Proposed Development at Courtstown,

Little Island,

Co. Cork

Civil Engineering Report

Prepared for:	Ruden Homes Ltd.
Prepared by:	MMOS Consulting Engineers
Date:	14/06/2024
Reference:	20093-MMS-XX-XX-RE-C-0001

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Report Title: Civil Engineering Report

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REVISION CONTROL TABLE

Document reference: 20093-MMS-XX-XX-RE-C-0001

Revision	Date	Issue	Author	Checked
01	27.09.23	Planning Issue	SL	PM
02	14.06.24	Planning Issue	GS	PM

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1.0 Introduction

Murphy Matson O'Sullivan (MMOS) have prepared this report as part of a planning application for a proposed residential development at Courtstown, Little Island, Co. Cork. The site can be accessed via Ballytrasna Park Road. This report deals with the civil engineering drainage aspects of the proposed development and is to be read in conjunction with the Civil Engineering planning drawings accompanying this application. The area related to this development can be indicated by the red boundary line in Figure 1**.**

1.1 Background

Murphy Matson O'Sullivan Consulting Engineers Ltd (MMOS) were requested by Ruden Homes Limited to carry out support services application in Courtstown, Little Island, Co. Cork for a planning application for a residential development.
The purpose of the report is to consider the main civil engineering elements involved with the proposed application for this development, including the following.

- Design of Surface water infrastructure network including the requirements for the provision of SUDs.
- Design of the Foul Sewer Network.
- Design of the Water Main Supply.
- Design of the Road network.

1.2 Existing Site

The site of the proposed development is located at Courtstown, Little Island, Co. Cork and is bounded by:

- Ballytrasna Park Road to the North.
- A greenland area to the South.
- Harbour Point Business Park to the East.
- A Greenland area to the West.

Figure 1 *– Site Location Map*

1.3 Proposed Development

The development will consist of:

- The construction of 172 no. residential units to include 146 no. dwelling houses (with 83 no. dwelling houses to include the option for constructing a ground floor extension to the rear); 6 no. duplex units; and 20 no. apartments.
- Provision of 1 no. creche and 4 no. commercial units.
- Upgrading of the existing vehicular access to the site and the creation of a signalised junction on Ballytrasna Part Road (L-2985-0), including footpaths, cycle lanes and pedestrian crossing points, to facilitate access into the site,
- The provision of a new distributor road, including footpaths and cycle lanes, connecting the proposed residential development with Ballytrasna Park Road.
- All associated infrastructure and ancillary development works to include the provision of roads, footpaths and cycle lanes as well as the provision of vehicular connections to adjoining lands with pedestrian/cycle facilities; Proposed diversion and undergrounding of the existing 10KV overhead electricity line and associated poles traversing the site; landscaping & amenity areas, lighting, drainage and services connections; bicycle and car parking; bin storage; and boundary treatments including fencing and landscape buffer of mixed native hedge planting along the eastern boundary of the site.

2.0 Drainage Impact Assessment

2.1 Surface Water Policy

The management of the surface water for the proposed development will be designed to comply with the policies and guidelines outlined in 'BS EN 752:2008 Drain and Sewer Systems outside buildings', Building Regulations 2010, TGD Part H, the Greater Dublin Strategic Drainage Study (GDSDS) and the Cork County Development Plan 2022.

The main criteria to be provided in the design are as follows.

- Water Course Regime Protection will be satisfied by the provision of on-site attenuation.
- On site flood protection will be satisfied by providing adequate surface water drainage to manage the runoff within the site, the site is not on a flood plain.

Following objective WM11-10 of the Cork County Development Plan, we have undertaken a review of all possible SUDS measures that can be incorporated into the scheme including such as swales, permeable pavements, filter drains, storage ponds, constructed wetlands and green roofs.

2.2 SUDS Measures Adopted

The following SUDs Measures and devices are considered.

1. Permeable Paving: Where carparking spaces are provided, these will be constructed in the form of permeable paving. with an overflow provided to the public surface water sewer.

2. Swales: Where practical, the landscape will be provided with swales, as indicated on the drainage drawing enclosed with this report. Surface water gullies on the estate roads will be directed to these swales to allow for infiltration and cleaning of surface water. An overflow pipe back to the main surface water runs will be provided to prevent against flooding in scenarios where the swales are overwhelmed during periods of excessive rainfall.

3. Green Roofs; As the development will be of a traditional roof design with tiled or slated pitched roofs, the use of Green Roofs will not be practical.

4. Storage Ponds: Given the relatively high-density nature of the housing development, it will not be practical to provide storage ponds within the development from a space planning viewpoint.

5. Wetlands: Given the relatively high-density nature of the housing development, it will not be practical to provide wetlands within the development from a space planning viewpoint.

