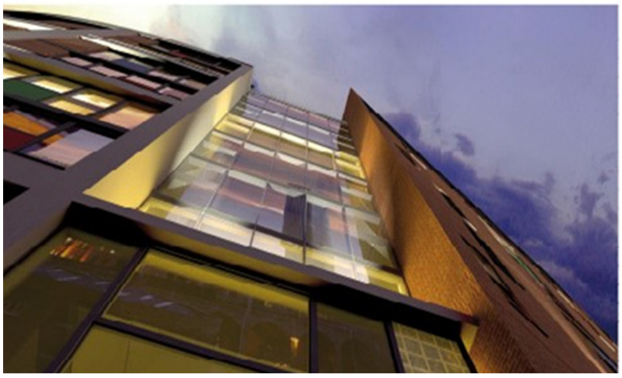
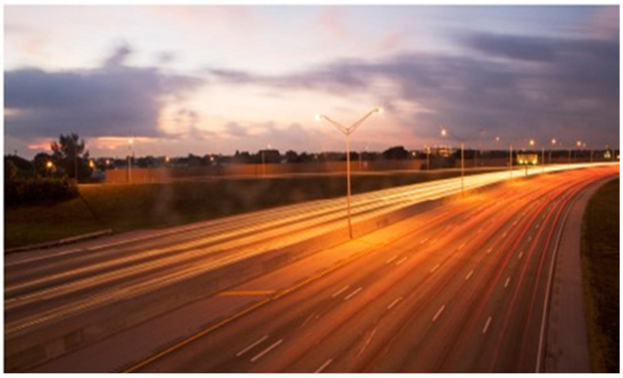


Engineering Assessment Report

St. Margaret's Metal Recycling Facility.
Saint Margaret's, Co. Dublin.

December 2024

Waterman Moylan Consulting Engineers Limited
Block S, EastPoint Business Park, Alfie Byrne Road, Dublin 3
www.waterman-moylan.ie

waterman moylan

Client Name: St. Margaret's Recycling Ltd
Document Reference: 23-072r.001Engineering Assessment Report
Project Number: 23-072

Quality Assurance – Approval Status

This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2015 and BS EN ISO 14001: 2015)

Issue	Date	Prepared by	Checked by	Approved by
No.1	Dec '24	J Burger / P Ingle	I Worrell	I Worrell

Comments

Disclaimer

Content

List of Figures

1. Introduction

This report has been prepared by Waterman Moylan Engineering Consultants, on behalf of St. Margaret's Recycling & Transfer Centre Ltd as part of a planning submission to Fingal County Council, for the proposed development relating to the on-going use of the facility (up to 21,900 tonnes per annum, on a site of c.1.75 ha and the development/physical works), including -

1. Underground surface water attenuation tank comprising c.675 cubic metres, and an above ground overflow connected to same comprising 1500 sqm.

2. Enhancement of car parking provision, including installation of 2no. EV charging points

3. Alterations to site boundary arrangements, including replacement of existing internal boundary comprising stacked steel containers with 3m high concrete panel and steel post wall, augmentation of dust netting where applicable, etc.

This report aims to provide an overview of existing development and proposed amendments to facilitate the proposed continued operations at the recycling facility.

2. Site Description

2.1. Site Location and Description

The subject site is located in Sandyhill, St. Margaret's, Co. Dublin. The overall site area is approximately 2 hectares.

The subject site is bounded by R122 to the west, R108 to the south and existing agricultural lands to the north and east. Access to the site is gained from the existing entrance off the R122.

The subject site displays a moderate slope, falling from the southwestern corner to the northeastern boundary. The highest elevation point is at 81.92 metres OD Malin, found at the site's southern boundary, while the lowest point is at 78.15 meters OD Malin in the northernmost corner.

The site is an operational metal recycling and waste transfer facility, functioning in part as an authorised treatment facility for end-of-life vehicles. The existing site includes a processing shed and mechanical plant, storage yard and entrance area with a heavy vehicle weighbridge. The majority of the extent of the site is existing hardstanding. The site features storage of material and machinery relevant to the ongoing recycling processes.

The approximate coordinates for the centroid of the site are 53° 25' 41.5668'' N, 6° 18' 3.1464'' W. Figure 1 shows the general site location of the subject site.

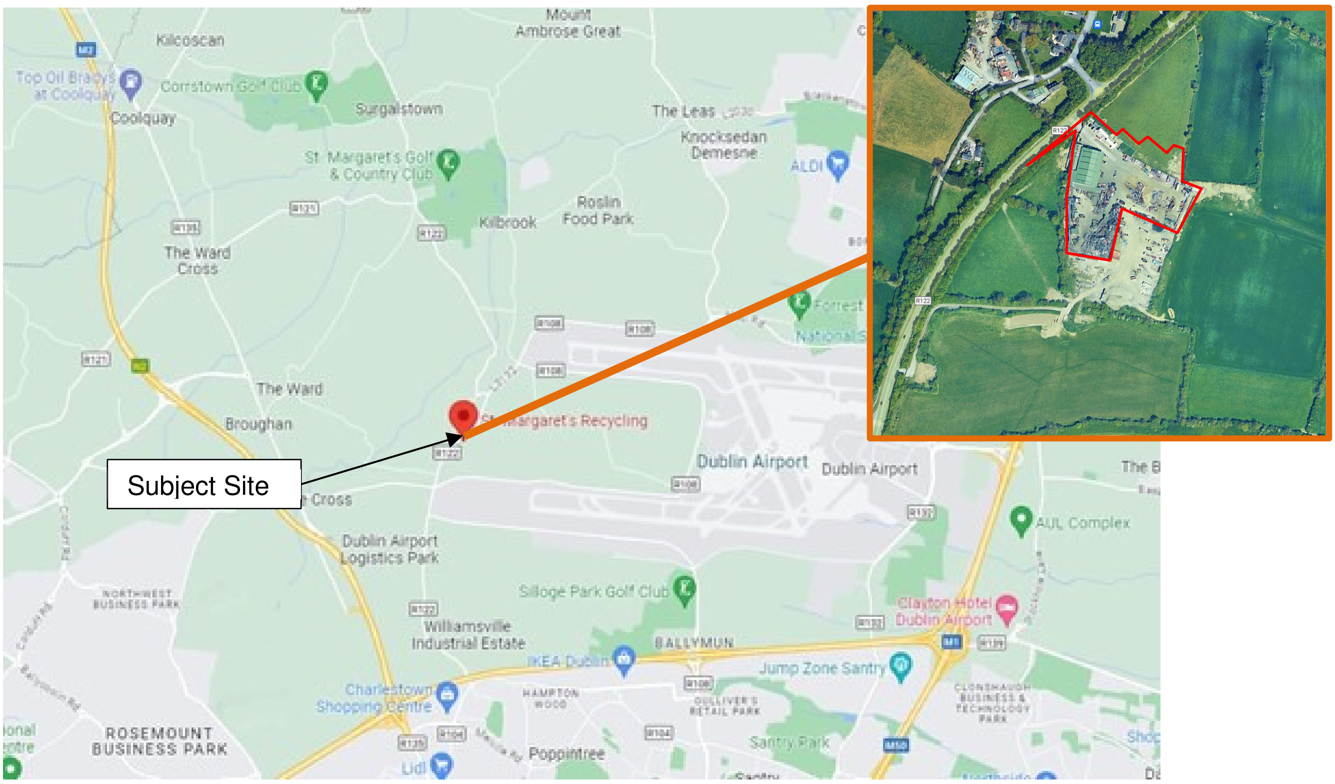


Figure 1: Site Location of the proposed development

2.2. Site Development and Planning History

07 December 2021 – Previous Planning Application – FW20A/0029 – Granted Permission & Retention

Retention planning permission and planning permission was sought by St. Margaret's Recycling & Transfer Centre Ltd. At St. Margaret's Metal Recycling, Sandyhill, St. Margaret's, Co. Dublin. Retention planning permission is sought for the permanent continuation of use of the existing waste processing and transfer facility for the bulking, transfer and recycling of metals, construction & demolition waste, bulky/skip waste, batteries, wood waste, glass, other non-biodegradable non-hazardous wastes, and an Authorised Treatment Facility for end-of-life vehicles, accepting up to 24,900 tonnes of waste per annum.

Retention permission was also sought for the continued use of the existing buildings on site associated with the daily operations of the facility including the processing shed, offices, plant room, shelter buildings etc., existing site services, boundary treatments and all ancillary site development works necessary to facilitate the development erected under and in accordance with Reg. Ref's. F13A/0409, F11A/0443, F10A/0177, F03A/1561, F03A/1682 and F97A/0109.

Planning permission was sought for new proposed stormwater attenuation storage tanks and associated stormwater treatment infrastructure to serve the existing development with permission also sought to restore part of the lands to agricultural use. The above development will require a review of the existing waste facility permit for the site and as such, a separate application will be made to the environmental section of Fingal County Council upon receipt of planning permission.

2.3. Proposed Development

Planning permission is sought for the on-going use of the existing Waste Recycling and Transfer facility with a proposed waste throughput at the facility to accept up to 21,900 tonnes per annum (in-line with waste permit) for the bulking, transfer and recycling of metals, construction & demolition waste, bulky/skip waste, batteries, wood waste, glass, other non-biodegradable non-hazardous wastes, and an Authorised Treatment Facility for end-of-life vehicles.

The application inlcudes for:

A new underground surface water attenuation tank comprising c.675 cubic metres, and a new above ground overflow connected to same comprising 1500 sqm.

Enhancement of car parking provision, including installation of 2no. EV charging point and bicycle parking,

Alterations to site boundary arrangements, including replacement of existing internal boundary comprising stacked steel containers with 3m high concrete panel and steel post wall, and augmentation of dust netting where applicable, and

Revisions to the site area, such that the site will comprise c.1.75 ha subject of the retention application and an additional 2,616sqm which will comprise the proposed surface water attenuation tank and basin (noted above).

This application is accompanied by An Environmental Impact Assessment Report (EIAR).

