is bisected by the Luffany Stream
- Diversion, extension and relocation of the outfall to the existing drainage pipe serving the Smartply facility, and;
- All associated Site development works.

This report has been prepared to form part of the planning submission to An Coimisiún Pleanála for the proposed development. The report provides a narrative relating to the proposed site location, the existing and proposed potable and fire fighting water supplies to the site, the existing and proposed foul water and storm water site drainage, the proposed power, lighting and communications, and also comments on flood risk and traffic/circulation.

This report accompanies a suite of Planning Drawings, a register of which is included in Appendix 1.

#### 2.0 SITE LOCATION

Port of Waterford and the development site are located in Gorteens on the northern bank of the Lower River Estuary, 8km downstream from Waterford City. Road access from the national road network to the Port is via the N29 National Route, which gives direct access to the Port's main entrance and access to a secondary road which leads to the Port's downstream entrance.

The existing port facilities, constructed in 1991, extended in 1996 and again in 2005/2007, comprise container handling, bulk storage and handling, warehouses and offices. The proposed development will be similar in construction to the existing port, located downstream, partly on land and partly in the nearshore area. Figure 2.1 below refers.



Figure 2-1: Site Location Map



The proposed main development site is bounded by the River Suir to the northeast, east and southeast, by the existing port development to the southwest and by the Rosslare-Waterford railway to the northwest.

The proposed development site to north of the Rosslare-Waterford railway is bounded by the railway line to the south east and by lands for port-related on other boundaries. Car parking is proposed to the northwest of the access route to the lands northeast of the site as indicated on the Drawings.

The proposed Biodiversity Enhancement Area site is bounded on all sides by agricultural lands.

#### 3.0 EXISTING WASTEWATER AND WATER SERVICES

#### 3.1 Foul Water

Existing foul water from the Port of Waterford Offices at Marine Point, the Terminal Building and the Port entrance security gatehouse is collected at a pumping station situated adjacent to the Port's main entrance and discharged via a rising main to the Uisce Éireann network via an Uisce Éireann pumping station located at the entrance to the South East Port Services site.

#### 3.2 Storm Water

Storm water discharge from the existing container and bulk terminals is channelled through road gullies and surface drains and collected in an underground gravity piped network. The collected storm water is discharged through a series of settling tanks and fuel interceptors to the River Suir. Facilities are provided whereby surface water may be sampled, tested and held in emergency holding tanks in the event of accidental spillage.

The proposed development will necessitate the extension of the existing 600mm diameter pipe which discharges storm water from the Port to the Lower River Estuary and the provision of a new replacement outfall in a new location within the proposed revetment as indicated on the Drawings. The construction methodology will ensure that the discharge capacity of the existing outfall will be retained both during the construction works and on completion of the works.

#### 3.3 Existing Discharge Pipe

The proposed development will also necessitate the extension of the existing 600mm diameter pipe which services the Smartply site. This pipe will be diverted and extended to outfall to the Lower River Estuary in a new location in the proposed revetment as indicated on the Drawings. The construction methodology will ensure that the discharge capacity of the existing outfall will be retained both during the construction works and on completion of the works.

#### 3.4 Watermains

The existing Uisce Éireann supply to the Gorteens area, delivered via a 400 mm diameter pipeline to the junction at Gorteens Castle, was recently extended to connect the Port to the Uisce Eireann network. This supply feeds the existing Port operations including water demand from Port offices and the bunkering of berthed vessels.



#### 3.5 Fire Water

Water for firefighting is supplied from an existing borewell and stored in a large capacity static firefighting water tank from where it is piped to the Port area to supply a network of hydrants in the container and bulk terminals. A second borewell provides a primary back up supply and a secondary back up supply is connected to the mains. The existing firewater tank was refurbished in 2024.

Existing water and wastewater services are indicated on Drawings W20088-XX-XXX-DR-MOR-CE-01204 and -01205.

#### 4.0 PROPOSED FOUL WATER DRAINAGE

#### 4.1 Foul Water

A new foul water drainage system is proposed to collect foul water from the Offshore Renewable Energy facilities at the downstream end of the Port and to discharge via a gravity and pumped system to the Uisce Éireann network subject to a connection agreement with Uisce Éireann and in accordance with the Irish Water Code of Practice for Wastewater Infrastructure. Uisce Éireann provided a Confirmation of Feasibility for the wastewater connection for the proposed development, Ref: CDS23005066, dated 28 May 2025. Refer to Appendix 8.

The general arrangement for the proposed new foul water drainage is given on Drawings W20088-XX-XXX-DR-MOR-CE-01218, -01219 and -01220.

Additional foul water generated by the anticipated employment associated with the development and relating to Port operations, estimated at thirty staff based in Port of Waterford's offices at Marine Point and the Terminal Building, will be discharged to the existing foul water network which has sufficient capacity to accommodate the generated flow.

#### 5.0 PROPOSED STORM WATER DRAINAGE

The general arrangement for the proposed storm water drainage is given on Drawings W20088-XX-XXX-DR-MOR-CE-01216 and -01217.

In general terms the proposed development areas are as follows;

Type of development	Area
Proposed ORE Buildings	c. 3100 m <sup>2</sup>
Proposed Wharf Area	c. 5,900 m <sup>2</sup>
Proposed Paved Areas	c. 13,000 m <sup>2</sup>
Proposed Permeable Paving	c. 1,500 m <sup>2</sup>

The proposed development consists of several distinct areas and the approach to storm water drainage design for each area is summarised as follows;



#### 5.1 c. 250m Wharf Extension and Reclaimed Area

Storm water generated by the wharf extension and reclaimed area will be collected via heavy duty drainage channels and gullies to discharge to an underground drainage network which will be routed through a settling tank and a hydrocarbon bypass interceptor before being discharged to the Lower River Estuary through a new outfall pipe. The works will include modifications to the existing storm drainage to facilitate the extended wharf structure and associated work areas.

#### 5.2 Offshore Renewable Energy Facilities- Quayside

Rainwater from the roofs of the new ORE buildings will be collected via rainwater downpipes and discharged to the proposed storm water piped network. Storm water from the proposed ORE yards will be directed into the new network through road gullies and channels. The drainage system will be routed through a settling tank to a hydrocarbon bypass interceptor before being discharged to the Lower River Estuary through the proposed new outfall pipe.

#### 5.3 Storm Water Management

All storm water generated in these areas will discharge through a settling tank to a bypass interceptor. The settling tank will have a V-notch weir fitting, composite sampling equipment and pH and conductivity probes. In the unlikely event of a major spill or a fire occurring at the Port, contaminated run off will be diverted to an Emergency Holding Tank where the discharge will be contained until appropriate measures are agreed with the Environmental Section of Kilkenny County Council.

Details of the Emergency Holding Tank are included in Appendix 5.

#### 5.4 Fuel tanks and refuelling zone

The refuelling area adjacent to the bunded fuel tanks is provided with additional measures to mitigate any impact of potential spillages or leakages which may occur during the refuelling operation.

Containment is provided by dishing the area to drain it to a dedicated gully from where it will discharge to a forecourt interceptor designed to have capacity to contain 7600l. to an area adjacent to the fuel tank bunds to mitigate any impact of potential spillages or leakages during the filling of the ORE fuel tanks by fuel delivery tankers. The rainwater generated in the re-fuelling zone and bunded areas will flow through an automated shut off valve, activated on detection of hydrocarbon, and discharge through a forecourt interceptor to the storm water network.

#### 5.5 Offshore Renewable Energy Facilities- North of the Rosslare- Limerick Railway

It is proposed to provide permeable paving to allow storm water generated by the proposed parking areas to discharge to the ground subject to verification by site investigations. The ORE building roof rainwater will be collected via rainwater downpipes, collected and attenuated in an underground network and discharged under controlled flow to the existing storm network to the east of the site which discharges to the Luffany Stream.

Rainfall intensity data figures used for design are based on records by Met Eireann for the site at Gorteens. The Met Eireann rainfall intensity data figures are included in Appendix 2. The storm water discharge pipes are designed for a 55mm/hour storm event. The pipes are designed to operate at  $\frac{3}{4}$  full bore (75%) flow capacity. The storm water flow velocity is designed to flow within the range of 0.75 m/s and 3m/s.



#### 6.0 PROPOSED WATERMAIN AND FIREMAIN

The general arrangement of the proposed watermains and firemains for the development is shown on Drawings W20088-XX-XXX-DR-MOR-CE-01214 and -01215.

#### 6.1 Potable Water

Potable water will be supplied to the Offshore Renewable Energy facilities on the quayside and for bunkering vessels berthed alongside the 250m quay extension by extending the existing potable supply network as shown on the drawings. Water main installation works will be carried out in compliance with Irish Water Code of Practice for Water Infrastructure.

Potable water for the Offshore Renewable Energy office building north of the Rosslare-Limerick railway line will be supplied from the existing port watermain in the industrial access road.

Uisce Eireann have confirmed feasibility for the ORE operator facilities, which will be subject to a connection agreement with Uisce Eireann. Confirmation of feasibility from Uisce Eireann was received on 28<sup>th</sup> May 2025 and is included in Appendix 8.

#### 6.2 Fire Water

Fire water supply will be provided to the proposed development by extending the existing port area fire main. This main is supplied from a large capacity firewater static tank located adjacent to the Port offices at the upstream entrance to the Port. The tank is fed by an existing borewell with primary back up from an existing second borewell and secondary back up from the Uisce Eireann network. Fire supply to the proposed development will be provided by extending the fire main, incorporating hydrants as indicated on the drawings to meet the firefighting requirements of the Offshore Renewable Energy facilities and the port extension.

#### 7.0 FLOOD RISK ASSESSMENT

An assessment of the hydrological impact of the development was undertaken by IE Consulting using published maps and accepted predicted future scenario criteria.

The results of the assessment, together with the risk categories for the proposed development and the predicated future scenarios, have been taken into account in determining the nominal design levels for the proposed new development.

The Site Specific Flood Risk Assessment Report accompanies the Planning Submission.

#### 8.0 PROPOSED POWER, LIGHTING AND TELECOMMUNICATIONS

The existing substation in the quayside area of the port has a MIC supply of 750 kVA. Presently this substation supplies power to the existing lighting, general services and crane requirements for the Port. The existing 750 kVA MIC is expected to be sufficient to supply the power requirements for the proposed ORE terminal and quay extension.

The existing substation building is proposed to be replaced with a new ESB- compliant substation building constructed to meet the current standards required by the ESB.



Power and communications will be supplied to separate locations within the new wharf extension via new LV and ELV ducting to a number of dual compartment mini pillars and external metering units depending on the electrical requirements needed at specific areas of the wharf.

New general lighting is proposed for the new wharf area, pontoons, staff car parks, pedestrian walkways, access roadways and work office areas. The proposed external lighting will be achieved with luminaires designed to minimise light pollution and will be controlled via time clocks and photocell units.

The proposed Offshore Renewable Energy offices and operations areas shall have their own dedicated electrical supply boards complete with separate metering for commercial purposes which will provide power and lighting to the facilities. These areas will also have a dedicated communications systems for all data and networking requirements.

Lighting is proposed at the following lux levels;

Roads; 15 to 20 luxWharves; 10 to 30 luxPontoons; 5 to 8 lux

External areas around buildings; 10 to 20 lux

- Car parking areas; 15 to 20 lux

The proposed lighting layout is shown on Drawings W20088-XX-XXX-DR-MOR-CE-01221 and -01222. The Lighting Report accompanies the Planning Submission.

#### 9.0 TRAFFIC, TRANSPORT AND CIRCULATION

The impact of traffic volumes expected to be generated by the proposed development on the local road network was undertaken by Roadplan Consulting and is set out in the Traffic Impact Assessment. The TIA assesses both the construction phase and the operational phase and concludes that there is sufficient capacity on the local road network to accommodate the proposed development.

Traffic generated by the proposed development will approach the port at the downstream entrance to the port. Parking for ORE employees, 70 no standard spaces, will be provided across two locations. The elevated site north of the railway will accommodate 35 spaces and a further 35 spaces will be provided at quayside level adjoining the railway. Spaces for people with special requirements are proposed at each facility building, 6 no in total. Pedestrian routes from car parking areas to the ORE facilities buildings are provided.

The Traffic Impact Assessment is provided as part of the Environmental Impact Assessment Report, ref Chapter 6.



# **Appendix 1**

**Drawing Register** 



# Port of Waterford: Proposed Offshore Renewable Energy Capable Terminal on a 250m Wharf Extension and Ancillary Operational Support Infrastructure

#### **Planning Drawing List**

W20088-XX-XXX-DR-MOR-CE-01200	Site Location Map and Location of Site Notices
W20088-XX-XXX-DR-MOR-CE-01201	Existing Overall Site Layout
W20088-XX-XXX-DR-MOR-CE-01202	Existing Site Layout-Sheet 1
W20088-XX-XXX-DR-MOR-CE-01203	Existing Site Layout-Sheet 2
W20088-XX-XXX-DR-MOR-CE-01204	Existing Site Layout-Sheet 3
W20088-XX-XXX-DR-MOR-CE-01205	Existing Site Layout-Sheet 4
W20088-XX-XXX-DR-MOR-CE-01206	Existing Site Layout-Sheet 5
W20088-XX-XXX-DR-MOR-CE-01207	Existing Watermain, Drainage & Services Layout-Sheet 1
W20088-XX-XXX-DR-MOR-CE-01208	Existing Watermain, Drainage & Services Layout-Sheet 2
W20088-XX-XXX-DR-MOR-CE-01209	Demolition Layout-Sheet 1
W20088-XX-XXX-DR-MOR-CE-01210	Demolition Layout-Sheet 2
W20088-XX-XXX-DR-MOR-CE-01211	Proposed Overall Site Layout
W20088-XX-XXX-DR-MOR-CE-01212	Proposed Site Layout-Sheet 1
W20088-XX-XXX-DR-MOR-CE-01213	Proposed Site Layout-Sheet 2
W20088-XX-XXX-DR-MOR-CE-01214	Proposed Watermain & Firemain Layout-Sheet 1
W20088-XX-XXX-DR-MOR-CE-01215	Proposed Watermain & Firemain Layout-Sheet 2
W20088-XX-XXX-DR-MOR-CE-01216	Proposed Storm Water Drainage Layout-Sheet 1
W20088-XX-XXX-DR-MOR-CE-01217	Proposed Storm Water Drainage Layout-Sheet 2
W20088-XX-XXX-DR-MOR-CE-01218	Proposed Foul Water & Foul Rising Main Drainage Layout-Sheet 1
W20088-XX-XXX-DR-MOR-CE-01219	Proposed Foul Water & Foul Rising Main Drainage Layout-Sheet 2
W20088-XX-XXX-DR-MOR-CE-01220	Proposed Foul Water & Foul Rising Main Drainage Layout-Sheet 3
W20088-XX-XXX-DR-MOR-CE-01221	Proposed Lighting Layout-Sheet 1
W20088-XX-XXX-DR-MOR-CE-01222	Proposed Lighting Layout-Sheet 2
W20088-XX-XXX-DR-MOR-CE-01223	Proposed Vehicle Movements-Sheet 1
W20088-XX-XXX-DR-MOR-CE-01224	Proposed Vehicle Movements-Sheet 2
	Durange of Whent Futersian Turied Biling Layert Costing 9
W20088-XX-XXX-DR-MOR-CE-01231	Proposed Wharf Extension, Typical Piling Layout, Section & Fendering Detail
W20088-XX-XXX-DR-MOR-CE-01232	Proposed Wharf Extension Elevation
	·
W20088-XX-XXX-DR-MOR-CE-01235	Proposed Pontoons Plan and Elevation
W20088-XX-XXX-DR-MOR-CE-01236	Proposed Pontoons Typical Details
W20088-XX-XXX-DR-MOR-CE-01241	Proposed Gangway Details to Landing Pontoons
W20088-XX-XXX-DR-MOR-CE-01242	Proposed Weighbridge Details
W20088-XX-XXX-DR-MOR-CE-01301	Existing & Proposed Site Cross Sections-Sheet 1
W20088-XX-XXX-DR-MOR-CE-01302	Existing & Proposed Site Cross Sections-Sheet 2
W20088-XX-XXX-DR-MOR-CE-01303	Existing & Proposed Site Cross Sections-Sheet 3
W20088-XX-XXX-DR-MOR-CE-01304	Existing & Proposed Site Cross Sections-Sheet 4



W20088-XX-XXX-DR-MOR-CE-01501	Site Development Details - Sheet 1
W20088-XX-XXX-DR-MOR-CE-01502	Site Development Details - Sheet 2
W20088-XX-XXX-DR-MOR-CE-01503	Site Development Details - Sheet 3
W20088-XX-XXX-DR-MOR-CE-01504	Site Development Details - Sheet 4
W20088-XX-XXX-DR-MOR-CE-01505	Site Development Details - Sheet 5
W20088-XX-XXX-DR-MOR-CE-01506	Site Development Details - Sheet 6
W20088-XX-XXX-DR-MOR-A-02001	Operator 1-Ground Floor & First Floor Layouts
W20088-XX-XXX-DR-MOR-A-02002	Operator 1-Second Floor Layout & Sections
W20088-XX-XXX-DR-MOR-A-02101	Operator 2-Office Building Layouts
W20088-XX-XXX-DR-MOR-A-02201	Operator 2-Warehouse Building Layouts
W20088-XX-XXX-DR-MOR-A-02301	Proposed ESB MV & LV Sub Station Building
W20088-XX-XXX-DR-MOR-A-03201	Operator 2-Warehouse Building Sections & 3D Views
W20088-XX-XXX-DR-MOR-A-04001	Operator 1-Proposed Elevations
W20088-XX-XXX-DR-MOR-A-04101	Operator 2-Office Building Elevations & Sections
W20088-XX-XXX-DR-MOR-A-04201	Operator 2-Warehouse Building Elevations



# Appendix 2 Met Eireann Rainfall Data



Met Eireann Return Period Rainfall Depths for sliding Durations Irish Grid: Easting: 261204, Northing: 112697,

	500,	N/A ,	N/A ,	N/A ,	N/A ,	N/A	N/A ,	N/A ,	N/A	N/A	N/A	N/A ,	N/A ,	40.5,	154.9,	167.8,	79.5,	200.2,	218.7,	35.5,	51.3,	280.2,	306.7,	337.5,	
	250,	19.8,	27.6,	32.5,	39.8,	48.7,	59.7,	67.2,	73.1,	82.3,	95.6,	100.8,	113.5,	123.4, 1	137.6, 1	150.1, 1	161.4, 1	181.3, 2	199.0, 2	215.2, 2	230.3, 2	258.0, 2	283.6,	313.2,	
									69.7,																
									65.5,																
									60.00																
									56.4,																
									51.7,																
									46.2,																
Years	20,	10.3,	14.3,	16.9,	21.2,	26.7,	33.5,	38.4,	42.2,	48.2,	55.2,	60.7,	69.4,	76.3,	88.9,	99.5,	109.0,	125.6,	140.4,	154.0,	166.7,	190.2,	212.0,	237.5,	
																								219.2,	
	5,	6.9	9.6	11.3,	14.5,	18.5,	23.7,	27.3,	30.2,	34.9,	40.3,	44.6,	51.5,	57.0,	68.3,	77.6,	85.9,	100.6,	113.7,	125.7,	137.0,	158.1,	177.8,	200.9,	
									28.4,																
	3,	5.8,	8.1,	9.5,	12.2,	15.7,	20.3,	23.5,	26.1,	30.2,	35.1,	38.9,	45.1,	50.1,	60.7,	69.5,	77.3,	91.1,	103.5,	114.9,	125.6,	145.7,	164.4,	186.5,	
	2,	4.9,	6.8,	8.0,	10.3,	13.4,	17.3,	20.2,	22.5,	26.2,	30.5,	34.0,	39.5,	44.0,	54.0,	62.2,	69.5,	82.5,	94.2,	105.0,	115.1,	134.2,	152.0,	173.1,	
val	lyear,	4.2,	5.9,	6.9	9.0,	11.8,	15.4,	17.9,	20.0,	23.4,	27.3,	30.5,	35.6,	39.8,	49.2,	57.0,	64.0,	76.4,	87.5,	97.8,	107.5,	125.8,	142.9,	163.2,	
Interval	6months,								15.2,																
	DURATION	5 mins	10 mins	15 mins	30 mins	1 hours	2 hours	3 hours	4 hours	6 hours	9 hours	12 hours	18 hours	24 hours	2 days	3 days	4 days	6 days	8 days	10 days	12 days	16 days	20 days	25 days	NOTES

NOTES:

N/A Data not available

These values are derived from a Depth Duration Frequency (DDF) Model

For details refer to:

'Fitzgerald D. L. (2007), Estimates of Point Rainfall Frequencies, Technical Note No. 61, Met Eireann, Dublin', Available for download at www.met.ie/climate/dataproducts/Estimation-of-Point-Rainfall-Freguencies\_TN61.pdf



# **Appendix 3**

Storm Water Attenuation ORE Building Site North of Railway



INPUT SHEET FOR	ATTENUA	TION CALC	ULATIONS		Page:	1 of 3
Job No. W20088	Job Name:	Belview Por	t Wharf Extension	า	Date: Jun	e 2025
Percolation Factors						
Roofs					= 0.95	]
Concreted / Paved Areas	8				= 0.95	]
Roads / Car Parks					= 0.90	]
Grass / Landscaped					= 0.05	]
Total Development Are	a				= 3,451 0.35	(m²) Ha
Division of Areas						
Roof Proposed Building Roofs	ı				365	
Total					365	(m <sup>2</sup> )
Concreted Areas						
Total						- -
Roads / Car Parks						
Total Road & Car Park						- (m²)
Landscaped Area						
Landscaping						
Total Landscaped						(m <sup>2</sup> )





INDIIT	SHEET EC	OR ATTENI	JATION CALCULATIONS	Page:	2	of	3
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Job No.	W20088	Job Name:	Belview Port Wharf Extension	Date: Jun	e 202	5	

#### **Average Percolation factor**

=	Roof	Χ	0.95	+ Conc. &	Χ	0.95	+	Blacktop	Х	0.90	+ La	andscaped	Х	0.05
	Area			Paved								Area		
				Total A	\rea	for Dev	<i>r</i> elop	ment						
=_	365	Х	0.95	+ 0	Х	0.95	+	-	х	0.90	+	-	х	0.05
						3,451								

- = <u>347</u> 3,451
- = 0.100

#### **Effective Area**

- = Total Area for Development x Percolation factor
- $= 3,451 \times 0.1005$
- = **347** m<sup>2</sup>

# Typical calculation of Permissible Discharge based on 30min storm, 30 year return period

Allowed Discharge from Site

QBAR = 
$$0.00108 \text{ x} \text{ (AREA)}^{0.89} \text{ x (SAAR)}^{1.17} \text{ x (SOIL)}^{###}$$

QBAR = **1.551** l/s

Obtained from Mett Eireann

Average Annual Rainfall Data = 25.9 mm

Average Percolation Factor

from previous calculations = 0.100 mm

**Volume of Stormwater** = Site Area (m2) x Rainfall (m) x Average Percolation factor

= 3,451 x 0.02585 x 0.100 = 8.9634875 m<sup>3</sup>

**Volume of Discharge** = Permissible Discharge x time

= 1.55 x 60 x 30 = 2791.2153 l 1/s sec min = 2.791 m<sup>3</sup>

**Storage Required** =  $8.963 - 2.791 = 6.172 \text{ m}^3$ 



Page: 3 of 3

#### INPUT SHEET FOR ATTENUATION CALCULATIONS

Job No. W20088 Belview Port Wharf Extension Date: June 2025

30

Storm	Rainfall	Volume X	Discharge	Storage
Duration	(including 10%)	Perc Factor		Required
(hrs)	(mm)	(m <sup>3</sup> )	(m <sup>3</sup> )	(m <sup>3</sup> )
0.25	20.7	7.171	1.396	5.775
0.5	25.9	8.963	2.791	6.172
1	32.3	11.214	5.582	5.631
2	40.6	14.075	11.165	2.910
4	50.8	17.622	22.330	-4.708
6	58.0	20.101	33.495	-13.393
12	72.6	25.174	66.989	-41.815
24	90.9	31.506	133.978	-102.473
48	105.1	36.426	267.957	-231.531

Standard Average Annual Rainfall = 948.2 mm (met eireann)

Soil Index = 0.3

100

Storm	Rainfall	Volume X	Discharge	Storage	
Duration	(including 10%)	Perc Factor		Required	
(hrs)	(mm)	(m <sup>3</sup> )	(m <sup>3</sup> )	(m³)	
0.25	28.27	9.803	1.396	8.407	
0.5	34.98	12.129	2.791	9.338	
1	43.23	14.990	5.582	9.408	
2	53.46	18.537	11.165	7.372	
4	66	22.886	22.330	0.556	
6	74.8	25.937	33.495	-7.558	
12	92.4	32.040	66.989	-34.949	
24	114.29	39.630	133.978	-94.348	
48	129.47	44.894	267.957	-223.063	



# **Calculations for Attenuation Storm Water Drainage**

**Calculation Sheet No. 4** 

JOB: Offshore Renewable Energy (ORE) Capaable Terminal						
JOB NO: W20088	DATE: June 2025					
SHEET NO: 1	DRG. NO: W20088-XX-XXX-DR-MOR-CE-01217					
PREPARED BY: BC	CHECKED BY: ES					