2.3 Surface Water Design

The proposed development will consist of a new dedicated surface water drainage system to collect generated runoff from roof and hardstanding areas, water runoff will discharge by gravity to the SUDS features adopted above and the below ground gravity surface water sewers. Runoff for both areas will combine into the local drainage and the surface water will flow into two online storm water attenuation tanks.

The proposed attenuation tanks provided on site are sized to accept 1 in 100 year rainfall event (with additional capacity for 20% increase for climate change). Discharge is limited to the expected flow rate from a greenfield area, the value of this flow is equal to 19.5 l/s (Refer to Appendix A).

The site will contain 2 No. attenuation tanks which have all been designed based on the percentage area drained as a proportion of the entire site. The following indicates the allowable discharge from each tank:

1. Tank 1 – 12 l/s
2. Tank 2 – 7.5 l/s

The proposed Stormtech cellular attenuation systems were designed using InfoDrainage software and an allowance of 20% for climate change was also included.
The following are the tank sizes:

- Tank 1 - 930m^3
- Tank 2 - 670m^3

The restricted outfall from the attenuation tank will then flow by gravity into the existing surface water network located on the Harbour Point Business Park Road. Refer to the proposed services layout planning drawing 20093-MMS-ZZ-ST-DR-C-10002 & 20093-MMS-ZZ-ST-DR-C-10003 for surface water layout details. Please refer to Appendix A for the storm network calculation, the greenfield runoff calculation, and the attenuation tanks calculation.

The landscaping design also includes the SuDS measures addressed in section 2.2. These items have not been included in the overall attenuation strategy but will provide additional beneficial storage to the storm drainage system.

Note that the proposed pipes on the main spine road of the proposed development, which do not pass through an attenuation tank, have been considered and the pipes have been upsized to provide the required attenuation in a 1/100 year storm event.

MMOS have undertaken an assessment of the existing Castleview Business Park drainage network and established an existing approximate flow within the 600mm diameter storm sewer. The proposed development discharge is 6 % of the total capacity of this 600mm sewer, with a spare capacity of 39% being allowed for any future development. We have attached herewith calculations for this assessment.

2.4 Sustainable Drainage Maintenance

2.4.1 Swales

REGULAR MAINTENANCE	FREQUENCY
- Grass Mow amenity grass access paths and verges surrounding swales and filter strips at 35-50mm minimum and 75mm maximum or as specified. Mow filter strips and swales at 100mm with 150mm maximum to filter and control runoff in normal grass swales removing first and last cut in season if grass is longer than 150mm removing cuttings to wildlife piles on site. Where marsh or wetland develops in the swale due to wet conditions then cut annually, or as required, at 100mm.	Monthly or as required
OCCASIONAL TASKS	**FREQUENCY**

Where there is a build-up of silt on the filter strip, swale, under-drained swale or at inlets, i.e. 50mm or more above the design level, then remove and spread on site. Undertake when ground is damp in autumn or early spring and transplant turf and overseed to original design levels. Spread excavated material on site above SuDS design profile, e.g. top of banks, in accordance with E.A. Waste Exemption Guidance.	As required
REMEDIAL WORK	**FREQUENCY**
All damage to be made good to design profile unless there is a design flaw.	As required

2.4.2 Permeable paving

REGULAR MAINTENANCE	**FREQUENCY**
- Cleaning Brush regularly and remove sweepings from all hard surfaces	Monthly
OCCASIONAL TASKS	**FREQUENCY**
Brush and vacuum surface once a year to prevent silt blockage and enhance design life.	Annually
REMEDIAL WORK	**FREQUENCY**
Monitor effectiveness of permeable pavement and when water does not infiltrate immediately advise Client of possible need for reinstatement of top layers or specialist cleaning. Recent experience suggests jet washing and suction cleaning will substantially reinstate pavement to 90% efficiency.	As required

3.0 Statement of Compliance with Uisce Éireann's Standard Details and Codes of Practice

A current/valid Letter of Feasibility has been obtained from Uisce Éireann, following the request of Cork County Council in their Opinion. This letter is dated 20th June 2024, is covered under case reference number CDS20003977 and confirms feasibility for 172 units. This letter is attached at Appendix C.

A Design Submission Letter was received from Uisce Éireann on 22nd March 2022, confirming no objections to the proposals. This letter was issued under the same case reference number (CDS20003977) and is attached at Appendix C.

Please note all correspondence with Uisce Éireann in respect of the application site and design proposals are continuously covered under Case Reference number CDS20003977.

As part of the request to Uisce Éireann for the current/valid Letter of Feasibility, the water and wastewater infrastructure proposals have been designed in full compliance with Irish Water's Standard Details and Codes of Practice and have been fully furnished to Uisce Éireann. The design proposals have been discussed with Uisce Éireann throughout the design process and all relevant drawings have been submitted and considered by them for approval under Case Reference Number CDS20003977 and as reflected in the current/valid Letter of Feasibility.