3. Wastewater Drainage

3.1 Existing On-site Infrastructure

The existing canteen and welfare facilities are located in the northwestern corner of the site. Domestic wastewater from these facilities is discharged into an existing on-site wastewater treatment plant. Treated effluent from the existing on-site wastewater treatment system is discharged to the ground via an existing percolation filter bed, both of which will be upgraded in accordance with ESC specifications to ensure these meet the current standards.

3.2 Wastewater demand

As the intensification of the facility's recycling processes will not require further staff numbers, the daily wastewater demand for the proposed development will not increase.

Strict separation of surface water and wastewater will be implemented within the development. Drains will be laid out to minimise the risk of inadvertent connection of waste pipes etc. to the surface water system.

4. Surface Water Drainage

4.1 Existing Drainage Scenario

The current site, within the operational area of the recycling facility, is 100% hardstanding, including roofs and a concrete hardstanding site yard. The majority of the existing site is conveyed by an existing piped surface water network. The existing network features an offline attenuation storage tank, providing 206m^3 of storage, an online full retention hydrocarbon interceptor and a pump station from which surface water is pumped through a sand filter and into the outfall manhole before discharging into the existing ditch adjacent to the site entrance.

The treated surface water discharges from the outlet manhole into the adjacent public surface water network. Forming part of the Huntstown catchment, the surface water discharge from the site is ultimate discharge into Huntstown Steam. The Huntstown Stream subsequently joins the Broadmeadow River, prior to entering the Malahide Estuary.

The roof of the main processing shed onsite, encompassing the main processing area, ATF area, workshop and non-ferrous shed, discharges into an existing rainwater harvesting system located behind the shed. The existing rainwater harvesting system comprises of 3 x 35m^3 tanks, which are utilised as storage for firefighting purposes. In order to have the largest available volume of water for firefighting purposes, the tanks remain full year-round. Runoff from the roof bypasses the full tanks and discharges directly into the outlet manhole.

The existing entrance area, including offices, ablutions, parking and the weighbridge currently discharge from the site via the pump station and connection into the surface water network after the existing hydrocarbon interceptor.

4.2 Proposed Drainage Philosophy

Where the proposed intensification of onsite processes does not require any additional hardstanding or footprint, the proposed surface water design intends to improve both the runoff quality and quantity from the site in line with the Greater Dublin Strategic Drainage Study (GDSDS).

It is proposed that the surface water discharge rate from the site is reduced to the pre-development/greenfield rate. The portion of the current site, particularly the main processing shed, which bypasses the onsite attenuation and treatment will be routed to ensure that all runoff is attenuated and routed through the full treatment train.

It is proposed that the quality of the surface water discharge from the site will be increased by additional onsite treatment measures in conjunction with the existing process as well as ensuring that all surface water conduits discharge prior to the online existing treatment train.

4.3 Proposed Design

4.3.1 Surface water network

It is proposed that the existing piped surface water network remains in place with alteration where required.

The surface water runoff from the main processing shed roof will remain feeding the firefighting rainwater harvesting system located behind the shed. A new surface water line shall be installed to the southeast of the building in order to convey any potential overflow from the existing rainwater harvesting system into the existing surface water network.

The entrance area to the site situated slightly lower than the rest of the site will drain via a new heavy-duty aco-drain at the entrance of the site into a new attenuation tank. The proposed attenuation tank will discharge via a proposed hydrobrake chamber and hydrocarbon separator before discharging into the existing surface water pump station.

An additional surface water pipe will connect the exiting surface water network to a proposed offline attenuation facility located to the north of the site which will provide the balance of the attenuation storage required to bring the surface water discharge in compliance with the required greenfield runoff rate. Refer to Waterman Moylan drawing number MAR WMC ZZ GF DR C P020. Table 4.1 summarizes the hydrology for the development as shown in detail in Appendix A.

Table 4.1 - Summary of greenfield/pre-development runoff rate

Catchment	Catchment Area (Ha)	Runoff coefficient (impermeability)	Soil type	Q_{bar} (l/s/ha)	Allowable Discharge Rate (l/s)
Catchment A	0.14	0.9	2	2.17	3.2
Catchment B	1.47	0.9	2	2.17	0.3
Total	**1.61***	**0.9**	**2**	**2.17**	**3.5**

**hardstanding area within the recycling facility.*

In order to restrict the site's discharge rate to the Q_{bar} of 3.5l/s, separate hydrobrake and attenuation facilities are proposed for each catchment. This allows the surface water in excess of the greenfield runoff rate to be attenuated in the existing and proposed attenuation facilities. Refer to Appendix A for the Q_{bar} calculations to which the site will be restricted.

Strict separation of surface water and wastewater will be implemented within the development. Drains will be laid out to minimise the risk of inadvertent connection of waste pipes etc. to the surface water network.

4.3.2 Overall attenuation strategy

The site shall be restricted to the pre-development Q_{bar} discharge rate of 3.5l/s, in line with GDSDS requirements. The existing onsite attenuation volume is not sufficient and further attenuation storage is required to comply with the GDSDS requirements. In line with the GDSDS requirements, an allowance of 20% climate change has been allowed for in the surface water design, including the attenuation volume.

The site has been split into two catchment areas. Catchment A consists of 0.14 hectares of the non-processing portion of the site, encompassing the site entrance, offices, parking and weighbridge. Catchment B consists of the remaining 1.47 hectares including the processing yard and main processing shed. Refer to Waterman Moylan drawing number MAR-WMC-ZZ-GF-DR-C-P020.

Catchment A shall drain into a 110 m^3 subterranean concrete attenuation tank, as per Waterman Moylan drawing number MAR-WMC-ZZ-GF-DR-C-P025-Attenuation Details. The attenuation tank will be restricted by a hydrobrake to 0.3l/s before discharging through a full retention hydrocarbon separator. Following the hydrocarbon separator, the proposed surface water will discharge into the existing surface water pump station. The attenuation tank will store the full catchment volume for up to and including the 1:100 year storm +20% climate change.

Catchment B features an existing 206m^3 of offline attenuation storage to the northeast of the main processing shed. In order to meet the requirement of the GDSDS requirements and restricted discharge rate of 3.2l/s an additional 1044 m^3 of attenuation is required. It is proposed that an offline attenuation facility will make up the remaining 1044m^3 required and will be situated to the north of the existing site to prevent the need for excessive onsite construction and demolition within existing hardstanding areas. The proposed attenuation facility will be a combination of a subterranean attenuation tank and a surface-level dry detention pond.

Refer to Table 4.2 for the summary of the onsite attenuation. Refer to Appendix B for the estimation of the onsite attenuation.

Table 4.2 - Summary of required on-site attenuation

Catchment	Total attenuation volume required (m^3)	Existing attenuation volume (m^3)	Proposed attenuation (m^3)	Total attenuation (m^3)
Catchment A	107	0	110	110
Catchment B	1250	206	1050	1256
Total	**1357**	**206**	**1160**	**1366**

4.3.3 Catchment B attenuation facility

For the proposed attenuation facility in Catchment B, the attenuation tank will feature a lower-level chamber that will provide storage for auxiliary firefighting storage, and a higher-level chamber will provide attenuation storage which will attenuate up to the 1:30 year storm +20% climate change after which water will discharge into the adjacent higher- levels surface detention pond. The surface level dry detention pond shall remain dry the majority of the time and only in the extreme event between the 1:30 and 1:100 year return prior shall water be attenuated in the detention facility.

The auxiliary firefighting storage portion of the proposed tank will be filled upon completion and is intended to remain full year-round for use in emergencies. Should the water from the auxiliary tank be emptied, the storage will refill when attenuated surface water backs up into the new proposed offline facility and/or when the online flows are routed through the same. The storage, situated below the invert level of the outgoing conduit, will fill prior to the attenuation volume of the tank being utilised.

The higher-level chamber is intended for temporary attenuation storage and will adequately contain the volume of the attenuated 1:30-year storm prior to surface water filling the adjacent detention basin. The tank will slowly release temporarily stored water as water is released in a controlled manner through the downstream hydrobrake and surface water pump.

The surface water detention basin will provide the balance of the volume required to attenuate up to and including the 1:100-year storm +20% climate change. the pond will remain dry the majority of the time to prevent wetland-type conditions from materializing, given the proximity of the site in relation to the Dublin Airport.

Details of the catchment B attenuation facility are set out in Table 4.3. refer to Waterman Moylan drawings number MAR WMC ZZ GF DR C P025.

Table 4.3 - Summary of required on-site attenuation

Design feature	Dimensions (L x B X H) (m)	Volume (m^3)	Design return period	Maximum water elevation (1:100 +20%) (m)
Auxiliary fire sighting storage*	15 x 10 x 1	135	NA	77.4 Permanently filled
Attenuation tank	21.05 x 7.6 x 0.7	675	Up to 1:30	78.4
Dry Detention Pond	1500 m^2	375	1:30 to 1:100+20%CC	78.31

**Excluded from Attenuation storage calculations. 100mm of the bottom of the tank reserves for sludge settlement.*

5. SUDS Assessment Criteria

Sustainable Urban Drainage systems (SUDS) have been developed and are in use to alleviate the detrimental effects of traditional urban stormwater drainage practices that typically consisted of piping runoff of rainfall from developments to the nearest receiving watercourse. Surface water drainage methods that take account of quantity, quality and amenity issues are collectively referred to as sustainable urban drainage systems; they are typically made up of one or more structures built to manage surface water runoff.

Strict separation of surface water and wastewater will be implemented within the development. Drains will be laid out to minimise the risk of inadvertent connection of waste pipes etc. to the surface water system.

Sustainable drainage systems aim towards minimizing the impact of urbanisation on downstream flooding and water quality. Originally, SUDS were introduced primarily as single-purpose facilities however this has now evolved into more integrated systems which serve a variety of purposes.

SUDS minimizes the impacts of urban runoff by capturing runoff as close to the source as possible and then releasing it slowly. The use of SUDS to control runoff also provides the additional benefit of reducing pollutants in the surface water by settling out suspended solids and other potential contaminates.

