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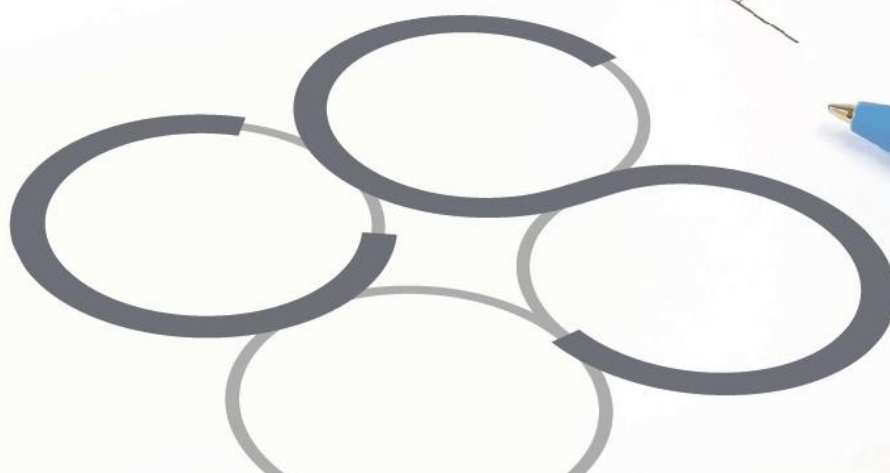
LIMERICK  
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DUBLIN

**Site Specific Flood Risk Assessment**  
**Strategic Housing Development (SHD)**  
**Heuston South Quarter, St. John's**  
**Road West, Kilmainham, Dublin 8**

Client: HPREF HSQ Investments Ltd.

Job No. H087

October 2021





## SITE SPECIFIC FLOOD RISK ASSESSMENT

### STRATEGIC HOUSING DEVELOPMENT (SHD)

#### HEUSTON SOUTH QUARTER, ST. JOHN'S ROAD WEST, KILMAINHAM, DUBLIN 8

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<b>BS 1192 FIELD</b>		<b>HSQ-CSC-ZZ-XX-RP-C-0003-P7</b>			
Job Ref.	Author	Reviewed By	Authorised By	Issue Date	Rev. No.
H087	PS	RFM	RFM	05.10.2021	P7
H087	PS	RFM	RFM	23.09.2021	P6
H087	PS	RFM	RFM	20.09.2021	P5
H087	PS	GF	RFM	23.07.2021	P4
H087	PS	FB	RFM	09.07.2021	P3
H087	PS	FB	RFM	10.12.2020	P2
H087	PS	FB	RFM	October 2020	P1

## 1.0 SITE SPECIFIC FLOOD RISK ASSESSMENT

This report was developed to review the HSQ site in relation to the requirements of Dublin City Council for the sites vulnerability to flooding and mitigation measures if required to enable the site to be developed. This report reviews the site for a variety of flooding mechanisms in accordance with published guidelines. The sequential approach as outlined by the national flood guidelines was followed in the preparation of this report.

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

- Dublin City Development Plan 2016–2022,  
(including Strategic Flood Risk Assessment)
- Greater Dublin Regional Code of Practice for Works,
- Office of Public Works Flood Maps,
- Department of the Environment Flooding Guidelines,
- Geological Survey of Ireland Maps,
- Local Authority Drainage Records.

The 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.

Note on sources:

The Office of Public Works flood database, ([www.floodinfo.ie](http://www.floodinfo.ie)) was accessed in September 2021. All historic, fluvial & tidal flooding accessed in this report is based on the data from this time.

The GSI website ([ww.gsi.ie](http://ww.gsi.ie)), for geological & hydrogeology data accessed in this report, is based on the data from this time.

## 2.0 SITE LOCATION AND PROPOSED DEVELOPMENT

### 2.1 Site Location

The proposed development is located on St. John's Road West at the Heuston South Quarter complex in Dublin 8, within the administrative jurisdiction of Dublin City Council. The site has an area of 1.08ha and is bounded to the west by the gardens of the Royal Hospital Kilmainham, to the north by St. John's Road West, and to the east and south by existing office and residential buildings forming Phase 1 of the larger HSQ development (which extend to Military Road, further to the south-east).

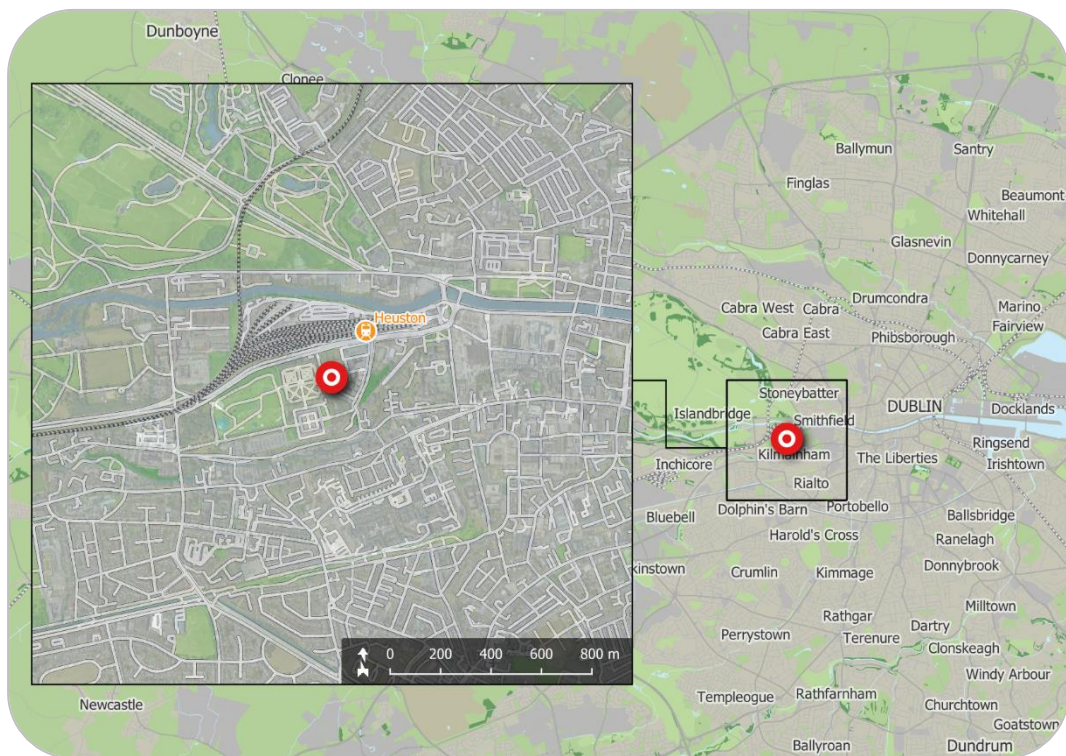


Figure 1 – Location of proposed development site  
(map data & imagery: EPA, OSi, OSM Contributors, Google)

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.

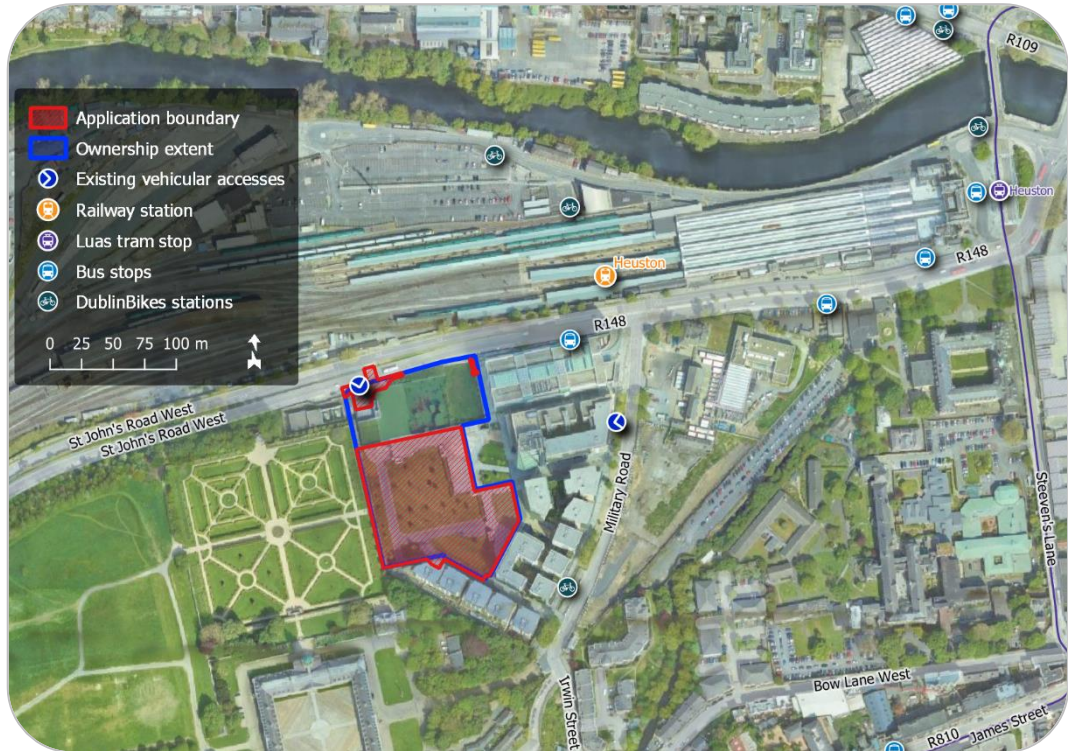


Figure 2 – Site extents and environs  
(map data & imagery: NTA, DCC, OSi, OSM Contributors, Google)

## 2.2 Existing Land Use

The subject site is brownfield, comprising a partially developed section of the Heuston South Quarter (HSQ) complex. Some surface level internal roads are present on the site, which benefits from the existing established HSQ vehicular accesses on St. John's Road West (R148) and Military Road. The site has been landscaped as an interim measure to improve its aesthetics pending its complete development. There is already an established road, pedestrian and cycle network in the vicinity of the site.

## 2.3 Description of Proposed Development

The proposed development will consist of a residential development of 399 no. 'Build To Rent' residential units and all ancillary and associated uses,

development and works, and a retail unit of 120 sq m, on a site of 1.08 ha.

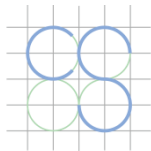
The proposed development consists of:

- Site clearance and localised demolitions to remove part of the podium and Basement Level -1 reinforced concrete slabs at the interface of the proposed Blocks A and B, together with the incorporation of part of the existing double basement level structure extending to approximately 7,613 sq.m over two levels (excluding an area of 3,318 sq.m that will be backfilled at Basement Level -1) within the proposed development.
- The construction of 5 no. buildings (Blocks A to E) ranging in height between 3- to 18-storeys over double basement level / podium level to provide a residential / mixed use development to provide 399 Specific BTR (Build to Rent) units with a total gross floor area of 29,391 sq.m, comprising 46 no. studios, 250 no. one bedroom units, 90 no. 2 bedroom / 4 person units and 13 no. 2 bedroom / 3 person units; internal communal ancillary residential services / amenities to include a shared co-working area / lounge (178 sq.m) and gym (102 sq.m) at lower ground floor level, and lounges on either side of a residential foyer at ground floor / podium level within Block A (196 sq.m), and a TV Room / lounge (57 sq.m) at ground floor / podium level within Block C.
- An independent retail unit (120 sq.m) is proposed at ground floor / podium level within Block B.
- A double basement is provided that will be integrated within the existing basement levels serving the wider HSQ development and will be accessed from the existing vehicular ramped accesses/egresses onto/off St. John's Road West and Military Road to the north and east, respectively. Basement level -1 provides: a refuse store; 80 no. car parking spaces (including 4 no. disabled spaces and 8 car club spaces); 4 no. motorcycle parking spaces; and, secure bicycle parking



/ storage in the form of 251 no. double stacked cycle parking spaces providing capacity for 502 no. secure bicycle storage spaces for residents. An additional 49 no. Sheffield type bicycle stands are provided at basement level -1 to provide 98 no. visitor cycle spaces (inclusive of 8 no. designated cargo bike spaces, that will also be available for the shared use with residents of the scheme) and a further 55 no. Sheffield type bicycle stands are provided at podium level to provide 110 no. cycle parking spaces (108 no. visitor cycle parking spaces (inclusive of 6 no. designated cargo bike spaces) and 2 no. cycle parking spaces in connection with the retail unit). All bicycle parking at basement level is accessed via a dedicated cycle lift from podium to basement level -1 that is situated to the south of Block B.

