

Portobello Park Harbour

Surface Water Management Plan

220075-X-91-Z00-XXX-RP-DBFL-CE-0001

INFRASTRUCTURE



April 2024



DBFL CONSULTING ENGINEERS



Project Title:	Portobello Park Harbour		
Document Title:	Surface Water Management Plan		
File Ref:	220075-X-91-Z00-XXX-RP-DBFL-CE-0001		
Status:	P3 - Planning	Rev:	3
	S - Issued		

Rev.	Date	Description	Prepared	Reviewed	Approved
1	10/10/23	Draft Issue	Andrew Ryan		
2	15/12/23	Draft Issue	Andrew Ryan		
3	08/04/24	Planning Issue	Andrew Ryan		

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1 Introduction

1.1 Background

DBFL were commissioned by Dublin City Council to undertake a Surface Water Management Plan in support of a Part 8 Planning application for the improvement and greening works to the open space adjacent to Richmond Row in Portobello, along the northern side of the Grand Canal, Saint Kevin's, Co. Dublin. Currently the site consists of a hard standing impermeable plaza with bidirectional cycle lanes and one way street (Richmond Row), as well as a Dublin Bikes station, which will be relocated. A new hotel is also being constructed on the western edge of the site.

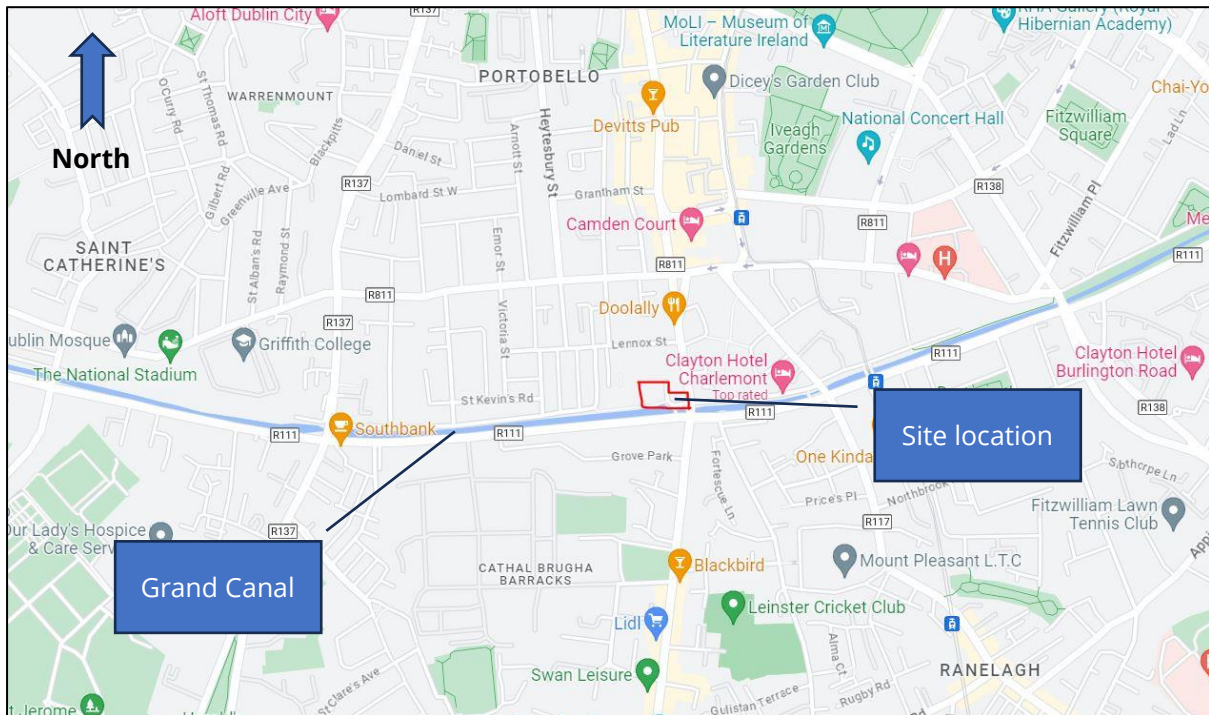


Figure 1 Site Location

1.2 Location and Topography

1.2.1 Location

The subject site is located in Portobello, Dublin City, to the north side of the Grand Canal, directly adjacent to Richmond Row.