The target development and design criteria for SUDS, set out in the CIRIA SUDS manual, are as follows:

- **Water Quantity** – Ensuring that the surface water runoff from the proposed development does not have a detrimental impact on the people, property and environment.
- **Water Quality –** Reducing urban runoff by SUDS and increasing the quality of the water
- **Amenity** – Aims to deliver pleasant, attractive and good-looking urban environments.
- **Biodiversity –** Creating new habitats and rehabilitating or enhancing habitats through SUDS measures.

The SUDS selection process used for this site is in accordance with the SUDS selection flow chart, Volume 3, Section 6.5, Figure 48 of the GDSDS. The characteristics of the site are utilised to select the various SUDS techniques that would be applicable.

The applicant has considered the use of all appropriate SUDS devices as part of the site SUDS strategy and has concluded that the following SUDS devices are most appropriate for the subject site.

Due to the nature of the retrofitting of additional surface water controls and the potential on-site contaminants, the proposed design limits groundwater infiltration for low-order return period storms to prevent contamination of groundwater. An engineered attenuation and treatment train are proposed to adequately capture, attenuate, and treat the surface water runoff from the subject site. the treatment train allows for suitable treatment of potential surface water contaminants prior to discharging into the receiving environment.

The selected SUDS measures have the least impact on the existing and ongoing operation of the site as well as minimizing the need for demolition and retrofitting within existing hardstands which will produce waste material and potentially hinder the ongoing recycling operation.

The effectiveness of each SUDS/drainage mechanism proposed is outlined below:

5.1 Water quality treatment train

In order to ensure onsite treatment of the potential suspension of onsite contaminates and particulate matter, the surface water shall feature a treatment train prior to discharging in the receiving environment.

The onsite treatment train shall consist of the following and function as indicated in Figure 2.

- 100% interception of surface runoff
- Gullies

- Silt trap manholes prior to attenuation.
- Hydrobrake flow control
- Online full retention hydrocarbon interceptors
- Surface water pump station with sump
- Sand filter

The treatment train will provide sufficient removal of the potentially suspended solids and particulate matter suspended during heavy rainfall as well as remove hydrocarbon contaminates, ensuring that the water quality discharge into the receiving environment is of suitable quality.

Silt Traps:

Silt traps are designed to treat surface water runoff, allowing for the settlement and collection of suspended particulate matter in the first flush of surface water runoff. The existing drainage network has several below-ground silt traps throughout the site. It is further proposed that an additional silt trap manhole is placed before inlets to the attenuation chamber as well as upgrading existing gullies to gully pots.

Hydrocarbon Interceptor:

A hydrocarbon interceptor is a trap used to filter out hydrocarbon pollutants from rainwater run-off. It is typically used in road construction to prevent fuel contamination of water courses carrying away the run-off.

Hydrocarbon interceptors work on the premise that some hydrocarbons such as petroleum and diesel float on top of water. The contaminated water enters the interceptor typically after flowing off roads and entering a drain before being deposited into the first tank inside the interceptor. The first tank builds up a layer of hydrocarbon as well as other scum preventing it from entering the water course.

Attenuation:

As discussed in detail in section 4.3 the site shall feature 2 attenuation facilities, one for each sub-catchment.

Catchment A shall drain into a 110 m^3 subterranean concrete attenuation tank restricted by a hydrobrake to 0.3l/s before discharging through a full retention hydrocarbon separator. Following the hydrocarbon separator, the proposed surface water will discharge into the existing surface water pump station. The attenuation tank will store the full catchment volume for up to and including the 1:100-year storm +20% climate change.

Catchment B features an existing 206m^3 of offline attenuation storage to the northeast of the main processing shed. In order to meet the requirement of the GDSDS requirements and restricted discharge rate of 3.2l/s an additional 1044 m^3 of attenuation is required. It is proposed that an offline attenuation facility will make up the remaining 1044m^3 required and will be situated to the north of the existing site. The proposed attenuation facility will be a combination of a subterranean attenuation tank and a surface-level dry detention pond.

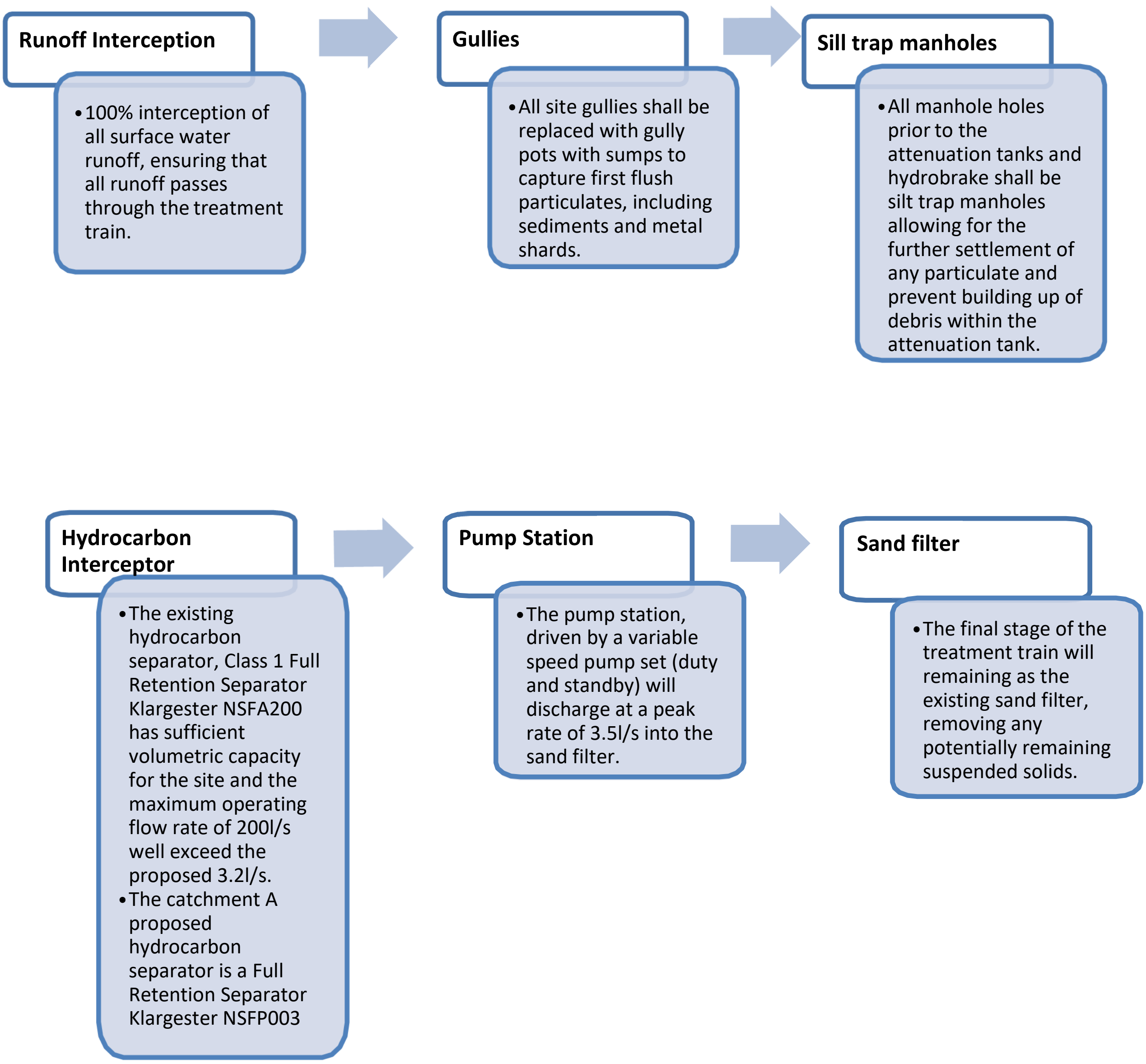


Figure 2: On-site surface water treatment train.

5.2 SUDS Assessment

Sustainable Urban Drainage systems (SUDS) have been developed and are in use to alleviate the detrimental effects of traditional urban stormwater drainage practices that typically consisted of piping runoff of rainfall from developments to the nearest receiving watercourse. Surface water drainage methods that take account of quantity, quality and amenity issues are collectively referred to as sustainable urban drainage systems; they are typically made up of one or more structures built to manage surface water runoff.

The proposed surface water drainage system for this development has been designed as a sustainable urban drainage system and uses trap gullies, silt trap manholes, full retention hydrocarbon separators, attenuation facilities, flow control devices and a sand filter to treat runoff and remove pollutants to improve quality and restrict outflow and control quantity.

5.3 **SUDS Maintenance**

For the SUDS strategy to work as designed it is important that the entire drainage system is well maintained. It will be the responsibility of the landowners and site management team to ensure the drainage system is maintained. Maintenance and cleaning of gullies, and manholes will ensure adequate performance. The recommended program is outlined below.