**CLIENT: Port of Waterford Company** 

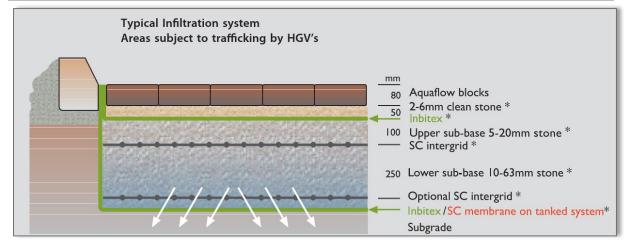
## DRAINAGE CRITERIA

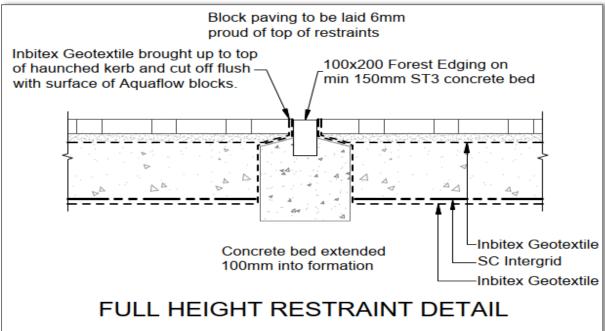
Proposed Storm Water Atten	uation
Required attenuation volume of the proposed roof	9.41 m³
The roof water will be attenuated within the large Ø surface water pipes and manholes as part of the attenuation system prior discharging into existing surface water network  No. of 1200mm Ø manhole Length of 300mm Ø surface water pipe	7 no. manholes 112 m
<ul> <li>Volume of the surface water network</li> <li>Volume of single 1200mm Ø manhole = 1.13m² x 1m</li> <li>Volume per m of 300mm Ø pipe = 0.071m² x 1m</li> </ul>	1.130 m³ 0.071m³
<ul> <li>Total volume of surface water network</li> <li>7 no. of manholes = 7 x 1.130m³</li> <li>112m of 450mm Ø pipe = 112m x 0.071m³</li> </ul>	7.91 m <sup>3</sup> 7.95 m <sup>3</sup> Total = 15.86 m <sup>3</sup>

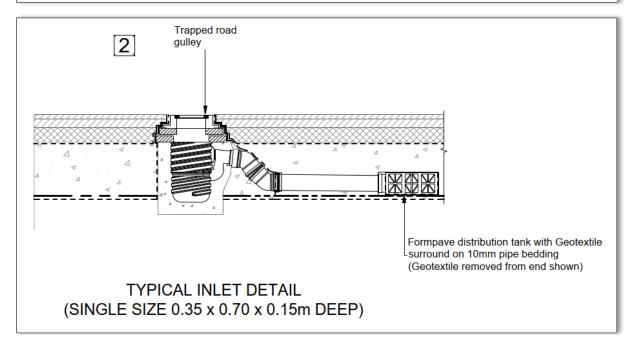


Appendix 4
Permeable Pavement Details Site North of Railway











# **Appendix 5**

Settling Tank and Emergency Holding Tank



#### **Emergency Holding Tank**

The proposed Emergency Holding Tank serves an area of approximately 19,000 m<sup>2</sup> and has a capacity of 636 m <sup>3</sup> which has been selected on the basis of the following assessment:

1. A firefighting event of a one hour period in combination with a 1 in 50 year 1 hour rainfall event, calculated as follows;

35l/sec x 3600	=126,000 I	= 126 m <sup>3</sup>
19,000 @ 0.0294 x 0.85		= c. 475 m <sup>3</sup>
Total		$= 601 \text{ m}^3$

2. A local spill incident in combination with a 1 in 100 year 1 hour rainfall event, calculated as follows:

19,000 @ 0.0393 x 0.85	$= 635 \text{ m}^3$

#### Sludge Removal

Sludge removal from both the Settling and Emergency Holding Tank will be carried out manually and periodically, aided when and if necessary by mechanical equipment to loosen the solidified sludge and to assist with lifting the sludge from the tanks. In addition, equipment may be lowered into the emergency holding tank and sludge loaded into skips should this prove necessary. Vacuum tankers may also be used to remove the sludge.

#### Sludge Holding Capacity of Settling Tanks

A depth of 1000mm can be retained in the 4 chambers following the grit removal chamber which provides a capacity potential of over 12m³ of storage volume.

Considering 100,000 tonnes of bulk material;

Estimated sludge generated per tonne handled; 40 g/tonne

Total estimated sludge generated; 4 tonnes / 100,000 tonnes of bulk material

Assuming a sludge density of between 1200 kg/m³ and 1400 kg/m³ this equates to a volume of approximately 3m³ which is substantially less than the available capacity.

Allowing for losses through the tank and bulking due to saturation, the settling tank has adequate capacity for sludge storage resulting from the handling of 100,000 tonnes of bulk.

#### Sludge Holding Capacity of Emergency Holding Tank

The sludge holding capacity of the proposed tank will be  $24 \times 10 \times 100$ m deep = 24 cubic metres for every 100mm depth of sludge. This capacity significantly exceeds any potential sludge generated as a consequence of a fire or a spill incident.



# Appendix 6

Storm Water Network Design Quay Extension, Reclaimed Area, ORE Facilities



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X91 V52K

Malone O'Regan Consulting Engineers 3-4 Canada Street Waterford File: Storm Drainage Design R01.pfd Network: Storm Network Brian Chong 21/07/2025 Page 1

#### **Design Settings**

Rainfall Methodology FSR Return Period (years) 1 Additional Flow (%) 0

FSR Region Scotland and Ireland M5-60 (mm) 18.500 Ratio-R 0.271

CV 0.750 Time of Entry (mins) 5.00 Maximum Time of Concentration (mins)

Maximum Rainfall (mm/hr)

Minimum Velocity (m/s)

Connection Type

Minimum Backdrop Height (m)

Preferred Cover Depth (m)

Include Intermediate Ground
Enforce best practice design rules

30.00

1.00

Level Soffits
0.200

1.200

4.200

#### Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Node Type	Diameter (mm)	Depth (m)
S28	0.038	5.00	12.100	Manhole	1500	1.100
S29			12.000	Manhole	1200	1.215
S30			11.900	Manhole	1200	1.180
S31			11.200	Manhole	1200	0.750
S32			11.000	Manhole	1200	0.839
S27	0.069	5.00	6.250	Manhole	1500	1.200
S26	0.094	5.00	6.210	Manhole	1200	1.400
S25	0.077	5.00	6.000	Manhole	1200	1.430
S15	0.081	5.00	6.000	Manhole	1350	2.575
S16	0.024	5.00	6.200	Manhole	1350	2.385
S17	0.045	5.00	6.200	Manhole	1350	2.145
S18	0.057	5.00	6.200	Manhole	1350	2.000
S19	0.075	5.00	6.200	Manhole	1350	1.820
S20	0.109	5.00	6.200	Manhole	1350	1.765
S21	0.031	5.00	6.200	Manhole	1350	1.535
S22	0.101	5.00	6.200	Manhole	1200	1.490
S23	0.034	5.00	6.200	Manhole	1200	1.345
S24	0.026	5.00	6.200	Manhole	1200	1.200
S04	0.100	5.00	6.000	Manhole	1500	3.165
S10			6.200	Manhole	1200	1.385
S08	0.123	5.00	6.200	Manhole	1200	1.200
S09	0.155	5.00	6.200	Manhole	1200	1.200
S07	0.058	5.00	11.400	Manhole	1200	3.955
S06	0.025	5.00	8.150	Manhole	1200	2.855
S05			6.000	Manhole	1200	1.775
S03			6.000	Manhole	1500	3.464
S01			6.000	Manhole	2100	4.814
S11	0.221	5.00	5.960	Manhole	1350	2.270
S12	0.138	5.00	5.960	Manhole	1350	1.890
S13			5.960	Manhole	1350	1.440
S14	0.098	5.00	5.960	Manhole	1350	0.960
Attenuation Tank			6.000	Junction		3.654
S02	0.051	5.00	6.000	Manhole	1500	1.700
Settlement Tank			6.000	Junction		3.514
Outfall			3.000	Manhole	1500	1.539
Interceptor	0.022	5.00	6.000	Manhole	1500	3.204

#### Links (Results)

Name	Vel (m/s)	Cap (I/s)	Flow (I/s)	US Depth	DS Depth	Σ Area (ha)	Σ Add Inflow	Pro Depth	Pro Velocity
				(m)	(m)		(l/s)	(mm)	(m/s)
S14 - S13	1.472	162.6	11.3	0.585	1.065	0.098	0.0	66	0.857
S13- S 12	1.472	162.5	10.8	1.065	1.515	0.098	0.0	65	0.846
S12 - S11	1.478	163.2	30.5	1.515	1.895	0.287	0.0	109	1.143
S11 - S04	3.114	344.0	53.6	1.895	2.565	0.508	0.0	99	2.287
5.001	2.812	111.8	32.6	1.160	2.565	0.278	0.0	83	2.448
6.000	1.627	64.7	14.9	0.975	1.160	0.123	0.0	73	1.329
5.000	1.068	42.5	18.4	0.975	1.160	0.155	0.0	103	1.030
S24 - S23	1.112	44.2	3.1	0.975	1.120	0.026	0.0	40	0.643
S23 - S22	1.025	40.7	6.9	1.120	1.265	0.059	0.0	63	0.770
1.002	0.981	39.0	18.5	1.265	1.310	0.160	0.0	109	0.970
S21 - S20	1.472	162.6	21.6	1.160	1.390	0.191	0.0	92	1.035

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3-4 Canada Street Netw Brian	Storm Drainage Design R01.pfd   Page 2 vork: Storm Network n Chong 7/2025
730.702.1	Links (Results)
Name Vel Cap Flow	US DS Σ Area Σ Add Pro Pro
(m/s) (l/s) (l/s)	Depth Depth (ha) Inflow Depth Velocity
S20 - S19 1.503 166.0 33.8	1.390 1.445 0.301 0.0 114 1.187
\$19-\$18 1.505 166.2 41.4 \$18-\$17 1.460 161.3 47.0	
S17 - S16 1.468 162.1 50.7	1.770 2.010 0.478 0.0 144 1.305
\$16 - \$15	2.010 2.050 0.502 0.0 145 1.312 2.200 2.565 0.823 0.0 168 1.750
\$27 - \$26	
S25 - S15 1.616 64.3 25.0	1.205 2.200 0.240 0.0 97 1.516
\$07 - \$06	3.730
S05 - S 04 2.915 115.9 10.0 S04 - Int 1.003 283.6 178.9	
Int - S03 2.860 808.8 180.1	2.604 2.864 1.813 0.0 191 2.325
S03 - ST 3.166 895.3 180.0 S03 - AT 3.808 1076.6 179.7	
AT - S01 4.901 1385.6 179.2 S01 - Outfall 1.927 544.7 176.5	3.054 3.714 1.813 0.0 144 3.426
S28 - S29 1.066 42.4 4.5	0.875 0.990 0.038 0.0 49 0.694
\$29 - \$30	
S31 - S32 1.699 67.6 4.2	0.525  0.614  0.038  0.0  38  0.958
S02-S12 1.395 55.5 6.2	
	Pipeline Schedule
Link Length Slope Dia Link (m) (1:X) (mm) Type	•
S14 - S13 72.447 150.9 375 Circul S13 - S 12 67.971 151.0 375 Circul	lar 5.960 5.000 0.585 5.960 4.520 1.065
S12 - S11 56.942 149.8 375 Circul	lar 5.960 4.070 1.515 5.960 3.690 1.895
\$11 - \$04	
6.000 11.988 64.8 225 Circul	lar 6.200 5.000 0.975 6.200 4.815 1.160
S24 - S23 19.980 137.8 225 Circul	lar 6.200 5.000 0.975 6.200 4.855 1.120
\$23 - \$22	
S21 - S20 34.718 150.9 375 Circul	lar 6.200 4.665 1.160 6.200 4.435 1.390
\$20 - \$19	
\$18-\$17 22.249 153.4 375 Circul \$17 - \$16 36.438 151.8 375 Circul	
S16 - S15 36.399 151.7 375 Circul	
	ia Node DS Dia Node
	50 Manhole S13 1350 Manhole
	150 Manhole S12 1350 Manhole 150 Manhole S11 1350 Manhole
S11 - S04 S11 13	50 Manhole S04 1500 Manhole
	200 Manhole S04 1500 Manhole 200 Manhole S10 1200 Manhole
	200 Manhole S10 1200 Manhole 200 Manhole S23 1200 Manhole
S23 - S22 S23 12	200 Manhole S22 1200 Manhole
	200 Manhole S21 1350 Manhole 150 Manhole S20 1350 Manhole
S20 - S19 S20 13	150 Manhole S19 1350 Manhole 150 Manhole S18 1350 Manhole
S18-S17 S18 13	50 Manhole S17 1350 Manhole
\$17 - \$16	150 Manhole S16 1350 Manhole 150 Manhole S15 1350 Manhole

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Link  S15 - S04 S27 - S26 S26 - S25 S25 - S15 S07 - S06 S06 - S05 S05 - S 04 S04 - Int Int - S03 S03 - ST	Length (m) 35.675 50.744 50.832 65.341 6.011	Slope (1:X) 97.7 211.4	Dia (mm)	Link	eline Sche	<u>dule</u>				
\$15 - \$04 \$27 - \$26 \$26 - \$25 \$25 - \$15 \$07 - \$06 \$06 - \$05 \$05 - \$ 04 \$04 - Int Int - \$03	(m) 35.675 50.744 50.832 65.341 6.011	(1:X) 97.7 211.4	(mm)							
\$27 - \$26 \$26 - \$25 \$25 - \$15 \$07 - \$06 \$06 - \$05 \$05 - \$ 04 \$04 - Int Int - \$03	35.675 50.744 50.832 65.341 6.011	97.7 211.4			US CL	US IL	US Depth	DS CL	DS IL	DS Depth
\$27 - \$26 \$26 - \$25 \$25 - \$15 \$07 - \$06 \$06 - \$05 \$05 - \$ 04 \$04 - Int Int - \$03	50.744 50.832 65.341 6.011	211.4		Type	(m)	(m)	(m)	(m)	(m)	(m)
\$26 - \$25 \$25 - \$15 \$07 - \$06 \$06 - \$05 \$05 - \$ 04 \$04 - Int Int - \$03	50.832 65.341 6.011		375	Circular	6.000	3.425	2.200	6.000	3.060	2.565
S25 - S15 S07 - S06 S06 - S05 S05 - S 04 S04 - Int Int - S03	65.341 6.011		225	Circular	6.250	5.050	0.975	6.210	4.810	1.175
S07 - S06 S06 - S05 S05 - S 04 S04 - Int Int - S03	6.011	211.8	225	Circular	6.210	4.810	1.175	6.000	4.570	1.205
S06 - S05 S05 - S 04 S04 - Int Int - S03		65.7 2.8	225 225	Circular Circular	6.000 11.400	4.570 7.445	1.205 3.730	6.000 8.150	3.575 5.295	2.200 2.630
S05 - S 04 S04 - Int Int - S03	5.793	5.4	225	Circular	8.150	5.295	2.630	6.000	4.225	1.550
S04 - Int Int - S03	18.093	20.3	225	Circular	6.000	4.225	1.550	6.000	3.335	2.440
	22.657	580.9	600	Circular	6.000	2.835	2.565	6.000	2.796	2.604
S03 - ST	18.869	72.6	600	Circular	6.000	2.796	2.604	6.000	2.536	2.864
	2.964	59.3	600	Circular	6.000	2.536	2.864	6.000	2.486	2.914
S03 - AT	5.747	41.1	600	Circular	6.000	2.486	2.914	6.000	2.346	3.054
AT - S01	16.381	24.8	600	Circular	6.000	2.346	3.054	6.000	1.686	3.714
S01 - Outfal		159.3	600	Circular	6.000	1.686	3.714	3.000	1.461	0.939
S28 - S29	32.164	149.6	225	Circular	12.100	11.000	0.875	12.000	10.785	0.990
S29 - S30	9.686	149.0	225	Circular	12.000	10.785	0.990	11.900	10.720	0.955
S30 - S31 S31 - S32	39.393 17.181	145.9 59.5	225 225	Circular Circular	11.900 11.200	10.720 10.450	0.955 0.525	11.200 11.000	10.450 10.161	0.525
S02-S12	20.227	87.9	225	Circular	6.000	4.300	1.475	5.960	4.070	0.614 1.665
302-312	20.221	01.5	223	Circulai	0.000	4.300	1.473	3.300	4.070	1.003
	Link		US	Dia	Node		DS	Dia	Node	
			Node	(mm			Node	(mm)	Type	
	S15 - S04	S15		1350		e S04		1500	Manhole	
	S27 - S26	S27		1500	) Manhol	e S26		1200	Manhole	
	S26 - S25	S26		1200				1200	Manhole	
	S25 - S15	S25		1200				1350	Manhole	
	S07 - S06	S07		1200				1200	Manhole	
	S06 - S05	S06		1200				1200	Manhole	
	S05 - S 04 S04 - Int	S05 S04		1200 1500			contor	1500	Manhole	
	Int - S03		ceptor	1500			ceptor	1500 1500	Manhole Manhole	
	S03 - ST	S03	ceptor	1500			ement Tank	1500	Junction	
	S03 - AT		ement Tar		Junction		nuation Tank		Junction	
	AT - S01	Atten	uation Ta	nk	Junction			2100	Manhole	
	S01 - Outfa	all S01		2100	) Manhol	e Outf	all	1500	Manhole	
	S28 - S29	S28		1500				1200	Manhole	
	S29 - S30	S29		1200				1200	Manhole	
	S30 - S31	S30		1200				1200	Manhole	
	S31 - S32 S02-S12	S31 S02		1200 1500				1200	Manhole	
	302-312	302		1500	) Manhol	e 512		1350	Manhole	
				Mar	nhole Sche	<u>dule</u>				
	Node	CL	Depth		Connecti	ons	Link	IL (=)	Dia	
	S28	(m) 12.100	(m) 1.100	(mm) 1500				(m)	(mm)	
	320	12.100	1.100	1300						
					$\bigcirc$					
						0	S28 - S29	11.000	225	
	S29	12.000	1.215	1200	_0	1	S28 - S29	10.785	225	
					1-0					
					$\circ$					
	000	44.000	4 400	4200		0	S29 - S30	10.785	225	
	S30	11.900	1.180	1200		1	S29 - S30	10.720	225	
					$\rightarrow$					
					1	0	S30 - S31	10.720	225	
	S31	11.200	0.750	1200	0	1	S30 - S31	10.720	225	
	551	11.200	0.730	1200	4	'	300 - 031	10.730	223	
					9					
						0	S31 - S32	10.450	225	
	S32	11.000	0.839	1200		1	S31 - S32	10.161	225	
					$\bigcirc$					
					Ψ					
					1					

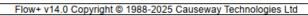


SCM MADES O SMOLENA	Malone O'Re 3-4 Canada Waterford X91 V52K		nsulting E	Engineers	Netwo	storm Drainage Des ork: Storm Network Chong /2025	ign R01.pfd	Page 4		
						anhole Schedule		-		
		Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
		S27	6.250	1.200	1500			()	,	
						<b>⊖</b> **	007 000	F 050	225	
		S26	6.210	1.400	1200	0 1		5.050 4.810	225 225	
						1				
		S25	6.000	1.430	1200	0		4.810 4.570	225 225	
						1-0				
		S15	6.000	2.575	1350	0		4.570 3.575	225 225	
		0.0	0.000	2.010	1000	1-0-2		3.575	375	
		040	0.000	2.205	4250	, <sup>4</sup> 0		3.425	375	
		S16	6.200	2.385	1350	0 ← ◆ ↓	S17 - S16	3.815	375	
		047	0.000	2.445	4250	0		3.815	375	
		S17	6.200	2.145	1350	1 ℃	S18-S17	4.055	375	
		040	0.000	2.000	4250	, 0		4.055	375	
		S18	6.200	2.000	1350	. 1		4.200	375	
		S19	6.200	1.820	1350	0		4.200 4.380	375 375	
		0.0	0.200	1.020	1000	·••	325 515	4.000	0.0	
		S20	6.200	1.765	1350	,' 0		4.380 4.435	375 375	
		020	0.200	1.100	1000	Ġ.,				
		S21	6.200	1.535	1350	<u> </u>		4.435 4.665	375 225	
						•				
		S22	6.200	1.490	1200	0		4.665 4.710	375 225	
						Ø,				
		S23	6.200	1.345	1200	, O		4.710 4.855	225 225	
			5.200		.200	.4	52. 525			
		S24	6.200	1.200	1200	0	S23 - S22	4.855	225	
			_,			9	624 622	E 000	225	
		S04	6.000	3.165	1500	1 1	S05 - S 04		225 225	
						2 3		3.210 3.060	225 375	
						s <sup>/</sup> 4	S15 - S04	3.060	375	
		S10	6.200	1.385	1200	<u> </u>	6.000	2.835 4.815	600 225	
						· • 2		4.815	225	
		S08	6.200	1.200	1200		5.001	4.815	225	
						0	6.000	5.000	225	
			Flow+	v14.0 Cop	yright @	1988-2025 Cause	way Technolog	gies Ltd		



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			wanno	<u>le Schedule</u>				
Node	CL (m)	Depth (m)	Dia (mm)	Connections		Link	IL (m)	Dia (mm)
809	6.200	1.200	1200	$\varphi$				
				F (	)	5.000	5.000	225
07	11.400	3.955	1200	Q,				
	0.450	0.055	4000		)	S07 - S06	7.445	225
06	8.150	2.855	1200	' O.,	1	S07 - S06	5.295	225
		4 775	4000		)	S06 - S05	5.295	225
05	6.000	1.775	1200	<b>'</b> \	1	S06 - S05	4.225	225
					0	S05 - S 04	4.225	225
803	6.000	3.464	1500	<del>О</del> -	1	Int - S03	2.536	600
					0	S03 - ST	2.536	600
801	6.000	4.814	2100	· <del>-</del>	1	AT - S01	1.686	600
S11	E 060	2 270	1250		)	S01 - Outfall	1.686	600
11	5.960	2.270	1350	,_ <del>_</del>	1	S12 - S11	3.690	375
		4.000			0	S11 - S04	3.690	375
12	5.960	1.890	1350		2	S02-S12 S13- S 12	4.070 4.070	225 375
	5.000	4 4 4 4 0	4050		)	S12 - S11	4.070	375
13	5.960	1.440	1350	1	1	S14 - S13	4.520	375
14	5.000	0.000	4250	(	)	S13- S 12	4.520	375
4	5.960	0.960	1350	<b>→</b> •				
		2.054			)	S14 - S13	5.000	375
ttenuation Tank	6.000	3.654		<b>∽</b> ¦	1	S03 - AT	2.346	600
	0.000	4 700	4500	(	)	AT - S01	2.346	600
)2	6.000	1.700	1500	Q				
ettlement Tank	6.000	3.514			1	S02-S12	4.300 2.486	225
ettierrierit Tarik	6.000	3.514		ڼ.	'	S03 - ST	2.400	600
outfall	2 000	4 520	4500		)	S03 - AT	2.486	600
outraii	3.000	1.539	1500	9	1	S01 - Outfall	1.461	600
nterceptor	6.000	3.204	1500	•	1	S04 - Int	2.796	600
				,	0	Int - S03	2.796	600





	Malone O'Regan Consulting Engineers	File: Storm Drainage Design R01.pfd	Page 6
W)	3-4 Canada Street	Network: Storm Network	
MAJONE OVEGAN	3-4 Canada Street Waterford	Brian Chong	
MALONE O NEGOV	X91 V52K	21/07/2025	

