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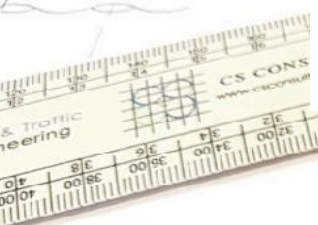
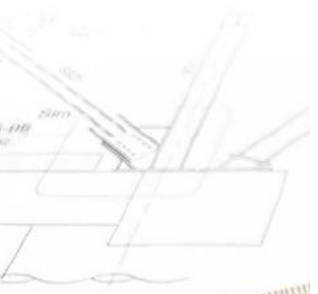
LIMERICK
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DUBLIN

**Site Specific Flood Risk Assessment
Proposed Residential Development
Glover Court, York Street, Dublin 2**

Client: Dublin City Council

Job No. D117

July 2025



SITE SPECIFIC FLOOD RISK ASSESSMENT
PROPOSED RESIDENTIAL DEVELOPMENT,
GLOVER COURT, YORK STREET, DUBLIN 2

CONTENTS

1.0	INTRODUCTION _____	1
2.0	SITE LOCATION AND PROPOSED DEVELOPMENT _____	2
3.0	PROCESS FOR SITE SPECIFIC FLOOD RISK ASSESSMENT _____	5
4.0	LEVEL OF SERVICE _____	7
5.0	FLOOD RISKS AND MITIGATION MEASURES _____	11
6.0	POTENTIAL FOR DEVELOPMENT TO CONTRIBUTE TO OFF-SITE FLOODING _____	17
7.0	CONCLUSION _____	18

Appendix A: Dublin City Council Flood Risk Maps

Appendix B: CFRAMS Flood Risk Mapping

Appendix C: OPW Past Flood Event Local Area Summary Report

Appendix D: Dublin City Fluvial Flood Map

Appendix E: GSI Geology and Hydrogeology Mapping

Appendix F: GDSDS Map

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File Location: Job-D117\B_DOCUMENTS\1.0 Planning\1.0 CIVIL ENGINEERING\Report\SSFRA

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Job Ref.	Author	Reviewed By	Authorised By	Issue Date	Version No.
D117	HY	LJ	OS	02.07.2025	P1

1.0 INTRODUCTION

Cronin & Sutton Consulting Engineers (CS Consulting) have been commissioned by Dublin City Council to prepare a Site-Specific Flood Risk Assessment Report to accompany a planning application for a proposed residential development at Glover Court, York Street, Dublin 2.

In preparing this report, CS Consulting has made reference to the following:

- Dublin City Development Plan 2022-2028
(including Strategic Flood Risk Assessment)
- Greater Dublin Strategic Drainage Study (GDSDS) 2005
- The Planning System and Flood Risk Management:
Guidelines for Planning Authorities 2009 (Flood Risk Management
Guidelines)
- Office of Public Works Flood Maps
- Geological Survey of Ireland Maps

The Site-Specific Flood Risk Assessment is to be read in conjunction with the engineering drawings and documents submitted by CS Consulting and with the various additional information submitted by the other members of the design team, which forms part of the planning submission.

2.0 SITE LOCATION AND PROPOSED DEVELOPMENT

2.1 Site Location

The site of the proposed development is located at Glover court, York Street, Dublin 2, in the operational area of Dublin City Council. The area enclosed by the planning application boundary is approximately 0.3ha.

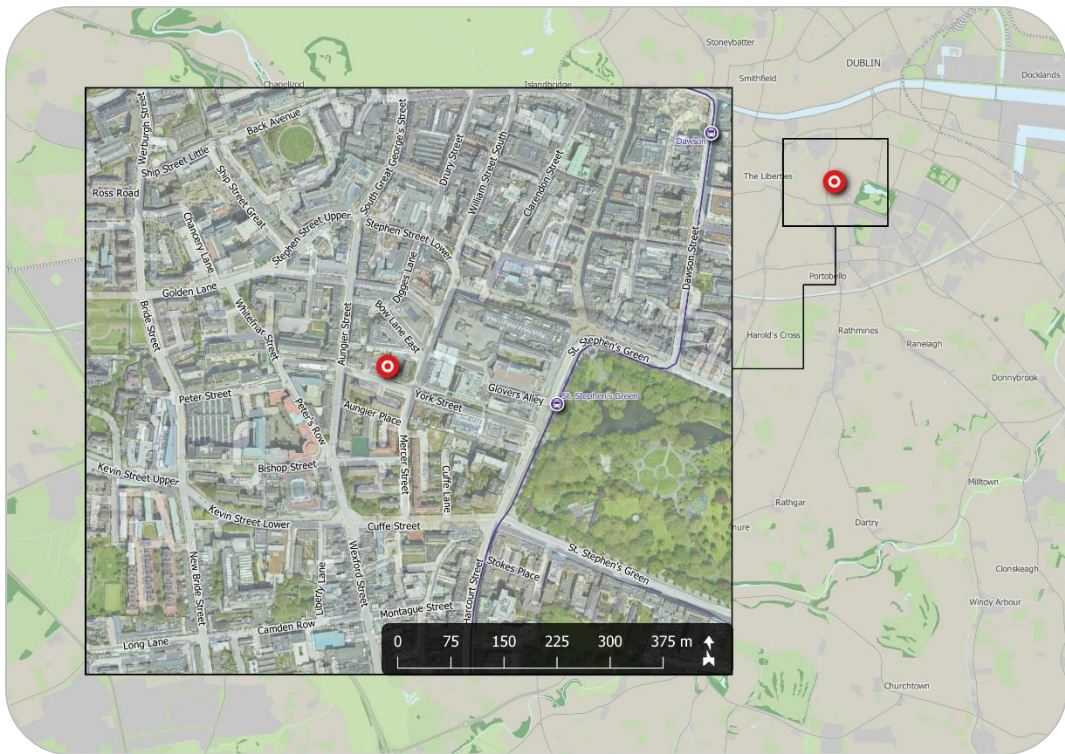


Figure 1 – Location of proposed development site
(map data & imagery: EPA, OSi, OSM Contributors, Google)

The location of the proposed development site is shown in **Figure 1** above; the indicative extents of the development site, as well as relevant elements of the surrounding road network, are shown in more detail in **Figure 2**.

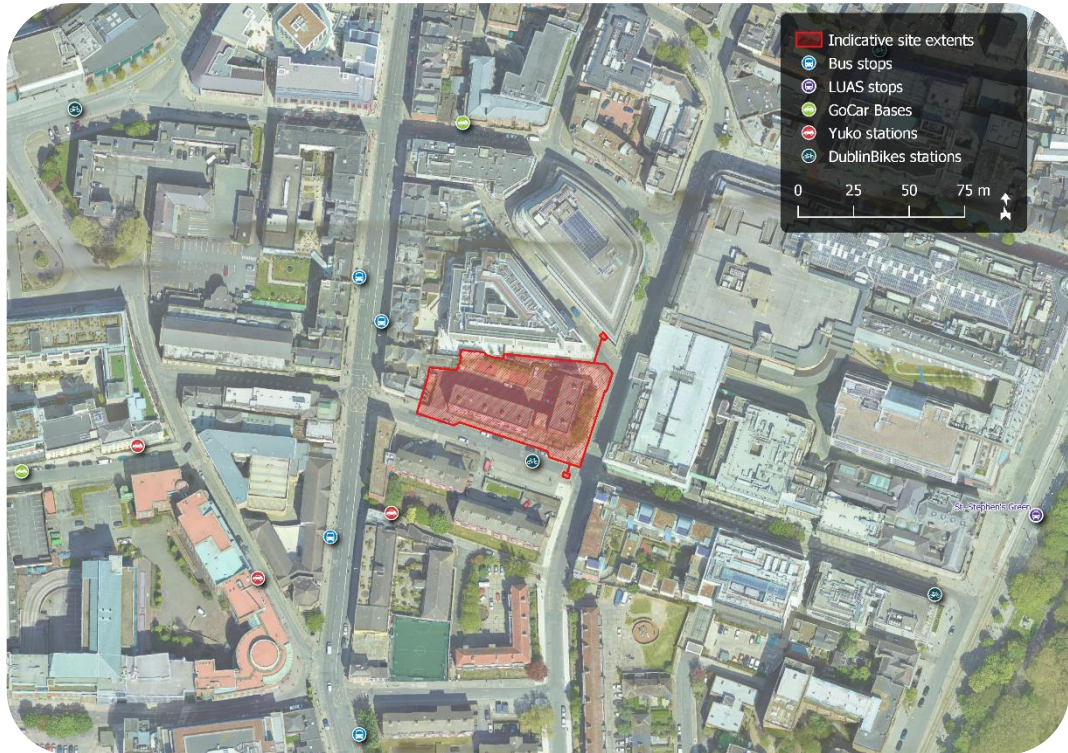
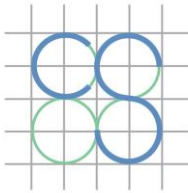


Figure 2 – Indicative site extents and environs
(map data & imagery: NTA, Dublin Bus, GoCar, Yuko, DublinBikes, OSM Contributors, Google)

The development site falls immediately south of Marlin Hotel, and is bound to the east by Mercer Street Lower, to the south by York Street, and to the west by existing commercial buildings.

2.2 Existing Land Use

The subject site currently comprises of existing residential units which shall be refurbished under this planning application. The site currently generates minimal vehicular, cyclist, and pedestrian traffic. The site is currently assessed from York Street.