Table 5.1: Detention Basin Maintenance Schedule

<table>
<tr><th rowspan="12">Detention Basin</th><th>Maintenance period</th><th>Maintenance Task</th><th>Frequency</th></tr>
<tr><td rowspan="6">Regular</td><td>Remove the litter and debris</td><td>Monthly, or as required</td></tr>
<tr><td>Cut grass – to retain height within specified design range.</td><td>Monthly (during growing season), or as required</td></tr>
<tr><td>Manage other vegetation and remove nuisance plants.</td><td>Monthly at start, then as required</td></tr>
<tr><td>Inspect inlets, outlets and overflows for blockages, and clear if required.</td><td>Monthly</td></tr>
<tr><td>Inspect infiltration coverage</td><td>Monthly for 6 months, quarterly for 2 years, then half yearly</td></tr>
<tr><td>Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies</td><td>Half yearly</td></tr>
<tr><td>Occasional</td><td>Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required</td><td>As required or if soil is exposed over 10% or more of the swale treatment area</td></tr>
<tr><td rowspan="4">Remedial actions</td><td>Repair erosion or other damage by re-turfing or re-seeding</td><td>As required</td></tr>
<tr><td>Re-level uneven surfaces and reinstate design levels</td><td>As required</td></tr>
<tr><td>Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip</td><td>As required</td></tr>
<tr><td>Remove and dispose of oils or petrol residues using safe standards practices</td><td>As required</td></tr>
</table>

Table 5.2: Attenuation Tank Maintenance Schedule

SUDS Element	Maintenance		
Attenuation Tanks	Maintenance Issues	Failure of components, blockage from debris	
	Maintenance Period	Maintenance Task	Frequency
	Regular	Inspect and identify any elements that are not operating correctly. If required, take remedial action.	Monthly for three months, then annually
		Remove sediment/debris from the catchment surface that may lead to blockage of structures.	Monthly or as required
		Remove sediment/debris from catch pits/ gullies and control structures.	Annually, after severe storms or as required
	Remedial Work	Repair inlets, outlets, vents, overflows and control structures.	As required
	Monitoring	Inspect all inlets, outlets, vents, overflows and control structures to ensure they are in good condition and operating as designed.	Annually or after severe storms
		Survey inside of the tank for sediment build-up and remove it if necessary	Every five years or as required

Hydrocarbon Interceptor:

Hydrocarbon interceptor maintenance should be carried out in accordance with British Standards BS EN 858-2:2003 Separator system for light liquids (e.g. oil and petrol – Part 2: selection of nominal size, installation, operation and maintenance which provides specific guidance on how to maintain petrol interceptors.

The above-mentioned standard states the following:

"All parts which have to be regularly maintained shall be at all times reachable. Maintenance of the systems has to be carried out at least every six months by experienced personnel. The maintenance shall be carried out in accordance with the manufacturer's instructions, but at least shall include the following;

a) sludge trap

- determination of sludge volume

b) separator

- measure the thickness of light liquids
- check the operation of the automatic closure device
- check the coalescing devices for permeability, if the water levels in front and behind the coalescing device show a significant difference
- check the function of the warning device

c) sampling shaft

- clean the drain channel

Light liquid and sludge shall be removed as required. Before putting in service sludge trap and separator shall be re-filled with fresh water. The emptying is recommended when one-half of the sludge volume or 80% of the storage capacity of the separator is reached.

In exceptional circumstances, when personnel need to enter the separator, it shall be fully drained and thoroughly ventilated. In intervals of a maximum of five years the separator system shall be emptied and then submitted to general inspection covering the following items:

- water tightness of the system;
- structural condition;
- internal coatings, if present;
- state of inbuilt parts;
- state of electrical devices and installations;
- checking of adjustment of the automatic closure device, e.g. floating bodies.

Hydrocarbon interceptor maintenance should be conducted by experienced personnel at least every 6 months. Usually, an interceptor service will not be necessary every 6 months and an interception inspection will be sufficient to fulfil this requirement.

Hydrobrakes/Flow control device:

These should be services and maintained strictly in accordance with the recommendation of the manufacturers. It is recommended that these be serviced on a 3, 6 or 12-month basis, depending on the device installed as per the manufactures recommendations.

6. Water Supply

6.1 Water Supply – General

It is not proposed that a new connection to the existing 100mm diameter watermain on R122 to the northwest of the site is required for potable water supply as no increase in deand on site is envisaged..

The minimum depth of cover from the finished ground level to the external crown of any watermaisn shall be 900mm. A greater depth of cover and/or greater strength pipe and/or a higher class of bedding may be required where high traffic loading is anticipated. Depths may be altered to avoid obstructions, including separation distances between other utility services. The desirable maximum cover for a Service Connection pipe or a Water Main should be 1200mm, where practicable.

6.2 Water Demand

As the intensification of the facility's recycling processes will not require further staff, the current water supply for the site is suitable without an upgrade.

Table 6.1 Total Water Demand

Description	No. of staff	Flow l/p/day	Average demand (l/s) *A*	Average peak demand (l/s) *A*1.25=B*	Total Demand (l/s) *B*5*
Site Staff	30	90	0.03	0.039	0.20

The total water requirement, from the public supply, for the development, is estimated at 17.28 m^3/day and is unchanged from the current site demand.

6.3 Water Supply – Fire Storage

In addition to the existing rainwater harvesting fire storage (3 x 35m^3 tanks) located behind the main processing shed, additional auxiliary storage is proposed. An additional 135 m^3 auxiliary storage is proposed to be will be located within the lower level storage of the new proposed Catchment B attenuation tank. The proposed auxiliary fire storage will be stored in a 15m x 10m x 1m subterranean tank. The bottom 100mm is dedicated for sludge settlement within the tank and discounted for the purposes of the storage capacity.

7. Transport

7.1 Traffic and Transport Assessment

Refer to the separate Traffic Transport Assessment (23-072r.201) included as part of this application.

7.2 Sightlines and Site Access

Stopping Sight Distances (SSD) is defined as the minimum distance a driver would require to safely stop their vehicle, should an object unexpectedly enter its path. The SSD is determined using the design speed of the roadway. The SSD has been implemented into this design in order to ensure adequate driver safety for vehicles along R122 and the vehicles entering/exiting the proposed development.

The site's access will be provided from the existing R122. R122 has a design speed of 80km/h which translates to a required SSD of 145m, in accordance with the requirements Fingal County Council. To the north (right), the sightline exceeds the required 145 metres for a Regional Road with a posted speed limit of 80 kph, as required by Fingal County Council. However, in order maintain a 145 metre sightline to the south (left) continued maintenance of the maturing growth along the western boundary is required. Sightline visibility is maintained by ongoing maintenance of the existing hedgerow.

7.3 Sustainable Accessibility

Pedestrian footpaths and dedicated cycle tracks are available on the main road external to the development. As part of the development, footpaths will be built to enhance pedestrian connectivity. The Pedestrian entrance will be provided to the northwest of the development access from the main road, R122.

7.4 Parking

7.4.1 Car Parking

This development plan has been used to determine the appropriate car parking provision for the proposed development in line with Fingal County Council Development Management standards. Details the car parking spaces requirements for dwelling units. A total of 22 no. parking spaces will be provided for the proposed development, this includes 1 disabled parking, 3 visitor bays, and 2 EV charging bays. Additionally, 1 motorcycle parking has been allowed for.

7.4.2 Cycle Parking

Additional cycle parking in the public domain is not required for this development, with all cycle storage provided on the curtilage. A total of 6 sheltered bicycle parking's have been provided to the north of the main processing shed.

APPENDICES

A. Hydrology

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	sidharth kurella
Site name:	St Margret's
Site location:	St Margret's Village

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	53.42825° N
Longitude:	6.30098° W
Reference:	2418295653
Date:	Jul 13 2023 15:06

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 1.61

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	2	2
HOST class:	N/A	N/A
SPR/SPRHOST:	0.3	0.3

Hydrological characteristics

	Default	Edited
SAAR (mm):	932	815
Hydrological region:	12	12
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.13	2.13
Growth curve factor 100 years:	2.61	2.61
Growth curve factor 200 years:	2.86	2.86

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited

Q_{BAR} (l/s):	4.1	3.51
1 in 1 year (l/s):	3.49	2.98
1 in 30 years (l/s):	8.74	7.47
1 in 100 year (l/s):	10.7	9.15
1 in 200 years (l/s):	11.73	10.03

Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 313026, Northing: 243199,

	Interval		Years										
DURATION	6months	1year	2	3	4	5	10	20	30	50	75	100	120
5 mins	2.6	3.7	4.3	5.2	5.8	6.3	7.9	9.6	10.8	12.5	14.0	15.1	15.9
10 mins	3.6	5.2	6.0	7.3	8.1	8.8	10.9	13.4	15.1	17.4	19.5	21.1	22.2
15 mins	4.3	6.1	7.1	8.5	9.5	10.3	12.9	15.8	17.7	20.5	22.9	24.8	26.1
30 mins	5.7	7.9	9.2	11.0	12.2	13.2	16.3	19.9	22.2	25.5	28.4	30.7	32.2
1 hours	7.5	10.3	11.9	14.1	15.7	16.8	20.7	25.0	27.8	31.7	35.2	37.9	39.7
2 hours	9.9	13.5	15.4	18.2	20.1	21.5	26.2	31.4	34.8	39.5	43.7	46.9	49.0
3 hours	11.6	15.8	17.9	21.1	23.2	24.9	30.1	35.9	39.7	44.9	49.5	53.1	55.4
4 hours	13.0	17.6	20.0	23.4	25.8	27.5	33.2	39.5	43.6	49.2	54.2	57.9	60.5
6 hours	15.4	20.5	23.2	27.2	29.8	31.8	38.2	45.2	49.7	56.0	61.4	65.6	68.4
9 hours	18.1	24.0	27.1	31.5	34.4	36.7	43.8	51.7	56.7	63.6	69.7	74.3	77.3
12 hours	20.3	26.8	30.1	35.0	38.2	40.6	48.4	56.8	62.3	69.7	76.2	81.1	84.4
18 hours	23.9	31.3	35.1	40.6	44.2	46.9	55.6	65.0	71.0	79.3	86.4	91.8	95.4
24 hours	26.8	35.0	39.1	45.1	49.0	51.9	61.3	71.5	78.0	86.8	94.5	100.3	104.1
2 days	33.1	42.2	46.8	53.4	57.6	60.8	71.0	81.7	88.6	97.8	105.8	111.7	115.7
3 days	38.3	48.3	53.3	60.3	64.9	68.4	79.1	90.6	97.7	107.4	115.7	121.9	126.1
4 days	42.9	53.7	59.0	66.6	71.4	75.1	86.4	98.4	105.9	116.1	124.7	131.1	135.4
6 days	51.2	63.3	69.2	77.6	82.9	87.0	99.4	112.4	120.5	131.4	140.6	147.5	152.1
8 days	58.6	71.9	78.4	87.4	93.2	97.6	110.9	124.8	133.5	145.0	154.8	162.1	166.9
10 days	65.6	79.8	86.8	96.5	102.7	107.3	121.5	136.3	145.4	157.5	167.8	175.5	180.5
12 days	72.1	87.4	94.7	105.1	111.6	116.5	131.5	146.9	156.5	169.2	180.0	187.9	193.2
16 days	84.4	101.4	109.6	121.0	128.2	133.5	149.9	166.7	177.1	190.9	202.4	211.0	216.6
20 days	95.9	114.5	123.4	135.8	143.6	149.4	167.0	185.1	196.1	210.8	223.1	232.2	238.2
25 days	109.6	130.0	139.8	153.2	161.7	168.0	187.0	206.5	218.4	234.1	247.3	257.0	263.3