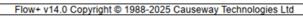
X91 V52K				21/07/20						
	Results for	1 voar 4	+20% C(	Critical	Storm Di	ıration I	owest ma	ee halanc	o· 80 63%	
	ixesuits ioi	ı year '	20 /0 C	Cilicai	Storiii Dt	nation. L	OWESTINA	35 Dalaile	e. 03.03 <i>7</i> 0	
	Node Ev	vent	US	Peak (mins)	Level	Depth (m)	Inflow	Node	Flood	
	15 minute	winter	Node S28	(mins) 10	(m) 11.056	(m) 0.056	(I/s) 5.8	Vol (m³) 0.1373	(m³) 0.0000	
	15 minute		S29	11	10.843	0.058	5.6	0.0655	0.0000	
	15 minute		S30	11	10.777	0.057	5.6	0.0644	0.0000	
	15 minute		S31	12	10.495	0.045	5.5	0.0504	0.0000	
	15 minute 15 minute		S32 S27	12 11	10.204 5.132	0.043 0.082	5.6 10.6	0.0000 0.2384	0.0000	
	15 minute		S26	11	4.948	0.138	24.4	0.3404	0.0000	
	15 minute		S25	11	4.688	0.118	34.8	0.2595	0.0000	
	15 minute		S15	12	3.642	0.217	115.9	0.4467	0.0000	
	15 minute 15 minute		S16 S17	12 11	3.998 4.235	0.183 0.180	73.0 70.0	0.3001 0.3336	0.0000	
	15 minute		S18	11	4.233	0.177	63.6	0.3549	0.0000	
	15 minute		S19	11	4.539	0.159	55.1	0.3574	0.0000	
	15 minute		S20	11	4.592	0.157	44.2	0.4191	0.0000	
	15 minute		S21	11	4.769	0.104	28.2	0.1918	0.0000	
	15 minute 15 minute		S22 S23	10 11	4.841 4.925	0.131 0.070	24.0 8.9	0.3256 0.1142	0.0000	
	15 minute		S24	10	5.044	0.070	3.9	0.0693	0.0000	
	15 minute		S04	11	3.196	0.361	251.0	0.8648	0.0000	
	15 minute		S10	11	4.913	0.098	41.8	0.1104	0.0000	
	15 minute		S08	10	5.088	0.088	18.8	0.2795	0.0000	
	15 minute 15 minute		S09 S07	10 10	5.124 7.471	0.124 0.026	23.7 8.8	0.4613 0.0363	0.0000	
	15 minute		S06	10	5.331	0.026	12.6	0.0363	0.0000	
	15 minute		S05	10	4.276	0.051	12.5	0.0579	0.0000	
	60 minute		S03	45	2.943	0.407	158.2	0.7187	0.0000	
	30 minute		S01	24	2.960	1.274	254.4	4.4116	0.0000	
	15 minute		S11 S12	11	3.810 4.199	0.120 0.129	71.6	0.4063	0.0000	
	15 minute 15 minute		S12	11 12	4.199	0.129	41.0 14.7	0.3724 0.1046	0.0000	
	15 minute	winter	S14	10	5.077	0.077	15.0	0.2680	0.0000	
Link Frank										Disabassa
Link Event	US	winter Lin		DS		Outflow	Velocity		ap Link	•
(Upstream Dep	US th) Node	Lin	ık	DS Nod		Outflow (I/s)	Velocity (m/s)	Flow/Ca	ap Link Vol (m	<sup>3</sup> ) Vol (m³)
	US th) Node		ı <b>k</b> 329	DS		Outflow	Velocity	Flow/Ca	ap Link Vol (m 32 0.25	13) Vol (m3) 11
(Upstream Dep 15 minute winter 15 minute winter 15 minute winter	US th) Node S28 S29 S30	S28 - S S29 - S S30 - S	329 330 331	DS Nod S29 S30 S31		Outflow (I/s) 5.6 5.6 5.5	Velocity (m/s) 0.726 0.708 0.839	0.1: 0.1: 0.1: 0.1:	ap Link Vol (m 32 0.25 33 0.077 29 0.261	1 <sup>3</sup> ) Vol (m <sup>3</sup> ) 11 72 17
(Upstream Dep 15 minute winter 15 minute winter	US th) Node S28 S29 S30	S28 - S S29 - S	329 330 331	DS Nod S29 S30		Outflow (I/s) 5.6 5.6	Velocity (m/s) 0.726 0.708	0.1: 0.1: 0.1: 0.1:	ap Link Vol (m 32 0.25 33 0.077 29 0.261	1 <sup>3</sup> ) Vol (m <sup>3</sup> ) 11 72 17
(Upstream Dep 15 minute winter 15 minute winter 15 minute winter	US th) Node S28 S29 S30 S31	S28 - S S29 - S S30 - S	329 330 331 332	DS Nod S29 S30 S31		Outflow (I/s) 5.6 5.6 5.5	Velocity (m/s) 0.726 0.708 0.839	0.1: 0.1: 0.1: 0.0:	ap Link Vol (m 32 0.25 33 0.077 29 0.261 82 0.093	1 <sup>3</sup> ) Vol (m <sup>3</sup> ) 11 72 17 87 2.7
(Upstream Depi 15 minute winter 15 minute winter 15 minute winter 15 minute winter 15 minute winter 15 minute winter	US Node S28 S29 S30 S31 S27 S26	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S	329 330 331 332 326 325	DS Nod \$29 \$30 \$31 \$32 \$26 \$25		Outflow (I/s) 5.6 5.6 5.5 5.6 10.2 23.7	Velocity (m/s) 0.726 0.708 0.839 1.018 0.540 1.021	Flow/Ca 0.1: 0.1: 0.1: 0.0: 0.0: 0.2: 0.6:	ap Link Vol (m 32 0.25 33 0.077 29 0.261 82 0.093 86 0.975 67 1.180	vol (m²)  Vol (m²)  22  37  2.7  566
(Upstream Depi 15 minute winter 15 minute winter 15 minute winter 15 minute winter 15 minute winter 15 minute winter 15 minute winter	US Node \$28 \$29 \$30 \$31 \$27 \$26 \$25	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S25 - S	329 330 331 332 326 325 315	DS Nod \$29 \$30 \$31 \$32 \$26 \$25 \$15		Outflow (l/s) 5.6 5.6 5.5 5.6 10.2 23.7 33.5	Velocity (m/s) 0.726 0.708 0.839 1.018 0.540 1.021 1.631	Flow/Ci 0.1: 0.1: 0.1: 0.0: 0.0: 0.2: 0.6: 0.5:	ap Link Vol (m 32 0.25; 33 0.07; 29 0.26; 82 0.09; 86 0.97; 67 1.180; 22 1.34;	(*) Vol (m*)  11  72  77  87  2.7  56  51  58
(Upstream Depi 15 minute winter 15 minute winter	US Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S25 - S S15 - S	329 330 331 332 326 325 315 304	DS Nod \$29 \$30 \$31 \$32 \$26 \$25 \$15 \$04		Outflow (I/s) 5.6 5.6 5.5 5.6 10.2 23.7 33.5 116.8	Velocity (m/s) 0.726 0.708 0.839 1.018 0.540 1.021 1.631 1.852	9.1: 0.1: 0.1: 0.0: 0.0: 0.2: 0.6: 0.5: 0.5:	ap Link Vol (m 32 0.25 33 0.077 29 0.261 82 0.093 86 0.975 67 1.186 22 1.345 77 2.245	Vol (m²)  Vol (m²)  22  77  87  2.7  566  511  588
(Upstream Depi 15 minute winter 15 minute winter 15 minute winter 15 minute winter 15 minute winter 15 minute winter 15 minute winter	US Node S28 S29 S30 S31 S27 S26 S25 S15 S16	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S25 - S	329 330 331 332 326 325 315 304	DS Nod \$29 \$30 \$31 \$32 \$26 \$25 \$15		Outflow (l/s) 5.6 5.6 5.5 5.6 10.2 23.7 33.5	Velocity (m/s) 0.726 0.708 0.839 1.018 0.540 1.021 1.631	Flow/Ci 0.1: 0.1: 0.0: 0.0: 0.2: 0.6: 0.5: 0.5: 0.4	ap Link Vol (m 32 0.25 <sup>2</sup> 33 0.077 29 0.26 <sup>2</sup> 82 0.093 86 0.975 67 1.180 22 1.345 77 2.244 48 1.877	Vol (m²)  Vol (m²)  22  73  74  75  76  76  77  77  77
(Upstream Depins of the control of t	US Node S28 S29 S30 S31 S27 S26 S25 S15 S16 S17 S18	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S25 - S S15 - S S16 - S S17 - S S18-S1	629 630 631 632 626 625 515 604 615 616	DS Nod S29 S30 S31 S32 S26 S25 S15 S04 S04 S15 S16 S17		Outflow (Vs) 5.6 5.5 5.6 10.2 23.7 33.5 116.8 72.7 69.5 63.5	Velocity (m/s) 0.726 0.708 0.839 1.018 0.540 1.021 1.631 1.852 1.409 1.325 1.230	Flow/Ci 0.1: 0.1: 0.0: 0.0: 0.2: 0.6: 0.5: 0.5: 0.4: 0.4: 0.3:	ap Link Vol (m 32 0.25 33 0.077 29 0.261 82 0.093 86 0.975 67 1.186 22 1.345 77 2.248 48 1.877 28 1.909 94 1.150	Vol (m³)  11  72  17  37  2.7  56  51  58  67  77  98
(Upstream Depins 15 minute winter 15 min	US Node S28 S29 S30 S31 S27 S26 S25 S15 S16 S17 S18 S19	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S25 - S S15 - S S17 - S S18-S1 S19-S1	329 330 331 332 326 325 315 3604 316 317	DS Nod S29 S30 S31 S32 S26 S25 S15 S04 S15 S16 S17 S18		Outflow (Vs) 5.6 5.6 5.5 5.6 10.2 23.7 33.5 116.8 72.7 69.5 63.5 55.3	Velocity (m/s) 0.726 0.708 0.839 1.018 0.540 1.021 1.631 1.852 1.409 1.325 1.230 1.158	Flow/Ci 0.1: 0.1: 0.1: 0.0: 0.2: 0.6 0.5: 0.5 0.4 0.4: 0.3: 0.3:	ap Link Vol (m 32 0.25' 33 0.077' 29 0.26' 82 0.093' 86 0.97' 67 1.180' 22 1.34' 77 2.24' 48 1.87' 28 1.909 94 1.150' 33 1.24'	Vol (m³)  11  72  17  87  2.7  66  91  97  77  98  90  19
(Upstream Depins in the control of t	US Node S28 S29 S30 S31 S27 S26 S25 S15 S16 S17 S18 S19 S20	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S25 - S S16 - S S17 - S S18-S1 S19-S1 S20 - S	329 330 331 332 326 325 315 304 317 318 319	DS Nod S29 S30 S31 S32 S26 S25 S15 S04 S15 S16 S17 S18 S19		Outflow (I/s) 5.6 5.6 5.5 5.6 10.2 23.7 33.5 116.8 72.7 69.5 63.5 55.3 44.4	Velocity (m/s) 0.726 0.708 0.839 1.018 0.540 1.021 1.631 1.852 1.409 1.325 1.230 1.158 1.008	Flow/Ci 0.1: 0.1: 0.0: 0.2: 0.6: 0.5: 0.4: 0.4: 0.3: 0.3: 0.2:	ap Link Vol (m 32 0.25' 33 0.07' 29 0.26' 82 0.093' 86 0.97' 67 1.180' 22 1.34' 77 2.24' 48 1.87' 228 1.90' 94 1.15' 33 1.24' 67 0.350'	Vol (m²)  11  12  17  17  17  17  17  17  18  19  19  19  19  19  19  19  19  19
(Upstream Depins 15 minute winter 15 min	US Node S28 S29 S30 S31 S27 S26 S25 S15 S16 S16 S17 S18 S19 S20 S21	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S25 - S S15 - S S17 - S S18-S1 S19-S1	329 330 331 332 326 325 315 304 317 318 319	DS Nod S29 S30 S31 S32 S26 S25 S15 S04 S15 S16 S17 S18		Outflow (Vs) 5.6 5.6 5.5 5.6 10.2 23.7 33.5 116.8 72.7 69.5 63.5 55.3	Velocity (m/s) 0.726 0.708 0.839 1.018 0.540 1.021 1.631 1.852 1.409 1.325 1.230 1.158	Flow/Ci 0.1: 0.1: 0.0: 0.0: 0.2: 0.6: 0.5: 0.4: 0.4: 0.3: 0.2: 0.6: 0.5: 0.4- 0.4: 0.3: 0.3: 0.2: 0.1:	ap Link Vol (m 32 0.25	Vol (m²)  11  72  77  77  78  77  77  78  78  78  77  78
(Upstream Depins 15 minute winter 15 min	US Node S28 S29 S30 S31 S27 S26 S25 S15 S16 S17 S18 S19 S20 S21 S22	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S15 - S S16 - S S17 - S S18-S1 S19-S1 S20 - S S21 - S	329 330 331 332 325 325 315 304 315 316 17 18 18	S29 S30 S31 S32 S26 S25 S15 S04 S15 S16 S17 S18 S19 S20		Outflow (I/s) 5.6 5.6 5.5 5.6 10.2 23.7 33.5 116.8 72.7 69.5 63.5 55.3 44.4 28.2	Velocity (m/s) 0.726 0.708 0.839 1.018 0.540 1.021 1.631 1.852 1.409 1.325 1.230 1.158 1.008 0.828	Flow/Ci 0.1: 0.1: 0.1: 0.0: 0.2: 0.6: 0.5: 0.4: 0.4: 0.3: 0.3: 0.2: 0.1: 0.6:	ap Link Vol (m 20.25) 233 0.077 299 0.266 82 0.093 866 0.975 667 1.186 22 1.345 77 2.244 88 1.877 28 1.905 94 1.156 33 1.247 67 0.356 74 1.197 03 0.166	Vol (m²)  11  72  77  77  78  77  78  79  79  79  79  79
(Upstream Depins in the winter 15 minute	US Node S28 S29 S30 S31 S27 S26 S25 S15 S16 S17 S18 S19 S20 S21 S22 S23 S24	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S25 - S S15 - S S16 - S S17 - S S18-S1 S19-S1 S21 - S S21 - S S21 - S S22 - S S23 - S	329 330 331 332 326 325 315 315 316 317 18 319 320	S29 S30 S31 S32 S26 S25 S15 S04 S15 S04 S15 S16 S17 S18 S19 S20 S20 S21 S22 S23	e	Outflow (I/s) 5.6 5.6 5.5 5.6 10.2 23.7 33.5 116.8 72.7 69.5 63.5 55.3 44.4 28.2 23.5 8.7 3.8	Velocity (m/s) 0.726 0.708 0.839 1.018 0.540 1.021 1.631 1.852 1.409 1.325 1.230 1.158 1.008 0.828 1.123 0.507 0.484	Flow/Ci  0.1: 0.1: 0.0: 0.2: 0.6: 0.5: 0.4: 0.4: 0.3: 0.2: 0.1: 0.6: 0.2: 0.1: 0.6: 0.2: 0.1: 0.6: 0.3: 0.2: 0.1: 0.6: 0.2: 0.1: 0.6: 0.2: 0.0:	ap Link Vol (m 32 0.25 33 0.077 29 0.261 82 0.093 86 0.975 67 1.186 22 1.345 48 1.877 22 2.245 48 1.877 28 1.909 94 1.150 33 1.247 67 0.350 74 0.166 13 0.166 13 0.405 87 0.155	Vol (m³)  11  72  17  87  2.7  66  01  88  97  77  98  90  19  18  14  67  60  99
(Upstream Depins in the winter 15 minute	US Node S28 S29 S30 S31 S27 S26 S25 S15 S16 S17 S18 S19 S20 S21 S22 S23 S24 S04	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S25 - S S15 - S S16 - S S17 - S S18 - S1 S19 - S1 S20 - S S21	329 330 331 332 326 325 315 315 316 317 18 319 320	DS Nod S29 S30 S31 S32 S26 S25 S15 S04 S15 S16 S17 S18 S19 S20 S21 S22 S23 Intercepto	e	Outflow (Vs) 5.6 5.6 5.5 5.6 10.2 23.7 33.5 116.8 72.7 69.5 63.5 55.3 44.4 28.2 23.5 8.7 3.8 249.6	Velocity (m/s) 0.726 0.708 0.839 1.018 0.540 1.021 1.631 1.852 1.409 1.325 1.230 1.158 1.008 0.828 1.123 0.507 0.484 1.695	Flow/Ci 0.1: 0.1: 0.0: 0.2: 0.6 0.5: 0.4: 0.4: 0.3: 0.2: 0.1: 0.60 0.2: 0.10 0.2: 0.10 0.20 0.10 0.20 0.20 0.10	ap Link Vol (m 32 0.25 33 0.077 29 0.261 82 0.093 86 0.975 67 1.186 22 1.345 77 2.245 48 1.877 28 1.909 94 1.150 33 1.247 67 0.350 74 1.191 03 0.166 13 0.405 87 0.158 80 3.345	Vol (m³)  11  72  17  87  2.7  66  61  68  89  77  77  98  100  19  88  14  16  17  18  18  18  18  18  18  18  18  18
(Upstream Depins in minute winter 15 min	US Node S28 S29 S30 S31 S27 S26 S25 S15 S16 S16 S17 S18 S19 S20 S21 S22 S23 S24 S04 S10	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S15 - S S16 - S S17 - S S18 - S S18 - S S19 - S S19 - S S10 - S S21 - S S21 - S S21 - S	329 330 331 332 326 325 315 315 316 317 18 319 320	\$29 \$30 \$31 \$32 \$26 \$25 \$15 \$04 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23 Interceptor	e	Outflow (I/s) 5.6 5.6 5.5 5.6 10.2 23.7 33.5 116.8 72.7 69.5 63.5 63.5 44.4 28.2 23.5 8.7 3.8 249.6 41.4	Velocity (m/s) 0.726 0.708 0.839 1.018 0.540 1.021 1.631 1.852 1.409 1.325 1.230 1.158 1.008 0.828 1.123 0.507 0.484 1.695 2.566	Flow/Ci 0.1: 0.1: 0.0: 0.0: 0.2: 0.6: 0.5: 0.4: 0.4: 0.3: 0.2: 0.1: 0.6: 0.2 0.0: 0.8: 0.3:	ap Link Vol (m 32 0.25° 33 0.07° 329 0.26° 82 0.09° 386 0.97° 41.18° 322 1.34° 48 1.87° 328 1.90° 33 1.24° 48 1.87° 33 0.16° 43 0.45° 88 0 3.34° 70 0.56° 88 0 3.34° 70 0.56° 32 0.56° 32 0.56° 33 0.56°	Vol (m³)  11  12  17  17  17  18  17  18  19  19  19  19  19  19  19  19  19
(Upstream Depins in minute winter 15 min	US Node S28 S29 S30 S31 S27 S26 S25 S15 S16 S16 S17 S18 S29 S20 S21 S22 S23 S24 S04 S10 S08	S28 - S S29 - S S30 - S S31 - S S26 - S S25 - S S15 - S S17 - S S18 - S1 S20 - S S21 - S 1.002 S23 - S S24 - S S25 - S	329 330 331 332 326 325 315 315 316 317 18 319 320	DS Nod S29 S30 S31 S32 S26 S25 S15 S04 S15 S16 S17 S18 S19 S20 S21 S22 S23 Intercepto	e	Outflow (Vs) 5.6 5.6 5.5 5.6 10.2 23.7 33.5 116.8 72.7 69.5 63.5 55.3 44.4 28.2 23.5 8.7 3.8 249.6	Velocity (m/s) 0.726 0.708 0.839 1.018 0.540 1.021 1.631 1.852 1.409 1.325 1.230 0.1158 1.008 0.828 1.123 0.507 0.484 4.1695 2.566 1.208	Flow/Ci 0.1: 0.1: 0.1: 0.0: 0.2: 0.6: 0.5: 0.4 0.4: 0.3: 0.2: 0.6: 0.2 0.0: 0.8: 0.3: 0.2: 0.8: 0.3: 0.2:	ap Link Vol (m 32 0.25 6.23 0.077 2.24 6.22 1.34 6.22 1.34 6.22 1.34 6.33 1.24 6.33 0.166 7.3 1.24 6.3 1.3 0.166 7.3 1.3 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1	Vol (m²)  11  12  17  17  17  18  17  18  19  19  19  19  19  19  19  19  19
(Upstream Depins in minute winter 15 min	US Node S28 S29 S30 S31 S27 S26 S25 S15 S16 S17 S18 S19 S20 S21 S22 S23 S24 S04 S10 S08 S09	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S15 - S S16 - S S17 - S S18 - S S18 - S S19 - S S19 - S S10 - S S21 - S S21 - S S21 - S	329 330 331 332 326 325 3615 3616 17 8819 320 322 323 nt	S29 S30 S31 S32 S26 S25 S15 S04 S15 S16 S17 S18 S19 S20 S21 S22 S23 Interceptor S04 S10	e	Outflow (I/s) 5.6 5.6 5.5 5.6 10.2 23.7 33.5 116.8 72.7 69.5 63.5 55.3 44.4 28.2 23.5 8.7 3.8 249.6 41.4 18.6	Velocity (m/s) 0.726 0.708 0.839 1.018 0.540 1.021 1.631 1.852 1.409 1.325 1.230 1.158 1.008 0.828 1.123 0.507 0.484 1.695 2.566	Flow/Ci 0.1: 0.1: 0.1: 0.0: 0.2: 0.6: 0.5: 0.4: 0.4: 0.3: 0.2: 0.1: 0.6: 0.2 0.0: 0.8: 0.3: 0.2: 0.0: 0.3: 0.2: 0.5: 0.5: 0.5: 0.5: 0.5: 0.5: 0.5: 0.5	ap Link Vol (m 32 0.257 32 0.077 32 0.267 32 0.093 33 0.77 22 448 1.877 2.244 48 1.877 2.244 1.156 33 1.241 67 0.356 74 1.190 0.3 0.166 13 0.405 87 0.156 87	Vol (m³)  11  72  17  87  2.7  66  61  68  89  77  98  90  98  144  67  68  68  68  68  68  68  68  68  68
(Upstream Depins in the winter 15 minute	US Node	S28 - S S29 - S S30 - S S31 - S S26 - S S25 - S S15 - S S16 - S S17 - S S18-S1 S19-S1 S20 - S S21 - S S10 - S S21 - S S24 - S S24 - S S04 - II 5.001 6.000 S07 - S S06 - S S06 - S	329 330 331 332 326 325 315 304 315 316 317 839 320 322 323 311	DS Nod S29 S30 S31 S32 S26 S25 S15 S04 S15 S16 S17 S18 S20 S21 S22 S23 Interceptor S04 S10 S06 S05	e	Outflow (I/s) 5.6 5.6 5.5 5.6 10.2 23.7 33.5 116.8 72.7 69.5 63.5 55.3 44.4 28.2 23.5 8.7 3.8 249.6 41.4 18.6 23.2 8.8 12.5	Velocity (m/s) 0.726 0.708 0.839 1.018 0.540 1.021 1.631 1.852 1.409 1.325 1.230 1.158 1.008 0.828 1.123 0.507 0.484 1.695 2.566 1.208 1.192 2.709 2.334	Flow/Ci  0.1: 0.1: 0.0: 0.2: 0.6: 0.5: 0.4: 0.3: 0.2: 0.1: 0.6: 0.5: 0.5: 0.4: 0.3: 0.2: 0.1: 0.6: 0.2: 0.0: 0.8: 0.3: 0.2: 0.5: 0.0: 0.8: 0.3: 0.2: 0.5: 0.0: 0.8: 0.3: 0.2: 0.5: 0.0: 0.8: 0.3: 0.2: 0.5: 0.0: 0.0: 0.0: 0.0: 0.0: 0.0:	ap Link Vol (m 32 0.25: 33 0.077: 29 0.26: 82 0.093 86 0.97: 67 1.18( 22 1.34: 22 1.34: 24 1.877 28 1.90: 94 1.15( 33 1.24' 67 0.35( 67 0.35( 67 0.35( 67 0.35( 67 0.35( 67 0.55( 67 0.55( 67 0.55( 67 0.55( 68 0.53( 68 0.53( 68 0.53( 68 0.53( 68 0.53( 68 0.53( 68 0.53( 68 0.53( 68 0.53( 68 0.53( 68 0.53( 68 0.53( 68 0.53( 68 0.53( 68 0.03( 68 0.	Vol (m³)  11  72  17  73  75  66  11  77  78  77  78  88  90  19  88  86  67  77  77  88  60  19  88  66  61  64  75  66  66  66  66  66  66  66  66  66
(Upstream Depins in minute winter 15 min	US Node S28 S29 S30 S31 S27 S26 S25 S15 S16 S17 S18 S19 S20 S21 S22 S23 S24 S04 S10 S08 S09 S07 S06 S05	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S25 - S S15 - S S16 - S S17 - S S18 - S1 S19 - S1 S20 - S S21 - S S21 - S S21 - S S24 - S S24 - S S04 - II 5.001 6.000 5.0	329 330 331 332 326 325 315 315 316 317 83 319 320 322 323 311	S29 S30 S31 S32 S26 S25 S15 S04 S15 S16 S17 S18 S19 S20 S21 S22 S23 Interceptor S04 S10 S10 S10 S10 S10 S10 S10 S10 S10 S10	e	Outflow (Vs) 5.6 5.6 5.5 5.6 10.2 23.7 33.5 116.8 72.7 69.5 63.5 55.3 44.4 28.2 23.5 8.7 3.8 249.6 41.4 18.6 23.2 8.8 12.5 12.4	Velocity (m/s) 0.726 0.708 0.839 1.018 0.540 1.021 1.631 1.852 1.409 1.325 1.230 0.828 1.123 0.507 0.484 1.695 2.566 1.208 1.192 2.709 2.334 1.876	Flow/Ci  0.1: 0.1: 0.0: 0.2: 0.6: 0.5: 0.4: 0.3: 0.2: 0.1: 0.6: 0.2: 0.1: 0.6: 0.2: 0.0: 0.2: 0.0: 0.2: 0.0: 0.0: 0.2: 0.0: 0.0	ap Link Vol (m 32 0.25; 33 0.077; 29 0.26; 82 0.093; 86 0.97; 67 1.18; 22 1.34; 48 1.87; 28 1.90; 94 1.15; 33 1.24; 67 0.35; 74 1.91; 30 0.16; 87 0.15; 80 3.34; 70 0.56; 87 0.18; 87 0.15; 88 0.15; 87 0.15; 87 0.15; 88 0.15; 87 0.15; 88 0.15; 87 0.15; 88 0.15; 87 0.15; 88 0.01; 89 0	Vol (m³)  11  72  17  73  75  66  61  77  78  78  78  78  78  78  78  78  7
(Upstream Depins in minute winter 15 min	US Node S28 S29 S30 S31 S27 S26 S25 S15 S16 S16 S17 S18 S19 S20 S21 S22 S23 S24 S04 S10 S08 S09 S07 S06 S05 S03	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S15 - S S16 - S S17 - S S18 - S S18 - S S18 - S S18 - S S19 - S S21 - S S22 - S S23 - S S23 - S S24 - S S25 - S S318 - S S3	329 330 331 332 326 325 315 304 315 316 317 18 319 320 322 323 311 332 326 327 331 332 332 332 332 333 332 333 332 333 333 334 335 336 337 337 337 337 337 337 337	S29 S30 S31 S32 S26 S25 S15 S04 S15 S16 S17 S18 S19 S20 S21 S22 S23 Interceptor S04 S10 S10 S05 S04 S10 S10 S10 S10 S10 S10 S10 S10 S10 S10	e	Outflow (I/s) 5.6 5.6 5.5 5.6 10.2 23.7 33.5 116.8 72.7 69.5 63.5 55.3 44.4 28.2 23.5 8.7 3.8 249.6 41.4 18.6 23.2 8.8 12.5 12.4 177.1	Velocity (m/s) 0.726 0.708 0.839 1.018 0.540 1.021 1.631 1.852 1.409 1.325 1.230 0.507 0.484 1.695 2.566 1.208 1.192 2.709 2.334 1.876 2.245	Flow/Ci 0.1: 0.1: 0.0: 0.2: 0.6: 0.5: 0.4 0.4: 0.3: 0.2: 0.6: 0.2 0.0: 0.8: 0.3: 0.2: 0.5: 0.0: 0.8: 0.1: 0.6: 0.1: 0.6: 0.1: 0.6: 0.1: 0.6: 0.1: 0.6: 0.1: 0.6: 0.1: 0.6: 0.1: 0.6: 0.1: 0.6: 0.1: 0.6: 0.1: 0.6: 0.1: 0.6: 0.1: 0.6: 0.1: 0.6: 0.1: 0.1:	ap Link Vol (m 32 0.25	Vol (m³)  11  12  17  17  17  17  17  18  17  18  19  19  19  19  19  19  19  19  19
(Upstream Depins in minute winter 15 min	US Node	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S15 - S S16 - S S17 - S S18 - S1 S20 - S S21 - S S21 - S S21 - S S21 - S S21 - S S22 - S S23 - S S23 - S S24 - S S25 - S S25 - S S26 - S S27 - S S27 - S S27 - S S27 - S S28 - S S28 - S S29 - S S29 - S S29 - S S21 - S S22 - S S23 - S S24 - S S24 - S S25 - S S26 - S S27 - S S27 - S S28 - S S28 - S S29 - S S29 - S S29 - S S29 - S S29 - S S20 - S S21 -	329 330 331 332 326 325 315 304 315 316 37 3819 320 322 323 331 332 345 357 367 367 367 367 367 367 367 36	S29 S30 S31 S32 S26 S25 S15 S04 S15 S16 S17 S18 S19 S20 S21 S22 S23 Interceptor S04 S10 S10 S10 S10 S10 S10 S10 S10 S10 S10	e	Outflow (I/s) 5.6 5.6 5.5 5.6 10.2 23.7 33.5 116.8 72.7 69.5 63.5 55.3 44.4 28.2 23.5 8.7 3.8 249.6 41.4 18.6 23.2 8.8 12.5 12.4 177.1 38.9	Velocity (m/s) 0.726 0.708 0.839 1.018 0.540 1.021 1.631 1.852 1.409 1.325 1.230 0.507 0.484 1.695 2.566 1.208 1.192 2.709 2.334 1.876 2.245	Flow/Ci 0.1: 0.1: 0.1: 0.0: 0.2: 0.6: 0.5: 0.4: 0.4: 0.3: 0.2: 0.6: 0.2: 0.0: 0.8: 0.3: 0.2: 0.5: 0.0: 0.1: 0.6: 0.2: 0.0: 0.8: 0.3: 0.2: 0.5: 0.0: 0.0: 0.1: 0.1: 0.1: 0.1: 0.0:	ap Link Vol (m 20.25) 233 0.077 229 0.266 82 0.093 86 0.975 86 1.186 77 2.244 88 1.877 2.84 1.903 0.166 74 1.191 0.3 0.166 74 1.191 0.3 0.166 87 0.158 80 3.345 70 0.566 87 0.184 46 0.537 28 0.015 66 0.031 0.7 0.115 98 0.647 1 1.235	Vol (m³)  11  72  17  87  2.7  66  61  68  89  77  78  88  90  18  18  18  18  18  18  18  18  18  1
(Upstream Depins in minute winter 15 min	US Node	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S15 - S S16 - S S17 - S S18 - S S18 - S S18 - S S18 - S S19 - S S21 - S S22 - S S23 - S S23 - S S24 - S S25 - S S318 - S S3	6 k 6 29 6 330 6 331 6 332 6 26 6 35 5 6 304 6 315 6 320 6 322 6 323 6 3 6 3 6 3 6 5 6 5 6 5 6 5 6 5 6 5 6	\$29 \$30 \$31 \$32 \$26 \$25 \$15 \$04 \$15 \$18 \$19 \$20 \$21 \$22 \$23 Interceptor \$04 \$10 \$06 \$05 \$04 \$ettlemer Outfall	e	Outflow (I/s) 5.6 5.6 5.5 5.6 10.2 23.7 33.5 116.8 72.7 69.5 63.5 55.3 44.4 28.2 23.5 8.7 3.8 249.6 41.4 18.6 23.2 8.8 12.5 12.4 177.1	Velocity (m/s) 0.726 0.708 0.839 1.018 0.540 1.021 1.631 1.852 1.409 1.325 1.230 0.507 0.484 1.695 2.566 1.208 1.192 2.709 2.334 1.876 2.245	Flow/Ci  0.1: 0.1: 0.0: 0.0: 0.2: 0.6: 0.5: 0.4: 0.4: 0.3: 0.2: 0.6: 0.5: 0.5: 0.6: 0.7: 0.6: 0.2: 0.0: 0.8: 0.3: 0.2: 0.6: 0.0: 0.8: 0.3: 0.1: 0.1: 0.1: 0.1: 0.1: 0.1: 0.1: 0.1	ap Link Vol (m 32 0.25 6.25 0.097 0.26 6.22 1.34 6.25 0.33 0.16 6.22 1.34 6.25 0.35 0.35 0.16 6.25 0.35 0.25 0.35 0.25 0.35 0.25 0.35 0.25 0.35 0.25 0.35 0.25 0.35 0.25 0.35 0.25 0.35 0.25 0.25 0.25 0.25 0.25 0.25 0.25 0.2	Vol (m³)  11  72  17  87  2.7  66  61  68  89  77  78  88  90  99  98  144  67  68  68  68  68  68  68  68  68  68
(Upstream Depins in minute winter 15 min	US Node	S28 - S S29 - S S30 - S S31 - S S26 - S S25 - S S16 - S S17 - S S18 - S1 S19 - S1 S20 - S S21 - S 1.002 S23 - S S04 - II 5.001 6.000 S07 - S S05 - S S05 - S S05 - S S15 - S S17 - S S18 - S1 S19 - S1 S20 - S S21 - S	618 629 6330 6331 6332 636 6325 6315 6315 6315 6316 6317 6320 6322 6323 6316 6317 6316 6317 6311 6311 6311 631	DS Nod S29 S30 S31 S32 S26 S25 S15 S04 S15 S16 S17 S18 S19 S20 S21 S22 S23 Interceptor S04 S10 S06 S05 S04 Settlemer Outfall S04 S11 S12	e	Outflow (I/s) 5.6 5.6 5.5 5.6 10.2 23.7 33.5 16.8 72.7 69.5 63.5 55.3 44.4 28.2 23.5 8.7 3.8 249.6 41.4 18.6 23.2 8.8 12.5 12.4 177.1 38.9 71.8 39.8 13.9	Velocity (m/s) 0.726 0.708 0.839 1.018 0.540 1.021 1.631 1.852 1.409 1.325 1.230 1.158 1.008 0.828 1.123 0.507 0.484 1.695 2.566 1.208 1.192 2.709 2.334 1.876 2.245 1.124 2.276 1.272 0.588	Flow/Ci  0.1: 0.1: 0.0: 0.2: 0.6: 0.5: 0.4: 0.4: 0.3: 0.6: 0.6: 0.6: 0.5: 0.1: 0.6: 0.2: 0.1: 0.6: 0.2: 0.1: 0.6: 0.2: 0.5: 0.0: 0.8: 0.3: 0.2: 0.1: 0.6: 0.2: 0.5: 0.0: 0.0: 0.0: 0.0: 0.0: 0.0: 0.0	ap Link Vol (m 32 0.25: 33 0.077: 29 0.26: 82 0.093: 86 0.975: 67 1.186: 22 1.345: 77 2.244 81 1.877 28 1.909 94 1.150 33 1.247 667 0.350 67 0.155 80 0.340 70 0.566 70 0.184 46 0.537 28 0.019 56 0.031 07 0.115 98 0.642 98 0.642 99 0.712 44 1.823 99 0.712 44 1.823 85 1.645	Vol (m³)  11  12  17  17  17  18  17  18  17  18  18  18
(Upstream Depins in minute winter 15 minute winter 30 minute winter 30 minute winter 15 min	US Node	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S15 - S S16 - S S18 - S S18 - S S19 - S S21 - S S24 - S S24 - S S04 - S S04 - S S04 - S S05 - S S06 - S S06 - S S07 - S S07 - S S07 - S S08 - S S08 - S S08 - S S09 - S S09 - S S09 - S S01 - S	618 629 6330 6331 6332 636 6325 6315 6315 6315 6316 6317 6320 6322 6323 6316 6317 6316 6317 6311 6311 6311 631	DS Nod S29 \$30 \$31 \$32 \$26 \$25 \$515 \$04 \$15 \$16 \$17 \$18 \$22 \$23 Interceptor \$04 \$10 \$06 \$05 \$04 \$11 \$21 \$21 \$21 \$22 \$23 \$10 \$21 \$22 \$23 \$10 \$20 \$21 \$22 \$23 \$10 \$20 \$21 \$22 \$23 \$10 \$20 \$21 \$22 \$23 \$10 \$20 \$21 \$22 \$23 \$10 \$20 \$21 \$21 \$21 \$21 \$21 \$21 \$21 \$21 \$21 \$21	e	Outflow (I/s) 5.6 5.6 5.5 5.6 10.2 23.7 33.5 116.8 72.7 69.5 63.5 55.3 44.4 28.2 23.5 8.7 3.8 249.6 41.4 18.6 23.2 8.8 12.5 12.4 177.1 38.9 71.8 39.8	Velocity (m/s) 0.726 0.708 0.839 1.018 0.540 1.021 1.631 1.852 1.409 1.325 1.230 1.158 1.008 0.828 1.123 0.507 0.484 1.695 2.566 1.208 1.192 2.709 2.334 1.876 2.245 1.124 2.276 1.272	Flow/Ci  0.1: 0.1: 0.0: 0.2: 0.6: 0.5: 0.4: 0.4: 0.3: 0.6: 0.6: 0.6: 0.5: 0.1: 0.6: 0.2: 0.1: 0.6: 0.2: 0.1: 0.6: 0.2: 0.5: 0.0: 0.8: 0.3: 0.2: 0.1: 0.6: 0.2: 0.5: 0.0: 0.0: 0.0: 0.0: 0.0: 0.0: 0.0	ap Link Vol (m 32 0.25: 33 0.077: 29 0.26: 82 0.093: 86 0.975: 67 1.186; 22 1.345: 77 2.245: 48 1.877; 28 1.909 94 1.150; 33 1.247: 67 0.350; 67 0.155: 80 3.345: 70 0.566; 87 0.156; 88 0.156; 88 0.156; 89 0.156; 98 0.646; 98 0.647; 98 0.648; 99 0.712 44 1.232; 99 0.712 44 1.822; 85 1.645;	Vol (m³)  11  12  17  17  17  18  17  18  17  18  18  18