2.3 Description of Proposed Development

The project comprises of the retrofit and amalgamation of the existing blocks, with the addition of new bays, additional floors, new vertical cores, new access decks and balconies. The proposal is to provide 53 residential units comprising of 15 no. 1 bed apartments, 30 no. 2 bed apartments, 8 no. 3 bed apartments. The York Street block will be extended at both ends and by one additional upper floor. The upper floor on the York Street block will be held back on the new build section of the western boundary to create a stepping down in height in respect of the protected structure context to Aungier Street which includes the Swan Bar. The Mercer Street block will be extended on the corner with York Street and by two additional upper floors. The amalgamated building will comprise of a 5 and 6 storey block to York Street and a 7-storey block to Mercer Street. New stairs and lift cores are to be accommodated within the grid of the existing frame, one in each block. A new external façade is introduced throughout the building with access provided by a new access deck to the internal courtyard and balconies to the street facing facades.

3.0 PROCESS FOR SITE SPECIFIC FLOOD RISK ASSESSMENT

The initial stage of the SSFRA comprises an assessment of available flood risk data in order to identify flood risk indicators in the study area. If the site is identified to be at risk of flooding, the SSFRA will proceed to a detailed assessment.

3.1 Potential Sources of Flood Risk

The study area is subject to the four potential flood risk mechanisms described below.

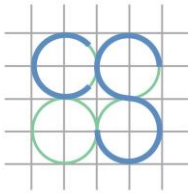
- Fluvial: flooding caused by overtopping of Rivers and Streams.
- Tidal: flooding caused by coastal sea level rises.
- Pluvial: flooding caused when the intensity of rainfall events is such that the ground cannot absorb rainfall run-off effectively or urban drainage systems cannot carry the run-off generated.
- Groundwater: flooding caused by a rise in the level of the water table.

3.2 Flood Risk Indicators

Indicators of flood risk are identified using available data, most of which is historically derived. Typically, this data is not prescriptive in relation to flood return periods and neither predictive nor inclusive of climate change analysis.

Flood risk indicators include:

- Records available on the OPW's National Flood Risk Website. As part of the National Flood Risk Management Policy, the OPW developed the www.floodmaps.ie web-based data set, which contains information concerning historical flood data and displays related



mapped information and provides tools to search for and display information about selected flood events.

- CFRAM mapping produced under the OPW CFRAM programme.
- Geological Survey of Ireland (GSI) mapping - Hydrogeological mapping maintained by the GSI and made available through its website www.gsi.ie.
- Ordnance Survey mapping - Ordnance Survey maps include areas which are marked as being "Liable to Floods". Generally, these areas are only shown identified indicatively and suggest historical flooding, usually recurrent. In addition, the maps indicate areas of wet or hummocky ground, bog, marsh, springs, rises and wells as well as surface water features including rivers, streams, bridges, weirs and dams.

4.0 LEVEL OF SERVICE

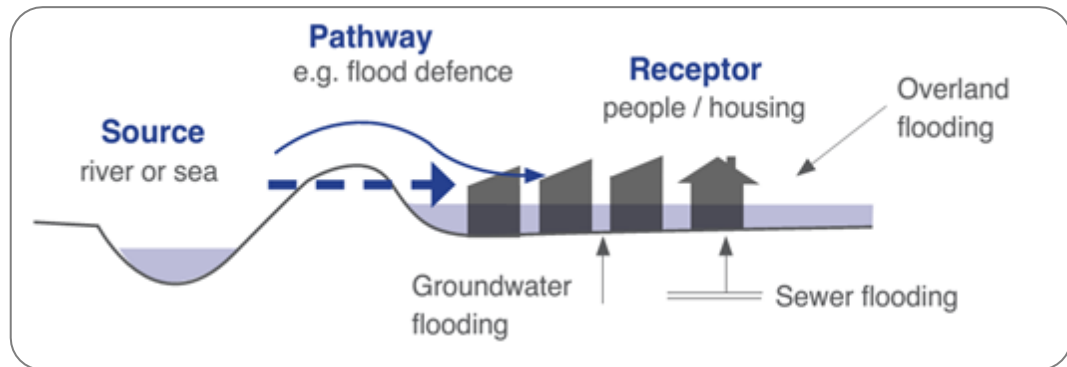


Figure 3 – Source-pathway-receptor model
(*The Planning System and Flood Risk Management Guidelines*)

There is an existing inherent risk of any flood event occurring during any given year. Typically, this likelihood of occurrence was traditionally expressed as a 1-in-100 chance of a 100-year storm event happening in any given year.

A less ambiguous expression of probability is the Annual Exceedance Probability (AEP), which may be defined as the probability of a flood event being exceeded in any given year. Therefore a 1-in-100-year event has a return period of 1% AEP flood event, similarly a 100% AEP can be expressed as a 1-in-1-year event.

The Planning System and Flood Risk Management, Guidelines for Planning Authorities (Flood Risk Management Guidelines), published in 2009 set out the best practice standards for flood risk assessment in Ireland. These are summarised in **Table 1** below (Table 8.1 from Flood Risk Management Guidelines document).

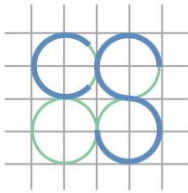


Table 1 – Summary of Level of Service: Flooding Source

Development Category	Flooding Source		
	Drainage	River	Tidal/Coastal
Residential	1% AEP	0.1% AEP	0.1% AEP
Commercial	1% AEP	1% AEP	0.5% AEP
Water-compatible (docks, marinas)	-	>1% AEP	>0.5% AEP

Under these guidelines, a proposed development site has first to be assessed to determine the flood zone category it falls under. The flooding guidelines categorise the risks associated with flooding into three areas, Zone A, B & C. This categorisation is indicated below.

- **Zone A** – High Probability of Flooding. Where the average probability of flooding from rivers and sea is highest (greater than 1% annually or 1 in 100 for river flooding or 0.5% annually or 1 in 200 for coastal flooding).
- **Zone B** – Moderate Probability of Flooding. Where the average probability of flooding from rivers and sea is moderate (risk between 0.1% annually or 1 in 1000 years and 1% annually or 1 in 100 years for river flooding, and between 0.1% or 1 in 1000 years and 0.5% annually or 1 in 200 for coastal flooding).
- **Zone C** – Low Probability of Flooding. Where the probability of flooding from rivers and sea is moderate (risk is less than 0.1% annually or 1 in 1000 years for both rivers and coastal flooding).

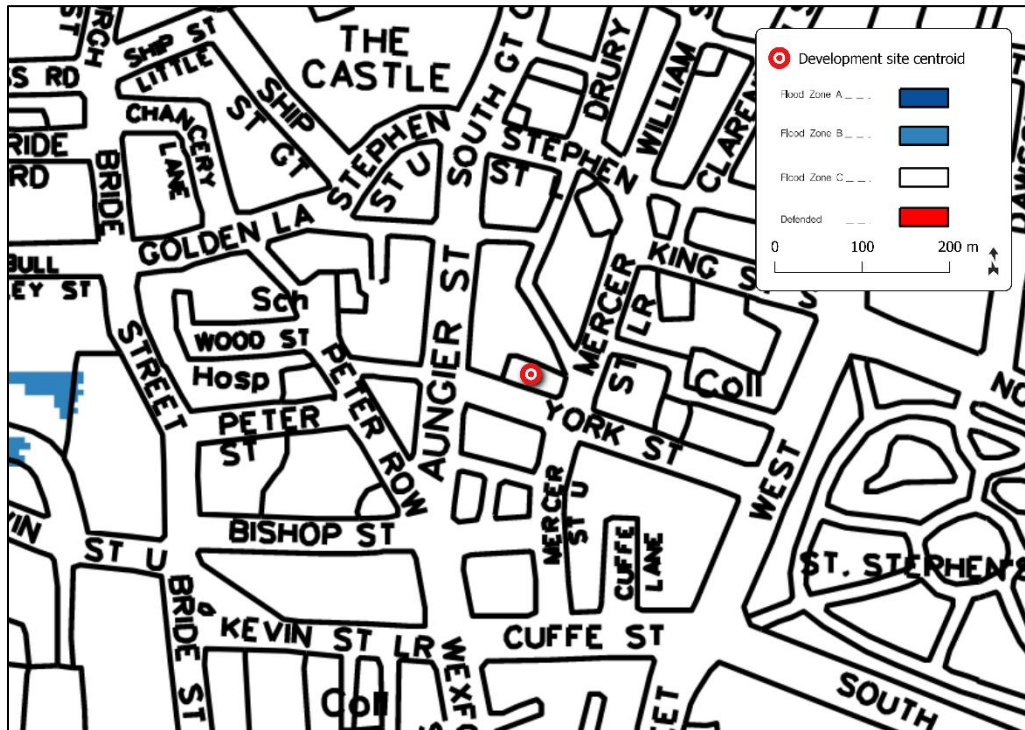


Figure 4- Extract of DCC 2022-2028 SFRA composite flood risk mapping
(background imagery source: Dublin City Council)

A review of flood risk mapping contained within the *Dublin City Development Plan 2022-2028 Strategic Flood Risk Assessment*, an extract of which is shown in **Figure 4**, shows the development site is located within the **Flood Zone C**. The relevant flood risk map is provided in full within **Appendix A**.

It is a requirement of Dublin City Council, the *Greater Dublin Strategic Drainage Study* (DCC 2005), and the *Flood Risk Management Guidelines* that the predicted effects of climate change be incorporated into any proposed design. **Table 2** below indicates the predicted climate change variations.

