Dublin City Development Plan 2022 – 2028

Strategic Flood Risk Assessment

December 22

Dublin City Council

Dublin City Development Plan

2022 – 2028

Strategic Flood Risk Assessment (SFRA)

This Strategic Flood Risk Assessment (SFRA) was undertaken as part of the preparation of the Dublin City Development Plan 2022 – 2028. This SFRA Report was written by Dublin City Council's Flood Projects and Water Framework Directive Division with the help of Elizabeth Russell of JBA Consulting.

Executive Summary

Flood Policy, Legislation and Flood Mapping

Dublin City Council has undertaken a Strategic Flood Risk Assessment (SFRA) to inform the Dublin City Development Plan 2022-2028. The purpose of this work is to provide a broad assessment of flood risk to inform strategic land-use planning decisions, in accordance with The Planning System and Flood Risk Management Guidelines for Planning Authorities and Technical Appendices, 2009, and these Guidelines were issued under the Planning and Development Act 2000 and recognise the significance of proper planning to manage flood risk.

Under the EU 'Floods' Directive, the national Catchment Flood Risk Assessment and Management (CFRAM) programme was carried out. It included a review of flood risk across the country and produced flood hazard mapping and flood risk management plans for tidal and main rivers. Dublin City was covered by the Eastern CFRAM study, which included the rivers Liffey, Santry, Poddle, Camac as well as the City coastal zones. Earlier pilot studies were carried out for the river Tolka, Mayne and Dodder catchments. Minor streams and rivers may require new studies. Some of the CFRAM Studies were updated by the OPW Flood Risk Management Plans (FRMP) launched in 2018 and viewable at floodinfo.ie. An updated flood study is ongoing on the Camac, Tolka and Dodder rivers.

There are a number of completed, ongoing and proposed flood relief schemes in Dublin which provide protection against various combinations of tidal, fluvial and surface water flooding. The standard of protection (SoP) provided by the various schemes is variable, but generally 1% Annual Exceedance Probability (AEP) for recently constructed and proposed fluvial defences and 0.5% AEP for tidal defences. Some of the ongoing/planned schemes also include an allowance for climate change, but this is not uniform.

The information provided by the above, and other local studies, is a useful source of data for the SFRA.

Definition of Flood Zones and Flood Risk

Within Dublin City, five main sources of flood risk have been identified. The natural causes are:

- Coastal and estuarine flooding of areas adjacent to the coast or tidal estuaries.
- Fluvial or riverine flooding due to the river banks overtopping and/or flood defence collapse.
- Pluvial flooding resulting from water run-off and ponding in low spots following intense rainfall.

In addition, flooding can occur from human activities including:

- Dam break and extreme operation flooding associated with dam failure, either actual failure or high discharge release when in danger of over topping.
- Drainage flooding due to failure or inadequacies of the sewerage system.

Flood Zones are used to indicate the likelihood of a flood occurring. Based on the definitions in "The Planning System and Flood Risk Management Guidelines for Planning Authorities and Technical Appendices, 2009", Flood Zone A indicates a high probability of flooding, Flood Zone B a moderate probability and Flood Zone C a low probability of flooding from fluvial or tidal sources. The Flood Zones are based on an undefended scenario and do not take into account the presence of flood protection structures such as flood walls or embankments. This is to allow for the fact that there is a residual risk of flooding behind the defences due to overtopping or breach and that there may be no guarantee that the defences will be maintained in perpetuity.

Flood risk is a product of the likelihood (or probability) of a flood occurring and the potential consequences. Therefore, the assessment of flood risk requires an understanding of the sources, the flow path of floodwater and the people and property that can be affected. This has been reviewed in relation to each watercourse within Dublin City and in the context of tidal/ coastal flooding.

The Flood Zone maps have been developed as composite datasets, drawing on the best available information across the city. This has ranged from finalised study outputs, the Eastern CFRAM study and Eastern FRMP flood extents, engineering knowledge, historical records and site walkover. The flood maps for the whole city comprise a ‘Composite Flood Map’, see Appendix E, and a set of flooding maps overlaid on the Land-Use Zoning Maps (Maps A to H) which are available for viewing on the Development Plan Website - Dublin City Council Development Plan 2022 - 2028 Climate change is one of the biggest potential risks over the lifetime of the defences. The Flood Zones do not take the impact of climate change into account directly, although an indication of the scale of likely changes is gained from a comparison of the extents of Flood Zone A and B, with Flood Zone B being an indication of the future extent of Flood Zone A. The CFRAM Study and FRMP also included climate change flood extents for two scenarios, the Medium Range Future Scenario (MRFS) and the High End Future Scenario (HEFS). It is important that the standard of protection (SoP) provided by the defences is reviewed over time, and if necessary, increased to ensure the 1 in 100-year standard of protection is maintained.

Flood Management Policies

This SFRA of the Dublin City Development Plan 2022-2028 includes a review of the land-use zonings in relation to flood risk and also recommends flood risk management policies and objectives. The Planning Guidelines recommend a sequential approach to the management of flood risk where the preferred option is the avoidance of development in areas of flood risk; where this is not possible development type should be substituted to a less vulnerable or water compatible land-use. Land-use zoning in an area of flood risk has been subject to the Justification Test for Plan Making to demonstrate that development is necessary for strategic growth of the area and that flood risk can be mitigated and managed appropriately.

The SFRA provides details of flood risk to the city, and where required includes the Justification Test for Plan Making (see Appendices B and C). In some locations, the proposed land-uses are water compatible, so justification is not

required. In others, the level of risk present has required specific direction to be provided. This direction guides the need for further study (either site-specific FRA or the appraisal of a wider scale flood management solution) and the scope and scale of mitigation works that will be required for development to proceed in accordance with the Justification Test for Development Management.

At site specific level, all development proposals, regardless of location, will require an appropriately detailed flood risk assessment. As a minimum this will be a ‘Stage 1 – Identification of Flood Risk’; where flood risk is identified, a ‘Stage 2 – Initial FRA’ will be required and depending on the scale and nature of the risk, a ‘Stage 3 – Detailed FRA’ may be required. The requirement for all applications to have an accompanying Stage 1 assessment is important, as, for example, a large site located in Flood Zone C may be appropriate in terms of vulnerability but might be at potential risk of surface water flooding or a risk from climate change impacts or may cause flooding to neighbouring lands by increasing run off or blocking an overland flow route.

Any proposal that is considered acceptable in principle shall demonstrate the use of the sequential approach in terms of the site layout and design, and where flood risk is identified, in satisfying the Justification Test for Development Management, the proposal will demonstrate that appropriate mitigation and management measures are put in place.

Conclusion

This SFRA has been developed to inform the preparation of land-use zoning, policies and objectives for the Dublin City Development Plan 2022-2028, which have been reviewed against the recommendations set out in The Planning System and Flood Risk Management Guidelines for Planning Authorities and Technical Appendices, 2009. The land-use zoning allocations aim to avoid areas of high flood risk and where this is not achieved, but the proposed zoning has passed parts 1 and 2 of the Justification Test, recommendations have been made in part 3 of the Justification Test, relating to flood risk. It is noted the Flood Zones are based on best currently available data, but that a more detailed, site specific, flood risk assessment may produce locally varying flood outlines. There are a number of triggers which may prompt a review of the SFRA, or will require a slight change in specification for site specific flood risk assessments, including the completion of various ongoing schemes and flood studies.

Contents

List of Figures

List of Tables

Abbreviations

AEP	Annual Exceedance Probability
AOD	Above Ordnance Datum
CFRAM	Catchment Flood Risk Assessment and Management
CFRAMS	Catchment-Based Flood Risk Assessment and Management Study
CFRMP	Catchment Flood Risk Management Plan
CIRIA	Company providing research and training in the construction industry
DCC	Dublin City Council
DECLG	Department of Environment, Community and Local Government
DHLGH	Department of Housing, Local Government and Heritage
DoEHLG	Department of the Environment, Heritage and Local Government
EC	European Community
EMRA	Eastern and Midland Regional Assembly
ESB	Electricity Supply Board
FAS	Flood Alleviation Scheme
FFL	Finished Floor Level
FRA	Flood Risk Assessment
FRM	Flood Risk Mapping
FRMP	Flood Risk Management Plan
FZ	Flood Zone
GDSDS	Greater Dublin Strategic Drainage Strategy
HEFS	High End Future Scenario
ICPSS	Irish Coastal Protection Strategy Study
IFM	Indicative Floodplain Map
LAP	Local Area Plan
MRFS	Medium Range Future Scenario
MSL	Mean Sea Level
NTA	National Transport Authority
OD	Ordnance Datum
OPW	Office of Public Works
PFRA	Preliminary Flood Risk Assessment

RBMP	River Basin Management Plan
SDZ	Strategic Development Zone
SEA	Strategic Environmental Assessment
SDRA	Strategic Development and Regeneration Areas
SFRA	Strategic Flood Risk Assessment
SSFRA	Site Specific Flood Risk Assessment
SuDS	Sustainable Drainage Systems
SWMP	Surface Water Management Plan
WFD	Water Framework Directive

1 Introduction Strategic Flood Risk Assessment (SFRA)

1.1 Introduction

This report outlines the findings of the Strategic Flood Risk Assessment (SFRA) for the Dublin City Development Plan 2022-2028.

This SFRA provides an area-wide assessment of significant flood risk to inform strategic land-use planning decisions. The SFRA enables Dublin City Council (DCC) to apply the sequential approach, including the Justification Test for Development Plans, allocate appropriate sites for development and identify how flood risk can be reduced as part of the plan making process.

The SFRA was prepared and informed by the DEHLG Guidelines for Planning Authorities (DEHLG and OPW, 2009) on The Planning System and Flood Risk Management and Technical Appendices, (including Planning Circular PL2/2014). These Guidelines were issued under Section 28 of the Planning and Development Act 2000 as amended and require Planning Authorities to introduce flood risk assessment as an integral and leading element of their Development Planning functions. It sets out that Development Plans and local area plans, must establish the flood risk assessment requirements for their functional area. The aim of the SFRA is to facilitate development within the city without increasing the number of people at significant risk of flooding in an existing Flood Zone.

1.2 Disclaimer

It is important to note that, although prepared in compliance with the requirements of The Planning System and Flood Risk Management Guidelines for Planning Authorities, 2009, the SFRA is a work in progress and is based on emerging and best available data at the time of preparing the assessment.

Accordingly, all information in relation to flood risk is provided for general policy guidance only, and may be substantially altered in light of future data and analysis, or future flood events. As a result, all landowners and developers are advised that Dublin City Council and their agents can accept no responsibility for losses or damages arising due to assessments of the vulnerability to flooding of lands, uses and developments. Owners, users and developers are advised to take all reasonable measures to assess the vulnerability to flooding of lands and buildings (including basements) in which they have an interest prior to making planning or development decisions.

This SFRA should be reviewed when a new Development Plan is being made, following completion of significant flood relief schemes and after significant flood events to ensure that its content and emphasis remains relevant, as laid out in Section 7.

1.3 Planning Policy

1.3.1 Planning System and Flood Risk Management Guidelines for Planning Authorities, 2009

The Planning System and Flood Risk Management Guidelines for Planning Authorities and Technical Appendices, 2009, were issued under Section 28 of the Planning and Development Act 2000 as amended and require Planning Authorities to introduce flood risk assessment as an integral and leading element of their Development Planning functions. It sets out that Development Plans and local area plans, must establish the flood risk assessment requirements for their functional area.

The policies and objectives for flood risk management in areas at risk of flooding must have been developed with regard to The Planning System and Flood Risk Management Guidelines for Planning Authorities and Technical Appendices both dated November 2009.

The Guidelines require the planning system at national, regional and local levels to:

- Avoid developments in areas at (significant) risk of flooding, particularly floodplains, unless there are proven wider sustainability grounds that justify appropriate development and where the flood risk can be reduced or managed to an acceptable level without increasing flood risk elsewhere.
- Adopt a sequential approach to flood risk management when assessing the location for new development based on avoidance, reduction and mitigation of flood risk.
- Incorporate flood risk assessment into the process of making decisions on planning applications and planning appeals.

In addition to the Planning Guidelines, Circular PL 2/2014 provides further advice and detail to Planning Authorities on older developed areas of towns and cities located in Flood Zone A and B, and also guidance on the development of Flood Zones and use of indicative flood risk data.

1.3.2 Regional Spatial and Economic Strategy for the Eastern and Midland Region (2019-2031)

As part of the preparation of the Regional Assembly Regional Spatial and Economic Strategy (RSES) for the Eastern and Midland Region, a Regional Flood Risk Assessment was undertaken so that the high-level impact of the proposed Policy Objectives on the environment could be evaluated and used to inform the direction of the RSES and the preparation of the Dublin Metropolitan Area Strategic Plan (MASP). The aim of the MASP is to ensure a supply of strategic development areas for the sustainable growth and continued success and competitiveness of the Dublin metropolitan area.

The Regional Flood Risk Appraisal (RFRA) was prepared as part of the Strategic Environmental Assessment of the Eastern and Midland Regional Spatial and Economic Strategy (RSES) in accordance with national and EU legislation. This RFRA was prepared by considering the requirements of The Planning System

and Flood Risk Assessment Guidelines for Planning Authorities (2009) and Circular PL02/2014 (August 2014).

The RFRA found that "Dublin City has, like other settlements in the Eastern Region, geographical constraints which limit its spatial growth. Growth of the capital is dictated to go west and north due the Dublin / Wicklow Mountains and the Irish Sea to the south and east respectively. The River Liffey and its tributaries already influence the development patterns in the City Centre and South Dublin. As the city progresses west, it will further encounter flood risk issues associated with the River Liffey. Dublin City itself is constrained by the fact that it has largely already fully developed. The urban rivers (Poddle, Dodder, Santry, Camac, Tolka) traversing the city have caused significant flooding as the city has grown radially from the banks of the Liffey. The principle of avoidance is difficult adjacent to these rivers as there is not always alternative flood free land to develop on, therefore the local authorities have built or are exploring flood risk management measures along these urban rivers to reduce the flood risk to surrounding areas and allow infill and regeneration projects adjacent to these rivers".

The RFRA included details of the Metropolitan Area Spatial Plan (MASP), including a flood risk summary for key development sites.

This drew upon the previous (2016-2022) Development Plan SFRA, CFRAM Study and CFRMP so does not provide any new insights into the assessment of risk in the city.

1.3.3 Dublin City Development Plan 2022 - 2028

The Dublin City Development Plan will shape the future development of the city and it therefore sets out the strategy for the proper planning and sustainable development of the city over the period 2022 to 2028. The Plan will provide for and manage, the physical, economic and social development of the city in line with the principles of compact growth and climate resilience; in the interests of the overall common good and in compliance with environmental controls.

The overall Core Strategy for Dublin City is to build on the principles established in the previous Dublin City Development Plan 2016–2022 together with incorporating updated and revised national and regional policy and guidance as issued by DHLGH, other Government departments and agencies and bodies acting under their aegis including the OPR, EMRA, NTA, OPW etc.

The Plan prioritises development in the inner city, Key Urban Villages (KUVs) and Strategic Development and Regeneration Areas (SDRAs).

For the inner city, the plan seeks to strengthen and consolidate the robust city-centre mixed-use zoning (Z5), with active promotion of the inner city, primarily as an attractive place for urban living, and for working and visiting; the delivery of housing regeneration projects; the emergence of spatial clusters of economic specialisms; public realm improvements with a strong emphasis on strengthening of the retail core by adapting to the new and evolving direction in retailing, all supported by multiple levels of public transport accessibility and public realm interventions.

The Key Urban Villages (KUV) represent the top-tier of urban centres outside the city centre, a number of which form part of the larger SDRAs. Each of the twelve KUVs underpin a wider area and act as strong spatial hubs providing a comprehensive range of commercial and community services to the surrounding populations that will encourage and promote the 15 minute city concept. Broadly, the designated KUVs align with planned or existing public transport rail corridors. The Development Plan reinforces the KUVs as sustainable anchors for the suburbs while performing an important regeneration role for local communities they serve.

