Portobello Park Harbour

Site Specific Flood Risk Assessment

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INFRASTRUCTURE

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DBFL CONSULTING ENGINEERS

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1	13/10/23	Draft Issue	Andrew Ryan		
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Contents

Figures

Tables

1 Introduction

1.1 Background

DBFL were commissioned by Dublin City Council to undertake a Site Specific Flood Risk Assessment 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.

1.2 Objectives

The objectives of this report are to inform the planning authority in relation to flood risk associated with the proposed works outlined above.

The report will assess the site in accordance with the requirement of "The Planning System and Flood Risk Management Guidelines for Planning Authorities" and it Technical Appendices (Office of Public Works, November 2009).

The report will provide the following;

- The site's flood zone category
- Information to allow an informed decision of the planning application in the context of flood risk.
- Appropriate flood risk mitigation and management measures for any residual flood risk

1.3 Flood Risk Assessment Scope

This SSFRA relates only to the proposed works and its immediate surroundings.

This report uses information obtained from various sources, together with an assessment of flood risk for the existing area and proposed works.

The report follows the requirements of "The Planning System and Flood Risk Management Guidelines for Planning Authorities", (referred to as the *Guidelines* for the remainder of this report).

1.4 Approach

Section 2.0 of this report considers "The Planning System and Flood Risk Management Guidelines for Planning Authorities" as they relate to the subject site.

Flood risk identification is presented in Section 3.0 and initial flood risk assessment in Section 4.0. A more detailed assessment of specific flood risk and residual risk relating to the proposed works is presented in Section 5.0.

Conclusions and recommendations are presented in Section 6.0.

1.5 Subject Site

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.

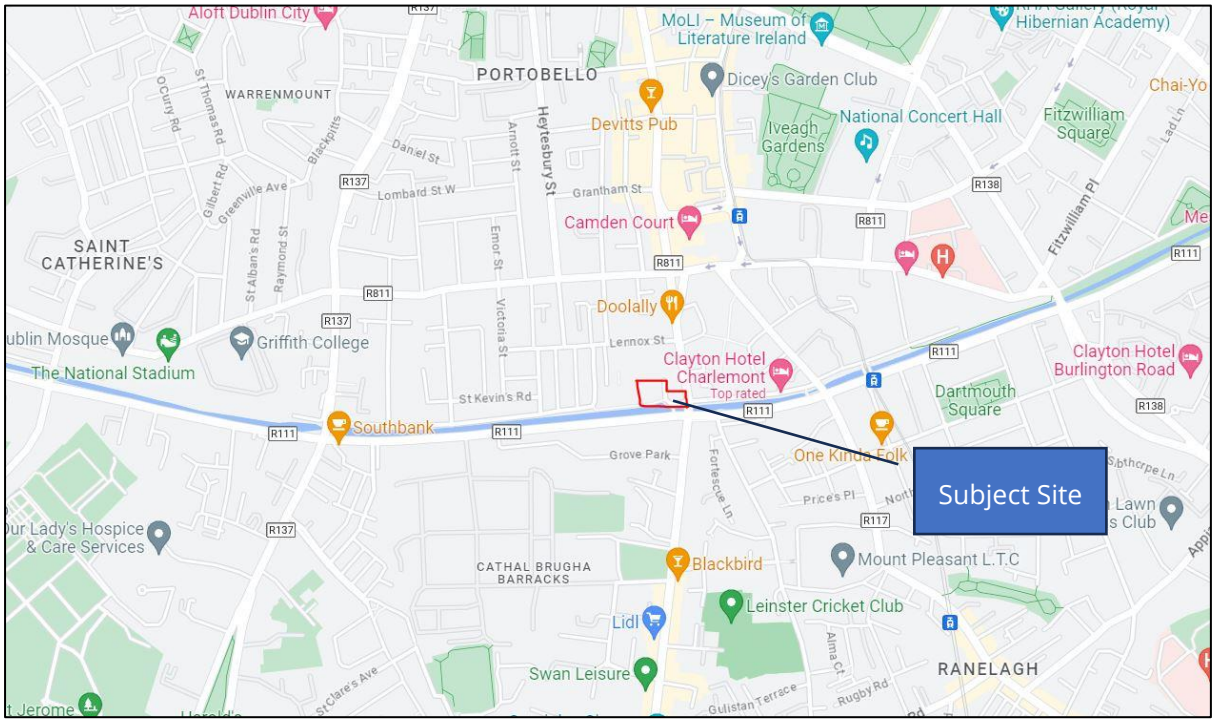


Figure 1 Site Location Plan

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.