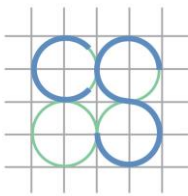


Table 2 – Predicted climate change variations

Design Category	Predicted Impact of Climate Change
Drainage	20% Increase in rainfall
Fluvial (river flows)	20% Increase in flood flow
Tidal / Coastal	Minimum Finished Floor Level 4.0 – 4.15m AOD

The Flood Risk Management Guidelines have developed an ‘appropriateness’ matrix for various developments and their potential risk factor. The table indicates if further analysis is required in the form of a justification test. **Table 3** below outlines the conditions that require a justification test.

The Flood Risk Management Guidelines classified residential dwellings as ‘High Vulnerable Development’ and commercial development as ‘Less Vulnerable Development’.

Table 3 – Flood Zone vs. Justification Test Matrix

Development Category	Flood Zone A	Flood Zone B	Flood Zone C
Highly Vulnerable Development	Justification Test Required	Justification Test Required	Appropriate
Less Vulnerable Development	Justification Test Required	Appropriate	Appropriate
Water-Compatible Development	Appropriate	Appropriate	Appropriate

As noted above, the subject site is located within **Flood Zone C**. As such, a justification test is not required.

5.0 FLOOD RISKS AND MITIGATION MEASURES

5.1 Past Flooding Events

A review of the Office of Public Works flood maps database (at www.floodinfo.ie) does not indicate any recorded historical instances of flooding on or near the development site, from any source. See **Figure 5** below and the OPW Past Flood Event Local Area Summary Report included as **Appendix B**.

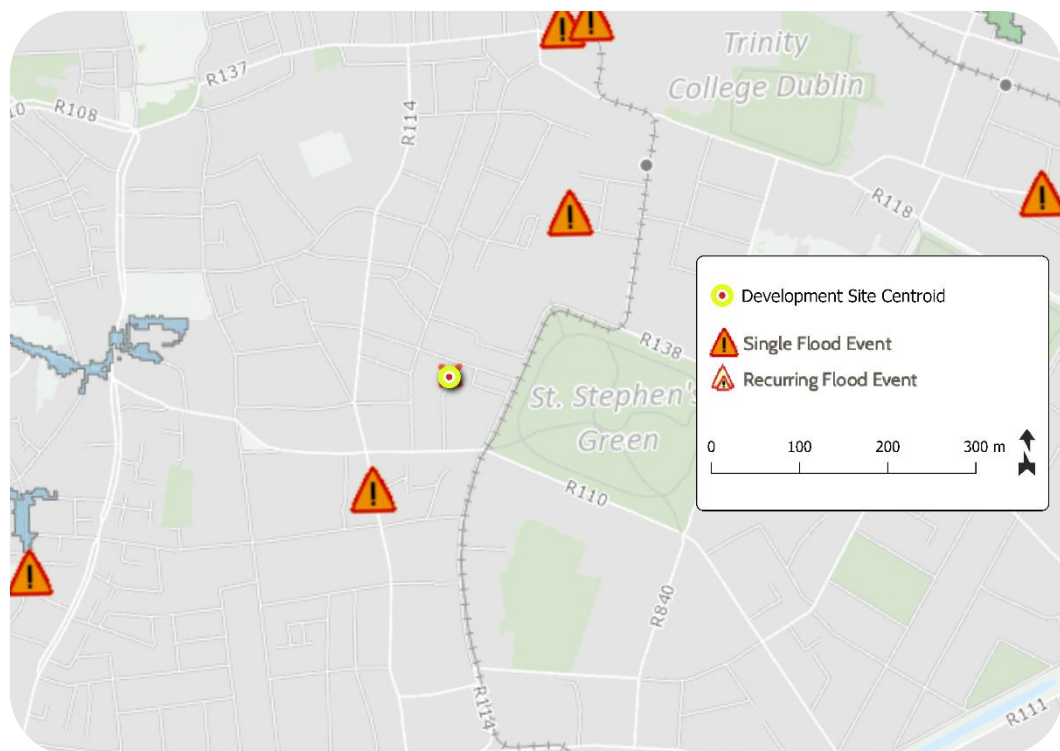


Figure 5 - OPW mapping of past flood events
(background imagery source: www.floodinfo.ie)

5.2 Fluvial Flooding

Recent modelling of the area as part of the *Dublin City Council Strategic Flood Risk Assessment* conducted by the OPW, indicates that the subject site is deemed to be located outside of the 0.1% AEP fluvial floodplain,

based on the currently available maps, see **Appendix C** for details; an extract is shown in **Figure 6**.

The risk of fluvial flooding impacting upon the subject development is therefore negligible, even during a 1-in-1000-year flooding event, and no mitigation measures are required.

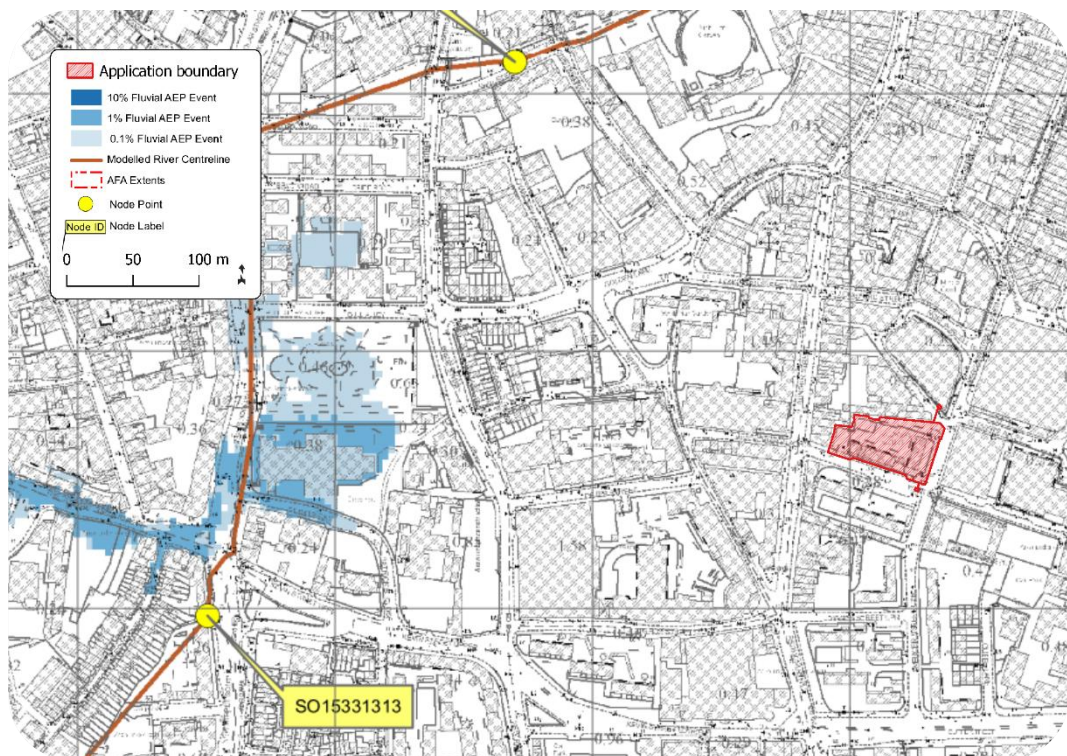


Figure 6 – CFRAMS mapping of fluvial flood risk extents
(background imagery source: Office of Public Works)

5.3 Tidal Flooding

The subject site is located approx. 5.5km from Dublin Bay. A review of the office of Public Works flooding records confirm that the development site's location is such that it is not affected by tidal water bodies and as such the risk of tidal flooding is negligible.

5.4 Pluvial Flooding

Pluvial flooding is flooding which has originated from overland flow resulting from high intensity rainfall. *The Dublin City Development Plan 2022-2028 Strategic Flood Risk Assessment* includes a map of modelled pluvial flooding depth for a 3-hour duration rainfall event with 1% AEP. For such a rainfall event, this model indicates that the development site may experience pluvial flooding up to a depth of approximately 0.2m (note that we will include proposed surface water drainage system designed in line with GDSDS and Part H of Building Regulations that will negate any on site pluvial floodings) This map is included within **Appendix D** to this report; an extract of the map is shown in **Figure 7** below.

From a review of OPW flood maps there are no records of flood events due to high rainfall events in the area and assessing the local topography we understand the risk of pluvial flooding to the site is negligible and the development site is deemed not be at risk form pluvial flooding. See **Appendix B** for OPW flood maps report.

