

Ruirside Developments Limited

## Parkgate Street Blocks A and B2

### Site Specific Flood Risk Assessment

Reference: PGATE-ARUP-ZZ-XX-RP-CF-0002

Issue 2 | 21 February 2025



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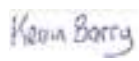
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Job number 265381-00

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## Document Verification

**Project title** Parkgate Street Blocks A and B2  
**Document title** Site Specific Flood Risk Assessment  
**Job number** 265381-00  
**Document ref** PGATE-ARUP-ZZ-XX-RP-CF-0002  
**File reference** 2025-02-21\_Parkgate Street\_Flood Risk Assessment.docx

Revision	Date	Filename	Parkgate Street - Flood Risk Assessment_ISSUE.docx		
Issue 1	24 May 2021	Description	First Issue		
			Prepared by	Checked by	Approved by
		Name	Tony Breen	Kevin Barry	Cloragh Byrne
		Signature			
Draft	10 Feb 2025	Filename	2025-02-10_Parkgate Street_Flood Risk Assessment.docx		
		Description	Updated for new planning application		
			Prepared by	Checked by	Approved by
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		Signature			
Issue 3	21 Feb 2025	Filename	2025-02-21_Parkgate Street_Flood Risk Assessment.docx		
		Description	Issued for planning		
			Prepared by	Checked by	Approved by
		Name	Lisa Condon	Kevin Barry	Sean Barrett
		Signature			

Issue Document Verification with Document



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## Photographs

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# 1. Introduction

## 1.1 Background

Arup was commissioned by Ruirside Developments Limited to prepare a Site-Specific Food Risk Assessment (FRA) for a proposed mixed-use development on 42A Parkgate Street in Dublin 8 ('the proposed development').

This report details the site-specific FRA which forms part of the planning application for the proposed development. It has been undertaken in accordance with the Guidelines for Planning Authorities on 'The Planning System and Flood Risk Management Guidelines for Planning Authorities' published in November 2009, jointly by the Office for Public Works (OPW) and the then Department of Environment, Heritage and Local Government (DEHLG).

## 1.2 Scope of Work

The scope of the study includes the following:

- Review of all relevant information and data from:
  - The Office of Public Works (OPW) Preliminary Flood Risk Assessment Mapping (PFRA);
  - Eastern Catchment Flood Risk Assessment and Management (CFRAM) Study;
  - The Dublin City Council Development Plan 2022 – 2028;
  - Any historic flood information for the area and/or any relevant studies.
- Review of available site investigation data;
- Review of the risk of coastal, fluvial, pluvial and groundwater flooding; and
- Preparation of an FRA Report.

## 1.3 Summary of Data Used

In preparing this report, the following data was collated and reviewed:

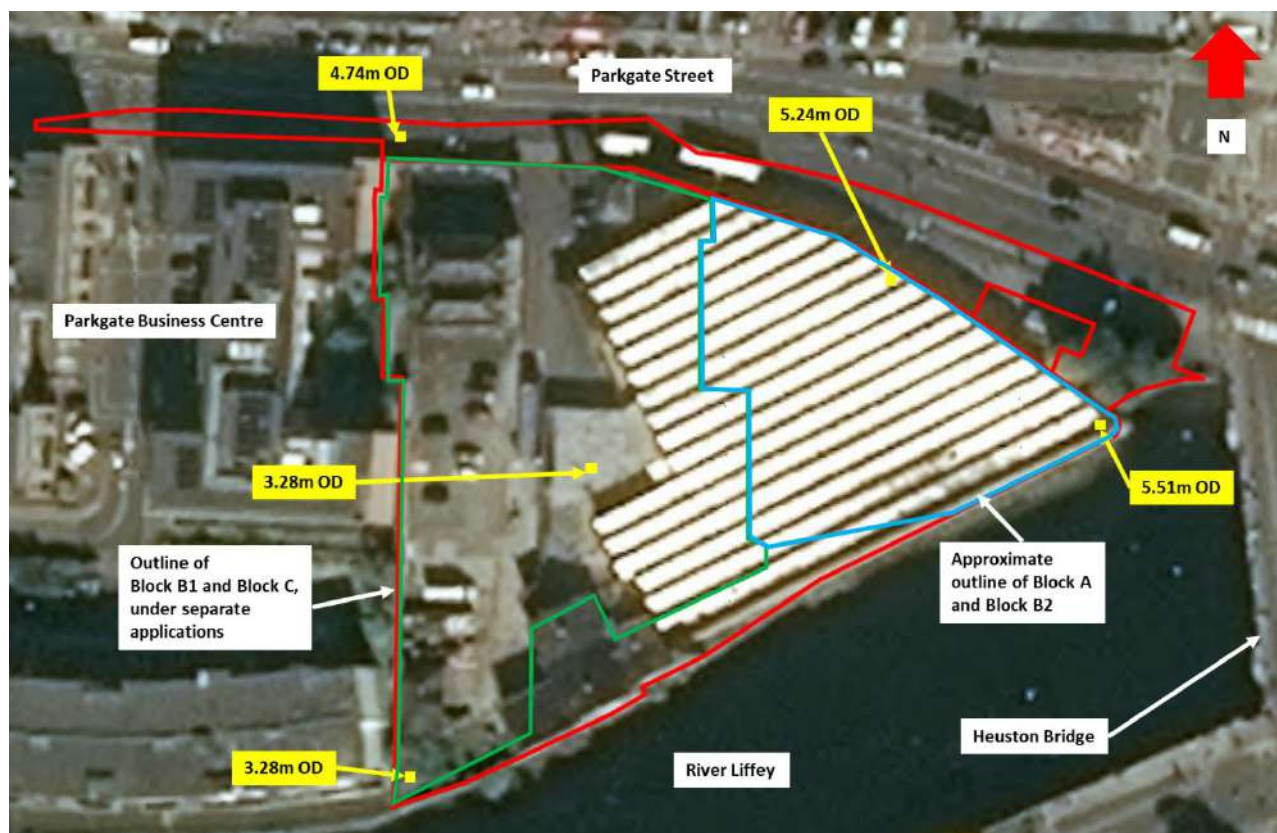
- Eastern Catchment Flood Risk Assessment and Management (CFRAM) report and mapping, produced by the OPW ([www.floodinfo.ie](http://www.floodinfo.ie));
- Flood history of the site from the OPW National Flood Hazard Mapping website (<https://www.floodinfo.ie/map/floodmaps/>);
- Site geological and hydrogeological data from the Geological Survey of Ireland website ([www.gsi.ie](http://www.gsi.ie));
- Guidelines for Planning Authorities on 'The Planning System and Flood Risk Management', published in November 2009, jointly by the Office of Public Works (OPW) and the then Department of Environment, Heritage and Local Government (DEHLG);
- Ground Investigation Report for Hickeys 43 Parkgate Place, completed by Ground Investigations Ireland, July 2019;
- Ground Investigation Report No. 8483, Hickey & Co., Parkgate Street on behalf of Arup IGSL, March 2003;
- Dublin City Development Plan 2022 – 2028 (<https://www.dublincity.ie/residential/planning/strategic-planning/dublin-city-development-plan/development-plan-2022-2028>); and
- Aerial photography and mapping from Bing Maps and Google Maps.



Note that all Ordnance Datum (OD) levels referred to in this report are to Malin Head Ordnance Datum.

## 1.4 Site Description

The site of the proposed development is located on 42A Parkgate Street, Dublin 8 as indicated in Figure 1. The site is bordered to the north by Parkgate Street, to the south by the River Liffey, to the west by the Parkgate Business Centre and to the east by both the River Liffey and Parkgate Street.



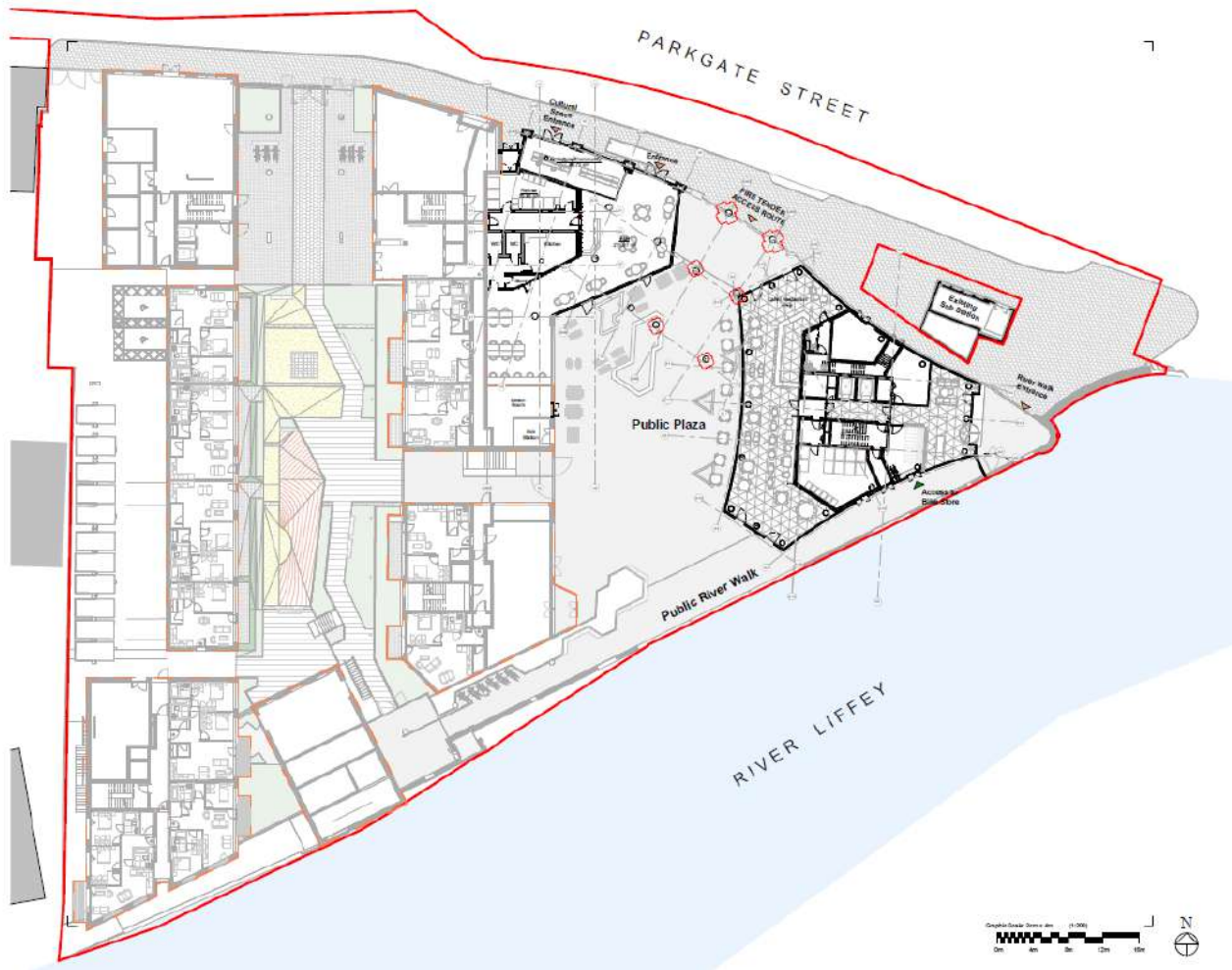
**Figure 1: Site location (source: Bing Maps)**

Existing ground levels across the site vary from approximately 3.30mOD at the southwest boundary to 5.50mOD at the northeast boundary as indicated in Figure 1. Please refer to Appendix A for the detailed topographical survey of the existing site, which was completed by Precision Surveys in July 2018.

## 1.5 Proposed Development

The proposed development comprises amendments to development permitted under ABP Ref. ABP-310567-21 (as amended by DCC Reg. Ref. LRD6042/23) at No. 42A Parkgate Street, Dublin 8 to expand the footprint and façade of Block A to accommodate a 2nd fire core. As a result of the expanded footprint, Block B2 has been reconfigured to provide 8no. new 'Build-to-Sell' apartments (1no. unit per floor) and 1no. 2-bedroom apartment in place of a 1-bedroom unit at the interface of Block A and Block B2 (increases to 48no. units total). Overall, the amendments result in the combined number of apartments increasing from 238no. units to 246no. units in Block A and Block B2.

A plan drawing of the ground floor of the proposed development is presented in Figure 2.



**Figure 2: Plan drawing of ground floor of the proposed development**

## 2. Planning Context

The following planning policy documents are relevant to the assessment of the proposed development:

- The National Planning Guidelines published by the OPW and the Department of the Environment, Heritage and Local Government in November 2009 entitled 'The Planning System and Flood Risk Management Guidelines for Planning Authorities'; and
- The Dublin City Council Development Plan 2022 – 2028.

### 2.1 The Planning System and the Flood Risk Management Guidelines

#### 2.1.1 Introduction

In November 2009, the Department of Environment, Heritage and Local Government and the Office of Public Works jointly published a Guidance Document for Planning Authorities entitled 'The Planning System and Flood Risk Management Guidelines for Planning Authorities'.

The Guidelines are issued under Section 28 of the Planning and Development Act 2000. Planning Authorities and An Bord Pleanála are therefore required to implement these Guidelines in carrying out their functions under the Planning Acts.



The aim of the Guidelines is to ensure that flood risk is neither created nor increased by inappropriate development. The Guidelines require the planning system to avoid development in areas at risk of flooding, unless the development can be justified on wider sustainability grounds and the risk can be reduced or managed to an acceptable level.

The Guidelines require the adoption of a Sequential Approach (to Flood Risk Management) of Avoidance, Reduction, Justification and Mitigation and they require the incorporation of Flood Risk Assessment into the process of making decisions on Planning Applications and Planning Appeals.

Fundamental to the Guidelines is the introduction of flood risk zoning and the classifications of different types of development having regard to their vulnerability.

The management of flood risk is now a key element of any development proposal in an area of potential flood risk and should therefore be addressed as early as possible in the site master planning stage.

### 2.1.2 Definition of Flood Zones

Flood Zones are geographical areas within which the likelihood of flooding is in a particular range. There are three types of flood zones defined in the Guidelines, as follows:

**Table 1: Flood zones (source: OPW Guidelines)**

Flood Zone	Probability
Flood Zone A	Probability of flooding from rivers and the sea is highest (greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 for coastal flooding).
Flood Zone B	Probability of flooding from rivers and the sea is moderate (between 0.1% or 1 in 1000 year and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding).
Flood Zone C	Probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 for both river and coastal flooding). Flood Zone C covers all areas of the plan which are not in zones A or B.

### 2.1.3 Definition of Vulnerability Classes

The following table summarises the Vulnerability Classes defined in the Guidelines and provides a sample of the most common type of development applicable to each.

**Table 2: Vulnerability classes (source: OPW Guidelines)**

Vulnerability	Type of Development
Highly Vulnerable Development	Includes Garda, ambulance and fire stations, hospitals, schools, residential dwellings, residential institutions, essential infrastructure, such as primary transport and utilities distribution and SEVESO and IPPC sites, etc.
Less Vulnerable Development	Includes retail, leisure, warehousing, commercial, industrial and non-residential institutions, etc.
Water Compatible Development	Includes flood control infrastructure, docks, marinas, wharves, navigation facilities, water-based recreation facilities, amenity open spaces and outdoor sport and recreation facilities.