The city's SDRAs have substantial development capacity (see Core Strategy in Volume 1 Written Statement). Table 1-1 below lists the 17 Strategic Development and Regeneration Areas (SDRAs) identified for the city in the Development Plan. A series of Framework Plans and detailed guiding principles have been set out for each SDRA in Chapter 13 of the Written Statement of the plan.

Table 1-1: Strategic Development Regeneration Areas

SDRA	Name
SDRA 1	Clongriffin/Belmayne and Environs
SDRA 2	Ballymun
SDRA 3	Finglas Village Environs and Jamestown Lands
SDRA 4	Park West/Cherry Orchard
SDRA 5	Naas Road
SDRA 6	Docklands
SDRA 7	Heuston and Environs
SDRA 8	Grangegorman/Broadstone
SDRA 9	Emmet Road
SDRA 10	North East Inner City
SDRA 11	St. Teresa's Gardens and Environs
SDRA 12	Dolphin House
SDRA 13	Markets Area and Environs
SDRA 14	St. James's Healthcare Campus and Environs
SDRA 15	Liberties and Newmarket Square
SDRA 16	Oscar Traynor Road
SDRA 17	Werburgh Street

In addition to the above, the Core Strategy of the Plan identifies under section 2.4.5, 'Future Development Areas' in the city. The areas identified are Kylemore Road/Naas Road lands and Glasnevin (the Dublin Industrial Estate and surrounding lands). It is the intent of the Council that, following feasibility studies some or all of these industrial lands may be brought forward as regeneration lands during the lifetime of the Development Plan. Any such change to the Development Plan would require Strategic Flood Risk Assessment.

The Core Strategy has been informed and guided by the Strategic Environmental Assessment (SEA), Appropriate Assessment (AA) and this Strategic Flood Risk Assessment (SFRA), undertaken in a parallel process in tandem with each stage

of the plan making process. To deliver the Core Strategy the following mechanisms are used, some of which will be subject to their own level of flood risk assessment (where relevant), which will be informed by this document:

a. Area-Specific Plans: Dublin City Council will continue to roll out existing, and where practicable prepare area-specific guidance for the, SDRAs and KUVs, using appropriate mechanisms of Strategic Development Zones (SDZs), Local Area Plans (LAPs), Village Improvement Plans (VIPs), Local Environmental Improvement Plans (LEIPs) and other strategies and plans, as considered appropriate and where resources permit.
b. Zoning and Standards: The zoning and standards provisions of the plan have been devised to support the delivery of the Core Strategy. In particular, the zoning provision ensures adequate land to meet the population targets and economic role of the city as the national gateway, intensification along public transport corridors and a mixed use approach to zonings. The standards reinforce this approach with clear guidance for quality residential development, successful neighbourhoods based on healthy living and the 15 minute city concept and green infrastructure.
c. Monitoring Indicators: This is a dynamic plan that will be actively implemented. In order to consistently and properly track and measure progress on the implementation of the plan, a set of City Performance Indicators has been devised and these are set out in Chapter 16 of the plan. The SEA, which have informed the policies and objectives in the plan, will also be monitored.
d. Engagement with City Stakeholders: Engagement on the City's vision and implementation of the Core Strategy of the Plan is essential to achieving the properly planned and sustainable development of a climate proofed Dublin into the future.

The SFRA was integrated into the SEA process that was undertaken alongside the preparation of the plan. The Environmental Authorities specified by the SEA Regulations were consulted during formal SEA scoping.

Flooding was included as an issue in the scoping issues paper, which was sent to the Environmental Authorities on 23rd April 2021. The findings of the SFRA were integrated into the SEA process.

1.4 Flood Risk

Flooding is a natural process which cannot be prevented entirely, but it can generally be managed to reduce its social and economic consequences and to safeguard the continued functioning of services and infrastructure. Climate change is likely to worsen the situation in areas susceptible to intermittent flooding.

Flood Risk is the likelihood of a particular flood happening (probability), e.g., the 1% annual exceedance probability (AEP) flood has a roughly 1 in 100 year chance of occurring. This does not mean that they only happen every 100 years, in betting terms the odds of such an event happening would be 100/1 in any year.

Flood risk can be expressed in terms of the following:

Flood risk = Probability of Flooding X Consequences of Flooding.

1.4.1 Flood Zones

Flood zones are geographical areas within which the likelihood of flooding is in a particular risk range and they are a key tool in flood risk management within the planning process as well as in flood warning and emergency planning.

There are three types or levels of Flood Zones defined in The Planning System and Flood Risk Management Guidelines for Planning Authorities and Technical Appendices, 2009:

- Zone A: High probability of flooding – Where the estimated average probability of flooding from rivers and sea is highest (greater than 1% annually or more frequent than 1 in 100 years for river flooding or greater than 0.5% annually or more frequently than 1 in 200 years respectively for coastal flooding). Most forms of development are deemed to be inappropriate here unless the requirements of the Justification Test for Plan Making are met. Only water compatible development would normally be allowed.
- Zone B: Moderate probability of flooding – Flood risk is between 0.1% (or 1 in 1,000 years) and 1% (or 1 in 100 years) annually for river flooding, and between 0.1% (or 1 in a 1,000 years) and 0.5% (or 1 in 200 years) annually for coastal flooding. Highly vulnerable development would generally be considered inappropriate unless the requirements of the Justification Test are met. Less vulnerable development should only be considered in this zone if adequate lands or sites are not available in Zone C and subject to a flood risk assessment to the appropriate level of detail to demonstrate that flood risk to and from the development can or will be adequately be managed.
- Zone C: Low probability of flooding – Areas where the risk of flooding is less than 0.1% annually (or 1 in 1000 years) for both rivers and coastal flooding. Development is appropriate from a flood risk perspective (subject to flood hazard from sources other than rivers and coast meeting normal proper planning considerations).

It is important to note that The Planning System and Flood Risk Management Guidelines for Planning Authorities and Technical Appendices, 2009 ignore the presence of flood defences when defining Flood Zones; this is due to the fact that even areas that benefit from an existing flood defence can still be vulnerable due to the speed when overtopping or a breach or other failure takes place. Therefore, this residual risk of flooding where appropriate should be assessed as part of the application of the Justification Test and, if the site is zoned for development, through the site specific flood risk assessment.[1]

1.4.2 Consequences of Flood Risk

The consequences of flooding depend on the hazards associated with the event, including: depth of water, speed of flow, rate of onset, duration, wave action effects and water quality. The consequences are also determined by the vulnerability of people, property and the environment potentially affected by a flood. The recovery time following flooding is also important.

1 The Planning System and Flood Risk Management Guidelines for Planning Authorities, 2009, Section 3.4

The Planning System and Flood Risk Management Guidelines for Planning Authorities and Technical Appendices, 2009 provide three vulnerability categories based on the type of development which are detailed below in Table 1-2 (source: The Planning System and Flood Risk Management Guidelines for Planning Authorities and Technical Appendices, 2009). This illustrates the types of development that would be appropriate to each Flood Zone and those that would be required to meet the Justification Test. Inappropriate development that does not meet the criteria of the Justification Test should not be considered at the plan making stage or approved within the development management process.

Table 1-2: Classification of Vulnerability of Different Types of Development

Vulnerability Class	Land-uses and types of development which include*:
Highly vulnerable development (including essential infrastructure)	Garda, ambulance and fire stations and command centres required to be operational during flooding; Hospitals; Emergency access and egress points; Schools; Dwelling houses, student halls of residence and hostels; Residential institutions such as residential care homes, children's homes and social services homes; Caravans and mobile home parks; Dwelling houses designed, constructed or adapted for the elderly or, other people with impaired mobility; and Essential Infrastructure, such as primary transport and utilities distribution, including: electricity generating power stations and sub-stations, water and sewage treatment, and potential significant sources of pollution (SEVESO sites, IPPC sites, etc.) in the event of flooding.
Less vulnerable development	Buildings used for; retail, leisure, warehousing, commercial, industrial and non-residential institutions; Land and buildings used for holiday or short-let caravans and camping, subject to specific warning and evacuation plans; Land and buildings used for agriculture and forestry; Water treatment (except landfill and hazardous waste); Mineral working and processing; and Local Transport Infrastructure.
Water compatible development	Flood control infrastructure; Docks, marinas and wharves; Navigation facilities; Ship building, repairing and dismantling , dockside fish processing and refrigeration and compatible activities requiring a waterside location; Water-based recreation and tourism (excluding sleeping accommodation); Lifeguard and coastguard stations; Amenity open space, outdoor sports and recreation and essential facilities such as changing rooms; and Essential ancillary sleeping or residential accommodation for

Vulnerability Class	Land-uses and types of development which include*:
	staff required by uses in this category (subject to a specific warning and evacuation plan).
*Uses not listed here should be considered on their own merits	

Table 1-3: Matrix of Vulnerability Versus Flood Zone to Illustrate Appropriate Development and that Required to Meet the Justification Test

	FLOOD ZONE A	FLOOD ZONE B	FLOOD ZONE C
Highly vulnerable development	JUSTIFICATION TEST	JUSTIFICATION TEST	APPROPRIATE
Less vulnerable development	JUSTIFICATION TEST	APPROPRIATE	APPROPRIATE
Water-compatible development	APPROPRIATE	APPROPRIATE	APPROPRIATE

1.4.3 Structure of a Flood Risk Assessment (FRA)

The Planning System and Flood Risk Management Guidelines for Planning Authorities and Technical Appendices, 2009 recommend that a staged approach is adopted when undertaking a Flood Risk Assessment (FRA), which include:

- Stage 1 – Flood Risk Identification: To identify whether there may be any flooding or surface water management issues that will require further investigation. This stage mainly comprises a comprehensive desk study of available information to establish whether a flood risk issue exists or whether one is reasonably likely to exist in the future.
- Stage 2 – Initial Flood Risk Assessment: If a flood risk issue is deemed to exist arising from the Stage 1 Flood Risk Identification process, the assessment proceeds to Stage 2 which confirms the sources of flooding, appraises the adequacy of existing information and determines the extent of additional surveys and the degree of modelling that will be required. Stage 2 must be sufficiently detailed to allow the application of the sequential approach within the flood risk zone.
- Stage 3 – Detailed Flood Risk Assessment: A detailed FRA is carried out where necessary to assess flood risk issues in sufficient detail and to provide a quantitative appraisal of potential flood risk, of its potential impact on flood risk elsewhere and the effectiveness of any proposed mitigation measures.[2]

For the purposes of the Development Plan, the Strategic Flood Risk Assessment covers Stages 1 and 2, i.e., Flood Risk Identification and Initial Flood Risk Assessment. Due to the number of flood studies that have been carried out within Dublin, there was sufficient quantitative information available for use in the SFRA and no additional areas were identified that required detailed (Stage 3)

2 The Planning System and Flood Risk Management Guidelines for Planning Authorities, 2009.

assessment. The SFRA has identified situations, and some specific locations, where Stage 3 flood risk assessments will be required to support site specific planning decisions, but in these cases the existing information was sufficient to allow land zoning to progress.

1.4.4 Geographical Scales of a Flood Risk Assessment

Flood risk assessments are undertaken at different scales for the purposes of decision making, and may be at regional, Development Plan or local area plan level, and also at site-specific level.

- Regional Flood Risk Assessment (RFRA): provides for a broad overview of the source and significance of all types of flood risk across a region and highlights areas where more detailed study will be required. These appraisals are undertaken by regional authorities. At regional level, the focus of a FRA will be at Stage 1 (Flood Risk Identification), where, in general the need for more detailed flood risk assessment is flagged for city/ county and local area plans. Details of the RFRA are provided in section 1.3.
- Strategic Flood Risk Assessment (SFRA): The SFRA provides a broad basis (masterplan, area-wide or city/ countywide) assessment of all types of known flood risk to inform strategic land-use planning decisions. The SFRA allows the Planning Authority to undertake the sequential approach (described below) and identify how flood risk can be reduced as part of the Development Plan process. Where development is planned in flood risk areas, a detailed flood risk assessment may have to be carried out within the SFRA so that the potential for development of the lands and their flood risk and wider environmental impact can be assessed. The SFRA will provide more detailed information on the spatial distribution of flood risk to enable adoption of the sequential approach and to identify where it will be necessary to apply the Justification Test[3]. The Flood Risk Assessment undertaken for the Dublin City Development Plan is at the Strategic Flood Risk Assessment scale.
- Site Specific Flood Risk Assessment (site FRA): A site specific FRA is undertaken to assess all types of flood risk for a new development. This requires identification of the sources of flood risk, the effects of climate change on the flood risk, the impact of the proposed development, the effectiveness of flood mitigation and management measures and the residual risks that then remain. The requirement for and scope of site specific flood risk assessments is detailed in this report in Appendices B and C.

1.4.5 Sequential Approach to Flood Risk Management and Justification Test

The sequential approach is the key tool in ensuring that development, particularly new developments, first and foremost is directed towards land that is at low risk[4].

Figure 1-1 sets out the broad philosophy underpinning the sequential approach.

3 The Planning System and Flood Risk Management Guidelines for Planning Authorities, 2009.
4 Source: The Planning System and Flood Risk Management Guidelines for Planning Authorities, 2009.

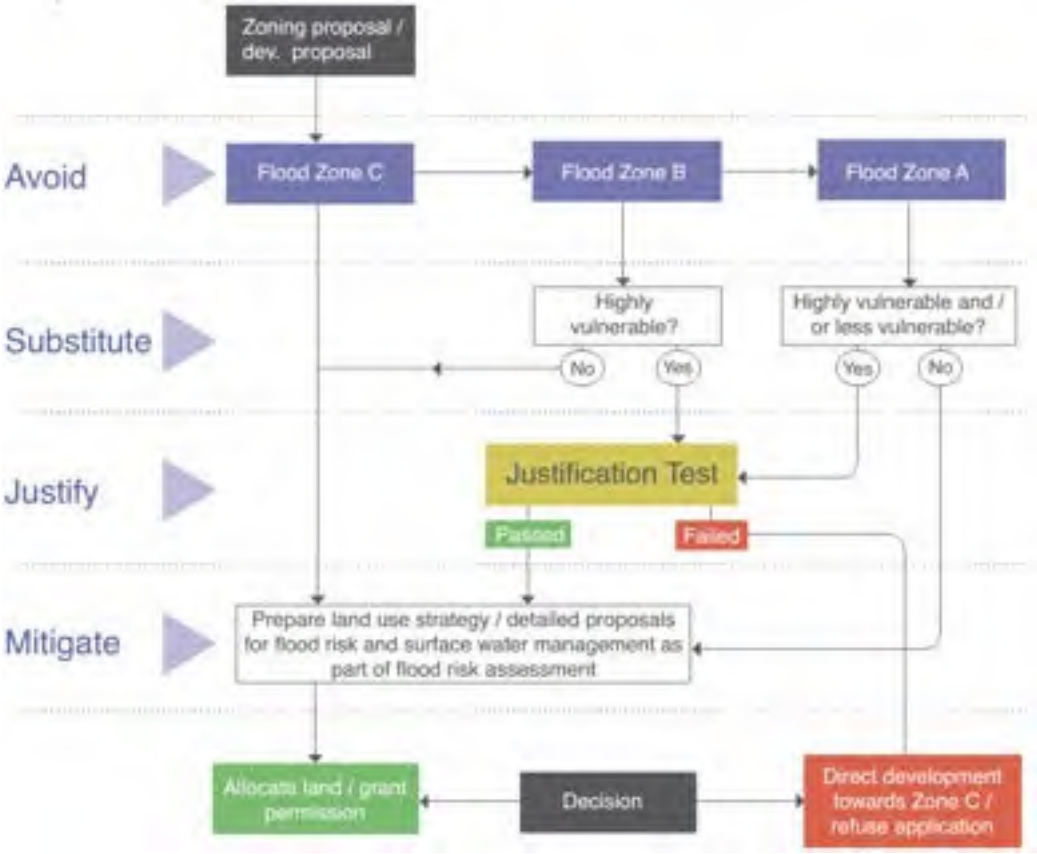


Figure 1-1: Sequential Approach from The Planning System and Flood Risk Management Guidelines for Planning Authorities, 2009

The sequential approach to flood risk makes use of flood risk assessment and of prior identification of Flood Zones for river and coastal flooding and classification of the vulnerability of flooding of different types of development. This approach highlights the importance of taking into account the risks of other sources of flooding in all areas and at all stages of the planning process.

