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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
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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.

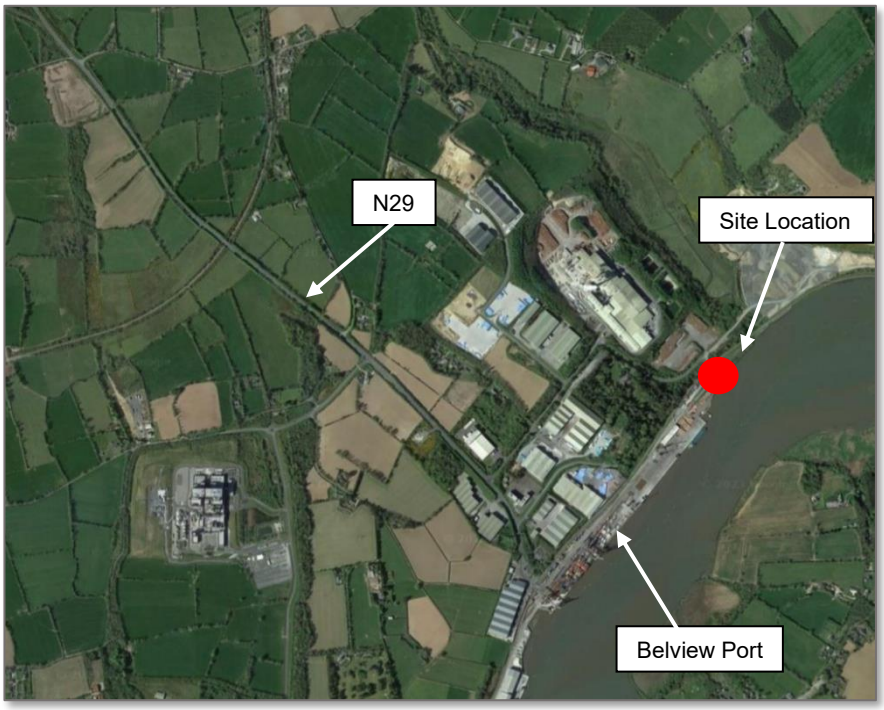


Figure 2-1: Site Location Map

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^2
Proposed Wharf Area	c. 5,900 m^2
Proposed Paved Areas	c. 13,000 m^2
Proposed Permeable Paving	c. 1,500 m^2

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 ¾ 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 28th 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 lux
- Wharves; 10 to 30 lux
- Pontoons; 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
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,

	Interval		Years												
DURATION	6months,	1year,	2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	150,	200,	250,	500,
5 mins	3.0,	4.2,	4.9,	5.8,	6.4,	6.9,	8.5,	10.3,	11.5,	13.1,	14.5,	15.7,	17.4,	18.7,	19.8,	N/A ,
10 mins	4.2,	5.9,	6.8,	8.1,	8.9,	9.6,	11.8,	14.3,	16.0,	18.2,	20.3,	21.8,	24.2,	26.1,	27.6,	N/A ,
15 mins	5.0,	6.9,	8.0,	9.5,	10.5,	11.3,	13.9,	16.9,	18.8,	21.5,	23.9,	25.7,	28.5,	30.7,	32.5,	N/A ,
30 mins	6.6,	9.0,	10.3,	12.2,	13.5,	14.5,	17.7,	21.2,	23.5,	26.7,	29.6,	31.8,	35.1,	37.7,	39.8,	N/A ,
1 hours	8.7,	11.8,	13.4,	15.7,	17.3,	18.5,	22.4,	26.7,	29.4,	33.3,	36.7,	39.3,	43.2,	46.3,	48.7,	N/A ,
2 hours	11.5,	15.4,	17.3,	20.3,	22.2,	23.7,	28.4,	33.5,	36.9,	41.5,	45.5,	48.6,	53.2,	56.8,	59.7,	N/A ,
3 hours	13.5,	17.9,	20.2,	23.5,	25.7,	27.3,	32.6,	38.4,	42.1,	47.2,	51.6,	55.0,	60.1,	64.0,	67.2,	N/A ,
4 hours	15.2,	20.0,	22.5,	26.1,	28.4,	30.2,	36.0,	42.2,	46.2,	51.7,	56.4,	60.0,	65.5,	69.7,	73.1,	N/A ,
6 hours	17.9,	23.4,	26.2,	30.2,	32.9,	34.9,	41.3,	48.2,	52.7,	58.7,	64.0,	68.0,	74.0,	78.6,	82.3,	N/A ,
9 hours	21.1,	27.3,	30.5,	35.1,	38.0,	40.3,	47.5,	55.2,	60.1,	66.8,	72.6,	76.9,	83.5,	88.6,	92.6,	N/A ,
12 hours	23.7,	30.5,	34.0,	38.9,	42.2,	44.6,	52.4,	60.7,	66.0,	73.1,	79.3,	84.0,	91.1,	96.4,	100.8,	N/A ,
18 hours	27.9,	35.6,	39.5,	45.1,	48.8,	51.5,	60.2,	69.4,	75.2,	83.2,	90.0,	95.1,	102.8,	108.7,	113.5,	N/A ,
24 hours	31.3,	39.8,	44.0,	50.1,	54.1,	57.0,	66.4,	76.3,	82.6,	91.1,	98.4,	103.9,	112.1,	118.3,	123.4,	140.5,
2 days	39.5,	49.2,	54.0,	60.7,	65.0,	68.3,	78.3,	88.9,	95.5,	104.4,	112.0,	117.7,	126.1,	132.5,	137.6,	154.9,
3 days	46.4,	57.0,	62.2,	69.5,	74.1,	77.6,	88.3,	99.5,	106.5,	115.8,	123.7,	129.6,	138.3,	144.9,	150.1,	167.8,
4 days	52.6,	64.0,	69.5,	77.3,	82.2,	85.9,	97.2,	109.0,	116.2,	125.9,	134.1,	140.2,	149.2,	156.0,	161.4,	179.5,
6 days	63.5,	76.4,	82.5,	91.1,	96.5,	100.6,	112.9,	125.6,	133.4,	143.8,	152.5,	159.0,	168.5,	175.6,	181.3,	200.2,
8 days	73.5,	87.5,	94.2,	103.5,	109.3,	113.7,	126.9,	140.4,	148.7,	159.6,	168.8,	175.6,	185.6,	193.0,	199.0,	218.7,
10 days	82.7,	97.8,	105.0,	114.9,	121.1,	125.7,	139.7,	154.0,	162.7,	174.2,	183.8,	190.9,	201.3,	209.0,	215.2,	235.5,
12 days	91.5,	107.5,	115.1,	125.6,	132.2,	137.0,	151.7,	166.7,	175.8,	187.7,	197.7,	205.1,	215.9,	223.9,	230.3,	251.3,
16 days	108.0,	125.8,	134.2,	145.7,	152.8,	158.1,	174.1,	190.2,	200.0,	212.8,	223.5,	231.3,	242.8,	251.3,	258.0,	280.2,
20 days	123.6,	142.9,	152.0,	164.4,	172.1,	177.8,	194.8,	212.0,	222.4,	236.0,	247.2,	255.5,	267.6,	276.5,	283.6,	306.7,
25 days	142.1,	163.2,	173.1,	186.5,	194.8,	200.9,	219.2,	237.5,	248.6,	263.0,	274.9,	283.7,	296.4,	305.8,	313.2,	337.5,