- Works proposed along the St John's Road West frontage include the omission of the existing left-turn filter lane to the vehicular ramped access to the HSQ development and re-configuration of the pedestrian crossings at the existing junction together with the re-configuration of the existing pedestrian crossing over the westbound lanes of St. John's Road West leading to an existing pedestrian refuge island. Re-alignment of the existing footpath along the site frontage onto St John's Road West to tie into the reconfigured junction arrangement and provision of a link to a new lift to provide wheelchair access from St John's Road West to the HSQ podium.
- Communal Outdoor Amenity space is provided for residents in the form of rooftop terraces (totalling 1,179sqm), and lower-level communal courtyards between blocks (totalling 960sqm).
- Hard and soft landscaping works are proposed at podium level which includes the extension and completion of the public plaza to the east of Block A; the provision of footpaths; a MUGA (Multi Use Games Area) and informal play areas for children (totalling 1,670sqm).



- A double ESB substation/switch room at ground / podium level within Block A, and a single substation/switch room at ground / podium level within Block B together with associated site development works, which includes the realignment / reprofiling of an existing vehicular access ramp at the southern end of the site between basement levels -1 and -2 and the closure / removal of a second vehicular access ramp between the subject site at basement level -1 and the raised basement level -1 under the Telford building.

### 3.0 EXISTING DEVELOPMENT INFRASTRUCTURE

The original masterplan for the entire HSQ development was granted planning permission by Dublin City Council in 2003 (DCC Ref 2656/03). As part of this planning grant, the developer was obliged to construct infrastructure to serve the entire development at the outset. This included new foul and surface water sewers along St John's Road and Military Road. The new 300mm foul sewer connected to a public combined sewer at Dr. Steeven's Hospital. The new 300mm surface water sewer connected to the existing Camac Culvert, also adjacent to Dr. Steeven's Hospital. Finally, a new 450mm watermain was extended down Military Road, from an existing line at Bow Lane, as part of these initial infrastructure works (see Appendix E).

A number of subsequent applications were approved by DCC, based on connecting into the infrastructure noted in the 2003 masterplan. The majority of the east of the site was constructed prior to the financial crash in 2008.

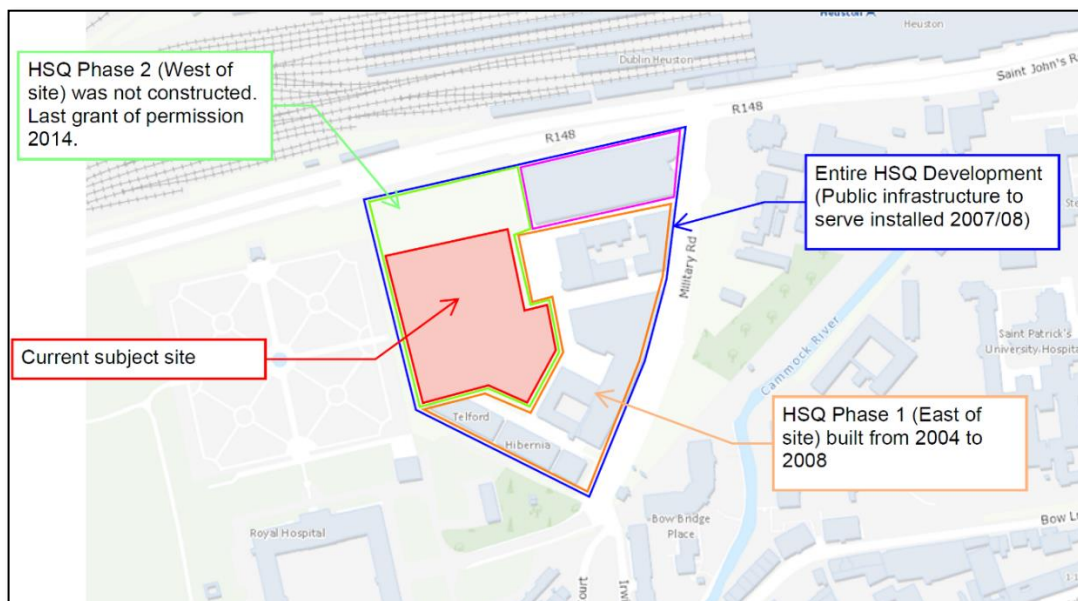


Figure 3 – Indicative location of early works

#### 4.0 LEVEL OF SERVICE

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 1% AEP; 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* set out the best practice standards for flood risk assessment in Ireland. These are summarised in **Table 1** below.

Table 1 – Summary of Level of Service – Flooding Source

Development Type	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.

It is a requirement of both Dublin City Council's and the Department of the Environment, community & Local Government flooding guidelines, *The Planning System and Flood Risk Management, Guidelines for Planning Authorities*, that the predicted effects of climate change are incorporated

into any proposed design. **Table 2** below indicates the predicted climate change variations.

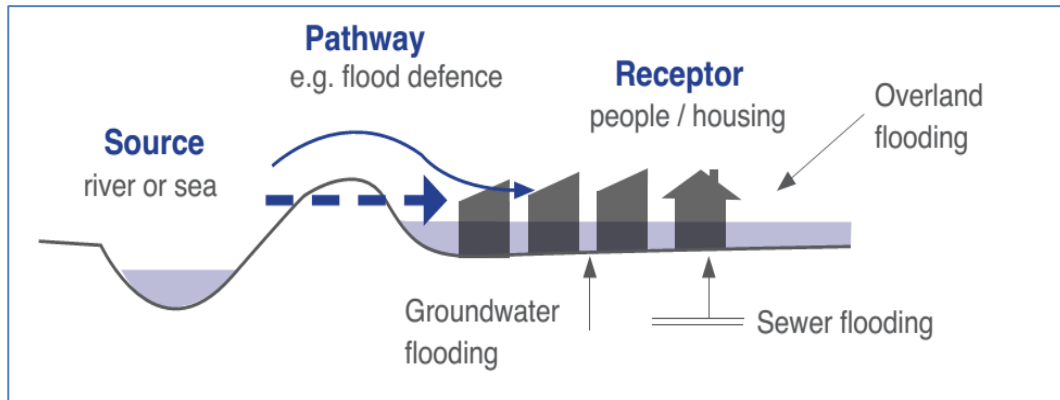
Table 2 – Predicted Climate Change Variations

Design Category	Predicted Impact of Climate Change
Drainage	20% Increase in rainfall
Fluvial (River flows)	20% Increase in flood flow

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).

In accordance with the *Planning Systems and Flood Risk Management Guidelines for Planning Authorities*, residential developments are classified as 'highly vulnerable developments'.



**Figure 4 – Source-pathway-receptor model Site location**

*(Flood Risk Management Guidelines)*

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.

Table 3 – Flood Zone vs. Justification Test Matrix

	Flood Zone A	Flood Zone B	Flood Zone C
Highly Vulnerable Development	<b>Justification Test Required</b>	<b>Justification Test Required</b>	Appropriate
Less Vulnerable Development	<b>Justification Test Required</b>	Appropriate	Appropriate
Water-compatible Development	Appropriate	Appropriate	Appropriate

## 5.0 HISTORIC FLOODING

A review of the Office of Public works historical flooding database ([www.floodmaps.ie](http://www.floodmaps.ie)) does not indicate any previous recorded incidents of flooding on the subject site. See **Appendix A** for a copy of the Past Flood Event Local Area Summary Report for this area. An extract of the associated mapping is shown in Figure 4 below.

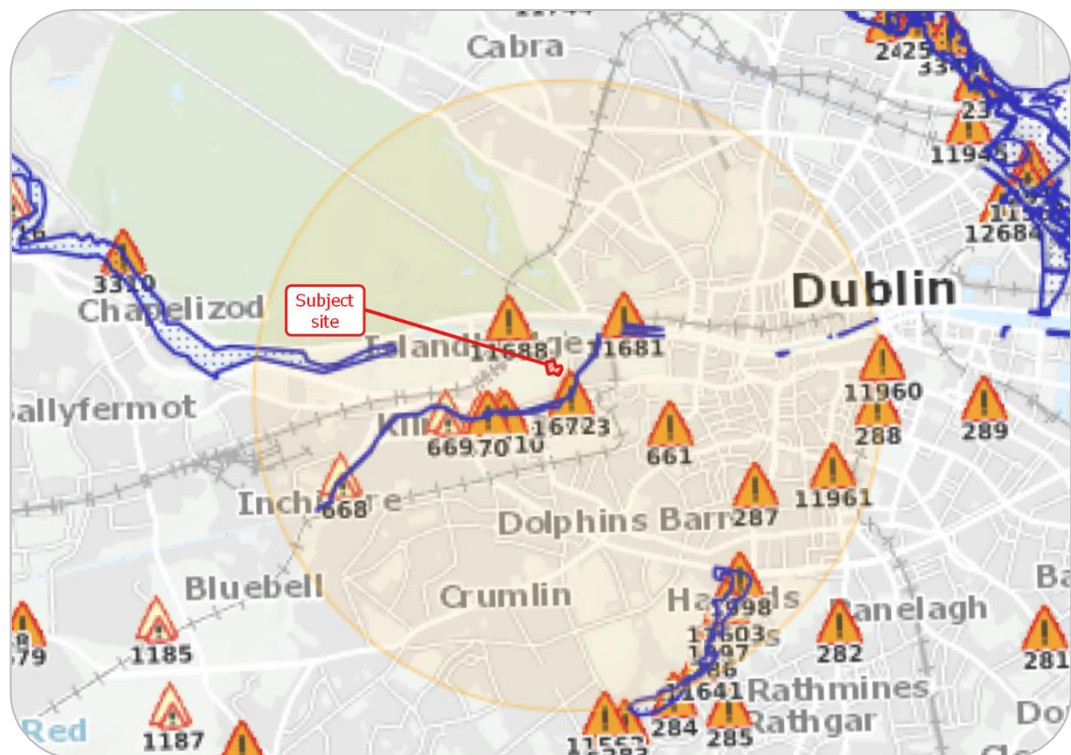


Figure 4 – Extract of Past Flood Event Local Area Summary Report map  
(background imagery source: OPW)

## 6.0 FLOOD ZONING

The Planning System and Flood Risk Management, Guidelines for Planning Authorities set out the best practice standards for flood risk assessment in Ireland. The requirement is for a site to be reviewed against fluvial / tidal / pluvial / site flooding & risk from groundwater, and its flood risk designation to be established.

In accordance with the *Planning Systems and Flood Risk Management Guidelines for Planning Authorities*, residential developments are classified as 'highly vulnerable developments'. The proposed development is within the **Zone C** designation; see **Appendix B** for Dublin City Council's Strategic Flood Risk Assessment composite flood zone map. An extract of this map is shown in Figure 5.