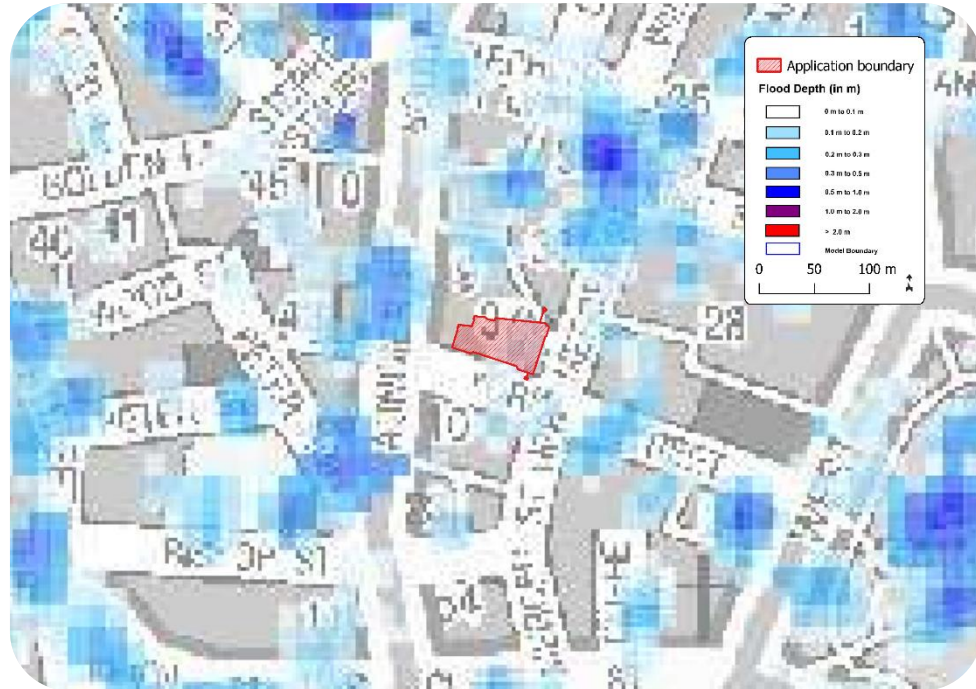
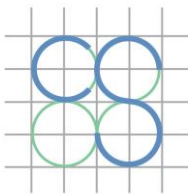


Figure 7-Extract of DCC 2022-2028 SFRA pluvial flood depth mapping
(background imagery source: DCC)

It is worth noting that, the proposed development shall be fitted with an attenuation system limiting storm water run-off and on-site attenuation storage shall be provided, catering for a 1-in-100-year extreme storm event, increased by 20% for the predicted effects of climate change. By reducing the run-off from the site into the local authority combined sewers the potential risk of pluvial flooding is deemed to be within acceptable limits.

5.5 Groundwater Flooding

According to the Geological Survey of Ireland (GSI) interactive maps, the subject site is underlain with dark limestone & shale ('calp') of the Lucan Formation. This site is shown as overlaying a locally important aquifer which is moderately productive only in local zones. The groundwater vulnerability assessment of the site shows that the vulnerability of groundwater in the area is moderate. The proposed alteration to the existing site shall not

increase the potential for groundwater flooding as such the risk is deemed acceptable. Refer to **Appendix E** for GSI maps.

5.6 Infrastructure Flooding

As part of Dublin City Council's survey of the drainage network of Dublin, the Greater Dublin Strategic Drainage Study (GDSDS), a review of the drainage assets in Dublin was carried out. From the survey, hydraulic performance mapping was developed to give an indication of the current and predicted hydraulic performance of sewers up to 2031.

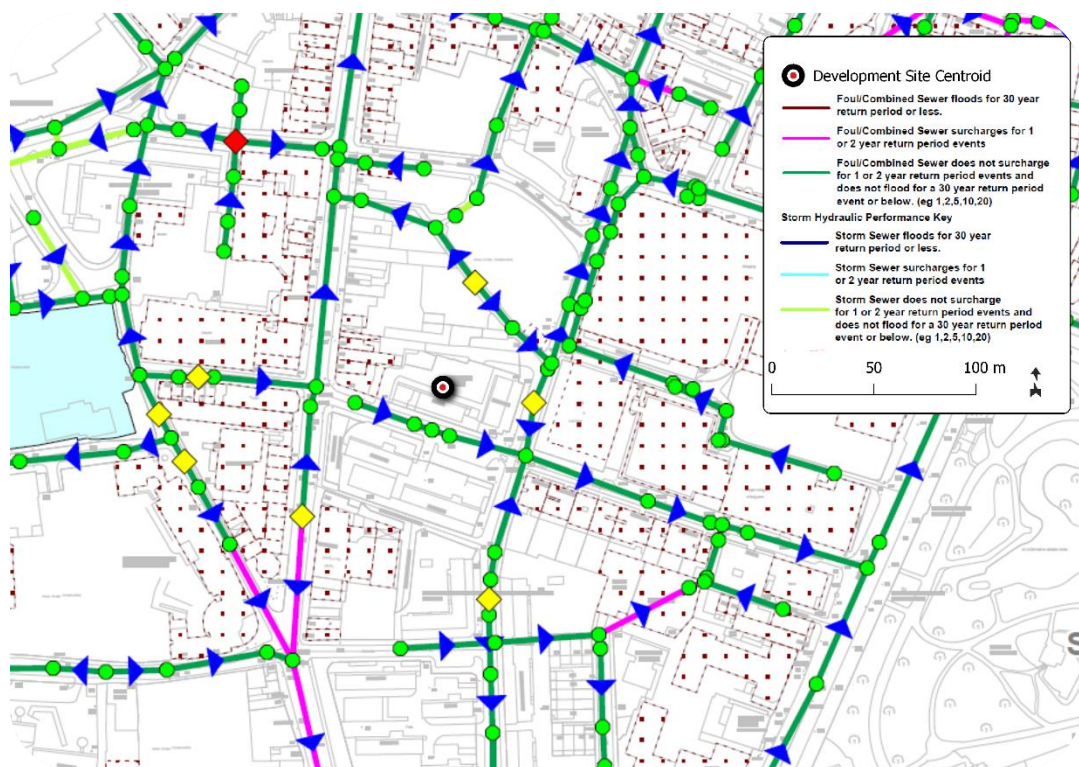
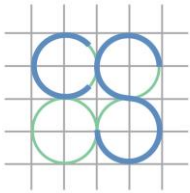


Figure 8 – Extract of 2031 GDSDS system performance assessment map
(background imagery source: Dublin Drainage)

The GDSDS mapping covering the development site indicates that the existing public combined sewers along York Street does not surcharge for 1 or 2 year return period events and does not flood for a 30 year return period



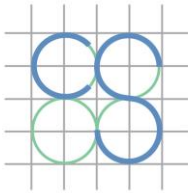
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event or below. See **Appendix F** for the relevant GSDS Hydraulic Performance Map, an extract of which is shown in **Figure 8**.

6.0 POTENTIAL FOR DEVELOPMENT TO CONTRIBUTE TO OFF-SITE FLOODING

The proposed development shall include a stormwater attenuation system, with storage sized for a 1-in-100-year critical storm event, increased by 20% for the predicted effects of climate change. The attenuation shall release the storm water in a controlled manner after the peak storm duration has passed. By restricting the flow, the likelihood of the proposed development adversely affecting the public drainage system or contributing to downstream flooding is mitigated.

Please refer to Engineering Services Report and Surface Water Management Plan submitted under separate covers with this planning application for further details.

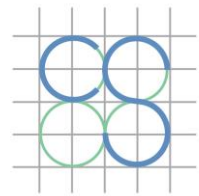


7.0 CONCLUSION

The Site-Specific Flood Risk Assessment has been carried out in accordance with the requirements of the national flood guidelines and Dublin City Council's Development Plan. Its conclusions are summarised as follows:

- The development site historically has no recorded flood events, as noted in the OPW's historical flood maps.
- Predicted flood hazard mapping for fluvial flood events shows that the development site is at low risk of flooding from this source.
- The permitted development shall have a storm water attenuation system to address a 1-in100-year extreme storm event, increased by 20% for predicted climate change effects. This shall significantly reduce the volume of storm water leaving the site during extreme storms, which in turn shall have the effect of reducing the loading on the existing public drainage system and reducing the risk of pluvial flooding and the risk of flooding on neighbouring sites due to runoff from the development site.
- The likelihood of onsite flooding from the hydrogeological ground conditions are deemed to be minor and within acceptable levels.

The proposed development is deemed to be suitable for the site location, as historical and potential flood routes have been reviewed and the likelihood of the development being subject to flooding is low, given the implementation of the mitigation measure described.