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-Frequencies_TN61.pdf

Appendix 3

Storm Water Attenuation ORE Building
Site North of Railway

INPUT SHEET FOR ATTENUATION CALCULATIONS

Page: 1 of 3

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

Percolation Factors

Roofs	=	0.95	
Concreted / Paved Areas	=	0.95	
Roads / Car Parks	=	0.90	
Grass / Landscaped	=	0.05	
Total Development Area	=	3,451	(m^2)
		0.35	Ha

Division of Areas

Roof

Proposed Building Roofs	365	
Total	**365**	(m^2)

Concreted Areas

Total	-	

Roads / Car Parks

Total Road & Car Park	-	(m^2)

Landscaped Area

Landscaping

Total Landscaped	-	(m^2)

INPUT SHEET FOR ATTENUATION CALCULATIONS

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

Average Percolation factor

$$= \frac{\text{Roof Area} \times 0.95 + \text{Conc. \& Paved} \times 0.95 + \text{Blacktop} \times 0.90 + \text{Landscaped Area} \times 0.05}{\text{Total Area for Development}}$$

$$= \frac{365 \times 0.95 + 0 \times 0.95 + - \times 0.90 + - \times 0.05}{3{,}451}$$

$$= \frac{347}{3{,}451}$$

= **0.100**

Effective Area

= Total Area for Development x Percolation factor

= 3,451 x 0.1005

= **347** m^2

Typical calculation of Permissible Discharge based on 30min storm, 30 year return period
Allowed Discharge from Site

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

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^3

Volume of Discharge = Permissible Discharge x time

= 1.55 l/s x 60 sec x 30 min = 2791.2153 l
= 2.791 m^3

Storage Required = 8.963 - 2.791 = 6.172 m^3

INPUT SHEET FOR ATTENUATION CALCULATIONS

Page: 3 of 3

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

30

Storm Duration (hrs)	Rainfall (including 10%) (mm)	Volume X Perc Factor (m^3)	Discharge (m^3)	Storage Required (m^3)
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 Duration (hrs)	Rainfall (including 10%) (mm)	Volume X Perc Factor (m^3)	Discharge (m^3)	Storage Required (m^3)
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	