MOR OREGAN	Malone O'Regan Consulting Engineers 3-4 Canada Street Waterford X91 V52K	File: Storm Drainage Design R01.pfd Network: Storm Network Brian Chong 21/07/2025	Page 7
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Results for 1 year +20% CC Critical Storm Duration. Lowest mass balance: 89.63%											
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (I/s)	Node Vol (m³)	Flood (m³)				
60 minute winter	Attenuation Tank	53	2.911	0.565	380.9	113.0431	0.0000				
15 minute winter	S02	10	4.357	0.057	7.9	0.1341	0.0000				
60 minute winter	Settlement Tank	49	2.962	0.476	177.1	12.0407	0.0000				
15 minute summer	Outfall	11	1.568	0.107	39.3	0.0000	0.0000				
15 minute winter	Interceptor	11	3.058	0.262	252.8	0.4997	0.0000				

	Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (I/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
ı	60 minute winter	Attenuation Tank	AT - S01	S01	234.3	0.919	0.169	4.5615	
ı	15 minute winter	S02	S02-S12	S12	7.8	0.543	0.140	0.3150	
ı	60 minute winter	Settlement Tank	S03 - AT	Attenuation Tank	348.9	2.817	0.324	1.4645	
	15 minute winter	Interceptor	Int - S03	S03	252.1	2.225	0.312	2.1381	