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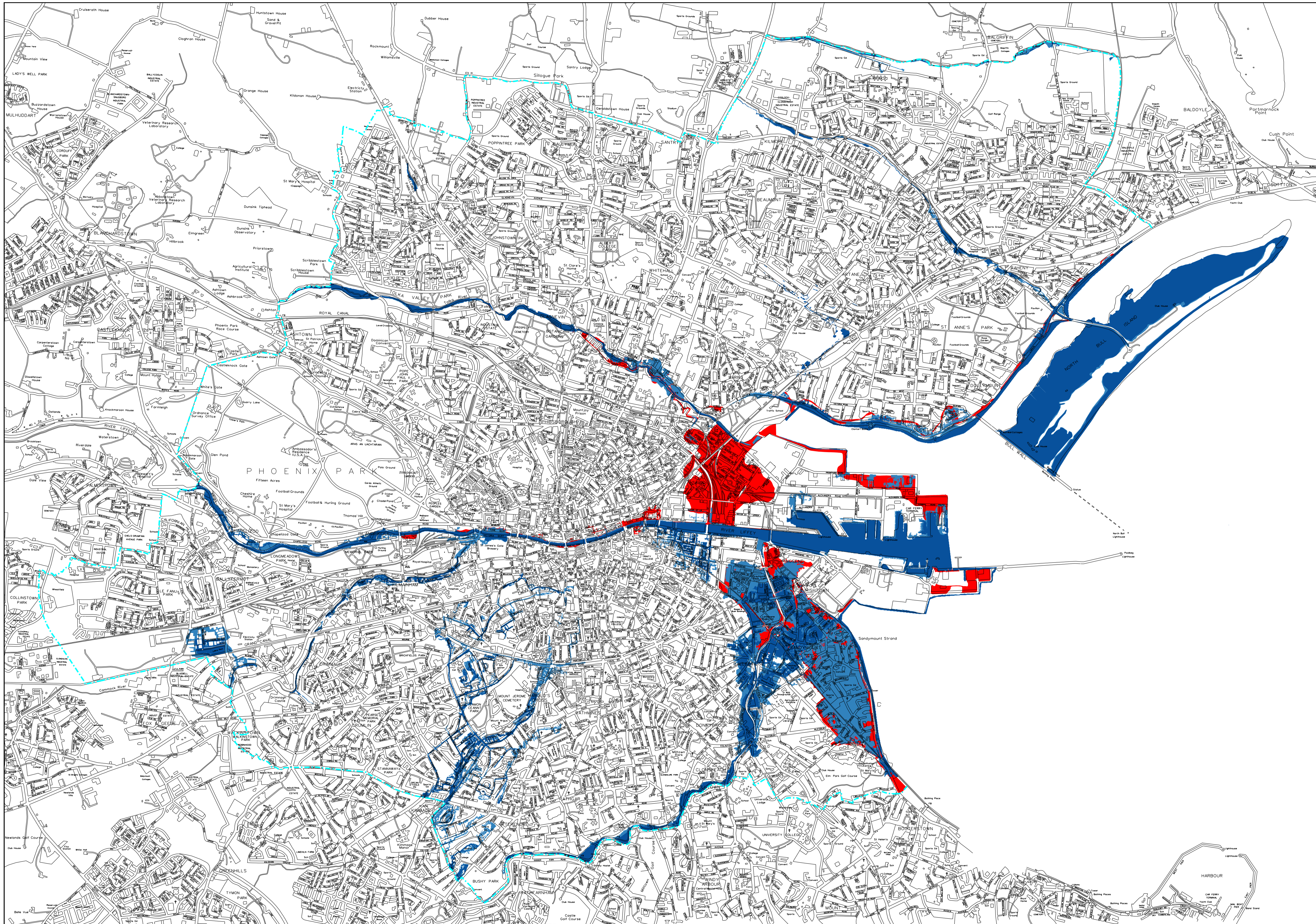
Appendix A

Dublin City Council Flood Maps

Dublin City Development Plan 2022-2028

Composite Flood Map for Dublin City Council

Note: The Composite Flood Map, and all other map extracts, illustrate Flood Zone A, B and Defended Areas (in red), where defended areas indicates lands defended to the 1% AEP fluvial and /or the 0.5% AEP tidal flood events and should therefore be considered also to be Flood Zone A.

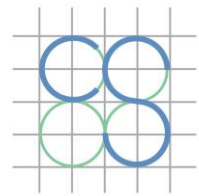


- Flood Zone A
- Flood Zone B
- Flood Zone C
- Defended
- City Boundary

Refer To OPW Website – FloodRisk

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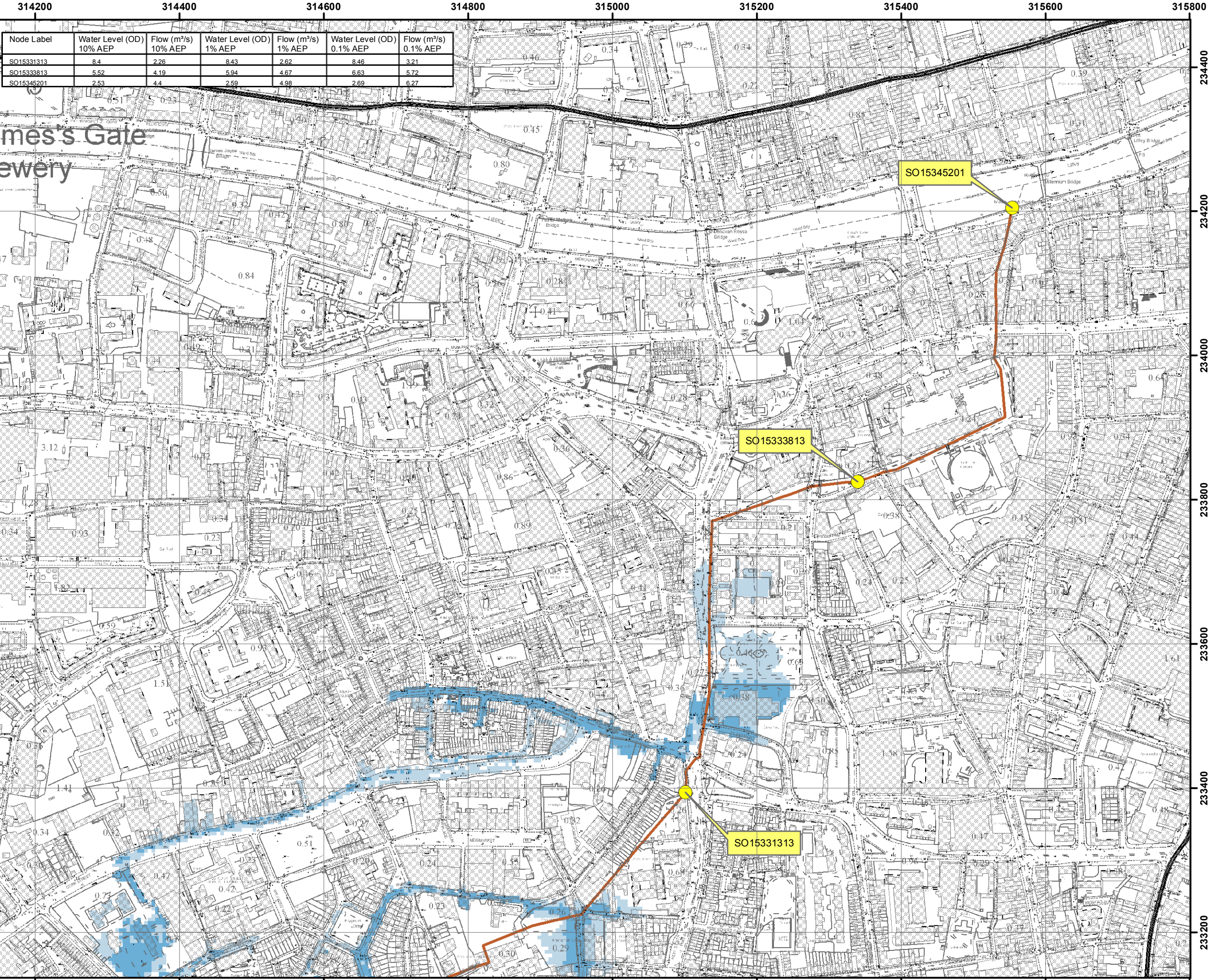
John O'Hara
Dublin City Planner



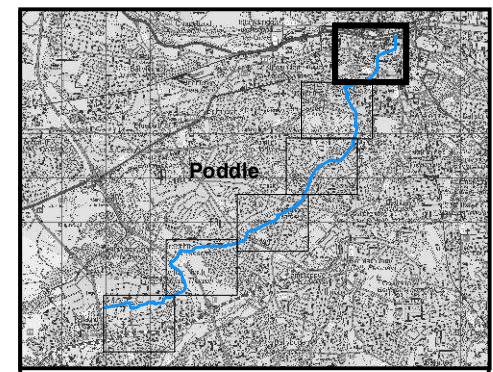
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Appendix B

CREAMS Flood Risk Mapping



Node Label	Water Level (OD) 10% AEP	Flow (m³/s) 10% AEP	Water Level (OD) 1% AEP	Flow (m³/s) 1% AEP	Water Level (OD) 0.1% AEP	Flow (m³/s) 0.1% AEP
SO15331313	8.4	226	8.43	2.62	8.46	3.21
SO15333813	5.52	4.19	5.94	4.67	6.63	5.72
SO15345201	2.53	4.4	2.59	4.98	2.69	6.27



IMPORTANT USER NOTE:
THE VIEWER OF THIS MAP SHOULD REFER TO THE DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE THAT ACCOMPANY THIS MAP.

- Legend**
- 10% Fluvial AEP Event
 - 1% Fluvial AEP Event
 - 0.1% Fluvial AEP Event
 - Modelled River Centreline
 - AFA Extents
 - Node Point
 - Node ID Node Label

FINAL

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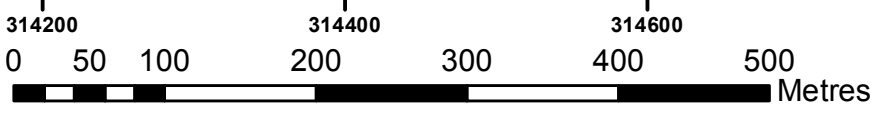


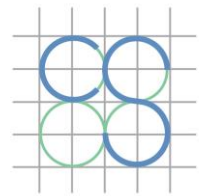
The Office of Public Works
Jonathan Swift Street
Trim
Co Meath

Elmwood House
74 Boucher Road
Belfast
BT12 6RZ

T +44(0) 28 90 667914
F +44(0) 28 90 668286
W www.rpsgroup.com
E ireland@rpsgroup.com

Map:	
Poddle River Fluvial Flood Extents	
Map Type: EXTENT	
Source: FLUVIAL	
Map Area: HPW	
Scenario: CURRENT	
Drawn By: F.M.C.	Date: 11 August 2016
Checked By: A.S.	Date: 11 August 2016
Approved By: S.P.	Date: 11 August 2016
Drawing No.:	
E09POD_EXFCD_F0_06	
Map Series: Page 6 of 6	
Drawing Scale: 1:5,000 @A3	