### 2.1.4 Types of Vulnerability Classes Appropriate to Each Zone

The following table illustrates the different types of Vulnerability Class appropriate to each Zone and indicates where a Justification Test will be required.

**Table 3: Vulnerability classes for each zone (source: OPW Guidelines)**

Vulnerability Class	Flood Zone A	Flood Zone B	Flood Zone C
Highly Vulnerable	Justification Test	Justification Test	Appropriate
Less Vulnerable	Justification Test	Appropriate	Appropriate
Water Compatible	Appropriate	Appropriate	Appropriate

## 2.2 The Dublin City Council Development Plan 2022 – 2028

The Dublin City Development Plan 2022 – 2028 came into effect in December 2022.

The Plan sets out policies and objectives to create a sustainable and vibrant city at the heart of the Greater Dublin Region and is a guide to how and where development will take place in the city over the years covered. The following paragraphs summarise the relevant provisions contained within the Plan which deal with Flood Risk Management.

Section 9.5.3 of the Plan deals with Flood Management and outlines the key policies and objectives of Dublin City Council in relation to flood risk.

The policies are listed as:

- SI13: To minimise the flood risk in Dublin City from all other sources of flooding as far as is practicable, including fluvial, coastal, reservoirs and dams, the piped water system, and potential climate change impacts.
- SI14: To implement and comply fully with the recommendations of the Strategic Flood Risk Assessment prepared as part of the Dublin City Development Plan 2022-2028, including all measures to mitigate identified climate change and flood risks, including those recommended under Part 3 (Specific Flood Risk Assessment) of the Justification Tests, and to have regard to the Flood Risk Management Guidelines (2009), as revised by Circular PL 2/2014, when assessing planning applications and in the preparation of statutory and non-statutory plans.
- SI15: All development proposals shall carry out, to an appropriate level of detail, a Site-Specific Flood Risk Assessment (SSFRA) that shall demonstrate compliance with:
  - The Planning System and Flood Risk Management, Guidelines for Planning Authorities, Department of the Environment, Community and Local Government (2009), as revised by Circular PL 2/2014 and any future amendments, and the Strategic Flood Risk Assessment (SFRA) as prepared by this development plan.
  - The application of the sequential approach, with avoidance of highly and less vulnerable development in areas at risk of flooding as a priority and/ or the provision of water compatible development only. Where the Justification Test for Plan Making and Development Management have been passed, the SSFRA will address all potential sources of flood risk and will consider residual risks including climate change and those associated with existing flood defences. The SSFRA will include sitespecific mitigation measures, flood-resilient design and construction, and any necessary management measures (the SFRA and Appendix B of the above mentioned national guidelines refer). Attention shall be given in the site-specific flood risk assessment to building design and creating a successful interface with the public realm through good design that addresses flood concerns but also maintains appealing functional streetscapes. Allowances for climate change shall be included in the SSFRA.
  - On lands where the Justification Test for Plan Making has been passed and where a small proportion of the land is at significant risk of flooding, the sequential approach to development will be applied, and development will be limited to Minor Development (Section 5.28 of the Planning System and Flood Risk Management Guidelines 2009) on the portion at significant risk of flooding. There will be a presumption against the granting of permission for highly or less vulnerable development which encroaches onto or results in the loss of the flood plain. Water

compatible development only will be considered in such areas at risk of flooding which do not have existing development on them.

- SI16: Proposals which may be classed as ‘minor development’, for example smallscale infill, extensions to houses and small-scale extensions to existing commercial and industrial enterprises in Flood Zone A or B, should be assessed in accordance with the Guidelines for Planning Authorities on the Planning System and Flood Risk Management and Technical Appendices (2009), as revised by Circular PL 2/2014 and any future amendments, with specific reference to Section 5.28 and in relation to the specific requirements of the Strategic Flood Risk Assessment. This will include an assessment of the impact of climate change and appropriate mitigation. The policy shall be not to increase the risk of flooding to the development or to third party lands, and to ensure risk to the development is managed.
- SI17: To assist the OPW in implementing catchment-based Flood Risk Management Plans for rivers, coastlines and estuaries in the Dublin City area, including planned investment measures for managing and reducing flood risk, and have regard to their provisions/ recommendations.
- SI18: To put in place adequate measures to protect the integrity of flood alleviation infrastructure in Dublin City and to ensure new developments or temporary removal of any flood alleviation asset does not increase flood risk, while ensuring that new flood alleviation infrastructure has due regard to nature conservation, natural assets, open space and amenity values, as well as potential climate change impacts.
- SI19: To facilitate the provision of new, or the upgrading of existing, flood alleviation assets where necessary and in particular, the implementation of proposed flood alleviation schemes, on the Santry, Camac, Dodder, Wad, Naniken, Mayne, Tolka and Poddle rivers as well as Clontarf Promenade, Sandymount/ Promenade (northwards towards Irishtown Nature Park subject to the outcome of a flood/ environmental study), Liffey estuary and any other significant flood risk areas being progressed through the planning process to completion during the lifetime of the 2022-2028 Dublin City Development Plan, with due regard to the protection of natural heritage, built heritage and visual amenities, as well as potential climate change impacts.
- SI20: That there is a general presumption against the development of basements for residential use below the estimated flood levels for Flood Zones A or B (see Section 15.18.4 and Appendix 9 for further guidance).
- SI21: To minimise flood risk arising from pluvial (surface water) flooding in the City by promoting the use of natural or nature-based flood risk management measures as a priority, by requiring the use of sustainable drainage systems (SuDS) to minimise and limit the extent of hard surfacing and paving, and requiring the use of sustainable drainage techniques, where appropriate, for new development or for extensions to existing developments, in order to reduce the potential impact of existing and predicted flooding risk and to deliver wider environmental and biodiversity benefits, and climate adaption.

The Objectives of Dublin City Council are listed as:

- SIO10: To support and facilitate the OPW in its duty to maintain flood relief schemes completed under the Arterial Drainage Acts, 1945-1995, including the schemes at River Dodder (Tidal), River Tolka, River Wad (Clanmoyle) South Campshires and Spencer Dock.
- SIO11: To work with neighbouring local authorities when developing cross-boundary flood management work programmes and when considering cross-boundary development.
- SIO12: To work with the OPW in the development and implementation of catchment-based strategies for the management of flood risk – including those relating to storage and conveyance, and climate adaption.

Regarding the provision of Sustainable Urban Drainage Systems (Section 9.5.4 of the Plan), the Plan also outlines specific policies and objectives. The policies of Dublin City Council are listed as:

- SI22: To require the use of Sustainable Drainage Systems (SuDS) in all new developments, where appropriate, as set out in the Greater Dublin Strategic Drainage Study (Vol 2: New Development)/ Greater Dublin Regional Code of Practice for Drainage Works and having regard to the guidance set out in Nature-based Solutions to the Management of Rainwater and Surface Water Runoff in Urban Areas, Water Sensitive Urban Design Best Practice Interim Guidance Document (DHLGH, 2021). Sustainable

Drainage Systems (SuDS) should incorporate nature-based solutions and be designed in accordance with the Dublin City Council Sustainable Drainage Design & Evaluation Guide (2021) which is summarised in Appendix 12. SuDS should protect and enhance water quality through treatment at source while enhancing biodiversity and amenity.

- SI23: To require all new developments with roof areas in excess of 100 sq. metres to provide for a green blue roof designed in accordance with the requirements of Dublin City Council's Green & Blue Roof Guide (2021) which is summarised in Appendix 11.
- SI24: To require that all surface water run-off from new/ extended domestic driveways, repaired/ replacement driveways, and vehicular entrances (where such development is not exempted from the requirement to obtain planning permission), is managed through the use of SuDS, ensuring no increase in surface water discharges to the public drainage network (for further guidance, please refer to Appendices 5 and 12).
- SI25: To require the preparation of a Surface Water Management Plan as part of all new developments in accordance with the requirements of Appendix 13 – the Council's Surface Water Management Guidance.
- SI26: To require that all new surface water infrastructure within public or private developments be constructed in accordance with the standards set out within the Greater Dublin Regional Code of Practice for Drainage Works, irrespective of the management and maintenance regime proposed for the development or whether or not the development is intended to be taken in charge, in full or in part (i.e., infrastructure shall be designed to taking in charge standards).

The Objectives regarding SuDs are given as:

- SIO13: To provide for new and improved surface water public networks, including projects undertaken in conjunction with Irish Water where applicable/ where required, in order to reduce pollution and negative impacts on receiving waters to allow for more sustainable development.

## 3. Overview of Flood Mechanisms at the Site

In broad terms, the potential sources of flooding at the site can be categorised as:

- Fluvial (river) flooding: the main risk of fluvial flooding is from the River Liffey.
- Tidal flooding/coastal flooding: the risk from tidal flooding is from surge events in the Irish Sea which can propagate up the River Liffey.
- Pluvial flooding: pluvial flooding occurs when the capacity of the local urban drainage network is exceeded during periods of intense rainfall. At these times, water can collect at low points in the topography and cause flooding.
- Groundwater flooding: this can occur during lengthy periods of heavy rainfall, typically during late winter/early spring when the groundwater table is already high. If the groundwater level rises above ground level, it can pond at local low points and cause periods of flooding.

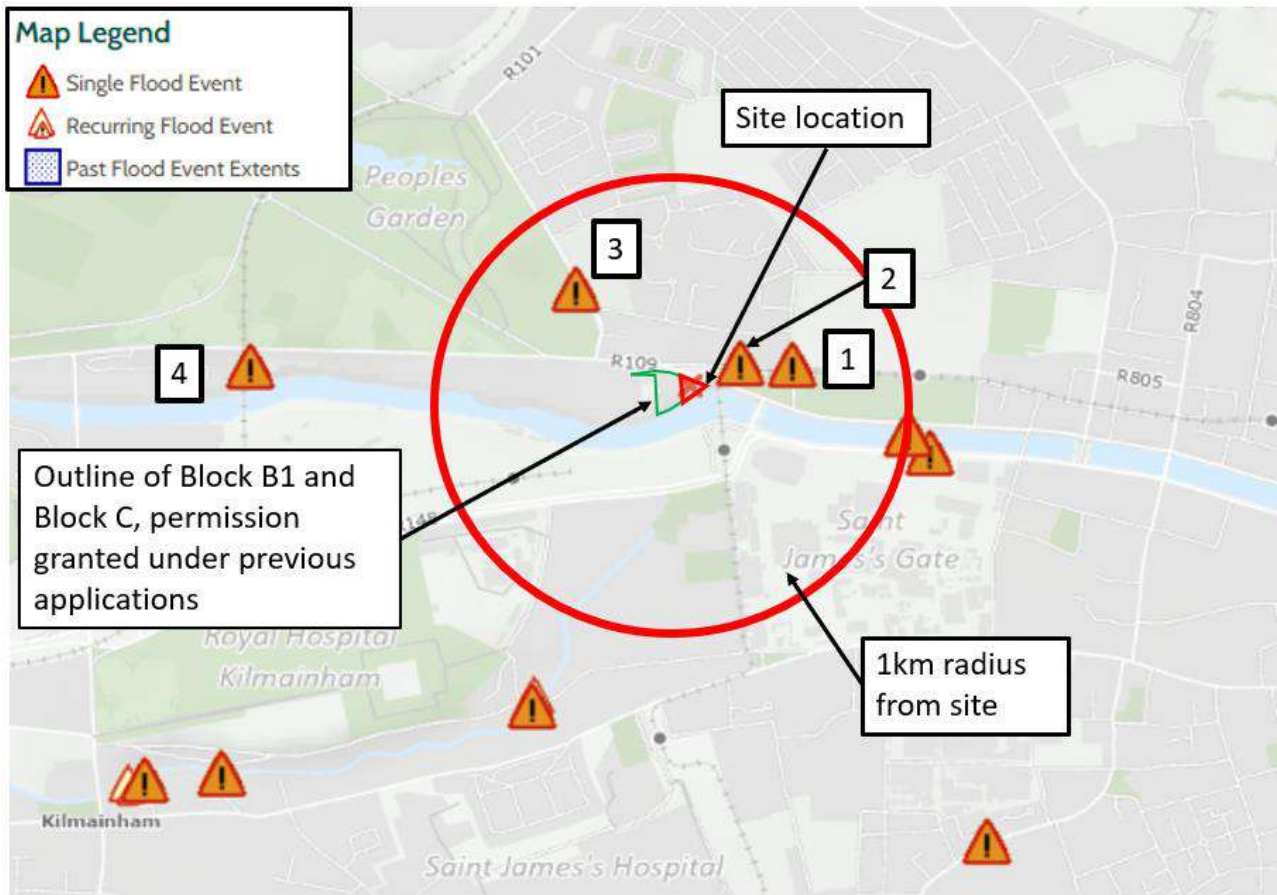
Each of these potential sources of flooding is considered in this FRA.

### 3.1 Historical Flooding at the Site

#### 3.1.1 Information from Floodmaps.ie

Reports and maps from the OPW's Flood Hazard Mapping website ([www.floodinfo.ie](http://www.floodinfo.ie)) have been examined as part of this flood risk assessment.

Figure 3 presents an extract from this website for the site and its immediate vicinity. There are four recorded flood events in the vicinity of the site, as marked on the figure, and further details are provided in Table 4. A report on historical flooding within a 2.5km radius of the site is presented in Appendix B.



**Figure 3: Historical flooding events in the vicinity of the site (source: [www.floodmaps.ie](http://www.floodmaps.ie))**

As outlined in Table 4 below, all the flood events discussed were caused by the capacity of the local drainage network being exceeded, which led to overland flow and water collecting in localised low-lying areas. It is noted that the site of the proposed development was not flooded during any of these flood events.

There is no record of historical flooding of the site. The absence of a historical record of flooding however does not mean that the site has not flooded in the past.



**Table 4: Details on recorded historical flood events (source: [www.floodmaps.ie](http://www.floodmaps.ie))**

	Location	Date	Source and cause	Flood depth	Impact
1	Aisling Hotel, Parkgate St, Dublin 8, approx. 100m from the proposed development	24/10/2011 to 25/10/2011	Significant rainfall resulted in overland flows from Conyngham Road. Some flow may have come from the Phoenix Park and possibly the nearby Viceregal Stream. The water then pooled in front of the Aisling Hotel and eventually flooded its ground floor entrance. Water from Montpellier Hill also came into the car park at the rear of the hotel	0.15m at the front of the hotel	The Aisling Hotel was affected by this flood event. Benburb Street was flooded for 100m in front of the hotel. The Luas red line was flooded for 100m in front of the hotel.
2	Parkgate St, Dublin 8, approx. 100m from the proposed development	14/06/2016	No information on OPW FloodInfo website, but news reports state significant rainfall resulted in overland flows, exacerbated by blocked drains	Unknown	Roads flooded. No properties affected, but the Ashling Hotel reports it was required to erect flood barriers to prevent flood waters entering the property.
3	Infirmity Road, Dublin 7	22/11/2017	No information on OPW FloodInfo website, but news reports state significant rainfall resulted in overland flows.	Unknown	The Infirmity Road near Phoenix Park was closed due to flooding
4	Bridgewater Quay Apartments, Islandbridge, Dublin 8	24/10/2011	According to local residents, surface water runoff from the Phoenix Park flowed into the Bridgewater Quay apartment complex car park and onto the South Circular Road Bridge footpath. The area is in close proximity to the Magazine Stream, which rises in and transverses the Phoenix Park. The River Liffey did not burst its banks in this area, it flooded a low-lying pedestrian walkway.	0.1m-0.5m	There were 11 ground floor apartments affected by the event. 30m of the South Circular Road Bridge and footpath were affected by this event. Part of the wall on the bridge also collapsed.