2 Planning System & Flood Risk Management Guidelines

2.1 General

"*The Planning System and Flood Risk Management Guidelines for Planning Authorities*" and its Technical Appendices outline the requirements for a Site-Specific Flood Risk Assessment.

Table 3.1 of the Guidelines classifies dwelling houses as "highly vulnerable development".

Table 3.2 of the Guidelines indicates that this type of developments are required to be in Flood Zone C i.e. where probability of flooding from rivers is low (less than 0.1% AEP (Annual Exceedance Probability)). A Justification Test is required for the development management to locate a "highly vulnerable development" in Flood Zone A or Flood Zone B.

2.2 Sequential Approach

This site-specific flood risk assessment (SSFRA) will initially use existing flood risk information to determine the flood zone category of the Site i.e. to determine whether the development is considered appropriate or whether a justification test is required, see Figure 2.1 below for details.

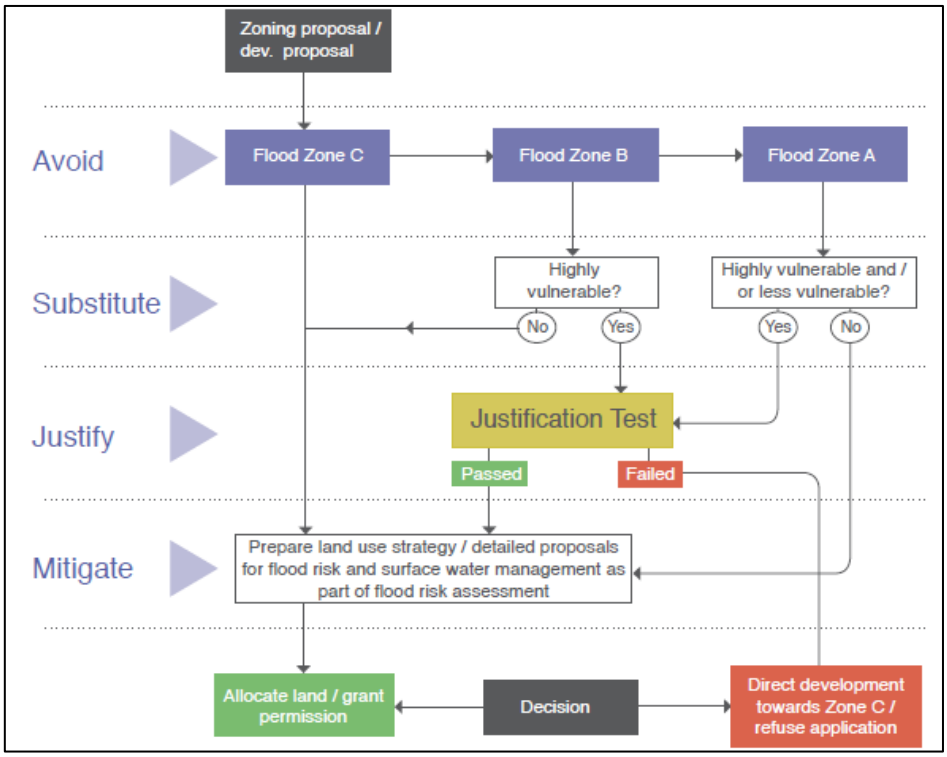


Figure 2 Sequential Approach mechanism in the Planning Process (Figure 3.2 of The Planning System and Flood Risk Management Guidelines)

2.3 Flood Risk Assessment Stages

Flood risk is normally assessed by a flood risk identification (Stage 1) stage followed by an initial flood risk assessment (Stage 2). A more detailed flood risk assessment (Stage 3) then follows which includes an assessment of surface water management, flood risk and mitigation measures to be applied.

The following report sections outline the flood risk assessment stages for the proposed development which follow the requirements of the Guidelines' Technical Appendices.

3 Stage 1 – Flood Risk Identification

3.1 General

The initial flood risk identification stage uses existing information to identify and confirm whether there may be flooding or surface water management issues for the lands that may require further investigation.