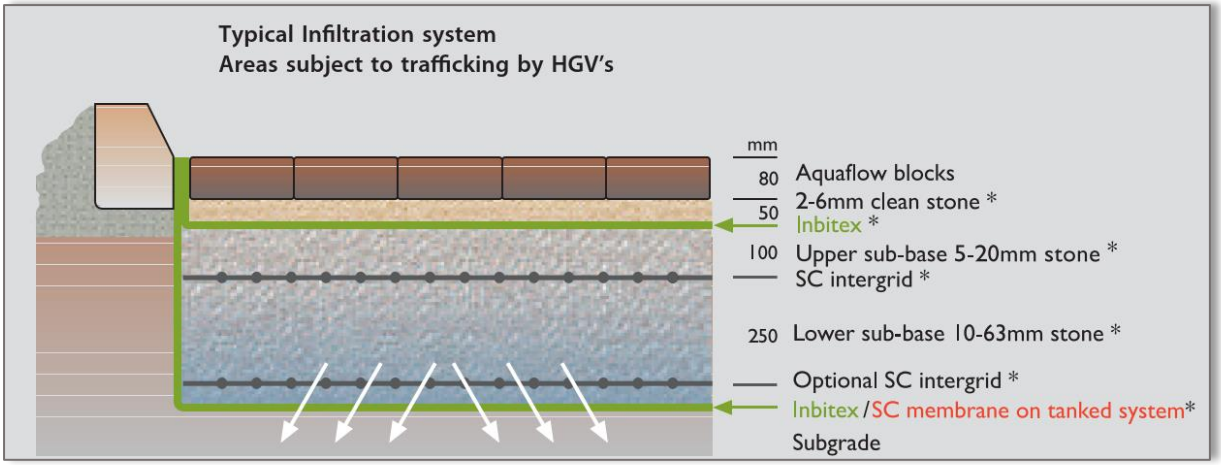
DRAINAGE CRITERIA

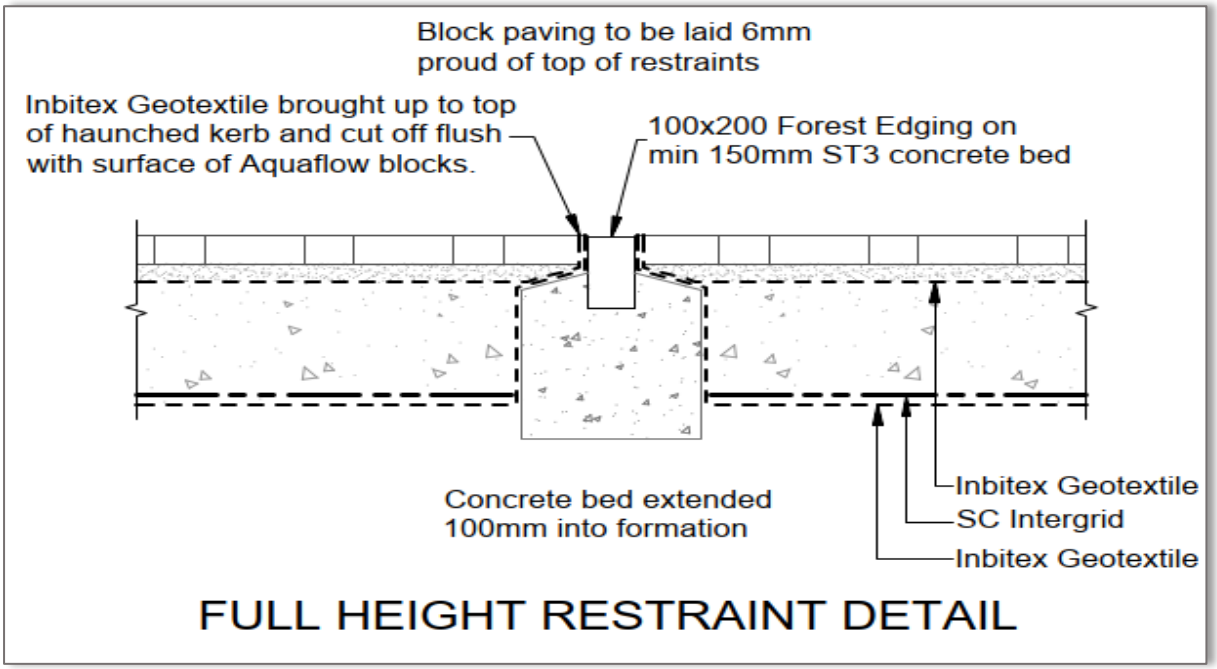
Proposed Storm Water Attenuation

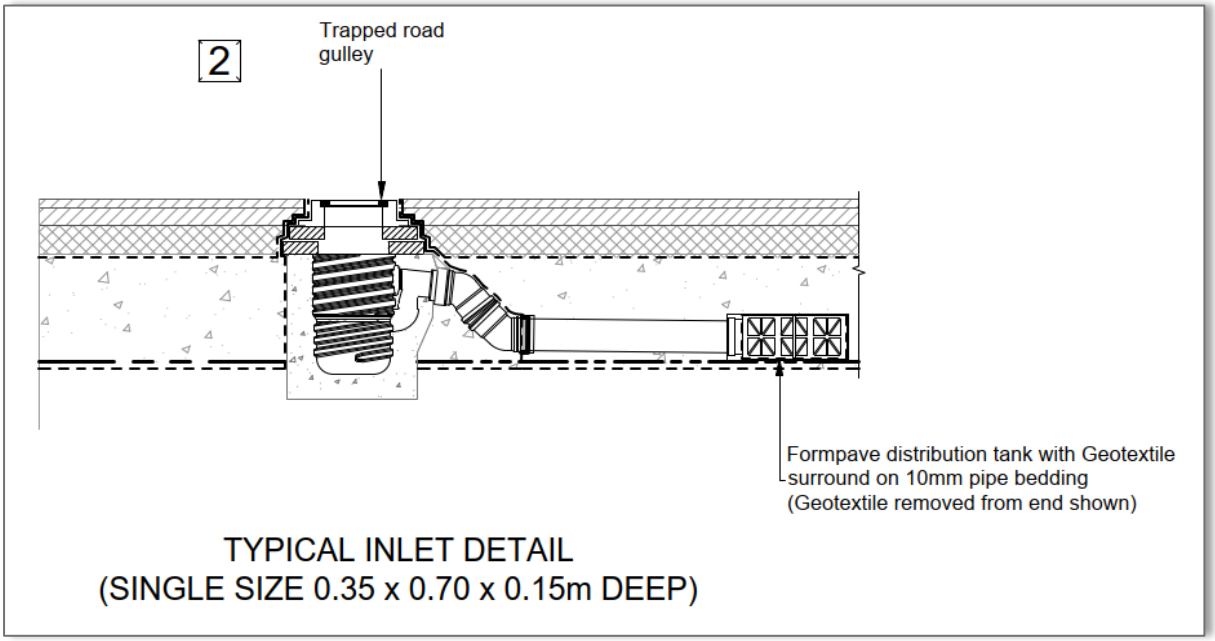
Required attenuation volume of the proposed roof	9.41 m^3
The roof water will be attenuated within the large ⌀ surface water pipes and manholes as part of the attenuation system prior discharging into existing surface water network • No. of 1200mm ⌀ manhole • Length of 300mm ⌀ surface water pipe	7 no. manholes 112 m
Volume of the surface water network • Volume of single 1200mm ⌀ manhole = 1.13m^2 x 1m • Volume per m of 300mm ⌀ pipe = 0.071m^2 x 1m Total volume of surface water network • 7 no. of manholes = 7 x 1.130m^3 • 112m of 450mm ⌀ pipe = 112m x 0.071m^3	1.130 m^3 0.071m^3 7.91 m^3 7.95 m^3 **Total = 15.86 m^3**

Appendix 4

Permeable Pavement Details
Site North of Railway


Typical Infiltration system
Areas subject to trafficking by HGV's
mm
80 Aquaflow blocks
50 2-6mm clean stone *
Inbitex *
100 Upper sub-base 5-20mm stone *
SC intergrid *
250 Lower sub-base 10-63mm stone *
Optional SC intergrid *
Inbitex / SC membrane on tanked system*
Subgrade