### 3.1.2 Additional Historical Flood Information

From previous Flood Risk Assessments of sites in the vicinity of Parkgate Street, Arup has identified other historic flood events in the area, including:

- On 1<sup>st</sup> February 2002, Dublin City experienced a very high tidal event that flooded Victoria Quay which is approximately 130m from the site of the proposed development. The recorded tidal level for the event was 3.12mOD at the Sarah Bridge, approximately 0.5km upstream of the site.
- Victoria Quay (approximately 150m from site) was flooded on 24<sup>th</sup> October 2011.
- Victoria Quay and Wolf Tone Quay were both flooded on 3<sup>rd</sup> January 2014. The maximum recorded level during this event was 3.14mOD. Refer to Figure 4 below.

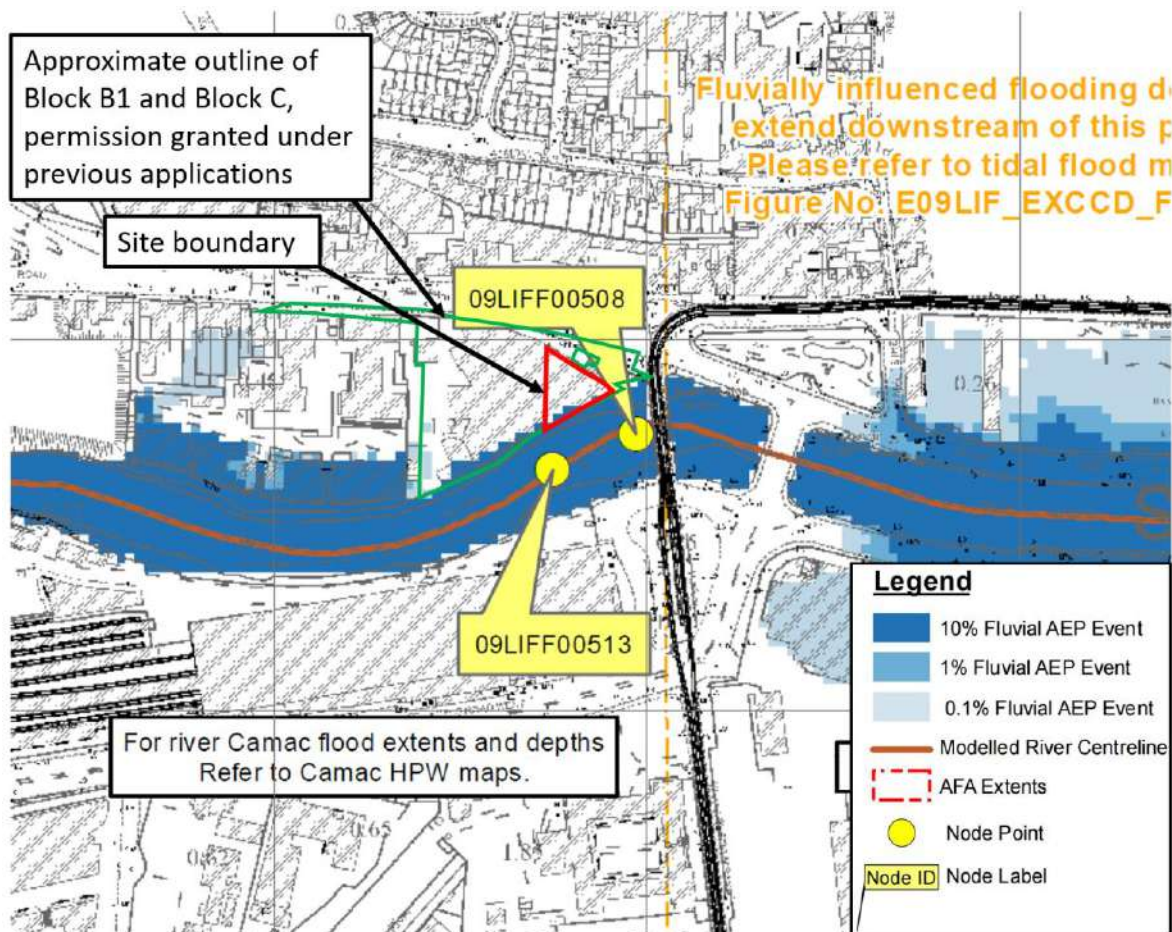


**Figure 4: Flooding at Victoria Quay in January 2014**

It is noted that the subject site has not been flooded in any of the historical flood events outlined above. While there have been recorded flood events in the vicinity of the proposed development site, there is no record of the site itself having flooded in the past.

### 3.2 Fluvial Flood Risk

Fluvial flood risk to the site has been assessed by assessing fluvial flood extents maps available produced as part of the Eastern CFRAM Study. Figure 5 presents an extract from the Eastern CFRAM Study fluvial flood extent map which highlights the flood extents for the 10%, 1% and 0.1% Annual Exceedance Probability (AEP) events. It can be seen from the figure that the site of the proposed development is outside the 1% Fluvial AEP flood extent. A very small area along the southern boundary is indicated as being within the 0.1% AEP extent.



**Figure 5: Extract from the Eastern CFRAM Study fluvial flood extents map with application boundary overlaid**

Predicted maximum water levels from the hydraulic model used to generate the flood map for the nearest node point to the site are indicated in Table 5 below. It can be seen from the table that the maximum water level for the 1% AEP fluvial flood event level is 3.11mOD which is circa 200mm below the lowest existing ground level of the site along the southern boundary of the site (approximately 3.30mOD).

**Table 5: Maximum fluvial water levels at the model nodes closest to the site (source: Eastern CFRAM Study)**

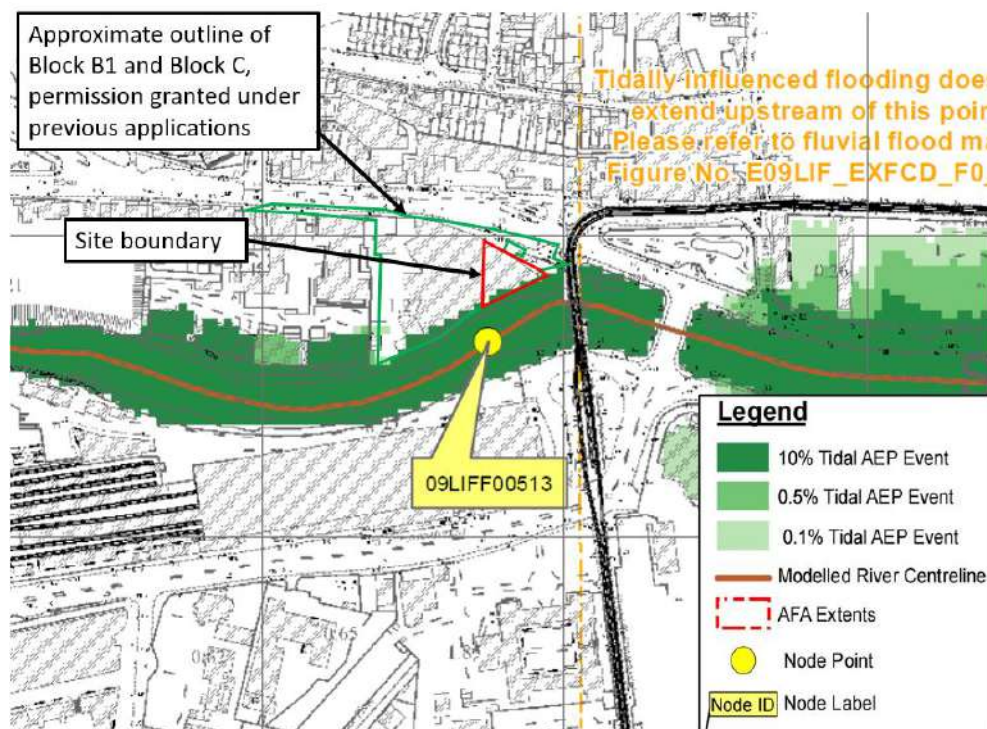
Node label	Water level (mOD) 10% AEP	Water level (mOD) 1% AEP	Water level (mOD) 0.1% AEP
09LIFF00513	2.82	3.10	3.50
09LIFF00508	2.82	3.11	3.51

We note that in the Mid-Range Future Scenario (a future scenario taking potential climate change implications into account) the site will be at risk from fluvial flooding. This however will be addressed as part of the proposed development as outlined in Section 4 of the report.

### 3.3 Tidal/Coastal Flooding

The risk of tidal or coastal flooding has been assessed by examining the tidal flood extents maps available as part of the Eastern CFRAM Study.

Figure 6 presents an extract from the Eastern CFRAM Study tidal flood map which shows the flood extents for the 10%, 0.5% and 0.1% Annual Exceedance Probability (AEP) events. It can be seen from the figure that the site is outside the predicted 0.5% AEP flood extents.



**Figure 6: Extract from the Eastern CFRAM Study tidal flood extents map with application boundary overlaid**

Predicted water levels from the hydraulic model used to generate the flood map for the nearest node point to the site are indicated in Table 6 below. It can be seen from the table that the peak 0.5% AEP water level is 3.27mOD which is circa 0.03m below the lowest existing ground level at the site along its southern boundary (circa 3.30m).



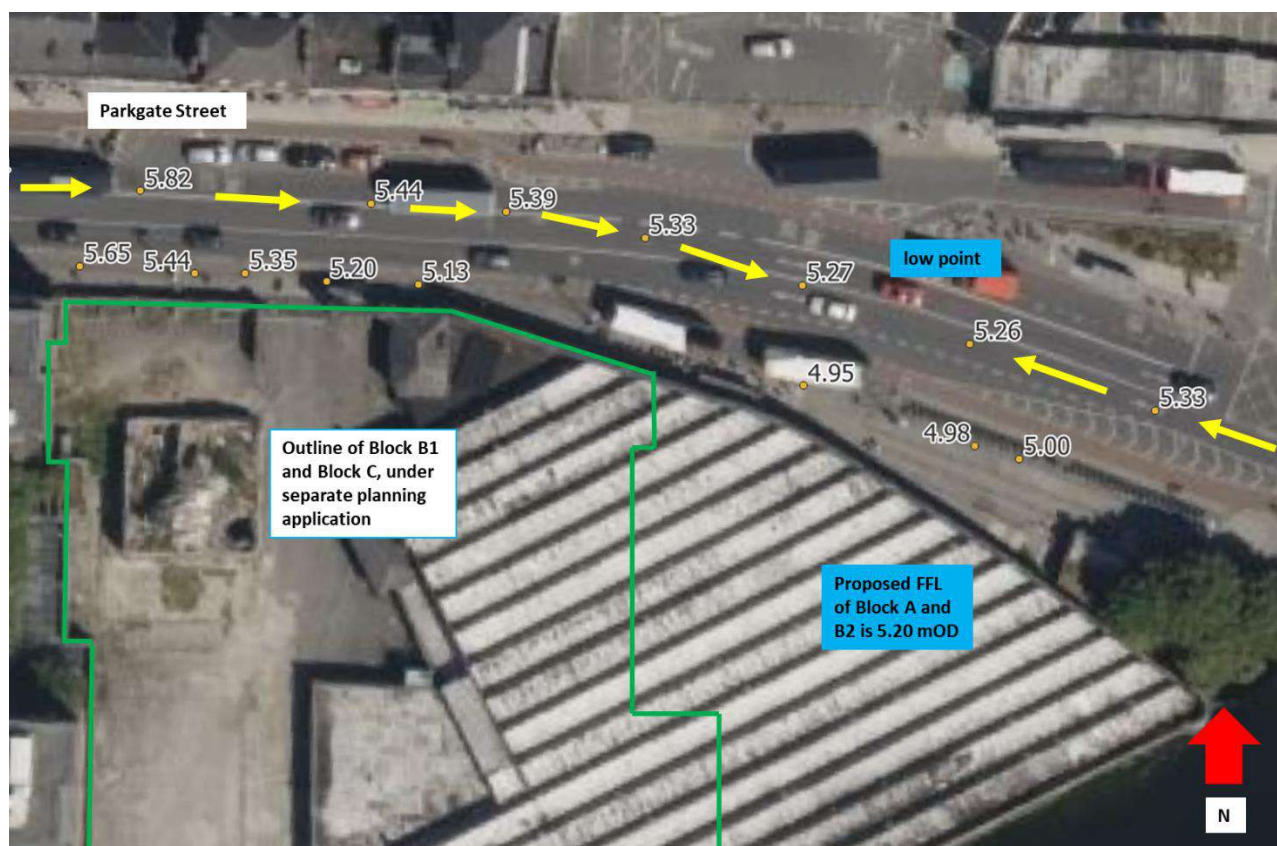
**Table 6: Maximum tidal water level at the node closest to the site (source: Eastern CFRAM Study)**

Node label	Water level (mOD) 10% AEP	Water level (mOD) 1% AEP	Water level (mOD) 0.1% AEP
09LIFF00513	2.86	3.27	3.48

We note that in the Mid-Range Future Scenario, the site will be at risk from tidal flooding. This however will be addressed as part of the proposed development as outlined in Section 4 of the report.

### 3.4 Pluvial Flooding

The risk of pluvial flooding at the site has been assessed using topographic information of the site and Parkgate Street. Figure 7 presents spot heights along Parkgate Street, as well as low points at the kerb at the locations of the street drainage gullies.



**Figure 7: Extract from the Dublin Pluvial Study flood extents map, for the 10% AEP event**

It can be seen from the figure that the levels of Parkgate Street fall in a south-easterly direction, with the street sloping from north to south in parts. This has the potential to direct pluvial runoff towards the entrance of the buildings on the site. In the event of an extreme rainfall event and/or blockage of the drainage system of the site, the capacity of the drainage system could be exceeded, leading to surface water ponding at the site. The site is therefore potentially at risk of pluvial flooding. This correlates with reports of historical pluvial flooding in the vicinity of the site, as detailed previously in Section 3.1.1.

### 3.5 Groundwater Flooding

Water levels in four boreholes were recorded over a four-week period between the 14<sup>th</sup> of August and 12<sup>th</sup> of September 2019, as part of the site investigation works for the proposed development. The groundwater level in the natural sand and gravel aquifer, and in the limestone bedrock aquifer varied with the tide during the monitoring period.

The groundwater levels for the four boreholes were electronically monitored and the maximum and minimum for the four locations are presented in the table below.