3.2 Information Sources Consulted

Information sources consulted for the identification exercise are outlined in table 3.1 below.

Information Source	Comments
Predictive and historic flood maps, and Benefiting Lands Maps, such as those at http://www.floodmaps.ie	Information obtained (and reviewed) from *www.floodmaps.ie* (OPW website).
Expert advice from OPW who may be able to provide reports containing the results of detailed modelling and flood-mapping studies, including critical drainage areas, and information on historic flood events, including flooding from all sources;	Information obtained (and reviewed) from *www.floodmaps.ie* (OPW website).
Predictive fluvial flood maps;	CFRA flood extents map consulted.
Previous Strategic Flood Risk Assessments;	Eastern CFRAM Study consulted.
Topographical maps, in particular digital elevation models produced by aerial survey or ground survey techniques;	OSI Maps consulted & Site topographic survey undertaken.
Information on flood defence condition and performance;	No flood defence information available.
Maps of the Geological Survey of Ireland (which would allow the potential for the implementation of source control and infiltration techniques, groundwater and overland flood risk to be assessed). These maps, while not providing full coverage, can indicate areas that have flooded in the past (the source of the alluvium) and may be particularly useful at the early stages of the FRA process where no other information is available;	GSI maps consulted.
National, regional & local spatial plans, such as the National Spatial Strategy, regional planning guidelines, development plans & local area plans provide key information on existing and potential future receptors.	Dublin City Council Development Plan Strategic Flood Risk Assessment (2022 - 2028) consulted.

Table 1 Information sources consulted

3.2.1 OPW Predictive, Historic & Benefiting Lands Maps & Flood Hazard Information

OPW's Summary Local Area Report is included in Appendix A. This report has been obtained from the OPW website (www.floodmaps.ie) and summarises all flood events within 2.5km of the subject site.

The report identifies 38 previous flood events within 2.5km of the proposed site, however none of these events caused flooding within the subject site.

3.2.2 Previous Strategic Flood Risk Assessments & Predictive Flood Maps

As part of the EU Floods Directive, the OPW is undertaking a Catchment Flood Risk Assessment and Management (CFRAM) Study. An initial part of this Study was a national Preliminary Flood Risk Assessment (PFRA) to identify areas at risk of significant flooding.

The PFRA report and maps are available at www.cfram.ie and identify areas deemed to be at risk of flooding (referred to as Areas for Further Assessment, or 'AFAs'), as they require more detailed assessment on the extent and degree of flood risk by the later CFRAM Studies. The Eastern Catchment Flood Risk Assessment and Management (CFRAM) study provides further assessment of areas identified in the PFRA for further investigation.

The Strategic Flood Risk Assessment for the Dublin City Development Plan 2022 - 2028 was examined as part of this flood risk assessment. The flood maps developed by Jacobs for this flood risk assessment indicate that the subject site is in Flood Zone C and is therefore not affected by fluvial flooding.

3.2.3 Tidal Flood Maps

As per the OPW mapping, the site is not affected by coastal flooding.

3.2.4 Other Sources

Other information sources were consulted to determine if there was any additional flood risk to the subject site, these included;

- Topographical surveys of the area – no evidence based on topography.
- Flood defences Information – no flood defence information available.
- Soil data from EPA and GSI – subsoils identified as dark limestone and shale.
- Groundwater information from GSI – no karst features or gravels identified in the site. Groundwater vulnerability of the site is a mix of low, medium and high throughout the site. The bedrock aquifer is noted as being locally moderately productive.

- Walkover survey – No evidence of flooding within the development lands.
- Development Plan & Local Area plan – lands are zoned for Amenity / Open Space Lands / Green Network.
- Existing Local Authority Drainage Records - Existing service records received from Irish water indicate that there is an existing combined drainage sewer located within the proposed site.
- Local Information & Local Authority Consultation – no evidence of flood risk to lands.
- Historic Maps – no evidence of flooding or marsh areas within the Site.

This Site-Specific Flood Risk Assessment concludes that the proposed works is appropriate for the site's flood zone category (Category C) for amenity / open space. From a review of the 'other sources' above there does not appear to be evidence of flood risk to the site.