This Statement has been prepared by MMOS Consulting Engineers and confirms that the water and wastewater infrastructure proposals have been designed in full compliance with and to satisfy all of Uisce Éireann's Standard Details and Codes of Practice.

4.0 Foul Water Discharge

4.1 Proposed Foul Layout

The proposed foul sewer system will consist of a new 150/225 mm diameter UPVC Pipe located within the site that will collect foul drainage from the units and will outfall to the existing foul sewer network located on Harbour Point Business Park Road. Please refer to drawing 20093-MMS-ZZ-ST-DR-C-10004 & 20093-MMS-ZZ-ST-DR-C-10005 for details of the proposed foul sewer network.

The existing foul sewer which is located on Harbour Point Business Park Road comprises a 225mm CO Pipe which has been confirmed by Irish Water. Irish Water have also stated that it is feasible to connect to this existing pipe. Please find Irish Water Confirmation of Feasibility and Statement of Design Acceptance in Appendix C.

4.2 Wastewater discharges

The foul sewer discharged from this development was calculated for all the residential houses, apartments, duplexes and the creche.

The foul sewer discharged from the proposed development can be found in Appendix B of this report, as follows:

- DWF 1.062 l/sec
- 6DWF 6.371 l/sec

4.3 Carrigrennan WWTP

The current PE load collected by Carrigrennan WWTP is 274780 PE. We can calculate the PE load from this proposed development using the flow in l/sec which equates to a load of 612 PE. Hence this proposed development will cause a minor increase of 0.2% on the loading of the Carrigrennan WWTP.

5.0 Water Supply

It is proposed to tie into the existing 300mm diameter watermain located in Ballytrasna Park Road with a 150mm diameter ring water main to supply the site.

Refer to the proposed services layout planning drawing 20093-MMS-ZZ-ST-DR-C-10006 & 20093-MMS-ZZ-ST-DR-C-10007 for watermain layout details.

A Confirmation of Feasibility and a Statement of Design Acceptance have been received from Irish Water regarding the proposed development. See Appendix C.

6.0 Roads and Sightlines Design

All roads, footpaths and sightlines within this proposed scheme are set out in accordance with the following documents.

A. Design Manual for Urban Roads & Streets (DMURS)
B. Design Guide for Residential Estate Development (DGRED)
C. Design Manual for Roads & Bridges (DMRB)

The Design Manual for Urban Roads and Streets (DMURS) is a guidance document published by the Department of the Environment which was most recently revised in 2019. The purpose of these guidelines is to produce an integrated multi-disciplinary focus on the design of positive and sustainable residential environments. The manual aims to address street design with urban areas which it achieves by setting out an integrated design approach.

The following are some of the specific design approaches that were incorporated into this scheme to ensure that the design is in compliance with DMURS.

The proposed road widths vary from 7.5 meters on the main spine road to between 5.0 and 5.5 meters on local access roads.

The following speed restrictions will be employed:

- 15 km/h – for the home-zones and local access areas
- 30 km/h – within the estate

This is achieved by reducing straight-line visibility with chicanes, landscaping, and on-street parking, along with raised platforms in contrasting colors. The design also includes signage, tighter corner radii (3-5 meters), frequent pedestrian crossings, and numerous junctions.

A stopping sight distance (SSD) of 23m has been adopted throughout the development, in accordance with Table 4.2 of 'Design Manual for Urban Streets' for the design speed of 30 km/h. Please refer to Figure 4 for the relevant SSD for the corresponding road design speeds.

SSD STANDARDS

Design Speed (km/h)	SSD Standard (metres)
10	7
20	14
30	23
40	33
50	45
60	59

Forward Visibility

Design Speed (km/h)	SSD Standard (metres)
10	8
20	15
30	24
40	36
50	49
60	65

Forward Visibility on Bus Routes

Table 4.2: Reduced SSD standards for application within cities towns and villages. Reduced forward visibility increases driver caution and reduces vehicle speeds.

***Figure 2** – SSD Standards (Extract from DMURS)*

Off street parking is provided for two vehicles for each dwelling and for one vehicle per apartment. Road crossfall shall generally be limited to 2.5%. Road longitudinal gradients are dictated by the general site topography which is reflective of the general topography.

Roads shall be drained using standard road gullies with hinged frame grating and aco drains. Gullies shall be provided at a rate of 1 gully per 200 m^2 of roadway. This report only covers the internal road and footpath layouts and design.

The sightlines have been adopted in accordance with DMURS and the National Roads Authority document, Design Manual for Roads & Bridges (DMRB). The proposed scheme will access Ballytrasna road which currently has a design speed of 60 km/h. Hence, the required sightline at this location is 90m as seen in the table below which is an extract from the DMRB.