The sequential approach is based on the following principles:

Avoid – Substitute – Justify – Mitigate – Proceed.

Where possible, development in areas identified as being at high flood risk for that type of development should be avoided. This may necessitate rezoning lands within the Development Plan from a higher vulnerability land-use, such as residential, to a less vulnerable use, such as open space. Where rezoning is not possible, development restrictions are provided for through the application of the Justification Test, as set out below.

1.4.6 Justification Test

The Justification Test is designed to rigorously assess the appropriateness or otherwise of particular developments that for various reasons are being considered in areas of moderate or high risk of flooding.

The tests comprise of two processes namely the plan making Justification Test and the development management Justification Test.

1.4.7 Justification Test for Development Plans

The primary approach for managing flood risk has been to either avoid development in Flood Zone A or B, or substitute a lower vulnerability

development. However, it is only when both avoidance and substitution cannot take place should consideration be given to mitigation and management of risks, which can only be provided for through the Justification Test.

The plan making Justification Test has been carried out as part of the SFRA using mapped Flood Zones. It applies where Dublin City Council (DCC) has reviewed the need for development of areas at a high or moderate risk of flooding for uses which are vulnerable to flooding and which would generally be inappropriate, as set out in Table 1.2, and where avoidance or substitution is not appropriate. Where land-use zoning objectives have been retained, DCC is satisfied that it has clearly demonstrated that the designation for development has satisfied the Justification Test for Development Plans. In such cases, all of the following criteria have been satisfied:

1. The urban settlement is targeted for growth under the National Planning Framework and Regional Spatial and Economic Strategy, statutory plans, as defined above or under the 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:

- **Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement;**
- **Comprises significant previously developed and/ or under-utilised lands;**
- **Is within or adjoining the core of an established or designated urban settlement;**
- **Will be essential in achieving compact and sustainable urban growth and**
- **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.

Box 4.1: Justification Test for Development Plans.

Source: The Planning System and Flood Risk Management Guidelines for Planning Authorities (2009)

Circular letter PL2/2014 from DECLG dated 13 August 2014 states that for existing developed areas at risk of flooding, and proposed regeneration areas, the Planning Authority or Development Plan must ‘specify the nature and design of structural or non-structural flood risk management measures prior to future development in such areas to ensure that flood hazard and flood risk to the area and other locations is not increased, or if practicable, will be reduced.’ In many

cases through this SFRA, flood risk to existing development has been identified and appraised. The extent and depth of flooding has been assessed and it has been determined that risks can be managed through development control measures, as detailed in the later sections of this SFRA. However, there are a number of areas where further development would be considered premature until ongoing or planned defence works have been completed and these have been identified in the Area Reviews and SDRA reviews as they arise (see Part 3 of the Justification Tests in Appendices B and C for further details).

2 Stage 1 – Flood Risk Identification

2.1 Development of Flood Zone Maps

Due to the number of flood investigation and management studies that have focused on Dublin City, there are a number of datasets which record either historical or predicted flood extents. The aim of the flood risk identification stage of the SFRA is to identify flood risk based on the data available, including historical records, considering all sources of flooding, and to appraise the quality and usefulness of the data.

A wide range of data was collected and reviewed for completeness, applicability, quality and confidence in its accuracy. One of the key outcomes of the SFRA is to produce a Flood Zone Map which, along with other planning considerations, will inform land-use zoning / development decisions. The accuracy of the flood extent may vary across the study area depending on the origin and quality of available data, but the best available or readily derivable information has been used to form the composite map. In all cases, the outlines have been reviewed against each other, any additional available data and against local engineering knowledge and have been refined where appropriate. In particular, the datasets that have been used are the Dodder, Fingal East Meath and Eastern CFRAM flood extents/zones, River Tolka and River Wad Flooding Studies, the Poddle modelling study, the Irish Coastal Wave and Water Level Modelling Study (ICWWS) 2018, and the National Coastal Flood Hazard Mapping, 2021, records of historical flood events, walkover survey and consultation with local authority area engineers.

The various sources of data are briefly discussed in the following paragraphs, which also give an indication of how each dataset was used in the SFRA study. More detail regarding each of the datasets is available from the relevant study specific reports.

The primary source of predictive flood information is the Office of Public Works (OPW) Catchment Flood Risk Assessment Management (CFRAM) Plans, which include the Dodder and Fingal East Meath Pilot studies, and the Eastern CFRAM study. These studies have mapped fluvial and coastal flood risk and have looked at the benefits provided by flood defences. Further information on the CFRAM studies is available at www.floodinfo.ie

The River Tolka flooding study carried out a detailed analysis on the River Tolka. The principal output was an analysis of the flood risk based on extreme flood events and included options for flood prevention and protection for properties at risk. A similar assessment had been carried out for the Wad River through the River Wad drainage study. In both cases, flood extents were available for use in developing the Flood Zone maps.

The Irish Coastal Protection Strategy Study (ICPSS) and the Dublin Coastal Flood Protection Project (DCFPP) have been updated by the Irish Coastal Wave and Water Level Modelling Study (ICWWS) 2018, and the National Coastal Flood Hazard Mapping, 2021 and these were cross-checked against the other available datasets.

Coastal erosion maps have also been reviewed and used to inform the assessment of risk in the city. Strategies and Actions for Flood Emergency Risk Management (SAFER) was an EU Interreg IIB funded project for Dublin City. It developed tide event forecasting, emergency response procedures and coastal flood maps from available information in 2008 to inform decision making on emergency response procedures. The coastal flood maps developed as part of the SAFER project have been largely superseded by the CFRAM and CFRMP maps.

Information on historical flood events provided a useful cross-check on the Flood Zones and allowed verification of the outputs. Details of recent flood events are provided in Section 2.2. This was coupled with the area engineer's knowledge of the watercourses and their catchments.

It should be noted that a number of Local Area Plans (LAPs)/Strategic Development Zones (SDZs) have been adopted in the past few years that have included a SFRA to Stage 2, including the Parkwest - Cherry Orchard LAP (2019) and Ballymun LAP (2017), and older LAPs in George's Quay (2012), Naas Road (2013), Ashtown-Pelletstown (2014) and North Fringe (2012) and Planning Schemes for Poolbeg SDZ (2019), Grangegorman SDZ (2012) and the North Lotts & Grand Canal Dock SDZ (2014). The findings of these assessments are reflected in the City Development Plan SFRA.

The CFRAM Programme is complete and implementation of the outputs from this work is underway by the OPW. The EU Floods Directive requires Member States to review the PFRA, the FRMPs and the flood maps on a six yearly cycle and consequently, the OPW completed the National Indicative Fluvial Mapping (NIFM) Programme in 2019 and it continues to update predictive flood mapping to provide the best available flood risk information through the map review programme. Further information on the above is available at www.floodinfo.ie

The OPW's National Indicative Fluvial Mapping (NIFM) and Preliminary Flood Risk Assessment (PFRA) mapping (now obsolete) provides indicative flood extents for fluvial, coastal, groundwater and surface water risks; however, the NIFM was not used in developing the Flood Zone map for the City SFRA as there were more detailed studies in Dublin City, as outlined above.

The flood maps for the whole city comprise a 'Composite Flood Map', see Appendix E, and a set of Flood Zone Maps overlaid on the Land-Use Zoning Maps (Maps A to H) for the city, which are available for viewing on the Development Plan Website.

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 also be considered to be Flood Zone A.

2.2 Main Sources of Flooding

Over the last few decades, the risk of flooding has continued to increase in Ireland. Much of this has been attributed to (i) climate change, resulting in increased and more intense rainfall (e.g. more thunderstorms), increased sea water levels, and (ii) increasing levels of urbanisation. Coastal erosion or

accretion can also increase the risk of flooding in some areas. The main types of flooding are from (i) tidal/coastal flooding which arises from the sea or estuaries, (ii) river or fluvial flooding which arise from rivers or streams, (iii) pluvial or surface water flooding which arises directly from rainfall, (iv) groundwater flooding (v) dam breach and (vi) sewer/ infrastructural failure.

Table 2-1 provides details of recent flood events that have impacted on Dublin City, arising from a range of source but primarily fluvial, pluvial and coastal.

Table 2-1: Summary of Recent Flood Events in Dublin [5]

Date	Source of Flooding	Areas impacted
3 January 2014	Coastal: Highest tide ever 3.014m Malin	Four buildings flooded. Some coastal road flooding, Clontarf, Sandymount Promenade flooding, East Link closed, All temporary flood defences put in place.
October 2011	Fluvial, Pluvial & Coastal: Extreme rainfall combined with heavy rainfall previous day, leading to soil saturation. Dublin Airport recorded 9 hour rainfall of 66.8 mm, with Casement Airport recording a daily total of 82.2 mm.	Severe flooding in many parts of Dublin city and east coast, with many homes and businesses under water. Over 1,250 reports of property flooding in Dublin City.
2nd July 2009 (Midnight to 9am)	Pluvial: Spells of heavy, thundery rain affected the east and northeast of the country. 38.2mm of rainfall was recorded at Dublin Airport.	Several areas within the Dublin City Council boundary were affected. One of the worst affected areas was Donnycarney in North Dublin, where the surface water collection system draining to the Wad River culvert was overwhelmed at the Malahide Road, resulting in flooding at Collins' Avenue and Clanmoyle Road. Reports also of spot flooding at Raheny, Clontarf, Drumcondra, Finglas Sandymount, Cabra, and Glendhu Park in Ashtown.
9 August 2008	Pluvial: Dublin Airport recorded 36 mm of rainfall in the worst hour, 43 mm in two hours and over 76 mm in five hours. Records from the south city only indicate 40% of this	Within two hours of commencement of precipitation numerous calls were placed with Dublin Fire Brigade, the Dublin Traffic Control Centre and the City Council's Drainage Division. 19 areas of North Dublin had severe flooding, many of these areas had no

5 Source: Met Éireann Major Weather Events.

Date	Source of Flooding	Areas impacted
	precipitation.	previous known history of such flooding. Over 150 residential properties were inundated, as well as commercial premises, public buildings, major roadways etc. Areas of Cabra, Finglas and Glendhu Park in Ashtown were badly flooded.
1 February 2002	Coastal: Rain led to high groundwater levels which was coupled with the highest tide ever recorded. This caused sea defences to be overtopped.	Over 1,100 buildings recorded as flooded. Cost estimate of reported flood insurance damages - €60M.
13 November 2000	Fluvial: Heavy rainfall in November, preceded by a very wet October, led to the ground being well saturated and unable to absorb the rain that fell over a 30 hour period on the 12 and 13 November 2000.	Significant disruption and damage, especially in the area of the Lower Tolka catchment.
25 August 1986	Fluvial: Hurricane Charlie – The heaviest rain fell on the mountains south of Dublin. At Kippure an estimated 280 mm fell, about double the normal rainfall in that area for the whole month of August. Record for the greatest fall of rain in a day, measuring 200mm, established at Kilcoole, south of Greystones.	Extensive storm and flood damage across the city, coupled with extreme tides giving coastal flooding.
9–11 June 1963	Pluvial: Thunderstorms were widespread. Highest hourly rainfall ever recorded in Ireland.	Considerable flooding occurred in the area between Dundrum, Blackrock and Sandymount. The high value recorded at Ballsbridge indicated this area must have had exceptional rainfall.

2.2.1 Coastal and Tidal Flooding

Storms or other extreme weather conditions combined with high tides can cause sea levels to rise above normal, and force sea water on to the land thus causing

coastal flooding. Coastal erosion also presents risk to existing and potential future development, although analysis by OPW under the ICPSS only indicates erosion risks to the spit linking Bull Island to the mainland.

Following extreme tide and flood events, and also predictions of a rise in sea levels due to climate change, DCC carried out a review of the capacity of the existing coastal flood defences to provide protection against tidal flooding to urban areas resulting from extreme weather conditions in the short to long term. The review was carried out as part of the Dublin Coastal Flooding Protection Project (DCFPP) and was published in 2005.

The DCFPP report identified a number of locations where the level of flood defences was below that required for current and future predicted sea levels. As described in Appendix A, some works have since been completed, some are ongoing with further works in the final design stages as recommended by the DCFPP. The DCFPP has been supplemented by the OPW CFRAMS and Flood Risk Management Plans (FRMP).

The Triton and Tidewatch early warning systems are based on sensors in Dublin Bay providing continuous information on sea-level changes and then sending alarm messages to relevant personnel in the Council. The former provides a 1 day advance warning of high tides and the latter provides a 3 day advance warning of same. These early warning systems then provide the necessary information to inform the subsequent emergency response strategy.

The early warning systems outlined above, in conjunction with capital works such as the South Campshires Flood Protection Project (now operational), Tolka, Liffey, the existing Spencer Dock sea gate and the existing flood defences along the River Dodder, provide alleviation to some of the coastal flood risk. The area around the South Campshires is protected from coastal flooding to the 0.5% AEP level plus an allowance for sea level rise due to climate change. Other portions of the Docklands SDZ are currently protected to the 0.5% AEP tidal flood level, but do not include an allowance for sea level rise so will require long term monitoring to ensure the standard of protection is maintained.

The Government has established an Inter-Departmental Group on Coastal Change Management to scope out an approach for the development of a national coordinated and integrated strategy to manage the projected impact of coastal change to our coastal communities, economies, heritage, culture and environment. The Group is jointly chaired by the DHLGH and the OPW and will bring forward options and recommendations for the Government to consider. Should these recommendations become available during the lifetime of the plan they will be given due consideration and assessed for impacts on the SFRA.

2.2.2 Fluvial (River) Flooding

There are three main rivers in Dublin City, the Tolka, the Liffey and the Dodder. There are also many smaller rivers including the Wad, Poddle, Santry, Mayne and the Camac, all of which have large stretches which are culverted and flow below ground. Flooding from the rivers and their tributaries arises when the capacity of the channel is exceeded and water flows out over the river banks. This is normally linked to prolonged rainfall and surface water run-off entering the

channel. Flooding from the rivers can also occur if the channel, or the inlet to a culvert becomes blocked. DCC has reviewed the condition of the screens to the culverts on all its rivers. As a result, some have been upgraded, some now have level monitors and cameras. A consultant has been appointed for the upgrading of access and functionality of 50% of them, with works being carried out in 2022 and 2023.

Flood Defences are largely in place on the lower Dodder from Ballsbridge to Donnybrook. A study is underway upstream of this to Orwell bridge. A flood study is also underway on the Camac river.

Figure 2-1: Rivers of Dublin City

2.2.3 Pluvial (Surface Water) Flooding

Pluvial flooding results when heavy, often sudden rainfall, causes flooding before it can infiltrate the ground, or enter a natural or man-made drainage system or a watercourse or a conveyance system (e.g. canal) because the system is already full to capacity. Pluvial flooding is associated with surface water flooding, which is a combination of true pluvial flooding, sewer flooding (due to heavy rainfall), groundwater flooding and flooding from urban watercourses.

The pure surface water system is managed by DCC. The combined (surface water and foul) system and foul drainage system are managed by Irish Water. Irish Water policy is to prevent 30 year flooding + estimated global effects to houses and buildings from the combined public drainage network while DCC has enhanced the local surface water networks to cope with pluvial flooding as far as

possible where previous flooding has occurred. Current indications are that a very large investment is required to upgrade the surface water system in order to cope with projected increases in rainfall due to climate change and possible developments in Dublin City and adjoining County Councils to the year 2100. It is DCC's intention to develop a plan for these networks in liaison with Irish Water where required.

Information on pluvial flood risk comes from the EU Interreg IVB FloodResilienCity Project. For the project, a city–wide Model provided a high level assessment of pluvial flood risk across Dublin and five 'Pilot Areas' (George's Quay, Carrickfoyle Terrace, Marino and Fairview, Kippure Park and East Wall) were identified for further detailed investigation of potential pluvial flood risk i.e. Type 2 modelling. This information has been useful in assessing pluvial risk in site specific flood risk assessments.