3.2.5 Source-Pathway-Receptor Model

A Source-Pathway-Receptor model was produced to summarise the possible sources of floodwater, the people and assets (receptors) that could be affected by potential flooding (with specific reference to the proposals) and the pathways by which flood water for a 0.1%AEP (Annual Exceedance Probability) and 1%AEP storms could reach the receptors, see table 3.2. It provides the probability and magnitude of the sources, the performance and response of pathways and the consequences to the receptors in the context of the LAP development proposals. These sources, pathways and receptors will be assessed further by the initial flood risk assessment stage.

Source	Pathway	Receptor	Likelihood	Consequence	Risk
Tidal	Tidal flooding from coast, 4km away	Entire Site	Remote	Low	Low
Fluvial	From Grand Canal and River Liffey	Entire Site	Remote	Low	Low
Surface Water Drainage (Pluvial)	Flooding from existing drainage systems surcharging	Entire Site	High	Low	Moderate
Groundwater flooding	Rising GWL on the site	Entire Site	Remote	Low	Low
Human or Mechanical Error (Pluvial)	Flooding from existing drainage systems surcharging	Entire Site	Possible	Low	Moderate

Table 2 Source-Pathway-Receptor analysis

4 Stage 2 – Initial Flood Risk Assessment Stage

Flood risks identified during Stage 1 – Flood Risk Identification, are outlined in Table 2 (Source Pathway Receptor Analysis) and noted below. These risks are assessed further in this section of the SSFRA.

- A possible risk of pluvial flood from existing drainage system.
- Pluvial flood risk following works.

The information sources identified in Section 3.2 are considered adequate for the purpose of an Initial Flood Risk Assessment for the site and no further technical studies are proposed.

4.1 Initial Fluvial Flood Risk Assessment

The Strategic Flood Risk Assessment for the Dublin City Development Plan 2022-2028 indicates that the subject site is located within Flood Zone C i.e., is outside the 0.1%AEP (Annual Exceedance Probability). Therefore, the proposed works is appropriate for the subject site.

4.2 Initial Pluvial Flood Risk Assessment

The Source-Pathway-Receptor model identified that there could be potential for pluvial flood risk within the site related to existing drainage networks serving the surrounding environs. These have potential to cause local flooding.

The Source-Pathway-Receptor model also identified that the proper operation and maintenance of the existing drainage system is necessary to reduce the risk of human or mechanical error causing pluvial flood risk from blockages etc.

4.3 Flood Zone Category

Following assessment of the flood risks to the site and available flood data the entirety of the site is within Flood Zone Category C as defined by the Guidelines. The amenity open space type of development proposed is therefore appropriate for this flood zone category. The Guidelines Sequential Approach is therefore met and the 'Avoid' principal achieved.

5 Stage 3 – Detailed Flood Risk Assessment Stage

5.1 General

Since the type of development proposed is appropriate for the Flood zone category C of the site, the detailed flood risk assessment stage will only consider pluvial flood risk in relation to the following;

- Proposed Surface Water Management measures.
- Flood Exceedance.
- Impact of proposals on flood risk to adjacent areas.
- Effects of climate change.
- Sustainable Urban Structure.
- Residual risks.
- Effectiveness of any flood mitigation measures.

5.2 Surface Water Management

The proposed storm-water proposals and drainage design for the development is a Sustainable Urban Drainage System design using rain gardens, tree pits and filter drains to treat and attenuate surface water runoff before discharging to the existing combined sewer. A Surface Water Management Plan has also been produced as part of the planning application.

The proposed works will decrease the impermeable area and run-off volumes when compared with the existing 100% impermeable plaza. The new drainage system has the following features;

- Discharged flows are reduced from existing (by approx. 25%) and are in accordance with the requirements of the GDSDS and Dublin City Council's Sustainable Drainage Design and Evaluation Guide (2021).
- Attenuation storage is provided in the rain gardens and filter drain by means of an orifice installed at each outfall manhole; in accordance with the GDSDS and Dublin City Council's Sustainable Drainage Design and Evaluation Guide (2021).

5.3 Flood Exceedance

In the case of flood exceedance the proposed park falls under the category of a water-compatible development. Any pluvial flood exceedance will not adversely affect the park. Additionally the

proposed gradients and levels have created low spots (rain gardens) which will only serve to improve the existing situation and protect more vulnerable development directly adjacent the park. Overland flow routes are highlighted on DBFL drainage drawing X-91-Z00-XXX-DR-DBFL-CE-1001, included within the planning application.