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	Waterford X91 V52K				21/07/2						
								_			
	Re	sults for	30 year -	+20% C	C Critical	Storm Du	ration. L	owest ma	ss balance	e: 89.63%	
		Node E	vent	US	Peak	Level	Depth	Inflow	Node	Flood	
		C minute :	winter	Node	(mins)		(m)	(I/s)	Vol (m³)	(m³)	
		5 minute 1		S28 S29	10 11	11.086 10.875	0.086	12.8 12.6	0.2100 0.1016	0.0000	
		5 minute		S30	11	10.807	0.087	12.5	0.0981	0.0000	
		5 minute		S31	11	10.518	0.068	12.5	0.0766	0.0000	
		5 minute		S32	12		0.065	12.4	0.0000	0.0000	
		5 minute		S27	12		0.337	23.5	0.9835	0.0000	
		5 minute 1 5 minute 1		S26 S25	12 12		0.516 0.424	51.0 70.1	1.2744 0.9371	0.0000 0.0000	
		5 minute		S15	11	4.067	0.642	227.6	1.3219	0.0000	
	1	5 minute	winter	S16	12	4.279	0.464	149.8	0.7594	0.0000	
		5 minute		S17	12		0.430	152.0	0.7978	0.0000	
		5 minute		S18	12		0.399	138.7	0.8000	0.0000	
		5 minute 1 5 minute 1		S19 S20	12 11	4.672 4.706	0.292 0.271	120.1 97.0	0.6571 0.7243	0.0000	
		5 minute		S21	11	4.822	0.157	61.2	0.2881	0.0000	
		5 minute		S22	11	4.966	0.256	51.2	0.6362	0.0000	
		5 minute		S23	11	4.993	0.138	20.0	0.2245	0.0000	
		5 minute		S24	10	5.067	0.067	8.7	0.1038	0.0000	
		80 minute 5 minute		S04 S10	144 11	3.985 4.967	1.150 0.152	168.9 89.9	2.7572 0.1719	0.0000	
		5 minute		S08	10	5.148	0.148	41.9	0.4702	0.0000	
	1	5 minute	winter	S09	11	5.293	0.293	52.6	1.0861	0.0000	
		5 minute		S07	10	7.482	0.037	19.6	0.0533	0.0000	
		5 minute		S06	10	5.350 4.301	0.055	28.0	0.0717 0.0856	0.0000	
		5 minute : 80 minute		S05 S03	10 152		0.076 1.897	26.5 934.3	3.3513	0.0000	
		20 minute		S01	104	3.948	2.262	249.0	7.8357	0.0000	
	1	20 minute	winter	S11	106	3.985	0.295	62.6	0.9941	0.0000	
		5 minute		S12	11	4.279	0.209	92.8	0.6035	0.0000	
		5 minute 1 5 minute 1		S13 S14	11 10	4.631 5.116	0.111 0.116	32.5 33.3	0.1584 0.4034	0.0000 0.0000	
	ink Event	US Node	Lin	k	DS		Outflow	Velocity	Flow/Ca		Discharge
(Ups	ink Event tream Depth) inute winter	Node			Nod		Outflow (I/s)	Velocity (m/s)	Flow/Ca	Vol (m³)	Discharge Vol (m³)
( <b>Ups</b> 15 m	tream Depth)		S28 - S S29 - S	29			Outflow	Velocity		Vol (m³) 6 0.4559	
( <b>Ups</b> 15 m 15 m 15 m	tream Depth) inute winter inute winter inute winter	Node \$28 \$29 \$30	S28 - S S29 - S S30 - S	29 30 31	\$29 \$30 \$31		Outflow (I/s) 12.6 12.5 12.5	Velocity (m/s) 0.886 0.869 1.042	0.29 0.29 0.29	Vol (m³) 6 0.4559 5 0.1398 2 0.4753	Vol (m³)
( <b>Ups</b> 15 m 15 m 15 m	tream Depth) inute winter inute winter	Node S28 S29	S28 - S S29 - S	29 30 31	Nod S29 S30		Outflow (I/s) 12.6 12.5	Velocity (m/s) 0.886 0.869	Flow/Ca 0.29 0.29	Vol (m³) 6 0.4559 5 0.1398 2 0.4753	
(Ups 15 m 15 m 15 m 15 m	tream Depth) inute winter inute winter inute winter inute winter inute winter	Node \$28 \$29 \$30 \$31	\$28 - \$ \$29 - \$ \$30 - \$ \$31 - \$	29 30 31 32	\$29 \$30 \$31 \$32 \$26		Outflow (I/s) 12.6 12.5 12.5 12.4	Velocity (m/s) 0.886 0.869 1.042 1.271	0.29 0.29 0.29 0.29 0.18	Vol (m³) 6 0.4559 5 0.1398 2 0.4753 3 0.1671 6 2.0181	Vol (m³)
(Ups 15 m 15 m 15 m 15 m 15 m	tream Depth) inute winter	Node \$28 \$29 \$30 \$31 \$27 \$26	\$28 - \$ \$29 - \$ \$30 - \$ \$31 - \$ \$27 - \$ \$26 - \$	29 30 31 32 26 25	\$29 \$30 \$31 \$32 \$26 \$25		Outflow (I/s) 12.6 12.5 12.5 12.4 20.5 43.9	Velocity (m/s) 0.886 0.869 1.042 1.271 0.611 1.105	0.29 0.29 0.29 0.18 0.57 1.23	Vol (m³) 6 0.4559 5 0.1398 2 0.4753 3 0.1671 6 2.0181 6 2.0216	Vol (m³)
(Ups 15 m 15 m 15 m 15 m 15 m 15 m	tream Depth) inute winter	Node \$28 \$29 \$30 \$31 \$27 \$26 \$25	\$28 - \$ \$29 - \$ \$30 - \$ \$31 - \$ \$27 - \$ \$26 - \$ \$25 - \$	29 30 31 32 26 25	\$29 \$30 \$31 \$32 \$26 \$25 \$15		Outflow (I/s) 12.6 12.5 12.5 12.4 20.5 43.9 62.3	Velocity (m/s) 0.886 0.869 1.042 1.271 0.611 1.105 1.766	0.29 0.29 0.29 0.18 0.57 1.23 0.97	Vol (m³) 6 0.4559 5 0.1398 2 0.4753 3 0.1671 6 2.0181 6 2.0216 0 2.5987	Vol (m³)
(Ups 15 m 15 m 15 m 15 m 15 m 15 m 15 m	tream Depth) inute winter	Node \$28 \$29 \$30 \$31 \$27 \$26	\$28 - \$ \$29 - \$ \$30 - \$ \$31 - \$ \$27 - \$ \$26 - \$	29 30 31 32 26 25 15	\$29 \$30 \$31 \$32 \$26 \$25		Outflow (I/s) 12.6 12.5 12.5 12.4 20.5 43.9	Velocity (m/s) 0.886 0.869 1.042 1.271 0.611 1.105	0.29 0.29 0.29 0.18 0.57 1.23	Vol (m³) 6 0.4559 5 0.1398 2 0.4753 3 0.1671 6 2.0181 6 2.0216 0 2.5987 2 3.9348	Vol (m³)
15 m 15 m 15 m 15 m 15 m 15 m 15 m 15 m	tream Depth) inute winter	Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15	\$28 - \$ \$29 - \$ \$30 - \$ \$31 - \$ \$27 - \$ \$26 - \$ \$25 - \$ \$15 - \$	29 30 31 32 26 25 15 04 15	\$29 \$30 \$31 \$32 \$26 \$25 \$15 \$04		Outflow (I/s) 12.6 12.5 12.5 12.4 20.5 43.9 62.3 225.1	Velocity (m/s) 0.886 0.869 1.042 1.271 0.611 1.105 1.766 2.043	0.29 0.29 0.29 0.18 0.57 1.23 0.97	Vol (m³) 6 0.4559 5 0.1398 2 0.4753 3 0.1671 6 2.0181 6 2.0216 0 2.5987 2 3.9348 3 4.0147	Vol (m³)
15 m 15 m 15 m 15 m 15 m 15 m 15 m 15 m	tream Depth) inute winter	Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17 \$18	\$28 - \$ \$29 - \$ \$30 - \$ \$31 - \$ \$27 - \$ \$26 - \$ \$25 - \$ \$15 - \$ \$16 - \$ \$17 - \$ \$18-\$1	29 30 31 32 26 25 15 04 15 16 7	\$29 \$30 \$31 \$32 \$26 \$25 \$15 \$04 \$15 \$16 \$17		Dutflow (I/s) 12.6 12.5 12.4 20.5 43.9 62.3 225.1 152.9 141.5 137.5	Velocity (m/s) 0.886 0.869 1.042 1.271 0.611 1.105 1.766 2.043 1.502 1.504 1.388	0.29 0.29 0.29 0.18 0.57 1.23 0.97 1.11 0.94 0.87	Vol (m³) 6 0.4559 5 0.1398 2 0.4753 3 0.1671 6 2.0181 6 2.0216 0 2.5987 2 3.9348 3 4.0147 3 4.0190 3 2.4540	Vol (m³)
(Ups 15 m 15 m 15 m 15 m 15 m 15 m 15 m 15 m	tream Depth) inute winter	Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17 \$18 \$19	\$28 - \$ \$29 - \$ \$30 - \$ \$31 - \$ \$27 - \$ \$26 - \$ \$25 - \$ \$15 - \$ \$16 - \$ \$17 - \$ \$18 - \$1 \$19 - \$1	29 30 31 32 26 25 15 04 15 16 7	\$29 \$30 \$31 \$32 \$26 \$25 \$15 \$04 \$15 \$16 \$17 \$18		Dutflow (I/s) 12.6 12.5 12.4 20.5 43.9 62.3 225.1 152.9 141.5 137.5 120.4	Velocity (m/s) 0.886 0.869 1.042 1.271 0.611 1.105 1.766 2.043 1.502 1.504 1.388 1.306	0.29 0.29 0.29 0.18 0.57 1.23 0.97 1.11 0.94 0.87 0.85	Vol (m³) 6 0.4559 5 0.1398 2 0.4753 3 0.1671 6 2.0181 6 2.0216 0 2.5987 2 3.9348 3 4.0147 3 4.0190 3 2.4540 4 2.6315	Vol (m³)
(Ups 15 m 15 m 15 m 15 m 15 m 15 m 15 m 15 m	tream Depth) inute winter	Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17 \$18 \$19 \$20	\$28 - \$ \$29 - \$ \$30 - \$ \$31 - \$ \$27 - \$ \$26 - \$ \$15 - \$ \$16 - \$ \$17 - \$ \$18 - \$1 \$19 - \$1	29 30 31 32 26 25 15 04 15 16 7 8	\$29 \$30 \$31 \$32 \$26 \$25 \$15 \$04 \$15 \$16 \$17 \$18 \$19		20.5 43.9 62.3 225.1 15.5 12.4 20.5 43.9 62.3 225.1 152.9 141.5 137.5 120.4 96.2	Velocity (m/s) 0.886 0.869 1.042 1.271 0.611 1.105 1.766 2.043 1.502 1.504 1.388 1.306 1.128	0.29 0.29 0.29 0.18 0.57 1.23 0.97 1.11 0.94 0.87 0.85 0.72	Vol (m³) 6 0.4559 5 0.1398 2 0.4753 3 0.1671 6 2.0181 6 2.0216 0 2.5987 2 3.9348 3 4.0147 3 4.0190 3 2.4540 4 2.6315 0 0.7035	Vol (m³)
15 m 15 m 15 m 15 m 15 m 15 m 15 m 15 m	tream Depth) inute winter	Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17 \$18 \$19	\$28 - \$ \$29 - \$ \$30 - \$ \$31 - \$ \$27 - \$ \$26 - \$ \$25 - \$ \$15 - \$ \$16 - \$ \$17 - \$ \$18 - \$1 \$19 - \$1	29 30 31 32 26 25 15 04 15 16 7 8	\$29 \$30 \$31 \$32 \$26 \$25 \$15 \$04 \$15 \$16 \$17 \$18		Dutflow (I/s) 12.6 12.5 12.4 20.5 43.9 62.3 225.1 152.9 141.5 137.5 120.4	Velocity (m/s) 0.886 0.869 1.042 1.271 0.611 1.105 1.766 2.043 1.502 1.504 1.388 1.306	0.29 0.29 0.29 0.18 0.57 1.23 0.97 1.11 0.94 0.87 0.85	Vol (m³) 6 0.4559 5 0.1398 2 0.4753 3 0.1671 6 2.0181 6 2.0216 0 2.5987 2 3.9348 3 4.0147 3 4.0190 2.4540 4 2.6315 0 0.7035 5 2.2375	Vol (m³)
15 m 15 m 15 m 15 m 15 m 15 m 15 m 15 m	tream Depth) inute winter	Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17 \$18 \$19 \$20 \$21	\$28 - \$ \$29 - \$ \$30 - \$ \$31 - \$ \$27 - \$ \$26 - \$ \$15 - \$ \$16 - \$ \$17 - \$ \$18 - \$1 \$19 - \$1 \$20 - \$ \$21 - \$	29 30 31 32 26 25 15 04 15 16 7 8 8 19	\$29 \$30 \$31 \$32 \$26 \$25 \$15 \$04 \$15 \$16 \$17 \$18 \$19 \$20		Dutflow (I/s) 12.6 12.5 12.4 20.5 43.9 62.3 225.1 152.9 141.5 137.5 120.4 96.2 61.0	Velocity (m/s) 0.886 0.869 1.042 1.271 0.611 1.105 1.766 2.043 1.502 1.504 1.388 1.306 1.128 0.941	0.29 0.29 0.29 0.18 0.57 1.23 0.97 1.11 0.94 0.87 0.85 0.72 0.58	Vol (m³) 6 0.4559 5 0.1398 2 0.4753 3 0.1671 6 2.0181 6 2.0216 0 2.5987 2 3.9348 3 4.0147 3 4.0190 3 2.4540 4 2.6315 0 0.7035 5 2.2375 0 0.2751	Vol (m³)
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15 m 15 m 15 m 15 m 15 m 15 m 15 m 15 m	tream Depth) inute winter	Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23 \$24 \$04	\$28 - \$ \$29 - \$ \$30 - \$ \$31 - \$ \$27 - \$ \$26 - \$ \$25 - \$ \$16 - \$ \$17 - \$ \$18 - \$1 \$20 - \$ \$21 - \$ \$1.002 \$23 - \$ \$24 - \$ \$24 - \$ \$24 - \$ \$24 - \$ \$25 - \$ \$25 - \$ \$26 - \$ \$26 - \$ \$27 - \$ \$27 - \$ \$28 - \$ \$28 - \$ \$28 - \$ \$28 - \$ \$29 - \$ \$20 -	29 30 31 32 26 25 15 04 15 16 7 8 19 20	\$29 \$30 \$31 \$32 \$26 \$25 \$15 \$04 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23 Intercepto	le	20.5 43.9 62.3 225.1 152.9 141.5 137.5 120.4 96.2 61.0 51.1 19.4 8.6 156.5	Velocity (m/s) 0.886 0.869 1.042 1.271 0.611 1.105 1.766 2.043 1.502 1.504 1.388 1.306 1.128 0.941 1.377 0.593 0.593	0.29 0.29 0.29 0.18 0.57 1.23 0.97 1.11 0.94 0.87 0.85 0.72 0.58 0.37 1.31 0.47 0.19	Vol (m³) 6 0.4559 5 0.1398 2 0.4753 3 0.1671 6 2.0181 6 2.0216 0 2.5987 2 3.9348 3 4.0147 3 4.0190 3 2.4540 4 2.6315 0 0.7035 5 2.2375 0 0.2751 5 0.7654 4 0.3503 2 6.3820	Vol (m³)
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(Ups 15 m 15 m 15 m 15 m 15 m 15 m 15 m 15 m	tream Depth) inute winter	Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23 \$24 \$04 \$10	\$28 - \$ \$29 - \$ \$30 - \$ \$31 - \$ \$27 - \$ \$26 - \$ \$25 - \$ \$15 - \$ \$17 - \$ \$18 - \$1 \$19 - \$1 \$20 - \$ \$21 - \$ \$1.002 \$23 - \$ \$24 - \$ \$25 - \$ \$26 - \$ \$26 - \$ \$27 - \$ \$27 - \$ \$28 -	29 30 31 32 26 25 15 04 15 16 7 8 19 20 22 23 tt	\$29 \$30 \$31 \$32 \$26 \$25 \$15 \$04 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23 Interceptor	le	20.5 43.9 62.3 225.1 155.9 141.5 137.5 120.4 96.2 61.0 51.1 19.4 8.6 156.5 90.2	Velocity (m/s) 0.886 0.869 1.042 1.271 0.611 1.105 1.766 2.043 1.502 1.504 1.388 1.306 1.128 0.941 1.377 0.593 0.593 0.593	0.29 0.29 0.29 0.18 0.57 1.23 0.97 1.11 0.94 0.87 0.85 0.72 0.58 0.37 1.31 0.47 0.19	Vol (m³) 6 0.4559 5 0.1398 2 0.4753 3 0.1671 6 2.0181 6 2.0216 0 2.5987 2 3.9348 3 4.0147 3 4.0190 3 2.4540 4 2.6315 0 0.7035 5 2.2375 0 0.2751 5 0.7654 0 0.3503 2 6.3820 7 1.1972 0 0.3338 8 0.9428	Vol (m³)
15 m 15 m 15 m 15 m 15 m 15 m 15 m 15 m	tream Depth) inute winter	Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23 \$24 \$04 \$10 \$08 \$09 \$09 \$09 \$09 \$09 \$09 \$09 \$09	\$28 - \$ \$29 - \$ \$30 - \$ \$31 - \$ \$27 - \$ \$26 - \$ \$25 - \$ \$16 - \$ \$17 - \$ \$18 - \$ \$19 - \$ \$1.002 \$23 - \$ \$24 - \$ \$04 - \$ \$04 - \$ \$05 - \$ \$05 - \$ \$06 - \$ \$06 - \$	29 30 31 32 26 25 15 04 115 16 7 8 19 20 22 23 1t	\$29 \$30 \$31 \$32 \$26 \$25 \$15 \$04 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23 Interceptor \$04 \$10 \$10 \$10 \$10 \$10 \$10 \$10 \$10 \$10 \$10	le	20.5 12.4 20.5 43.9 62.3 225.1 152.9 141.5 137.5 120.4 96.2 61.0 51.1 19.4 8.6 156.5 90.2 41.4 50.0 19.6 27.9	Velocity (m/s) 0.886 0.869 1.042 1.271 0.611 1.105 1.766 2.043 1.502 1.504 1.388 1.306 1.128 0.941 1.377 0.593 0.593 1.440 2.882 1.488 1.390 3.342 2.953	0.29 0.29 0.29 0.18 0.57 1.23 0.97 1.11 0.94 0.87 0.58 0.37 1.31 0.47 0.19 0.55 0.80 0.64 1.17	Vol (m³) 6 0.4559 5 0.1398 2 0.4753 3 0.1671 6 2.0181 6 2.0216 0 2.5987 3 .9348 3 4.0147 3 4.0190 3 2.4540 4 2.6315 0 0.7035 5 0.7035 5 0.7654 4 0.3503 2 6.3820 7 1.1972 0 0.3338 8 0.9428 2 0.0355 4 0.0550	Vol (m³)
(Ups 15 m 15 m 15 m 15 m 15 m 15 m 15 m 15 m	tream Depth) inute winter inute summer	Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23 \$24 \$04 \$10 \$08 \$09 \$07 \$06 \$05	\$28 - \$ \$29 - \$ \$30 - \$ \$31 - \$ \$27 - \$ \$26 - \$ \$25 - \$ \$16 - \$ \$17 - \$ \$18 - \$ \$19 - \$ \$1.002 \$23 - \$ \$24 - \$ \$24 - \$ \$24 - \$ \$24 - \$ \$24 - \$ \$25 - \$	29 30 31 32 26 25 15 04 15 16 7 8 19 20 22 23 at	\$29 \$30 \$31 \$32 \$26 \$25 \$15 \$04 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23 Interceptor \$04 \$10 \$10 \$10 \$10 \$10 \$10 \$10 \$10 \$10 \$10	de	20.5 12.4 20.5 43.9 62.3 225.1 152.9 141.5 137.5 120.4 96.2 61.0 51.1 19.4 8.6 156.5 90.2 41.4 50.0 19.6 27.9 27.2	Velocity (m/s) 0.886 0.869 1.042 1.271 0.611 1.105 1.766 2.043 1.502 1.504 1.388 1.306 1.128 0.941 1.377 0.593 0.593 1.440 2.882 1.488 1.390 3.342 2.953 2.249	0.29 0.29 0.29 0.18 0.57 1.23 0.97 1.11 0.94 0.87 0.55 0.37 1.31 0.47 0.19 0.55 0.80 0.64 1.17	Vol (m³) 6 0.4559 5 0.1398 2 0.4753 3 0.1671 6 2.0181 6 2.0216 0 2.5987 2 3.9348 3 4.0147 3 4.0190 3 2.4540 4 2.6315 0 0.7035 5 0.2751 5 0.7654 0.3503 2 6.3820 7 1.1972 0 0.3338 8 0.9428 2 0.0355 4 0.0550 4 0.3596	Vol (m³)
(Ups 15 m 15 m 15 m 15 m 15 m 15 m 15 m 15 m	tream Depth) inute winter inute summer minute winter	Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23 \$24 \$04 \$10 \$08 \$09 \$07 \$06 \$05 \$03	\$28 - \$ \$29 - \$ \$30 - \$ \$31 - \$ \$27 - \$ \$26 - \$ \$25 - \$ \$15 - \$ \$16 - \$ \$17 - \$ \$18 - \$ \$19 - \$ \$1002 \$23 - \$ \$24 - \$ \$24 - \$ \$34 - \$ \$504 - \$ \$5001 \$50000 \$50000 \$50000 \$50000 \$50000 \$50000 \$50000 \$50000 \$50000 \$50000 \$50000 \$50000 \$50000	29 30 31 32 26 25 15 04 15 16 7 8 19 20 22 23 at	\$29 \$30 \$31 \$32 \$26 \$25 \$15 \$04 \$17 \$18 \$19 \$20 \$21 \$22 \$23 Interceptor \$04 \$10 \$10 \$10 \$10 \$10 \$10 \$10 \$10 \$10 \$10	de	Dutflow (I/s) 12.6 12.5 12.4 20.5 43.9 62.3 225.1 152.9 141.5 137.5 120.4 96.2 61.0 51.1 19.4 8.6 156.5 90.2 41.4 50.0 19.6 27.9 27.2 -781.5	Velocity (m/s) 0.886 0.869 1.042 1.271 0.611 1.105 1.766 2.043 1.502 1.504 1.388 1.306 1.128 0.941 1.377 0.593 0.593 1.440 2.882 1.488 1.390 3.342 2.953 2.249 -3.603	0.29 0.29 0.29 0.18 0.57 1.23 0.97 1.11 0.94 0.85 0.72 0.58 0.37 1.31 0.47 0.19 0.55 0.80 0.64 1.17 0.06 0.12	Vol (m³) 6 0.4559 5 0.1398 2 0.4753 3 0.1671 6 2.0181 6 2.0216 0 2.5987 2 3.9348 3 4.0147 3 4.0190 3 2.4540 4 2.6315 0 0.7035 5 2.2375 0 0.2751 5 0.7654 4 0.3503 2 6.3820 7 1.1972 0 0.3338 8 0.9428 2 0.3355 4 0.0550 4 0.3596 3 0.8349	Vol (m³) 5.9
(Ups 15 m 15	tream Depth) inute winter inute summer	Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23 \$24 \$04 \$10 \$08 \$09 \$07 \$06 \$05	\$28 - \$ \$29 - \$ \$30 - \$ \$31 - \$ \$27 - \$ \$26 - \$ \$25 - \$ \$16 - \$ \$17 - \$ \$18 - \$ \$19 - \$ \$1.002 \$23 - \$ \$24 - \$ \$24 - \$ \$24 - \$ \$24 - \$ \$24 - \$ \$25 - \$	29 30 31 32 26 25 15 04 15 16 7 8 19 20 22 23 3t T	\$29 \$30 \$31 \$32 \$26 \$25 \$15 \$04 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23 Interceptor \$04 \$10 \$10 \$10 \$10 \$10 \$10 \$10 \$10 \$10 \$10	de	20.5 12.4 20.5 43.9 62.3 225.1 152.9 141.5 137.5 120.4 96.2 61.0 51.1 19.4 8.6 156.5 90.2 41.4 50.0 19.6 27.9 27.2	Velocity (m/s) 0.886 0.869 1.042 1.271 0.611 1.105 1.766 2.043 1.502 1.504 1.388 1.306 1.128 0.941 1.377 0.593 0.593 1.440 2.882 1.488 1.390 3.342 2.953 2.249 3.603 1.135	0.29 0.29 0.29 0.18 0.57 1.23 0.97 1.11 0.94 0.87 0.55 0.37 1.31 0.47 0.19 0.55 0.80 0.64 1.17	Vol (m³) 6 0.4559 5 0.1398 2 0.4753 3 0.1671 6 2.0181 6 2.0216 0 2.5987 2 3.9348 3 4.0147 3 4.0190 3 2.4540 4 2.6315 0 0.7035 5 2.2375 0 0.2751 5 0.2751 5 0.7654 4 0.3503 2 0.3338 8 0.9428 2 0.0355 4 0.3596 3 0.8349 4 1.2710	Vol (m³)
15 m 15 m 15 m 15 m 15 m 15 m 15 m 15 m	tream Depth) inute winter inute summer minute winter minute winter inute summer minute winter	Node \$28 \$29 \$30 \$31  \$27 \$26 \$25 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23 \$24 \$504 \$510 \$508 \$509 \$507 \$506 \$503 \$501	\$28 - S \$29 - S \$30 - S \$31 - S \$27 - S \$26 - S \$15 - S \$15 - S \$17 - S \$18 - S1 \$19 - S1 \$20 - S \$21 - S \$1.002 \$23 - S \$24 - S \$24 - S \$24 - S \$24 - S \$24 - S \$24 - S \$25 -	29 30 31 32 26 25 15 104 115 16 7 8 19 20 22 23 tt	\$29 \$30 \$31 \$32 \$26 \$25 \$15 \$04 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23 Interceptor \$04 \$10 \$05 \$05 \$04 \$10 \$05 \$05 \$04 \$05 \$05 \$05 \$05 \$05 \$05 \$05 \$05 \$05 \$05	de	Dutflow (I/s) 12.6 12.5 12.4 20.5 43.9 62.3 225.1 152.9 141.5 137.5 120.4 96.2 61.0 51.1 19.4 8.6 156.5 90.2 41.4 50.0 19.6 27.9 27.2 -781.5 40.3	Velocity (m/s) 0.886 0.869 1.042 1.271 0.611 1.105 1.766 2.043 1.502 1.504 1.388 1.306 1.128 0.941 1.377 0.593 0.593 1.440 2.882 1.488 1.390 3.342 2.953 2.249 -3.603	0.29 0.29 0.29 0.18 0.57 1.23 0.97 1.11 0.94 0.85 0.72 0.58 0.37 1.31 0.47 0.19 0.55 0.80 0.64 1.17 0.06 0.12 0.23	Vol (m³) 6 0.4559 5 0.1398 2 0.4753 3 0.1671 6 2.0181 6 2.0216 6 2.5987 2 3.9348 3 4.0147 3 4.0190 3 2.4540 4 2.6315 0 7035 5 2.2375 0 0.7654 4 0.3503 2 6.3820 7 0 0.3338 8 0.9428 2 0.0355 4 0.0550 4 0.3596 3 0.8349 4 1.2710 2 1.785	Vol (m³) 5.9
(Ups 15 m 15	tream Depth) inute winter minute winter minute winter minute winter	Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23 \$24 \$04 \$10 \$08 \$09 \$07 \$06 \$05 \$05 \$05 \$05 \$05 \$05 \$05 \$05	\$28 - \$ \$29 - \$ \$30 - \$ \$31 - \$ \$27 - \$ \$26 - \$ \$25 - \$ \$15 - \$ \$18 - \$ \$19 - \$ \$10 - \$ \$21 - \$ \$23 - \$ \$24 - \$ \$24 - \$ \$24 - \$ \$304 - \$ \$305 - \$ \$305 - \$ \$305 - \$ \$305 - \$ \$305 - \$ \$301 - \$ \$311 - \$ \$	29 30 31 32 26 25 15 04 15 16 7 8 19 20 22 23 at 06 05 04 T cutfall 04 11	\$29 \$30 \$31 \$32 \$26 \$25 \$15 \$04 \$15 \$16 \$17 \$18 \$20 \$21 \$22 \$23 Interceptor \$10 \$10 \$10 \$10 \$10 \$10 \$10 \$10 \$10 \$10	de	Dutflow (I/s) 12.6 12.5 12.5 12.4 20.5 43.9 62.3 225.1 152.9 141.5 137.5 120.4 96.2 61.0 51.1 19.4 8.6 156.5 90.2 41.4 50.0 19.6 27.9 2-781.5 40.3 62.7	Velocity (m/s) 0.886 0.869 1.042 1.271 0.611 1.105 1.766 2.043 1.502 1.504 1.388 1.306 1.128 0.941 1.377 0.593 0.593 1.440 2.882 1.488 1.390 3.342 2.953 2.249 -3.603 1.135 2.246	0.29 0.29 0.29 0.18 0.57 1.23 0.97 1.11 0.94 0.87 0.58 0.72 0.58 0.37 1.31 0.47 0.19 0.55 0.80 0.64 1.17 0.06 0.12 0.23 -0.87	Vol (m³) 6 0.4559 5 0.1398 2 0.4753 3 0.1671 6 2.0181 6 2.0216 0 2.5987 3 .9348 3 4.0147 3 4.0190 3 2.4540 4 2.6315 0 0.7035 5 0.7035 5 0.7654 4 0.3503 2 6.3820 7 1.1972 0 0.3338 8 0.9428 2 0.0355 4 0.0550 4 0.3596 3 0.8349 1.2710 2 1.7785 6 3.4430 5 3.0665	Vol (m³) 5.9

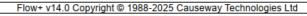
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Malone O'Regan Consulting Engineers 3-4 Canada Street Waterford X91 V52K	File: Storm Drainage Design R01.pfd Network: Storm Network Brian Chong 21/07/2025	Page 9
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Results for 30 year +20% CC Critical Storm Duration. Lowest mass balance: 89.63%											
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (I/s)	Node Vol (m³)	Flood (m³)				
120 minute winter 15 minute winter 120 minute winter 120 minute winter 120 minute winter	Attenuation Tank S02 Settlement Tank Outfall Interceptor	104 10 118 104 118	3.949 4.386 3.989 1.569 4.054	1.603 0.086 1.503 0.108 1.258	280.4 17.5 1136.3 40.3 240.9	320.5663 0.2032 38.0170 0.0000 2.3962	0.0000 0.0000 0.0000 0.0000				

	Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (I/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
ı	120 minute winter	Attenuation Tank	AT - S01	S01	249.0	1.133	0.180	4.6142	
ı	15 minute winter	S02	S02-S12	S12	17.3	0.662	0.312	0.5259	
	120 minute winter	Settlement Tank	S03 - AT	Attenuation Tank	280.4	2.892	0.260	1.6188	
	120 minute winter	Interceptor	Int - S03	S03	259.9	1.871	0.321	5.3150	