The site has a new hotel to the west, bidirectional cycle lanes and a one way street (Richmond Row) to the east, Grand Canal to the south and Portobello House also to the east.

The site falls within the Dublin City Council Development Plan 2022-2028 and is zoned Z9 Amenity / Open Space Lands / Green Network. It is also within a conservation area.



Figure 2 Extract from Dublin City Council Development Plan (2022-2028) land use zoning map

1.2.2 Topography

A topographical survey was undertaken by Murphy Geospatial in September 2021. The site is generally flat with a very shallow gradient north towards Lennox Street.

1.3 Description of Development

Dublin City Council intend to apply via the Part 8 Application process for the development of a Park and Amenity Space within the area outlined above.

The park includes an enlarged 0.25 hectare public open space that will serve as multi-functional and multi-generational. It include an open lawn area, benches, soft landscaping, trees, planting,, be cycle and pedestrian friendly along with an area to accommodate skateboarders. The lawn and soft landscaping elements will serve to accommodate surface water runoff using nature based solutions such as rain gardens and infiltration areas.



Figure 3 Proposed plan

2 Surface Water Management Plan

2.1 Existing Surface Water Arrangement

The existing site is an impermeable plaza with bidirectional cycle lanes and one-way street which is served by a traditional gully drainage system. The gullies outfall to a 300mm diameter vitrified clay gravity combined sewer running north along Richmond Row where it connects to a 600mm concrete combined sewer at Lennox Street. It is assumed that the final outfall for this catchment is Ringsend Wastewater Treatment Plant.