Design Speed of Major Road (kph)	'y' Distance (m)
42	50
50	70
60	90
70	120
85	160
100	215

Table 7/1: 'y' Visibility Distances from the Minor Road (Para 7.7c)

The proposed development is consistent with both the principles and guidance outlined within the Design Manual for Urban Roads and Streets (DMURS) 2019. These schemes proposals are the product of an integrated urban design and landscaping strategy which create lower traffic speeds through the development and thereby facilitating a safer environment for pedestrians and cyclists. MMOS Engineers along with the rest of the design team have utilised the DMURS principles to ensure the final layout provides a high quality urban development within the proposed scheme.

See drawings 20093-MMS-ZZ-ST-DR-C-10024 & 20093-MMS-ZZ-ST-DR-C-10025 for autotracking details and drawing 20093-MMS-ZZ-ST-DR-C-10021 for sightlines details.

APPENDIX A STORM WATER DISCHARGE AND ATTENUATION DESIGN

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
	Designed by: GSilva	Checked by: PMatson	Approved By: PMatson
Report Details: Type: Stormwater Controls Storm Phase: Tank 1	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

Tank

Type : Tank

Dimensions

Exceedence Level (m)	49.870
Depth (m)	1.200
Base Level (m)	48.670
Freeboard (mm)	0
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:x)	0.00
Total Volume (m³)	930.000

Depth (m)	Area (m²)	Volume (m³)
0.000	775.00	0.000
1.200	775.00	930.000

Advanced

Perimeter	Circular
Length (m)	35.000

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
	Designed by: GSilva	Checked by: PMatson	Approved By: PMatson
Report Title: Rainfall Analysis Criteria	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FSR

Type: FSR

Region	Scotland and Ireland
M5-60 (mm)	17.7
Ratio R	0.250
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
100.0	20

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
720	1440
1440	2880
2880	5760

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
	Designed by: GSilva	Checked by: PMatson	Approved By: PMatson
Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 1	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 15 mins: Summer

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	48.966	48.966	0.296	0.296	536.6	229.410	0.000	0.000	8.3	11.118	75	OK

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
	Designed by: GSilva	Checked by: PMatson	Approved By: PMatson
Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 1	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 15 mins: Winter

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	49.002	49.002	0.332	0.332	565.4	256.967	0.000	0.000	9.0	11.971	72	OK

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
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Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 1	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 30 mins: Summer

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	49.083	49.083	0.413	0.413	385.6	319.742	0.000	0.000	9.4	18.813	66	OK

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FSR: 100 years: Increase Rainfall (%): +20: 30 mins: Winter

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	49.135	49.135	0.465	0.465	405.3	360.177	0.000	0.000	9.9	17.059	61	OK

Project:	Date:		
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	Designed by: GSilva	Checked by: PMatson	Approved By: PMatson
Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 1	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 60 mins: Summer

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	49.210	49.210	0.540	0.540	350.8	418.193	0.000	0.000	9.9	33.056	55	OK

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FSR: 100 years: Increase Rainfall (%): +20: 60 mins: Winter

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	49.278	49.278	0.608	0.608	316.0	470.832	0.000	0.000	9.7	34.823	49	OK

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
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Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 1	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 120 mins: Summer

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	49.348	49.348	0.678	0.678	266.0	525.353	0.000	0.000	9.1	71.219	44	OK

Project:	Date:		
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Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 1	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 120 mins: Winter

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	49.431	49.431	0.761	0.761	214.2	590.065	0.000	0.000	9.5	76.494	37	OK

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FSR: 100 years: Increase Rainfall (%): +20: 240 mins: Summer

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	49.489	49.489	0.819	0.819	182.6	634.526	0.000	0.000	9.1	155.744	32	OK

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FSR: 100 years: Increase Rainfall (%): +20: 240 mins: Winter

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	49.593	49.593	0.923	0.923	137.5	715.470	0.000	0.000	9.0	166.019	23	OK

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Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 1	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 360 mins: Summer

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	49.566	49.566	0.896	0.896	142.1	694.255	0.000	0.000	9.1	242.849	25	OK

Project:	Date:		
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FSR: 100 years: Increase Rainfall (%): +20: 360 mins: Winter

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	49.685	49.685	1.015	1.015	104.9	786.443	0.000	0.000	8.9	257.704	15	OK

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Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
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Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 1	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 720 mins: Summer

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	49.667	49.667	0.997	0.997	90.7	772.964	0.000	0.000	8.8	498.197	17	OK

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
	Designed by: GSilva	Checked by: PMatson	Approved By: PMatson
Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 1	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 720 mins: Winter

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	49.812	49.812	1.142	1.142	65.5	885.063	0.000	0.000	8.8	532.854	5	OK