NOTES:
These values are derived from a Depth Duration Frequency (DDF) Model update 2023
For details refer to:
'Mateus C., and Coonan, B. 2023. Estimation of point rainfall frequencies in Ireland. Technical Note No. 68. Met Eireann',
Available for download at:
http://hdl.handle.net/2262/102417

SAAR = 815
M5-60 = 16.8
M5-2 = 60.8
R = (M5-60)/(M5-2) = 16.8/60.8 = 0.2763

B. Surface Water Simulation and Design

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	5	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	0.75
FSR Region	Scotland and Ireland	Connection Type	Level Soffits
M5-60 (mm)	16.800	Minimum Backdrop Height (m)	0.600
Ratio-R	0.276	Preferred Cover Depth (m)	0.800
CV	1.000	Include Intermediate Ground	✓
Time of Entry (mins)	4.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
CA Tank			78.200		712901.914	743429.498	1.138
S5	0.140	4.00	78.100	1200	712894.577	743429.426	0.965
PC			78.510	1200	712889.794	743412.198	1.554

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	S5	CA Tank	7.337	0.600	77.135	77.062	0.073	100.5	225	4.09	50.0
1.001	CA Tank	PC	21.123	0.600	77.062	76.956	0.106	199.3	225	4.48	50.0

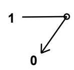
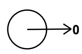
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.304	51.8	25.3	0.740	0.913	0.140	0.0	111	1.298
1.001	0.922	36.7	25.3	0.913	1.329	0.140	0.0	138	0.993

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)
1.000	7.337	100.5	225	Circular	78.100	77.135	0.740	78.200	77.062	0.913
1.001	21.123	199.3	225	Circular	78.200	77.062	0.913	78.510	76.956	1.329

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S5	1200	Manhole	Adoptable	CA Tank		Junction	
1.001	CA Tank		Junction		PC	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections		Link	IL (m)	Dia (mm)
CA Tank	712901.914	743429.498	78.200	1.138			1	1.000	77.062	225
							0	1.001	77.062	225
S5	712894.577	743429.426	78.100	0.965	1200		0	1.000	77.135	225

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
PC	712889.794	743412.198	78.510	1.554	1200	1	1.001	76.956	225

Simulation Settings

Rainfall Methodology	FSR	Skip Steady State	x
FSR Region	Scotland and Ireland	Drain Down Time (mins)	240
M5-60 (mm)	16.800	Additional Storage (m^3/ha)	20.0
Ratio-R	0.276	Check Discharge Rate(s)	x
Summer CV	0.900	Check Discharge Volume	x
Analysis Speed	Detailed		

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
5	0	0	0
10	20	0	0
30	20	0	0
100	20	0	0

Node CA Tank Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	1.001	Sump Available	✓
Replaces Downstream Link	✓	Product Number	CTL-SHE-0026-3000-0800-3000
Invert Level (m)	77.062	Min Outlet Diameter (m)	0.075
Design Depth (m)	0.800	Min Node Diameter (mm)	1200
Design Flow (l/s)	0.3		

Node CA Tank Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	77.062
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m^2)	Inf Area (m^2)	Depth (m)	Area (m^2)	Inf Area (m^2)	Depth (m)	Area (m^2)	Inf Area (m^2)
0.000	110.0	0.0	1.000	110.0	0.0	1.001	0.0	0.0

Results for 5 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute summer	CA Tank	1440	77.501	0.439	4.9	48.2753	0.0000	SURCHARGED
1440 minute summer	S5	1440	77.501	0.366	2.8	1.4755	0.0000	SURCHARGED
15 minute summer	PC	1	76.956	0.000	0.2	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute summer	CA Tank	Hydro-Brake®	PC	0.2				18.8
1440 minute summer	S5	1.000	CA Tank	4.9	0.596	0.094	0.2918	

Results for 10 year +20% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute summer	CA Tank	1440	77.681	0.619	3.7	68.0581	0.0000	SURCHARGED
1440 minute summer	S5	1440	77.681	0.546	3.8	2.2009	0.0000	SURCHARGED
15 minute summer	PC	1	76.956	0.000	0.2	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute summer	CA Tank	Hydro-Brake®	PC	0.3				21.3
1440 minute summer	S5	1.000	CA Tank	3.7	0.571	0.071	0.2918	

Results for 30 year +20% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute summer	CA Tank	1440	77.828	0.766	4.4	84.2966	0.0000	SURCHARGED
1440 minute summer	S5	1440	77.828	0.693	4.6	2.7962	0.0000	FLOOD RISK
15 minute summer	PC	1	76.956	0.000	0.2	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute summer	CA Tank	Hydro-Brake®	PC	0.3				23.0
1440 minute summer	S5	1.000	CA Tank	4.4	0.589	0.086	0.2918	

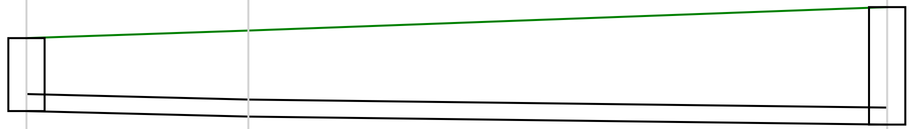
Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute summer	CA Tank	1440	78.033	0.971	5.5	106.8589	0.0000	FLOOD RISK
1440 minute summer	S5	1440	78.033	0.898	5.7	3.6235	0.0000	FLOOD RISK
15 minute summer	PC	1	76.956	0.000	0.2	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute summer	CA Tank	Hydro-Brake®	PC	0.3				25.1
1440 minute summer	S5	1.000	CA Tank	5.5	0.602	0.106	0.2918	

Waterman Moylan Consulting	File: St Margaret's flow model - R3.pfd Network: Storm Networkr 2 Sidharth Kurella 27/07/2023	Page 1 23-072 St Margaret's Catchment A Longsections

Node Name	S5		CA Tank		PC
Link Name		1.000		1.001	
Section Type		225mm		225mm	
Slope (1:X)		100.5		199.3	
Cover Level (m)	78.100		78.200		78.510
Invert Level (m)	77.135	77.062	77.062	76.956	
Length (m)		7.337		21.123	



A4 drawing

Hor Scale 250
Ver Scale 100

Datum (m) 72.000

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	5	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	0.75
FSR Region	Scotland and Ireland	Connection Type	Level Soffits
M5-60 (mm)	16.800	Minimum Backdrop Height (m)	0.600
Ratio-R	0.276	Preferred Cover Depth (m)	0.800
CV	1.000	Include Intermediate Ground	✓
Time of Entry (mins)	4.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
CB Tank			78.500		712975.140	743403.241	1.100
outfall	0.121	4.00	78.500	1350	712966.364	743372.808	1.150
Ex Tank		4.00	78.620	1200	712919.089	743379.654	1.420
pond		4.00	78.500	1200	712995.302	743408.270	0.300
EX SILT TRAP	0.302	4.00	78.680	1200	712916.993	743308.518	1.080
S1	0.246	8.00	78.600	1200	712924.966	743345.076	1.210
S2-1	0.148	8.00	78.500	1200	713004.731	743340.031	0.960
S2	0.125	16.00	78.520	1200	712996.506	743317.358	0.890
S1D			78.600	1200	712916.908	743344.597	1.170
S3	0.149	16.00	78.550	1350	712932.092	743377.443	1.390
S3A			78.600	1350	712922.520	743394.409	1.510
S4			78.470	1350	712912.848	743405.029	1.430
Ex Interseptor			78.490	1350	712901.045	743408.427	1.493
PC			78.510	1200	712889.794	743412.198	1.554
S1C			78.700	1200	712872.379	743353.016	1.050
S1B			78.700	1200	712874.890	743375.555	0.940
S1A	0.203	16.00	78.700	1200	712876.889	743386.769	0.900

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
2.001	CB Tank	outfall	10.000	0.600	77.400	77.350	0.050	200.0	300	4.15	47.1
1.000	S2	S2-1	23.877	0.600	77.630	77.540	0.090	265.3	225	16.50	50.0
2.000	pond	CB Tank	1.000	0.600	78.200	78.100	0.100	10.0	225	4.00	50.0
1.001	S2-1	outfall	50.629	0.600	77.540	77.350	0.190	266.5	225	17.56	50.0
3.000	EX SILT TRAP	S1	37.359	0.600	77.600	77.390	0.210	177.9	225	4.64	29.9
3.001	S1	S3	33.142	0.600	77.390	77.160	0.230	144.1	225	18.15	29.6
1.002	outfall	S3	34.584	0.600	77.350	77.160	0.190	182.0	225	18.16	45.5

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)
2.001	1.108	78.3	0.0	0.800	0.850	0.000	0.0	0	0.000
1.000	0.798	31.7	22.6	0.665	0.735	0.125	0.0	140	0.864
2.000	4.161	165.5	0.0	0.075	0.175	0.000	0.0	0	0.000
1.001	0.796	31.6	49.3	0.735	0.925	0.273	0.0	225	0.811
3.000	0.977	38.8	32.6	0.855	0.985	0.302	0.0	159	1.091
3.001	1.087	43.2	80.3	0.985	1.165	0.751	0.0	225	1.107
1.002	0.966	38.4	64.8	0.925	1.165	0.394	0.0	225	0.984