**Table 7: 2019 Site investigation groundwater levels**

Location ID	Aquifer type	Maximum groundwater level (mOD)	Minimum groundwater level (mOD)
BH101	Sand and Gravel	1.18	0.18
BH102	Limestone bedrock	0.91	0.12
BH103	Sand and Gravel	1.08	0.82
BH106	Sand and Gravel	1.45	-0.38

The data shows that water was generally encountered between -0.38mOD and 1.18mOD, which is below the existing ground levels (3.30mOD – 5.5mOD) on the site. An undercroft is proposed at the site for bicycle parking, with a proposed level of 3.00mOD.

Site investigation works were also conducted on the site in 2002 and 2003, and this data has been reviewed by Arup as part of this FRA. Groundwater monitoring standpipes were installed in 6 of 8 boreholes drilled on the site at that time. Water was generally encountered in the gravel aquifer at 3.0m - 4.0m below ground level. This would indicate that the groundwater level lies at approximately 0.5m – 1.0mOD Malin, which generally correlates with the 2019 site investigation data outlined above.

As the site is in close proximity to the River Liffey, it can be expected that there will be hydraulic connectivity between groundwater levels and tidal levels, as was confirmed during the 2019 site investigation. As existing ground levels and proposed levels of the development are higher than the tidal levels, the risk of groundwater flooding is considered to be low.

## 4. Proposed Mitigation Measures

### 4.1 Establishment of Design Flood Levels

#### 4.1.1 Predicted 1 in 200 Year Tidal Level at the Subject Site

As established in Section 3.3, the 1 in 200 year (0.5% AEP) maximum tidal water level at the site is 3.27mOD. As this level is higher than the 1% AEP fluvial water level, it will be used as the flood level for the site.

#### 4.1.2 Climate Change

The OPW has issued Draft Guidance on the “Assessment of potential future scenarios for Flood Risk Management”. This document suggests the use of two scenarios to assess climate change: a mid-range future scenario (MRFS) and a high-end future scenario (HEFS). The MRFS represents a likely future scenario which is within the bounds of the widely accepted projections. The HEFS is a more extreme, but plausible future event, and is within the upper bounds of the widely accepted projections. These are detailed within the table below.



**Table 8: Allowance in Flood Parameters for the Mid-Range and High-End Future Scenarios (source: extract from Table 3.2 OPW Climate Change Sectorial Adaption Plan)**

Parameter	MRFS	HEFS
Extreme rainfall depths	+20%	+30%
Peak flood flows	+20%	+30%
Mean sea level rise	+500mm	+1000mm

There are a number of conclusions that can be taken from the predictions made on climate change implications:

- Increases in sea levels may result in extreme tidal events, with tidal levels increasing by more than a meter in the next century; and
- Increase in the frequency of extreme events, particularly hydrological extremes, storms and droughts may cause an increase in rainfall intensity, duration and amount, resulting in increased surface water runoff.

Based on this, we propose accounting for climate change by considering a 500mm increase in the water levels in the estuary as per the Mid-Range Future Scenario.

#### 4.1.3 Freeboard

A detailed freeboard analysis has not been undertaken as part of this study. However, it is generally recognised and accepted in Ireland, that a minimum freeboard of 300mm is appropriate, with a higher freeboard where this is justified.

A freeboard of 300mm has therefore been adopted as part of the study.

#### 4.1.4 Recommended Site Flood Defence Level

From our analysis of the available data, the 200-year design tidal level at our site of interest was estimated to be 3.27mOD.

Allowing for climate change and freeboard the recommended design level of the proposed development can be calculated as:

$$3.27\text{mOD (200-year tidal level)} + 0.50\text{m (climate change allowance)} + 0.30\text{m (freeboard allowance)} \\ = \underline{\underline{4.07\text{mOD Malin}}}$$

## 5. Management of Residual Flood Risk at the Site

### 5.1 Proposed Ground Floor Level

It is proposed to set the ground floor levels of the proposed buildings of the development at 5.20mOD. This is above the minimum recommended site flood defence level as outlined in Section 4.1.4.

Flood risk to the buildings of the proposed development is therefore remote. The development therefore complies with the OPW Planning Guidelines.

## 5.2 Basement of the Development

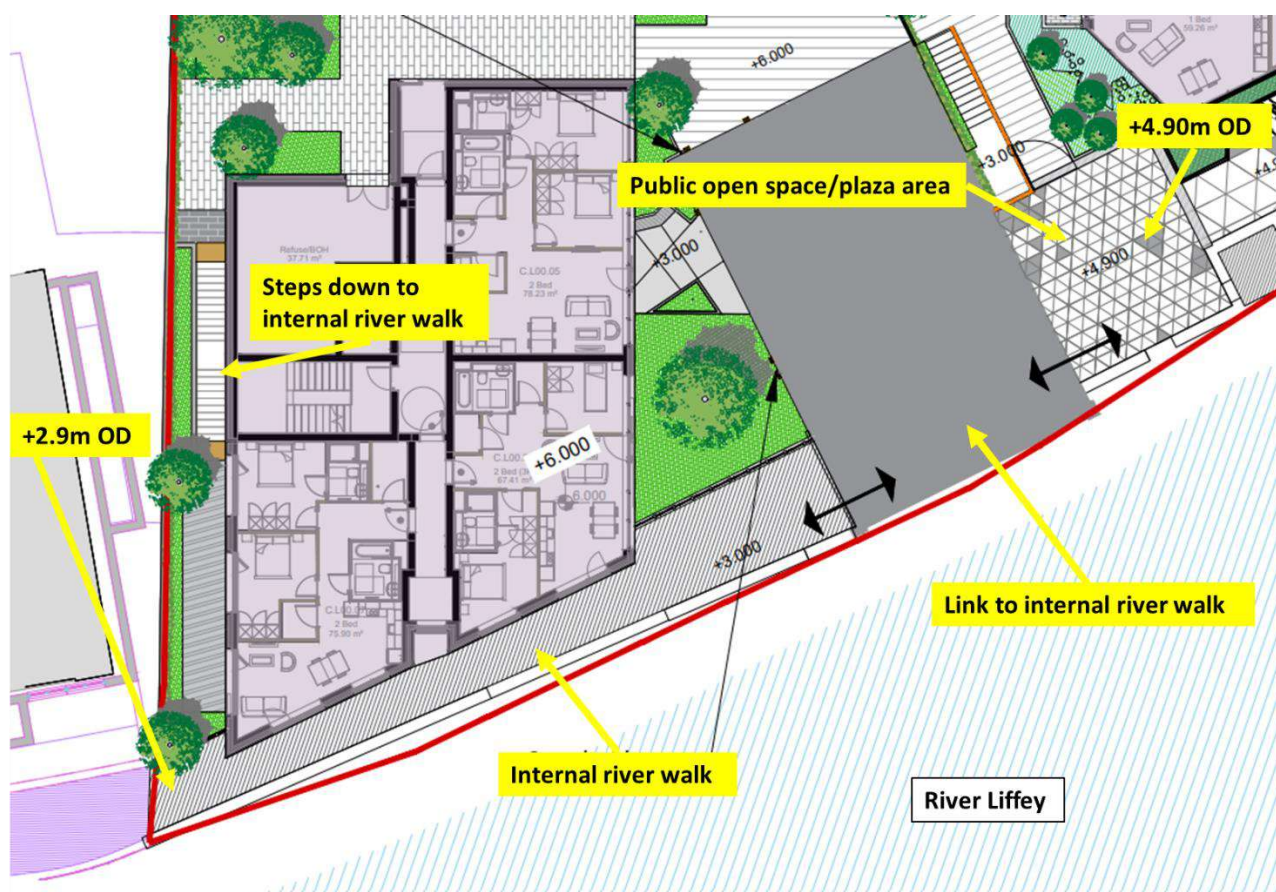
No basement is proposed for Block A and B2. However, there is a basement proposed in the other blocks, dealt with in a separate FRA under a separate planning application. To mitigate against the risk of groundwater ingress the basement will be fully sealed and tanked to ensure water cannot penetrate it.

It is noted that policy objective SI20 of the Dublin City Council Development Plan 2022 – 2028 states that “there is a general presumption against the development of basements for residential use below the estimated flood levels for Flood Zones A or B.” The basement for the proposed development will be compliant with this objective as it includes plant areas, office staff changing facilities, and bicycle parking, and will not be for residential use.

## 5.3 Access and Egress Routes to the Site

There is an internal riverwalk proposed at the southwest corner of the site. This is dealt with under the separate planning application for Blocks C and B1, but is discussed here as the sites are adjacent to each other and this access and egress routes are applicable to this planning application.

The internal riverwalk will be graded to facilitate the future tie into the existing boardwalk along the River Liffey at a level of approximately 2.9mOD. The proposed internal riverwalk slopes and steps down from an access and egress point at the ground level public plaza which is at a level of approximately 4.9mOD. This is shown in Figure 8 below:



**Figure 8: Proposed internal river walk at the southwest corner of the site**

It can be seen from the figure that a section of the internal river walk is below the 1 in 200-year tidal flood level of 3.27m and the recommended site flood defence level. The access and egress point to the building at this location, however, is at a level of 4.9mOD and is not a main access and egress point to the building. It is proposed that a security door be installed at this point which can be closed during a flood event.

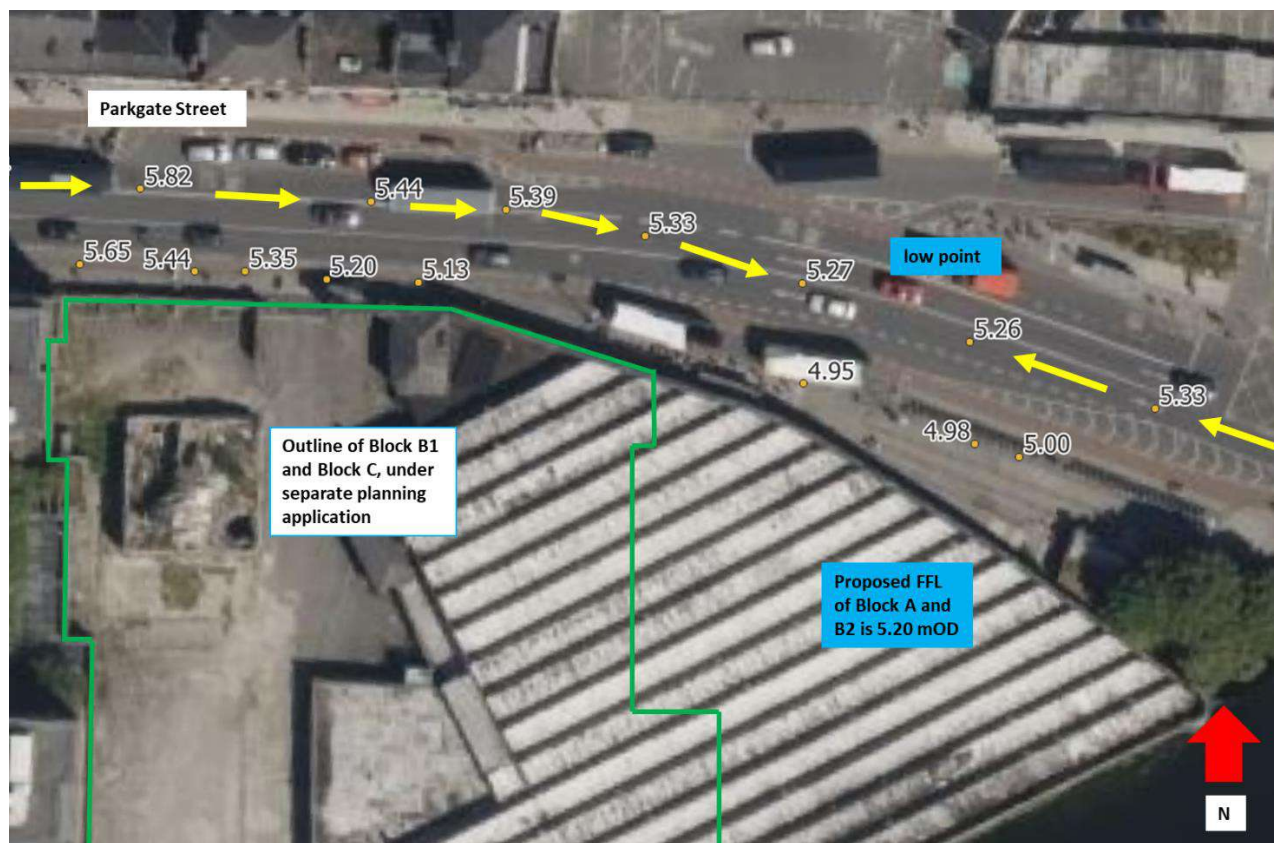
No other access and egress routes to the site will be compromised during flood events.

## 5.4 Storage and Conveyance

The proposed development will have no impact on floodplain storage and conveyance as it is located outside the 1 in 1000-year fluvial and coastal flood plain.

## 5.5 Pluvial Flood Risk

In the event of an extreme rainfall event and/or blockage of the drainage system of the site, the capacity of the drainage system could be exceeded, leading to surface water ponding at the site. There is a risk of surface water ingress to the proposed buildings as existing ground levels on Parkgate Street generally fall in a south-easterly direction towards the buildings. There is a low point on Parkgate Street where there is potential for surface water to pond, which is illustrated in Figure 9.



**Figure 9: Direction of surface water drainage flowpaths (source: adapted from Google Maps)**

In order to mitigate against surface water ingress to the proposed development, all doorways and entrance points to the building should be raised above external ground levels by 150mm. A minor fall should also be provided on all paved surfaces to direct surface water to the drainage system, or a drainage channel should be installed across the entrance point to collect surface water.

Further mitigation actions have been taken at the development site to mitigate against the risk of pluvial flooding. An agreement has been reached with Uisce Éireann and Dublin City Council for the development to redirect some of the gullies on Parkgate Street from the combined sewer and into a new surface water sewer which will run through the site to discharge directly into the River Liffey. This will remove part of the surface runoff from the combined sewer and will relieve the drainage system in the area, reducing the risk of pluvial flooding in the vicinity of the site.

## 5.6 Flood Emergency Plan

A tidal flood forecasting and warning system for Dublin Bay is operated by Dublin City Council and provides warnings of extreme tidal flooding. Extreme flood events will therefore be well forecast. As part of the emergency response plan, staff in the buildings of the proposed development will be kept well informed of flood and weather forecasts on an on-going basis as well as receiving warnings from Dublin City Council. In the event of a significant flood event being forecast, the emergency response plan will be implemented.



This will involve ensuring that no occupants of the proposed development remain below the site flood defence level (e.g., at the internal river walk area next to the River Liffey).

## 6. Application of “The Planning System and Flood Risk Management” Guidelines

### 6.1 Vulnerability Classification

It is considered that the development should be classed as a “highly vulnerable development” as per the vulnerability classification presented previously in Table 2.

### 6.2 Flood Zones

Based on the analysis presented in this FRA report, the subject site is not at risk of flooding from either the 0.5% AEP tidal event or the 1% AEP event. A very small area of the site is marginally within the 0.1% AEP tidal and fluvial extents. While this level of flood risk could be interpreted as a Flood Zone C classification, we have adopted a conservative approach and considered the entire site as being within Flood Zone B.

### 6.3 Sequential Approach

Figure 10 below illustrates the sequential approach to be adopted under the “Planning System and Flood Risk Management Guidelines”.