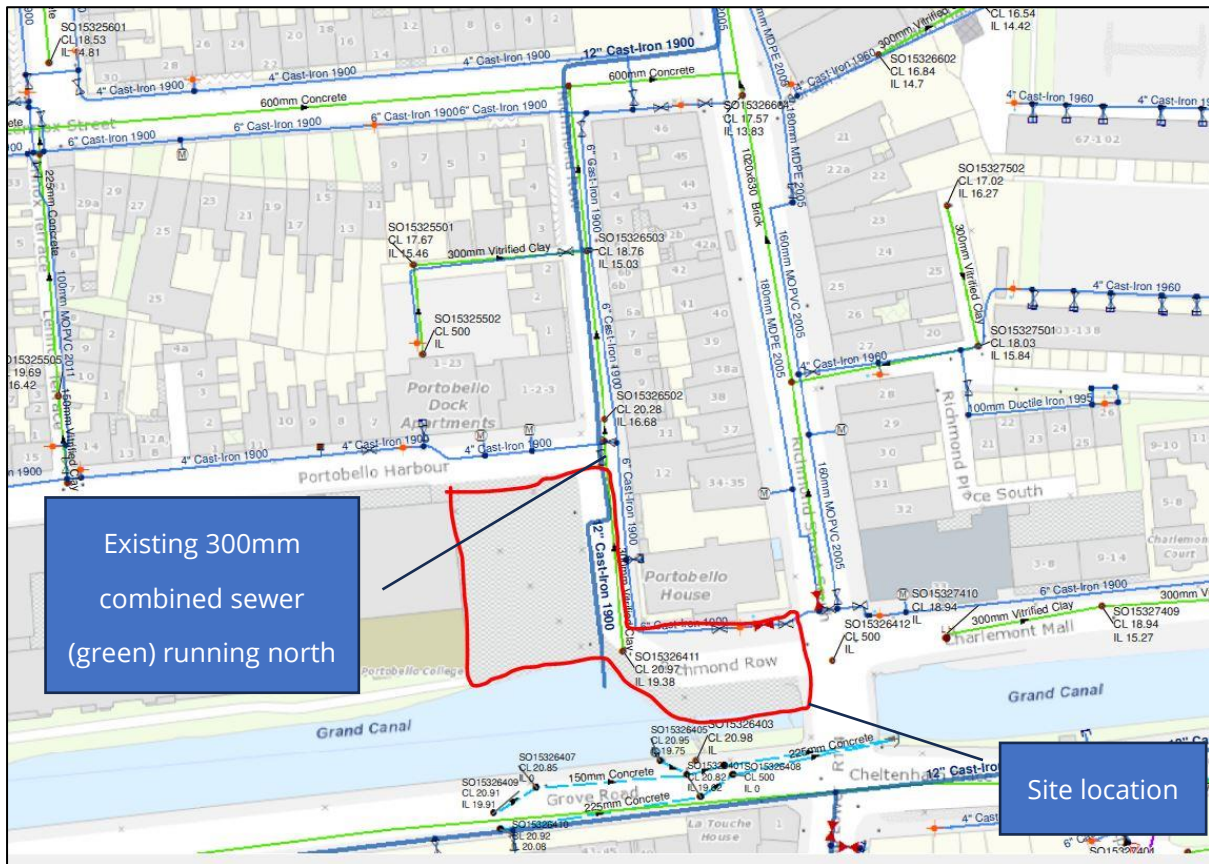


Figure 4 Existing Surface Water Arrangement



2.2 Surface Water Management Plan

The management of surface water for the proposed park has been designed to comply with the policies and guidelines in the Greater Dublin Strategic Drainage Study (GDSDS) and with the requirements of Dublin City Council's Sustainable Drainage Design and Evaluation Guide (2021).

The Dublin City Council Development Plan 2022 – 2028 that was adopted in November 2022 and came into effect in December 2022 includes a section on Green Infrastructure and Recreation (Chapter 10). This chapter outlines DCC's strategic approach to achieve a healthy, green, connected city. DBFL have worked closely with AIT Urbanism + Landscape, Landscape Architects in coordinating the civil and landscape strategy for the proposed plaza to adhere to the Strategic Themes mentioned in this document. The strategic themes are as follows:

- Create a climate resilient city by deploying urban greening / nature based solutions – the development proposes to incorporate rain gardens, tree pits and filter strips to filter and attenuate surface water runoff prior to entering the existing drainage system. These NBS solutions will greatly reduce the amount and speed of discharge into the existing system and filter any harmful hydrocarbons and particulates. The existing traditional gully catchment system will be removed, sealed at both ends and grouted up. The only use of a traditional gully will be from the existing open channel drain outside of Portobello House. This channel will be renewed with existing levels maintained.
- Provide a network of multifunctional green spaces / urban green spaces – the existing area consists entirely of hard landscaping while the proposed park includes large areas of lawn, wildflower planting, trees, rain gardens and benches.
- Provide opportunities for people to get active and lead healthier lifestyles – area encourages the public to use the space by creating an attractive public space for use by pedestrians, cyclists and skateboarders, using trees, green areas, benches, skate friendly infrastructure and wide boulevards for cyclists.
- Create and reinforce a climate resilient and robust Urban Forest – surface water strategy includes for proposed gradients and levels that encourage surface water runoff into the NBS elements that will self-water trees and plants placed in the proposed environment.

Finally, regards interception, the GDSDS recommends that no run-off should pass directly to a river for rainfall depths of 5mm. As mentioned above, the proposed levels and gradients ensure that surface water will flow to the proposed SUDS and NBS infrastructure before discharging to

existing drainage system. Also prior to discharging the outfall will be controlled via an orifice in the outfall manhole. This orifice will limit the discharge to 2l/s from the site.