Block paving to be laid 6mm
proud of top of restraints
Inbitex Geotextile brought up to top
of haunched kerb and cut off flush
with surface of Aquaflow blocks.
100x200 Forest Edging on
min 150mm ST3 concrete bed
Concrete bed extended
100mm into formation
Inbitex Geotextile
SC Intergrid
Inbitex Geotextile
FULL HEIGHT RESTRAINT DETAIL


2
Trapped road
gulley
Formpave distribution tank with Geotextile
surround on 10mm pipe bedding
(Geotextile removed from end shown)
TYPICAL INLET DETAIL
(SINGLE SIZE 0.35 x 0.70 x 0.15m DEEP)

Appendix 5

Settling Tank and Emergency Holding Tank

Emergency Holding Tank

The proposed Emergency Holding Tank serves an area of approximately 19,000 m² and has a capacity of 636 m ³ 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 l	= 126 m³
19,000 @ 0.0294 x 0.85		= c. 475 m³
Total		= 601 m³

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 m³

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/m ³ 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 x 10 x 100m 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

MDR MALONE O'REGAN	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 1

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	1	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	Scotland and Ireland	Connection Type	Level Soffits
M5-60 (mm)	18.500	Minimum Backdrop Height (m)	0.200
Ratio-R	0.271	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

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 (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (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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Links (Results)

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
S20 - S19	1.503	166.0	33.8	1.390	1.445	0.301	0.0	114	1.187
S19-S18	1.505	166.2	41.4	1.445	1.625	0.375	0.0	127	1.258
S18-S17	1.460	161.3	47.0	1.625	1.770	0.433	0.0	138	1.272
S17 - S16	1.468	162.1	50.7	1.770	2.010	0.478	0.0	144	1.305
S16 - S15	1.469	162.2	52.1	2.010	2.050	0.502	0.0	145	1.312
S15 - S04	1.833	202.4	83.9	2.200	2.565	0.823	0.0	168	1.750
S27 - S26	0.895	35.6	7.9	0.975	1.175	0.069	0.0	72	0.721
S26 - S25	0.894	35.6	17.7	1.175	1.205	0.163	0.0	112	0.893
S25 - S15	1.616	64.3	25.0	1.205	2.200	0.240	0.0	97	1.516
S07 - S06	7.882	313.4	7.0	3.730	2.630	0.058	0.0	23	3.285
S06 - S05	5.660	225.1	10.1	2.630	1.550	0.082	0.0	32	2.881
S05 - S 04	2.915	115.9	10.0	1.550	2.440	0.082	0.0	44	1.801
S04 - Int	1.003	283.6	178.9	2.565	2.604	1.791	0.0	347	1.058
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	2.864	2.914	1.813	0.0	181	2.504
S03 - AT	3.808	1076.6	179.7	2.914	3.054	1.813	0.0	164	2.860
AT - S01	4.901	1385.6	179.2	3.054	3.714	1.813	0.0	144	3.426
S01 - Outfall	1.927	544.7	176.5	3.714	0.939	1.813	0.0	234	1.728
S28 - S29	1.066	42.4	4.5	0.875	0.990	0.038	0.0	49	0.694
S29 - S30	1.069	42.5	4.4	0.990	0.955	0.038	0.0	49	0.695
S30 - S31	1.080	42.9	4.2	0.955	0.525	0.038	0.0	48	0.695
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	1.475	1.665	0.051	0.0	51	0.927

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
S14 - S13	72.447	150.9	375	Circular	5.960	5.000	0.585	5.960	4.520	1.065
S13- S 12	67.971	151.0	375	Circular	5.960	4.520	1.065	5.960	4.070	1.515
S12 - S11	56.942	149.8	375	Circular	5.960	4.070	1.515	5.960	3.690	1.895
S11 - S04	21.444	34.0	375	Circular	5.960	3.690	1.895	6.000	3.060	2.565
5.001	35.057	21.8	225	Circular	6.200	4.815	1.160	6.000	3.210	2.565
6.000	11.988	64.8	225	Circular	6.200	5.000	0.975	6.200	4.815	1.160
5.000	27.607	149.2	225	Circular	6.200	5.000	0.975	6.200	4.815	1.160
S24 - S23	19.980	137.8	225	Circular	6.200	5.000	0.975	6.200	4.855	1.120
S23 - S22	23.473	161.9	225	Circular	6.200	4.855	1.120	6.200	4.710	1.265
1.002	7.944	176.5	225	Circular	6.200	4.710	1.265	6.200	4.665	1.310
S21 - S20	34.718	150.9	375	Circular	6.200	4.665	1.160	6.200	4.435	1.390
S20 - S19	7.970	144.9	375	Circular	6.200	4.435	1.390	6.200	4.380	1.445
S19-S18	26.008	144.5	375	Circular	6.200	4.380	1.445	6.200	4.200	1.625
S18-S17	22.249	153.4	375	Circular	6.200	4.200	1.625	6.200	4.055	1.770
S17 - S16	36.438	151.8	375	Circular	6.200	4.055	1.770	6.200	3.815	2.010
S16 - S15	36.399	151.7	375	Circular	6.200	3.815	2.010	6.000	3.575	2.050