2.2.4 Groundwater Flooding

Groundwater flooding can occur when groundwater rises up from the underlying water table. Water emerges at the ground surface or into basements, flooding both surface and subsurface infrastructure. This tends to occur after much longer periods of sustained rainfall or very high tides. Higher rainfall means that more water will infiltrate into the ground, causing the water table to rise. Groundwater flooding tends to occur in low lying areas, where with additional groundwater flowing towards these areas, the water table can rise to the surface causing flooding. High river, estuary or tide levels can prevent groundwater escaping into them in times of significant rainfall thus causing ground water flooding.

Data available on the Geological Survey Ireland map viewer[6] has been examined and found no particular karst or other ground water systems within the catchment, although a number of springs and wells are recorded across the city (Figure 2-2). There are no recorded historic or predictive groundwater flood extents within the city.

Groundwater risks should be assessed on a site-by-site basis through percolation testing and bore holes as appropriate. Groundwater risk in relation to basement development should be carried out in accordance with the Development Plan's 'Appendix 9 - Basement Development Guidance'. This guidance requires a basement impact assessment to consider groundwater/ surface water flooding and gives a general restriction against the development of basements below the estimated flood levels for Flood Zones A or B.

6 https://www.gsi.ie/en-ie/data-and-maps/Pages/default.aspx

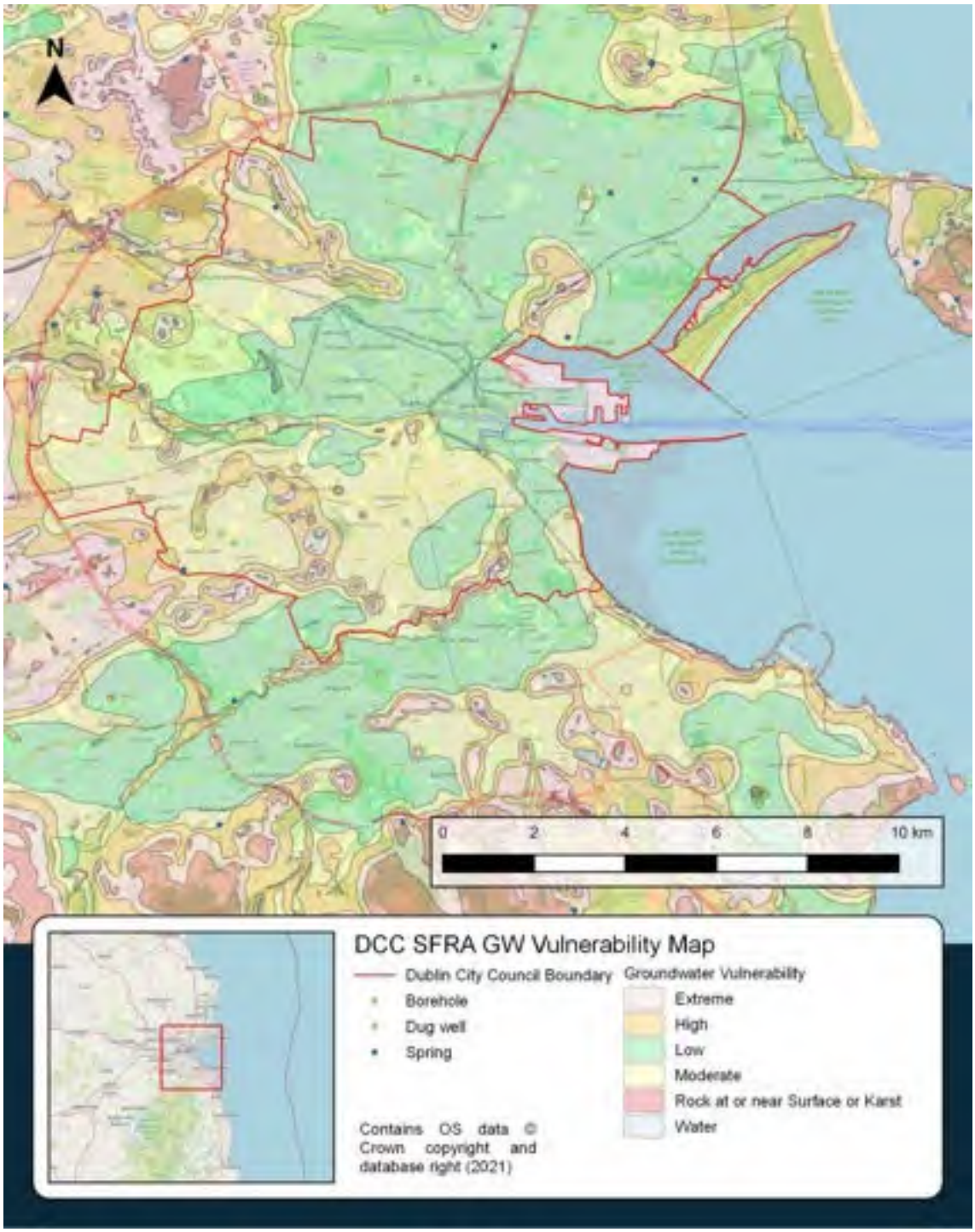


Figure 2-2: Groundwater Vulnerability Map

2.2.5 Flooding from Flood Defence Overtopping or Breach

Owing to an extensive and frequent history of flooding in some parts of the city, there are a number of flood relief schemes in Dublin. These include large scale DCC managed schemes on the River Dodder, and some smaller works which have been constructed, or are due for construction on smaller watercourses (see Appendix A). It should be noted that whilst existing development clearly benefits from the construction of defences, it is against sustainability objectives, and the general approach of the OPW, to construct defences with the intention of releasing land for development.

It is also not appropriate to consider the benefits of schemes which have not been constructed, and which may only be at pre-feasibility or design stage.

Residual risk is the risk that remains after measures to control flood risk have been carried out. Residual risk can arise from overtopping of flood defences and/ or from the breach from structural failure of the defences.

The concept of residual risk is explained in The Planning System and Flood Risk Management Guidelines for Planning Authorities and Technical Appendices, 2009 as follows:

“Although flood defences may reduce the risk of flooding, they cannot eliminate it. A flood defence may be overtopped by a flood that is higher than that for which it was designed, or be breached and allow flood water to rapidly inundate the area behind the defence. In addition, no guarantee can be given that flood defence will be maintained in perpetuity. As well as the actual risk, which may be reduced as a result of the flood defence, there will remain a residual risk that must be considered in determining the appropriateness of particular land-uses and development. For these reasons, flooding will still remain a consideration behind flood defences and the Flood Zones deliberately ignore the presence of flood defences.”

Overtopping of flood defences will occur during flood events greater than the design level of the defences. Overtopping is likely to cause more limited inundation of the floodplain than if defences had not been built, but the impact will depend on the duration, severity and volume of floodwater. However, and more critically, overtopping can destabilise a flood defence, cause erosion and make it more susceptible to breach or fail. Recovery time and drainage of overtopping quantities should also be considered.

Overtopping may become more likely in future years due to the impacts of climate change and it is important that any assessment of defences includes an appraisal of climate change risks.

Breach or structural failure of flood defences is hard to predict and is largely related to the structural condition and type of flood defence. 'Hard' flood defences such as solid concrete walls are less likely to breach than 'soft' flood defences such as earth embankments.

Breach will usually result in sudden flooding with little or no warning and presents a significant hazard and danger to life. There is likely to be deeper flooding in the event of a breach than due to overtopping.

The assessment of breach should be proportionate to the likelihood of the defence failing, taking into account the age, maintenance regime, construction type and the presence of any demountable or mechanically operated components.

Whilst it is important that residual risks are recognised and appropriate management measures put in place, it is also important to acknowledge the benefits that a flood relief scheme provides to those living and working behind it. In this regard, although The Planning System and Flood Risk Management Guidelines for Planning Authorities and Technical Appendices, 2009 requires Flood Zones to be undefended, consideration should be given to the benefit provided by flood defences, but only once the Justification Test has been applied and passed. The benefit of defences has been reviewed in relation to specific

sites, detailed in Appendices B and C, and is addressed more generally in the development management guidance provided in Section 4.

2.2.6 Dam Failure

It should be noted for the SFRA that there is a minor risk of infrastructural failure associated with a possible dam burst at Poulaphuca, which dams the River Liffey. The Upper Liffey catchment is designed to hold the 10,000-year flood volume for the Upper Liffey where reasonably practicable. This dam is one of four major sources of Dublin's Water Supply. The Dam at Leixlip carries a lesser flood risk. The River Dodder is clay dammed by the two Bohernabreena Reservoirs, which is also a part of the Dublin Water Supply System. The Spillways to these two dams were increased in capacity to carry the 'Probable Maximum Flood' in 2005 thus reducing the risk of Dam failure.

The earth embankment dams on the River Dodder at Bohernabreena are maintained by Irish Water. The dams are regularly inspected by an All Reservoirs Panel Engineer and the drainage is inspected on a weekly basis to ensure that no excess water is passing through or underneath the dam. The lower reservoir can be lowered in advance of a forecasted rain event to increase upstream storage capacity.

The reinforced concrete dams on the River Liffey are maintained and operated by the ESB. ESB staff at Turlough Hill can release water prior to a forecasted rainfall event to increase upstream storage capacity. Water released from Poulaphouca takes approximately 18 hours to reach the City Centre. This is timed to ensure it does not coincide with exceptionally high tide levels in the City Centre. ESB managerial and operational staff are stakeholders in DCC's Flood Emergency Plan and are consulted during Flood Watch and Flood Monitoring situations. The ESB maintains regular contact with DCC and briefs the Council with regard to discharges at Poulaphouca and Leixlip.

The Council's Flood Emergency Plan (a Sub-Plan of DCC's Major Emergency Plan) has been reviewed and all stakeholders including the ESB are being consulted on the revised Plan. This sub-Plan is reviewed every year and following a large flood event.

2.2.7 Infrastructural Failure/ Overload

Flooding can also be caused from a failure of the sewerage system. Most sewage flooding incidents are as a result of overloaded sewers following heavy rainfall or blockages. Flooding can also occur from a failure of infrastructure designed to store or carry water as in the case of a dam or leaking canal, a burst water main or a collapsed sewer.

2.3 Climate Change

2.3.1 The Dublin City Council Climate Change Action Plan 2019-2024

At the city level, the Dublin City Climate Change Action Plan, 2019-2024 (CCAP) demonstrates Dublin City Council's commitment to transitioning to a low carbon society and economy. The CCAP, which is reviewed quarterly and reported on annually, sets out four key targets and over 200 actions that the Council is undertaking in the areas of energy and buildings, transport, flood resilience,

nature-based solutions and resource management – see Dublin City Council Climate Change Action Plan 2019-2024.

Figure 2-3: Dublin City Council Climate Change Action Plan 2019-2024 Climate Action Themes

2.3.2 The SFRA and Climate Change

In addition to the current level of flood risk (either fluvial or coastal), the SFRA has identified an increased risk as a result of climate change, particularly along the coast and tidally dominant river reaches. Based on OPW guidance, between a 0.5m (medium range future scenario, MRFS) and 1m (high end future scenario, HEFS) rise in sea level should be allowed for. This appraisal has not included storm damage which occurs currently or may occur in the future; it is based on still sea levels only.

Climate change has been addressed at both the plan making and development management stages as part of this SFRA.

From a plan making perspective, the Flood Zones for the current and future scenarios were compared with a view to identifying locations where climate change impacts could be significant, (i.e. where there was a significant difference between the current and future extents in both Flood Zone A and B). In locations where there was a difference in extents, further consideration was given to how development proposals could be managed in the processes contained in this SFRA. Consideration was also given to the presence or otherwise of flood defences, and where a flood relief scheme is ongoing or planned, it was noted that an adaptation plan would be an integral part of the scheme design. The findings of this assessment are noted in the relevant risk reviews in Appendices B and C.

Climate change risk mitigation through development management is also addressed in the recommendations for the scope of site-specific FRAs and in the discussion on potential flood mitigation measures, including consideration of site layouts and landscaping, finished floor levels and design of drainage systems and SuDS. This is detailed in Section 4.

Where the OPW and DCC are designing flood relief schemes for an area, consideration will be given to the management of climate change risks within the scheme design and as part of a climate change adaptation plan. This may follow an adaptive approach whereby the defence height is based on current design levels but the foundations of the walls and embankments are designed to take additional loading should the defences be raised in the future.

2.3.3 Climate Change and the City Development Plan 2022 - 2028

Chapter 3 of the Dublin City Development Plan 2022-2028 sets out the achievements and challenges facing DCC in relation to Climate Change. The Plan sets out policies and objectives which support: the implementation of the DCC Climate Change Action Plan (2019); the integration of climate action measures into development proposals; the decarbonisation of the energy sector and the continuing development of renewable and low carbon sources of energy, local and city wide energy strategies and initiatives; the transition towards more sustainable modes of movement and transport and the decarbonisation of transport; and, the transition towards the circular economy approach to waste. It also supports the principles of nature-based solutions and urban greening and includes specific policies relating to flood risk mitigation and adaptation measures as follows:

- CA26: Flood and Water Resource Resilience - To support, encourage and facilitate the delivery of soft, green and grey adaptation measures to enhance flood and water resource resilience in the city and support the delivery of grey adaptation measures to enhance flood and water resource resilience where necessary.
- CA27: Flood Risk Assessment and Adaptation - To address flood risk at strategic level through the process of Strategic Flood Risk Assessment, and through improvements to the city's flood defences.
- CA28: Natural Flood Risk Mitigation - To encourage the use of natural flood risk mitigation or nature based solutions including integrated wetlands, green infrastructure, and Sustainable Drainage Systems (SuDS) as part of wider adaptation and mitigation responses to achieve flood resilience.

2.4 Existing Flood Management Infrastructure and Strategies

Flood Risk Management aims to minimise the risks arising from flooding to people, property and the environment. Flood Risk Management can include structural interventions that block or restrict the pathways of floodwaters, such as river or coastal defences, or non-structural measures often aimed at reducing the vulnerability of people and communities such as flood warning, flood level monitoring, effective flood emergency response or resilience measures.

DCC and its partners such as the OPW, other Local Authorities, Met Éireann, Department of the Environment, Climate and Communications and Irish Water have implemented several measures and projects to address the main flood risks in the Dublin City area to allow for continuing development of the city and to protect as far as reasonably practicable existing vulnerable areas. These include:

- Participation by DCC, following the flood event in 2002, in the SAFER (Strategies and Actions for Flood Emergency Risk Management) project with 5 European Partners. The project was initiated in 2002 and ran until 2008. This saw the development of a tide event warning system, emergency response procedures and coastal flood maps to inform decision making on emergency response procedures.
- Participation by DCC in a four-year programme from 2008– 2012 to make the capital a flood resilient city. The FloodResilienCity (FRC) project was an EU funded project supporting local authorities in eight cities in North-West Europe to combat flooding in urban areas and exchange information on best practice. It built on the previous EU-funded SAFER project, an outcome of which was the establishment of an operational coastal (tidal surge) early warning system for Dublin. The FRC project led to the development of pluvial flood hazard maps (depth and velocity maps in isolation) and flood risk maps to identify Dublin City's overall vulnerability to pluvial flood risk. As part of the project, five 'Pilot Areas' (see Section 2.2.3 above) were selected to identify and trial pluvial flood risk assessment and management techniques for development and use in future programmes of work.
- Implementation and enhancement of the Triton and Tidewatch early warning systems which, based on sensors in Dublin Bay, provide continuous information on sea-level changes and then send alarm messages to relevant personnel in the Council. The former provides a 1-day advance warning of high tides and the latter provides a three-day advance warning of same. These early warning systems provide the necessary information to inform the subsequent emergency response strategy.
- Construction of new flood alleviation walls, embankments, floodgates along the tidal and lower fluvial stretches of the River Dodder from Ringsend Bridge to just below Ballsbridge. An allowance for estimated climate change to 2100 is included in the design. Phase 3 from Clonskeagh to Orwell Bridge is at preliminary options appraisal stage.
- Construction of Flood Gate at Spencer Dock.
- Construction of River Tolka Flood Alleviation Scheme.
- Construction of Wad River Flood Alleviation Scheme, Clanmoyle Road Phase 1. Phase 2 from Clontarf Golf Club to coast at detailed design stage.
- Construction of swales or large flood retention ponds at Glendhu Park and Park Road, Ashtown, Killala Road and Drumcliffe Road, Crumlin and beside Ballygall Crescent, Finglas.
- Development of the South Campshires Flood Protection Project, now operational, comprising the construction of a flood wall along the South Quays extending 1.1km from Butt Bridge to junction of Sir John Rogerson's Quay with Cardiff Lane.
- Santry River, Harmonstown Road flood defence in place.