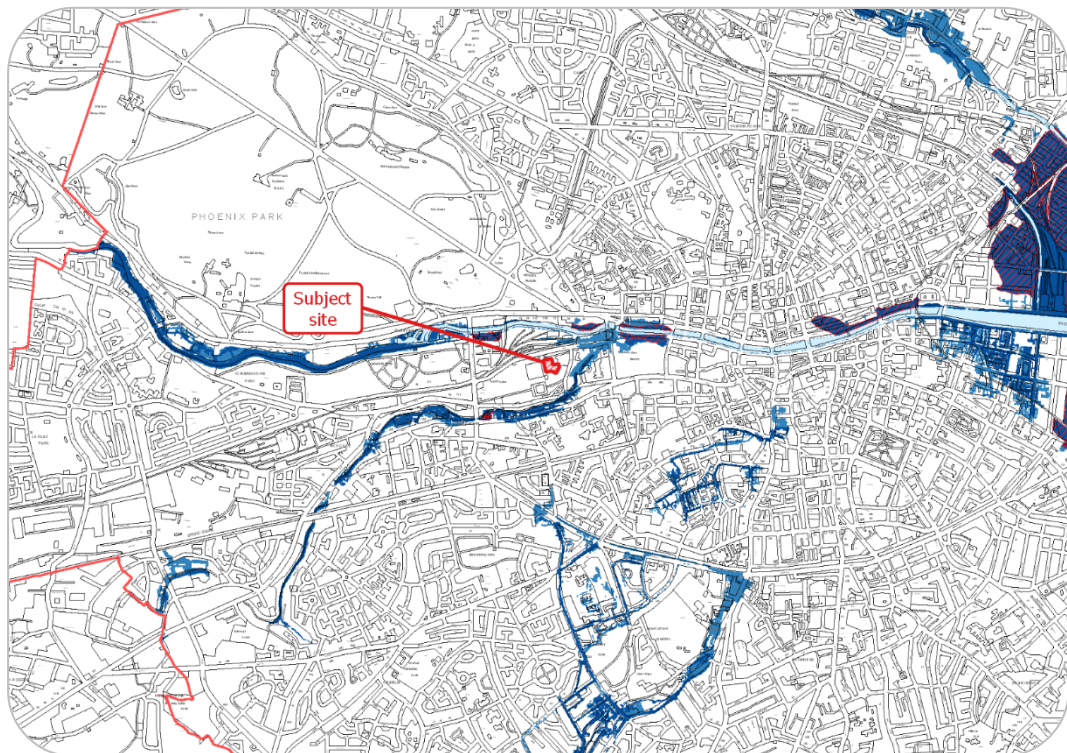


Figure 5 – Extract of DCC composite flood zone map  
(background imagery source: DCC)



As the subject site is located within Flood Zone C, a justification test is not required (see **Table 3**).

## 7.0 FLUVIAL FLOODING

A review of the Office of Public Works flood maps database, [www.floodmaps.ie](http://www.floodmaps.ie), for the area does not indicate historical flooding at the site. See the OPW Map-report included in **Appendix A**. A review of the Office of Public Works fluvial flood risk maps developed as part of the CFRAM initiative indicates that the subject site is located outside of the zone at risk from a predicted 1-in-1000-year fluvial flood event. See **Appendix C** for the relevant CFRAM map of predicted fluvial flooding extents, an extract of which is shown in Figure 6.

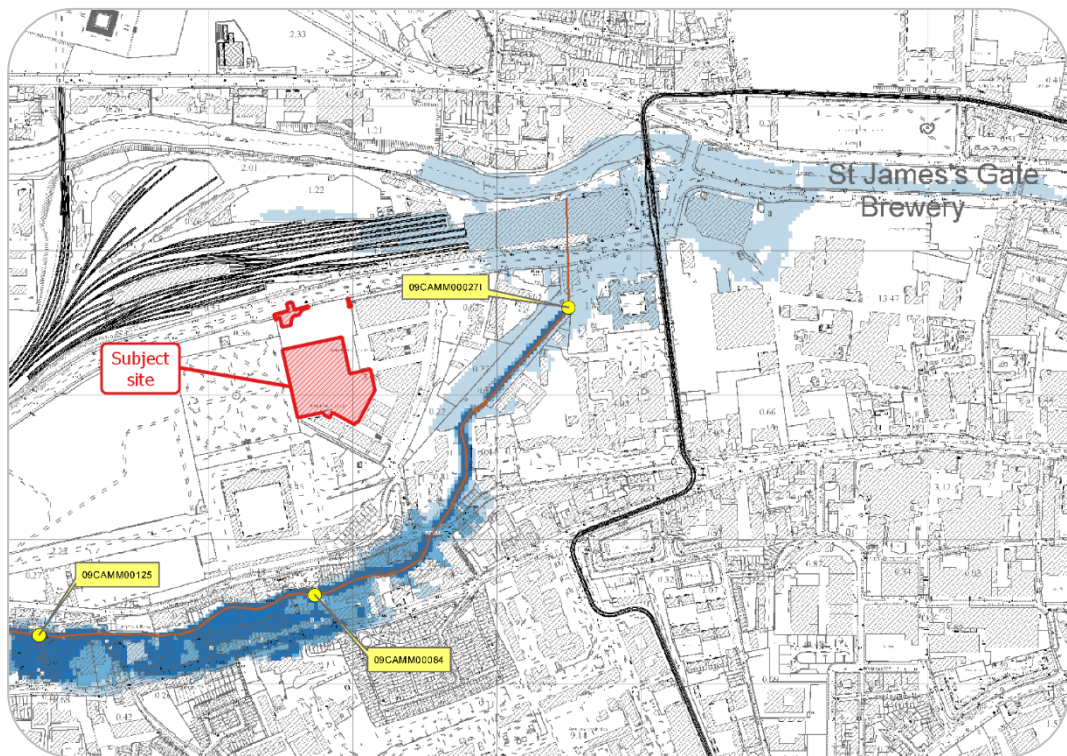


Figure 6 – Extract of CFRAM fluvial flood extents mapping  
(background imagery source: OPW)

## 8.0 PLUVIAL FLOODING

Pluvial flooding is flooding which has originated from overland flow resulting from high intensity rain fall. A high-level pluvial flood map has been produced by both Dublin City Council & the OPW, but it is of benefit as a high level tool rather than for a specific site. Previous flood events in the area can be reviewed on the Office of Public Works web site, [www.floodmaps.ie](http://www.floodmaps.ie), refer to Figure 1 and **Appendix A** for the historical flood mapping in the area & **Appendix D** for the DCC pluvial flood map.

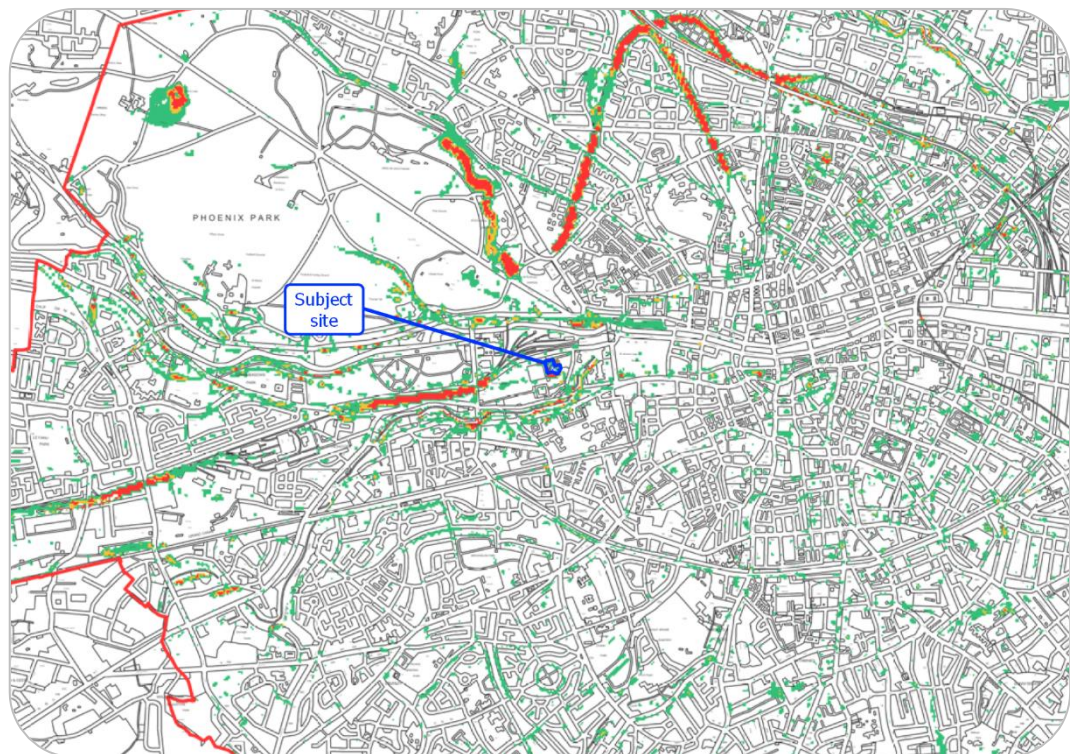
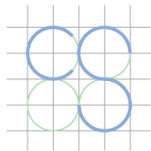


Figure 7 – Extract of DCC pluvial flood hazard mapping  
(background imagery source: DCC)



## **9.0 POTENTIAL FOR SITE TO CONTRIBUTE TO OFF-SITE FLOODING.**

The site is currently partially developed but does not have any attenuation systems in place. As such the proposed redevelopment of the site will require attenuation to be provided. The attenuation tank will be sized for a 1-in-100-year storm event and will 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.

## 10.0 TIDAL FLOODING

A review of the Office of Public Works tidal maps developed as part of the CFRAM initiative indicates that the subject site is located outside of the predicted 1-in-1000-year flood event. In addition, the OPW undertook further modelling to establish the range of risk associated with tidal flooding due to the potential effects of climate change. The modelling looked at two scenarios: mid-range (an increase in sea levels by 0.5m) and high-end (an increase in sea levels by 1.0m). Due to the subject site's location and elevation, it would not be affected by the future high-end scenario. The proposed site have a finished floor level of 7.5mAOD and the predicted 1-in-1000 year tidal level in the River Liffey being calculated at 3.48mAOD.

See **Appendix E** for the relevant CFRAM map of predicted tidal flooding extents, an extract of which is shown in Figure 8.