Link	US Node	Dia (mm)	Node Type	DS Node	Dia (mm)	Node Type
S14 - S13	S14	1350	Manhole	S13	1350	Manhole
S13- S 12	S13	1350	Manhole	S12	1350	Manhole
S12 - S11	S12	1350	Manhole	S11	1350	Manhole
S11 - S04	S11	1350	Manhole	S04	1500	Manhole
5.001	S10	1200	Manhole	S04	1500	Manhole
6.000	S08	1200	Manhole	S10	1200	Manhole
5.000	S09	1200	Manhole	S10	1200	Manhole
S24 - S23	S24	1200	Manhole	S23	1200	Manhole
S23 - S22	S23	1200	Manhole	S22	1200	Manhole
1.002	S22	1200	Manhole	S21	1350	Manhole
S21 - S20	S21	1350	Manhole	S20	1350	Manhole
S20 - S19	S20	1350	Manhole	S19	1350	Manhole
S19-S18	S19	1350	Manhole	S18	1350	Manhole
S18-S17	S18	1350	Manhole	S17	1350	Manhole
S17 - S16	S17	1350	Manhole	S16	1350	Manhole
S16 - S15	S16	1350	Manhole	S15	1350	Manhole

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Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
S15 - S04	35.675	97.7	375	Circular	6.000	3.425	2.200	6.000	3.060	2.565
S27 - S26	50.744	211.4	225	Circular	6.250	5.050	0.975	6.210	4.810	1.175
S26 - S25	50.832	211.8	225	Circular	6.210	4.810	1.175	6.000	4.570	1.205
S25 - S15	65.341	65.7	225	Circular	6.000	4.570	1.205	6.000	3.575	2.200
S07 - S06	6.011	2.8	225	Circular	11.400	7.445	3.730	8.150	5.295	2.630
S06 - S05	5.793	5.4	225	Circular	8.150	5.295	2.630	6.000	4.225	1.550
S05 - S 04	18.093	20.3	225	Circular	6.000	4.225	1.550	6.000	3.335	2.440
S04 - Int	22.657	580.9	600	Circular	6.000	2.835	2.565	6.000	2.796	2.604
Int - S03	18.869	72.6	600	Circular	6.000	2.796	2.604	6.000	2.536	2.864
S03 - ST	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 - Outfall	35.838	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	39.393	145.9	225	Circular	11.900	10.720	0.955	11.200	10.450	0.525
S31 - S32	17.181	59.5	225	Circular	11.200	10.450	0.525	11.000	10.161	0.614
S02-S12	20.227	87.9	225	Circular	6.000	4.300	1.475	5.960	4.070	1.665

Link	US Node	Dia (mm)	Node Type	DS Node	Dia (mm)	Node Type
S15 - S04	S15	1350	Manhole	S04	1500	Manhole
S27 - S26	S27	1500	Manhole	S26	1200	Manhole
S26 - S25	S26	1200	Manhole	S25	1200	Manhole
S25 - S15	S25	1200	Manhole	S15	1350	Manhole
S07 - S06	S07	1200	Manhole	S06	1200	Manhole
S06 - S05	S06	1200	Manhole	S05	1200	Manhole
S05 - S 04	S05	1200	Manhole	S04	1500	Manhole
S04 - Int	S04	1500	Manhole	Interceptor	1500	Manhole
Int - S03	Interceptor	1500	Manhole	S03	1500	Manhole
S03 - ST	S03	1500	Manhole	Settlement Tank		Junction
S03 - AT	Settlement Tank		Junction	Attenuation Tank		Junction
AT - S01	Attenuation Tank		Junction	S01	2100	Manhole
S01 - Outfall	S01	2100	Manhole	Outfall	1500	Manhole
S28 - S29	S28	1500	Manhole	S29	1200	Manhole
S29 - S30	S29	1200	Manhole	S30	1200	Manhole
S30 - S31	S30	1200	Manhole	S31	1200	Manhole
S31 - S32	S31	1200	Manhole	S32	1200	Manhole
S02-S12	S02	1500	Manhole	S12	1350	Manhole

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S28	12.100	1.100	1500				
				0	S28 - S29	11.000	225
S29	12.000	1.215	1200		1	S28 - S29	10.785	225
				0	S29 - S30	10.785	225
S30	11.900	1.180	1200		1	S29 - S30	10.720	225
				0	S30 - S31	10.720	225
S31	11.200	0.750	1200		1	S30 - S31	10.450	225
				0	S31 - S32	10.450	225
S32	11.000	0.839	1200		1	S31 - S32	10.161	225

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Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S27	6.250	1.200	1500	0	S27 - S26	5.050	225
S26	6.210	1.400	1200	1	S27 - S26	4.810	225
				0	S26 - S25	4.810	225
S25	6.000	1.430	1200	1	S26 - S25	4.570	225
				0	S25 - S15	4.570	225
S15	6.000	2.575	1350	1	S25 - S15	3.575	225
				2	S16 - S15	3.575	375
				0	S15 - S04	3.425	375
S16	6.200	2.385	1350	1	S17 - S16	3.815	375
				0	S16 - S15	3.815	375
S17	6.200	2.145	1350	1	S18-S17	4.055	375
				0	S17 - S16	4.055	375
S18	6.200	2.000	1350	1	S19-S18	4.200	375
				0	S18-S17	4.200	375
S19	6.200	1.820	1350	1	S20 - S19	4.380	375
				0	S19-S18	4.380	375
S20	6.200	1.765	1350	1	S21 - S20	4.435	375
				0	S20 - S19	4.435	375
S21	6.200	1.535	1350	1	1.002	4.665	225
				0	S21 - S20	4.665	375
S22	6.200	1.490	1200	1	S23 - S22	4.710	225
				0	1.002	4.710	225
S23	6.200	1.345	1200	1	S24 - S23	4.855	225
				0	S23 - S22	4.855	225
S24	6.200	1.200	1200	0	S24 - S23	5.000	225
S04	6.000	3.165	1500	1	S05 - S 04	3.335	225
				2	5.001	3.210	225
				3	S11 - S04	3.060	375
				4	S15 - S04	3.060	375
				0	S04 - Int	2.835	600
S10	6.200	1.385	1200	1	6.000	4.815	225
				2	5.000	4.815	225
				0	5.001	4.815	225
S08	6.200	1.200	1200	0	6.000	5.000	225