- Completion of the River Dodder Catchment Flood Risk Assessment and Management Study (CFRAMS) on the Dodder River. This resulted in recommendations for further flood protection measures along the river, upstream of the tidal section, which are ongoing.
- Eastern CFRAM study which includes the Rivers Liffey, Santry, Poddle, Camac and coastal areas was finalised in 2016.
- Construction of Pumping Station at Spencer Dock (SDPS) with associated rising mains and new services tunnel under the River Liffey. Construction also of new trunk sewers to serve the SDPS.
- Construction of separate foul and surface water drainage infrastructure in South Docklands.
- DCC have prepared the following guidance documents to complement the Development Plan Policies: a Green & Blue Roof Guide (2021) and a Sustainable Drainage Design & Evaluation Guide (2021) - with technical summaries of both of these guidance documents forming Appendices to the Dublin City Development Plan 2022-2028. Appendices 11 and 12 of the Written Statement, Volume 1, refer respectively.
- DCC has prepared new Surface Water Management Guidance (see Appendix 13 of the Dublin City Development Plan 2022-2028).
- Study of City Centre Sewerage System currently being progressed by Irish Water.
- DCC's Flood Emergency Plan (a sub-plan of DCC's Major Emergency Plan). Rescue agencies – Civil Defence and the Fire Brigade – are stakeholders in the Plan with extensive experience and resources, in terms of trained personnel and high bodied vehicles suitable for navigating through flood waters during a flood event.
- Development and implementation of Sustainable Drainage Systems (SuDS), green roof, surface-water management and green infrastructure policies throughout the city. Ongoing improvement and development of surface water infrastructure.
- Continuous development of Dublin's Flood Forecasting and Flood Warning Systems.
- Various improvements to the local surface water network to reduce pluvial flooding risk.

2.5 Flood Risk Summary

Having regard to all the information sources available to DCC, it is concluded that Dublin City is subject to flood risk from fluvial, coastal and pluvial flooding, which may be exacerbated by high groundwater levels, and the assessment will therefore proceed to Stage 2. In many cases, the level of risk is moderated by the presence of flood defences or other flood management infrastructure. However, the residual risks associated with these structures remains and also needs to be considered. Risks from climate change are also likely to be significant particularly along the coastline and up tidally influenced rivers.

3 Stage 2 – Initial Flood Risk Assessment

3.1 Settlement Zoning Review

Having developed Flood Zone Maps and established the areas of flood risk within the plan area, the next step is to apply the sequential approach to land-use planning. Flood Zone A and B (high and moderate risk of flooding) were compared with the proposed land-use zoning objective maps for the city, which identified where flood risk management and future development may cause potential conflicts. If the proposed land-use zoning was found to be water-compatible and located within either Flood Zone A or B there was no requirement for the Justification Test; however if highly vulnerable uses were proposed for Flood Zones A or B, or less vulnerable uses in Flood Zone A, then the Justification Test was applied.

The purpose of the land-use zoning objectives are to indicate to property owners and members of the public the types of development the Planning Authority considers most appropriate in each land-use category. Zoning is designed to reduce conflicting uses within areas to protect resources and amenities as appropriate.

Each land-use zoning objective has been reviewed and an appraisal made of the associated vulnerability of the particular uses provided for. A clarification on the requirement of the application of the Justification Test was then made. This took into account the fact that the zoning objectives typically span a range of possible (permissible and open for consideration) uses, which could be water compatible, less vulnerable or highly vulnerable. The summary table (Table 3-1) is provided as a general guide and the specific development types within the zoning objective must be considered individually.

Table 3-1: Land-Use Zoning and Vulnerabilities

Zoning Objective Use	Vulnerability	Justification Test Required
Z1: To protect, provide and improve residential amenities	High, with water compatible elements	For development in Flood Zone A or B
Z2: To protect and/or improve the amenities of residential conservation areas	High, with water compatible elements	For development in Flood Zone A or B
Z3: To provide for and improve neighbourhood facilities	High/Less/ with water compatible elements	For highly vulnerable uses in Flood Zones A & B For less vulnerable development in Flood Zone A
Z4: To provide for and improve mixed services facilities	High/Less/ with water compatible elements	For highly vulnerable uses in Flood Zones A & B For less vulnerable

Zoning Objective Use	Vulnerability	Justification Test Required
		development in Flood Zone A
Z5: To consolidate and facilitate the development of the central area, and to identify, reinforce, strengthen and protect its civic design character and dignity	High/Less/ with water compatible elements	For highly vulnerable uses in Flood Zones A & B For less vulnerable development in Flood Zone A
Z6: To provide for the creation and protection of enterprise and facilitate opportunities for employment creation	Less/ with water compatible elements (High if a vulnerable use is proposed)	For highly vulnerable uses in Flood Zones A and B For less vulnerable development in Flood Zone A
Z7: To provide for the protection and creation of industrial uses and facilitate opportunities for employment creation including Port Related Activities	Less with water compatible elements (High if a vulnerable use is proposed)	For highly vulnerable uses in Flood Zones A and B For less vulnerable development in Flood Zone A
Z8: To protect the existing architectural and civic design character, and to allow only for limited expansion consistent with the conservation objective	High/Less/ with water compatible elements	For highly vulnerable uses in Flood Zones A and B For less vulnerable development in Flood Zone A
Z9: To preserve, provide and improve recreational amenity, open space and ecosystem services	Water Compatible / Less vulnerable (High if a vulnerable use is proposed)	Development is generally appropriate but for high / less vulnerable development in Flood Zone A, Justification Test is required.
Z10: To consolidate and facilitate the development of inner city and inner suburban sites for mixed uses	High/Less/ with water compatible elements	For highly vulnerable uses in Flood Zones A and B For less vulnerable development in Flood Zone A
Z11: To protect and improve canal, coastal and river amenities	Water Compatible / Less vulnerable	Development is generally appropriate but for less vulnerable development in Flood Zone A, Justification Test is required.

Zoning Objective Use	Vulnerability	Justification Test Required
Z12: To ensure existing environmental amenities are protected in the predominantly residential future use of these lands	High/Less/Water Compatible	For development in Flood Zone A or B
Z14: To seek the social, economic and physical development and/or regeneration of an area with mixed use, of which residential would be the predominant use.	High/Less/ with water compatible elements	For highly vulnerable uses in Flood Zones A and B For less vulnerable development in Flood Zone A
Z15: To protect and provide for community uses and social infrastructure.	High/Less with water compatible elements	For highly vulnerable uses in Flood Zones A & B For less vulnerable development in Flood Zone A

3.2 Application of the Justification Test for the Development Plan 2022-2028

The need to apply the Justification Test, and resulting Justification Test tables are included in Appendices B and C to the rear of this report. Below are further details on the application of Part 1, 2 and 3 of the Justification Tests across the City.

3.2.1 Part 1 of the Justification Test

To satisfy Part 1 of the Development Plan Justification Test, an urban settlement must be targeted for growth under the National Planning Framework (NPF) and the Regional Spatial and Economic Strategy (RSES) and statutory plans as defined under the Planning and Development Act 2000, as amended.

The National Planning Framework, 2018 (NPF) sets out both the national strategic outcomes (NSO's) and national policy objectives (NPO's) for the future growth and sustainable development of the country to 2040. There is a major new policy emphasis on compact growth and urban consolidation. This is to prevent urban sprawl and to secure the provision of housing, jobs, amenities and services within our cities (National Strategic Outcome No. 1). The NPF sets a target that half (50%) of future population and employment growth will be focused in the country's cities and suburbs (National Policy Objective 2a).

As the country's leading global city of scale, the NPF acknowledges the critical role that Dublin City plays in the country's competitiveness. It therefore supports Dublin's growth (jobs and population) and anticipates the city and suburbs to accommodate its growth.

To support and manage Dublin's growth, the NPF is seeking that the city needs to accommodate a greater proportion of the growth it generates within its footprint than was the case heretofore and that housing choice, transport mobility and quality of life are key issues in the future growth of the city. The NPF therefore

sets a target of at least 50% of all new homes targeted for Dublin City and suburbs are delivered within its existing built-up footprints (NPO 3b).

To achieve these targets of compact growth and urban consolidation, the NPF identifies as key, the reusing of large and small 'brownfield' land, / infill sites, and underutilised lands at locations that are well served by existing and planned public transport. The NPF particularly highlights the need to focus on underutilised lands within the canals in Dublin City and within the M50 ring. The benefits of such an approach for Dublin City are manifold and include: the potential to achieve more home and jobs in the city through high quality and high density mixed use development; continued support of existing services and infrastructure and facilitating people to live, work and recreate within a reasonable distance. Such an approach also facilitates the transition to a low carbon future.

The Regional Spatial and Economic Strategy (RSES) for the Eastern and Midland Regional Assembly (EMRA) area translates the National Planning Framework objectives to the regional level. It sets out the vision for growth (homes and jobs) and Regional Policy Objectives (RPO's) for the Eastern and Midland Region to the year 2031.

Dublin City in its entirety lies within the metropolitan area. The RSES and in particular the Metropolitan Area Spatial Plan (MASP) for Dublin give direction to Dublin City as the 'gateway core' for high-intensity clusters, brownfield development, urban renewal and regeneration. The RSES/ MASP settlement strategy for the metropolitan area includes a strong policy emphasis on the need to gain maximum benefit from existing assets, such as public transport and social infrastructure, through the continuation of compact growth, consolidation, densification and intensification to achieve optimal use of brownfield, underutilised lands and infill sites within the existing built footprint of the city. A further key aspect is that future development/ redevelopment and regeneration agenda, whether housing or mixed-uses, occur in tandem with high-quality rail-based public transport (both planned and existing).

Part 1 of the Justification Test has, therefore, been applied universally across the city.

3.2.2 Part 2 of the Justification Test

Where flood risk has been identified and the Justification Test is required, this is provided in Appendices B and C, where Part 2 has been completed by the DCC Planning team to establish the planning rationale behind development objectives and in particular as they pertain to the Strategic Development Regeneration Areas (SDRAs).

3.2.3 Part 3 of the Justification Test

Appendix B gives an overview of the flood risk across the city, divided into 32 different areas. Appendix C provides further specific assessment of flood risk and development frameworks within the SDRAs, providing an overlap with the area based assessments in Appendix B and detailing the outcome of the Part 3 Justification Test assessment. The flood management considerations provided in Appendix B and C, which are specific to certain areas, are supplemented by the general guidance which is provided in Section 4 of this SFRA.

The list in Section 3.2.4 below, details the Area Assessments which have been identified based on the flood mechanism within the cell (e.g. fluvial, tidal or overland) and with consideration to the development potential within the area. The Area Assessments are detailed in Appendix B.

There are some areas where potential future development has been found to be at risk of flooding. Where the Justification Test Parts 1 and 2 have been passed, flood risk has been summarised and an indication of the required flood mitigation measures has been provided. These typically range from avoiding Flood Zone A and/ or B, to working through the general guidelines on flood risk assessment, as provided in Section 4, often with particular considerations specific to that flood cell.

In all cases where flood risk to existing development has been identified, Parts 1 and 2 of the Justification Test have been passed. However, there are some areas of the city where risks are higher and a strategic scale flood relief scheme needs to be completed prior to allowing development, or redevelopment, to take place (see Part 3 of Justification Tests in Appendices B and C for details). There are other locations where risks are lower and it is likely that development will largely be limited to small residential extensions only. Provided flow paths are preserved, this development has generally been found to be justified. This is detailed in the Area Assessment tables.

3.2.4 List of Justification Test Tables - Area Assessments (32 in total including 16A and 22A)

1. Dublin Port South of the Liffey from Tom Clarke Bridge
2. Dublin Port North of the Liffey to Tom Clarke Bridge
3. Liffey: O'Connell Bridge to Tom Clarke Bridge
4. Liffey: Sean Heuston Br. – O'Connell Bridge
5. Liffey: Sean Heuston Br. – Sarah Bridge, South Circular Road
6. Liffey: Sarah Bridge, South Circular Road – Anna Livia Br. Chapelizod
7. Liffey: Anna Livia Br. Chapelizod -– City Boundary
8. Coastal: Sandymount
9. Dodder: Liffey to Ballsbridge
10. Dodder: Ballsbridge to Donnybrook Bridge
11. Dodder: Donnybrook Bridge – Dundrum Road
12. Dodder: Dundrum Road – Bushy Park Boundary
13. Poddle: Inside Canal
14. Poddle: Culverts outside Canal
15. Poddle: Grand Canal to Sundrive Road
16. Poddle: Sundrive Road – Kimmage Road West

16A. Poddle: Terenure Road West, Templeogue Road to City Boundary

17. Lower Camac: South Circular Road to Liffey Estuary
18. Middle Camac: Davitt Road to South Circular Road
19. Upper Camac: Old Naas Road Boundary to Davitt Road
20. Tolka: Dublin Port to Drumcondra Bridge
21. Tolka: Drumcondra Bridge to St Mobhi Road
22. Tolka: St Mobhi Road – Finglas Road

22A. Finglas Stream: East of Finglas Road and West of North Road
23. Tolka: Finglas Road – City Boundary
24. Wad: Clontarf Road to Collins Avenue East
25. Wad: Collins Avenue East to Collins Park
26. Clontarf Alfie Byrne Road to Wooden Bridge
27. Santry River: James Larkin Road to DART Railway Line and Dollymount Wooden Bridge to Clontarf Road Coastal Zone
28. Santry River: DART Railway – Boundary
29. Mayne: Dublin Belfast Railway Line – M50
30. Bull Island

3.3 Application of the Justification Test for Strategic Development Regeneration Areas (SDRAs)

The specific Justification Test tables for a number of Strategic Development Regeneration Areas (SDRAs) are included in Appendix C (see C1 and C2). The detail in the individual tables is to supplement the general development management guidance which is provided in Section 4 of this document.

All 17 SDRAs were reviewed as to their potential for fluvial and/or tidal flooding risk and 12 SDRAs were identified as being at risk from fluvial and / or tidal flooding, see Table 3-2 below.

Table 3-2: Strategic Development Regeneration Areas

	Name	Within Flood Zone A and/or B
SDRA 1	Clongriffin/Belmayne and Environs	Yes
SDRA 2	Ballymun	No
SDRA 3	Finglas Village Environs and Jamestown Lands	Yes
SDRA 4	Park West/Cherry Orchard	No
SDRA 5	Naas Road	Yes
SDRA 6	Docklands	Yes
SDRA 7	Heuston and Environs	Yes
SDRA 8	Grangegorman/Broadstone	No
SDRA 9	Emmet Road	Yes
SDRA 10	North East Inner City	Yes
SDRA 11	St. Teresa's Gardens and Environs	Yes
SDRA 12	Dolphin House	Yes
SDRA 13	Markets Area and Environs	Yes
SDRA 14	St. James's Healthcare Campus and Environs	Yes
SDRA 15	Liberties and Newmarket Square	Yes
SDRA 16	Oscar Traynor Road	No
SDRA 17	Werburgh Street	No

The 12 no. SDRAs were screened to establish the need for a Justification Test (see Appendix C1). Following this screening, 6 SDRAs were identified as

requiring a Justification Test (see Appendix C2). These are listed on Table 3-3, below.

Table 3-3: List of SDRAs requiring Justification Tests

	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

4 Development Management and Flood Risk

4.1 Introduction

In order to guide both applicants and planning officials through the process of planning for and managing flood risk, the key features of a range of development scenarios have been identified (relating to the Flood Zone, development vulnerability and presence or absence of flood defences). For each scenario, a number of considerations relating to the suitability of the development are summarised below, and are shown as process flow charts in Appendix D.

The aim of the flow charts is to provide a guide through the flood risk assessment process and to indicate which approaches to managing flood risk are expected in different circumstances. However, it is accepted that flood risk and its management is a complex and highly site-specific phenomenon so the specific requirements of the assessment should be agreed with DCC prior to commencing work.