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
	Designed by: GSilva	Checked by: PMatson	Approved By: PMatson
Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 1	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 1440 mins: Summer

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	49.713	49.713	1.043	1.043	56.3	808.113	0.000	0.000	9.0	972.538	13	OK

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
	Designed by: GSilva	Checked by: PMatson	Approved By: PMatson
Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 1	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 1440 mins: Winter

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	49.863	49.863	1.193	1.193	40.9	924.406	0.000	0.000	9.4	1023.837	1	OK

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
	Designed by: GSilva	Checked by: PMatson	Approved By: PMatson
Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 1	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 2880 mins: Summer

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	49.698	49.698	1.028	1.028	34.9	796.834	0.000	0.000	8.7	1529.454	14	OK

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
	Designed by: GSilva	Checked by: PMatson	Approved By: PMatson
Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 1	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 2880 mins: Winter

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	49.828	49.828	1.158	1.158	26.4	897.188	0.000	0.000	9.6	1709.729	4	OK

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
	Designed by: GSilva	Checked by: PMatson	Approved By: PMatson
Report Details: Type: Stormwater Controls Storm Phase: Tank 2	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

Tank

Type : Tank

Dimensions

Exceedence Level (m)	50.300
Depth (m)	1.200
Base Level (m)	49.100
Freeboard (mm)	0
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:x)	0.00
Total Volume (m³)	666.000

Depth (m)	Area (m²)	Volume (m³)
0.000	555.00	0.000
1.200	555.00	666.000

Advanced

Perimeter	Circular
Length (m)	24.999

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
	Designed by: GSilva	Checked by: PMatson	Approved By: PMatson
Report Title: Rainfall Analysis Criteria	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FSR

Type: FSR

Region	Scotland and Ireland
M5-60 (mm)	17.7
Ratio R	0.250
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
100.0	20

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
720	1440
1440	2880
2880	5760

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
	Designed by: GSilva	Checked by: PMatson	Approved By: PMatson
Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 2	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 15 mins: Summer

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	49.367	49.367	0.267	0.267	345.9	148.329	0.000	0.000	5.0	6.561	78	OK

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
	Designed by: GSilva	Checked by: PMatson	Approved By: PMatson
Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 2	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 15 mins: Winter

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	49.400	49.400	0.300	0.300	363.9	166.268	0.000	0.000	5.2	6.641	75	OK

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
	Designed by: GSilva	Checked by: PMatson	Approved By: PMatson
Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 2	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 30 mins: Summer

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	49.474	49.474	0.374	0.374	247.1	207.620	0.000	0.000	5.7	9.482	69	OK

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
	Designed by: GSilva	Checked by: PMatson	Approved By: PMatson
Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 2	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 30 mins: Winter

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	49.520	49.520	0.420	0.420	259.7	232.966	0.000	0.000	5.9	9.743	65	OK

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
	Designed by: GSilva	Checked by: PMatson	Approved By: PMatson
Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 2	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 60 mins: Summer

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	49.587	49.587	0.487	0.487	224.8	270.347	0.000	0.000	6.7	20.178	59	OK

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
	Designed by: GSilva	Checked by: PMatson	Approved By: PMatson
Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 2	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 60 mins: Winter

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	49.646	49.646	0.546	0.546	202.5	302.942	0.000	0.000	8.1	27.904	55	OK

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
	Designed by: GSilva	Checked by: PMatson	Approved By: PMatson
Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 2	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 120 mins: Summer

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	49.755	49.755	0.655	0.655	172.3	363.525	0.000	0.000	165.5	85.133	45	OK

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
	Designed by: GSilva	Checked by: PMatson	Approved By: PMatson
Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 2	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 120 mins: Winter

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	49.790	49.790	0.690	0.690	137.1	382.936	0.000	0.000	5.8	48.274	43	OK

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
	Designed by: GSilva	Checked by: PMatson	Approved By: PMatson
Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 2	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 240 mins: Summer

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	49.868	49.868	0.768	0.768	117.0	426.162	0.000	0.000	26.3	111.950	36	OK

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
	Designed by: GSilva	Checked by: PMatson	Approved By: PMatson
Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 2	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 240 mins: Winter

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	49.942	49.942	0.842	0.842	88.0	467.547	0.000	0.000	9.7	99.353	30	OK

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
	Designed by: GSilva	Checked by: PMatson	Approved By: PMatson
Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 2	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 360 mins: Summer

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	49.950	49.950	0.850	0.850	154.2	471.824	0.000	0.000	11.9	163.201	29	OK

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
	Designed by: GSilva	Checked by: PMatson	Approved By: PMatson
Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 2	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 360 mins: Winter

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	50.043	50.043	0.943	0.943	67.2	523.549	0.000	0.000	12.2	146.248	21	OK

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
	Designed by: GSilva	Checked by: PMatson	Approved By: PMatson
Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 2	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 720 mins: Summer