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Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S09	6.200	1.200	1200	0	5.000	5.000	225
S07	11.400	3.955	1200	0	S07 - S06	7.445	225
S06	8.150	2.855	1200	1	S07 - S06	5.295	225
				0	S06 - S05	5.295	225
S05	6.000	1.775	1200	1	S06 - S05	4.225	225
				0	S05 - S 04	4.225	225
S03	6.000	3.464	1500	1	Int - S03	2.536	600
				0	S03 - ST	2.536	600
S01	6.000	4.814	2100	1	AT - S01	1.686	600
				0	S01 - Outfall	1.686	600
S11	5.960	2.270	1350	1	S12 - S11	3.690	375
				0	S11 - S04	3.690	375
S12	5.960	1.890	1350	1	S02-S12	4.070	225
				2	S13- S 12	4.070	375
				0	S12 - S11	4.070	375
S13	5.960	1.440	1350	1	S14 - S13	4.520	375
				0	S13- S 12	4.520	375
S14	5.960	0.960	1350	0	S14 - S13	5.000	375
Attenuation Tank	6.000	3.654		1	S03 - AT	2.346	600
				0	AT - S01	2.346	600
S02	6.000	1.700	1500	0	S02-S12	4.300	225
Settlement Tank	6.000	3.514		1	S03 - ST	2.486	600
				0	S03 - AT	2.486	600
Outfall	3.000	1.539	1500	1	S01 - Outfall	1.461	600
Interceptor	6.000	3.204	1500	1	S04 - Int	2.796	600
				0	Int - S03	2.796	600

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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 (l/s)	Node Vol (m³)	Flood (m³)
15 minute winter	S28	10	11.056	0.056	5.8	0.1373	0.0000
15 minute winter	S29	11	10.843	0.058	5.6	0.0655	0.0000
15 minute winter	S30	11	10.777	0.057	5.6	0.0644	0.0000
15 minute winter	S31	12	10.495	0.045	5.5	0.0504	0.0000
15 minute winter	S32	12	10.204	0.043	5.6	0.0000	0.0000
15 minute winter	S27	11	5.132	0.082	10.6	0.2384	0.0000
15 minute winter	S26	11	4.948	0.138	24.4	0.3404	0.0000
15 minute winter	S25	11	4.688	0.118	34.8	0.2595	0.0000
15 minute winter	S15	12	3.642	0.217	115.9	0.4467	0.0000
15 minute winter	S16	12	3.998	0.183	73.0	0.3001	0.0000
15 minute winter	S17	11	4.235	0.180	70.0	0.3336	0.0000
15 minute winter	S18	11	4.377	0.177	63.6	0.3549	0.0000
15 minute winter	S19	11	4.539	0.159	55.1	0.3574	0.0000
15 minute winter	S20	11	4.592	0.157	44.2	0.4191	0.0000
15 minute winter	S21	11	4.769	0.104	28.2	0.1918	0.0000
15 minute winter	S22	10	4.841	0.131	24.0	0.3256	0.0000
15 minute winter	S23	11	4.925	0.070	8.9	0.1142	0.0000
15 minute winter	S24	10	5.044	0.044	3.9	0.0693	0.0000
15 minute winter	S04	11	3.196	0.361	251.0	0.8648	0.0000
15 minute winter	S10	11	4.913	0.098	41.8	0.1104	0.0000
15 minute winter	S08	10	5.088	0.088	18.8	0.2795	0.0000
15 minute winter	S09	10	5.124	0.124	23.7	0.4613	0.0000
15 minute winter	S07	10	7.471	0.026	8.8	0.0363	0.0000
15 minute winter	S06	10	5.331	0.036	12.6	0.0468	0.0000
15 minute winter	S05	10	4.276	0.051	12.5	0.0579	0.0000
60 minute winter	S03	45	2.943	0.407	158.2	0.7187	0.0000
30 minute winter	S01	24	2.960	1.274	254.4	4.4116	0.0000
15 minute winter	S11	11	3.810	0.120	71.6	0.4063	0.0000
15 minute winter	S12	11	4.199	0.129	41.0	0.3724	0.0000
15 minute winter	S13	12	4.593	0.073	14.7	0.1046	0.0000
15 minute winter	S14	10	5.077	0.077	15.0	0.2680	0.0000

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S28	S28 - S29	S29	5.6	0.726	0.132	0.2511	
15 minute winter	S29	S29 - S30	S30	5.6	0.708	0.133	0.0772	
15 minute winter	S30	S30 - S31	S31	5.5	0.839	0.129	0.2617	
15 minute winter	S31	S31 - S32	S32	5.6	1.018	0.082	0.0937	2.7
15 minute winter	S27	S27 - S26	S26	10.2	0.540	0.286	0.9756	
15 minute winter	S26	S26 - S25	S25	23.7	1.021	0.667	1.1801	
15 minute winter	S25	S25 - S15	S15	33.5	1.631	0.522	1.3458	
15 minute winter	S15	S15 - S04	S04	116.8	1.852	0.577	2.2497	
15 minute winter	S16	S16 - S15	S15	72.7	1.409	0.448	1.8777	
15 minute winter	S17	S17 - S16	S16	69.5	1.325	0.428	1.9098	
15 minute winter	S18	S18-S17	S17	63.5	1.230	0.394	1.1500	
15 minute winter	S19	S19-S18	S18	55.3	1.158	0.333	1.2419	
15 minute winter	S20	S20 - S19	S19	44.4	1.008	0.267	0.3508	
15 minute winter	S21	S21 - S20	S20	28.2	0.828	0.174	1.1914	
15 minute winter	S22	1.002	S21	23.5	1.123	0.603	0.1667	
15 minute winter	S23	S23 - S22	S22	8.7	0.507	0.213	0.4050	
15 minute winter	S24	S24 - S23	S23	3.8	0.484	0.087	0.1599	
15 minute winter	S04	S04 - Int	Interceptor	249.6	1.695	0.880	3.3458	
15 minute winter	S10	5.001	S04	41.4	2.566	0.370	0.5656	
15 minute winter	S08	6.000	S10	18.6	1.208	0.287	0.1844	
15 minute winter	S09	5.000	S10	23.2	1.192	0.546	0.5375	
15 minute winter	S07	S07 - S06	S06	8.8	2.709	0.028	0.0196	
15 minute winter	S06	S06 - S05	S05	12.5	2.334	0.056	0.0314	
15 minute winter	S05	S05 - S 04	S04	12.4	1.876	0.107	0.1198	
60 minute winter	S03	S03 - ST	Settlement Tank	177.1	2.245	0.198	0.6428	
30 minute winter	S01	S01 - Outfall	Outfall	38.9	1.124	0.071	1.2399	175.5
15 minute winter	S11	S11 - S04	S04	71.8	2.276	0.209	0.7125	
15 minute winter	S12	S12 - S11	S11	39.8	1.272	0.244	1.8221	
15 minute winter	S13	S13- S 12	S12	13.9	0.588	0.085	1.6459	
15 minute winter	S14	S14 - S13	S13	14.7	0.972	0.090	1.1225	