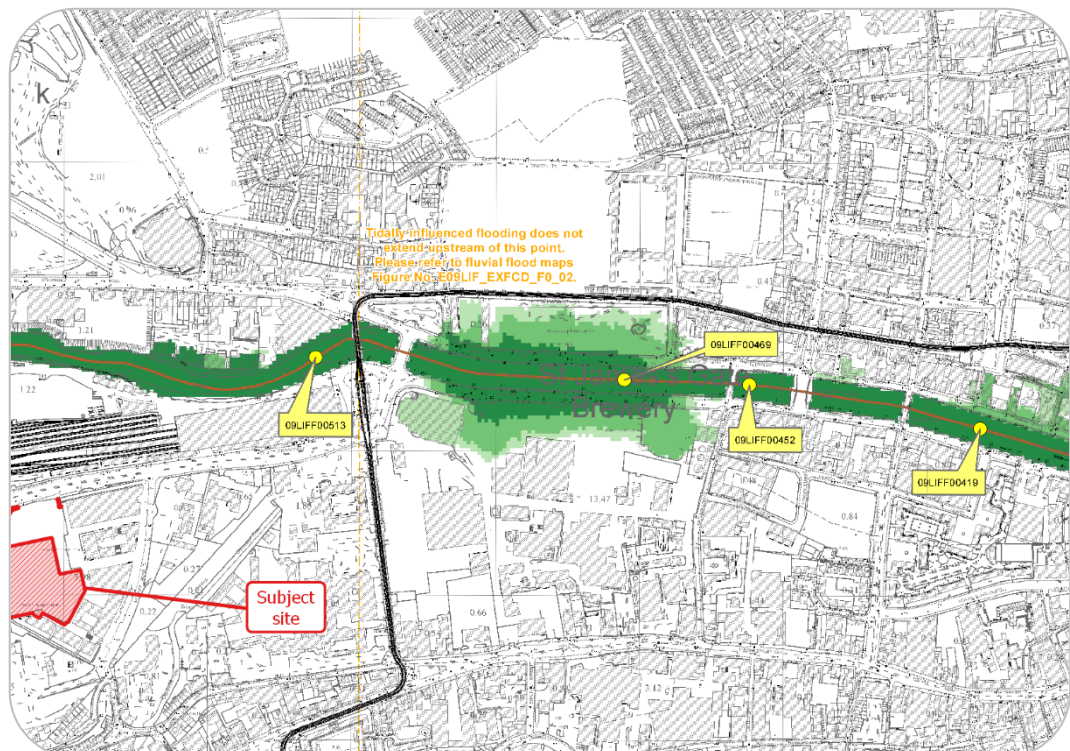
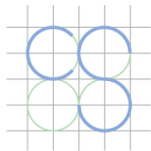


Figure 8 – Extract of CFRAM tidal flood extents mapping  
(background imagery source: OPW)



## **11.0 EXISTING OFF-SITE DRAINAGE**

It is the understanding of CS Consulting that at present there are no issues with the local drainage arrangements. This opinion was reached by a review of the historic flooding for the area and the knowledge that the proposed development will drain an attenuated storm water flow into a dedicated storm water sewer. By discharging an attenuated flow for all extreme storm events into the public sewer the restricted flow will help prevent the storm water network from surcharging during a high intensity event.

## 12.0 GROUNDWATER FLOODING

A review of the Geological Survey of Ireland's database, ([www.GSI.ie](http://www.GSI.ie)) gives background data to the site's geology & hydrogeological properties. The site is underlain with Dark limestone and shale and forms part of the Lucan Formation. The GSI classifies the regional aquifer as *locally important* and *moderately productive* with a vulnerability classification as *low*.

The site's elevation and the lack of Karst features indicates that the potential for the subject lands to be flooded due to groundwater features is low and deemed insignificant. This view is further supported by the knowledge that the site currently has an existing basement in place for over a decade. As no alterations to this basement is proposed, flooding which may have been generated during basement excavation works would not occur.

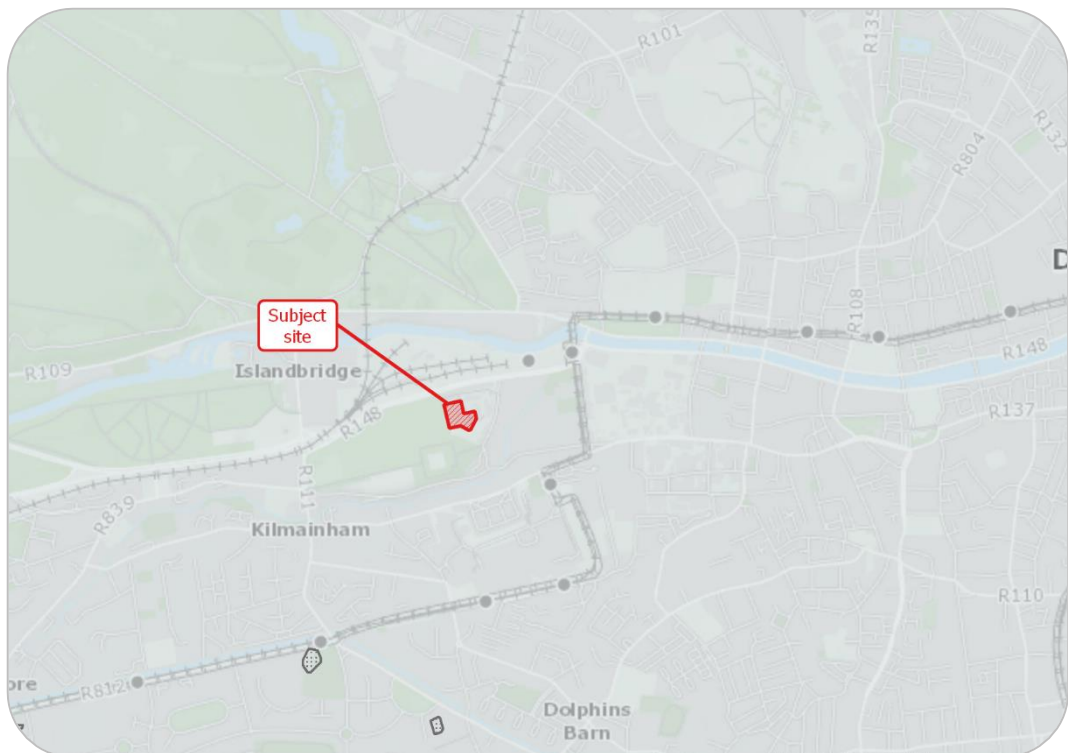


Figure 9 – Extract of GSI geology mapping  
(background imagery source: GSI)

See **Appendix F** for GSI Geological & Hydrogeological Maps. Extracts of these maps – showing the subject site location – are given in Figure 9 and Figure 10.

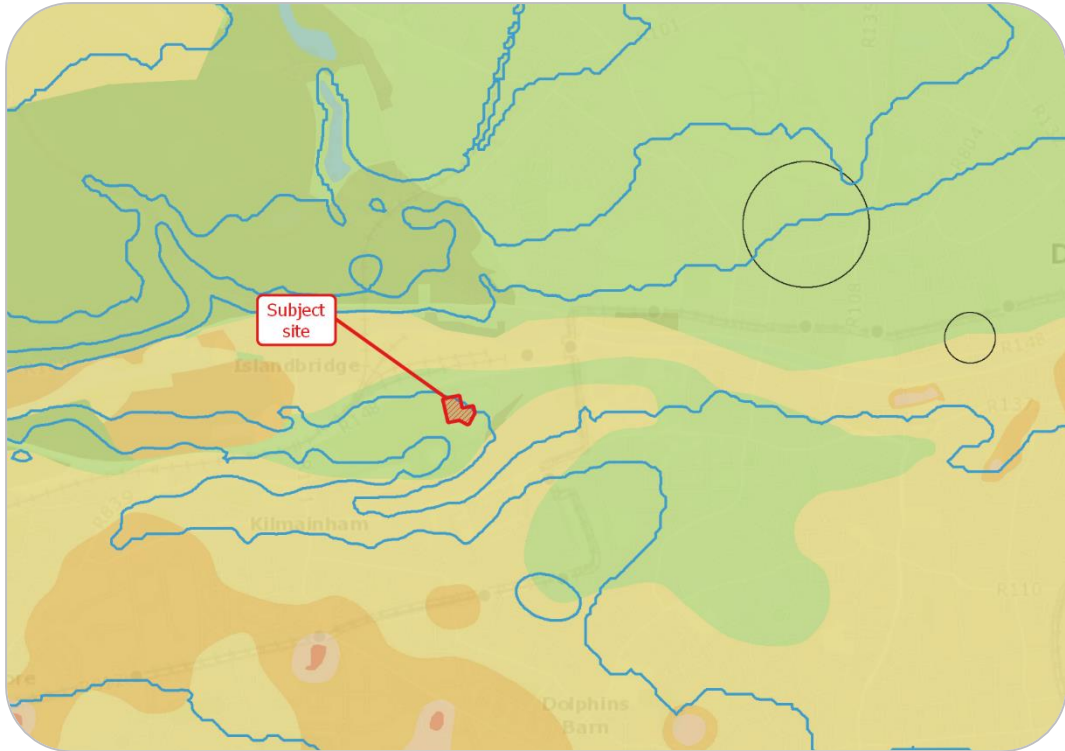


Figure 10 – Extract of GSI hydrogeology mapping  
(background imagery source: GSI)



### 13.0 INFRASTRUCTURE FLOODING

As part of Dublin City Council's survey of the drainage network of Dublin, the Greater Dublin Strategic Drainage Study (GSDSDS), 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. The GSDSDS was published in 2005 and alterations to the local drainage arrangements have taken place since its publication. The GSDSDS map for the subject site indicates that the sewers to the south, located along Kilmainham Lane, a 275mm combined sewer does not surcharge for 1- or 2-year return period events. There are no drainage utilities located to the east of the subject lands along Military Road. To the north of the subject lands notes surcharging in the existing 375mm storm sewer and the 1060 x 630 culvert combined sewers.

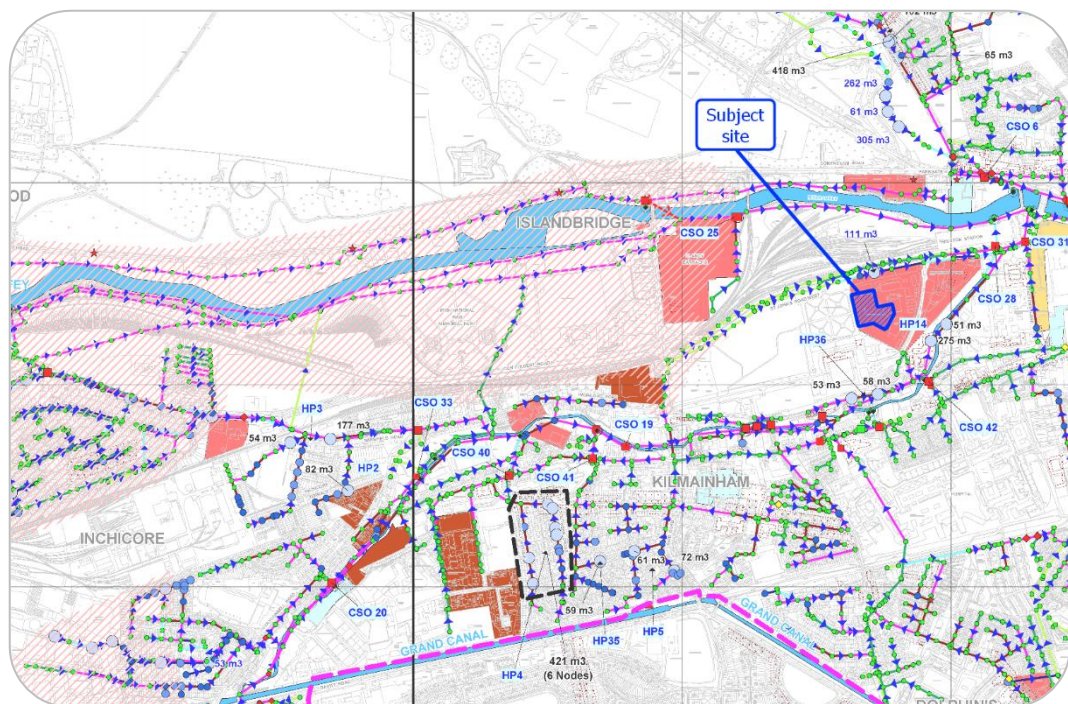
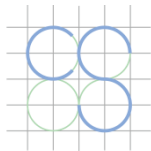


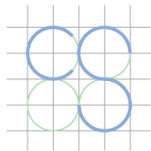
Figure 11 – Extract of 2031 system performance assessment map  
(background imagery source: Dublin Drainage)



The proposed stormwater outfall will not connect into these lines as modelled by the GDSDS. Since the GDSDS a new storm water sewer was laid along St. Johns Road West into which the proposed developments restricted storm water flow will discharge. This will ensure that local drainage infrastructure will not flood or adversely affect the site. See **Appendix G** for the relevant GDSDS Hydraulic Performance Map, an extract of which is shown in Figure 11.