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	50.100	50.100	1.000	1.000	72.5	555.122	0.000	0.000	70.4	327.196	17	OK

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
	Designed by: GSilva	Checked by: PMatson	Approved By: PMatson
Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 2	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 720 mins: Winter

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	50.222	50.222	1.122	1.122	214.9	622.449	0.000	0.000	161.7	366.597	7	OK

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
	Designed by: GSilva	Checked by: PMatson	Approved By: PMatson
Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 2	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 1440 mins: Summer

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	50.139	50.139	1.039	1.039	169.7	576.795	0.000	0.000	14.7	550.585	13	OK

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
	Designed by: GSilva	Checked by: PMatson	Approved By: PMatson
Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 2	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 1440 mins: Winter

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	50.248	50.248	1.148	1.148	30.3	637.383	0.000	0.000	15.1	604.259	4	OK

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
	Designed by: GSilva	Checked by: PMatson	Approved By: PMatson
Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 2	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 2880 mins: Summer

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	50.178	50.178	1.078	1.078	111.6	598.225	0.000	0.000	21.3	1017.835	10	OK

Project:	Date:		
Proposed Development at Courtstown, Little Island, Co. Cork	31/05/2024		
	Designed by: GSilva	Checked by: PMatson	Approved By: PMatson
Report Details: Type: Stormwater Controls Summary Storm Phase: Tank 2	Company Address: The Chapel, Blackrock House, Blackrock Road, Cork T12KRK7		

FSR: 100 years: Increase Rainfall (%): +20: 2880 mins: Winter

Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	50.265	50.265	1.165	1.165	42.7	646.448	0.000	0.000	73.9	1092.571	3	OK

MMOS
MURPHY · MATSON · O'SULLIVAN
CONSULTING CIVIL & STRUCTURAL ENGINEERS

Project: Courtstown, Little Island, Co. Cork.

Subject: Storm Sewer Drainage Calculations

Job No.: **20093**

Design rainfall for existing areas = 50.000 mm / hr
Coefficient of roughness, k_s = 0.600

Ground Floor Level Water

Pipe Run		Areas Collected		Flow (l/s)	Flow from adjoining branch (l/s)	Q cumulative (l/s)	Pipework Details			
Start MH	End MH	Road / Paved Area (m2)	Roof Area (m2)				Pipe Ø (mm)	Gradient (1 in xx)	Q Capacity (l/s)	% of Capacity Used
Proposed H. Devel.	Att. Tank	0	0.0	29.22	0.00	29.22	600	200	485.26	6%
Existing Ind Estate Assumed *		17100	0.0	237.50	29.22	266.72	600	200	485.26	55%
						295.94				61%

*60% of the existing area taken

Spare Capacity for existing storm sewer	39%

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Stephen Leonard
Site name:	20093
Site location:	20093

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:	51.89919° N
Longitude:	8.33734° W
Reference:	512022256
Date:	Mar 09 2022 17:36

Runoff estimation approach IH124

Site characteristics

Total site area (ha): 6.55

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):	1072	1072
Hydrological region:	13	13
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	1.65	1.65
Growth curve factor 100 years:	1.95	1.95
Growth curve factor 200 years:	2.15	2.15

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):	19.65	19.65
1 in 1 year (l/s):	16.71	16.71
1 in 30 years (l/s):	32.43	32.43
1 in 100 year (l/s):	38.33	38.33
1 in 200 years (l/s):	42.26	42.26

APPENDIX B WATER AND WASTE WATER DEMAND CALCULATIONS

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Water Demand Calculations

Note; Calculations carried out in accordance with Section 3.7.2 of Code of Practice for Water Infrastructure document IW-CDS-5020-03

IW Average Occupancy Ratio	2.70		
Assumed Housing Occupancy Ratio	2.70		(based on 2.7 person per house)
Assumed Apartment Occupancy Ratio	2.00		(based on 2 person per apartment)
Assumed Retail Occupancy Ratio	0.0833	p/sqm	(4 units with 85sqm per unit)
Per Capita Domestic Consumption	150	l/day	
Per Capita Retail Consumption	90	l/day	
average day multiplier	1.25		
Peak Day multiplier	5.00		

Type	No. of Units	Assumed Occupancy	Daily Domestic Demand (l/sec)	Average Domestic Demand (l/sec)	Peak Domestic Demand (l/sec)
Housing Development	146	394	0.684	0.855	4.277
Apartments/Duplex	26	52	0.090	0.113	0.564
Commercial Space	340	28.32	0.030	0.0369	0.184
Total			0.804	**1.005**	**5.026**

Assumed Occupancy Ratio	40.00		
Per Customer Consumption	10	l/meal	
Assumed Staff Occupancy Ratio	3.00		
Per Customer Consumption	60	l/day (Over 8 Hours)	
average day multiplier	1.25		
Peak Day multiplier	5.00		