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Appendix C

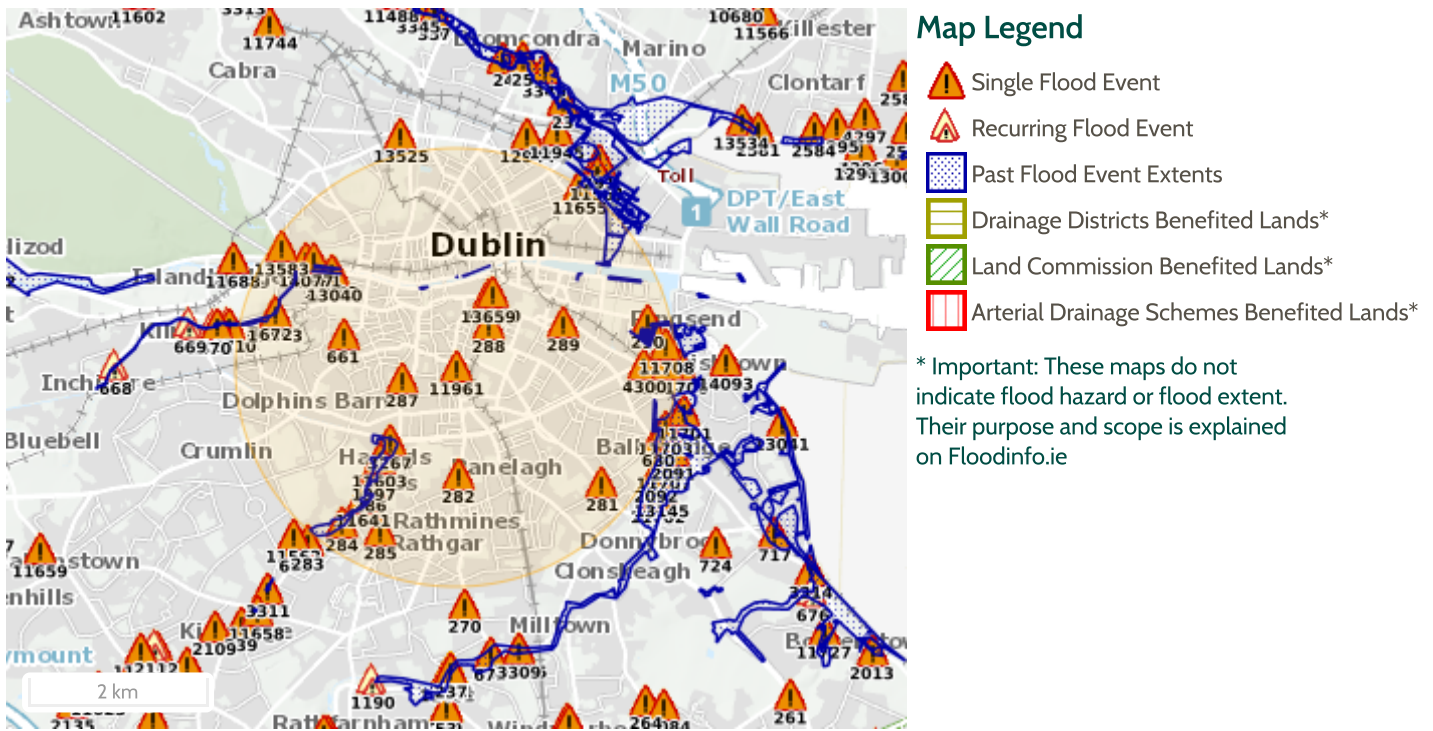
OPW Past Flood Event Local Area Summary Report



Report Produced: 4/4/2024 14:25

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.

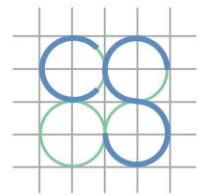


34 Results

Name (Flood_ID)	Start Date	Event Location
1. Flooding at Dublin City on 30/07/2019 (ID-13659) Additional Information: Reports (0) , Press Archive (0)	30/07/2019	Approximate Point
2. Flooding at Dublin City on 22/11/2017 (ID-13583) Additional Information: Reports (0) , Press Archive (0)	22/11/2017	Approximate Point
3. Poddle Limekiln Lane Sept 1931 (ID-3267) Additional Information: Reports (1) , Press Archive (0)	02/09/1931	Approximate Point
4. Flooding at Trinity College, Dublin 2, 26th July 2013 (ID-11960) Additional Information: Reports (1) , Press Archive (0)	25/07/2013	Approximate Point
5. Flooding on Wexford St, Dublin 2 on 26th July 2013 (ID-11961) Additional Information: Reports (1) , Press Archive (0)	25/07/2013	Approximate Point
6. Dodder Oct 1987 (ID-680) Additional Information: Reports (3) , Press Archive (0)	20/10/1987	Approximate Point

	Name (Flood_ID)	Start Date	Event Location
7.	 Poddle August 1986 (ID-32) Additional Information: Reports (9) . Press Archive (1) .	24/08/1986	Area
8.	 Dodder August 1986 (ID-1) Additional Information: Reports (21) . Press Archive (18) .	25/08/1986	Area
9.	 Poddle St Claires Ave Sept 1931 (ID-1997) Additional Information: Reports (1) . Press Archive (0) .	02/09/1931	Approximate Point
10.	 Poddle Limekiln Lane Aug 1905 (ID-1998) Additional Information: Reports (1) . Press Archive (0) .	24/08/1905	Approximate Point
11.	 Bath Avenue June 1963 (ID-4300) Additional Information: Reports (4) . Press Archive (0) .	10/06/1963	Exact Point
12.	 Camac August 1986 (ID-125) Additional Information: Reports (3) . Press Archive (0) .	24/08/1986	Area
13.	 Flooding at Dublin City on 06/01/2014 (ID-13040) Additional Information: Reports (0) . Press Archive (0) .	06/01/2014	Approximate Point
14.	 Dodder Donnybrook June 1963 (ID-281) Additional Information: Reports (4) . Press Archive (3) .	10/06/1963	Exact Point
15.	 Rathmines Lower June 1963 (ID-282) Additional Information: Reports (4) . Press Archive (2) .	10/06/1963	Exact Point
16.	 Kimmage Mount Argus June 1963 (ID-284) Additional Information: Reports (4) . Press Archive (2) .	10/06/1963	Exact Point
17.	 Harold's Cross June 1963 (ID-285) Additional Information: Reports (4) . Press Archive (2) .	10/06/1963	Exact Point
18.	 Mount Jerome Harold's Cross June 1963 (ID-286) Additional Information: Reports (4) . Press Archive (2) .	10/06/1963	Exact Point
19.	 Clanbrassil Street June 1963 (ID-287) Additional Information: Reports (4) . Press Archive (2) .	10/06/1963	Exact Point
20.	 Grafton Street June 1963 (ID-288) Additional Information: Reports (4) . Press Archive (2) .	10/06/1963	Exact Point
21.	 Fenian Street June 1963 (ID-289) Additional Information: Reports (4) . Press Archive (2) .	10/06/1963	Exact Point
22.	 Ringsend June 1963 (ID-290) Additional Information: Reports (4) . Press Archive (2) .	10/06/1963	Exact Point
23.	 Poddle Tributary Marrowbone Lane Jan 1941 (ID-661) Additional Information: Reports (1) . Press Archive (0) .	20/01/1941	Approximate Point
24.	 Camac Bow Bridge Recurring (ID-672) Additional Information: Reports (1) . Press Archive (0) .	n/a	Approximate Point
25.	 Flooding at Dublin City on 14/06/2016 (ID-14077) Additional Information: Reports (0) . Press Archive (0) .	14/06/2016	Approximate Point