Note   Front   Note   Peak   Level   Depth   Inflow   Note   Front   Note   Peak   Level   Depth   Inflow   Note   Front   Note   Peak   Level   Depth   Inflow   Note   Peak	SCAN MAIGHE GARGEN	Malone O'Re 3-4 Canada Waterford X91 V52K		ulting Eng	gineers	Network: Brian Ch	Storm N ong	age Desigr etwork	R01.pfd	Page 1	0		
Node			esults for 1	100 year	+20% (			uration.	Lowest ma	ass balanc	ce: 89.63%		
15 minute winter   S28													
15 minute winter   S29			15 minute	winter									
15 minute winter   S30													
15 minute winter   S31													
15 minute winter   S32													
15 minute winter   S27   13   6.158   1.108   30.6   3.2353   0.0000   15													
15 minute winter   S25													
15 minute winter   S25   228   4.733   3.08   37.4   2.3247   0.0000			15 minute	winter									
240 minute winter   S16   228   4.732   0.917   49.6   1.4894   0.0000   1.5 minute winter   S18   12   5.037   0.837   152.7   1.6789   0.0000   1.5 minute winter   S18   12   5.037   0.837   152.7   1.6789   0.0000   1.5 minute winter   S19   12   5.158   0.778   135.1   1.7506   0.0000   1.5 minute winter   S21   12   5.239   0.574   77.3   1.0553   0.0000   1.5 minute winter   S21   12   5.239   0.574   77.3   1.0553   0.0000   1.5 minute winter   S21   12   5.360   0.640   66.1   1.5876   0.0000   1.5 minute winter   S21   12   5.378   0.378   11.8   0.5892   0.0000   1.5 minute winter   S22   1.3   5.368   0.513   2.4   3.08366   0.0000   1.5 minute winter   S24   12   5.378   0.378   11.8   0.5892   0.0000   1.5 minute winter   S04   228   4.737   1.902   1.77.1   4.5586   0.0000   1.5 minute winter   S08   12   5.376   0.376   6.45   1.1954   0.0000   1.5 minute winter   S08   12   5.376   0.376   6.45   1.1954   0.0000   1.5 minute winter   S08   12   5.376   0.376   6.45   1.1954   0.0000   1.5 minute winter   S07   10   7.488   0.043   2.5 5   0.0008   0.0000   1.5 minute winter   S07   10   7.488   0.043   2.5 5   0.0008   0.0000   1.5 minute winter   S07   10   7.488   0.043   3.5 5   0.0008   0.0000   1.5 minute winter   S08   2.28   4.736   0.104   6.2   0.5765   0.0000   0.0000   1.5 minute winter   S08   2.28   4.736   0.104   6.2   0.5765   0.00000   0.00000   0.00000   0.00000   0.00000   0.00000   0.000000   0.0000000   0.00000000			15 minute	winter	S25	13	5.623	1.053	74.4	2.3247	0.0000		
15 minute winter   S17   12   4,898   0.843   161,7   1.5623   0.0000   15 minute winter   S18   12   5.037   0.837   152,7   1.7678   0.0000   15 minute winter   S19   12   5.158   0.778   135,1   1.7506   0.0000   15 minute winter   S20   12   5.158   0.778   135,1   1.7506   0.0000   15 minute winter   S20   12   5.158   0.778   135,1   1.7506   0.0000   15 minute winter   S20   12   5.159   0.764   77.3   1.0553   0.0000   15 minute winter   S21   12   5.239   0.574   77.3   1.0553   0.0000   15 minute winter   S22   12   5.350   0.640   66.1   1.5876   0.0000   15 minute winter   S24   12   5.3578   0.378   11.8   0.5892   0.0000   15 minute winter   S24   12   5.378   0.378   11.8   0.5892   0.0000   15 minute winter   S24   12   5.376   0.378   1.18   0.5892   0.0000   15 minute winter   S09   12   5.649   0.649   0.549   0.0000   15 minute winter   S09   12   5.649   0.649   0.649   0.549   0.0000   15 minute winter   S09   12   5.649   0.649   0.649   0.649   0.0000   15 minute winter   S09   12   5.649   0.649   0.649   0.649   0.0000   15 minute winter   S06   10   5.399   0.064   0.350   0.0833   0.0000   12 minute winter   S05   10   5.399   0.064   0.350   0.0833   0.0000   12 minute winter   S05   12   5.399   0.064   0.550   0.0833   0.00000   0.00000   0.00000   0.00000   0.00000   0.00000   0.00000   0.00000   0.00000   0.0000000			240 minute	e winter	S15	228	4.733	1.308	81.3	2.6926	0.0000		
15 minute winter   S18   12   5.037   0.837   15.2   1.6789   0.0000   1.5			240 minute	e winter	S16	228	4.732	0.917	49.6	1.4994	0.0000		
15 minute winter   S19			15 minute	winter	S17	12	4.898	0.843	161.7	1.5623	0.0000		
15 minute winter   S20   12   5.194   0.759   11.77   2.0280   0.0000			15 minute	winter	S18	12	5.037	0.837	152.7	1.6789	0.0000		
15 minute winter   S21   12   5.239   0.574   77.3   1.0553   0.0000			15 minute	winter	S19	12	5.158	0.778	135.1	1.7506	0.0000		
15 minute winter													
15 minute winter   S24   12   5378   0.378   118   0.5892   0.0000													
15 minute winter   240 m													
240 minute winter   S04   228   4737   1902   1771   45586   0.0000   15 minute winter   S10   12   5251   0.436   1034   0.4927   0.0000   15 minute winter   S08   12   5.376   0.376   5.45   1.1954   0.0000   15 minute winter   S09   12   5.649   0.649   684   2.4066   0.0000   15 minute winter   S07   10   7.488   0.043   25.5   0.0608   0.0000   15 minute winter   S07   10   7.488   0.043   25.5   0.0833   0.0000   15 minute winter   S05   228   4.735   0.510   8.2   0.5765   0.0000   180   180   100   18													
15 minute winter   S10													
15 minute winter   S08													
15 minute winter   S09													
15 minute winter   S07   10   7,488   0.043   25.5   0.0608   0.0000     15 minute winter   S05   228   4.735   0.510   8.2   0.5765   0.0000     240 minute winter   S05   228   4.735   0.510   8.2   0.5765   0.0000     120 minute winter   S01   116   4.509   2.823   178.7   9,7789   0.0000     240 minute winter   S11   228   4.736   1.046   50.3   3.9471   0.0000     240 minute winter   S12   228   4.740   0.670   28.4   1.9357   0.0000     240 minute winter   S13   228   4.740   0.670   28.4   1.9357   0.0000     240 minute winter   S14   228   4.740   0.670   28.4   1.9357   0.0000     240 minute winter   S14   10   5.134   0.134   43.4   0.4643   0.0000     15 minute winter   S28   S28   S29   S29   S30													
15 minute winter													
240 minute winter   S05   228   4.735   0.510   8.2   0.5765   0.0000     180 minute winter   S03   184   4.770   2.234   617.6   3.9471   0.0000     120 minute winter   S01   116   4.509   2.823   178.7   9.7789   0.0000     240 minute winter   S12   228   4.736   1.046   50.3   3.5313   0.0000     240 minute winter   S13   228   4.740   0.670   284   4.19357   0.0000     240 minute winter   S14   228   4.740   0.220   12.5   0.3143   0.0000     15 minute winter   S14   10   5.134   0.134   43.4   0.4643   0.0000     15 minute winter   S28   S28 - S29   S													
180 minute winter   S03													
120 minute winter   S01													
Add minute winter   S12   228   4.736   1.046   50.3   3.5313   0.0000													
A columnate winter   S12   228   4.740   0.670   28.4   1.9357   0.0000													
Link Event   US													
Link Event (Upstream Depth)   Node   S28   S28   S29   S29													
Cupstream Depth   Node   See   See													
Cupstream Depth   Node   See   See			15 minute	winter	S14	10	5.134						
15 minute winter S28 S28 S29 S29 16.4 0.942 0.386 0.5587 15 minute winter S29 S29 S30 S30 16.3 0.928 0.384 0.1706 15 minute winter S30 S30 S31 S31 16.4 1.115 0.381 0.5795 15 minute winter S31 S31 S31 S32 S32 16.1 1.361 0.239 0.2041 7.7 15 minute winter S27 S27 S26 S26 S26 23.0 0.621 0.647 2.0181 15 minute winter S26 S26 S25 S25 45.9 1.163 1.291 2.0216 15 minute winter S25 S25 S25 45.9 1.163 1.291 2.0216 15 minute winter S25 S25 S25 45.9 1.163 1.291 2.0216 15 minute winter S15 S15 S04 S04 81.3 1.648 0.402 3.9348 240 minute winter S16 S16 S15 S15 49.5 1.278 0.305 4.0147 15 minute winter S17 S17 S16 S16 149.8 1.517 0.924 4.0190 15 minute winter S18 S18-S17 S17 142.8 1.401 0.885 2.4540 15 minute winter S20 S20 S19 S19 S19 S10 S18 18 128.8 1.318 0.775 2.8686 15 minute winter S20		ink Event						0.134	43.4	0.4643	0.0000	Discharge	
15 minute winter S29 S29 - S30 S30 16.3 0.928 0.384 0.1706 15 minute winter S30 S30 - S31 S31 16.4 1.115 0.381 0.5795 15 minute winter S31 S31 - S32 S32 16.1 1.361 0.239 0.2041 7.7  15 minute winter S27 S27 S26 S26 23.0 0.621 0.647 2.0181 15 minute winter S26 S26 - S25 S25 45.9 1.163 1.291 2.0216 15 minute winter S25 S25 - S15 S15 67.9 1.755 1.057 2.5987 240 minute winter S15 S15 - S04 S04 81.3 1.648 0.402 3.9348 240 minute winter S16 S16 S15 S15 49.5 1.278 0.305 4.0147 15 minute winter S16 S16 S15 S15 49.5 1.278 0.305 4.0147 15 minute winter S17 S17 - S16 S16 149.8 1.517 0.924 4.0190 15 minute winter S18 S18-S17 S17 142.8 1.401 0.885 2.4540 15 minute winter S19 S19-S18 S18 128.8 1.318 0.775 2.8686 15 minute winter S20 S20 - S19 S19 104.0 1.129 0.626 0.8791 15 minute winter S21 S21 - S20 S20 69.3 0.945 0.426 3.8293 15 minute winter S22 1.002 S21 63.4 1.628 1.626 0.3159 15 minute winter S24 S23 - S22 S22 2.56 0.644 0.628 0.9335 15 minute winter S24 S23 - S23 S23 11.1 0.606 0.251 0.7946 240 minute winter S04 S04 Int Interceptor 170.7 1.513 0.602 6.3820 15 minute winter S04 S04 - Int Interceptor 170.7 1.513 0.602 6.3820 15 minute winter S04 S04 - Int Interceptor 170.7 1.513 0.602 6.3820 15 minute winter S08 6.000 S10 49.4 1.537 0.764 0.4768 15 minute winter S08 6.000 S10 57.8 1.452 1.360 1.0980 15 minute winter S08 6.000 S10 57.8 1.452 1.360 1.0980 15 minute winter S06 S06 S05 S05 3.64 3.151 0.162 0.0671 240 minute winter S07 S07 - S06 S06 25.5 3.550 0.081 0.0435 15 minute winter S07 S07 - S06 S06 25.5 3.550 0.081 0.0435 15 minute winter S07 S07 - S06 S06 25.5 3.550 0.081 0.0435 15 minute winter S01 S01 Outfall 45.0 1.172 0.083 1.3754 797.0 240 minute winter S03 S03 - ST Settlement Tank 1120.7 3.979 1.252 0.8349 120 minute winter S01 S01 Outfall 43.9 1.173 0.269 6.2805 240 minute winter S12 S12 S12 - 10.8 0.527 - 0.066 6.0273 15 minute winter S13 S13 S13 42.4 1.281 0.261 2.4376			US			DS		0.134 Outflow	43.4 Velocity	0.4643	0.0000 p Link		
15 minute winter	(Ups	tream Depth	US ) Node	Lin	k	DS Node		0.134 Outflow (I/s)	43.4 Velocity (m/s)	0.4643 Flow/Ca	0.0000 ip Link Vol (m³)	Vol (m³)	
15 minute winter S31 S31 S32 S32 16.1 1.361 0.239 0.2041 7.7  15 minute winter S26 S26 S26 S25 S25 45.9 1.163 1.291 2.0216 15 minute winter S26 S26 S25 S25 45.9 1.163 1.291 2.0216 15 minute winter S25 S25 S25 S25 45.9 1.755 1.057 2.5987 240 minute winter S15 S15 S04 S04 81.3 1.648 0.402 3.9348 240 minute winter S16 S16 S15 S15 49.5 1.278 0.305 4.0147 15 minute winter S17 S17 S17 S16 S16 149.8 1.517 0.924 4.0190 15 minute winter S18 S18-S17 S17 142.8 1.401 0.885 2.4540 15 minute winter S20 S20 S19 S19 104.0 1.129 0.626 0.8791 15 minute winter S20 S20 S20 S19 S19 104.0 1.129 0.626 0.8791 15 minute winter S21 S21 S20 69.3 0.945 0.426 3.8293 15 minute winter S22 1.002 S21 63.4 1.628 1.626 0.3159 15 minute winter S23 S23 S22 S22 2.56 0.644 0.628 0.9335 15 minute winter S24 S24 S23 S23 11.1 0.600 0.251 0.7946 240 minute winter S04 S04 Int Interceptor 170.7 1.513 0.602 6.3820 15 minute winter S04 S04 Int Interceptor 170.7 1.513 0.602 6.3820 15 minute winter S08 6.000 S10 49.4 1.537 0.764 0.4768 15 minute winter S09 S05 S05 36.4 3.151 0.162 0.0671 240 minute winter S09 S05 S05 S05 36.4 3.151 0.162 0.0671 240 minute winter S09 S05 S05 S05 36.4 3.151 0.162 0.0671 240 minute winter S09 S05 S05 S04 S04 19.0 1.648 0.164 0.7196 180 minute winter S01 S01 Outfall Outfall 45.0 1.172 0.083 1.3754 797.0 240 minute winter S01 S01 Outfall Outfall 45.0 1.172 0.083 1.3754 797.0 240 minute winter S01 S01 Outfall Outfall 43.9 1.173 0.269 6.2805 240 minute winter S01 S01 Outfall Outfall 43.9 1.173 0.269 6.2805 240 minute winter S01 S13 S13 S13 42.4 1.281 0.261 2.4376	( <b>Ups</b> 15 m	tream Depth inute winter	US Node S28	Lin S28 - S	<b>k</b> 29	DS Node S29		0.134 Outflow (I/s) 16.4	43.4 Velocity (m/s) 0.942	0.4643 Flow/Ca	0.0000 up Link Vol (m²) 36 0.5587	Vol (m³)	
15 minute winter S27 S27 - S26 S26 23.0 0.621 0.647 2.0181 15 minute winter S26 S26 - S25 S25 45.9 1.163 1.291 2.0216 15 minute winter S25 S25 - S15 S15 67.9 1.755 1.057 2.5987 240 minute winter S15 S15 - S04 S04 81.3 1.648 0.402 3.9348 240 minute winter S16 S16 - S15 S15 49.5 1.278 0.305 4.0147 15 minute winter S17 S17 - S16 S16 149.8 1.517 0.924 4.0190 15 minute winter S18 S18-S17 S17 142.8 1.401 0.885 2.4540 15 minute winter S19 S19-S18 S18 128.8 1.318 0.775 2.8686 15 minute winter S20 S20 - S19 S19 104.0 1.129 0.626 0.8791 15 minute winter S21 S21 - S20 S20 69.3 0.945 0.426 3.8293 15 minute winter S22 S21 63.4 1.628 1.626 0.3159 15 minute winter S23 S23 - S22 S22 25.6 0.644 0.628 0.9335 15 minute winter S24 S24 - S23 S23 11.1 0.606 0.251 0.7946 240 minute winter S04 S04 - Int Interceptor 170.7 1.513 0.602 6.3820 15 minute winter S08 6.000 S10 49.4 1.537 0.764 0.4768 15 minute winter S08 6.000 S10 49.4 1.537 0.764 0.4768 15 minute winter S08 505 S05 36.4 3.151 0.162 0.0671 240 minute winter S05 S05 - S04 S04 19.0 1.648 0.164 0.7196 180 minute winter S05 S05 - S05 S05 36.4 3.151 0.162 0.0671 240 minute winter S01 S01 - Outfall Outfall 45.0 1.172 0.083 1.3754 797.0 240 minute winter S1 S11 S11 43.9 1.173 0.266 6.2805 240 minute winter S1 S12 S12 - S11 S11 43.9 1.173 0.266 6.2805 240 minute winter S1 S13 S13 42.4 1.281 0.261 2.4376	( <b>Ups</b> 15 m 15 m	tream Depth inute winter inute winter	US Node S28 S29	Lin S28 - S S29 - S	k 29 30	DS Node S29 S30		0.134 Outflow (I/s) 16.4 16.3	43.4 Velocity (m/s) 0.942 0.928	0.4643 Flow/Ca 0.38 0.38	0.0000 p Link Vol (m³) 36 0.5587 34 0.1706	Vol (m³)	
15 minute winter	( <b>Ups</b> 15 m 15 m 15 m	tream Depth inute winter inute winter inute winter	US Node \$28 \$29 \$30	S28 - S S29 - S S30 - S	k 29 30 31	DS Node \$29 \$30 \$31		0.134 Outflow (I/s) 16.4 16.3 16.4	43.4 Velocity (m/s) 0.942 0.928 1.115	0.4643 Flow/Ca 0.38 0.38 0.38	0.0000 up Link Vol (m³) 36 0.5587 34 0.1706 31 0.5795	Vol (m³)	
15 minute winter S25 S25 - S15 S15 S15 G7.9 1.755 1.057 2.5987 240 minute winter S15 S15 - S04 S04 81.3 1.648 0.402 3.9348 240 minute winter S16 S16 - S15 S15 49.5 1.278 0.305 4.0147 15 minute winter S17 S17 - S16 S16 149.8 1.517 0.924 4.0190 15 minute winter S18 S18-S17 S17 142.8 1.401 0.885 2.4540 15 minute winter S19 S19-S18 S18 128.8 1.318 0.775 2.8686 15 minute winter S20 S20 - S19 S19 104.0 1.129 0.626 0.8791 15 minute winter S21 S21 - S20 S20 69.3 0.945 0.426 3.8293 15 minute winter S22 1.002 S21 63.4 1.628 1.626 0.3159 15 minute winter S23 S23 - S22 S22 2.56 0.644 0.628 0.9335 15 minute winter S24 S24 - S23 S23 11.1 0.606 0.251 0.7946 240 minute winter S04 S04 - Int Interceptor 170.7 1.513 0.602 6.3820 15 minute winter S04 S04 - Int Interceptor 170.7 1.513 0.602 6.3820 15 minute winter S08 6.000 S10 49.4 1.537 0.764 0.4768 15 minute winter S08 6.000 S10 49.4 1.537 0.764 0.4768 15 minute winter S07 S07 - S06 S06 25.5 3.550 0.081 0.0435 15 minute winter S07 S07 - S06 S06 25.5 3.550 0.081 0.0435 15 minute winter S08 S05 S05 36.4 3.151 0.162 0.0671 240 minute winter S05 S05 - S 04 S04 19.0 1.648 0.164 0.7196 180 minute winter S01 S1 S01 - Outfall Outfall S01 - 1.72 0.083 1.3754 797.0 240 minute winter S01 S01 - Outfall Outfall S04 50.2 2.072 0.146 2.3652 240 minute winter S11 S11 - S04 S04 50.2 2.072 0.146 2.3652 240 minute winter S12 S12 - S11 S11 43.9 1.173 0.269 6.2805 240 minute winter S13 S13 S13 42.4 1.281 0.261 2.4376	(Ups 15 m 15 m 15 m 15 m	tream Depth inute winter inute winter inute winter inute winter	US Node \$28 \$29 \$30 \$31	S28 - S S29 - S S30 - S S31 - S	k 29 30 31 32	DS Node \$29 \$30 \$31 \$32		0.134 Outflow (l/s) 16.4 16.3 16.4 16.1	43.4 Velocity (m/s) 0.942 0.928 1.115 1.361	0.4643 Flow/Ca 0.38 0.38 0.38 0.23	0.0000 p Link Vol (m³) 36 0.5587 34 0.1706 31 0.5795 39 0.2041	Vol (m³)	
240 minute winter         \$15         \$15 - \$04         \$04         \$1.3         \$1.648         \$0.402         \$3.9348           240 minute winter         \$16         \$16 - \$15         \$15         \$49.5         \$1.278         \$0.305         \$4.0147           15 minute winter         \$17         \$17 - \$16         \$16         \$149.8         \$1.517         \$0.924         \$4.0190           15 minute winter         \$18         \$18 - \$17         \$17         \$142.8         \$1.401         \$0.885         \$2.4540           15 minute winter         \$19         \$19 - \$18         \$18         \$128.8         \$1.318         \$0.775         \$2.8686           15 minute winter         \$20         \$20 - \$19         \$19         \$104.0         \$1.129         \$0.626         \$0.8791           15 minute winter         \$20         \$20 - \$21         \$63.4         \$1.628         \$1.626         \$0.3159           15 minute winter         \$22         \$20         \$21         \$63.4         \$1.628         \$1.626         \$0.3159           15 minute winter         \$22         \$22         \$22         \$25.6         \$0.644         \$0.628         \$0.9335           15 minute winter         \$24         \$24 - \$23         \$23 <td>(Ups 15 m 15 m 15 m 15 m</td> <td>tream Depth inute winter inute winter inute winter inute winter inute winter</td> <td>US Node \$28 \$29 \$30 \$31</td> <td>S28 - S S29 - S S30 - S S31 - S</td> <td>k 29 30 31 32</td> <td>DS Node \$29 \$30 \$31 \$32 \$26</td> <td></td> <td>0.134 Outflow (l/s) 16.4 16.3 16.4 16.1 23.0</td> <td>43.4 Velocity (m/s) 0.942 0.928 1.115 1.361 0.621</td> <td>0.4643 Flow/Ca 0.38 0.38 0.23 0.64</td> <td>0.0000 p Link Vol (m³) 36 0.5587 34 0.1706 31 0.5795 39 0.2041 47 2.0181</td> <td>Vol (m³) 7.7</td>	(Ups 15 m 15 m 15 m 15 m	tream Depth inute winter inute winter inute winter inute winter inute winter	US Node \$28 \$29 \$30 \$31	S28 - S S29 - S S30 - S S31 - S	k 29 30 31 32	DS Node \$29 \$30 \$31 \$32 \$26		0.134 Outflow (l/s) 16.4 16.3 16.4 16.1 23.0	43.4 Velocity (m/s) 0.942 0.928 1.115 1.361 0.621	0.4643 Flow/Ca 0.38 0.38 0.23 0.64	0.0000 p Link Vol (m³) 36 0.5587 34 0.1706 31 0.5795 39 0.2041 47 2.0181	Vol (m³) 7.7	
240 minute winter         S16         S16 - S15         S15         49.5         1.278         0.305         4.0147           15 minute winter         S17         S17 - S16         S16         149.8         1.517         0.924         4.0190           15 minute winter         S18         S18 - S17         S17         142.8         1.401         0.885         2.4540           15 minute winter         S19         S19-S18         S18         128.8         1.318         0.775         2.8686           15 minute winter         S20         S20 - S19         S19         104.0         1.129         0.626         0.8791           15 minute winter         S21         S21 - S20         S20         69.3         0.945         0.426         3.8293           15 minute winter         S22         1.002         S21         63.4         1.628         1.626         0.3159           15 minute winter         S23         S22         S22         25.6         0.644         0.628         0.9335           15 minute winter         S24         S24 - S23         S23         11.1         0.606         0.251         0.7946           240 minute winter         S04         S04 - Int         Interceptor	(Ups 15 m 15 m 15 m 15 m 15 m	tream Depth, inute winter inute winter inute winter inute winter inute winter inute winter	US Node \$28 \$29 \$30 \$31 \$27 \$26	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S	29 30 31 32 26 25	DS Node \$29 \$30 \$31 \$32 \$26 \$25		0.134 Outflow (l/s) 16.4 16.3 16.4 16.1 23.0 45.9	43.4 Velocity (m/s) 0.942 0.928 1.115 1.361 0.621 1.163	0.4643 Flow/Ca 0.38 0.38 0.23 0.64 1.29	0.0000 p Link Vol (m²) 36 0.5587 36 0.5795 39 0.2041 47 2.0181 2.0216	Vol (m³) 7.7	
15 minute winter S17 S17 S16 S16 149.8 1.517 0.924 4.0190 15 minute winter S18 S18 S17 S17 142.8 1.401 0.885 2.4540 15 minute winter S19 S19-S18 S18 128.8 1.318 0.775 2.8686 15 minute winter S20 S20 S20 S19 S19 104.0 1.129 0.626 0.8791 15 minute winter S21 S21 S21 S20 S20 69.3 0.945 0.426 3.8293 15 minute winter S22 1.002 S21 63.4 1.628 1.626 0.3159 15 minute winter S23 S23 S22 S22 25.6 0.644 0.628 0.9335 15 minute winter S24 S24 S23 S23 11.1 0.606 0.251 0.7946 240 minute winter S04 S04 Int Interceptor 170.7 1.513 0.602 6.3820 15 minute winter S08 6.000 S10 49.4 1.537 0.764 0.4768 15 minute winter S08 6.000 S10 49.4 1.537 0.764 0.4768 15 minute winter S07 S07 S06 S06 25.5 3.550 0.081 0.0435 15 minute winter S06 S06 S05 S05 36.4 3.151 0.162 0.0671 240 minute winter S08 S06 S05 S05 36.4 3.151 0.162 0.0671 240 minute winter S08 S05 S05 36.4 3.151 0.162 0.0671 240 minute winter S01 S01 Outfall Utfall 45.0 1.172 0.083 1.3754 797.0 240 minute winter S01 S01 Outfall Outfall 43.9 1.173 0.269 6.2805 240 minute winter S12 S12 S12 -10.8 0.527 -0.066 6.0273 15 minute winter S13 S13 S13 S13 42.4 1.281 0.261 2.4376	(Ups 15 m 15 m 15 m 15 m 15 m 15 m	tream Depth, inute winter inute winter inute winter inute winter inute winter inute winter inute winter inute winter	US Node \$28 \$29 \$30 \$31 \$27 \$26 \$25	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S25 - S	29 30 31 32 26 25	DS Node \$29 \$30 \$31 \$32 \$26 \$25 \$15		0.134  Outflow (I/s) 16.4 16.3 16.4 16.1 23.0 45.9 67.9	43.4 Velocity (m/s) 0.942 0.928 1.115 1.361 0.621 1.163 1.755	0.4643 Flow/Ca 0.38 0.38 0.23 0.64 1.29 1.05	0.0000  Deciding Link Vol (m³)  60 0.5587  64 0.1706  61 0.5795  69 0.2041  67 2.0181  67 2.5987	Vol (m <sup>3</sup> ) 7.7	
15 minute winter S18 S18-S17 S17 142.8 1.401 0.885 2.4540 15 minute winter S19 S19-S18 S18 128.8 1.318 0.775 2.8686 15 minute winter S20 S20 S20 69.3 0.945 0.426 3.8293 15 minute winter S21 S21 - S20 S20 69.3 0.945 0.426 3.8293 15 minute winter S22 1.002 S21 63.4 1.628 1.626 0.3159 15 minute winter S23 S23 S23 S22 S22 25.6 0.644 0.628 0.9335 15 minute winter S24 S24 - S23 S23 11.1 0.606 0.251 0.7946 240 minute winter S04 S04 - Int Interceptor 170.7 1.513 0.602 6.3820 15 minute winter S08 6.000 S10 49.4 1.537 0.764 0.4768 15 minute winter S08 6.000 S10 49.4 1.537 0.764 0.4768 15 minute winter S09 5.000 S10 57.8 1.452 1.360 1.0980 15 minute winter S07 S07 - S06 S06 25.5 3.550 0.081 0.0435 15 minute winter S06 S06 S05 S05 36.4 3.151 0.162 0.0671 240 minute winter S03 S03 - ST Settlement Tank 1120.7 3.979 1.252 0.8349 120 minute winter S01 S01 - Outfall Outfall 45.0 1.172 0.083 1.3754 797.0 240 minute winter S11 S11 S04 S04 50.2 2.072 0.146 2.3652 240 minute winter S13 S13 S13 42.4 1.281 0.261 2.4376	(Ups 15 m 15 m 15 m 15 m 15 m 15 m 240 r	tream Depth, inute winter inute winter inute winter inute winter inute winter inute winter inute winter minute winter	US Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S25 - S S15 - S	29 30 31 32 26 25 15	DS Node \$29 \$30 \$31 \$32 \$26 \$25 \$15 \$04		0.134  Outflow (I/s) 16.4 16.3 16.4 16.1 23.0 45.9 67.9 81.3	43.4 Velocity (m/s) 0.942 0.928 1.115 1.361 0.621 1.163 1.755 1.648	0.4643 Flow/Ca 0.38 0.38 0.23 0.64 1.29 1.05 0.40	0.0000  P. Link Vol (m³)  86	Vol (m <sup>3</sup> ) 7.7	
15 minute winter S20 S20 S20 S20 69.3 0.945 0.426 3.8293 15 minute winter S21 S21 - S20 S20 69.3 0.945 0.426 3.8293 15 minute winter S22 1.002 S21 63.4 1.628 1.626 0.3159 15 minute winter S23 S23 S22 S22 25.6 0.644 0.628 0.9335 15 minute winter S24 S24 - S23 S23 11.1 0.606 0.251 0.7946 240 minute winter S04 S04 - Int Interceptor 170.7 1.513 0.602 6.3820 15 minute winter S10 5.001 S04 102.4 2.941 0.916 1.3943 15 minute winter S08 6.000 S10 49.4 1.537 0.764 0.4768 15 minute winter S09 5.000 S10 49.4 1.537 0.764 0.4768 15 minute winter S09 5.000 S10 57.8 1.452 1.360 1.0980 15 minute winter S07 S07 - S06 S06 25.5 3.550 0.081 0.0435 15 minute winter S06 S06 S05 S05 36.4 3.151 0.162 0.0671 240 minute winter S05 S05 - S 04 S04 19.0 1.648 0.164 0.7196 180 minute winter S01 S01 - Outfall Outfall 45.0 1.172 0.083 1.3754 797.0 240 minute winter S11 S11 - S04 S04 50.2 2.072 0.146 2.3652 240 minute winter S13 S13 S13 42.4 1.281 0.261 2.4376	(Ups 15 m 15 m 15 m 15 m 15 m 15 m 240 r 240 r	tream Depth, inute winter inute winter inute winter inute winter inute winter inute winter inute winter minute winter minute winter	US Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S25 - S S15 - S S16 - S	29 30 31 32 26 25 15 04	S29 S30 S31 S32 S26 S25 S15 S04 S15		0.134  Outflow (l/s) 16.4 16.3 16.4 16.1 23.0 45.9 67.9 81.3 49.5	43.4 Velocity (m/s) 0.942 0.928 1.115 1.361 0.621 1.163 1.755 1.648 1.278	0.4643 Flow/Ca 0.38 0.38 0.23 0.64 1.29 1.05 0.40 0.30	0.0000  Deciding Link Vol (m³) 0.5587 0.1706 0.5795 0.2041 0.20216 0.7 0.20181 0.20216 0.7 0.20381 0.2	Vol (m³) 7.7	
15 minute winter S21 S21 - S20 S20 69.3 0.945 0.426 3.8293 15 minute winter S22 1.002 S21 63.4 1.628 1.626 0.3159 15 minute winter S23 S23 - S22 S22 25.6 0.644 0.628 0.9335 15 minute winter S24 S24 - S23 S23 11.1 0.606 0.251 0.7946 240 minute winter S04 S04 - Int Interceptor 170.7 1.513 0.602 6.3820 15 minute winter S10 5.001 S04 102.4 2.941 0.916 1.3943 15 minute winter S08 6.000 S10 49.4 1.537 0.764 0.4768 15 minute winter S09 5.000 S10 49.4 1.537 0.764 0.4768 15 minute winter S09 5.000 S10 57.8 1.452 1.360 1.0980 15 minute winter S07 S07 - S06 S06 25.5 3.550 0.081 0.0435 15 minute winter S06 S06 - S05 S05 36.4 3.151 0.162 0.0671 240 minute winter S05 S05 - S 04 19.0 1.648 0.164 0.7196 180 minute winter S03 S03 - ST Settlement Tank 1120.7 3.979 1.252 0.8349 120 minute winter S01 S01 - Outfall Outfall 45.0 1.172 0.083 1.3754 797.0 240 minute winter S11 S11 - S04 S04 50.2 2.072 0.146 2.3652 240 minute winter S13 S13 S13 42.4 1.281 0.261 2.4376	(Ups 15 m 15 m 15 m 15 m 15 m 15 m 240 r 240 r	tream Depth, inute winter inute winter inute winter inute winter inute winter inute winter minute winter minute winter minute winter	US Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S25 - S S15 - S S16 - S S17 - S	29 30 31 32 26 25 15 04 15	S29 S30 S31 S32 S26 S25 S15 S04 S15 S16		0.134  Outflow (I/s) 16.4 16.3 16.4 16.1 23.0 45.9 67.9 81.3 49.5 149.8	43.4 Velocity (m/s) 0.942 0.928 1.115 1.361 0.621 1.163 1.755 1.648 1.278 1.517	0.4643 Flow/Ca 0.38 0.38 0.23 0.64 1.29 1.05 0.40 0.30	0.0000  PD Link Vol (m³) 36 0.5587 34 0.1706 31 0.5795 39 0.2041 47 2.0181 37 2.5987 4.0147 4.0190	Vol (m³) 7.7	
15 minute winter S22 1.002 S21 63.4 1.628 1.626 0.3159 15 minute winter S23 S23 S22 S22 25.6 0.644 0.628 0.9335 15 minute winter S24 S24 S23 S23 11.1 0.6006 0.251 0.7946 240 minute winter S04 S04 - Int Interceptor 170.7 1.513 0.602 6.3820 15 minute winter S10 5.001 S04 102.4 2.941 0.916 1.3943 15 minute winter S08 6.000 S10 49.4 1.537 0.764 0.4768 15 minute winter S09 5.000 S10 57.8 1.452 1.360 1.0980 15 minute winter S07 S07 - S06 S06 25.5 3.550 0.081 0.0435 15 minute winter S06 S06 S05 S05 36.4 3.151 0.162 0.0671 240 minute winter S05 S05 S04 19.0 1.648 0.164 0.7196 180 minute winter S03 S03 - ST Settlement Tank 1120.7 3.979 1.252 0.8349 120 minute winter S01 S01 - Outfall Outfall 45.0 1.172 0.083 1.3754 797.0 240 minute winter S11 S11 S11 S04 S04 50.2 2.072 0.146 2.3652 240 minute winter S13 S13 S13 42.4 1.281 0.261 2.4376	(Ups 15 m 15 m 15 m 15 m 15 m 240 r 240 r 15 m 15 m	tream Depth, inute winter inute winter inute winter inute winter inute winter inute winter minute winter inute winter inute winter inute winter inute winter inute winter	US Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17 \$18 \$19	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S25 - S S15 - S S17 - S S18 - S S18 - S S18 - S S18 - S	29 30 31 32 26 25 15 04 15 16 7	S29 S30 S31 S32 S26 S25 S15 S04 S15 S16 S17 S18		0.134  Outflow (I/s) 16.4 16.3 16.4 16.1 23.0 45.9 67.9 81.3 49.5 149.8 142.8 128.8	43.4 Velocity (m/s) 0.942 0.928 1.115 1.361 0.621 1.163 1.755 1.648 1.278 1.517 1.401 1.318	0.4643 Flow/Ca 0.38 0.38 0.23 0.64 1.29 1.05 0.40 0.30 0.92 0.88 0.77	0.0000  Deciding Link Vol (m³)  60 0.5587  64 0.1706  631 0.5795  69 0.2041  67 2.0181  67 2.5987  62 4.0147  64 4.0190  65 2.8686	Vol (m³) 7.7	