5.4 Impact on Adjacent Areas

The existing drainage system is a traditional gully system out falling to an existing combined sewer under the ownership of Uisce Eireann. The existing pluvial flooding is assumed to occur due to blockages and surcharging of the existing sewer. The proposed development proposes to remove this traditional gully system in favour of a more sustainable approach using rain gardens, tree pits, permeable ground and filter drains. These nature based solutions will soak up and attenuate the majority of the surface water before slowly allowing it to out fall to the combined sewer. Maintenance of SuDS features will also be carried out in accordance with the recommendations of "The SuDS Manual" (CIRIA - 2015). As highlighted above in section 5.3, adjacent areas will not be impacted by the proposed park.

5.5 Sustainable Urban Structure

The park has been designed in accordance with the GDSDS and Dublin City Council's Sustainable Drainage Design and Evaluation Guide (2021).

5.5.1 Access and Egress during flood events

The proposed park and its essential infrastructure is in flood zone C. Based on relevant fluvial flood levels from PFRA, it is anticipated that for a 0.1% AEP flood event the development can be safely accessed and exited through the proposed emergency vehicular entrances.

5.6 Residual Risks

Remaining residual flood risks, following the detailed assessment include the following;

- Pluvial flooding from the existing drainage system related to a pipe blockage or from flood exceedance.
- Pluvial flooding from the existing drainage system for storms in excess of the design capacity.

5.7 Mitigation Measures

Proposed mitigation measures to address residual flood risks are summarised below;

M1. Proposed drainage system to be maintained on a regular basis to reduce the risk of a blockage.

5.7.1 Effectiveness of Mitigation Measures

It is considered that the flood risk mitigation measures if implemented are sufficient to provide a suitable level of protection to the proposed park. The NBS approach highlighted in section 5.4 above provide adequate protection from pluvial flood risk. Existing pluvial flooding is assumed to occur due to the traditional drainage system currently in place.

Should extreme pluvial flooding occur that is in excess of the park's drainage capacity i.e. probability less than 0.1%AEP, then overland flood routes to the each NBS feature low spot and canal will protect the adjacent development.

6 Conclusions

The Site-Specific Flood Risk Assessment for the proposed park at Portobello was undertaken in accordance with the requirements of the Planning System and Flood Risk Management Guidelines for Planning Authorities", November 2009.

Following the flood risk assessment stages, it was determined that the site is within Flood Zone C as defined by the Guidelines.

It is concluded that the;

- Park proposed is appropriate for the Site's flood zone category.
- Planning System and Flood Risk Management Guidelines Sequential Approach is met and the 'Avoid' principal achieved.

The park was concluded as having a good level of flood protection up to the 100-year return event. For pluvial floods exceeding the 100-year capacity of the drainage system then proposed flood routing mitigation measures are recommended.

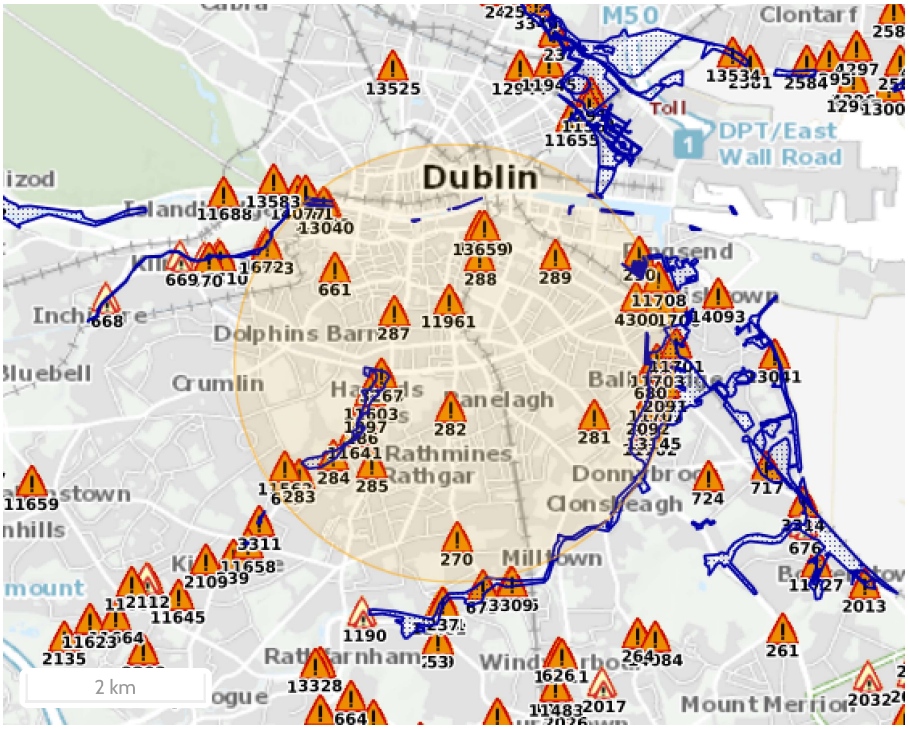
Appendix A : OPW Flood hazard Website Report