## 14.0 CONCLUSIONS

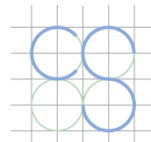
- 14.1 The Site Specific Flood Risk Assessment was carried out in accordance with the requirements of the national flood guidelines and Dublin City Councils Development Plan.
- 14.2 The subject lands has no historical evidence of on site flooding, based on historical records from the OPW.
- 14.3 A review of Dublin City Councils Development Plan indicates that the subject site is located in Flood Zone 'C', while the proposal is for residential units, which are deemed 'highly vulnerable' a justification test is not required due to the Flood Zone 'C' designation.
- 14.4 CFRAM Fluvial maps produced by the OPW does not indicate the site is vulnerable to the potential of onsite flooding from Fluvial sources, River Liffey or Camac. Therefore, the risk due to fluvial flooding is considered to be negligible.
- 14.5 Dublin City Council's pluvial flood mapping does not indicate that the subject lands are located in an area subject to pluvial flooding. Therefore, the risk due to pluvial flooding is considered to be negligible.
- 14.6 As the subject site is located close to the tidally influence River Liffey a review of this potential pathway was undertaken. Mapping provided by the OPW does not indicate that the site would be affected by tidal flood events. Therefore, the risk due to tidal flooding is considered to be negligible.
- 14.7 The potential for infrastructure failure either from offsite or from within the proposed developments storm water drainage systems was assessed. The sites elevation about the public road network would prevent storm water entering the site and the developments use of a storm water attenuation



system to restrict storm water flows existing the site it is considered that the potential for flooding either on/off site due to infrastructure failure is remote.

- 14.8 A review of groundwater flooding sources for the subject site did not establish a potential route for groundwater flooding. As the proposed development is to complete a previous development there is no requirement for a basement to be installed as one was previously constructed. A review of the GSI database does not indicate that the site has experienced flooding from past events, nor does it predict groundwater flooding in the future. As such, the potential for groundwater flooding is deemed to be negotiable.

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 remote.



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## Appendix A

### **OPW Historic Flood Mapping**

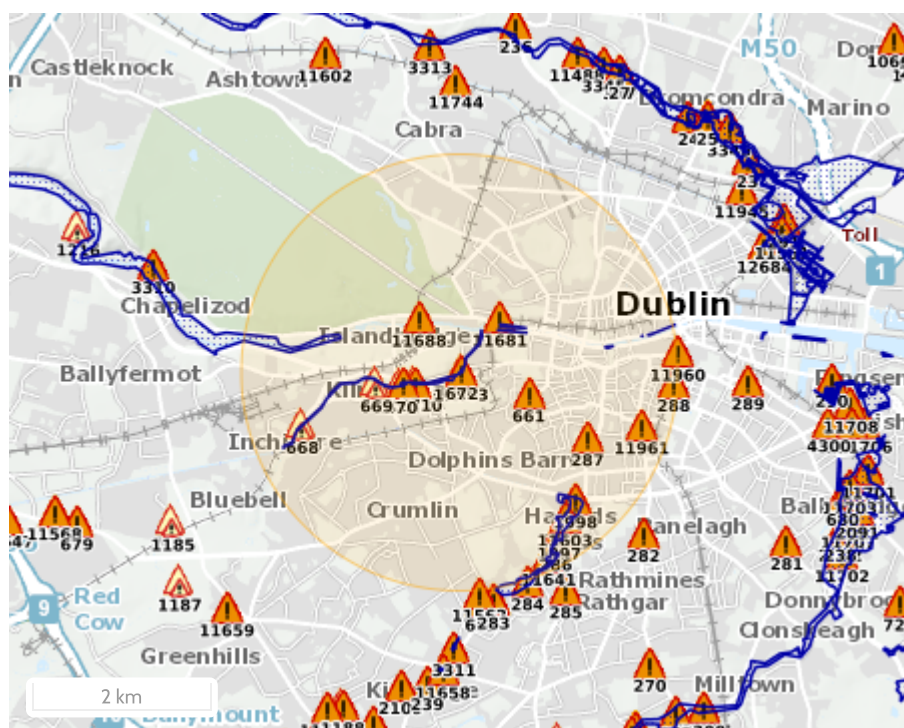




Report Produced: 17/12/2020 12:31

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](http://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

## 24 Results

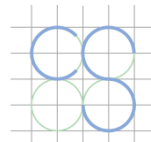
Name (Flood_ID)	Start Date	Event Location
1.  Flooding on Wexford St, Dublin 2 on 26th July 2013 (ID-11961) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	26/07/2013	Approximate Point
2.  Poddle August 1986 (ID-32) Additional Information: <a href="#">Reports (9)</a> <a href="#">Press Archive (1)</a>	25/08/1986	Area
3.  Dublin City Tidal Feb 2002 (ID-456) Additional Information: <a href="#">Reports (45)</a> <a href="#">Press Archive (27)</a>	01/02/2002	Area
4.  Mount Jerome Harold's Cross June 1963 (ID-286) Additional Information: <a href="#">Reports (4)</a> <a href="#">Press Archive (2)</a>	11/06/1963	Exact Point
5.  Clanbrassil Street June 1963 (ID-287) Additional Information: <a href="#">Reports (4)</a> <a href="#">Press Archive (2)</a>	11/06/1963	Exact Point
6.  Grafton Street June 1963 (ID-288) Additional Information: <a href="#">Reports (4)</a> <a href="#">Press Archive (2)</a>	11/06/1963	Exact Point

Name (Flood_ID)	Start Date	Event Location
7.  Camac Turvey Ave Recurring (ID-669) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	n/a	Exact Point
8.  Poddle Tributary Marrowbone Lane Jan 1941 (ID-661) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	21/01/1941	Approximate Point
9.  Camac Goldenbridge Recurring (ID-668) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	n/a	Approximate Point
10.  Camac Carrickfoyle Terrace Recurring (ID-670) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	n/a	Exact Point
11.  Camac Kearns Place Recurring (ID-671) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	n/a	Exact Point
12.  Camac Bow Bridge Recurring (ID-672) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	n/a	Approximate Point
13.  Poddle St Claires Ave Sept 1931 (ID-1997) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	03/09/1931	Approximate Point
14.  Poddle Limekiln Lane Aug 1905 (ID-1998) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	24/08/1905	Approximate Point
15.  Poddle Limekiln Lane Sept 1931 (ID-3267) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	03/09/1931	Approximate Point
16.  Liffey Lower - Dec 1954 (ID-241) Additional Information: <a href="#">Reports (5)</a> <a href="#">Press Archive (2)</a>	08/12/1954	Area
17.  Camac August 1986 (ID-125) Additional Information: <a href="#">Reports (3)</a> <a href="#">Press Archive (0)</a>	25/08/1986	Area
18.  Flooding at Bow Lane, Kilmainham, Dublin 8 on 24th Oct 2011 (ID-11563) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	24/10/2011	Approximate Point
19.  Flooding at Harold's Cross, Dublin City on 24th Oct 2011 (ID-11603) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	24/10/2011	Approximate Point
20.  Flooding at Kearns Place, Kilmainham, Dublin 8 on 24th Oct 2011 (ID-11620) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	24/10/2011	Approximate Point
21.  Flooding at Lady's Lane, Kilmainham, Co. Dublin on 24th Oct 2011 (ID-11622) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	24/10/2011	Approximate Point
22.  Flooding at Mount Argus Road and Kimmage Road Lower on 24th Oct 2011 (ID-11641) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	24/10/2011	Exact Point
23.  Flooding at Ashling Hotel, Parkgate Street, Dublin 8 on 24th Oct 2011 (ID-11681) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	24/10/2011	Exact Point



	Name (Flood_ID)	Start Date	Event Location
24.	 Flooding at Bridgewater Quay Apartments, Islandbridge, Dublin 8. on 24th Oct 2011 (ID-11688) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	24/10/2011	Exact Point





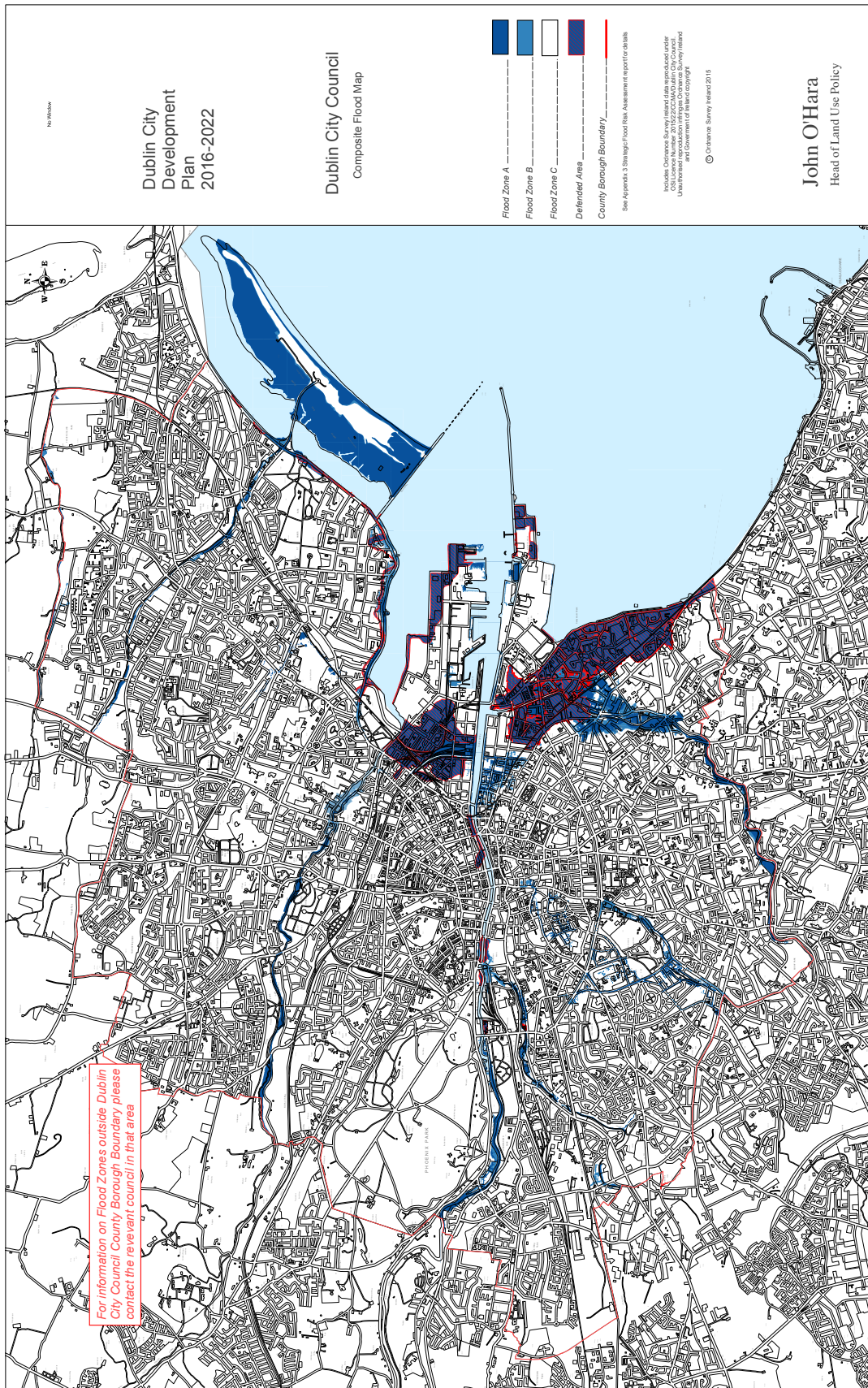
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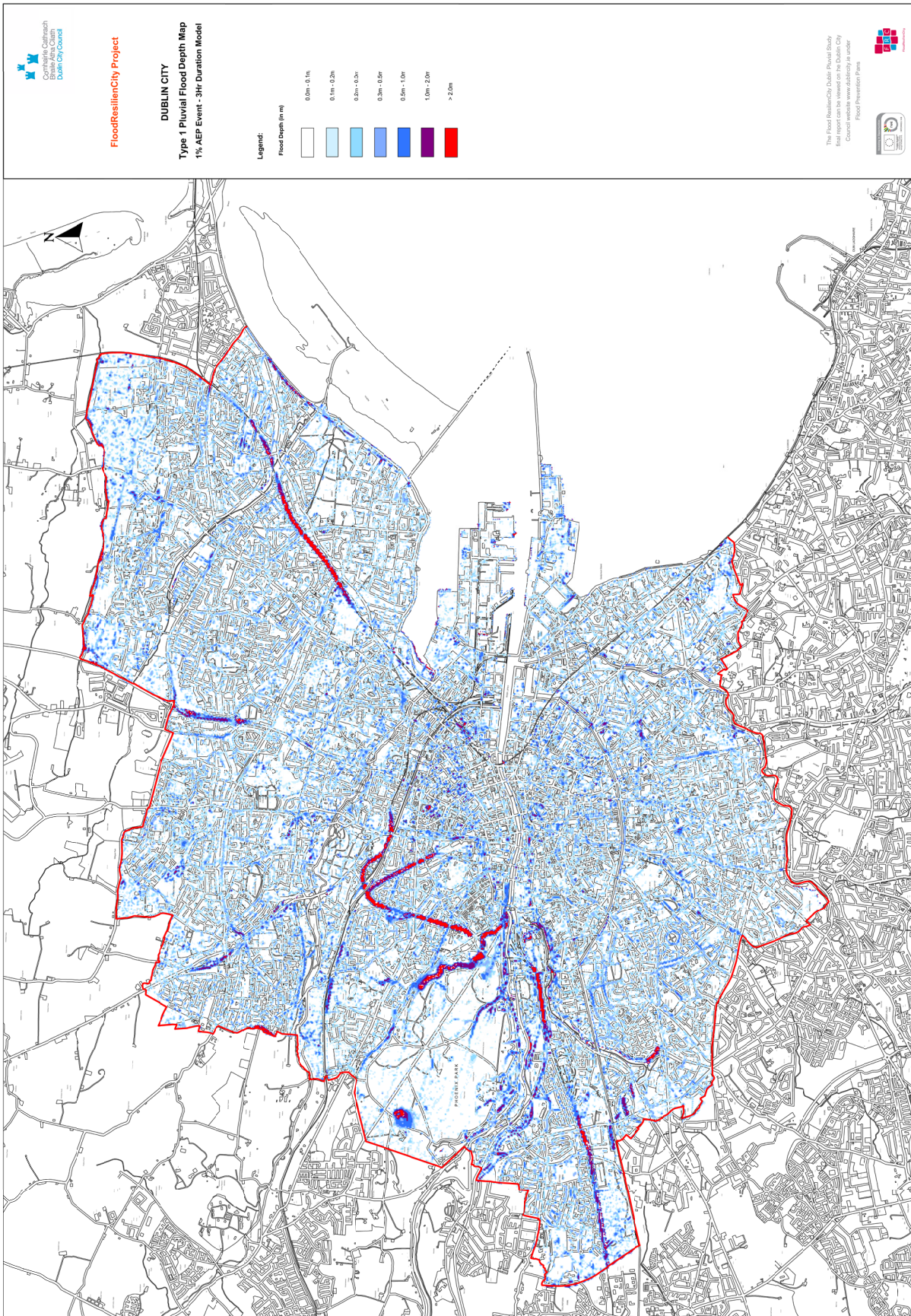
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## Appendix B