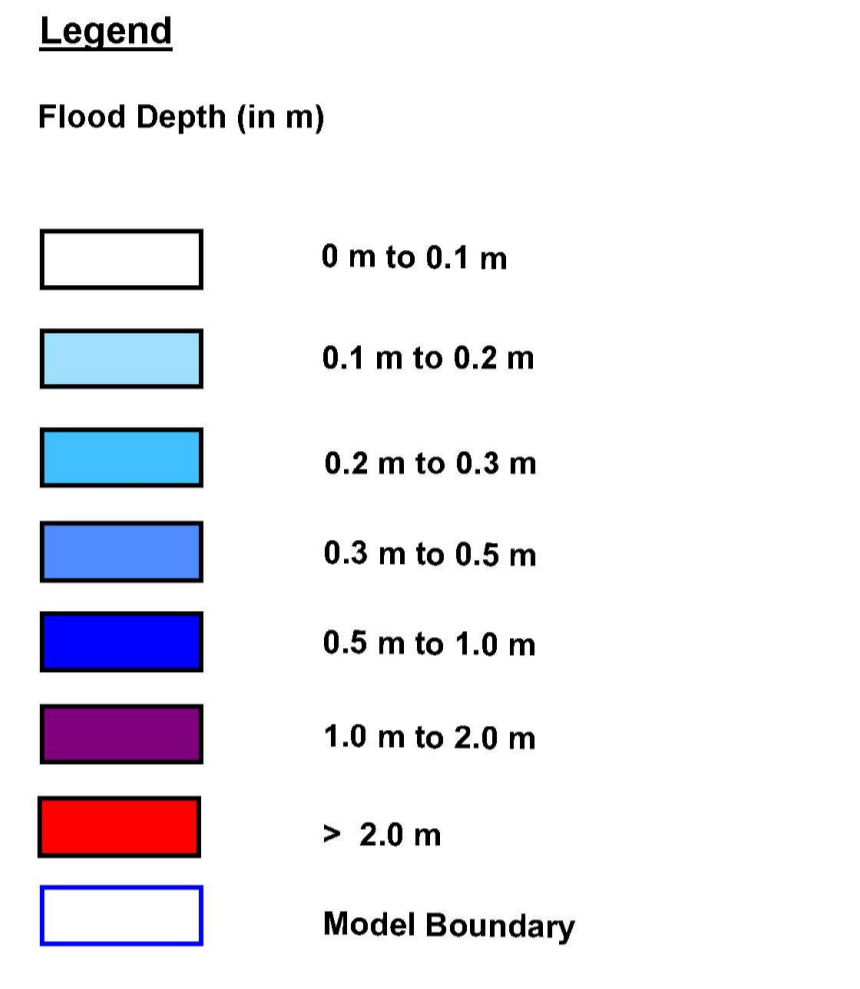
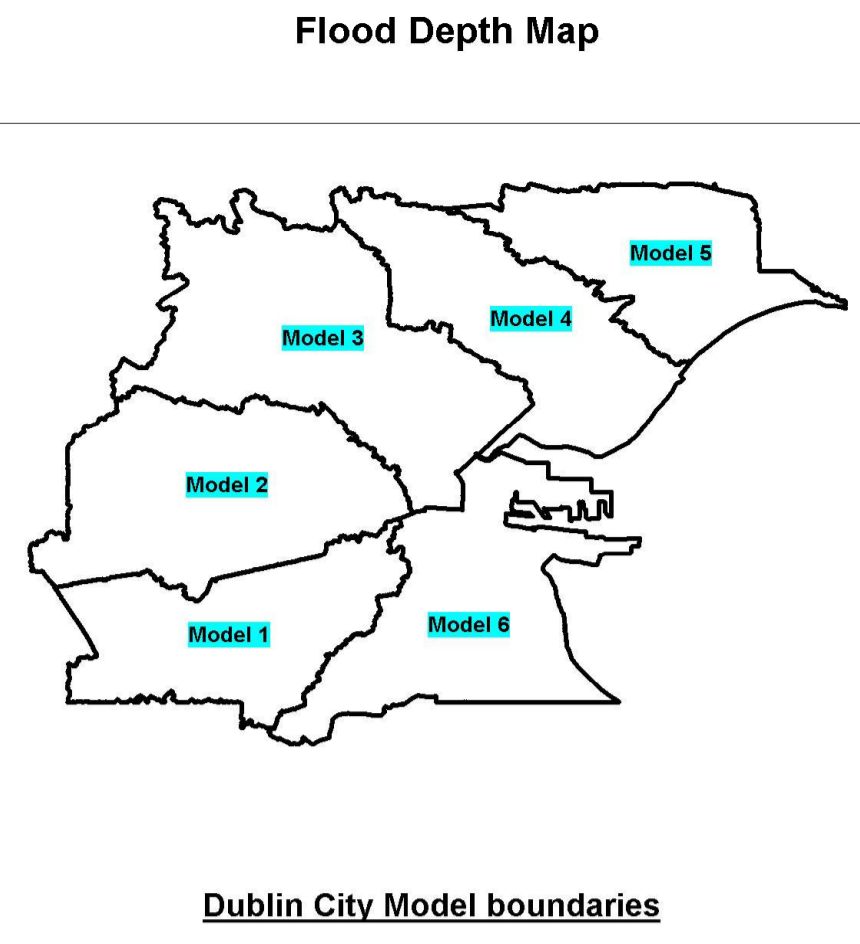
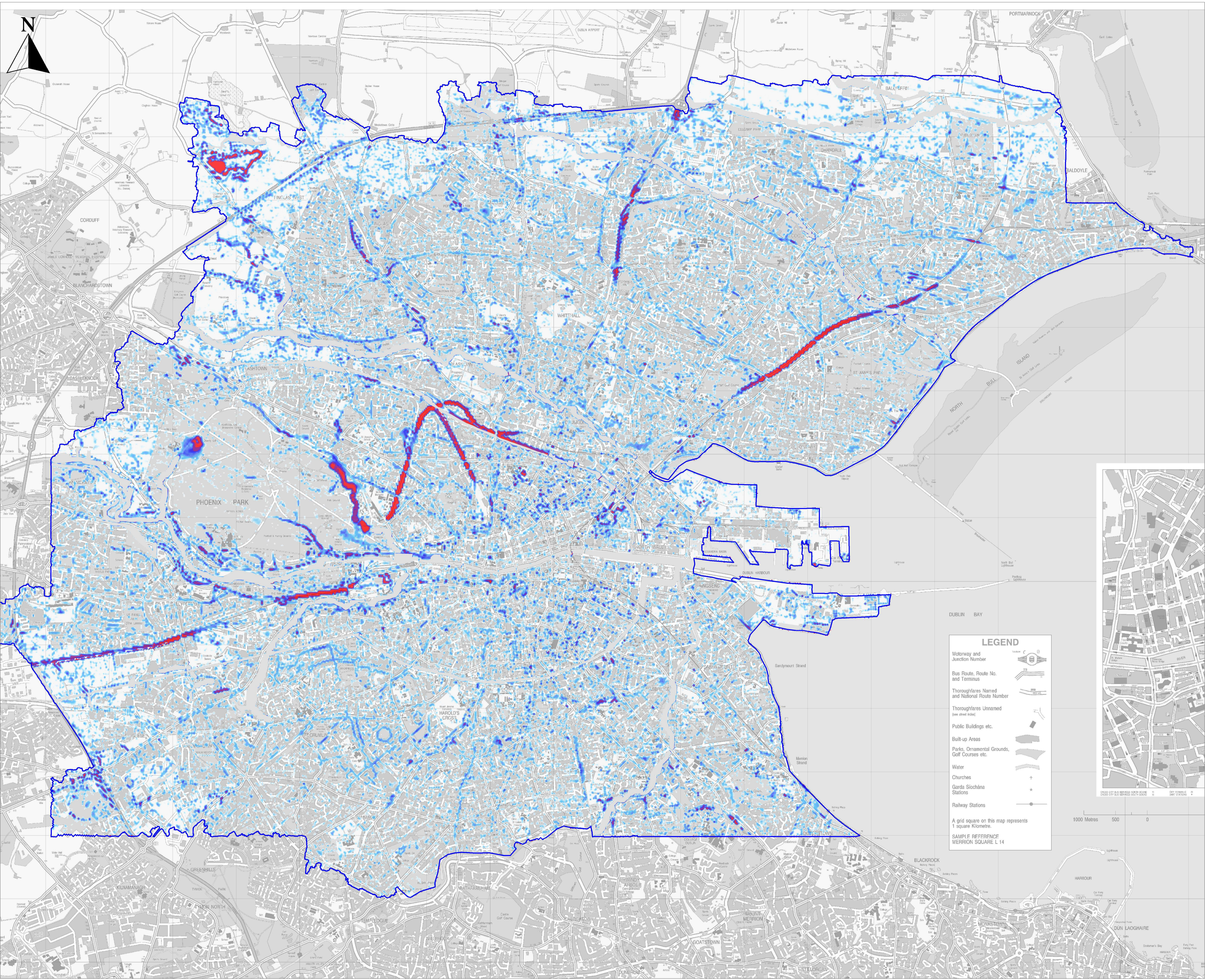
	Name (Flood_ID)	Start Date	Event Location
26.	 Dublin City Tidal Feb 2002 (ID-456)	01/02/2002	Area
Additional Information: Reports (45) , Press Archive (27)			
27.	 Flooding at Bow Lane, Kilmainham, Dublin 8 on 24th Oct 2011 (ID-11563)	23/10/2011	Approximate Point
Additional Information: Reports (1) , Press Archive (0)			
28.	 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)			
29.	 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)			
30.	 Flooding at Ashling Hotel, Parkgate Street, Dublin 8 on 24th Oct 2011 (ID-11681)	23/10/2011	Exact Point
Additional Information: Reports (1) , Press Archive (0)			
31.	 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)			
32.	 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)			
33.	 Flooding at ESB Sportsco, Ringsend, Dublin 4 on 24th Oct 2011 (ID-11708)	23/10/2011	Exact Point
Additional Information: Reports (1) , Press Archive (0)			
34.	 Flooding at Dublin City on 03/02/2014 (ID-13093)	03/02/2014	Approximate Point
Additional Information: Reports (0) , Press Archive (0)			