15 minute winter S23 S23 S22 S22 S25 0.644 0.628 0.9335 15 minute winter S24 S24 S23 S23 11.1 0.606 0.251 0.7946 240 minute winter S04 S04 - Int Interceptor 170.7 1.513 0.602 6.3820 15 minute winter S10 5.001 S04 102.4 2.941 0.916 1.3943 15 minute winter S08 6.000 S10 49.4 1.537 0.764 0.4768 15 minute winter S09 5.000 S10 57.8 1.452 1.360 1.0980 15 minute winter S07 S07 - S06 S06 25.5 3.550 0.081 0.0435 15 minute winter S06 S06 S05 S05 36.4 3.151 0.162 0.0671 240 minute winter S03 S03 - ST Settlement Tank 1120.7 3.979 1.252 0.8349 120 minute winter S01 S01 - Outfall Outfall 45.0 1.172 0.083 1.3754 797.0 240 minute winter S11 S11 S04 S04 50.2 2.072 0.146 2.3652 240 minute winter S13 S13 S13 S13 42.4 1.281 0.261 2.4376	(Ups 15 m 15 m 15 m 15 m 15 m 15 m 240 r 240 r 15 m 15 m 15 m	tream Depth, inute winter inute winter inute winter inute winter inute winter inute winter minute winter minute winter inute winter inute winter inute winter inute winter inute winter	US Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17 \$18 \$19 \$20	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S25 - S S15 - S S17 - S S18 - S S18 - S S18 - S S18 - S	29 30 31 32 26 25 15 04 15 7 8	S29 S30 S31 S32 S26 S25 S15 S04 S15 S16 S17 S18 S19		0.134  Outflow (I/s) 16.4 16.3 16.4 16.1 23.0 45.9 67.9 81.3 49.5 149.8 142.8 128.8 104.0	43.4 Velocity (m/s) 0.942 0.928 1.115 1.361 0.621 1.163 1.755 1.648 1.278 1.517 1.401 1.318 1.129	0.4643 Flow/Ca 0.38 0.38 0.23 0.64 1.29 1.05 0.40 0.30 0.92 0.88 0.77 0.62	0.0000  Deciding Link Vol (m³)  6 0.5587  6 0.5795  9 0.2041  17 2.0181  11 2.0216  17 2.5987  12 3.9348  15 4.0147  4.0190  15 2.8886  16 0.8791	Vol (m³) 7.7	
15 minute winter S24 S24 S23 S23 11.1 0.606 0.251 0.7946 240 minute winter S04 S04 - Int Interceptor 170.7 1.513 0.602 6.3820 15 minute winter S10 5.001 S04 102.4 2.941 0.916 1.3943 15 minute winter S08 6.000 S10 49.4 1.537 0.764 0.4768 15 minute winter S09 5.000 S10 57.8 1.452 1.360 1.0980 15 minute winter S07 S07 - S06 S06 25.5 3.550 0.081 0.0435 15 minute winter S06 S06 S05 S05 36.4 3.151 0.162 0.0671 240 minute winter S05 S05 - S 04 S04 19.0 1.648 0.164 0.7196 180 minute winter S03 S03 - ST Settlement Tank 1120.7 3.979 1.252 0.8349 120 minute winter S01 S01 - Outfall Outfall 45.0 1.172 0.083 1.3754 797.0 240 minute winter S11 S11 - S04 S04 50.2 2.072 0.146 2.3652 240 minute winter S13 S13 S13 S13 42.4 1.281 0.261 2.4376	(Ups 15 m 15 m 15 m 15 m 15 m 240 r 240 r 15 m 15 m 15 m 15 m	tream Depth, inute winter inute winter	US Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17 \$18 \$19 \$20 \$21	S28 - S S29 - S S30 - S S31 - S S26 - S S25 - S S15 - S S17 - S S18 - S S17 - S S18 - S S17 - S S18 - S	29 30 31 32 26 25 15 04 15 7 8	S29 S30 S31 S32 S26 S25 S25 S15 S04 S15 S16 S17 S18 S19 S20		0.134  Outflow (l/s) 16.4 16.3 16.4 16.1 23.0 45.9 67.9 81.3 49.5 149.8 142.8 128.8 104.0 69.3	43.4 Velocity (m/s) 0.942 0.928 1.115 1.361 0.621 1.163 1.755 1.648 1.278 1.517 1.401 1.318 1.129 0.945	0.4643  Flow/Ca  0.38 0.38 0.23  0.64 1.29 1.05 0.40 0.30 0.92 0.88 0.77 0.62 0.42	0.0000  P. Link Vol (m³) 60 0.5587 64 0.1706 631 0.5795 69 0.2041 67 2.0181 67 2.5987 62 3.9348 65 4.0147 64 4.0190 65 2.4540 65 2.8686 66 0.8791 62 3.8293	Vol (m³) 7.7	
240 minute winter         S04         S04 - Int         Interceptor         170.7         1.513         0.602         6.3820           15 minute winter         S10         5.001         S04         102.4         2.941         0.916         1.3943           15 minute winter         S08         6.000         S10         49.4         1.537         0.764         0.4768           15 minute winter         S09         5.000         S10         57.8         1.452         1.360         1.0980           15 minute winter         S07         S07 - S06         S06         25.5         3.550         0.081         0.0435           15 minute winter         S06         S05 - S05         36.4         3.151         0.162         0.0671           240 minute winter         S05         S05 - S 04         S04         19.0         1.648         0.164         0.7196           180 minute winter         S03         S03 - ST         Settlement Tank         1120.7         3.979         1.252         0.8349           120 minute winter         S01         S01 - Outfall         Outfall         45.0         1.172         0.083         1.3754         797.0           240 minute winter         S11         S11 - S04	(Ups 15 m 15 m 15 m 15 m 15 m 240 r 240 r 240 r 15 m 15 m 15 m 15 m	tream Depth, inute winter inute winter inute winter inute winter inute winter inute winter minute winter minute winter inute winter	US Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S25 - S S15 - S S17 - S S18-S1 S19-S1 S20 - S S21 - S S11 - S	29 30 31 32 26 25 15 04 15 16 7 8 19	S29 S30 S31 S32 S26 S25 S15 S04 S15 S16 S17 S18 S19 S20 S21		0.134  Outflow (I/s) 16.4 16.3 16.4 16.1 23.0 45.9 67.9 81.3 49.5 149.8 142.8 128.8 104.0 69.3 63.4	43.4 Velocity (m/s) 0.942 0.928 1.115 1.361 0.621 1.163 1.755 1.648 1.278 1.517 1.401 1.318 1.129 0.945 1.628	0.4643  Flow/Ca  0.38  0.38  0.23  0.64  1.29  1.05  0.40  0.30  0.92  0.88  0.77  0.62  0.42  1.62	0.0000  Property Link Vol (m³) 36 0.5587 34 0.1706 37 0.5795 39 0.2041 37 2.0181 37 2.0181 37 2.5987 3.9348 35 4.0147 4.0190 35 2.4540 55 2.8686 0.8791 26 3.8293 26 0.3159	Vol (m³) 7.7	
15 minute winter S10 5.001 S04 102.4 2.941 0.916 1.3943 15 minute winter S08 6.000 S10 49.4 1.537 0.764 0.4768 15 minute winter S09 5.000 S10 57.8 1.452 1.360 1.0980 15 minute winter S07 S07 - S06 S06 25.5 3.550 0.081 0.0435 15 minute winter S06 S06 - S05 S05 36.4 3.151 0.162 0.0671 240 minute winter S05 S05 S04 S04 19.0 1.648 0.164 0.7196 180 minute winter S03 S03 - ST Settlement Tank 1120.7 3.979 1.252 0.8349 120 minute winter S01 S01 - Outfall Outfall 45.0 1.172 0.083 1.3754 797.0 240 minute winter S11 S11 S11 S04 S04 50.2 2.072 0.146 2.3652 240 minute winter S12 S12 S11 S11 43.9 1.173 0.269 6.2805 240 minute winter S13 S13 S13 42.4 1.281 0.261 2.4376	(Ups 15 m 15 m 15 m 15 m 15 m 15 m 240 r 240 r 15 m 15 m 15 m 15 m	tream Depth, inute winter inute winter inute winter inute winter inute winter inute winter minute winter minute winter inute winter	US Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S25 - S S15 - S S17 - S S17 - S S18 - S17 - S S18 - S1 - S S19 - S S21 - S S21 - S S22 - S S23 - S S23 - S	29 30 31 32 26 25 15 04 15 16 7 8 19 20	S29 S30 S31 S32 S26 S25 S15 S04 S15 S16 S17 S18 S19 S20 S21 S22		0.134  Outflow (I/s) 16.4 16.3 16.4 16.1 23.0 45.9 67.9 81.3 49.5 149.8 142.8 128.8 104.0 69.3 63.4 25.6	43.4  Velocity (m/s) 0.942 0.928 1.115 1.361  0.621 1.163 1.755 1.648 1.278 1.517 1.401 1.318 1.129 0.945 1.628 0.644	0.4643 Flow/Ca 0.38 0.38 0.23 0.64 1.29 1.05 0.40 0.30 0.92 0.88 0.77 0.62 0.42 1.62 0.62	0.0000  Property Link Vol (m³)  106 0.5587  124 0.1706  137 2.0181  137 2.0181  137 2.0181  137 2.5987  122 3.9348  139 4.0147  124 4.0190  135 2.4540  136 0.8791  137 2.8686  138 293  138 293  138 293  138 293  138 293  138 293  138 293  138 293  138 293	Vol (m³) 7.7	
15 minute winter S08 6.000 S10 49.4 1.537 0.764 0.4768 15 minute winter S09 5.000 S10 57.8 1.452 1.360 1.0980 15 minute winter S07 S07 - S06 S06 25.5 3.550 0.081 0.0435 15 minute winter S06 S06 - S05 S05 36.4 3.151 0.162 0.0671 240 minute winter S05 S05 - S 04 S04 19.0 1.648 0.164 0.7196 180 minute winter S03 S03 - ST Settlement Tank 1120.7 3.979 1.252 0.8349 120 minute winter S01 S01 - Outfall Outfall 45.0 1.172 0.083 1.3754 797.0 240 minute winter S11 S11 - S04 S04 50.2 2.072 0.146 2.3652 240 minute winter S12 S12 - S11 S11 43.9 1.173 0.269 6.2805 240 minute winter S13 S13 S13 S13 42.4 1.281 0.261 2.4376	15 m 15 m 15 m 15 m 15 m 15 m 240 r 240 r 240 r 15 m 15 m 15 m 15 m 15 m	tream Depth, inute winter inute winter	US Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23 \$24	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S15 - S S16 - S S17 - S S18 -	29 30 31 32 26 25 15 04 15 7 8 19 20	S29 S30 S31 S32 S26 S25 S15 S04 S15 S16 S17 S18 S19 S20 S21 S22 S23	3	0.134  Outflow (I/s) 16.4 16.3 16.4 16.1 23.0 45.9 67.9 81.3 49.5 149.8 142.8 128.8 104.0 69.3 63.4 25.6 11.1	43.4  Velocity (m/s) 0.942 0.928 1.115 1.361  0.621 1.163 1.755 1.648 1.278 1.517 1.401 1.318 1.129 0.945 1.628 0.644 0.606	0.4643  Flow/Ca  0.38 0.38 0.23  0.64 1.29 1.05 0.40 0.30 0.92 0.88 0.77 0.62 0.42 1.62 0.62 0.25	0.0000  Ip Link Vol (m³) 66 0.5587 84 0.1706 81 0.5795 89 0.2041 87 2.0181 81 2.0216 87 2.5987 82 3.9348 84 0.147 85 2.4540 875 2.8686 86 0.8791 86 0.3159 88 0.9335 81 0.7946	Vol (m³) 7.7	
15 minute winter S09 5.000 S10 57.8 1.452 1.360 1.0980 15 minute winter S07 S07 - S06 S06 25.5 3.550 0.081 0.0435 15 minute winter S06 S06 - S05 S05 36.4 3.151 0.162 0.0671 240 minute winter S05 S05 - S 04 S04 19.0 1.648 0.164 0.7196 180 minute winter S03 S03 - ST Settlement Tank 1120.7 3.979 1.252 0.8349 120 minute winter S01 S01 - Outfall Outfall 45.0 1.172 0.083 1.3754 797.0 240 minute winter S11 S11 - S04 S04 50.2 2.072 0.146 2.3652 240 minute winter S12 S12 - S11 S11 43.9 1.173 0.269 6.2805 240 minute winter S13 S13 S13 S13 42.4 1.281 0.261 2.4376	15 m 15 m 15 m 15 m 15 m 15 m 15 m 240 r 240 r 15 m 15 m 15 m 15 m 15 m 15 m 240 r 240 r	tream Depth, inute winter inute winter	US Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23 \$23 \$24 \$04	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S25 - S S16 - S S17 - S S18 -	29 30 31 32 26 25 15 04 15 7 8 19 20	S29 S30 S31 S32 S26 S25 S15 S04 S15 S16 S17 S18 S19 S20 S21 S22 S23 Interceptor	3	0.134  Outflow (I/s) 16.4 16.3 16.4 16.1 23.0 45.9 67.9 81.3 49.5 149.8 142.8 104.0 69.3 63.4 25.6 11.1 170.7	43.4  Velocity (m/s) 0.942 0.928 1.115 1.361 0.621 1.163 1.755 1.648 1.278 1.517 1.401 1.318 1.129 0.945 1.628 0.644 0.606 1.513	0.4643  Flow/Ca  0.38 0.38 0.23  0.64 1.29 1.05 0.40 0.30 0.92 0.88 0.77 0.62 0.42 1.62 0.62 0.25 0.60	0.0000  Link Vol (m³) 6 0.5587 64 0.1706 631 0.5795 89 0.2041 17 2.0181 11 2.0216 67 2.5987 12 3.9348 4.0147 4.0190 85 2.4540 85 2.4540 87 2.8686 12 0.8791 12 0.3159 12 0.3159 12 0.7946 12 0.38293 15 0.7946 12 0.7946 12 0.7946	Vol (m³) 7.7	
15 minute winter S07 S07 - S06 S06 S06 25.5 3.550 0.081 0.0435 15 minute winter S06 S06 - S05 S05 36.4 3.151 0.162 0.0671 240 minute winter S05 S05 - S 04 S04 19.0 1.648 0.164 0.7196 180 minute winter S03 S03 - ST Settlement Tank 1120.7 3.979 1.252 0.8349 120 minute winter S01 S01 - Outfall Outfall 45.0 1.172 0.083 1.3754 797.0 240 minute winter S11 S11 - S04 S04 50.2 2.072 0.146 2.3652 240 minute winter S12 S12 S12 - 10.8 0.527 - 0.066 6.0273 15 minute winter S14 S14 S13 S13 S13 42.4 1.281 0.261 2.4376	15 m 15 m 15 m 15 m 15 m 15 m 15 m 240 r 240 r 15 m 15 m 15 m 15 m 15 m 15 m	tream Depth, inute winter inute winter	US Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23 \$24 \$04 \$10	S28 - S S29 - S S30 - S S31 - S S26 - S S25 - S S15 - S S17 - S S18 - S S17 - S S17 - S S18 - S S17 - S S18 - S S17 - S S18 - S S17 - S S17 - S S18 - S S17 - S S17 - S S17 - S S18 - S S17 -	29 30 31 32 26 25 15 04 15 7 8 19 20	S29 S30 S31 S32 S26 S25 S15 S04 S15 S16 S17 S18 S19 S20 S21 S22 S23 Interceptor	3	0.134  Outflow (I/s) 16.4 16.3 16.4 16.1 23.0 45.9 67.9 81.3 49.5 149.8 142.8 128.8 104.0 69.3 63.4 25.6 11.1 170.7 102.4	43.4  Velocity (m/s) 0.942 0.928 1.115 1.361 0.621 1.163 1.755 1.648 1.278 1.517 1.401 1.318 1.129 0.945 1.628 0.644 0.606 1.513 2.941	0.4643  Flow/Ca  0.38 0.38 0.23  0.64 1.29 1.05 0.40 0.30 0.92 0.88 0.77 0.62 0.42 1.62 0.62 0.25 0.60 0.91	0.0000  P. Link Vol (m³)  86	Vol (m³) 7.7	
15 minute winter S06 S06 - S05	(Ups 15 m 15 m 15 m 15 m 15 m 240 r 240 r 15 m 15 m 15 m 15 m 15 m 240 r 240 r 240 r	tream Depth, inute winter inute winter	US Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23 \$24 \$04 \$10 \$08	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S25 - S S15 - S S17 - S S18-S1 S20 - S S21 - S 1.002 S23 - S S24 - S S24 - S	29 30 31 32 26 25 15 04 15 7 8 19 20	S29 S30 S31 S32 S26 S25 S15 S04 S15 S16 S17 S18 S19 S20 S21 S22 S23 Interceptor S04 S10	3	0.134  Outflow (I/s) 16.4 16.3 16.4 16.1 23.0 45.9 67.9 81.3 49.5 149.8 142.8 128.8 104.0 69.3 63.4 25.6 11.1 170.7 102.4 49.4	43.4  Velocity (m/s) 0.942 0.928 1.115 1.361 0.621 1.163 1.755 1.648 1.278 1.517 1.401 1.318 1.129 0.945 1.628 0.644 0.606 1.513 2.941 1.537	0.4643  Flow/Ca  0.38 0.38 0.23  0.64 1.29 1.05 0.40 0.30 0.92 0.88 0.77 0.62 0.42 1.62 0.62 0.60 0.91 0.76	0.0000    Description   Color   Color	Vol (m³) 7.7	
240 minute winter       S05       S05 - S 04       S04       19.0       1.648       0.164       0.7196         180 minute winter       S03       S03 - ST       Settlement Tank       1120.7       3.979       1.252       0.8349         120 minute winter       S01       S01 - Outfall       Outfall       45.0       1.172       0.083       1.3754       797.0         240 minute winter       S11       S11 - S04       S04       50.2       2.072       0.146       2.3652         240 minute winter       S12       S12 - S11       S11       43.9       1.173       0.269       6.2805         240 minute winter       S13       S13 - S 12       S12       -10.8       0.527       -0.066       6.0273         15 minute winter       S14       S14 - S13       S13       42.4       1.281       0.261       2.4376	15 m 15 m 15 m 15 m 15 m 15 m 240 r 240 r 15 m 15 m 15 m 15 m 15 m 15 m 15 m 15 m	tream Depth inute winter inute winter	US Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23 \$24 \$04 \$10 \$08 \$09	\$28 - S\$29 - S\$30 - S\$31 - S\$\$27 - S\$26 - S\$25 - S\$15 - S\$17 - S\$21 - S\$17 - S\$21 - S\$	29 30 31 32 26 25 15 04 15 7 8 19 20 22 23 1t	\$29 \$30 \$31 \$32 \$26 \$25 \$15 \$04 \$17 \$18 \$19 \$20 \$21 \$22 \$23 Interceptor \$04 \$10 \$10	3	0.134  Outflow (I/s) 16.4 16.3 16.4 16.1 23.0 45.9 67.9 81.3 49.5 149.8 128.8 104.0 69.3 63.4 25.6 11.1 170.7 102.4 49.4 57.8	43.4  Velocity (m/s) 0.942 0.928 1.115 1.361  0.621 1.163 1.755 1.648 1.278 1.517 1.401 1.318 1.129 0.945 1.628 0.644 0.606 1.513 2.941 1.537 1.452	0.4643  Flow/Ca  0.38 0.38 0.23  0.64 1.29 1.05 0.40 0.30 0.92 0.88 0.77 0.62 0.42 1.62 0.25 0.60 0.91 0.76 1.36	0.0000    Description   Colored   Co	Vol (m³) 7.7	
180 minute winter         S03         S03 - ST         Settlement Tank         1120.7         3.979         1.252         0.8349           120 minute winter         S01         S01 - Outfall         Outfall         45.0         1.172         0.083         1.3754         797.0           240 minute winter         S11         S11 - S04         S04         50.2         2.072         0.146         2.3652           240 minute winter         S12         S12 - S11         S11         43.9         1.173         0.269         6.2805           240 minute winter         S13         S13- S 12         S12         -10.8         0.527         -0.066         6.0273           15 minute winter         S14         S14 - S13         S13         42.4         1.281         0.261         2.4376	(Ups 15 m 15 m 15 m 15 m 15 m 15 m 240 r 240 r 15 m 15 m 15 m 240 r 15 m 15 m 15 m 15 m	tream Depth, inute winter inute winter	US Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23 \$24 \$04 \$10 \$08 \$09 \$07	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S15 - S S16 - S S17 - S S18 - S S10 - S S21 -	29 30 31 32 26 25 15 04 15 7 8 19 20 22 23 1t	S29 S30 S31 S32 S26 S25 S15 S04 S15 S16 S17 S18 S19 S20 S21 S22 S23 Interceptor S04 S10 S10 S06	3	0.134  Outflow (I/s) 16.4 16.3 16.4 16.1 23.0 45.9 67.9 81.3 49.5 149.8 128.8 104.0 69.3 63.4 25.6 11.1 170.7 102.4 49.4 57.8 25.5	43.4  Velocity (m/s) 0.942 0.928 1.115 1.361  0.621 1.163 1.755 1.648 1.278 1.517 1.401 1.318 1.129 0.945 1.628 0.644 0.606 1.513 2.941 1.537 1.452 3.550	0.4643  Flow/Ca  0.38 0.38 0.23  0.64 1.29 1.05 0.40 0.30 0.92 0.88 0.77 0.62 0.42 1.62 0.62 0.60 0.91 0.76 1.36 0.08	0.0000    Description   Colored   Co	Vol (m³) 7.7	
120 minute winter     S01     S01 - Outfall     Outfall     45.0     1.172     0.083     1.3754     797.0       240 minute winter     S11     S11 - S04     S04     50.2     2.072     0.146     2.3652       240 minute winter     S12     S12 - S11     S11     43.9     1.173     0.269     6.2805       240 minute winter     S13     S13 - S 12     S12     -10.8     0.527     -0.066     6.0273       15 minute winter     S14     S14 - S13     S13     42.4     1.281     0.261     2.4376	(Ups 15 m 15 m 15 m 15 m 15 m 15 m 240 r 240 r 15 m 15 m 15 m 15 m 240 r 15 m 15 m 15 m 15 m 15 m 15 m	tream Depth, inute winter inute winter	US Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23 \$24 \$04 \$10 \$08 \$09 \$07 \$06	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S15 - S S16 - S S17 - S S18 - S S18 - S S18 - S S18 - S S18 - S S18 - S S10 - S S21 -	29 30 31 32 26 225 115 04 115 116 7 7 8 119 20 22 23 11	S29 S30 S31 S32 S26 S25 S15 S04 S17 S18 S19 S20 S21 S22 S23 Interceptor S04 S10 S10 S06 S05	3	0.134  Outflow (I/s) 16.4 16.3 16.4 16.1 23.0 45.9 67.9 81.3 49.5 149.8 142.8 104.0 69.3 63.4 25.6 11.1 170.7 102.4 49.4 57.8 25.5 36.4	43.4  Velocity (m/s) 0.942 0.928 1.115 1.361  0.621 1.163 1.755 1.648 1.278 1.517 1.401 1.318 1.129 0.945 1.628 0.644 0.606 1.513 2.941 1.537 1.452 3.550 3.151	0.4643  Flow/Ca  0.38 0.38 0.23  0.644 1.29 1.05 0.40 0.30 0.92 0.88 0.77 0.62 0.42 1.62 0.62 0.62 0.60 0.91 0.76 1.36 0.08 0.16	0.0000    Description   Link	Vol (m³) 7.7	
240 minute winter     S11     S11 - S04     S04     50.2     2.072     0.146     2.3652       240 minute winter     S12     S12 - S11     S11     43.9     1.173     0.269     6.2805       240 minute winter     S13     S13 - S 12     S12     -10.8     0.527     -0.066     6.0273       15 minute winter     S14     S14 - S13     S13     42.4     1.281     0.261     2.4376	(Ups 15 m 15 m 15 m 15 m 15 m 240 r 240 r 15 m 15 m 15 m 15 m 15 m 15 m 15 m 15 m	tream Depth, inute winter	US Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23 \$24 \$04 \$10 \$08 \$09 \$07 \$06 \$05	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S15 - S S16 - S S17 - S S18 - S1 S19 - S1 S20 - S S21 - S S	29 30 31 32 26 225 115 04 115 16 7 8 119 20 22 223 31	S29 S30 S31 S32 S26 S25 S15 S04 S15 S16 S17 S18 S19 S20 S21 S22 S23 Interceptor S04 S10 S10 S06 S05 S04		0.134  Outflow (I/s) 16.4 16.3 16.4 16.1 23.0 45.9 67.9 81.3 49.5 149.8 142.8 104.0 69.3 63.4 25.6 11.1 170.7 102.4 49.4 57.8 25.5 36.4 19.0	43.4  Velocity (m/s) 0.942 0.928 1.115 1.361  0.621 1.163 1.755 1.648 1.278 1.517 1.401 1.318 1.129 0.945 1.628 0.644 0.606 1.513 2.941 1.537 1.452 3.550 3.151 1.648	0.4643  Flow/Ca  0.38 0.38 0.23  0.64 1.29 1.05 0.40 0.30 0.92 0.88 0.77 0.62 0.42 1.62 0.62 0.25 0.60 0.91 0.76 1.36 0.08 0.16 0.16	0.0000  Link Vol (m³) 6 0.5587 64 0.1706 631 0.5795 89 0.2041 17 2.0181 11 2.0216 67 2.5987 12 3.9348 15 4.0147 14 4.0190 15 2.8686 16 0.8791 16 0.3159 16 0.3159 16 0.7946 17 0.7946 18 0.4768 18 0.4768 18 0.4768 18 0.4768 18 0.4768 18 0.4768 18 0.4768 18 0.4768 18 0.4768 18 0.4768 18 0.4768 18 0.4768 18 0.4768 18 0.4768	Vol (m³) 7.7	
240 minute winter       S12       S12 - S11       S11       43.9       1.173       0.269       6.2805         240 minute winter       S13       S13- S 12       S12       -10.8       0.527       -0.066       6.0273         15 minute winter       S14       S14 - S13       S13       42.4       1.281       0.261       2.4376	(Ups 15 m 15 m 15 m 15 m 15 m 240 r 240 r 15 m 15 m 15 m 240 r 15 m 240 r 15 m 240 r 15 m 240 r 15 m	tream Depth, inute winter minute	US Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23 \$24 \$04 \$10 \$08 \$09 \$07 \$06 \$05 \$03	S28 - S S29 - S S30 - S S31 - S S26 - S S26 - S S15 - S S17 - S S18 - S S17 - S S18 - S S17 - S S18 - S S17 - S S19 - S S10 - S S21 -	29 30 31 32 26 25 515 04 115 16 7 8 119 20 22 23 1t	S29 S30 S31 S32 S26 S25 S15 S04 S15 S16 S17 S18 S19 S20 S21 S22 S23 Interceptor S04 S10 S10 S05 S04 S10 S10 S10 S10 S10 S10 S10 S10 S10 S10		0.134  Outflow (I/s) 16.4 16.3 16.4 16.1 23.0 45.9 67.9 81.3 49.5 149.8 142.8 128.8 104.0 69.3 63.4 25.6 11.1 170.7 102.4 49.4 57.8 25.5 36.4 19.0 1120.7	43.4  Velocity (m/s) 0.942 0.928 1.115 1.361 0.621 1.163 1.755 1.648 1.278 1.517 1.401 1.318 1.129 0.945 1.628 0.644 0.606 1.513 2.941 1.537 1.452 3.550 3.151 1.648 3.979	0.4643  Flow/Ca  0.38 0.38 0.23  0.64 1.29 1.05 0.40 0.30 0.92 0.88 0.77 0.62 0.42 1.62 0.62 0.60 0.91 0.76 1.36 0.08 0.16 0.16 0.16 1.25	0.0000  Link Vol (m³) 6 0.5587 64 0.1706 81 0.5795 89 0.2041 87 2.0181 81 2.0216 87 2.5987 82 4.0147 83 2.4540 85 2.4540 85 2.8686 80 0.3759 81 0.7946 81 0.7946 82 0.3759 83 0.9335 84 0.4768 85 0.4768 85 0.4768 85 0.0671 86 0.0671 86 0.0671 86 0.0673	Vol (m³) 7.7	
240 minute winter       S13       S13- S 12       S12       -10.8       0.527       -0.066       6.0273         15 minute winter       S14       S14 - S13       S13       42.4       1.281       0.261       2.4376	(Ups 15 m 15 m 15 m 15 m 15 m 240 r 240 r 15 m 15 m 15 m 15 m 15 m 15 m 15 m 15 m	tream Depth, inute winter minute winter minute winter minute winter minute winter	US Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23 \$24 \$04 \$10 \$08 \$09 \$07 \$06 \$05 \$05 \$05 \$06 \$05 \$06 \$06 \$06 \$06 \$06 \$06 \$06 \$06 \$06 \$06	\$28 - S\$29 - S\$30 - S\$31 - S\$ \$27 - S\$26 - S\$25 - S\$15 - S\$17 - S\$17 - S\$21 - S\$17 - S\$20 - S\$21 - S\$1000 - S\$21 - S\$1000 - S\$21 - S\$1000 - S\$21 - S\$	29 30 31 32 26 225 15 04 15 7 8 19 20 22 23 31	S29 S30 S31 S32 S26 S25 S15 S04 S15 S16 S17 S18 S19 S20 S21 S22 S23 Interceptor S04 S10 S06 S05 S04 Settlement		0.134  Outflow (I/s) 16.4 16.3 16.4 16.1 23.0 45.9 67.9 81.3 49.5 149.8 128.8 104.0 69.3 63.4 25.6 11.1 170.7 102.4 49.4 57.8 25.5 36.4 19.0 1120.7 45.0	43.4  Velocity (m/s) 0.942 0.928 1.115 1.361 0.621 1.163 1.755 1.648 1.278 1.517 1.401 1.318 1.129 0.945 1.628 0.644 0.606 1.513 2.941 1.537 1.452 3.550 3.151 1.648 3.979 1.172	0.4643  Flow/Ca  0.38 0.38 0.23  0.64 1.29 1.05 0.40 0.30 0.92 0.42 1.62 0.25 0.60 0.91 0.76 1.36 0.08 0.16 0.16 1.25 0.08	0.0000    Description   Colored   Co	Vol (m³) 7.7 797.0	
15 minute winter S14 S14 - S13 S13 42.4 1.281 0.261 2.4376	(Ups 15 m 15 m 15 m 15 m 15 m 15 m 240 r 15 m 15 m 15 m 15 m 15 m 15 m 15 m 15 m	tream Depth, inute winter inute	US Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23 \$24 \$04 \$10 \$08 \$09 \$07 \$06 \$05 \$05 \$05 \$06 \$05 \$06 \$06 \$06 \$06 \$06 \$06 \$06 \$06 \$06 \$06	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S25 - S S15 - S S17 - S S18 - S S18 - S S18 - S S18 - S S18 - S S10 - S S21 -	29 30 31 32 26 25 15 04 15 16 17 8 19 20 22 23 1t	S29 S30 S31 S32 S26 S25 S15 S04 S15 S16 S17 S18 S19 S20 S21 S22 S23 Interceptor S04 S10 S10 S06 S05 S04 Settlement Outfall S04		0.134  Outflow (I/s) 16.4 16.3 16.4 16.1 23.0 45.9 67.9 81.3 49.5 149.8 128.8 104.0 69.3 63.4 25.6 11.1 170.7 102.4 49.4 57.8 25.5 36.4 19.0 1120.7 45.0 50.2	43.4  Velocity (m/s) 0.942 0.928 1.115 1.361  0.621 1.163 1.755 1.648 1.278 1.517 1.401 1.318 1.129 0.945 1.628 0.644 0.606 1.513 2.941 1.537 1.452 3.550 3.151 1.648 3.979 1.172 2.072	0.4643  Flow/Ca  0.38 0.38 0.23  0.64 1.29 1.05 0.40 0.30 0.92 0.88 0.77 0.62 0.42 1.62 0.62 0.62 0.60 0.91 0.76 1.36 0.08 0.16 0.16 0.16 1.25 0.08	0.0000    Description   Link	Vol (m³) 7.7 797.0	
Flow+ v14.0 Copyright © 1988-2025 Causeway Technologies Ltd	(Ups 15 m 15 m 15 m 15 m 15 m 15 m 240 r 240 r 15 m 15 m 15 m 15 m 15 m 15 m 15 m 15 m	tream Depth, inute winter inute	US Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23 \$24 \$04 \$10 \$08 \$09 \$07 \$06 \$05 \$03 \$01 \$11 \$12	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S15 - S S16 - S S17 - S S18 - S S18 - S S18 - S S18 - S S18 - S S10 - S S21 - S S21 - S S21 - S S21 - S S21 - S S21 - S S22 - S S23 - S S24 - S S24 - S S25 - S S25 - S S26 - S S27 - S S27 - S S27 - S S27 - S S27 - S S27 - S S28 - S S28 - S S29 - S S29 - S S29 - S S29 - S S20 -	29 30 31 32 26 225 115 04 115 16 7 8 8 119 20 22 23 at	S29 S30 S31 S32 S26 S25 S15 S04 S15 S16 S17 S18 S19 S20 S21 S22 S23 Interceptor S04 S10 S10 S10 S10 S06 S05 S04 Settlement Outfall S04 S11		0.134  Outflow (I/s) 16.4 16.3 16.4 16.1 23.0 45.9 67.9 81.3 49.5 149.8 128.8 104.0 69.3 63.4 25.6 11.1 170.7 102.4 49.4 457.8 25.5 36.4 19.0 1120.7 45.0 50.2 43.9	43.4  Velocity (m/s) 0.942 0.928 1.115 1.361  0.621 1.163 1.755 1.648 1.278 1.517 1.401 1.318 1.129 0.945 1.628 0.644 0.606 1.513 2.941 1.537 1.452 3.550 3.151 1.648 3.979 1.172 2.072 1.173	0.4643  Flow/Ca  0.38 0.38 0.23  0.64 1.29 1.05 0.40 0.30 0.92 0.88 0.77 0.62 0.42 1.62 0.25 0.60 0.91 0.76 1.36 0.16 0.16 0.16 0.16 0.16 0.26	0.0000    Description   Link	Vol (m³) 7.7 797.0	
	(Ups 15 m 15 m 15 m 15 m 15 m 240 r 240 r 15 m 15 m 15 m 15 m 15 m 15 m 15 m 15 m	tream Depth, inute winter minute winter minut	US Node \$28 \$29 \$30 \$31 \$27 \$26 \$25 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23 \$24 \$04 \$10 \$08 \$09 \$07 \$06 \$05 \$03 \$01 \$11 \$12 \$13	S28 - S S29 - S S30 - S S31 - S S27 - S S26 - S S15 - S S16 - S S17 - S S18 -	29 30 31 32 26 225 115 04 115 16 7 8 19 20 22 23 31 11 10 6 6 005 104 11 11 11	S29 S30 S31 S32 S26 S25 S15 S04 S15 S16 S17 S18 S19 S20 S21 S22 S23 Interceptor S04 S10 S10 S06 S05 S04 Settlement Outfall S04 S11 S12		0.134  Outflow (I/s) 16.4 16.3 16.4 16.1 23.0 45.9 67.9 81.3 49.5 149.8 142.8 104.0 69.3 63.4 25.6 11.1 170.7 102.4 49.4 57.8 25.5 36.4 19.0 1120.7 45.0 50.2 43.9 -10.8	43.4  Velocity (m/s) 0.942 0.928 1.115 1.361 0.621 1.163 1.755 1.648 1.278 1.517 1.401 1.318 1.129 0.945 1.628 0.644 0.606 1.513 2.941 1.537 1.452 3.550 3.151 1.648 3.979 1.172 2.072 1.173 0.527	0.4643  Flow/Ca  0.38 0.38 0.23  0.644 1.29 1.05 0.40 0.30 0.92 0.88 0.77 0.62 0.42 1.62 0.62 0.62 0.60 0.91 0.76 1.36 0.08 0.16 0.16 0.16 0.16 0.26 0.26 0.04	0.0000  Link Vol (m³) 6 0.5587 84 0.1706 81 0.5795 89 0.2041 87 2.0181 81 2.0216 87 2.5987 82 3.9348 84 0.147 84 2.018 85 2.4540 87 2.8686 86 0.8791 86 3.8293 86 0.3159 86 0.3159 86 0.4768 87 0.4768 87 0.4768 88 0.4768 88 0.4768 89 0.4768	Vol (m³) 7.7 797.0	