Type		Assumed Occupancy	Daily Domestic Demand (l/sec)	Average Domestic Demand (l/sec)	Peak Domestic Demand (l/sec)
Creche					
Staff		4	0.008	0.010	0.052
Students		55	0.153	0.191	0.955
Total			0.161	**0.191**	**0.955**

Total Development		Assumed Occupancy	Daily Domestic Demand (l/sec)	Average Domestic Demand (l/sec)	Peak Domestic Demand (l/sec)
Water Demand			0.965	**1.196**	**5.981**

Waste Water Calculations

Note; Calculations carried out in accordance with Section 3.7.2 of Code of Practice for Water

IW Average Occupancy Ratio	2.70		
Assumed Housing Occupancy Ratio	2.70	(based on 2.7 person per house)	
Assumed Apartment Occupancy Ratio	2.00	(based on 2 person per apartment)	
Assumed Retail Occupancy Ratio	0.0833	p/sqm	(4 units with 85sqm per unit)
Per Capita Consumption	150	l/day	
Per Capita Retail Consumption	90	l/day	
Growth Factor	10	%	
average day multiplier	1.00	DWF	
Peak Day multiplier	6.00	DWF	

Type	No. of Units	Assumed Occupancy	Daily Domestic Demand (l/sec)	Average Domestic Demand (l/sec)	Peak Domestic Demand (l/sec)
Housing Development	146	394	0.753	0.753	4.517
Apartments/Duplex	26	52	0.099	0.099	0.596
Commercial Space	340	28.32	0.032	0.032	0.195
Total			0.885	**0.885**	**5.307**

Assumed Occupancy Ratio	40.00		
Per Customer Consumption	10	l/meal	
Assumed Staff Occupancy Ratio	3.00		
Per Customer Consumption	60	l/day (Over 8 Hours)	
Growth Factor	10	%	
average day multiplier	1.00	DWF	
Peak Day multiplier	6.00	DWF	

Type		Assumed Occupancy	Daily Domestic Demand (l/sec)	Average Domestic Demand (l/sec)	Peak Domestic Demand (l/sec)
Creche					
Staff		4	0.009	0.009	0.055
Students		55	0.168	0.168	1.008
Total			0.177	**0.177**	**1.063**

Total Development		Assumed Occupancy	Daily Domestic Demand (l/sec)	Average Domestic Demand (l/sec)	Peak Domestic Demand (l/sec)
Waste Water Demand			1.062	**1.062**	**6.371**

WWTP	
Peak Daily Demand (l/day)	91739
Per capita Consumption (l/day)	150.000
PE Equivilant	612
Percentage increase on WWTP	**0.223**

APPENDIX C IRISH WATER CORREPONDENCE

CONFIRMATION OF FEASIBILITY

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

Gaby Silva

MMOS Engineers
The Chapel
Blackrock House
Blackrock Road
Cork
T12KRK7

20 June 2024

Our Ref: CDS20003977 Pre-Connection Enquiry
Old Court, Little Island, Cork for 172 units

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 172 unit(s) at Old Court, Little Island, Cork, (the **Development)**.

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

- **Water Connection** - Feasible without infrastructure upgrade by Irish Water
- **Wastewater Connection** - Feasible Subject to upgrades
  - In order to accommodate the proposed connection, an approximately 70m network extension will be required. These works will be carried out by Irish Water and the costs for this included in your connection fee. Please see www.water.ie/connections/ for information on connection charges.
  - Permission to connect via third party land (from the site to the road) may be required in order for a gravity connection to be possible.

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/

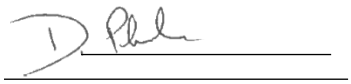
Where can you find more information?

- **Section A -** What is important to know?
- **Section B -** Details of Uisce Éireann's Network(s)

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

Section A - What is important to know?

What is important to know?	Why is this important?
Do you need a contract to connect?	• Yes, a contract is required to connect. This letter does not constitute a contract or an offer in whole or in part to provide a connection to Uisce Éireann's network(s). • Before the Development can connect to Uisce Éireann's network(s), you must submit a connection application and be granted and sign a connection agreement with Uisce Éireann.
When should I submit a Connection Application?	• A connection application should only be submitted after planning permission has been granted.
Where can I find information on connection charges?	• Uisce Éireann connection charges can be found at: https://www.water.ie/connections/information/charges/
Who will carry out the connection work?	• All works to Uisce Éireann's network(s), including works in the public space, must be carried out by Uisce Éireann*. *Where a Developer has been granted specific permission and has been issued a connection offer for Self-Lay in the Public Road/Area, they may complete the relevant connection works
Fire flow Requirements	• The Confirmation of Feasibility does not extend to fire flow requirements for the Development. Fire flow requirements are a matter for the Developer to determine. • **What to do?** - Contact the relevant Local Fire Authority
Plan for disposal of storm water	• The Confirmation of Feasibility does not extend to the management or disposal of storm water or ground waters. • **What to do?** - Contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges.
Where do I find details of Uisce Éireann's network(s)?	• Requests for maps showing Uisce Éireann's network(s) can be submitted to: datarequests@water.ie