It should be noted that this section of the SFRA is for lands and sites where the Justification Test for Development Plans has been applied and passed, and therefore Part 1 of the Justification Test for development management can also be passed. In addition to the general recommendations in the following sections, Appendices B and C should be reviewed for specific recommendations for the watercourses within Dublin City.

As detailed in Section 2 of this document, the Flood Zone maps have been developed using the most appropriate data available to DCC at the time of preparing the Development Plan. The Flood Zone maps have been created specifically to inform the application of the Justification Test and to guide development policy within the city. However, it should be borne in mind that the input data was developed at a point in time and there may be changes within the catchment that mean a future study, or more localised assessment of risk may result in a change in either flood extent or depth. This means a Site-Specific Flood Risk Assessment may result in locally appropriate information which could show a greater or less level of risk than is included in the Flood Zone maps. This is to be expected and it will require discussion between the applicant/developer

and the DCC Planning and Engineering teams to ensure the assessment is appropriate and relevant to the site in question.

4.2 Requirements for a Flood Risk Assessment

An appropriately detailed Flood Risk Assessment (FRA) will be required in support of any planning application. The level of detail will vary depending on the risks identified and the proposed land-use. As a minimum, all proposed development, including that in Flood Zone C, must consider the impact of surface water flood risks on drainage design and demonstrate compliance with the minimum required finished floor levels, detailed in the following sections of this report. In addition, flood risk from sources other than fluvial and tidal should be reviewed, as should the impacts of climate change. Groundwater flood risk for each portion of a development below ground should be evaluated in the FRA. This should be reported in a surface water assessment and management report (see Development Plan Policy SI25 and Appendix 13 - Surface Water Management Guidance).

For sites within Flood Zones A or B, a site-specific 'Stage 2 – Initial FRA' will be required, and may need to be developed into a 'Stage 3 – Detailed FRA'. The extents of Flood Zones A and B are delineated through this SFRA. However, future studies may refine the extents (either to reduce or enlarge them) so a comprehensive review of available data should be undertaken once a FRA has been triggered.

The FRA may be a relatively straight forward, with qualitative appraisal of risks accompanying the drainage design. Alternatively, the findings of the Eastern CFRAM study, CFRMP and the various other studies that have been carried out in Dublin City may be drawn upon to inform finished floor levels and provide details on flood depth, velocity and impacts of defence breach. This information will all be essential in understanding residual flood risks and in developing emergency plans. In other circumstances, a detailed modelling study and flood risk assessment may need to be undertaken. Further examples of where the different types of assessment may be needed, including considerations for the flood risk assessment are provided in Appendices B and C.

Any proposal that is considered acceptable in principle shall demonstrate the use of the sequential approach in terms of the site layout and design and, in satisfying the Justification Test (where required), and the proposal will demonstrate that appropriate mitigation and management measures are put in place.

Specific requirements for a FRA in varying circumstances are detailed in the following sections.

4.3 Consideration of Surface Water in All Areas

The Development Plan has identified nature based sustainable drainage design (SuDS) as the preferred way of managing rainfall from new development – Policies SI22 – SI26 in Chapter 9 refer and Objective SIO13 refers.

Conventional drainage systems in the city are at capacity, are ageing and are under pressure due to climate change and urban development. There is a need to build

resilience into the city's drainage system to deal with both current and future pressures.

Appropriately designed nature based SuDS will make a valuable contribution to Dublin City - reducing flood risk, improving water quality, supporting biodiversity and generally making the city a more pleasant and healthy environment in which to live, work and visit.

To achieve this, the Council has given a commitment to prepare a surface water framework for the city and a green infrastructure strategy (GI). The Council has prepared a technical SuDS guidance document for new development. It is anticipated that there will be opportunities for integrated and area based provision of SuDS and GI in the new development areas of the city.

(1) SuDS / GI Strategies

Objective SIO9: Planning for Surface Water Management

To undertake Surface Water Management Plans for each river catchment and as part of this, include a study of relevant zoned lands within the city in order to ensure that sufficient land is provided for nature-based surface water management, SuDS and green infrastructure.

Objective GIO2 Preparation of a Green Infrastructure Strategy for Dublin City

To prepare a Green Infrastructure Strategy for Dublin City that will include a newly developed set of green micro areas.

(2) Technical Guidance Documents / Requirements

The Council has prepared the following guidance documents to inform sustainable Drainage Design and evaluation and to guide surface water management at the area and site level as follows:

Sustainable Drainage Design & Evaluation Guide (2021), Dublin City Council (Summarised in Appendix 12 - Technical Summary of Dublin City Council Sustainable Drainage Design & Evaluation Guide (2021)).

This guidance document sets out nature based SuDS techniques to facilitate the best possible SuDS designs for the city. The guide is to be used in the design of SuDS for new developments in the city.

The Council has also produced a Green & Blue Roof Guidance Document in 2021 (a Technical Summary of which can be found in Appendix 11 of the Development Plan Written Statement).

Appendix 13 – Dublin City Council Surface Water Management (SWMP) Guidance.

This guidance document requires the preparation of SWMP's as part of the plan making / master plan process. It also requires the preparation and submission of SWMP's with applications for planning permission.

(3) Strategic Development and Regeneration Areas (SDRAs)

Chapter 13 of the Written Statement of the Development Plan identifies 17 Strategic Development Regeneration Areas (SDRAs) in the city. Objective SDRAO1 Overarching Principles and Vision in Chapter 13, sets out a series of

overarching urban planning principles for the development of these lands including Surface Water Management and Green Infrastructure principles.

A masterplan approach is required for a number of sites within the individual SDRA's and therefore there will be opportunities to address the integrated and area based provision of SuDS.

(4) Area Plans

Over the lifetime of the Development Plan the Planning Authority will prepare Local Statutory Plans for large scale strategic landbanks at Kylemore Road / Naas Road/ Ballymount (City Edge) and lands at Glasnevin (Dublin Industrial Estate). Integrated and area based provision of SuDS and green infrastructure will be developed for these areas as part of the plan making process.

4.3.1 Site based assessment

All proposed development, including that in Flood Zone C, should be accompanied by an appropriately detailed flood risk assessment, or surface water assessment (see Development Plan Policy SI25 and Appendix 13 - Surface Water Management Guidance). The assessment shall have regard to surface water management policies contained in the Greater Dublin Strategic Drainage Study, Dublin City Council's Surface Water Management Guidance (Appendix 13 of the CDP 2022 - 2028) and the Council's Sustainable Drainage Design & Evaluation Guide and Green & Blue Roof Guide - Technical Summaries of which form Appendices 12 and 11 of the CDP 2022 - 2028, and relevant information in this SFRA and Chapters 9 and 10 of the City Development Plan.

There are extensive networks of surface water run-off routes across the city, as indicated in the Flood Resilient City Maps, included in Appendix F. When commencing a surface water assessment, these maps should be consulted and appropriate incorporation of surface water management applied. In particular, attention should be given to development in low-lying areas which may act as natural ponds for collection of run-off.

There are two key objectives to this stage of assessment:

- Ensuring no increase in surface water risk elsewhere, which is achieved through managing run-off from the site and ensuring appropriately designed drainage systems.
- Ensuring risks from surface water are managed. This can be achieved through consideration of threshold levels, maintaining flow paths and preventing obstruction of areas where surface water ponds.

It is essential that overland flow routes are retained and development does not obstruct or divert them without full appraisal of the consequences for other sites and developments and that identified risks are fully mitigated.

As per the requirement for surface water management plans for all development proposals (See Policy SI25, Chapter 9, Written Statement), a surface water assessment shall be carried out for all new developments and reported either in a standalone report, including drainage design drawings and supporting calculations, or it may form part of a more detailed flood risk assessment, which will also consider other flood risks.

A specific requirement of the EU Water Framework Directive is that surface water discharge is controlled and managed so that any impact on its receiving environment is mitigated. This can be achieved through the use of Sustainable Drainage Systems (SuDS). SuDS can reduce the rate of run-off through a combination of infiltration, storage and conveyance (slowing down the movement of water). Sustainable drainage can be achieved through the use of green infrastructure such as green roofs and pervious pavements, rainwater harvesting, soakaways, swales and detention basins, ponds and wetlands. Development must conform with the Council's Sustainable Drainage Design & Evaluation Guide which is summarised in Appendix 12 of the CDP 2022 - 2028.

In order to reduce flooding and improve water quality, all developments in the City Council's administrative area are required to implement the policies of the Council's Sustainable Drainage Design & Evaluation Guide (2021) as summarised in Appendix 12 of the CDP 2022 - 2028, in relation to surface-water and flood risk management. This is done by ensuring new development does not obstruct existing flow routes and by limiting the run-off from new development to green-field rates.

It is noted that the GDSDS requires consideration of a 10% increase in rainfall intensity to take into account the possible impacts of climate change. However, the OPW Guidance in their Climate Change Sectoral Adaption Plan 2019 contains more recent recommendations in this regard. Drainage and surface water design should, therefore, take into account climate change in the same way as fluvial or tidal risk assessments. Guidance on the application of climate change allowances is provided in Section 4.9.

4.3.2 Nature Based Solutions

Nature-based measures can be adopted in urban / river environments that aim to retain water on the landscape during periods of high rainfall and flood by mimicking the functioning of a natural landscape, thereby reducing the magnitude of flood events and providing complimentary ecosystem services. In general, nature-based measures aim to:

- Reduce the rate of run-off during periods of high rainfall;
- Provide flood storage in upper catchment areas; and
- Use natural materials and "soft" engineering techniques to managing flooding in place of "hard" engineering in river corridors.

Nature-based and green infrastructure measures to control flooding typically focus on the use of porous surfaces in developments (Sustainable Drainage Systems or SuDS), planting of native vegetation communities/ assemblages that are tolerant of both wet and dry conditions, and reversing the impacts of urban soil sealing / over-engineered river corridors (river restoration) to reduce the peak of flood events by mimicking the function of a natural catchment landscape. In addition to providing flood relief benefits, nature-based solutions can provide an array of ecosystem services including silt and pollution control for run-off entering the river system, improved riparian and in-river habitats, localised temperature reduction during periods of extreme heat, reduced maintenance requirements in engineered systems, groundwater recharge, and carbon sequestration.

These measures can be implemented across an array of scales, for instance across a catchment as part of a wider flood relief scheme, or on a site-specific basis as part of a landscaping or green infrastructure plan. Nature-based solutions can provide flood mitigation benefits and ecosystem services across all scales if given adequate planning and should be considered during the site layout and design stages of a development. Developers should have 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) and see also policies SI10, SI11, SI12, SI22, SI23, SI24, SI25, GI3, GI5, GI6, GI24, GI29, GI34, and GI35 in the CDP 2022-2028.

4.4 Development in Flood Zone C

Where a site is within Flood Zone C, but adjoining or in close proximity to Flood Zone A or B there could be a risk of flooding associated with factors such as future scenarios (climate change) or in the event of failure of a defence, blocking of a bridge or culvert. Risk from sources other than fluvial and coastal must also be addressed for all development in Flood Zone C. Where a site is located on a 'dry island' (i.e., is fully surrounded by Flood Zone A or B), it is particularly important that flood risks are fully investigated and particular consideration is given to emergency response and evacuation routes; it should not be assumed that development on a 'dry island' is appropriate.

As a minimum, a FRA should be undertaken which will screen out possible indirect sources of flood risk and where they cannot be screened out it should present mitigation measures. The most likely mitigation measure will involve setting finished floor levels to a height that is above the 1 in 100 year fluvial or 1 in 200 year tidal flood level, with an allowance for climate change and freeboard. Design elements such as channel maintenance or trash screens may also be required. Evacuation routes in the event of inundation of surrounding land should also be detailed.

The impacts of climate change should be considered for all proposed developments. This is particularly important for development near areas at risk of tidal flooding. A development which is currently in Flood Zone C may be shown to be at risk when 0.5 m is added to the extreme (1 in 200 year) tide. Design considerations should be proportionate to the type of development, including design life and future adaptability, but may include raising finished floor levels.

It may also be appropriate to consider residual risks arising from culvert/ structure blockage, particularly where it is identified that the site in question forms part of a flow route. Identification of flow routes across the site will not necessarily prohibit development but should be incorporated into the landscaping and design of the development. This will prevent ingress of water to the development itself and ensure risks to neighbouring sites are unchanged.

4.5 Development within Flood Zone A and B

Within Flood Zone A and B, potential development has been classed as either minor (typically extensions and changes of use) or major new development,

which may be less or highly vulnerable to flooding. Each scenario is discussed below.

On lands where the Justification Test for Plan Making has been passed and where a small proportion of the land is at risk of flooding, the sequential approach to development will be applied, and development within Flood Zones A and B will be limited to Minor Development (see below and Section 5.28 of the Planning System and Flood Risk Management Guidelines). 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.

4.5.1 Minor Development

Section 5.28 of The Planning System and Flood Risk Management Guidelines for Planning Authorities, 2009 identifies certain types of development as being 'minor works' and, therefore, exempt from the Justification Test. Such development relates to works associated with existing developments, such as extensions, renovations and rebuilding of existing development, small scale infill and changes of use.

Despite the 'sequential approach' and 'Justification Test' not applying, as they relate to existing buildings, an assessment of the risks of flooding should accompany such applications. This must demonstrate that the development would not increase flood risks, by introducing significant numbers of additional people into the flood plain and/or putting additional pressure on emergency services or existing flood management infrastructure. The development must not have adverse impacts or impede access to a watercourse, floodplain or flood protection and management facilities. Where possible, the design of built elements in these applications should demonstrate principles of flood resilient design. (See: The Planning System and Flood Risk Management Guidelines for Planning Authorities Technical Appendices, 2009, Section 4 – Designing for Residual Flood Risk).

Generally the approach to deal with flood protection would involve raising the ground floor levels above the level of extreme high tides. However, in some parts of the plan area, which are already developed, ground floor levels for flood protection could lead to floor levels being much higher than adjacent streets, thus creating a hostile streetscape for pedestrians. This would cause problems for infill development sites if floor levels were required to be significantly higher than those of neighbouring properties. In this regard, for the key development sites in the plan area it has been recognised that ground floor levels below predicted high tide levels could be allowed, in limited circumstances, on a site-by-site basis, for commercial and business developments. However, if this is the case, then these would be required to be of flood resistant construction using water resistant materials and electrical fittings placed at higher levels. For high risk areas it would also be necessary to impose planning restrictions in these areas. Residential uses would not be permitted at ground flood levels in high risk zones.

It should be noted that for residential buildings within Flood Zone A or B, bedroom accommodation shall not be permitted at basement or ground floor.

For commercial operations, business continuity must be considered, and steps taken to ensure operability during and recovery after a flood event for both residential and commercial developments. Emergency access must be considered as in many cases flood resilience will not be easily achieved in the existing built environment.

The requirement for providing compensatory storage for minor developments has been reviewed and can generally be relaxed, even where finished floor levels have been raised. This is because the development concerns land which has previously been developed and would already have limited capacity to mitigate flooding. However, a commentary to this effect must be substantiated in the FRA.

4.5.2 Highly Vulnerable Development

Two broad classes of major development have been identified for the purposes of this assessment. The first is new development which is located in 'greenfield' (currently undeveloped) parts of the city. The second is brownfield and larger scale infill and regeneration, which, given the urban nature of the city, will form the majority of major development proposals.

Highly vulnerable development in Flood Zones A or B needs to have passed both the Plan Making Justification Test and the Justification Test for Development Management. Development which is highly vulnerable to flooding, as defined in The Planning System and Flood Risk Management Guidelines for Planning Authorities and Technical Appendices, 2009, includes (but is not limited to): dwelling houses, hospitals, emergency services and caravan parks, and requires a particularly rigorous consideration of flood risks and robust flood management measures.

4.5.2.1 New Development

It is not appropriate for new, highly vulnerable development to be located on greenfield land in Flood Zone A or B, whether it is highly or less vulnerable. In the main, such areas are parks and public open space within the wider built environment which provide flood storage and reduce risks to existing development. There would be little or no opportunity to compensate for the loss of such storage areas, and development within them would be contrary to a number of the policies and objectives within this Plan. Such proposals do not pass the Justification Test. Instead, a less vulnerable use should be considered.