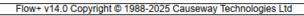


	Malone O'Regan Consulting Engineers	File: Storm Drainage Design R01.pfd	Page 11
SCW.	3-4 Canada Street Waterford	Network: Storm Network	
MAJONE OVEGAN	Waterford	Brian Chong	
madra di nasi	X91 V52K	21/07/2025	

#### Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 89.63%

Node Event	US	Peak	Level	Depth	Inflow	Node	Flood
	Node	(mins)	(m)	(m)	(I/s)	Vol (m³)	(m³)
120 minute winter	Attenuation Tank	116	4.510	2.164	298.8	432.8079	0.0000
240 minute winter	S02	228	4.741	0.441	5.1	1.0460	0.0000
120 minute winter	Settlement Tank	118	4.511	2.025	1252.0	51.2328	0.0000
120 minute winter	Outfall	116	1.575	0.114	45.0	0.0000	0.0000
240 minute winter	Interceptor	228	4.797	2.001	172.9	3.8114	0.0000

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (I/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute winter	Attenuation Tank	AT - S01	S01	-180.3	0.845	-0.130	4.6142	
240 minute winter	S02	S02-S12	S12	7.9	0.425	0.142	0.8044	
120 minute winter	Settlement Tank	S03 - AT	Attenuation Tank	286.4	3.045	0.266	1.6188	
240 minute winter	Interceptor	Int - S03	S03	321.4	1.736	0.397	5.3150	





# Appendix 7 Foul Water Network Design ORE Facilities



# Calculations for Foul Drainage Calculation Sheet No. 1



3-4 CANADA STREET WATERFORD

Tel: 051 876 855 Fax: 051 876 828

42,000 L/day

(0.486 L/s)

**JOB: Ore Capable Terminal 250m Quay Extension** 

 JOB NO: W20088
 DATE: June 2025

 SHEET NO: 1
 DRG. NO: 01218, 01219, 01220

 PREPARED BY: BC
 CHECKED BY: ES

**CLIENT: Port of Waterford** 

**WASTEWATER:** 

## DRAINAGE CRITERIA

### Proposed Development which consists of facility buildings that will 70 staffs accommodate 70 people in total. 35 staffs from Operator 1 35 staffs from Operator 2 The design foul flow of the proposed development is based on Appendix C of Irish Water Publication Code of Practice IW-CDS-5030-03 **Wastewater Loading Rates:** 100 L/day/person Office / Factory with Canteen 1. Dry Weather Flow (D.W.F) 7000 L/day Q = 100 L/day/person x 70 staffs = 7,000 L/day(0.081 L/s)2. Design Foul Flow



 $Q = 6.0 [100 \text{ L/day} \times 70 \text{ staffs}] = 42,000 \text{ L/day}$ 

# CALCUATING SHEET FOR FOUL WATER



Malone O'Regan
Consulting Engineers
3 - 4 Canada Street
Waterford

Tel: 051 876855 Fax: 051 876828

e-mail: waterford@morce.ie

Job:	Waaterford Port Masterplaning					
Job No:	W20088					
Sheet No:	2					
Ref to Drg No:	01218, 01219, 01220					
Prepared By:	ВС					
Checked By:	ES					

Port of Waterford

					Ciletti.	Poit of Waterloid			
PIPE RUN	NO OF PEOPLE	CUM. NO OF PEOPLE	FLOW (Q)	PIPE Ø	GRADIENT	LENGTH	CAPACITY (L/S)	VELOCITY (m/s)	
F5 to pump	35	35	0.243	225	1:150	15	34.79	0.949	
F1 -F2	0	0	0.000	150	1:150	15.0	11.80	0.72	
F2 - F3	10	10	0.069	150	1:150	24.0	11.80	0.72	
F3 - F4	0	10	0.069	150	1:150	8.0	11.80	0.72	
F4 - F5	10	20	0.139	150	1:150	28.0	11.80	0.72	
F5 - F6	0	20	0.139	150	1:150	8.0	11.80	0.72	
F6 - F7	10	30	0.208	150	1:150	26.0	11.80	0.72	
F7 - F8	0	30	0.208	150	1:150	21.0	11.80	0.72	
F8 - F9	0	30	0.208	150	1:150	30.0	11.80	0.72	
F11 - F12	5	35	0.243	150	1:150	12.0	11.80	0.72	
F12 - F9	0	35	0.243	150	1:150	7.0	11.80	0.72	
F9 - F10	0	35	0.243	150	1:150	38.0	11.80	0.72	
F10 - Pump	0	35	0.243	150	1:150	14.0	11.80	0.72	
544 E. N.		70	0.406	225	4.450	F 0	24.70	0.040	
F11 - Ex.MH	0	70	0.486	225	1:150	5.0	34.79	0.949	
		<u> </u>		L			L	L	



Appendix 8
Uisce Eireann Confirmation of Feasibility for Water and Wastewater





#### **CONFIRMATION OF FEASIBILITY**

Eimear Sharkey 3-4 Canada Street Waterford

28 May 2025

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

Uisce Éireann PO Box 448 South City Delivery Office Cork City

www.water.ie

Our Ref: CDS24006776 Pre-Connection Enquiry Site at, Belview Port Slieverue, Kilkenny

Dear Applicant/Agent,

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

Uisce Éireann has reviewed the pre-connection enquiry in relation to a Water & Wastewater connection for a Multi/Mixed Use Development of 4 unit(s) at Site at, Belview Port Slieverue, Kilkenny, (the **Development**).

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

 Water Connection
 Feasible without infrastructure upgrade by Uisce Éireann

 Wastewater Connection
 Feasible without infrastructure upgrade by Uisce Éireann

This letter does not constitute an offer, in whole or in part, to provide a connection to any Uisce Éireann infrastructure. Before the Development can be connected to our network(s) you must submit a connection application and be granted and sign a connection agreement with Uisce Éireann.

As the network capacity changes constantly, this review is only valid at the time of its completion. As soon as planning permission has been granted for the Development, a completed connection application should be submitted. The connection application is available at <a href="https://www.water.ie/connections/get-connected/">www.water.ie/connections/get-connected/</a>

#### Where can you find more information?

Section A - What is important to know?

Stiúrthóirí / Directors: Niall Gleeson (POF / CEO), Jerry Grant (Cathaoirleach / Chairperson), Gerard Britchfield, Liz Joyce, Michael Nolan, Patricia King, Eileen Maher, Cathy Mannion, Paul Reid, Michael Walsh.

Oifig Chláraithe / Registered Office: Teach Colvill, 24-26 Sráid Thalbóid, Baile Átha Cliath 1, D01 NP86 / Colvill House, 24-26 Talbot Street, Dublin, Ireland D01NP86

ls cuideachta ghníomhaíochta ainmnithe atá faoi theorainn scaireanna é Uisce Éireann / Uisce Éireann is a designated activity company, limited by shares.

Cláraithe in Éirinn Uimh.: 530363 / Registered in Ireland No.: 530363.



This letter is issued to provide information about the current feasibility of the proposed connection(s) to Uisce Éireann's network(s). This is not a connection offer and capacity in Uisce Éireann's network(s) may only be secured by entering into a connection agreement with Uisce Éireann.

For any further information, visit <a href="www.water.ie/connections">www.water.ie/connections</a>, email <a href="mailto:newconnections@water.ie">newconnections@water.ie</a> or contact 1800 278 278.

Yours sincerely,

**Dermot Phelan** 

**Connections Delivery Manager** 



# **Appendix 9**

Fuel Interceptors - Typical Details



# Klargester Bypass Separators

NSB RANGE

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



#### Performance & Compliance

> Fully compliant and tested to EN 858-1.

Concentration Less Than

- Bypass separators are tested by British standards institute (BSI).
- Certified flow and process performance assessing effluent qualities to the requirements of EN 858-1.
- The unit is designed to treat the 'first flush' - 10% of peak flow. The calculated drainage areas served by each separator are indicated according to the formula given by PPG3 NSB = 0.0018A(m2).
- Class I separators are designed to achieve a concentration of less than 5mg per litre.

#### Product Benefits

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

#### Technical Specifications

Model Reference	Flow (I/s)	Peak Flow Rate (I/s)	Drainage Area(m²) Based on UK rainwater flow	Stori Capacit Silt		Length (mm)	Diameter (mm)	Access Shaft Diameter (mm)	Base Inlet Invert (mm)	Base to Outlet Invert (mm)	Standard Fall Across (mm)	Min Inlet Invert (mm)	Standard Pipework Diameter (mm)**
Polyethylene Chamber Construction													
NSBP003	3	30	1670	300	45	1700	1350	600	1420	1320	100	500	160
NSBP004	4.5	45	2500	450	60	1700	1350	600	1420	1320	100	500	160
NSBP006	6	60	3335	600	90	1700	1350	600	1420	1320	100	500	160
GRP Chambo	GRP Chamber Construction												
NSBE010	10	100	5560	1000	150	2069	1220	750	1450	1350	100	700	315
NSBE015	15	150	8335	1500	225	2947	1220	750	1450	1350	100	700	315
NSBE020	20	200	11111	2000	300	3893	1220	750	1450	1350	100	700	375
NSBE025	25	250	13890	2500	375	3575	1420	750	1680	1580	100	700	375
NSBE030	30	300	16670	3000	450	4265	1420	750	1680	1580	100	700	450
NSBE040	40	400	22222	4000	600	3230	1920	600	2185	2035	150	1000	500
NSBE050	50	500	27778	5000	750	3960	1920	600	2185	2035	150	1000	600
NSBE075	75	750	41667	7500	1125	5841	1920	600	2235	2035	200	950	675
NSBE100	100	1000	55556	10000	1500	7661	1920	600	2235	2035	200	950	750
NSBE125	125	1250	69444	12500	1875	9548	1920	600	2235	2035	200	950	750

<sup>\*</sup> Some units have more than one access shaft – diameter of laraest shown | \*\* Laraer pipework available on reauest.