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.003	S3	S3A	19.480	0.600	77.160	77.090	0.070	278.3	225	18.57	44.6
1.004	S3A	S4	14.364	0.600	77.090	77.040	0.050	287.3	225	18.89	44.0
1.005	S4	Ex Interseptor	12.282	0.600	77.040	76.997	0.043	285.6	225	19.15	43.6
1.006	Ex Interseptor	PC	11.866	0.600	76.997	76.956	0.041	289.4	225	19.41	43.1
5.000	Ex Tank	S3A	15.149	0.600	77.200	77.100	0.100	151.5	225	4.24	46.6
1.000_1	S1A	S1B	11.391	0.600	77.800	77.760	0.040	284.8	225	16.25	50.0
1.001_1	S1B	S1C	22.678	0.600	77.760	77.650	0.110	206.2	225	16.66	50.0
1.002_1	S1C	S1D	45.317	0.600	77.650	77.430	0.220	206.0	225	17.50	50.0
1.003_1	S1D	S1	8.072	0.600	77.430	77.390	0.040	201.8	225	17.64	50.0

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)
1.003	0.779	31.0	208.6	1.165	1.285	1.294	0.0	225	0.793
1.004	0.766	30.5	205.8	1.285	1.205	1.294	0.0	225	0.780
1.005	0.768	30.6	203.9	1.205	1.268	1.294	0.0	225	0.783
1.006	0.763	30.3	201.6	1.268	1.329	1.294	0.0	225	0.777
5.000	1.060	42.1	0.0	1.195	1.275	0.000	0.0	0	0.000
1.000_1	0.770	30.6	36.7	0.675	0.715	0.203	0.0	225	0.784
1.001_1	0.907	36.0	36.7	0.715	0.825	0.203	0.0	189	1.028
1.002_1	0.907	36.1	36.7	0.825	0.945	0.203	0.0	189	1.028
1.003_1	0.917	36.4	36.7	0.945	0.985	0.203	0.0	187	1.040

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)
2.001	10.000	200.0	300	Circular	78.500	77.400	0.800	78.500	77.350	0.850
1.000	23.877	265.3	225	Circular	78.520	77.630	0.665	78.500	77.540	0.735
2.000	1.000	10.0	225	Circular	78.500	78.200	0.075	78.500	78.100	0.175
1.001	50.629	266.5	225	Circular	78.500	77.540	0.735	78.500	77.350	0.925
3.000	37.359	177.9	225	Circular	78.680	77.600	0.855	78.600	77.390	0.985
3.001	33.142	144.1	225	Circular	78.600	77.390	0.985	78.550	77.160	1.165
1.002	34.584	182.0	225	Circular	78.500	77.350	0.925	78.550	77.160	1.165
1.003	19.480	278.3	225	Circular	78.550	77.160	1.165	78.600	77.090	1.285
1.004	14.364	287.3	225	Circular	78.600	77.090	1.285	78.470	77.040	1.205
1.005	12.282	285.6	225	Circular	78.470	77.040	1.205	78.490	76.997	1.268
1.006	11.866	289.4	225	Circular	78.490	76.997	1.268	78.510	76.956	1.329

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
2.001	CB Tank		Junction		outfall	1350	Manhole	Adoptable
1.000	S2	1200	Manhole	Adoptable	S2-1	1200	Manhole	Adoptable
2.000	pond	1200	Manhole	Adoptable	CB Tank		Junction	
1.001	S2-1	1200	Manhole	Adoptable	outfall	1350	Manhole	Adoptable
3.000	EX SILT TRAP	1200	Manhole	Adoptable	S1	1200	Manhole	Adoptable
3.001	S1	1200	Manhole	Adoptable	S3	1350	Manhole	Adoptable
1.002	outfall	1350	Manhole	Adoptable	S3	1350	Manhole	Adoptable
1.003	S3	1350	Manhole	Adoptable	S3A	1350	Manhole	Adoptable
1.004	S3A	1350	Manhole	Adoptable	S4	1350	Manhole	Adoptable
1.005	S4	1350	Manhole	Adoptable	Ex Interseptor	1350	Manhole	Adoptable
1.006	Ex Interseptor	1350	Manhole	Adoptable	PC	1200	Manhole	Adoptable

Pipeline Schedule

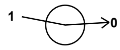
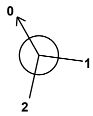
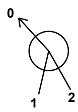
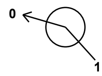
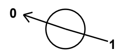
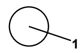
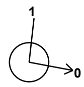
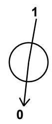
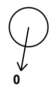
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
5.000	15.149	151.5	225	Circular	78.620	77.200	1.195	78.600	77.100	1.275
1.000_1	11.391	284.8	225	Circular	78.700	77.800	0.675	78.700	77.760	0.715
1.001_1	22.678	206.2	225	Circular	78.700	77.760	0.715	78.700	77.650	0.825
1.002_1	45.317	206.0	225	Circular	78.700	77.650	0.825	78.600	77.430	0.945
1.003_1	8.072	201.8	225	Circular	78.600	77.430	0.945	78.600	77.390	0.985

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
5.000	Ex Tank	1200	Manhole	Adoptable	S3A	1350	Manhole	Adoptable
1.000_1	S1A	1200	Manhole	Adoptable	S1B	1200	Manhole	Adoptable
1.001_1	S1B	1200	Manhole	Adoptable	S1C	1200	Manhole	Adoptable
1.002_1	S1C	1200	Manhole	Adoptable	S1D	1200	Manhole	Adoptable
1.003_1	S1D	1200	Manhole	Adoptable	S1	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
CB Tank	712975.140	743403.241	78.500	1.100		1	2.000	78.100	225
						0	2.001	77.400	300
outfall	712966.364	743372.808	78.500	1.150	1350	1	2.001	77.350	300
						2	1.001	77.350	225
						0	1.002	77.350	225
Ex Tank	712919.089	743379.654	78.620	1.420	1200	0	5.000	77.200	225
pond	712995.302	743408.270	78.500	0.300	1200	0	2.000	78.200	225
EX SILT TRAP	712916.993	743308.518	78.680	1.080	1200	0	3.000	77.600	225
S1	712924.966	743345.076	78.600	1.210	1200	1	3.000	77.390	225
						2	1.003_1	77.390	225
						0	3.001	77.390	225
S2-1	713004.731	743340.031	78.500	0.960	1200	1	1.000	77.540	225
						0	1.001	77.540	225
S2	712996.506	743317.358	78.520	0.890	1200	0	1.000	77.630	225

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections		Link	IL (m)	Dia (mm)
S1D	712916.908	743344.597	78.600	1.170	1200		1	1.002_1	77.430	225
							0	1.003_1	77.430	225
S3	712932.092	743377.443	78.550	1.390	1350		1	1.002	77.160	225
							2	3.001	77.160	225
							0	1.003	77.160	225
S3A	712922.520	743394.409	78.600	1.510	1350		1	5.000	77.100	225
							2	1.003	77.090	225
							0	1.004	77.090	225
S4	712912.848	743405.029	78.470	1.430	1350		1	1.004	77.040	225
							0	1.005	77.040	225
Ex Interseptor	712901.045	743408.427	78.490	1.493	1350		1	1.005	76.997	225
							0	1.006	76.997	225
PC	712889.794	743412.198	78.510	1.554	1200		1	1.006	76.956	225
S1C	712872.379	743353.016	78.700	1.050	1200		1	1.001_1	77.650	225
							0	1.002_1	77.650	225
S1B	712874.890	743375.555	78.700	0.940	1200		1	1.000_1	77.760	225
							0	1.001_1	77.760	225
S1A	712876.889	743386.769	78.700	0.900	1200		0	1.000_1	77.800	225

Simulation Settings

Rainfall Methodology	FSR	Skip Steady State	x
FSR Region	Scotland and Ireland	Drain Down Time (mins)	240
M5-60 (mm)	16.800	Additional Storage (m^3/ha)	20.0
Ratio-R	0.276	Check Discharge Rate(s)	x
Summer CV	0.900	Check Discharge Volume	x
Analysis Speed	Detailed		

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
5	0	0	0
10	20	0	0
30	20	0	0
100	20	0	0

Node S4 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	77.040	Product Number	CTL-SHE-0081-3200-1300-3200
Design Depth (m)	1.300	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	3.2	Min Node Diameter (mm)	1200

Node CB Tank Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.06300	Safety Factor	1.0	Invert Level (m)	77.400
Side Inf Coefficient (m/hr)	0.06300	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	625.0	0.0	1.000	625.0	0.0	1.010	0.0	0.0

Node Ex Tank Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	77.200
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	206.0	0.0	1.000	206.0	0.0	1.010	0.0	0.0

Node pond Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	78.200
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	1400.0	0.0	0.250	1500.0	0.0	0.251	0.0	0.0

Node EX SILT TRAP Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	1.0	Invert Level (m)	78.510
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	0.0	0.0	0.100	1228.0	0.0	0.101	0.0	0.0

Node S2-1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	1.0	Invert Level (m)	78.360
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	0.0	0.0	0.100	955.0	0.0	0.101	0.0	0.0

Node S1A Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	1.0	Invert Level (m)	78.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	0.0	0.0	0.100	1000.0	0.0	0.101	0.0	0.0