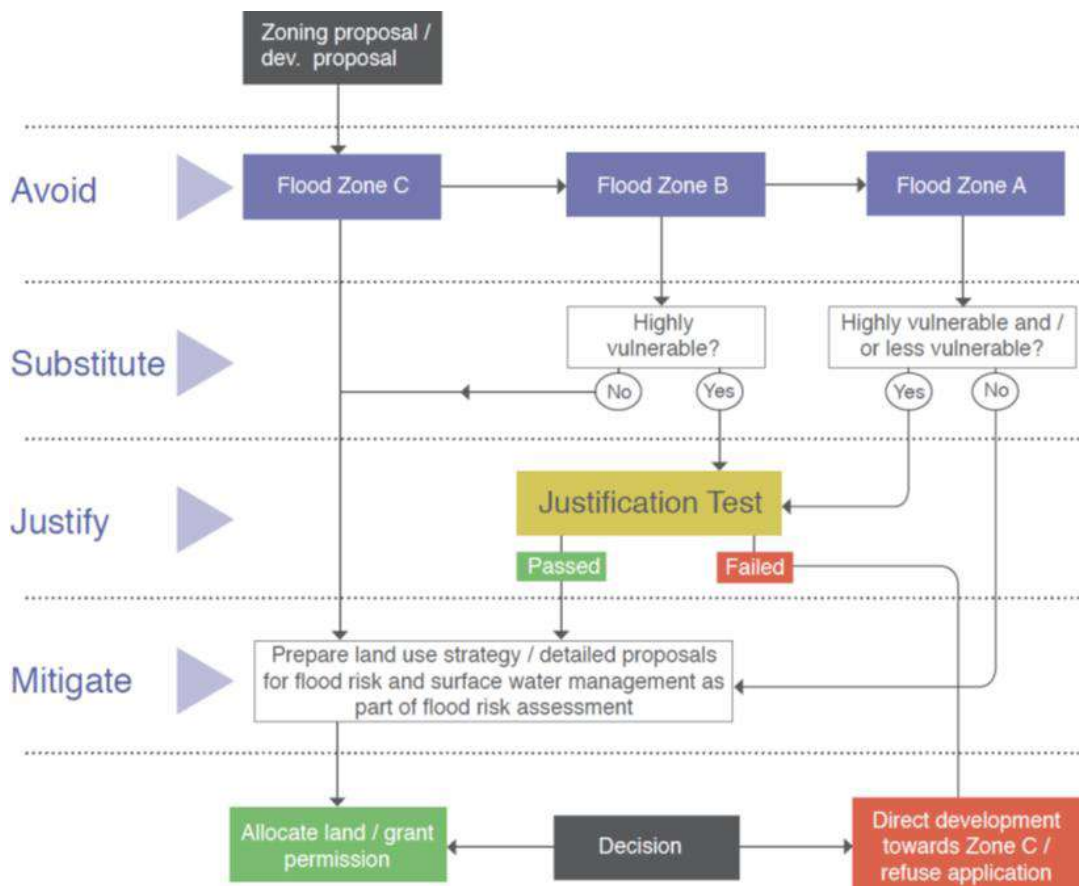


Figure 10: Sequential approach mechanism in the planning process (source: OPW “The Planning System and Flood Risk Management” Guidelines)

As per Figure 10 above, the proposed development is a “highly vulnerable development” (for residential use) that lies within Flood Zone B. A Justification Test for the development is therefore required and is presented in Section 6.4 and Section 6.5 of this report.

## 6.4 The “Plan Making Justification Test” from Chapter 4 of the OPW Flood Risk Management Guidelines

The Justification Test for Plan Making requires that three criteria must be met as shown in the following figure.

**Box 4.1: Justification Test for development plans**

Where, as part of the preparation and adoption or variation and amendment of a development/local area plan<sup>1</sup>, a planning authority is considering the future development of areas in an urban settlement that are at moderate or high risk of flooding, for uses or development vulnerable to flooding that would generally be inappropriate as set out in Table 3.2, all of the following criteria must be satisfied:

- 1 The urban settlement is targeted for growth under the National Spatial Strategy, regional planning guidelines, statutory plans as defined above or under the Planning Guidelines or Planning Directives provisions of the Planning and Development Act, 2000, as amended.
- 2 The zoning or designation of the lands for the particular use or development type is required to achieve the proper planning and sustainable development of the urban settlement and, in particular:
  - (i) Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement<sup>2</sup>;
  - (ii) Comprises significant previously developed and/or under-utilised lands;
  - (iii) Is within or adjoining the core<sup>3</sup> of an established or designated urban settlement;
  - (iv) Will be essential in achieving compact and sustainable urban growth; and
  - (v) There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement.
- 3 A flood risk assessment to an appropriate level of detail has been carried out as part of the Strategic Environmental Assessment as part of the development plan preparation process, which demonstrates that flood risk to the development can be adequately managed and the use or development of the lands will not cause unacceptable adverse impacts elsewhere.

N.B. The acceptability or otherwise of levels of any residual risk should be made with consideration for the proposed development and the local context and should be described in the relevant flood risk assessment.

**Figure 11: Justification Test for Development (source: OPW “The Planning System and Flood Risk Management” Guidelines)**

The “Plan Making Justification Test” relevant to the proposed development was completed and passed as part the Strategic Flood Risk Assessment (SFRA) undertaken for the Dublin City Council Development Plan 2022 – 2028.



The SFRA is included under Volume 7 of the DCC Development Plan and is available to download from the Dublin City Council website: (<https://www.dublincity.ie/residential/planning/strategic-planning/dublin-city-development-plan/development-plan-2022-2028/volume-7-strategic-flood-risk-assessment-1>).

The proposed development lies within Area 5 of the Justification Test Tables in the SFRA. The Justification Test Tables for Area 5 are included in full in Appendix D of this report.

## **6.5 The “Development Management Justification Test” from Chapter 5 of the OPW Flood Risk Management Guidelines**

The “Development Management Justification Test” requires that two criteria must be met as follows:

1. The subject lands have been zoned or otherwise designated for the particular use or form of development in an operative development plan, which has been adopted or varied taking account of these Guidelines.
2. The proposal has been subject to an appropriate flood risk assessment that demonstrates:
  - a. The development proposed will not increase flood risk elsewhere and, if practicable, will reduce overall flood risk.
  - b. The development proposal includes measures to minimise flood risk to people, property, the economy and the environment as far as reasonably possible.
  - c. The development proposed includes measures to ensure that residual risks to the area and/or development can be managed to an acceptable level as regards the adequacy of existing flood protection measures or the design, implementation and funding of any future flood risk management measures and provisions for emergency services access; and
  - d. The development proposed addresses the above in a manner that is also compatible with the achievement of wider planning objectives in relation to development of good urban design and vibrant and active streetscapes.

### **6.5.1 Item 1**

With regard to Item 1 above, the applicable policy context is the Dublin City Council Development Plan 2022 – 2028. Under the scheme the subject site is specifically identified as being included within Specific Development Regeneration Area (SDRA) No. 7 Heuston and Environs. Figure 12 presents an extract from the map for SDRA No.7. It can be seen that the area is identified for Potential Redevelopment Site.

As the DCC Development Plan took full account of the OPW Guidelines and incorporated an SFRA as part of an appraisal of the plan, and the site has been designated for the form of development proposed, we can therefore state this criterion is passed.

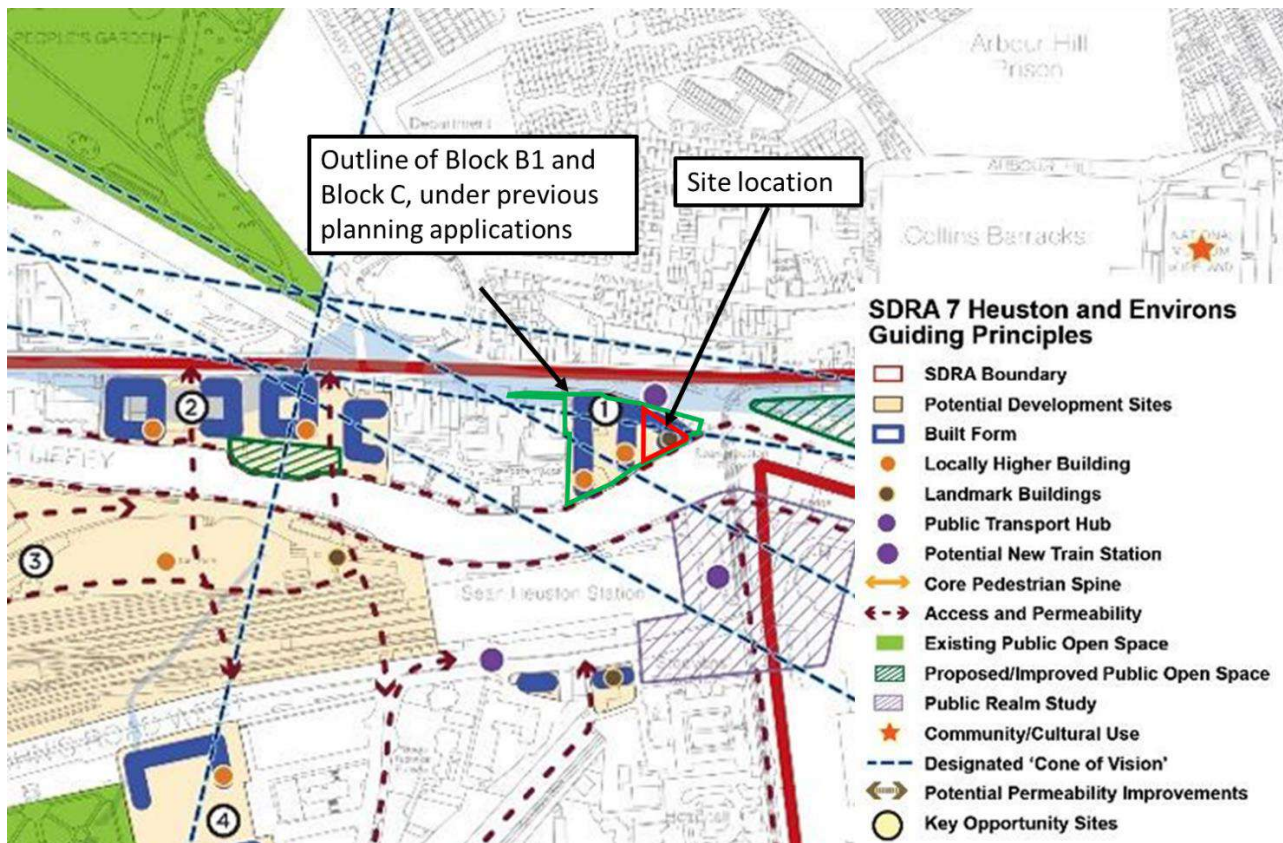


Figure 12: Key development principles for SDR Area No.7 (source: DCC Development Plan 2022-2028)

#### 6.5.2 Item 2

With regard to Item 2, we consider that these criteria have been met as follows:

- The development proposed will not increase flood risk elsewhere and, if practicable, will reduce overall flood risk;

The proposed development will not increase the risk of flooding at adjacent sites. There will be no increase in the overall hardstanding area and the new drainage network to be provided as part of the development will be more effective than the current drainage on the site.

- The proposed development includes measures to minimise flood risk to people, property, the economy and the environment as far as reasonably possible;

The development proposal includes a number of measures to minimise flood risk which include the following:

- The ground floor levels of the proposed buildings on the site will be 5.20mOD. This is above the minimum recommended site flood defence level as outlined in Section 4.1.4.
  - The proposed development will have no impact on floodplain storage and conveyance as it is located outside of the 1 in 1000-year fluvial and coastal flood plain.
  - The proposed drainage network to be constructed as part of the development includes a number of Sustainable (urban) Drainage features (SuDS)
- The development proposed includes measures to ensure that residual risks to the area and/or development can be managed to an acceptable level as regards the adequacy of existing flood protection measures or the design, implementation and funding of any future flood risk management measure and provisions for emergency service access

As previously noted in this report, the residual risk will be managed by ensuring that the ground floor level is set above the site design flood defence level.

- The development proposed addresses the above in a manner that is also compatible with the achievement of wider planning objectives in relation to the development of good urban design and vibrant and active streetscapes.

The scheme has been designed to the highest standards and creates a successful and vibrant public realm. Measures to address the flood risk have been incorporated into the design without compromising the streetscape and functioning of the development.

It is deemed that these criteria are sufficient for the development to pass this section of the Justification Test.

## 7. Conclusion

This FRA reviews the risk of flooding for a proposed mixed-use development at Parkgate Street in Dublin 8. This FRA is to form part of the planning application for the development.

There is no record historical flooding at the site.

While the site borders the River Liffey, flood risk to the site is low and existing ground levels are above the maximum 1% AEP fluvial water level and the 0.5% AEP tidal level. The risk of groundwater flooding is also low.

There is a risk of pluvial flooding at the site. This risk will be managed through grading of paved surfaces to direct surface water to the drainage system, and provision of drainage channels across entrance points to collect surface water. Further mitigation actions will be taken to remove part of the surface runoff from the combined sewer on Parkgate Street and relieve the drainage system in the area, reducing the risk of pluvial flooding in the vicinity of the site.

The minimum site flood defence level of the proposed development including an allowance for climate change and freeboard is 4.07mOD.

Flood risk to the buildings on site will be managed by setting minimum FFLs to 5.20mOD.

Access and egress routes will not be compromised during a flood event with the exception of the route to the internal river walk next to the River Liffey. This is not a primary access and egress route for the proposed development and the entrance/exit point to the building itself will be above the minimum site flood defence level.