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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 (l/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 (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute winter	Attenuation Tank	AT - S01	S01	234.3	0.919	0.169	4.5615	
15 minute winter	S02	S02-S12	S12	7.8	0.543	0.140	0.3150	
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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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 (l/s)	Node Vol (m³)	Flood (m³)
15 minute winter	S28	10	11.086	0.086	12.8	0.2100	0.0000
15 minute winter	S29	11	10.875	0.090	12.6	0.1016	0.0000
15 minute winter	S30	11	10.807	0.087	12.5	0.0981	0.0000
15 minute winter	S31	11	10.518	0.068	12.5	0.0766	0.0000
15 minute winter	S32	12	10.226	0.065	12.4	0.0000	0.0000
15 minute winter	S27	12	5.387	0.337	23.5	0.9835	0.0000
15 minute winter	S26	12	5.326	0.516	51.0	1.2744	0.0000
15 minute winter	S25	12	4.994	0.424	70.1	0.9371	0.0000
15 minute winter	S15	11	4.067	0.642	227.6	1.3219	0.0000
15 minute winter	S16	12	4.279	0.464	149.8	0.7594	0.0000
15 minute winter	S17	12	4.485	0.430	152.0	0.7978	0.0000
15 minute winter	S18	12	4.599	0.399	138.7	0.8000	0.0000
15 minute winter	S19	12	4.672	0.292	120.1	0.6571	0.0000
15 minute winter	S20	11	4.706	0.271	97.0	0.7243	0.0000
15 minute winter	S21	11	4.822	0.157	61.2	0.2881	0.0000
15 minute winter	S22	11	4.966	0.256	51.2	0.6362	0.0000
15 minute winter	S23	11	4.993	0.138	20.0	0.2245	0.0000
15 minute winter	S24	10	5.067	0.067	8.7	0.1038	0.0000
180 minute winter	S04	144	3.985	1.150	168.9	2.7572	0.0000
15 minute winter	S10	11	4.967	0.152	89.9	0.1719	0.0000
15 minute winter	S08	10	5.148	0.148	41.9	0.4702	0.0000
15 minute winter	S09	11	5.293	0.293	52.6	1.0861	0.0000
15 minute winter	S07	10	7.482	0.037	19.6	0.0533	0.0000
15 minute winter	S06	10	5.350	0.055	28.0	0.0717	0.0000
15 minute summer	S05	10	4.301	0.076	26.5	0.0856	0.0000
180 minute winter	S03	152	4.433	1.897	934.3	3.3513	0.0000
120 minute winter	S01	104	3.948	2.262	249.0	7.8357	0.0000
120 minute winter	S11	106	3.985	0.295	62.6	0.9941	0.0000
15 minute winter	S12	11	4.279	0.209	92.8	0.6035	0.0000
15 minute winter	S13	11	4.631	0.111	32.5	0.1584	0.0000
15 minute winter	S14	10	5.116	0.116	33.3	0.4034	0.0000

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S28	S28 - S29	S29	12.6	0.886	0.296	0.4559	
15 minute winter	S29	S29 - S30	S30	12.5	0.869	0.295	0.1398	
15 minute winter	S30	S30 - S31	S31	12.5	1.042	0.292	0.4753	
15 minute winter	S31	S31 - S32	S32	12.4	1.271	0.183	0.1671	5.9
15 minute winter	S27	S27 - S26	S26	20.5	0.611	0.576	2.0181	
15 minute winter	S26	S26 - S25	S25	43.9	1.105	1.236	2.0216	
15 minute winter	S25	S25 - S15	S15	62.3	1.766	0.970	2.5987	
15 minute winter	S15	S15 - S04	S04	225.1	2.043	1.112	3.9348	
15 minute winter	S16	S16 - S15	S15	152.9	1.502	0.943	4.0147	
15 minute winter	S17	S17 - S16	S16	141.5	1.504	0.873	4.0190	
15 minute winter	S18	S18-S17	S17	137.5	1.388	0.853	2.4540	
15 minute winter	S19	S19-S18	S18	120.4	1.306	0.724	2.6315	
15 minute winter	S20	S20 - S19	S19	96.2	1.128	0.580	0.7035	
15 minute winter	S21	S21 - S20	S20	61.0	0.941	0.375	2.2375	
15 minute winter	S22	1.002	S21	51.1	1.377	1.310	0.2751	
15 minute winter	S23	S23 - S22	S22	19.4	0.593	0.475	0.7654	
15 minute winter	S24	S24 - S23	S23	8.6	0.593	0.194	0.3503	
180 minute winter	S04	S04 - Int	Interceptor	156.5	1.440	0.552	6.3820	
15 minute winter	S10	5.001	S04	90.2	2.882	0.807	1.1972	
15 minute winter	S08	6.000	S10	41.4	1.488	0.640	0.3338	
15 minute winter	S09	5.000	S10	50.0	1.390	1.178	0.9428	
15 minute winter	S07	S07 - S06	S06	19.6	3.342	0.062	0.0355	
15 minute winter	S06	S06 - S05	S05	27.9	2.953	0.124	0.0550	
15 minute summer	S05	S05 - S 04	S04	27.2	2.249	0.234	0.3596	
180 minute winter	S03	S03 - ST	Settlement Tank	-781.5	-3.603	-0.873	0.8349	
120 minute winter	S01	S01 - Outfall	Outfall	40.3	1.135	0.074	1.2710	683.6
120 minute winter	S11	S11 - S04	S04	62.7	2.246	0.182	2.1785	
15 minute winter	S12	S12 - S11	S11	92.3	1.581	0.566	3.4430	
15 minute winter	S13	S13- S 12	S12	31.7	0.719	0.195	3.0665	
15 minute winter	S14	S14 - S13	S13	32.5	1.197	0.200	2.0099	