4.5.2.2 Regeneration

Regeneration of areas within Flood Zones A and B has, in the main, been justified and the approach for managing risks to such development is provided below.

The DECLG Circular Letter PL2/2014 states that 'notwithstanding the need for future development to avoid areas at risk of flooding, it is recognised that the existing urban structure of the country contains many well established cities and urban centres which will continue to be at risk of flooding'. In addition, the Dublin City Development Plan 2022-2028 has recognised urban areas whose continued consolidation, growth, development or regeneration, including for residential use, is being encouraged to bring about compact and sustainable growth.

In cases where development has passed the Justification Test for Plan Making, the outline requirements for a site-specific FRA have been detailed in this SFRA in both the following sections, the Area Assessments in Appendix B and the site specific assessments in Appendix C, which also details where such development has been justified. Of prime importance is the requirement to manage risk to the development site and not to increase flood risk elsewhere. This should give due consideration to safe evacuation routes and access for emergency services during a flood event.

4.5.3 Less Vulnerable Development

This section applies to less vulnerable development in Flood Zone A which has passed the Justification test for Development Plans, and less vulnerable development in Flood Zone B, where this form of development is appropriate, and the Justification Test is not required.

Less vulnerable development includes retail, leisure and warehousing etc. This category includes less vulnerable development in all forms, including refurbishment or infill development, and new development both in defended and undefended situations.

The design and assessment of less vulnerable development should be the 1% AEP fluvial or 0.5% AEP tidal events as standard, with climate change and a suitable freeboard included in the setting of finished floor levels.

The presence or absence of flood defences informs the level of flood mitigation recommended for less vulnerable developments in areas at risk of flooding. In contrast with highly vulnerable development, there is greater scope for the developer of less vulnerable uses to accept flood risks and build to a lower standard of protection, which is still high enough to manage risks for the development in question. However, any deviation from the design standard of 1%/0.5% AEP, plus climate change, plus freeboard, needs to be fully justified within the FRA.

4.6 Defended Sites

A site is considered to be defended if the standard of protection provided by the defence is at least the 1% AEP (fluvial) or 0.5% AEP (tidal) design level, with an appropriate freeboard allowance. The defence should also be classified as 'formal' and be part of a certified OPW or Local Authority scheme. Where the defence has a lower standard of protection or is informal, then the site should be considered to be undefended for the purposes of both plan making and development management.

In a defended site, the requirement to provide freeboard and climate change allowances on the finished floor levels can be relaxed if the defences already include the allowance. Where the defence does not include for climate change, such as along the Tolka, the specific risks to the development should be appraised and an appropriate response taken. For example, relatively short lived developments (i.e. up to approximately 20-30 years) would not necessarily need to be raised above climate change levels, but a high-tech or long term investment development project may need to be raised above the current design flood level.

In a defended site, it may be possible to lower the finished floor levels even further if risks are fully appraised and the development design and operation is resilient and an increase in risk can be accepted. This appraisal should include consideration of defence failure, which is likely to be through breach or overtopping. The breach assessment should consider the likelihood of breach (the age, construction and maintenance of the defences). If breach is considered to be a risk, then the impacts of breach should be discussed in the FRA. As a conservative estimate it may be assumed that the in-channel levels are projected across the floodplain, and as such a 'worst case' inundation depth will be calculated. The Eastern CFRAM study / FRMP also includes analysis of the impact of defence breach for some watercourses. With this information a decision to accept or avoid the potential risks can be made. Acceptance should reflect emergency planning and business continuity within the development. It may reflect the design life of the development, the proposed use, the vulnerability of items to be kept in the premises, the insurability of the development, the occupants and users, emergency plan and inclusion of flood resilience and recovery measures.

In such a way, further acceptance of flood risks may allow the finished floor level to be set below the 1% AEP (1 in 100 year) level but should not allow depths of flooding greater than 600mm, even in the event of defence breach. This step will require a detailed assessment of risks at the site specific scale, including residual risk, flood depths and inundation times.

In a defended site, compensatory storage is not required as the floodplain was removed through implementation of the flood defence scheme.

Further details regarding the location, condition and standard of protection offered by the various defences within the city is provided in Appendix A.

4.7 Undefended Sites

In an undefended site there is less scope for accepting 'below design level' finished floor levels than in a site which is defended. However, with consideration of the design life of the development, the proposed use, the vulnerability of items to be kept in the premises and long-term adaptability, it may be acceptable to design finished floor levels to current, rather than climate change standards. An appropriate freeboard allowance would still be required.

It is also a requirement that loss of floodplain within Flood Zone A should be compensated for on a level-for-level basis within the site bounds for the 1% AEP (1 in 100-year event). Within currently developed areas the impact of loss of storage should be investigated for the 0.1% AEP (1 in 1000-year) event, and further compensatory storage provided if the development is shown to have a significant impact on flood risk elsewhere.

4.8 Checklist for Applications for Development in Areas at Risk of Flooding

This section applies to both highly and less vulnerable development in Flood Zone A and highly vulnerable development in Flood Zone B that satisfy the following:

- Meet the definition of Minor Development; or

- Pass the Justification Test for Development Plans and Justification Test for Development Management to the satisfaction of the Planning Authority.

The following checklist is required for all development proposals:

- The site specific flood risk assessment (SSFRA) be carried out by an appropriately qualified Engineer with relevant FRA experience (as deemed acceptable by the Planning Authority), in accordance the Dublin City SFRA and the Flood Risk Guidelines.
- Demonstration that the specific objectives or requirements for managing flood risk set out in this SFRA have been complied with, including an assessment of residual risks.
- Preparation of access, egress and emergency plans which are appropriate to the vulnerability of the development and its occupiers, the intensity of use and the level of flood risk.
- An assessment of the potential impacts of climate change and the adaptive capacity of the development.
- Compliance with C753 CIRIA SUDS guide, and the DCC Surface Water Management Guidance (Appendix 13 of the CDP 2022-2028) and inclusion of SuDS (Appendix 12 of the CDP 2022 – 2028).

4.9 Incorporating Climate Change into Development Design

Ireland's climate is changing and analysis of the potential impacts of future climate change is essential for understanding and planning. Climate change should be considered when assessing flood risk and in particular residual flood risk. Areas of residual risk are highly sensitive to climate change impacts as an increase in flood levels will increase the likelihood of defence failure. As laid out in the Climate Adaptation Strategy, new development should include consideration of climate change impacts on fluvial, pluvial and tidal source of flooding.

The Planning Guidelines recommend that a precautionary approach to climate change is adopted due to the level of uncertainty involved in the potential effects. Specific advice on the expected impacts of climate change and the allowances to be provided for future flood risk management in Ireland is given in the OPW ~~draft~~ guidance and the OPW Climate Change Sectoral Adaption Plan 2019[7]. Climate science, particularly in relation to sea level rise, is developing rapidly. There are many coastal related climate change impacts, these include:

- continued sea level rise:
- potentially more severe Atlantic storms, which could generate more significant storm surges and extreme waves;
- increased water depths lead to larger waves reaching the coast.

The OPW guidance recommended two climate change scenarios are considered. These are the Mid-Range Future Scenario (MRFS) and the High-End Future Scenario (HEFS). The allowances should be applied to the 1% AEP fluvial or 0.5% AEP tidal levels. Where a development is critical or extremely vulnerable

[7] OPW Climate Change Sectoral Adaption Plan 2019

(see Table 4-1) the impact of climate change on 0.1% AEP flows should also be applied, and greater climate change allowances tested for resilience purposes.

These climate change allowances are particularly important at the development management stage of planning and will ensure that proposed development is designed and constructed according to current local and national Government advice.

Table 4-1: Climate Change Allowances by Vulnerability and Flood Source

Development vulnerability	Fluvial climate change allowance (increase in flows)	Tidal climate change allowance (increase in sea level)	Storm water / surface water
Less vulnerable	20%	0.5m (MRFS)	20% increase in rainfall
Highly vulnerable	20%	0.5m (MRFS)	
Critical or extremely vulnerable (e.g. hospitals, major sub-stations, blue light services)	30%	1.0m (HEFS)	30% increase in rainfall

Further work on the impacts of climate change on flood levels was undertaken as part of the Eastern CFRAM Study, FRMP and the ICPSS. The studies provided flood extents for both fluvial and coastal risk, which are available on www.floodinfo.ie.

Assessment of climate change impacts can be carried out in a number of ways. For watercourses that fall within the Eastern CFRAM study, FRMP area, flood extents and water levels for the MRFS and HEFS have been developed. For other fluvial watercourses a conservative approach would be to take the 0.1% AEP event levels and extent as representing the 1% AEP event plus climate change. Where access to the hydraulic river model is readily available a run with climate change could be carried out, or hand calculations undertaken to determine the likely impact of additional flows on river levels. In a coastal or tidal scenario, a 0.5m or 1m increase to the 0.5% AEP sea level can be assessed based on topographic levels.

Where the risk associated with inundation of a development is low and the design life of the development is short (typically less than 30 years) the allowance provided for climate change may be less than the 20% flow/0.5 m sea level /20% rainfall depth. However, the reasoning and impacts of such an approach should be provided in the site specific FRA and must be agreed by DCC.

4.10 Flood Mitigation Measures at Site Design

For any development proposal in an area at moderate or high risk of flooding that is considered acceptable in principle (i.e. has passed the Plan Making Justification Test), the site-specific FRA must demonstrate that appropriate mitigation measures can be put in place and that residual risks can be managed

to acceptable levels. This may include the use of flood-resistant construction measures that are aimed at preventing water from entering a building and that mitigate the damage floodwater causes to buildings. Alternatively, designs for flood resilient construction may be adopted where it can be demonstrated that entry of floodwater into buildings is preferable to limit damage caused by floodwater and allow relatively quick recovery.

Various mitigation measures are outlined below and further detail on flood resilience and flood resistance are included in the Technical Appendices of the Planning Guidelines, The Planning System and Flood Risk Management[8].

It should be emphasised that measures such as those highlighted below should only be considered once it has been deemed 'appropriate', to allow development in a given location or the Justification Test for Development Plans has been passed. The Planning Guidelines do not advocate an approach of engineering solutions in order to justify the development which would otherwise be inappropriate.

4.10.1 Site Layout and Design

To address flood risk in the design of new development, a risk-based approach should be adopted to locate more vulnerable land-use to higher ground while water compatible development i.e. car parking (with appropriate flood management plan) and recreational space can be located in higher flood risk areas.

The site layout should identify and protect land required for current and future flood risk management. Waterside areas or areas along known flow routes can be used for recreation, amenity and environmental purposes to allow preservation of flow routes and flood storage, while at the same time providing valuable social and environmental benefits.

At an individual building level, assigning a water compatible use, such as open public realm, or less vulnerable use to the ground floor level, along with suitable flood resilient construction, is an effective way of raising vulnerable living space above design flood levels. It can however, have an impact on the streetscape. The provision of safe access and egress is a critical consideration in allocating ground floor uses.

4.10.2 Ground Levels, Floor Levels and Building Use

Modifying ground levels to raise land above the design flood level is a very effective way of reducing flood risk to the site. However, in most areas of fluvial flood risk, conveyance or flood storage would be reduced locally and could increase flood risk off site. There are a number of criteria which must all be met before this is considered a valid approach:

- Development at the site must have been justified through this SFRA based on the existing (unmodified) ground levels.

8 The Planning System and Flood Risk Management Guidelines for Planning Authorities, Technical Appendices, November 2009

- The FRA should establish the function provided by the floodplain (either conveyance or static storage).
- Where conveyance is a prime function then a hydraulic model will be required to show the impact of the alteration of the floodplain profile.
- Where the floodplain provides static storage, compensatory storage should be provided on a level for level basis to balance the total volume that will be lost through infilling.
- The land being given over to compensatory storage must be land which does not flood in the 1% AEP fluvial event (i.e. within Flood Zone B or C).
- The provision of the compensatory storage should be in close proximity to the area that storage is being lost from.
- The land proposed to provide the compensatory storage area must be within the ownership / control of the developer.
- The compensatory storage area should be constructed before land is raised to facilitate development.
- Compensatory storage is generally not required for loss of floodplain in a tidal scenario, or in locations behind defences.

In some sites it is possible that ground levels can be re-landscaped to provide a sufficiently large development footprint. However, it is likely that in other potential development locations there is insufficient land available to fully compensate for the loss of floodplain. In such cases it will be necessary to reconsider the layout or reduce the scale of development or propose an alternative and less vulnerable type of development. In other cases, it is possible that the lack of availability of suitable areas of compensatory storage mean the target site cannot be developed and should remain open space.

Raising finished floor levels within a development is an effective way of avoiding damage to the interior of buildings (i.e. furniture and fittings) in times of flood. Finished floor levels should be assessed in relation to the specific development, but the minimum levels set out in Table 4-2 should apply. It should be noted that in certain locations it may be appropriate to adopt a more precautionary approach to setting finished floor levels, for example where residual risks associated with bridge blockage occur or the 0.1% AEP event is more extreme, and this should be specifically assessed in the SSFRA. It is also noted that typically finished floor levels should be set a minimum of 300mm above surrounding ground levels to prevent ingress of surface water.

Table 4-2: Recommended Minimum Finished Floor Levels

Scenario	Finished floor level to be based on
Fluvial, undefended	1% AEP flood + climate change (as Table 4-1) + 300mm freeboard
Tidal, undefended	0.5% AEP flood + climate change (as Table 4-1) + 300mm freeboard.
Fluvial, defended	1% AEP flood + 300mm freeboard. Climate change does not need to be included, provided it is included in the defence height or adaption plan for the scheme.

Tidal, defended	0.5% AEP flood + 300mm freeboard. Climate change does not need to be included, provided it is included in the defence height or adaption plan for the scheme.

4.10.3 Basements

In Dublin City there are at least 20,000 basements[9] associated with existing buildings. Basements have the potential to;

- Impact on groundwater flows - cause drainage, flooding problems or damage to the ecosystem.
- Affect the stability of adjacent buildings either during construction or in the long term.
- Be at risk of flooding themselves – such risks requiring limitations to the usage of basement.
- Damage the character of areas and the natural environment.
- Cause considerable disruption and environmental impact during construction.

As a result, all proposals including a basement, and any proposals which include the refurbishment or repurposing of an existing basement need to be supported by a Basement Impact Assessment, carried out in accordance with the Council's Basement Development Guidance (Appendix 9 of the CDP 2022-2028), and should particularly focus on risks associated with groundwater and below ground streams.

4.10.4 Raised Defences

Construction of raised defences (i.e. flood walls and embankments) has traditionally been the response to flood risk. However, this is not a preferred option on an ad-hoc basis and where the defences to protect the development are not part of a strategically led flood relief scheme. Where a defence scheme is proposed as the means of providing flood defence, the impact of the scheme on flood risk up and downstream must be assessed and appropriate compensatory storage must be provided.

A site is considered to be defended if the standard of protection is 1% AEP (fluvial) or 0.5% AEP (tidal), within which a freeboard of at least 300mm is included. The Finished Floor Level (FFL) of the proposed development needs to include for the impacts of climate change and other residual risks, including overtopping in the 0.1% event, unless this has also been incorporated into the defence design. This may be assessed through breach analysis, overtopping analysis or projection of water levels across the floodplain.

4.10.5 Emergency Flood Response Plans

In some instances, and only when all parts of both the Plan Making and Development Management Justification Tests have been passed, it may be necessary for an emergency flood response plan to be prepared to support other flood management measures within the context of a less vulnerable or water

[9] Figure based on a compilation of GDSDS, Bord Gais and DCC surveys (Source: DCC Flood Office)

compatible development. An emergency response plan may be required to trigger the operation of demountable flood defences to a less vulnerable development, evacuation of a car park or closure of a business or retail premises.

The emergency plan will need to detail triggers for activation, including receipt of a timely flood warning, a staged response and to set out the management and operational roles and responsibilities.

The plan will also need to set out arrangements for access and egress, both for pedestrians, vehicles and emergency services. The details of the plan should be based on an appropriately detailed assessment of flood risk, including speed of onset of flooding, depths and duration of inundation.

However, just because it is possible to prepare and emergency plan does not mean this is advisable or appropriate for the nature and vulnerability of development.