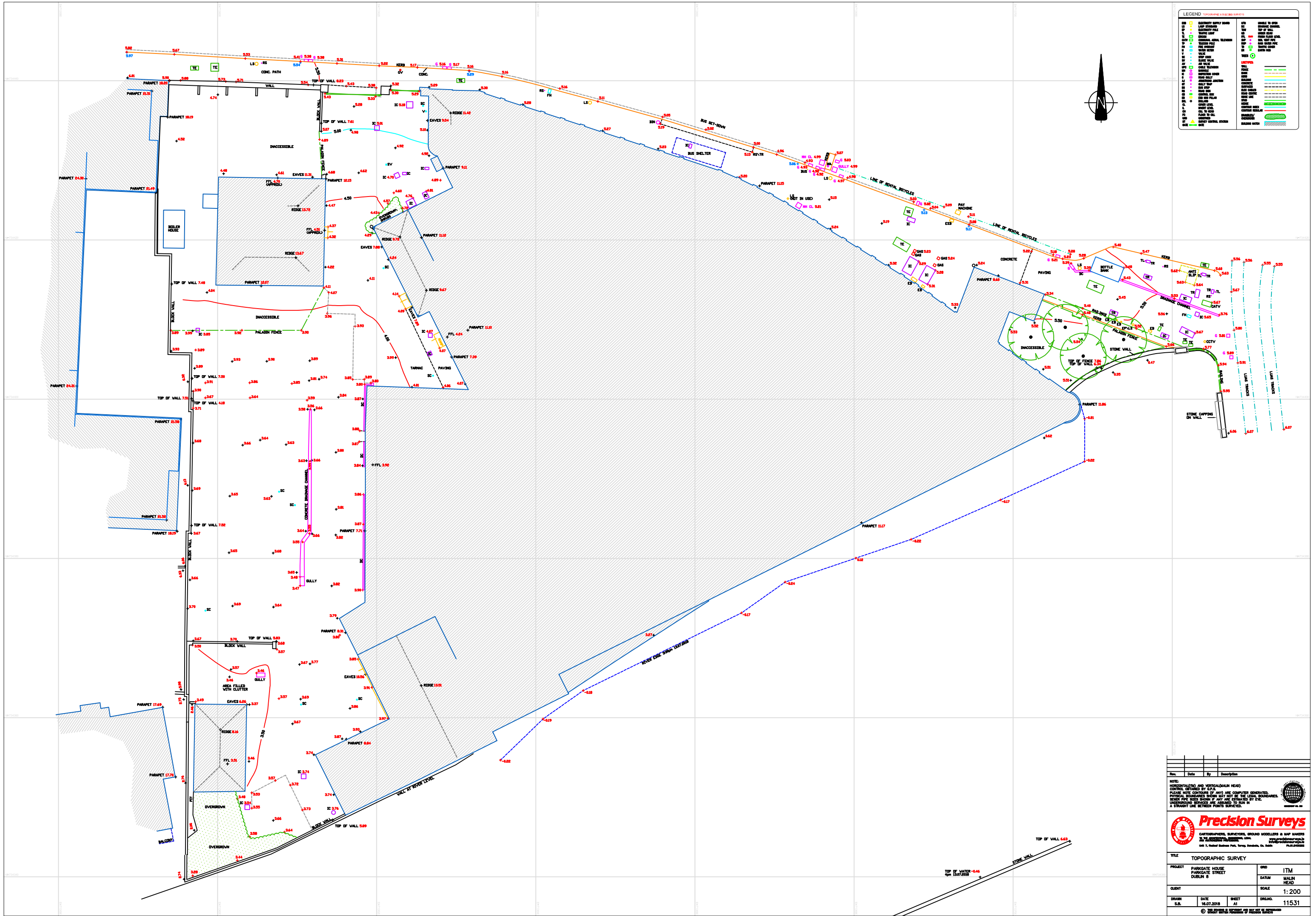
The proposed development will also not impact on floodplain storage or conveyance.

As a small area of the existing site is within the 0.1% AEP tidal flood extent. The site is therefore classified as Flood Zone B and a Justification Test is required. Both the Plan Making and Development Management Justification elements of the Justification test have been assessed and both are deemed to be passed as part of this FRA.

# Appendix A

## Topographical Survey of Existing Site





LEGEND TOPOGRAPHIC & BUILDING SURVEYS			
100	ELECTRICITY SUPPLY MAIN	101	SHOULDER TO OPEN
102	ELECTRICITY POLE	102	SHOULDER CHANNEL
103	TRAP	103	TRAP
104	TRAP LIFT	104	TRAP LIFT
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Rev. Date By Description

NOTE:  
HORIZONTAL (HTD) AND VERTICAL (HVD) HEADS  
CONTROLS ESTIMATED BY S.P.S.  
PLEASE NOTE COORDINATES (IF ANY) ARE COMPUTER GENERATED.  
VERTICAL COORDINATES SHOWN MAY NOT BE THE LEGAL BOUNDARIES.  
UNDERGROUND SERVICES ARE ASSUMED TO RUN IN  
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TITLE  
TOPOGRAPHIC SURVEY

PROJECT  
PARKGATE HOUSE  
PARKGATE STREET  
DUBLIN 8

CLIENT

DATE  
16.07.2018

SHEET  
A1

SCALE  
1:200

ORIGIN  
11531

GRID  
ITM  
DATUM  
MALIN  
HEAD

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# Appendix B

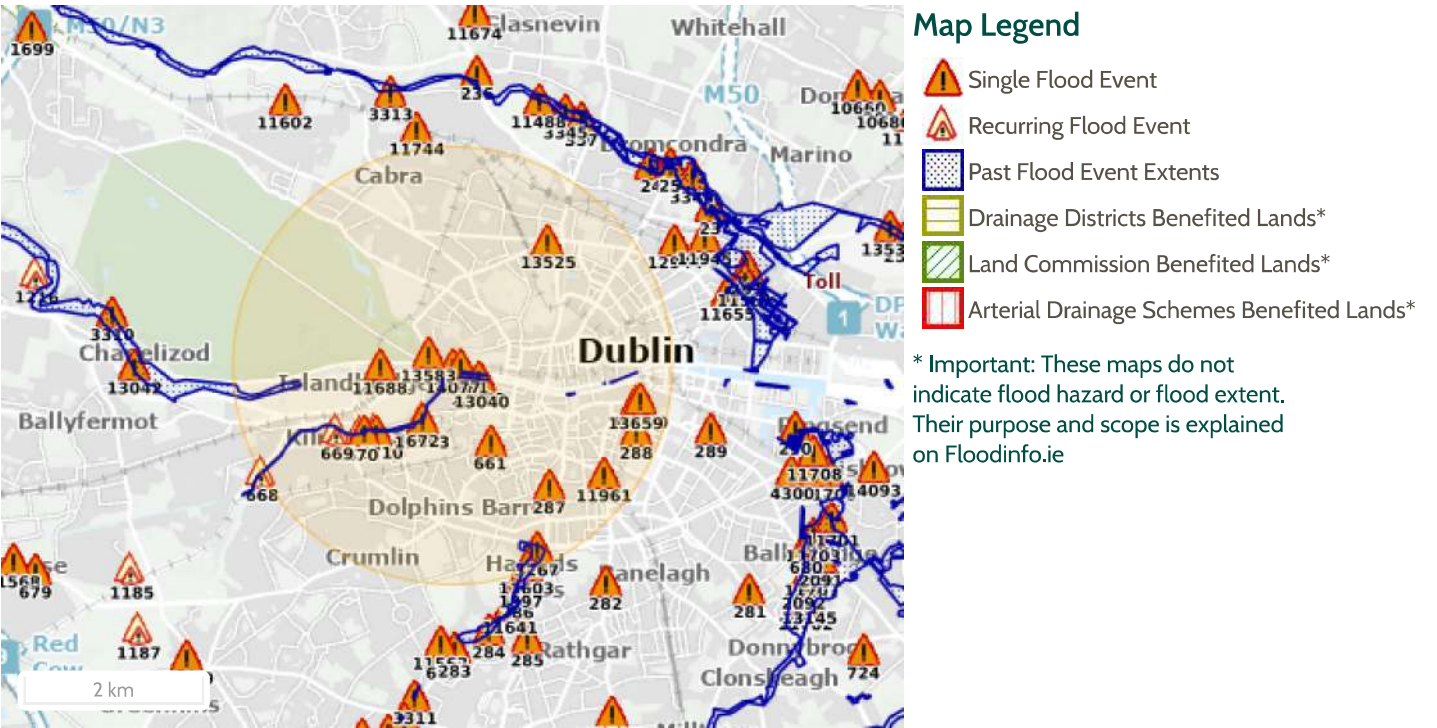
## Historical Flood Event Information

# Past Flood Event Local Area Summary Report







Report Produced: 27/11/2024 16:29

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.



## 28 Results

Name (Flood_ID)		Start Date	Event Location
1. 	Liffey Lower - Dec 1954 (ID-241)	08/12/1954	Area
Additional Information: <a href="#">Reports (5)</a> <a href="#">Press Archive (2)</a>			
2. 	Flooding at Dublin City on 30/07/2019 (ID-13659)	30/07/2019	Approximate Point
Additional Information: <a href="#">Reports (0)</a> <a href="#">Press Archive (0)</a>			
3. 	Flooding at Dublin City on 22/11/2017 (ID-13583)	22/11/2017	Approximate Point
Additional Information: <a href="#">Reports (0)</a> <a href="#">Press Archive (0)</a>			
4. 	Poddle Limekiln Lane Sept 1931 (ID-3267)	02/09/1931	Approximate Point
Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>			
5. 	Flooding at Trinity College, Dublin 2, 26th July 2013 (ID-11960)	25/07/2013	Approximate Point
Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>			
6. 	Flooding on Wexford St, Dublin 2 on 26th July 2013 (ID-11961)	25/07/2013	Approximate Point
Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>			

	Name (Flood_ID)	Start Date	Event Location
7.	 Poddle August 1986 (ID-32) Additional Information: <a href="#">Reports (9)</a> <a href="#">Press Archive (1)</a>	24/08/1986	Area
8.	 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
9.	 Camac August 1986 (ID-125) Additional Information: <a href="#">Reports (3)</a> <a href="#">Press Archive (0)</a>	24/08/1986	Area
10.	 Flooding at Dublin City on 06/01/2014 (ID-13040) Additional Information: <a href="#">Reports (0)</a> <a href="#">Press Archive (0)</a>	06/01/2014	Approximate Point
11.	 Clanbrassil Street June 1963 (ID-287) Additional Information: <a href="#">Reports (4)</a> <a href="#">Press Archive (2)</a>	10/06/1963	Exact Point
12.	 Grafton Street June 1963 (ID-288) Additional Information: <a href="#">Reports (4)</a> <a href="#">Press Archive (2)</a>	10/06/1963	Exact Point
13.	 Poddle Tributary Marrowbone Lane Jan 1941 (ID-661) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	20/01/1941	Approximate Point
14.	 Camac Turvey Ave Recurring (ID-669) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	n/a	Exact Point
15.	 Camac Goldenbridge Recurring (ID-668) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	n/a	Approximate Point
16.	 Camac Carrickfoyle Terrace Recurring (ID-670) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	n/a	Exact Point
17.	 Camac Kearns Place Recurring (ID-671) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	n/a	Exact Point
18.	 Camac Bow Bridge Recurring (ID-672) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	n/a	Approximate Point
19.	 Flooding at Dublin City on 14/06/2016 (ID-14077) Additional Information: <a href="#">Reports (0)</a> <a href="#">Press Archive (0)</a>	14/06/2016	Approximate Point
20.	 Flooding at Dublin City on 15/06/2016 (ID-13525) Additional Information: <a href="#">Reports (0)</a> <a href="#">Press Archive (0)</a>	15/06/2016	Approximate Point
21.	 Dublin City Tidal Feb 2002 (ID-456) Additional Information: <a href="#">Reports (45)</a> <a href="#">Press Archive (27)</a>	01/02/2002	Area
22.	 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>	23/10/2011	Approximate Point
23.	 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>	23/10/2011	Approximate Point
24.	 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>	23/10/2011	Approximate Point

	Name (Flood_ID)	Start Date	Event Location
25.	 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 (Q)</a>	23/10/2011	Approximate Point
26.	 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 (Q)</a>	23/10/2011	Exact Point
27.	 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 (Q)</a>	23/10/2011	Exact Point
28.	 Flooding at Dublin City on 03/02/2014 (ID-13093) Additional Information: <a href="#">Reports (Q)</a> <a href="#">Press Archive (Q)</a>	03/02/2014	Approximate Point

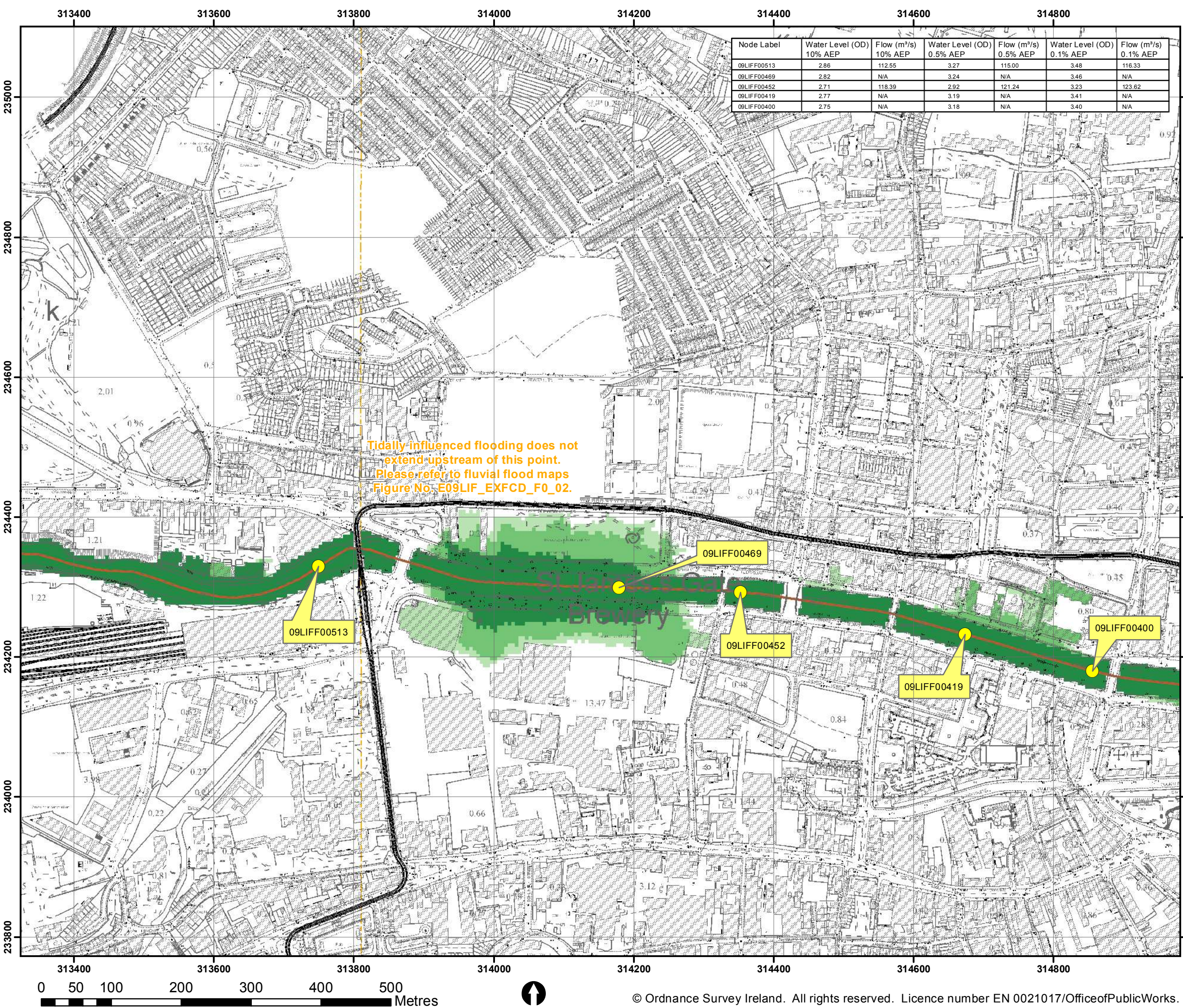


# Appendix C

## Eastern CFRAM Study Flood Maps

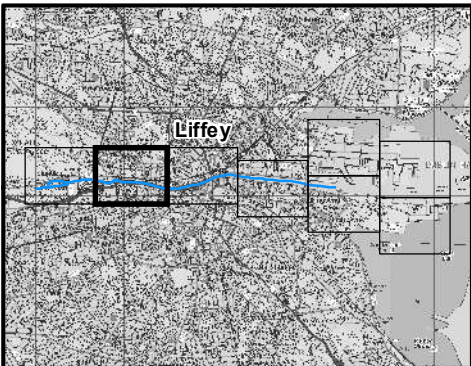
# C.1 Coastal Tidal Flood Extents





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
09LIFF00419	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