Results for 5 year Critical Storm Duration. Lowest mass balance: 99.50%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute summer	CB Tank	1290	77.772	0.372	17.9	232.5224	0.0000	SURCHARGED
1440 minute summer	outfall	1290	77.772	0.422	18.1	1.4923	0.0000	SURCHARGED
1440 minute summer	Ex Tank	1290	77.771	0.571	6.5	118.3392	0.0000	SURCHARGED
15 minute summer	pond	1	78.200	0.000	0.0	0.0000	0.0000	OK
30 minute summer	EX SILT TRAP	21	78.526	0.926	61.2	7.7045	0.0000	FLOOD RISK
30 minute summer	S1	21	78.453	1.063	78.7	5.5223	0.0000	FLOOD RISK
30 minute summer	S2-1	21	77.835	0.295	32.6	1.2434	0.0000	SURCHARGED
30 minute summer	S2	22	77.854	0.224	12.6	0.8836	0.0000	OK
30 minute summer	S1D	21	78.457	1.027	31.3	1.1619	0.0000	FLOOD RISK
15 minute summer	S3	12	77.818	0.658	79.3	2.3521	0.0000	SURCHARGED
1440 minute summer	S3A	1290	77.771	0.681	9.6	0.9750	0.0000	SURCHARGED
1440 minute summer	S4	1290	77.771	0.731	3.1	1.0458	0.0000	SURCHARGED
15 minute summer	Ex Interseptor	42	77.046	0.049	3.0	0.0707	0.0000	OK
15 minute summer	PC	42	77.000	0.044	3.0	0.0000	0.0000	OK
30 minute summer	S1C	21	78.483	0.833	30.9	0.9425	0.0000	FLOOD RISK
30 minute summer	S1B	22	78.502	0.742	30.5	0.8392	0.0000	FLOOD RISK
30 minute summer	S1A	25	78.518	0.718	22.4	5.6400	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute summer	CB Tank	2.001	outfall	-17.9	-0.725	-0.228	0.7042	
1440 minute summer	CB Tank	Infiltration		0.0				
1440 minute summer	outfall	1.002	S3	-10.2	-0.258	-0.266	1.3754	
1440 minute summer	Ex Tank	5.000	S3A	-6.5	-0.164	-0.155	0.6025	
15 minute summer	pond	2.000	CB Tank	0.0	0.000	0.000	0.0000	
30 minute summer	EX SILT TRAP	3.000	S1	41.3	1.038	1.063	1.4858	
30 minute summer	S1	3.001	S3	68.5	1.721	1.584	1.3181	
30 minute summer	S2-1	1.001	outfall	32.3	0.813	1.021	2.0136	
30 minute summer	S2	1.000	S2-1	15.7	0.624	0.496	0.9491	
30 minute summer	S1D	1.003_1	S1	32.0	0.806	0.879	0.3210	
15 minute summer	S3	1.003	S3A	47.7	1.199	1.540	0.7747	
1440 minute summer	S3A	1.004	S4	3.1	0.118	0.101	0.5713	
1440 minute summer	S4	1.005	Ex Interseptor	3.0	0.473	0.099	0.0787	
15 minute summer	Ex Interseptor	1.006	PC	3.0	0.509	0.100	0.0706	45.1
30 minute summer	S1C	1.002_1	S1D	31.3	0.788	0.869	1.8023	
30 minute summer	S1B	1.001_1	S1C	30.9	0.777	0.857	0.9019	
30 minute summer	S1A	1.000_1	S1B	30.5	0.767	0.997	0.4530	

Results for 10 year +20% CC Critical Storm Duration. Lowest mass balance: 99.50%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute summer	CB Tank	1440	78.009	0.609	23.0	380.3770	0.0000	SURCHARGED
1440 minute summer	outfall	1440	78.009	0.659	23.2	2.3288	0.0000	SURCHARGED
1440 minute summer	Ex Tank	1440	78.008	0.808	7.7	167.3194	0.0000	SURCHARGED
15 minute summer	pond	1	78.200	0.000	0.0	0.0000	0.0000	OK
30 minute summer	EX SILT TRAP	23	78.557	0.957	85.2	20.1084	0.0000	FLOOD RISK
30 minute summer	S1	19	78.527	1.137	86.6	5.9089	0.0000	FLOOD RISK
30 minute summer	S2-1	21	78.077	0.537	45.7	2.2623	0.0000	SURCHARGED
30 minute summer	S2	22	78.111	0.481	17.5	1.8937	0.0000	SURCHARGED
30 minute summer	S1D	19	78.530	1.100	38.0	1.2438	0.0000	FLOOD RISK
1440 minute summer	S3	1440	78.009	0.849	23.7	3.0335	0.0000	SURCHARGED
1440 minute summer	S3A	1440	78.008	0.918	10.5	1.3134	0.0000	SURCHARGED
1440 minute summer	S4	1440	78.007	0.967	3.1	1.3841	0.0000	SURCHARGED
480 minute summer	Ex Interseptor	168	77.046	0.049	3.0	0.0707	0.0000	OK
480 minute summer	PC	168	77.000	0.044	3.0	0.0000	0.0000	OK
15 minute summer	S1C	12	78.531	0.881	38.3	0.9969	0.0000	FLOOD RISK
30 minute summer	S1B	22	78.532	0.772	37.0	0.8731	0.0000	FLOOD RISK
30 minute summer	S1A	30	78.547	0.747	28.5	15.0728	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute summer	CB Tank	2.001	outfall	-23.0	-0.533	-0.294	0.7042	
1440 minute summer	CB Tank	Infiltration		0.0				
1440 minute summer	outfall	1.002	S3	-13.1	-0.329	-0.340	1.3754	
1440 minute summer	Ex Tank	5.000	S3A	-7.7	-0.193	-0.182	0.6025	
15 minute summer	pond	2.000	CB Tank	0.0	0.000	0.000	0.0000	
30 minute summer	EX SILT TRAP	3.000	S1	43.6	1.097	1.123	1.4858	
30 minute summer	S1	3.001	S3	68.9	1.733	1.594	1.3181	
30 minute summer	S2-1	1.001	outfall	45.2	1.135	1.427	2.0136	
30 minute summer	S2	1.000	S2-1	21.6	0.568	0.682	0.9496	
30 minute summer	S1D	1.003_1	S1	38.6	0.972	1.061	0.3210	
1440 minute summer	S3	1.003	S3A	10.5	0.265	0.341	0.7747	
1440 minute summer	S3A	1.004	S4	3.1	0.094	0.100	0.5713	
1440 minute summer	S4	1.005	Ex Interseptor	3.0	0.473	0.099	0.0788	
480 minute summer	Ex Interseptor	1.006	PC	3.0	0.509	0.100	0.0706	112.8
15 minute summer	S1C	1.002_1	S1D	39.1	0.983	1.084	1.8023	
30 minute summer	S1B	1.001_1	S1C	37.2	0.937	1.033	0.9019	
30 minute summer	S1A	1.000_1	S1B	37.0	0.929	1.208	0.4530	

Results for 30 year +20% CC Critical Storm Duration. Lowest mass balance: 99.50%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute summer	CB Tank	1440	78.197	0.797	28.4	497.9466	0.0000	SURCHARGED
1440 minute summer	outfall	1440	78.197	0.847	28.6	2.9940	0.0000	SURCHARGED
1440 minute summer	Ex Tank	1440	78.196	0.996	9.9	206.2524	0.0000	SURCHARGED
15 minute summer	pond	1	78.200	0.000	0.0	0.0000	0.0000	OK
30 minute summer	EX SILT TRAP	24	78.576	0.976	108.7	33.4259	0.0000	FLOOD RISK
15 minute summer	S1	11	78.564	1.174	99.1	6.1011	0.0000	FLOOD RISK
30 minute summer	S2-1	22	78.343	0.803	57.5	3.3818	0.0000	FLOOD RISK
30 minute summer	S2	22	78.400	0.770	22.4	3.0333	0.0000	FLOOD RISK
15 minute summer	S1D	11	78.559	1.129	39.4	1.2772	0.0000	FLOOD RISK
1440 minute summer	S3	1440	78.197	1.037	28.6	3.7061	0.0000	SURCHARGED
1440 minute summer	S3A	1440	78.196	1.106	12.8	1.5823	0.0000	SURCHARGED
1440 minute summer	S4	1440	78.195	1.155	3.0	1.6530	0.0000	FLOOD RISK
360 minute summer	Ex Interseptor	112	77.046	0.049	3.0	0.0707	0.0000	OK
360 minute summer	PC	112	77.000	0.044	3.0	0.0000	0.0000	OK
30 minute summer	S1C	21	78.548	0.898	37.8	1.0155	0.0000	FLOOD RISK
60 minute summer	S1B	40	78.550	0.790	35.1	0.8939	0.0000	FLOOD RISK
30 minute summer	S1A	31	78.568	0.768	41.9	27.1749	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute summer	CB Tank	2.001	outfall	-28.4	-0.447	-0.363	0.7042	
1440 minute summer	CB Tank	Infiltration		0.0				
1440 minute summer	outfall	1.002	S3	-16.0	-0.403	-0.417	1.3754	
1440 minute summer	Ex Tank	5.000	S3A	-9.9	-0.250	-0.236	0.6025	
15 minute summer	pond	2.000	CB Tank	0.0	0.000	0.000	0.0000	
30 minute summer	EX SILT TRAP	3.000	S1	42.8	1.075	1.101	1.4858	
15 minute summer	S1	3.001	S3	67.3	1.693	1.558	1.3181	
30 minute summer	S2-1	1.001	outfall	56.4	1.419	1.782	2.0136	
30 minute summer	S2	1.000	S2-1	27.8	0.699	0.877	0.9496	
15 minute summer	S1D	1.003_1	S1	39.8	1.001	1.093	0.3210	
1440 minute summer	S3	1.003	S3A	12.8	0.321	0.412	0.7747	
1440 minute summer	S3A	1.004	S4	3.0	0.089	0.100	0.5713	
1440 minute summer	S4	1.005	Ex Interseptor	3.0	0.473	0.099	0.0788	
360 minute summer	Ex Interseptor	1.006	PC	3.0	0.509	0.100	0.0706	97.2
30 minute summer	S1C	1.002_1	S1D	38.0	0.956	1.055	1.8023	
60 minute summer	S1B	1.001_1	S1C	35.3	0.887	0.979	0.9019	
30 minute summer	S1A	1.000_1	S1B	37.5	0.944	1.227	0.4530	