Past Flood Event Local Area Summary Report

Report Produced: **10/10/2023 17:10**

This Past Flood Event Summary Report summarises all past flood events within 2.5 kilometres of the map centre.

This report has been downloaded from www.floodinfo.ie (the "**Website**"). The users should take account of the restrictions and limitations relating to the content and use of the Website that are explained in the Terms and Conditions. It is a condition of use of the Website that you agree to be bound by the disclaimer and other terms and conditions set out on the Website and to the privacy policy on the Website.



Map Legend

- Single Flood Event
- Recurring Flood Event
- Past Flood Event Extents
- Drainage Districts Benefited Lands*
- Land Commission Benefited Lands*
- Arterial Drainage Schemes Benefited Lands*

* Important: These maps do not indicate flood hazard or flood extent. Their purpose and scope is explained on Floodinfo.ie

38 Results

	Name (Flood_ID)	Start Date	Event Location
1.	Flooding at Dublin City on 30/07/2019 (ID-13659)	30/07/2019	Approximate Point
	Additional Information: Reports (0) Press Archive (0)		
2.	Poddle Limekiln Lane Sept 1931 (ID-3267)	02/09/1931	Approximate Point
	Additional Information: Reports (1) Press Archive (0)		
3.	Flooding at Trinity College, Dublin 2, 26th July 2013 (ID-11960)	25/07/2013	Approximate Point
	Additional Information: Reports (1) Press Archive (0)		
4.	Flooding on Wexford St, Dublin 2 on 26th July 2013 (ID-11961)	25/07/2013	Approximate Point
	Additional Information: Reports (1) Press Archive (0)		
5.	Dodder Oct 1987 (ID-680)	20/10/1987	Approximate Point
	Additional Information: Reports (3) Press Archive (0)		
6.	Poddle August 1986 (ID-32)	24/08/1986	Area
	Additional Information: Reports (9) Press Archive (1)		

	Name (Flood_ID)	Start Date	Event Location
7.	Dodder August 1986 (ID-1) Additional Information: Reports (21) Press Archive (18)	25/08/1986	Area
8.	Poddle St Claires Ave Sept 1931 (ID-1997) Additional Information: Reports (1) Press Archive (0)	02/09/1931	Approximate Point
9.	Poddle Limekiln Lane Aug 1905 (ID-1998) Additional Information: Reports (1) Press Archive (0)	24/08/1905	Approximate Point
10.	Dodder Ballsbridge Sept 1931 (ID-2091) Additional Information: Reports (8) Press Archive (7)	02/09/1931	Approximate Point
11.	Dodder Anglesea Road Dec 1958 (ID-2092) Additional Information: Reports (7) Press Archive (0)	18/12/1958	Approximate Point
12.	Bath Avenue June 1963 (ID-4300) Additional Information: Reports (4) Press Archive (0)	10/06/1963	Exact Point
13.	Flooding at Dublin City on 06/01/2014 (ID-13040) Additional Information: Reports (0) Press Archive (0)	06/01/2014	Approximate Point
14.	Rathgar June 1963 (ID-270) Additional Information: Reports (4) Press Archive (2)	10/06/1963	Exact Point
15.	Dodder Donnybrook June 1963 (ID-281) Additional Information: Reports (4) Press Archive (3)	10/06/1963	Exact Point
16.	Rathmines Lower June 1963 (ID-282) Additional Information: Reports (4) Press Archive (2)	10/06/1963	Exact Point
17.	Kimmage June 1963 (ID-283) Additional Information: Reports (4) Press Archive (2)	10/06/1963	Exact Point
18.	Kimmage Mount Argus June 1963 (ID-284) Additional Information: Reports (4) Press Archive (2)	10/06/1963	Exact Point
19.	Harold's Cross June 1963 (ID-285) Additional Information: Reports (4) Press Archive (2)	10/06/1963	Exact Point
20.	Mount Jerome Harold's Cross June 1963 (ID-286) Additional Information: Reports (4) Press Archive (2)	10/06/1963	Exact Point
21.	Clanbrassil Street June 1963 (ID-287) Additional Information: Reports (4) Press Archive (2)	10/06/1963	Exact Point
22.	Grafton Street June 1963 (ID-288) Additional Information: Reports (4) Press Archive (2)	10/06/1963	Exact Point
23.	Fenian Street June 1963 (ID-289) Additional Information: Reports (4) Press Archive (2)	10/06/1963	Exact Point
24.	Ringsend June 1963 (ID-290) Additional Information: Reports (4) Press Archive (2)	10/06/1963	Exact Point
25.	Poddle Tributary Marrowbone Lane Jan 1941 (ID-661)	20/01/1941	Approximate Point