### **Dublin City Council Flood Zoning**



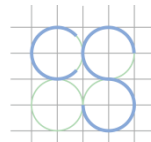












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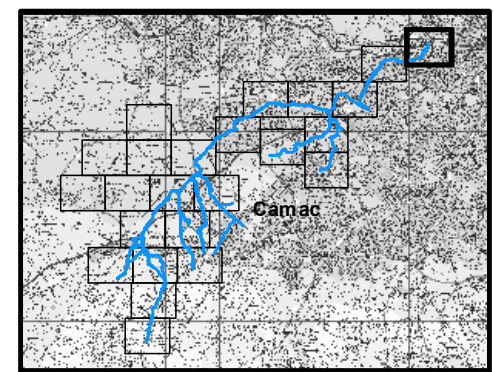
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## Appendix C

### **OPW Fluvial Flood 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
09Camm00084	6.88	N/A	7.68	N/A	8.49	N/A
09Camm000271	3.29	32.00	4.37	50.7	6.09	88.70
09Camm00125	9.61	N/A	10.18	N/A	10.93	N/A



**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
  - Embankment
  - Wall
  - Defended Area
  - 1% AEP Standard of Protection of Flood Defence (Walls / Embankments)
  - 0.1% AEP Standard of Protection of Flood Defence (Walls / Embankments)
  - Node Point
  - Node ID Node Label

FINAL

REV: 01	NOTE: SOP label updated (Pg 21) Removal of Def. Area (Pg 21)	DATE: 13/11/2017
---------	-----------------------------------------------------------------	------------------

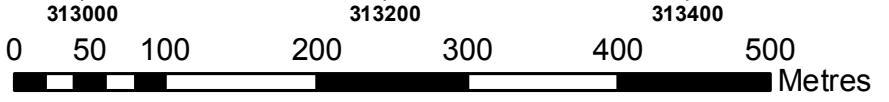


The Office of Public Works  
Jonathan Swift Street  
Trim  
Co Meath

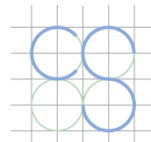
Elmwood House  
74 Boucher Road  
Belfast  
BT12 6RZ

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

<b>Map:</b> Camac Fluvial Flood Extents
<b>Map Type:</b> EXTENT
<b>Source:</b> FLUVIAL
<b>Map Area:</b> HPW
<b>Scenario:</b> CURRENT
<b>Drawn By:</b> C.McG. <b>Date:</b> 13 November 2017
<b>Checked By:</b> A.S. <b>Date:</b> 13 November 2017
<b>Approved By:</b> S.P. <b>Date:</b> 13 November 2017
<b>Drawing No.:</b> E09CAM_EXFCD_F1_24
<b>Map Series:</b> Page 24 of 24
<b>Drawing Scale:</b> 1:5,000 @A3







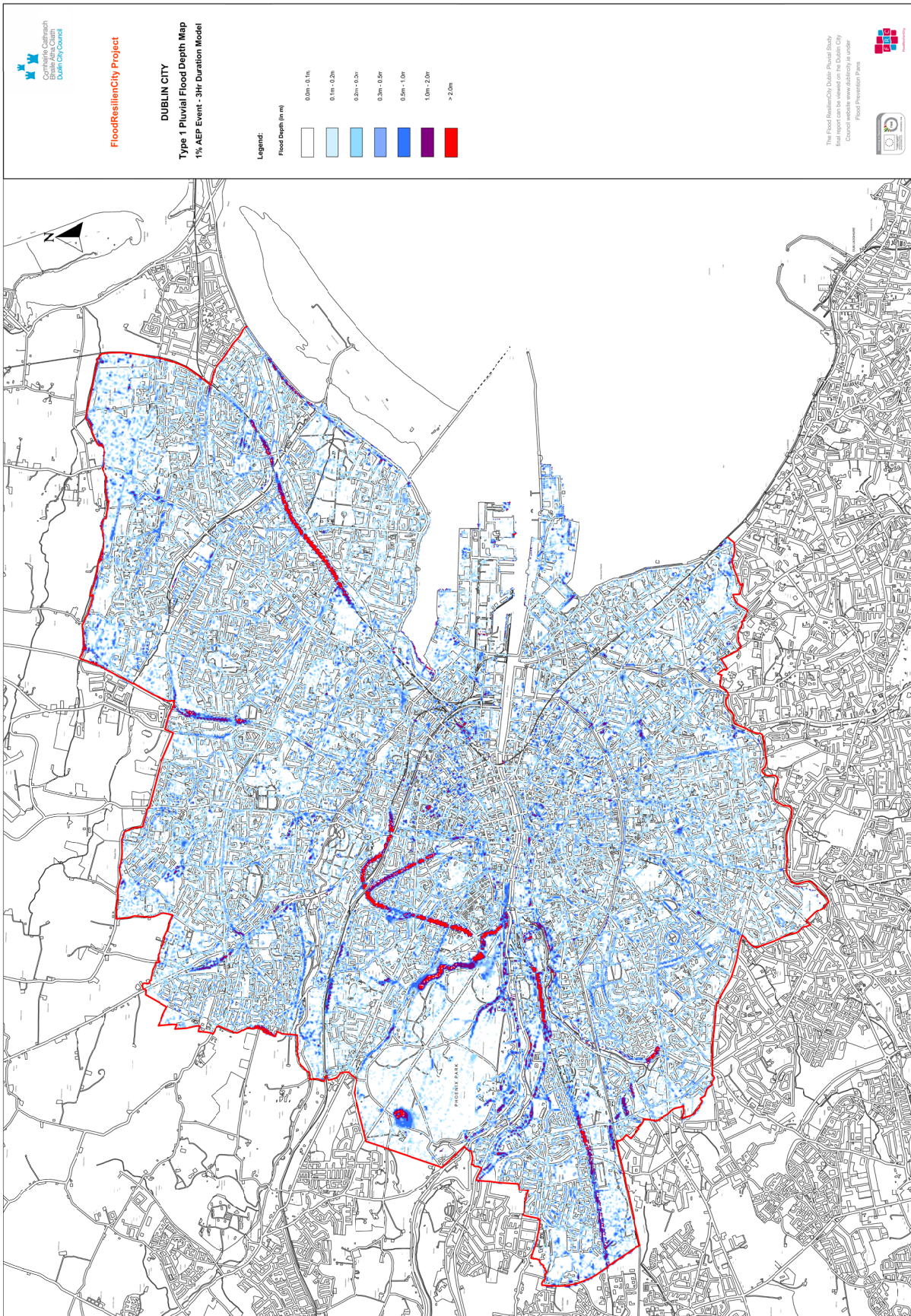
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## Appendix D