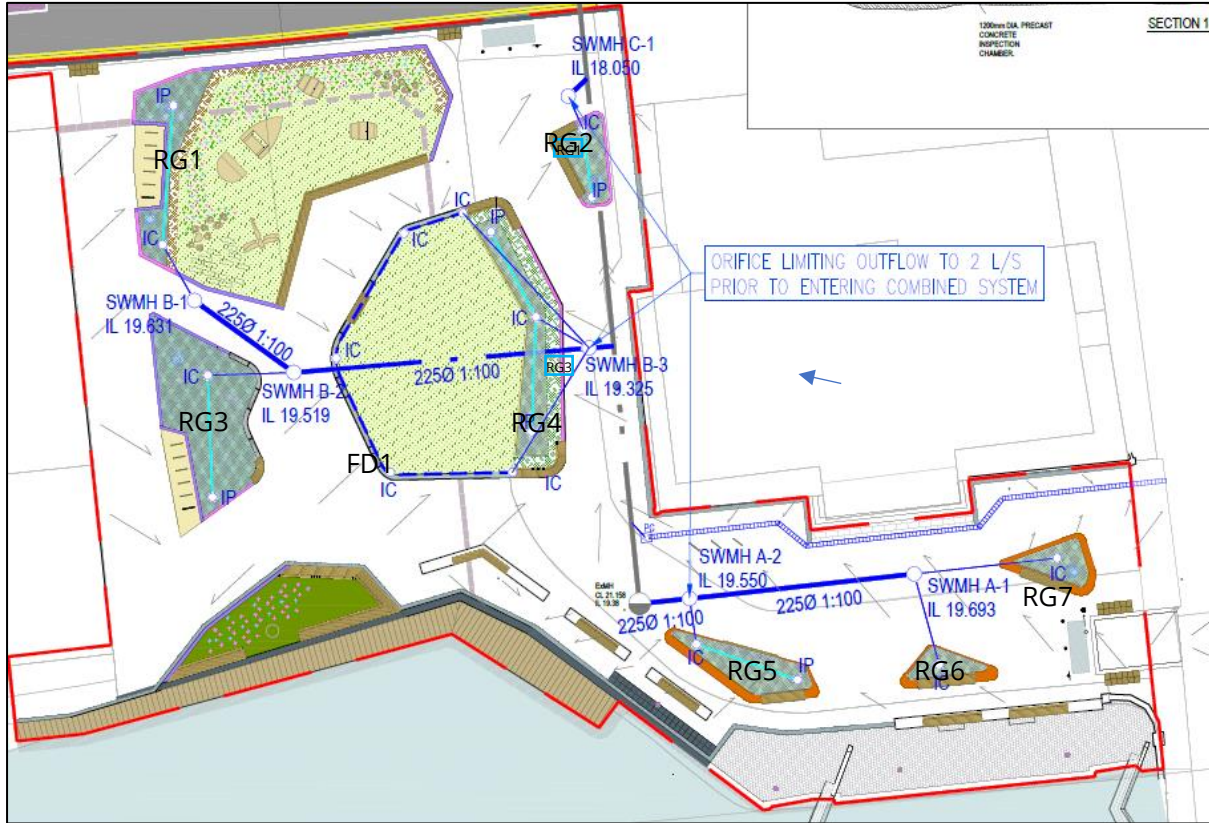


Figure 5 Proposed SUDS features layout (extract from DBFL Drainage Layout drawing X-91-Z00-XXX-DR-DBFL-CE-1001)