What are the design requirements for the connection(s)?	• The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this Development shall comply with ***the Uisce Éireann Connections and Developer Services Standard Details and Codes of Practice,*** available at www.water.ie/connections
Trade Effluent Licensing	• Any person discharging trade effluent** to a sewer, must have a Trade Effluent Licence issued pursuant to section 16 of the Local Government (Water Pollution) Act, 1977 (as amended). • More information and an application form for a Trade Effluent License can be found at the following link: https://www.water.ie/business/trade-effluent/about/ **trade effluent is defined in the Local Government (Water Pollution) Act, 1977 (as amended)

Section B – Details of Uisce Éireann's Network(s)

The map included below outlines the current Uisce Éireann infrastructure adjacent the Development: To access Uisce Éireann Maps email datarequests@water.ie

Reproduced from the Ordnance Survey of Ireland by Permission of the Government. License No. 3-3-34

Note: The information provided on the included maps as to the position of Uisce Éireann's underground network(s) is provided as a general guide only. The information is based on the best available information provided by each Local Authority in Ireland to Uisce Éireann.

Whilst every care has been taken in respect of the information on Uisce Éireann's network(s), Uisce Éireann assumes no responsibility for and gives no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided, nor does it accept any liability whatsoever arising from or out of any errors or omissions. This information should not be solely relied upon in the event of excavations or any other works being carried out in the vicinity of Uisce Éireann's underground network(s). The

onus is on the parties carrying out excavations or any other works to ensure the exact location of Uisce Éireann’s underground network(s) is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.

Roberto Mione
The Chapel
Blackrockhouse
Blackrock Road
Co. Cork T12KRK7

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

Irish Water
PO Box 448,
South City
Delivery Office,
Cork City.

www.water.ie

22 March 2022

Re: Design Submission for Old Court, Little Island, Cork (the "Development") (the "Design Submission") / Connection Reference No: CDS20003977

Dear Roberto Mione,

Many thanks for your recent Design Submission.

We have reviewed your proposal for the connection(s) at the Development. Based on the information provided, which included the documents outlined in Appendix A to this letter, Irish Water has no objection to your proposals.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Irish Water infrastructure. Before you can connect to our network you must sign a connection agreement with Irish Water. This can be applied for by completing the connection application form at www.water.ie/connections. Irish Water's current charges for water and wastewater connections are set out in the Water Charges Plan as approved by the Commission for Regulation of Utilities (CRU)(https://www.cru.ie/document_group/irish-waters-water-charges-plan-2018/).

You the Customer (including any designers/contractors or other related parties appointed by you) is entirely responsible for the design and construction of all water and/or wastewater infrastructure within the Development which is necessary to facilitate connection(s) from the boundary of the Development to Irish Water's network(s) (the "**Self-Lay Works**"), as reflected in your Design Submission. Acceptance of the Design Submission by Irish Water does not, in any way, render Irish Water liable for any elements of the design and/or construction of the Self-Lay Works.

If you have any further questions, please contact your Irish Water representative:
Name: Adrian Roberts
Email: Adrian.roberts@water.ie

Yours sincerely,

Yvonne Harris

Yvonne Harris
Head of Customer Operations

Appendix A
Document Title & Revision

- 20093-MMS-ZZ-ST-DR-C-10004 REV- P07
- 20093-MMS-ZZ-ST-DR-C-10005 REV- P06
- 20093-MMS-ZZ-ST-DR-C-10006 REV- P07
- 20093-MMS-ZZ-ST-DR-C-10007 REV- P08
- 20093-MMS-ZZ-ST-DR-C-10014 REV- P03
- 20093-MMS-ZZ-ST-DR-C-10012 REV- P02
- 20093-MMS-ZZ-ST-DR-C-10013 REV- P04
- 20093-MMS-ZZ-ST-DR-C-10015 REV- P02
- 20093-MMS-ZZ-ST-DR-C-10027 REV- P06
- 20093-MMS-ZZ-ST-DR-C-10028 REV- P06

For further information, visit ***www.water.ie/connections***

Notwithstanding any matters listed above, the Customer (including any appointed designers/contractors, etc.) is entirely responsible for the design and construction of the Self-Lay Works. Acceptance of the Design Submission by Irish Water will not, in any way, render Irish Water liable for any elements of the design and/or construction of the Self-Lay Works.