	Name (Flood_ID)	Start Date	Event Location
	Additional Information: Reports (1) Press Archive (0)		
26.	Poddle Harold's Cross undated 1940's (ID-662)	n/a	Exact Point
	Additional Information: Reports (1) Press Archive (0)		
27.	Poddle Larkfield Mills Undated 1940s (ID-663)	n/a	Approximate Point
	Additional Information: Reports (1) Press Archive (0)		
28.	Flooding at Ballsbridge on 14/11/2014 (ID-13145)	14/11/2014	Approximate Point
	Additional Information: Reports (0) Press Archive (0)		
29.	Dublin City Tidal Feb 2002 (ID-456)	01/02/2002	Area
	Additional Information: Reports (45) Press Archive (27)		
30.	Flooding at Blarney Park, Crumlin, Dublin 12 on 24th Oct 2011 (ID-11562)	23/10/2011	Approximate Point
	Additional Information: Reports (1) Press Archive (0)		
31.	Flooding at Harold's Cross, Dublin City on 24th Oct 2011 (ID-11603)	23/10/2011	Approximate Point
	Additional Information: Reports (1) Press Archive (0)		
32.	Flooding at Mount Argus Road and Kimmage Road Lower on 24th Oct 2011 (ID-11641)	23/10/2011	Exact Point
	Additional Information: Reports (1) Press Archive (0)		
33.	Flooding at Anglesea Road, Ballsbridge, Dublin 4 on 24th Oct 2011 (ID-11702)	23/10/2011	Exact Point
	Additional Information: Reports (1) Press Archive (0)		
34.	Flooding at Herbert Cottages, Ballsbridge, Dublin 4 on 24th Oct 2011 (ID-11703)	23/10/2011	Exact Point
	Additional Information: Reports (1) Press Archive (0)		
35.	Flooding at RDS, Ballsbridge, Dublin 4 on 24th Oct 2011 (ID-11707)	23/10/2011	Exact Point
	Additional Information: Reports (1) Press Archive (0)		
36.	Flooding at Havelock Square, Sandymount, Dublin 4 on 24th Oct 2011 (ID-11725)	23/10/2011	Exact Point
	Additional Information: Reports (1) Press Archive (0)		
37.	Dodder Anglesea Road Nov 1965 (ID-238)	17/11/1965	Approximate Point
	Additional Information: Reports (11) Press Archive (10)		
38.	Flooding at Dublin City on 03/02/2014 (ID-13093)	03/02/2014	Approximate Point
	Additional Information: Reports (0) Press Archive (0)		

DBFL CONSULTING ENGINEERS

Registered Office
Ormond House
Upper Ormond Quay
Dublin 7 Ireland D07 W704

+ 353 1 400 4000
info@dbfl.ie
www.dbfl.ie

Cork Office
14 South Mall
Cork T12 CT91

+ 353 21 202 4538
info@dbfl.ie
www.dbfl.ie

Waterford Office
Suite 8b The Atrium
Maritana Gate, Canada St
Waterford X91 W028

+ 353 51 309 500
info@dbfl.ie
www.dbfl.ie