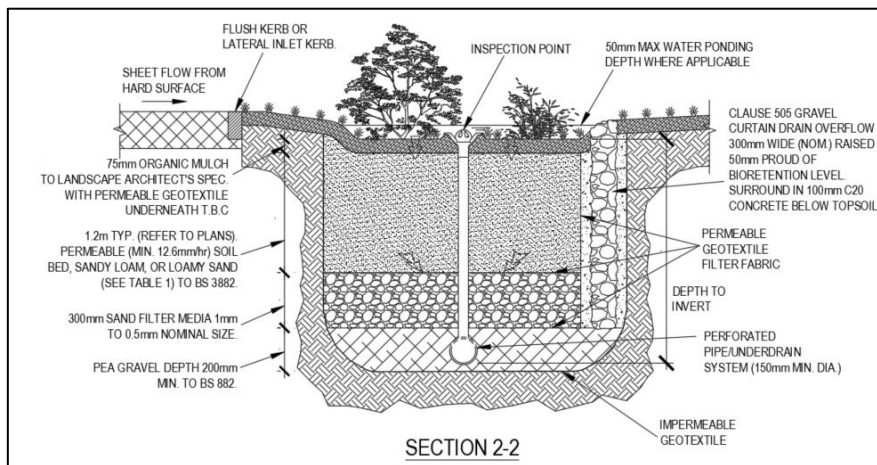


Figure 6 Typical Rain Garden Depths

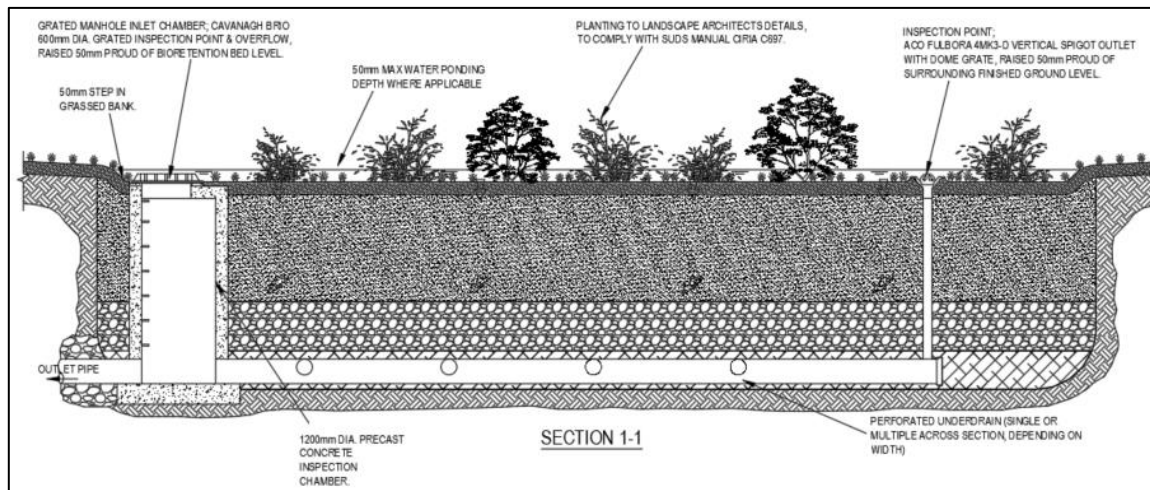


Figure 7 Typical Rain Garden section details

2.2.1 Interception Storage

To prevent pollutants or sediments discharging into water courses the GDSDS requires “interception storage” to be incorporated into proposed works. The volume of interception required is based on 5mm rainfall depth for 80% of runoff from impermeable areas as defined in the GDSDS. Refer to table 2 below for details of interception required and interception provided.

The interception volume attributable to each SUDs feature consists of the volume of water that can infiltrate to the ground, what will evaporate into the atmosphere and what can transpire through plants and vegetation. Additionally, there will be some losses of water due to absorption and wetting of stone and soil media.

Also to note, any exceptional rainfall will be attenuated on-site within these raingardens and filter drain by installing an orifice at each outfall manhole limiting discharge to 2l/s.

<u>Rain Gardens (area / volume)</u>	<u>Filter Drain (length)</u>
RG1 - 24m ² / 12m ³	FD1 - 32m
RG2 - 13m ² / 6.5m ³	
RG3 - 58m ² / 29m ³	
RG4 - 26m ² / 13m ³	
RG5 - 18m ² / 9m ³	
RG6 - 7m ² / 3.5m ³	
RG7 - 9m ² / 4.5m ³	

Table 1 Sizes of SUDs elements



Site Summary		
Impermeable Area (m ²)		1600m ²
Interception Requirements		
Interception Storage Required (m ³) (5mm of 80% Impermeable Area)		6.4m ³
Interception Provided		
Rain Gardens (155m ²)	Interception provided in rain gardens is assumed to take the area provided by a depth of 500mm as per Figure 6 above.	77.5m ³
Filter drain (32m)		6.4m ³
Total Interception Provided		83.9m³

Table 2 Surface Water interception Storage

2.2.2 Treatment Volume

The GSDSDS requires that a “treatment volume” (V_t) be provided to prevent any pollutants or sediments entering river systems. Additionally, a “treatment train” stormwater runoff management system is required. According to CIRIA document C697 the following treatment train approach is necessary:

- Surface Water Runoff from other Paved Areas excluding Roads – 1 Treatment Stage

The treatment volume is based on treatment of 15mm of rainfall depth from 80% of the runoff from impermeable areas as defined in GSDSDS. Treatment volumes are summarised in Table 3 below:

Impermeable Area (m²)	1600m ²
Treatment Volume Required (m³) (15mm of 80% Impermeable Area)	19.2m ³

Table 3 Treatment Volume Requirements

2.2.3 Flood Risk

Refer to the “Site Specific Flood Risk Assessment” (SSFRA by DBFL Consulting Engineers, which is included as a separate report within the planning application.



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