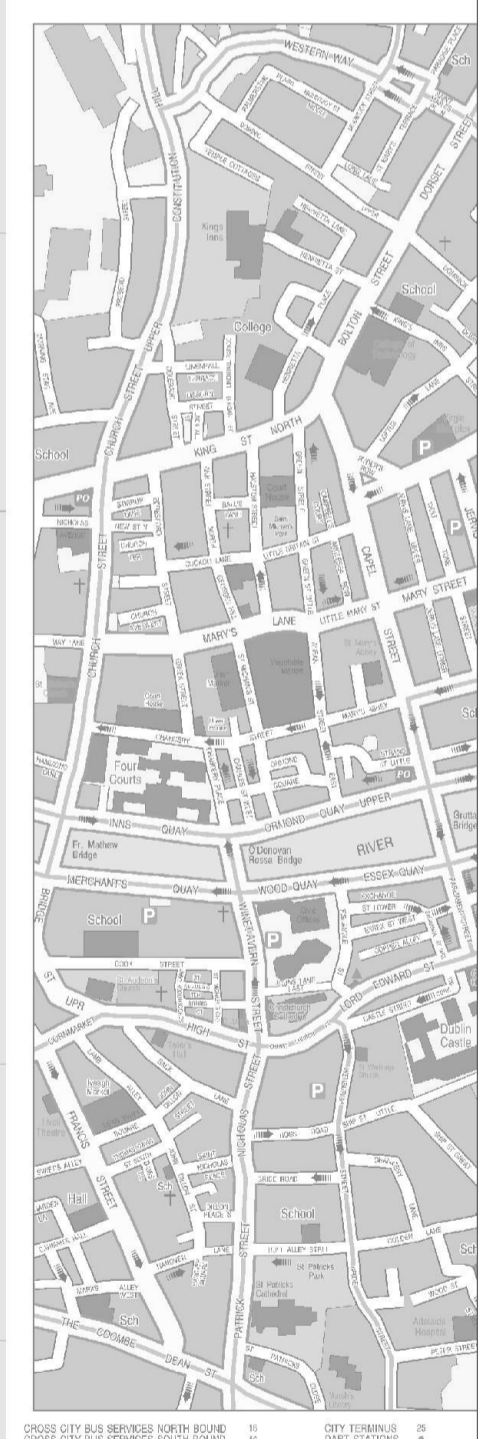
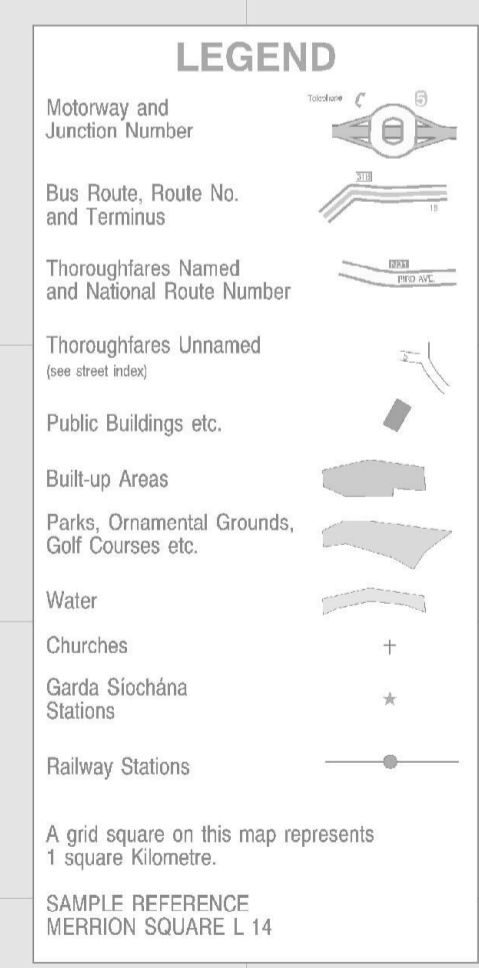
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Appendix D

Dublin City Pluvial Flood Map

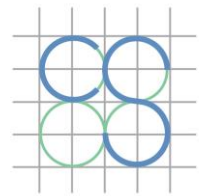


Notes



JACOBS

Client	
Project	FloodResilientCity Project
Title	Type 1 Model - Flood Depth Map Dublin - 1% AEP Event - 3hr Duration
Drawing Status	DRAFT
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Figure No.	32102500/D/OV/FD/0010
Scale	0 500 1000 Metres
Revision	0
Date	
Drawn	MM
Checker	MV
Review	PS
Approved	CF



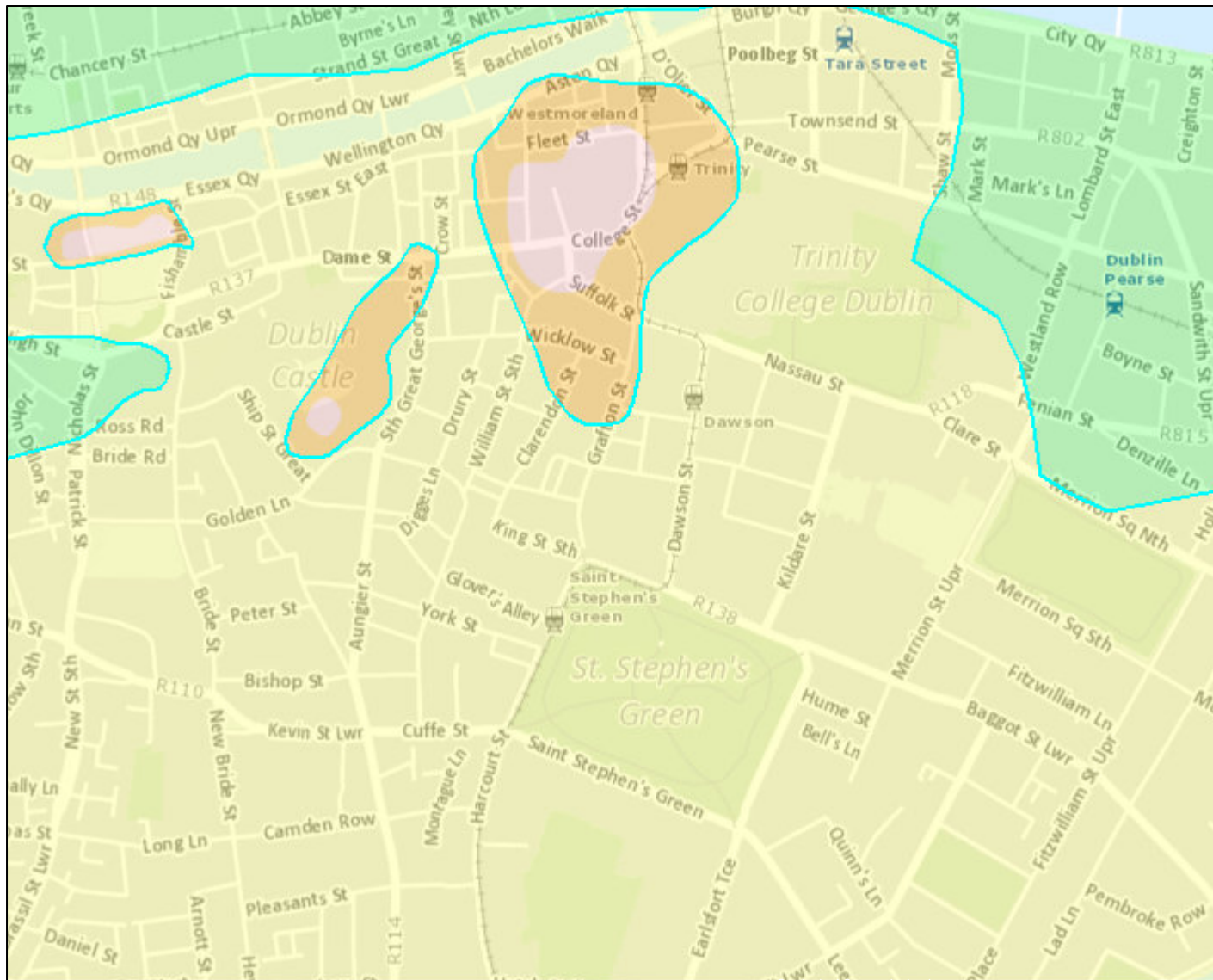
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Appendix E

GSI Geology and Hydrogeology Mapping

GSI Groundwater Vulnerability

- Legend
IE_GSI_Groundwater_...
- Rock at or near Surface or Karst Extreme
 - High
 - Moderate
 - Low
 - Water

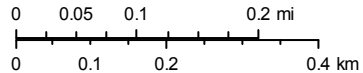


Scale: 1:10,000

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Map Centre Coordinates (ITM) 7 15,877 733,695

8/7/2024, 4:20:49 PM

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Legend

- IE_GSI_Structural_Sy...**
- Lithological boundary offshore
 - ↗ Dip of bedding or main foliation, old GSI data
 - ↖ First foliation parallel to bedding
 - Foliation trend, Thorr and Rosses Granites
 - Horizontal Bedding
 - ↗ Strike and dip of bedding, right way up
 - ↖ Strike and dip of bedding, way up unknown
 - ↗ Strike and dip of first foliation
 - ↖ Strike and dip of overturned bedding
 - ↗ Strike and dip of second foliation
 - ↖ Strike and dip of third foliation
 - Strike and plunge of first generation fold axis
 - Strike and plunge of second generation fold axis
 - Strike and plunge of third generation fold axis
 - Strike of vertical bedding/foliation
 - Strike of vertical first foliation
 - ▣ Bedrock Outcrops
- IE_GSI_Geological_Li...**
- ◆ Anticlinal Axis
 - ◆ Antiformal axis
 - Aquifer Boundary
 - - - Area
 - Coal seam
 - Dyke
 - Fault
 - Ghost Line
 - Goniatite marine band (R1-R4)

Scale: 1:10,000

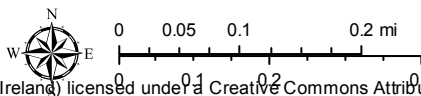
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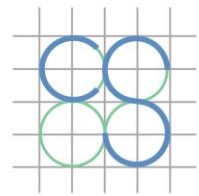
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8/7/2024, 4:18:28 PM

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Appendix F

GDSDS 2031 Performance Map