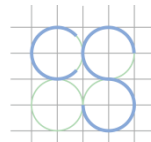
### **Pluvial Flooding Maps**











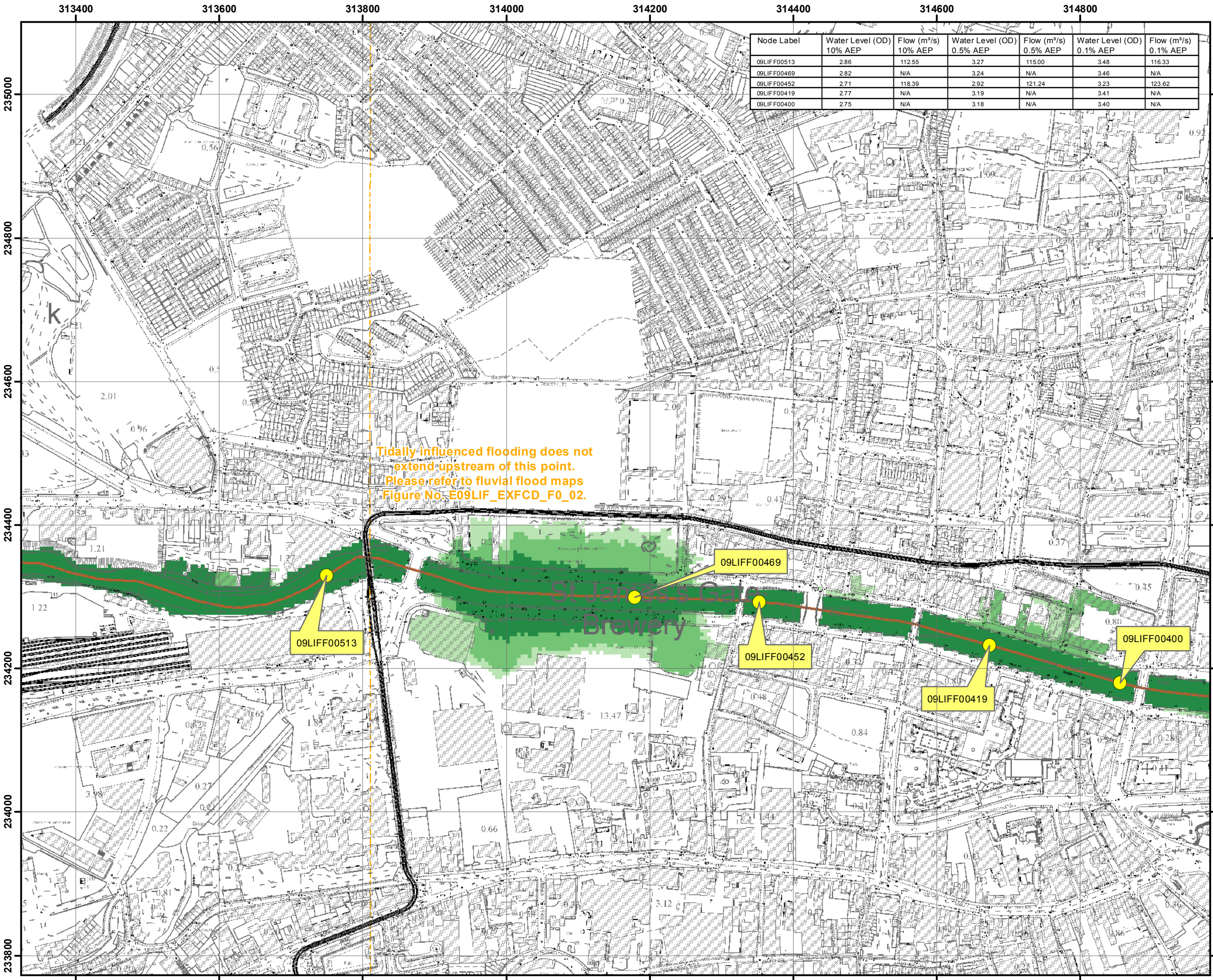
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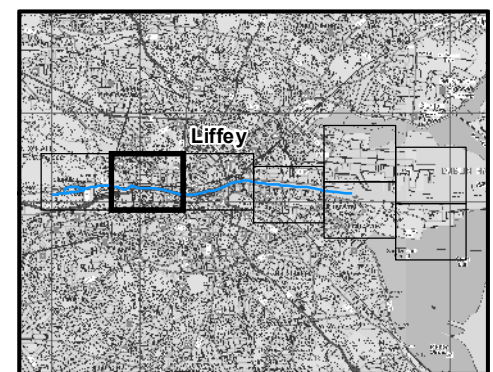
## Appendix E

### **OPW Tidal Flood Maps**





Node Label	Water Level (OD) 10% AEP	Flow (m³/s) 10% AEP	Water Level (OD) 0.5% AEP	Flow (m³/s) 0.5% AEP	Water Level (OD) 0.1% AEP	Flow (m³/s) 0.1% AEP
09LIFF00513	2.86	112.55	3.27	115.00	3.48	116.33
09LIFF00469	2.82	N/A	3.24	N/A	3.46	N/A
09LIFF00452	2.71	118.39	2.92	121.24	3.23	123.62
09LIF F00419	2.77	N/A	3.19	N/A	3.41	N/A
09LIFF00400	2.75	N/A	3.18	N/A	3.40	N/A



**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% Tidal AEP Event
- 0.5% Tidal AEP Event
- 0.1% Tidal AEP Event
- Modelled River Centreline
- AFA Extents
- Node Point
- Node ID

Tidally influenced flooding does not extend upstream of this point. Please refer to fluvial flood maps Figure No. E09LIF\_EXFCD\_F0\_02.

**FINAL**

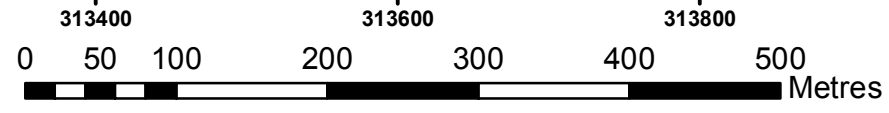
REV:	NOTE:	DATE:
01	Amendments to Flood Extents.	05/12/16



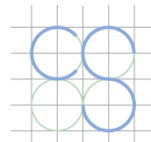
The Office of Public Works  
Jonathan Swift Street  
Trim  
Co Meath

Elmwood House  
74 Boucher Road  
Belfast  
BT 12 6RZ  
Eireland@rpsgroup.com

<b>Map:</b>	Liffey Tidal Flood Extents
<b>Map Type:</b>	EXTENT
<b>Source:</b>	TIDAL
<b>Map Area:</b>	COASTAL
<b>Scenario:</b>	CURRENT
<b>Drawn By:</b>	C.C. Date : 9 May 2017
<b>Checked By:</b>	A.S. Date : 9 May 2017
<b>Approved By:</b>	S.P. Date : 9 May 2017
<b>Drawing No.:</b>	E09LIF_EXCCD_F1_02
<b>Map Series:</b>	Page 2 of 8
<b>Drawing Scale:</b>	1:5,000 @ A3







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## Appendix F

### **GSI Geology & Hydrogeological Maps**





## Legend

### EPA CONTOUR 20m

— 0- 100m

### Groundwater Wells and Springs

□ Groundwater Wells and Springs

### Bedrock Aquifer

LI - Locally Important Aquifer - Bedrock  
which is Moderately Productive only in  
Local Zones

### Groundwater Vulnerability

X - Rock at or near surface or Karst

E - Extreme

H - High

M - Moderate

L - Low

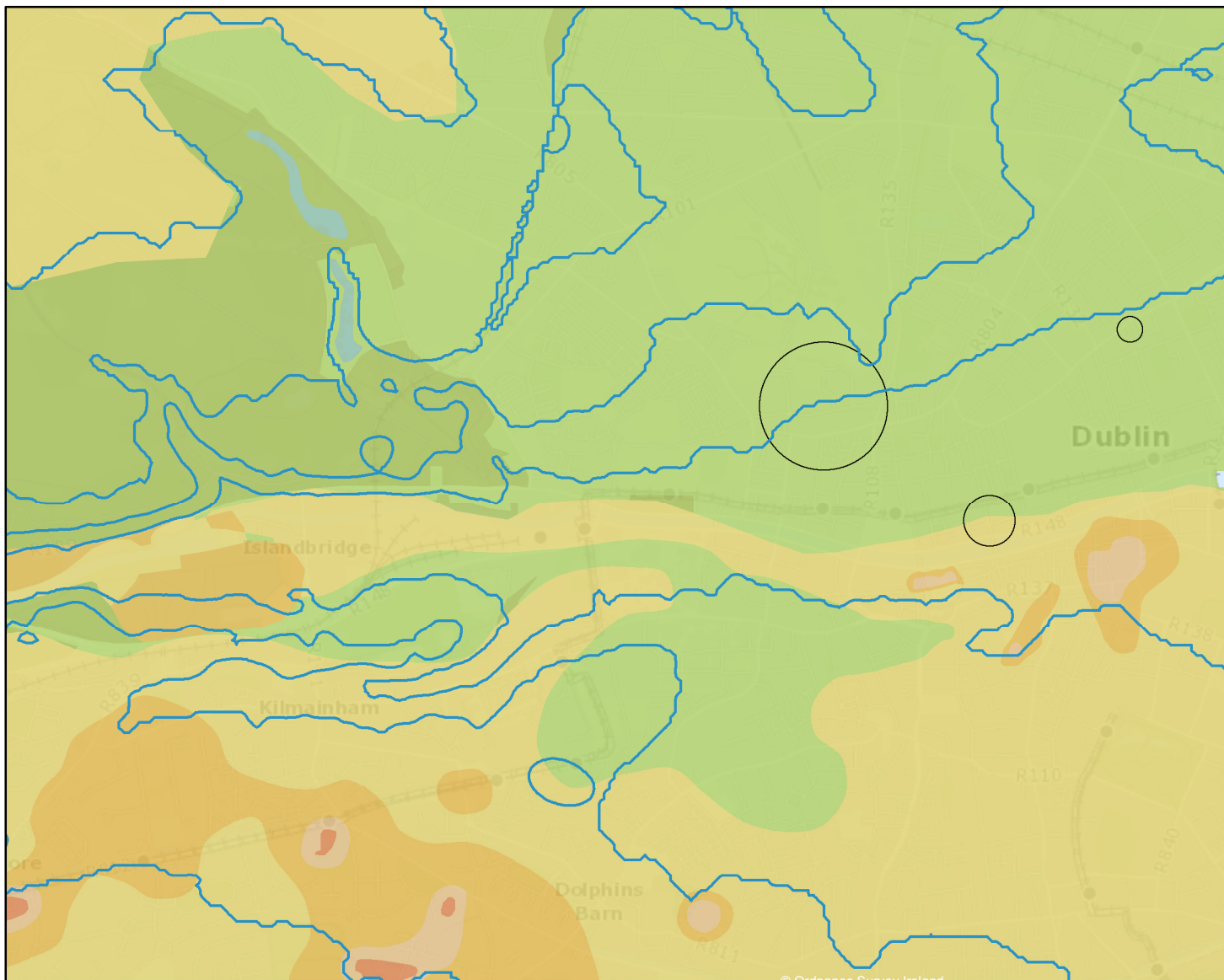
### Groundwater Recharge (mm/yr)