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



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 Node Label

FINAL

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



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Co Meath

Elmwood House  
74 Boucher Road  
Belfast  
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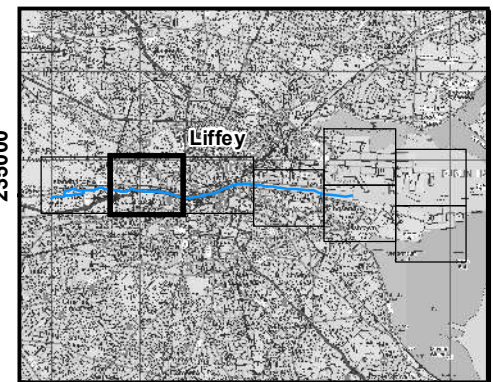
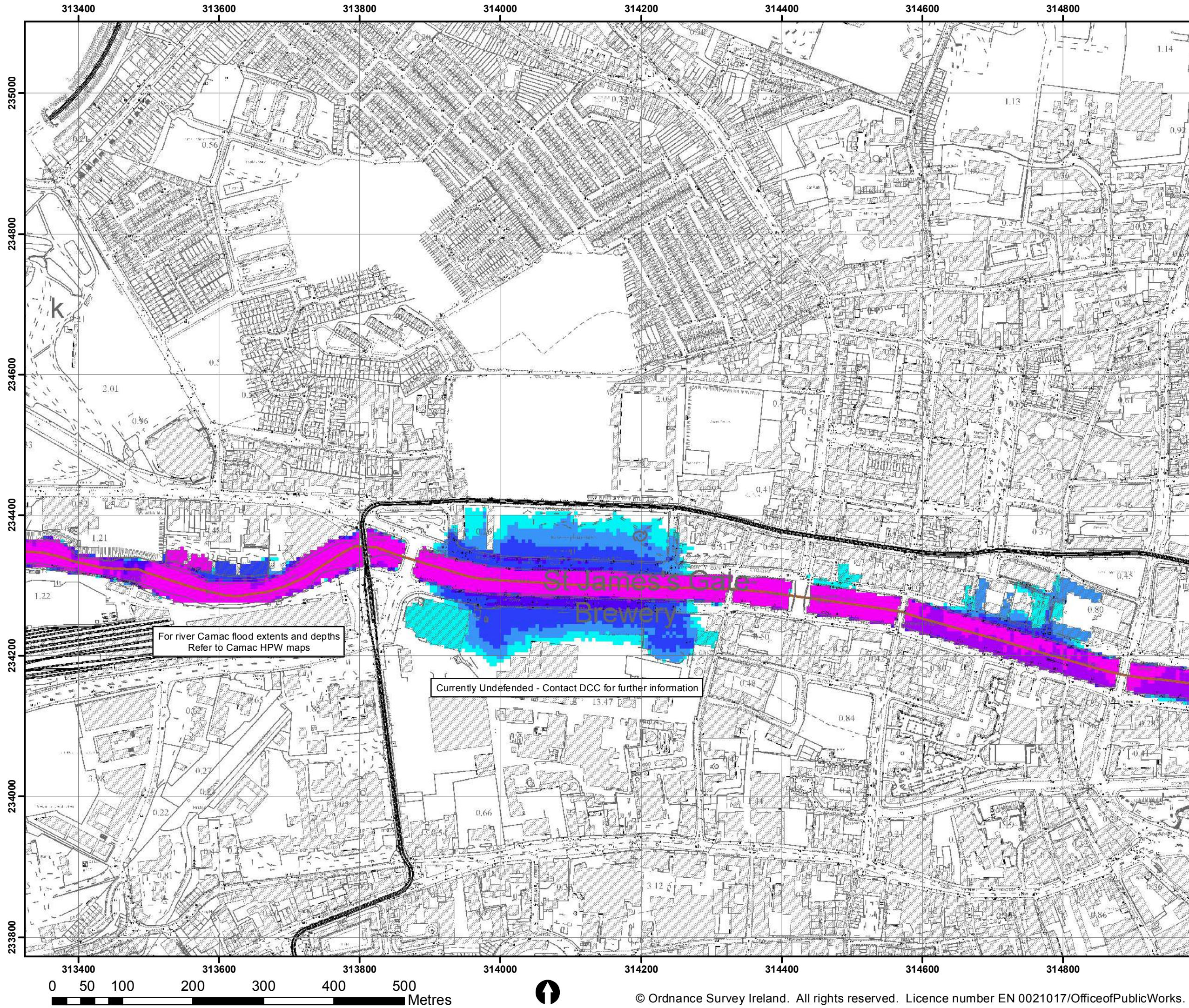
T +44(0) 28 90 667914  
F +44(0) 28 90 668286  
W www.rpsgroup.com  
E ireland@rpsgroup.com

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



# C.2 Coastal Tidal Flood Depths 0.1% AEP





IMPORTANT USER NOTE:  
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AND CONDITIONS OF USE THAT  
ACCOMPANY THIS MAP.

**Legend**

**0.1% Tidal AEP Flood Depth**

- 0 - 0.25m
- 0.25 - 0.5m
- 0.5 - 1m
- 1.0 - 1.5m
- 1.5 - 2m
- >2m

— Modelled River Centreline

- - - AFA Extents

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E ireland@rpsgroup.com

<b>Map:</b>	
<b>Liffey Tidal Flood Depths</b>	
<b>Map Type:</b> DEPTH	
<b>Source:</b> TIDAL	
<b>Map Area:</b> COASTAL	
<b>Scenario:</b> CURRENT	
<b>Drawn By :</b> C.McG.	<b>Date :</b> 9 May 2017
<b>Checked By :</b> A.S.	<b>Date :</b> 9 May 2017
<b>Approved By :</b> G.G.	<b>Date :</b> 9 May 2017
<b>Drawing No. :</b> E09LIF_DPCCD001_F1_02	
<b>Map Series :</b> Page 2 of 8	
<b>Drawing Scale :</b> 1:5,000 @A3	

For river Camac flood extents and depths  
Refer to Camac HPW maps

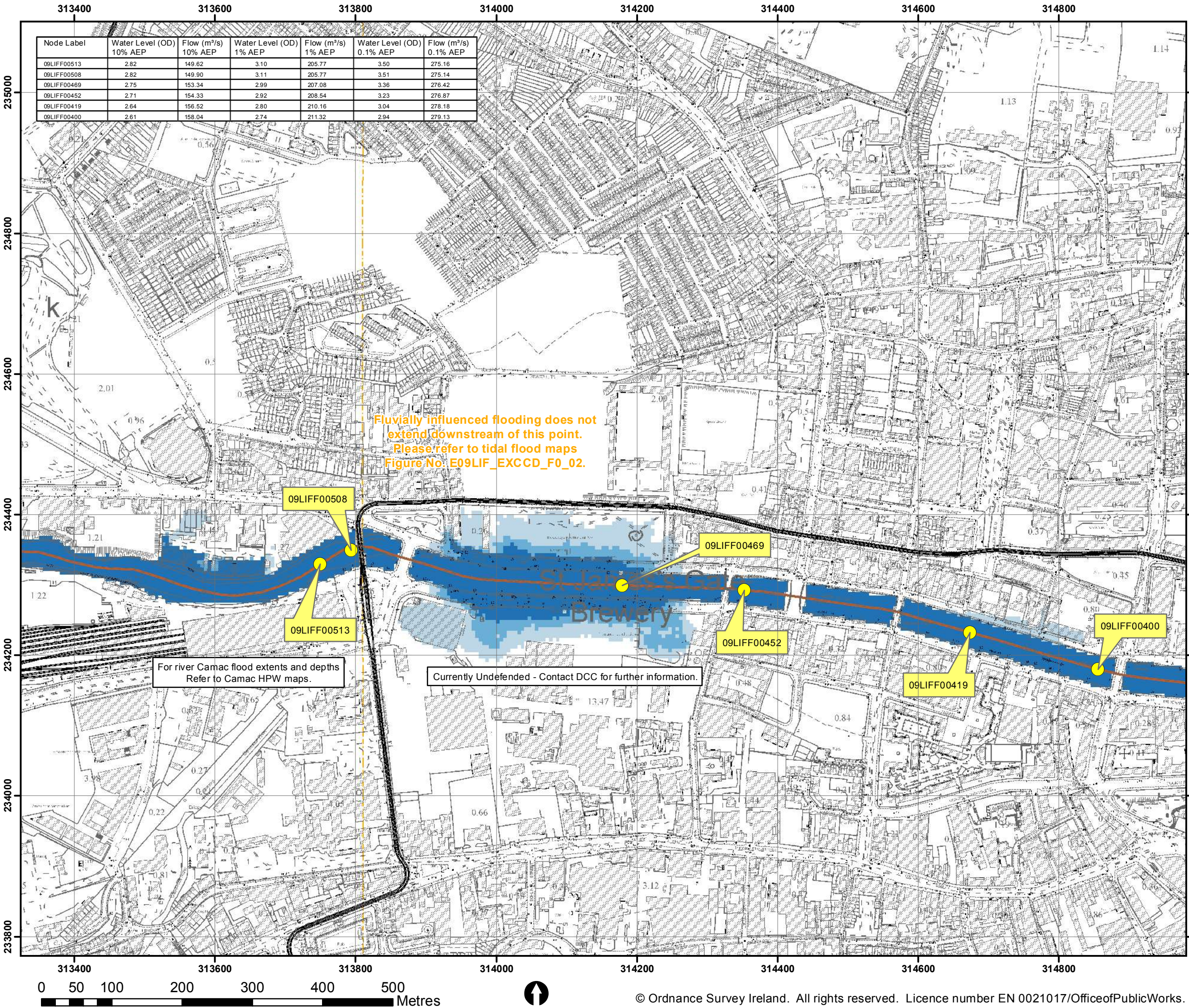
Currently Undefended - Contact DCC for further information



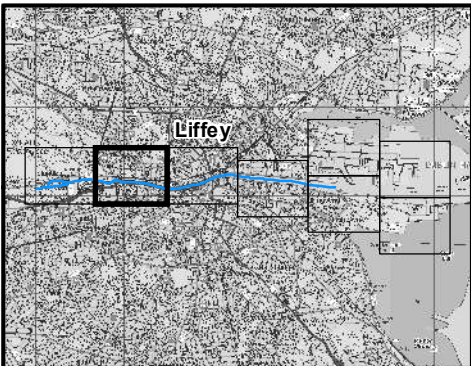


# C.3 Fluvial Flood Extents





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
09LIF00513	2.82	149.62	3.10	205.77	3.50	275.16
09LIF00508	2.82	149.90	3.11	205.77	3.51	275.14
09LIF00469	2.75	153.34	2.99	207.08	3.36	276.42
09LIF00452	2.71	154.33	2.92	208.54	3.23	276.87
09LIF00419	2.64	156.52	2.80	210.16	3.04	278.18
09LIF00400	2.61	158.04	2.74	211.32	2.94	279.13



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**

REV:	NOTE:	DATE:
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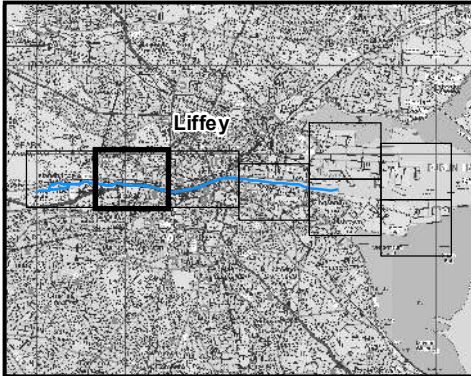
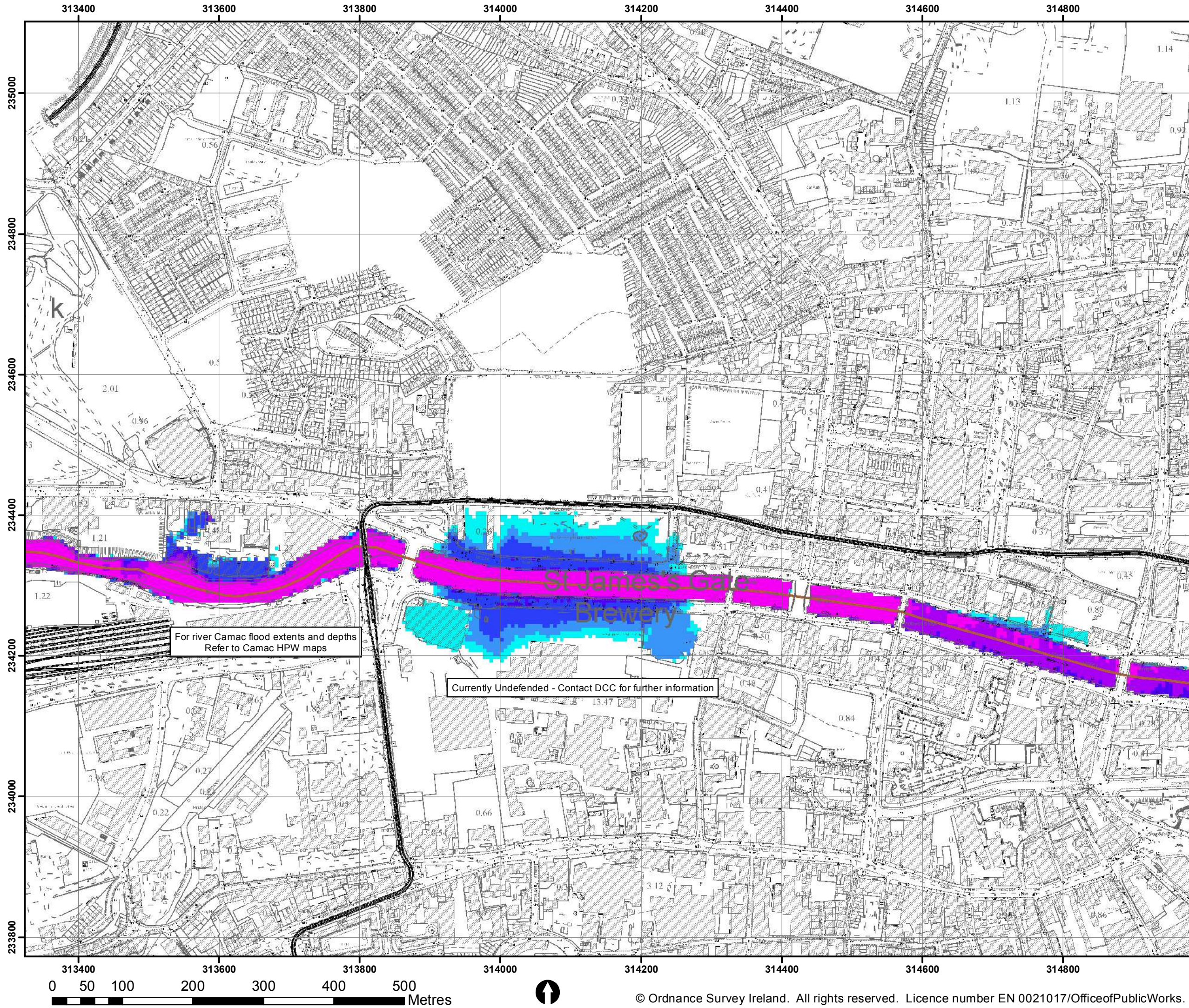
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E ireland@rpsgroup.com