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.50%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute summer	CB Tank	960	78.316	0.916	35.5	572.5708	0.0000	FLOOD RISK
1440 minute summer	outfall	960	78.317	0.967	35.7	3.4199	0.0000	FLOOD RISK
1440 minute summer	Ex Tank	930	78.323	1.123	12.9	208.2997	0.0000	FLOOD RISK
1440 minute summer	pond	1440	78.303	0.103	12.9	146.5639	0.0000	OK
60 minute summer	EX SILT TRAP	43	78.600	1.000	105.5	56.9030	0.0000	FLOOD RISK
15 minute summer	S1	10	78.600	1.210	109.4	6.2884	0.3932	FLOOD
30 minute summer	S2-1	24	78.397	0.857	80.4	9.9838	0.0000	FLOOD RISK
30 minute summer	S2	24	78.489	0.859	29.2	3.3856	0.0000	FLOOD RISK
30 minute summer	S1D	20	78.594	1.164	36.1	1.3169	0.0000	FLOOD RISK
1440 minute summer	S3	930	78.324	1.164	35.6	4.1596	0.0000	FLOOD RISK
1440 minute summer	S3A	930	78.323	1.233	15.6	1.7639	0.0000	FLOOD RISK
1440 minute summer	S4	930	78.322	1.282	3.2	1.8344	0.0000	FLOOD RISK
1440 minute summer	Ex Interseptor	930	77.047	0.050	3.1	0.0718	0.0000	OK
1440 minute summer	PC	930	77.001	0.045	3.1	0.0000	0.0000	OK
60 minute summer	S1C	37	78.571	0.921	33.1	1.0422	0.0000	FLOOD RISK
60 minute summer	S1B	42	78.576	0.816	33.0	0.9230	0.0000	FLOOD RISK
60 minute summer	S1A	50	78.592	0.792	54.5	46.3428	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute summer	CB Tank	2.001	outfall	-35.5	-0.505	-0.454	0.7042	
1440 minute summer	CB Tank	Infiltration		0.0				
1440 minute summer	outfall	1.002	S3	-20.1	-0.505	-0.523	1.3754	
1440 minute summer	Ex Tank	5.000	S3A	-12.9	-0.324	-0.305	0.6025	
1440 minute summer	pond	2.000	CB Tank	25.5	0.928	0.154	0.0277	
60 minute summer	EX SILT TRAP	3.000	S1	36.0	0.905	0.926	1.4858	
15 minute summer	S1	3.001	S3	67.0	1.684	1.550	1.3181	
30 minute summer	S2-1	1.001	outfall	58.0	1.460	1.834	2.0136	
30 minute summer	S2	1.000	S2-1	29.2	0.734	0.920	0.9496	
30 minute summer	S1D	1.003_1	S1	36.3	0.912	0.996	0.3210	
1440 minute summer	S3	1.003	S3A	15.6	0.392	0.504	0.7747	
1440 minute summer	S3A	1.004	S4	3.2	0.084	0.103	0.5713	
1440 minute summer	S4	1.005	Ex Interseptor	3.1	0.477	0.102	0.0805	
1440 minute summer	Ex Interseptor	1.006	PC	3.1	0.514	0.103	0.0722	293.8
60 minute summer	S1C	1.002_1	S1D	33.2	0.836	0.922	1.8023	
60 minute summer	S1B	1.001_1	S1C	33.1	0.833	0.919	0.9019	
60 minute summer	S1A	1.000_1	S1B	33.0	0.830	1.079	0.4530	

CAUSEWAY	Waterman Moylan Consulting	File: St Margaret's flow model - R3.pfd Network: Storm Network Sidharth Kurella 27/07/2023	Page 1 23-072 St Margaret's Catchment B Longsections

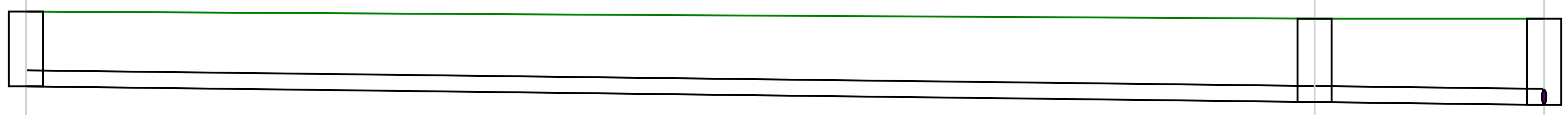
A4 drawing

Hor Scale 250
Ver Scale 100

Datum (m) 72.000

Node Name	S1A		S1B		S1C
Link Name		1.000_1		1.001_1	
Section Type		225mm		225mm	
Slope (1:X)		284.8		206.2	
Cover Level (m)	78.700		78.700		78.700
Invert Level (m)	77.800		77.760 | 77.760		77.650
Length (m)		11.391		22.678	

Node Name	S1C		S1D		S1



A4 drawing

Hor Scale 250
Ver Scale 100

Datum (m) 72.000

Link Name	1.002_1		1.003_1	
Section Type	225mm		225mm	
Slope (1:X)	206.0		201.8	
Cover Level (m)	78.700	78.600		78.600
Invert Level (m)	77.650	77.430 / 77.430		77.390
Length (m)	45.317		8.072	

Node Name	S1		S3		S3A

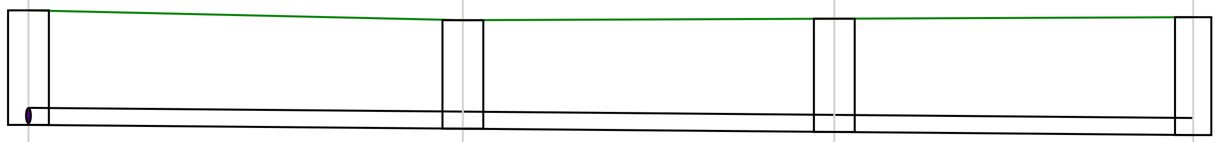
A4 drawing

Hor Scale 250
Ver Scale 100

Datum (m) 72.000

	S1		S3		S3A
Link Name		3.001		1.003	
Section Type		225mm		225mm	
Slope (1:X)		144.1		278.3	
Cover Level (m)	78.600		78.550		78.600
Invert Level (m)	77.390		77.160 / 77.160		77.090
Length (m)		33.142		19.480	

Node Name	S3A		S4		Ex Interseptor		PC

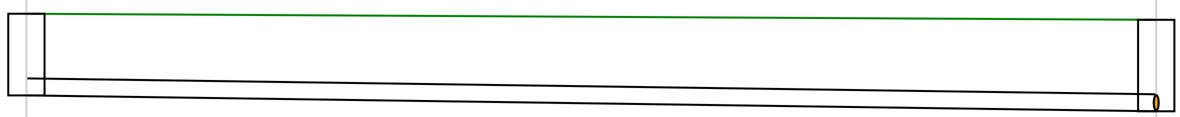


A4 drawing

Hor Scale 250
Ver Scale 100

Datum (m) 72.000

Link Name		1.004		1.005		1.006		
Section Type		225mm		225mm		225mm		
Slope (1:X)		287.3		285.6		289.4		
Cover Level (m)	78.600		78.470		78.490		78.510	
Invert Level (m)	77.090	77.040	77.040	76.997	76.997	76.956		
Length (m)		14.364		12.282		11.866		



Node Name	EX SILT TRAP		S1
A4 drawing Hor Scale 250 Ver Scale 100 Datum (m) 72.000			
Link Name		3.000	
Section Type		225mm	
Slope (1:X)		177.9	
Cover Level (m)	78.680		78.600
Invert Level (m)	77.600		77.390
Length (m)		37.359	

Node Name	S2	S2-1

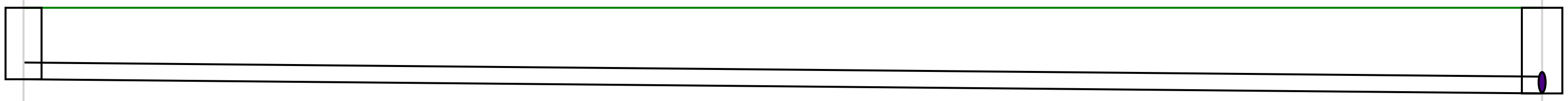
A4 drawing

Hor Scale 250
Ver Scale 100

Datum (m) 72.000

Link Name	1.000	
Section Type	225mm	
Slope (1:X)	265.3	
Cover Level (m)	78.520	78.500
Invert Level (m)	77.630	77.540
Length (m)	23.877	

Node Name	S2-1		outfall



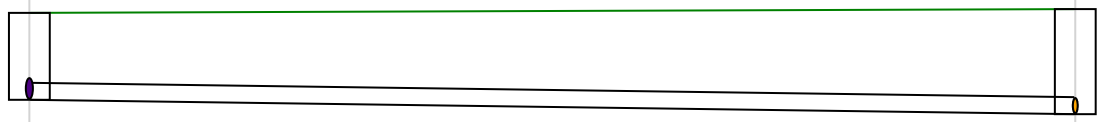
A4 drawing

Hor Scale 250
Ver Scale 100

Datum (m) 72.000

Link Name		1.001	
Section Type		225mm	
Slope (1:X)		266.5	
Cover Level (m)	78.500		78.500
Invert Level (m)	77.540		77.350
Length (m)		50.629	

Node Name	outfall	S3



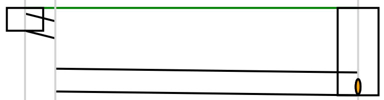
A4 drawing

Hor Scale 250
Ver Scale 100

Datum (m) 72.000

Link Name	1.002	
Section Type	225mm	
Slope (1:X)	182.0	
Cover Level (m)	78.500	78.550
Invert Level (m)	77.350	77.160
Length (m)	34.584	

Node Name	pond	CB Tank	outfall



A4 drawing

Hor Scale 250
Ver Scale 100

Datum (m) 72.000

Link Name	2.0	2.001	
Section Type	22	300mm	
Slope (1:X)	10	200.0	
Cover Level (m)	78.500	78.500	78.500
Invert Level (m)	78.100 / 78.200	77.400	77.350
Length (m)	1.0	10.000	

Node Name	Ex Tank	S3A

A4 drawing

Hor Scale 250
Ver Scale 100

Datum (m) 72.000

Link Name	5.000	
Section Type	225mm	
Slope (1:X)	151.5	
Cover Level (m)	78.620	78.600
Invert Level (m)	77.200	77.100
Length (m)	15.149	

UK and Ireland Office Locations