1-50 mm

51-100 mm

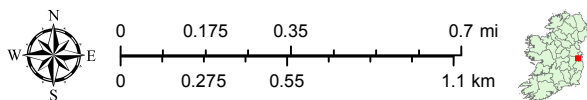
151-200 mm

Water



Scale: 1:25,000

Geological Survey Ireland



Map Centre Coordinates (ITM) 713,879 734,429  
22/02/2019, 10:03:22

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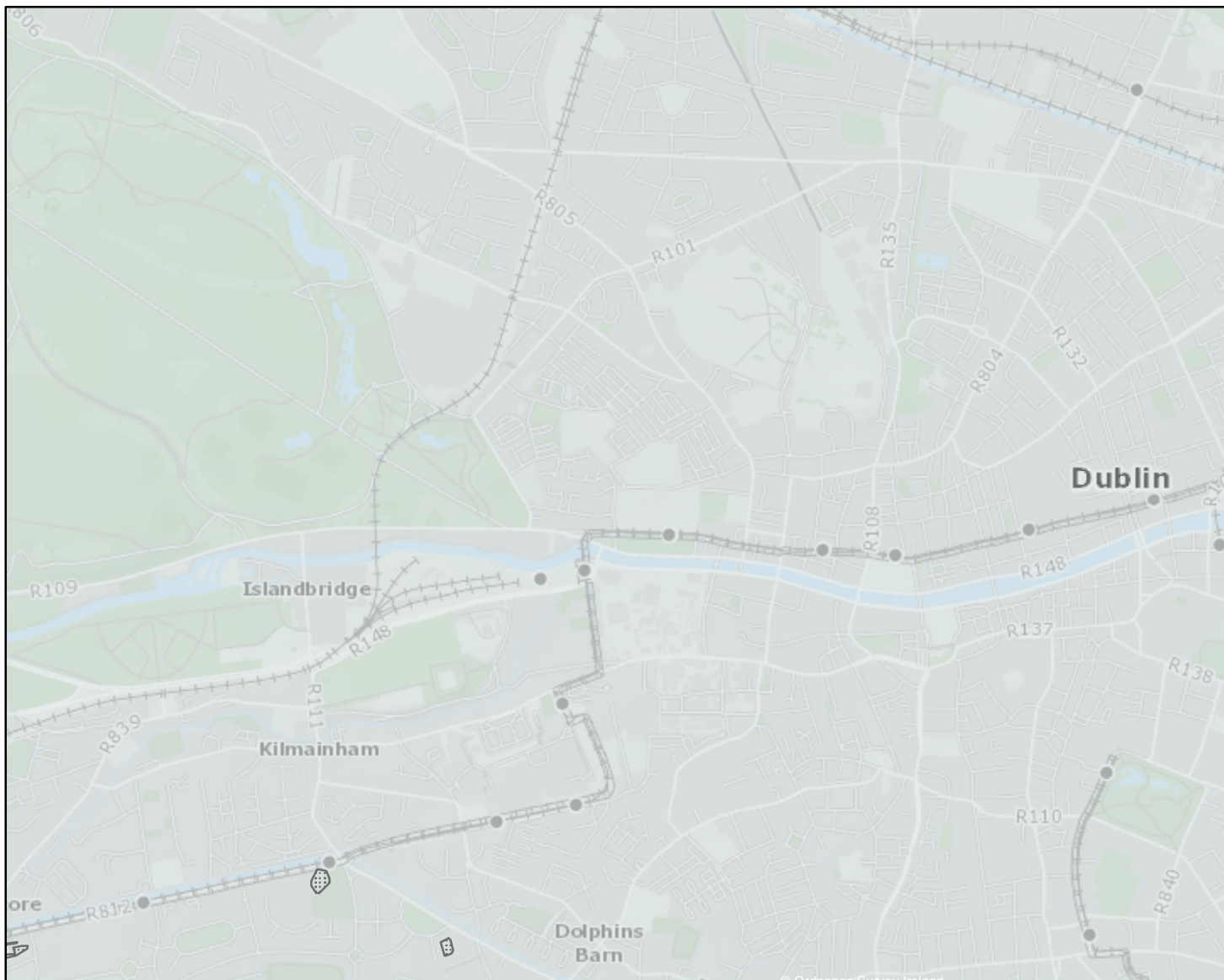
## Legend

Bedrock Outcrop

Bedrock Outcrop

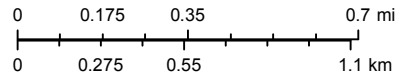
Bedrock Rock Units

Lucan Formation



Scale: 1:25,000

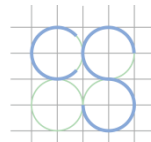
Geological Survey Ireland



Map Centre Coordinates (ITM) 713,879 734,591  
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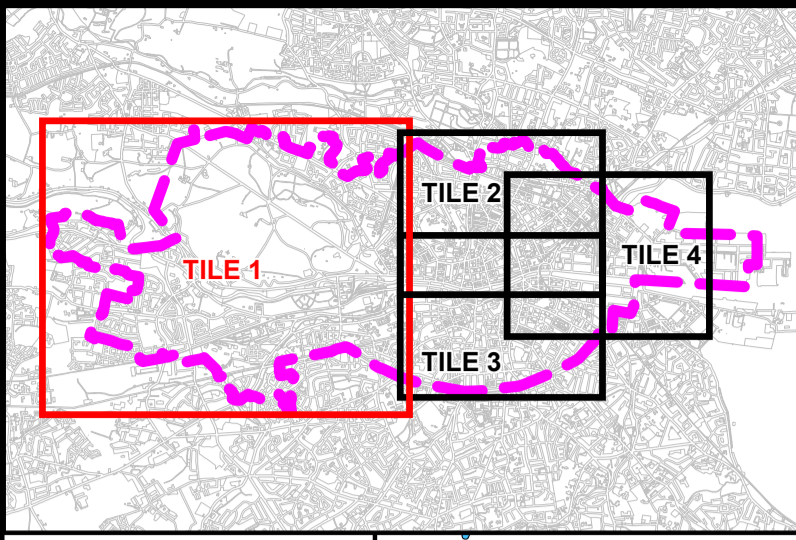
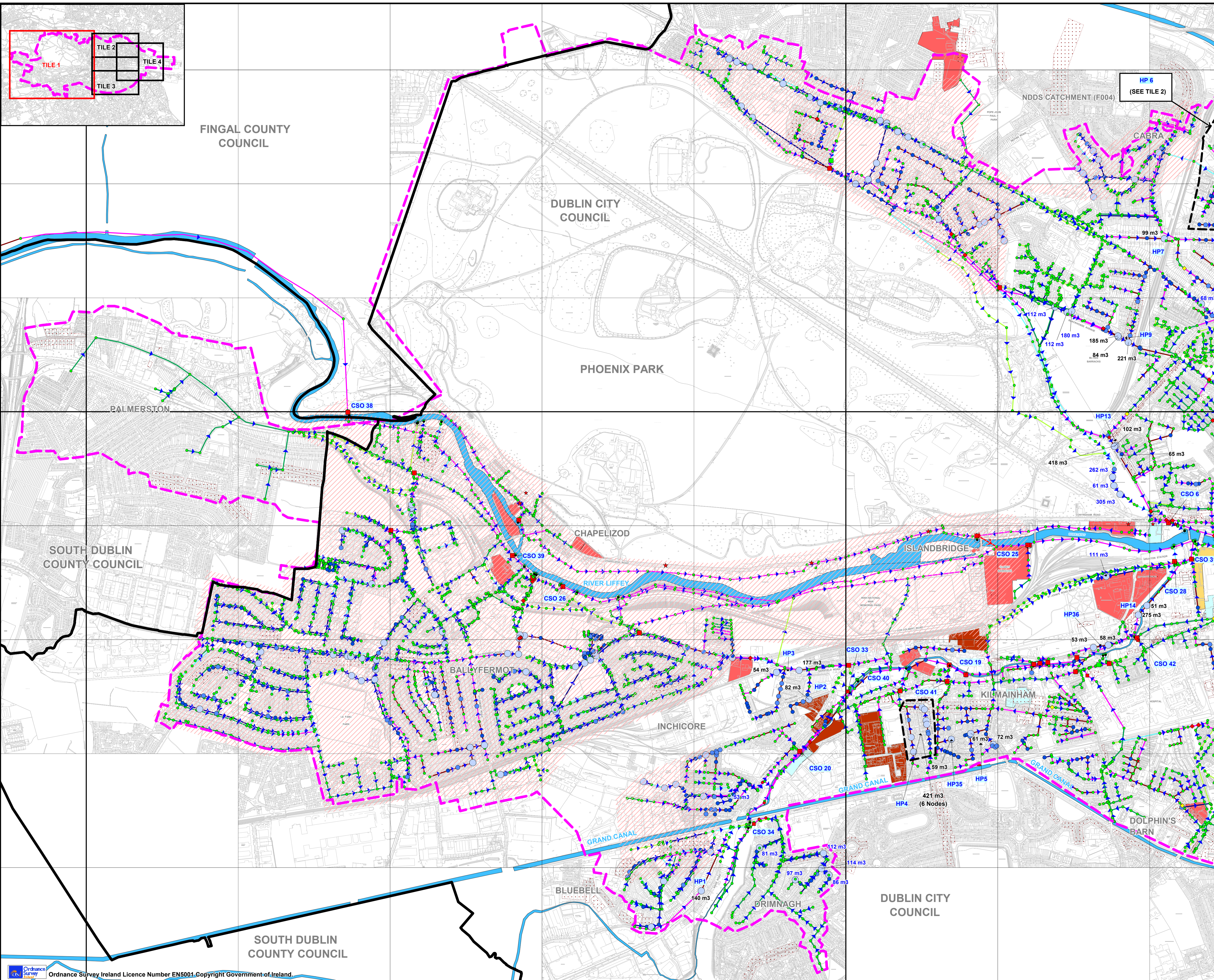
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## Appendix G

### **Greater Dublin Strategic Flood Risk Assessment**





**Legend**

- Wastewater Treatment Works
- County Council Boundaries
- Catchment Boundary
- Rising Main (Coloured as sewer)
- Sewer not included in hydraulic model
- Direction of Flow (on sewer line)
- River/Watercourse
- Culverted River/Watercourse
- 1:1000 OS Grid Line Boundaries
- 1:5000 OS Grid Line Boundaries
- Combined Sewer Overflow
- Foul/Combined Pumping Station
- Foul/Combined Bifurcation
- Foul/Combined Apex Manhole
- Foul/Combined Flow Management Chamber
- Storm Water Overflow to Foul/Combined
- Storm Water Bifurcation
- Storm Water Apex Manhole

**Flooding Performance Key**

- Flooding greater than 50m<sup>3</sup> Volume for 5yr Return Period Event (Volume m<sup>3</sup>)
- Flooding between 25m<sup>3</sup> and 50m<sup>3</sup> Volume for 5yr Return Period Event
- Flooding less than 25m<sup>3</sup> Volume for 5yr Return Period Event
- Modelled Manhole does not flood for 5 year Return Period Event

75m<sup>3</sup> 1:5 year Foul/Combined flood volume  
 75m<sup>3</sup> 1:5 year Storm flood volume

★ Historically Reported Flooding Incidents caused by Hydraulic Overloading

○ Outfall

**Foul/Combined Hydraulic Performance Key**

- Foul/Combined Sewer floods for 30 year return period or less.
- Foul/Combined Sewer surcharges for 1 or 2 year return period events
- Foul/Combined Sewer does not surcharge for 1 or 2 year return period events and does not flood for a 30 year return period event or below. (eg 1,2,5,10,20)

**Storm Hydraulic Performance Key**

- Storm Sewer floods for 30 year return period or less.
- Storm Sewer surcharges for 1 or 2 year return period events
- Storm Sewer does not surcharge for 1 or 2 year return period events and does not flood for a 30 year return period event or below. (eg 1,2,5,10,20)

Area Covered by EDS/DCC Asset Survey

**Important Hydraulic Considerations**

- Location of Known Basements
- Zoned Residential Land
- Zoned Science/Technology Parks/Land
- Zoned Industrial Land
- Zoned Commercial Land
- Zoned Land for Mixed Development
- Recently Completed Developments

**Catchment Deficiency Reference Key**

- HP 1 Hydraulic Deficiency Reference No (Foul/Combined) (Not included for EDS/DCC Asset Survey area).
- CSO 1 CSO Deficiency Reference No. (Hydraulic or Environmental)
- OP 1 Operational Deficiency Reference No.

**Notes**

- Results are based on assessment of sewer system under 1, 2, 5, 10, 20, 30, 50 and 100 year return period rainfall events.
- For colour coding, flooding takes priority over surcharging.
- Levels referenced in meters to Ordnance Survey Datum, which is Mean Sea Level at Malin Head, Co. Donegal (1970 Adjustment).

**GREATER DUBLIN STRATEGIC DRAINAGE STUDY**

**CITY CENTRE/DOCKLANDS CATCHMENT**

**PHASE 3 - 2031 System Performance Assessment**

**GDSDS/MAR3079/F001/P3-003\_Tile1**

Drawn	JGA	Check	MCB
Reviewed	MCB		
Scale	N.T.S.	Revision	A
Date	7/5/04		

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Dublin Drainage  
A Strategic Study for Greater Dublin