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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 (l/s)	Node Vol (m³)	Flood (m³)
120 minute winter	Attenuation Tank	104	3.949	1.603	280.4	320.5663	0.0000
15 minute winter	S02	10	4.386	0.086	17.5	0.2032	0.0000
120 minute winter	Settlement Tank	118	3.989	1.503	1136.3	38.0170	0.0000
120 minute winter	Outfall	104	1.569	0.108	40.3	0.0000	0.0000
120 minute winter	Interceptor	118	4.054	1.258	240.9	2.3962	0.0000

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute winter	Attenuation Tank	AT - S01	S01	249.0	1.133	0.180	4.6142	
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	

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

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)
15 minute winter	S28	10	11.100	0.100	16.7	0.2442	0.0000
15 minute winter	S29	11	10.890	0.105	16.4	0.1185	0.0000
15 minute winter	S30	11	10.820	0.100	16.3	0.1135	0.0000
15 minute winter	S31	11	10.528	0.078	16.4	0.0887	0.0000
15 minute winter	S32	11	10.235	0.074	16.1	0.0000	0.0000
15 minute winter	S27	13	6.158	1.108	30.6	3.2353	0.0000
15 minute winter	S26	13	6.071	1.261	56.1	3.1167	0.0000
15 minute winter	S25	13	5.623	1.053	74.4	2.3247	0.0000
240 minute winter	S15	228	4.733	1.308	81.3	2.6926	0.0000
240 minute winter	S16	228	4.732	0.917	49.6	1.4994	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	1.6789	0.0000
15 minute winter	S19	12	5.158	0.778	135.1	1.7506	0.0000
15 minute winter	S20	12	5.194	0.759	117.7	2.0280	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	S23	13	5.368	0.513	24.3	0.8366	0.0000
15 minute winter	S24	12	5.378	0.378	11.8	0.5892	0.0000
240 minute winter	S04	228	4.737	1.902	177.1	4.5586	0.0000
15 minute winter	S10	12	5.251	0.436	103.4	0.4927	0.0000
15 minute winter	S08	12	5.376	0.376	54.5	1.1954	0.0000
15 minute winter	S09	12	5.649	0.649	68.4	2.4066	0.0000
15 minute winter	S07	10	7.488	0.043	25.5	0.0608	0.0000
15 minute winter	S06	10	5.359	0.064	36.5	0.0833	0.0000
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	S11	228	4.736	1.046	50.3	3.5313	0.0000
240 minute winter	S12	228	4.740	0.670	28.4	1.9357	0.0000
240 minute winter	S13	228	4.740	0.220	12.5	0.3143	0.0000
15 minute winter	S14	10	5.134	0.134	43.4	0.4643	0.0000

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
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 - 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	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	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	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- 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	

MDR MALONE O'REGAN	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 11

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

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (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 (l/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

MALONE O'REGAN
CONSULTING ENGINEERS

3-4 CANADA STREET
WATERFORD
Tel: 051 876 855
Fax: 051 876 828

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	

DRAINAGE CRITERIA

WASTEWATER:

Proposed Development which consists of facility buildings that will accommodate 70 people in total. • 35 staffs from Operator 1 • 35 staffs from Operator 2	70 staffs
The design foul flow of the proposed development is based on Appendix C of Irish Water Publication Code of Practice IW-CDS-5030-03 <u>Wastewater Loading Rates:</u> Office / Factory with Canteen 1. Dry Weather Flow (D.W.F) Q = 100 L/day/person x 70 staffs = 7,000 L/day 2. Design Foul Flow Q = 6.0 [100 L/day × 70 staffs] = 42,000 L/day	 100 L/day/person 7000 L/day (0.081 L/s) 42,000 L/day (0.486 L/s)

CALCUATING SHEET FOR FOUL WATER

MALONE O'REGAN
CONSULTING ENGINEERS

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:	BC
Checked By:	ES
Client:	Port of Waterford

PIPE RUN	NO OF PEOPLE	CUM. NO OF PEOPLE	FLOW (Q) (L/S)	PIPE Ø (mm)	GRADIENT	LENGTH (m)	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
F11 - Ex.MH	0	70	0.486	225	1:150	5.0	34.79	0.949

Appendix 8

Uisce Eireann Confirmation of Feasibility for Water and Wastewater

CONFIRMATION OF FEASIBILITY

Eimear Sharkey

3-4 Canada Street
Waterford

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

28 May 2025

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 www.water.ie/connections/get-connected/

Where can you find more information?

- **Section A** - What is important to know?

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

For any further information, visit **www.water.ie/connections**, **email** **newconnections@water.ie** or contact 1800 278 278.

Yours sincerely,

Dermot Phelan
Connections Delivery Manager

Appendix 9

Fuel Interceptors - Typical Details

Klargester Bypass Separators

NSB RANGE

Concentration Less Than

5
MG/L

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

Product Benefits

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

Performance & Compliance

› Fully compliant and tested to EN 858-1.

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

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

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

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

Technical Specifications

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

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