<b>Map:</b>	
<b>Liffey Fluvial Flood Extents</b>	
<b>Map Type:</b> EXTENT	
<b>Source:</b> FLUVIAL	
<b>Map Area:</b> HPW	
<b>Scenario:</b> CURRENT	
<b>Drawn By :</b> C.C.	<b>Date :</b> 9 May 2017
<b>Checked By :</b> A.S.	<b>Date :</b> 9 May 2017
<b>Approved By :</b> S.P.	<b>Date :</b> 9 May 2017
<b>Drawing No. :</b>	
<b>E09LIF_EXFCD_F1_02</b>	
<b>Map Series :</b> Page 2 of 8	
<b>Drawing Scale :</b> 1:5,000 @ A3	



# C.4 Fluvial Flood Depths 0.1 % AEP





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

**Legend**

**0.1% Fluvial AEP Flood Depth**

- 0 - 0.25m
- 0.25 - 0.5m
- 0.5 - 1m
- 1.0 - 1.5m
- 1.5 - 2m
- >2m

— Modelled River Centreline

- - - AFA Extents

**FINAL**

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





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<b>Map:</b>	
<b>Liffey Fluvial Flood Depths</b>	
<b>Map Type:</b> DEPTH	
<b>Source:</b> FLUVIAL	
<b>Map Area:</b> HPW	
<b>Scenario:</b> CURRENT	
<b>Drawn By :</b> C.McG.	<b>Date :</b> 9 May 2017
<b>Checked By :</b> A.S.	<b>Date :</b> 9 May 2017
<b>Approved By :</b> G.G.	<b>Date :</b> 9 May 2017
<b>Drawing No. :</b> E09LIF_DPFC001_F1_02	
<b>Map Series :</b> Page 2 of 8	
<b>Drawing Scale :</b> 1:5,000 @A3	



# Appendix D

## The Plan Making Justification Test – Site 5. Liffey: Sean Heuston Bridge – Sarah Bridge, South Circular Road

## C SDRA Screening and Justification Tests

### C.1 SDRA Screening Tables

The following tables illustrate the screening process carried out for each of the SDRAs, where key development sites have been identified in the Development Plan and reviewed with respect to the Flood Zone(s) they lie in. Where a site is within Flood Zone A or B, the need for a Justification Test has been assessed, based on the vulnerability of permitted development. For those sites where a Justification Test is indicated, this is provided in Appendix C.2.

## SDRA 7 - Heuston and Environs

See Section 13.9 of the Written Statement

### Zoning Map E of the Development Plan:

The lands are subject to land use zoning objectives:

Z1: To protect, provide and improve residential amenities.

Z5: To consolidate and facilitate the development of the central area, and to identify, reinforce, strengthen and protect its civic design character and dignity.

Z9: To preserve, provide and improve recreational amenity, open space and ecosystem services.

Z10: To consolidate and facilitate the development of inner city and inner suburban sites for mixed uses.

### SFRA Area Assessment:

No. 4 Liffey: Sean Heuston Br. – O’Connell Bridge

No. 5 Liffey: Sean Heuston Br. Sarah Bridge, South Circular Rd.

No. 17 Lower Camac: South Circular Road to Liffey

### Flood Zones:

SDRA 7	Heuston and Environs	Flood Zone A	Flood Zone B	Flood Zone C
Site 1	Hickeys	Z5, Z9	Z5, Z9	Z5
Site 2	Conyngham Road	Z9	Z9	Z5
Site 3	Heuston	Z5, Z9, Z10	Z5, Z9, Z10	Z5, Z9 and Z10
Site 4	Heuston South Quarter			Z5
Site 5	St. James’ St./ Bow Lane West		Z1	Z1

Table 8. SDRA 7 Development Areas Relationship with Flood Zones



	FLOOD ZONE A	FLOOD ZONE B	FLOOD ZONE C
Highly vulnerable development	JUSTIFICATION TEST	JUSTIFICATION TEST	APPROPRIATE
1 Hickeys	Z5 partly defended	Z5	Z5
2 Conyngham Road			Z5
3 Heuston	Z5, Z10	Z5, Z10	Z5, Z9 and Z10
4 Heuston South Quarter			Z5
5 St. James' St./ Bow Lane West		Z1	Z1

Table 9. SDRA 7 Matrix of Vulnerability Versus Flood Zones

### Conclusion:

SDRA 7	Heuston and Environs	Justification Test: <b>Required</b>
--------	----------------------	--

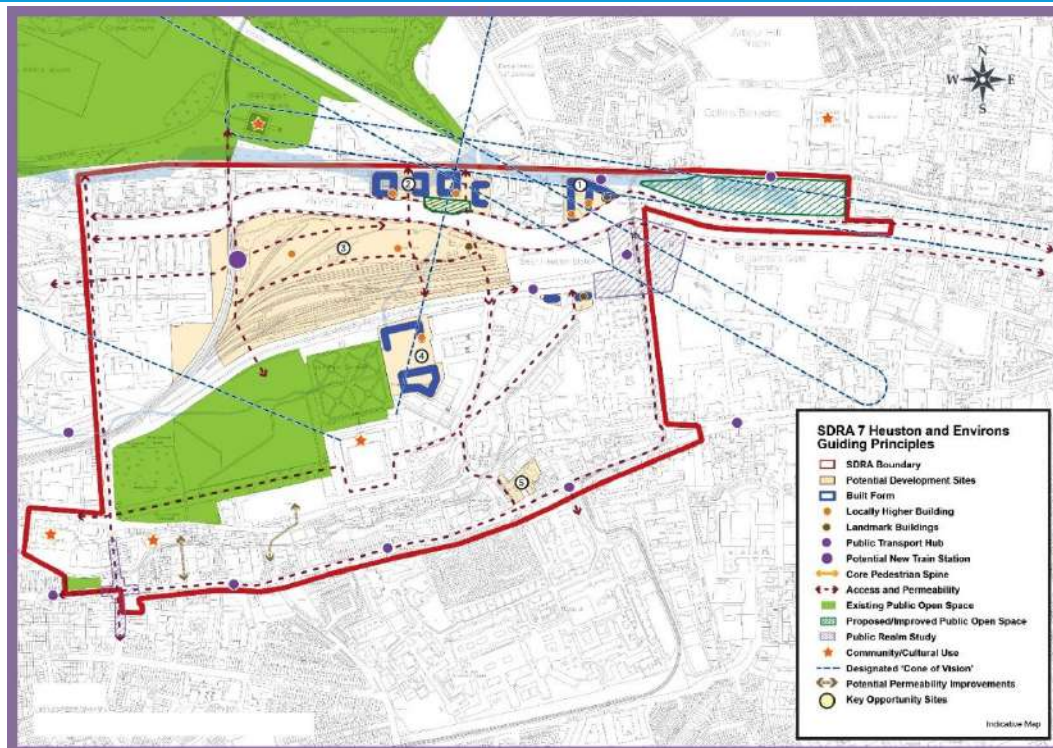
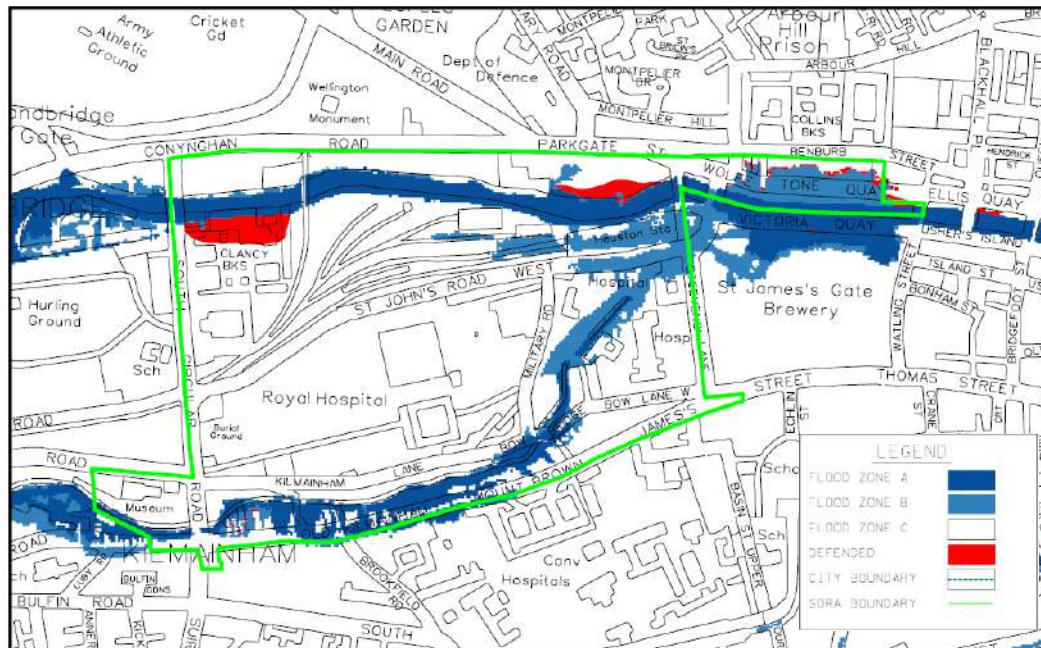
## C.2 SDRA Justification Test Tables

The tables that follow detail the Plan Making Justification Tests for the SDRAs where development sites with high or less vulnerable development classifications were located within Flood Zones A and / or B. It should be noted that SDRA 3 also requires a Justification Test, but this has been included in the Justification Test for SFRA Area Assessment No. 22A Tolka: Finglas Stream.

Name	
SDRA 1	Clongriffin/Belmayne and Environs
SDRA 3	Finglas Village Environs and Jamestown Lands (see SFRA Area Assessment No. 22A Tolka: Finglas Stream)
SDRA 6	Docklands
SDRA 7	Heuston and Environs
SDRA 11	St. Teresa's Gardens and Environs
SDRA 15	Liberties and Newmarket Square

It should be noted that the Composite Flood Map, and all other map extracts, illustrate Flood Zone A, B and Defended Areas (in red), where defended areas indicate 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.

## SDRA 7: Heuston and Environs



### Area Description

The SDRA lands comprise Heuston Station, lands to the south of St. John's Road West in the Heuston Quarter, lands at Bow Lane and lands to the north of the River Liffey. The SDRA is served by Heuston Station and the Red Luas Line. The Rivers Liffey and the Camac traverse the SDRA lands.

### Land Use Zoning:

Z1: To protect, provide and improve residential amenities.  
 Z5: To consolidate and facilitate the development of the central area, and to identify, reinforce, strengthen and protect its civic design character and dignity.  
 Z9: To preserve, provide and improve



## SDRA 7: Heuston and Environs

	<p>recreational amenity, open space and ecosystem services.</p> <p>Z10: To consolidate and facilitate the development of inner city and inner suburban sites for mixed uses.</p>
<b>SDRA 7 Heuston and Environs:</b>	<p>The Framework Plan, above, identifies 5 opportunity sites for development. Section 13.9 in Chapter 13 of the Written Statement sets out Guiding Principles for the development of these lands and identifies opportunities for the integration of new development into the area by addressing issues such as urban structure, land use, infrastructure, design, movement, permeability, building lines, heights and greening opportunities.</p>
<b>Benefitting from Defences (flood relief scheme works)/</b> <b>Sensitivity to Climate Change/</b> <b>Residual Risk/</b> <b>Surface Water/</b> <b>Historical Flooding</b>	<p>See Area Assessments:</p> <p>No. 4 Liffey: Sean Heuston Br. - O'Connell Bridge</p> <p>No. 5 Liffey: Sean Heuston Br. – Sarah Bridge, South Circular Rd.</p> <p>No. 17 Lower Camac: South Circular Road to Liffey Estuary</p>

### Commentary on Flood Risk:

The development areas and their flood zones are set out below:

#### Flood Zones:

SDRA 7	Heuston and Environs	Flood Zone A	Flood Zone B	Flood Zone C
Site 1	Hickeys	Z5, Z9	Z5, Z9	Z5
Site 2	Conyngham Road	Z9	Z9	Z5
Site 3	Heuston	Z5, Z9, Z10	Z5, Z9, Z10	Z5, Z9 and Z10
Site 4	Heuston South Quarter			Z5
Site 5	St. James' St./Bow Lane West		Z1	Z1

## SDRA 7: Heuston and Environs

### Justification Test for Development Plans

**1. Part 1 of the Justification Test is covered under Section 3.2.1 in the main body of the SFRA report.**

**2. The zoning or designation of the lands for the particular use or development type is required to achieve the proper planning and sustainable development of the urban settlement and, in particular:**

**(i) Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement.**

**Answer: Yes:** The continuing redevelopment and regeneration of the Heuston and environs area is essential to facilitate the consolidation and expansion of Dublin City. The lands are located inside the canals and are served by high quality public transport – Main Line Rail, Luas and Bus Connects. According to the NPF, the RSES and MASP, infill development, such as that outlined in the Guiding Principles above, based around high quality public transport is essential to facilitate the consolidation of the Dublin Metropolitan Area and to provide new homes.

**(ii) Comprises significant previously developed and/or under-utilised lands**

**Answer: Yes:** The opportunity sites comprise under-utilised lands within the canals. The regeneration and redevelopment of these underutilised lands is essential to achieve a more compact urban form facilitated through well-designed higher density development.

**(iii) Is within or adjoining the core of an established or designated urban settlement.**

**Answer: Yes:** The lands are located within the Inner City in close proximity to the Retail Core.

**(iv) Will be essential in achieving compact and sustainable urban growth**

**Answer: Yes:** The SDRA lands have significant potential for further regeneration and can make a valuable contribution to the future physical and social regeneration of this part of the city. The Core Strategy identifies that the lands have the capacity to deliver 1,250 residential units. The regeneration and redevelopment of opportunity sites beside the city centre is essential in achieving compact and sustainable urban growth in line with the NPF, the RSES and MASP.

**(v) There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement.**

**Answer:** There are no suitable alternative lands for the particular uses or development type in areas at lower risk of flooding, within or adjoining the urban settlement.

### 3. Specific Flood Risk Assessment

The SDRA is located primarily within Flood Zone C. Development in the main could reasonably be accommodated within the extents of Flood Zone C and should not need to extend into Flood Zones A and B.

Opportunity sites on the northern side of the River Liffey are partly within Flood Zones A and B. Although these sites are behind river bank walls, these are old and in parts structurally unsound so do not provide a flood relief function. The development of these sites is premature until the lands are defended as part of a development scheme. Any master planning for the site would require a flood defence strategy, which will need to be constructed

#### SDRA 7: Heuston and Environs

prior to commencement of the development of the rest of the site.

**Conclusion: The subject area passes Part 1 and 2 of the Justification Test for Development Plans but Part 3 has found that new development should be located in Flood Zone C and avoid Flood Zone A and B.**