4.10.6 Ground Floor and Basement Access Protection

In relation to basements and ground level access protection the following Flood Resilience and Adaptation Measures are recommended:

Doorway and access threshold levels are an important factor in determining the susceptibility of domestic and commercial properties and below ground infrastructure to pluvial and other types of flooding. This can be especially important in flat areas where, although the depth of ponding may be relatively shallow, it can be extensive and potentially affect many properties if doorway and access thresholds are close to street level or even below street level. For low doorway accesses to domestic properties, raising of the threshold step may be practical in some instances but not always – in such circumstances temporary door-guards should be considered but these will require advance warning for installation.

- Doorway accesses to public, commercial and residential properties are often at ground level to facilitate access. Shallow ramping may be sufficient to keep pluvial floodwater out of the building.
- Vehicular accesses may also ramp down to underground car parks or basement loading areas, for example. Again raised ramping or floodgates across the entrance may be sufficient to mitigate the risk.
- Drainage augmentation across entrances may assist but in itself may not be sufficient to deal with surface flows arising from high intensity rainfall.
- Particular care should be taken where there are street level accesses to below-ground infrastructure such as underground or low-level transportation systems. In such circumstances rapid inundation could pose a threat to life as well as potentially causing major disruption and damage.
- Access protection should be considered as a potential ‘early win’, particularly for one-off situations where shallow ramping is feasible and relatively inexpensive to install. If the number of properties with low thresholds is extensive then provision of financial incentives to support property resistance measures can be considered, however, no centrally funded scheme is yet available for this.

- Alarm systems should be strongly considered for semi-basements and should be mandatory for one-storey or multiple-storey basements. Training of residents and building personnel in alarms and escape routes and escorting all visitors out of sub-basement zones should be a requirement.

4.10.7 River Corridor Restoration

River Corridor Restoration seeks to support the natural processes and historical functioning of a river and to improve its water quality and ecology in line with the requirements of the WFD, RBMP and climate change adaption. Providing more 'room for the river' is central to the concept.

The CDP 2022-2028 seeks to manage development within and adjacent to the city's river corridors and in particular, the Camac River Corridor, through the application of the following policies:

- SI10: Managing Development Within and Adjacent to River Corridors - To require development proposals that are within or adjacent to river corridors in the city (excluding the Camac River) to provide for a minimum set-back distance of 10-15m from the top of the river bank in order to create an appropriate riparian zone. The Council will support riparian zones greater than 10 metres depending on site specific characteristics and where such zones can integrate with public/ communal open space.
- SI11: Managing Development Within and Adjacent to Camac River Corridor - To manage all development within and adjacent to the Camac River Corridor in a way that enhances the ecological functioning and water quality of the river and aligns with the principles for river restoration. All development shall provide for a minimum set-back distance of 10-25m from the top of the river bank depending on site characteristics. Large development sites in excess of 0.5ha should provide a minimum set-back of 25m from the top of the river bank where informed by a hydromorphological study.
- SI12: River Restoration in Strategic Development and Regeneration Areas To provide opportunities for enhanced river corridors in the following Strategic Development and Regeneration Areas (SDRAs) in order to harness significant opportunities for river restoration where feasible:

    - SDRA 1 Clongriffin/ Belmayne and Environs
        - SDRA 3 Finglas Village Environs and Jamestown Lands
        - SDRA 4 Park West/Cherry Orchard
        - SDRA 5 Naas Road
        - SDRA 6 Docklands
        - SDRA 7 Heuston and Environs
        - SDRA 9 Emmet Road
        - SDRA 10 North East Inner City
        - SDRA 16 Oscar Traynor Road-

This management approach will have a number of benefits, including:

- Retention of the natural floodplain where feasible;

- Potential opportunities for amenity, including riverside walks and public open spaces;
- Maintenance of the connectivity between the river and its floodplain, encouraging the development of a full range of habitats and biodiversity;
- Natural attenuation of flows will help ensure no increase in flood risk downstream;
- Allows access to the river for maintenance works;
- Some provision for increase in flood extents due to climate change; and,
- Retention of clearly demarcated areas where development is not appropriate on flood risk grounds, and in accordance with The Planning System and Flood Risk Management Guidelines for Planning Authorities and Technical Appendices, 2009.

4.10.8 Bridges, Culverts and Weirs

Where a planning application includes proposals to amend an existing bridge, culvert or weir, or introduce a new in-channel structure, it will be necessary for the applicant to seek OPW's approval under Section 48 (weirs) and Section 50 (bridges and culverts) of the Arterial Drainage Act 1945. It should be noted that OPW approval under Section 48 and / or 50 does not influence or determine the outcome of the planning application process.

5 Flood Risk Management Policies/Objectives

5.1 Flood Management

5.1.1 Flood Management Policies

Flood management policies are found in several chapters in the Development Plan, as follows:

Chapter 3 – Climate Action

- CA8: Climate Mitigation Actions in the Built Environment - To require low carbon development in the city which will seek to reduce carbon dioxide emissions and which will meet the highest feasible environmental standards during construction and occupation, see Section 15.7.1 when dealing with development proposals. New development should generally demonstrate/ provide for:
    a. building layout and design which maximises daylight, natural ventilation, active transport and public transport use;
    b. sustainable building/services/site design to maximise energy efficiency;
    c. sensitive energy efficiency improvements to existing buildings;
    d. energy efficiency, energy conservation, and the increased use of renewable energy in existing and new developments;
    e. on-site renewable energy infrastructure and renewable energy;
    f. minimising the generation of site and construction waste and maximising reuse or recycling;
    g. the use of construction materials that have low to zero embodied energy and CO_2 emissions; and
    h. connection to (existing and planned) decentralised energy networks including the Dublin District Heating System where feasible.
- CA9: Climate Adaptation Actions in the Built Environment - Development proposals must demonstrate sustainable, climate adaptation, circular design principles for new buildings / services / site. The Council will promote and support development which is resilient to climate change. This would include:
    a. measures such as green roofs and green walls to reduce internal overheating and the urban heat island effect;
    b. ensuring the efficient use of natural resources (including water) and making the most of natural systems both within and around buildings;
    c. minimising pollution by reducing surface water run-off through increasing permeable surfaces and use of Sustainable Drainage Systems (SuDS);
    d. reducing flood risk, damage to property from extreme events– residential, public and commercial;

e. reducing risks from temperature extremes and extreme weather events to critical infrastructure such as roads, communication networks, the water/drainage network, and energy supply;

f. promoting, developing and protecting biodiversity, novel urban ecosystems and green infrastructure.

- CA26: Flood and Water Resource Resilience - To support, encourage and facilitate the delivery of soft, green and grey adaptation measures to enhance flood and water resource resilience in the city and support the delivery of grey adaptation measures to enhance flood and water resource resilience where necessary.
- CA27: Flood Risk Assessment and Adaptation - To address flood risk at strategic level through the process of Strategic Flood Risk Assessment, and through improvements to the city's flood defences.
- CA28: Natural Flood Risk Mitigation - To encourage the use of natural flood risk mitigation or nature based solutions including integrated wetlands, green infrastructure, and Sustainable Drainage Systems (SuDS) as part of wider adaptation and mitigation responses to achieve flood resilience.
- CA30: Coastal Zone Management - To support, encourage and facilitate coastal zone management measures for adapting to climate change which include restoration of degraded ecosystems, increased flood resilience, water quality improvement, habitat conservation and provision of amenities for the residents and visitors of Dublin City.

Chapter 9 – Sustainable Environmental Infrastructure and Flood Risk

- SI10: Managing Development Within and Adjacent to River Corridors –

  To require development proposals that are within or adjacent to river corridors in the City (excluding the Camac River) to provide for a minimum set-back distance of 10-15m from the top of the river bank in order to create an appropriate riparian zone. The Council will support riparian zones greater than 10 metres depending on site-specific characteristics and where such zones can integrate with public/communal open space.
- SI11: Managing Development Within and Adjacent to Camac River Corridor - To manage all development within and adjacent to the Camac River Corridor in a way that enhances the ecological functioning and water quality of the river and aligns with the principles for river restoration. All development shall provide for a minimum set-back distance of 10-25m from the top of the river bank depending on site characteristics. Large development sites in excess of 0.5ha should provide a minimum set-back of 25m from the top of the river bank where informed by a hydromorphological study.
- SI12: River Restoration in Strategic Development and Regeneration Areas - To provide opportunities for enhanced river corridors in the following Strategic Development and Regeneration Areas (SDRAs) in order to harness significant opportunities for river restoration where feasible:

- SDRA 1 Clongriffin /Belmayne and Environs
- SDRA 3 Finglas Village Environs and Jamestown Lands
- SDRA 4 Park West/Cherry Orchard
- SDRA 5 Naas Road
- SDRA 6 Docklands
- SDRA 7 Heuston and Environs
- SDRA 9 Emmet Road
- SDRA 10 North East Inner City
- SDRA 16 Oscar Traynor Road

- SI13: Minimising Flood Risk - 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: Strategic Flood Risk Assessment - 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: Site-Specific Flood Risk Assessment – 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 site-specific 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 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) 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: Site-Specific Flood Risk Assessment - Proposals which may be classed as 'minor development', for example small-scale 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: Catchment-Based Flood Risk Management Plans - 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: Protection of Flood Alleviation Infrastructure - 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: Provision and Upgrading of Flood Alleviation Assets - 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: Basement Flood Risk Management - 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 Managing Surface Water Flood Risk - 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.

Chapter 10 - Green Infrastructure and Recreation

- GI3: Multi-functionality - To ensure delivery of multifunctional green and civic spaces that meet community needs, support biodiversity, promote active and passive recreation, flood and surface water management and local habitat improvements. The multi-functionality of spaces will be balanced against the need to protect and enhance local habitat and the recreational and functional requirements of parks.
- GI24: Multi-Functionality (GI) - To incorporate new open space into the green infrastructure network for the city, and providing a multi-functional role including: outdoor recreation, biodiversity, urban drainage, flood management, connection and carbon absorption without compromising public access to and the amenity function of open space (see Section 15.6: Green Infrastructure and Landscaping).
- GI29: Protect Character of River Corridors - To protect, maintain, and enhance the watercourses and their river corridors in the city and to ensure that development does not cover or encroach upon rivers and their banks. To maintain natural river banks and restore them as part of any new development. The creation and/or enhancement of river corridors will be required and river restoration opportunities where possible will be supported to help improve water quality, and ecology, provide natural flood relief as well as providing amenity and leisure benefits.
- GI34: New Development and Public Open Space along River Corridors - To ensure that new development, in terms of siting and design, responds to the character, importance and setting of the city's rivers where the context allows, and to require public open space which is to be provided as part of new development, to supplement riparian buffer zones so as to support the attainment of 'good ecological status' or higher for water bodies, flood management, the conservation of biodiversity and ecosystem functions.
- GI35: General Protection of Coastal Zone - To protect and enhance the coast shoreline and marine environment as open space and valuable natural habitats.

5.1.2 Flood Management Objectives

Flood management objectives included in the Development Plan, are:

Chapter 9 – Sustainable Environmental Infrastructure and Flood Risk

- SIO8: River Restoration Strategies/ Masterplans - To prepare river-specific restoration strategies/ masterplans for the City's rivers and their tributaries

in order to create a comprehensive, collaborative and integrated catchment management planning approach to improving the river corridor which addresses water quality, flooding, hydromorphology, ecology, biodiversity, heritage, amenity and tourism.

- SIO10: OPW Flood Relief Maintenance - 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: Cross-Boundary Flood Management - To work with neighbouring local authorities when developing cross-boundary flood management work programmes and when considering cross-boundary development.

  SIO12: OPW Catchment-Based Flood Risk - 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.

5.1.3 SUDS Policies

SUDS policies included in the Development Plan, are:

Chapter 9 – Sustainable Environmental Infrastructure and Flood Risk

- SI21: Managing Surface Water Flood Risk - 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.
- SI22: Sustainable Drainage Systems - 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: Green Blue Roofs - 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: Control of Paving of Private Driveways / Vehicular Entrances / Grassed Areas - 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: Surface Water Management - 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.

Chapter 3 Climate Action

- CA28: Natural Flood Risk Mitigation - To encourage the use natural flood risk mitigation or nature based solutions including integrated wetlands, green infrastructure, and Sustainable Drainage Systems (SuDS) as part of wider adaptation and mitigation responses to achieve flood resilience.
- CA9: Climate Adaptation Actions in the Built Environment - Development proposals must demonstrate sustainable, climate adaptation, circular design principles for new buildings / services / site. The Council will promote and support development which is resilient to climate change. This would include:
    a. measures such as green roofs and green walls to reduce internal overheating and the urban heat island effect;
    b. ensuring the efficient use of natural resources (including water) and making the most of natural systems both within and around buildings;
    c. minimising pollution by reducing surface water run-off through increasing permeable surfaces and use of Sustainable Drainage Systems (SuDS);
    d. reducing flood risk, damage to property from extreme events– residential, public and commercial;
    e. reducing risks from temperature extremes and extreme weather events to critical infrastructure such as roads, communication networks, the water/drainage network, and energy supply;
    f. promoting, developing and protecting biodiversity, novel urban ecosystems and green infrastructure.

5.1.4 SUDS Objectives

SUDS objectives included in the Development Plan, are:

Chapter 9 – Sustainable Environmental Infrastructure and Flood Risk

- SIO9: Planning for Surface Water Management - To undertake Surface Water Management Plans for each river catchment and as part of this, include a study of relevant zoned lands within the City in order to ensure that

sufficient land is provided for nature-based surface water management, SuDS and green infrastructure.

5.1.5 Green Infrastructure Policies

Green Infrastructure policies are found in a number of chapters in the Development Plan.

Chapter 10 - Green Infrastructure and Recreation

- GI1: Green Infrastructure Assets - To identify and protect the integrity of the city's GI assets, as appropriate, and to enhance and expand the connectivity, multi-functionality, and accessibility of the city's green infrastructure network, while addressing gaps in the network.
- GI2: Connectivity - To develop an interconnected green infrastructure network of strategic natural and semi-natural areas with other environmental features including green spaces, rivers, canals, the coastal and marine area and other physical features including streets and civic spaces that supports ecological, wildlife, and social connectivity.
- GI5: Greening of Public Realm / Streets - To integrate urban greening features including nature based solutions into the existing public realm where feasible and into the design of public realm projects for civic spaces and streets. The installation of living green walls will be encouraged to the fullest possible extent throughout the city of Dublin and tree pits with mixed planting will be preferred for the greening of streets in recognition of the co-benefits they offer for SuDs, biodiversity, amenity value and traffic calming.
- GI6: New Development / New Growth Areas - To integrate Green Infrastructure and an ecosystem services approach into new developments / new growth areas in the city that contributes to the city's green infrastructure network by its extension and enhancement and that provides for the environmental resilience of new development.
- GI7: Connecting Greening Elements in Site Design - To avoid the fragmentation of green spaces in site design and to link green spaces /greening elements to existing adjacent green infrastructure / the public realm where feasible and to provide for ecological functions.
- GI24: Multi-Functionality (GI) - To incorporate new open space into the green infrastructure network for the city, and providing a multi-functional role including: outdoor recreation, biodiversity, urban drainage, flood management, connection and carbon absorption without compromising public access to and the amenity function of open space (see Section 15.6: Green Infrastructure and Landscaping).
- GI34: New Development and Public Open Space along River Corridors - To ensure that new development, in terms of siting and design, responds to the character, importance and setting of the city's rivers where the context allows, and to require public open space which is to be provided as part of new development, to supplement riparian buffer zones so as to support the attainment of 'good ecological status' or higher for water

bodies, flood management, the conservation of biodiversity and ecosystem functions.

- GI35: General Protection of Coastal Zone - To protect and enhance the coast shoreline and marine environment as open space and valuable natural habitats.

Chapter 7 - City Centre and Retail

- CCUV39: Permeable, Legible and Connected Public Realm - To deliver a permeable, legible and connected public realm that contributes to the delivery of other key objectives of this development plan namely active travel and sustainable movement, quality urban design, healthy placemaking and green infrastructure. See Chapter 7 of CDP.
- CCUV44: New Development - That development proposals should deliver a high quality public realm which is well designed, clutter-free, with use of high quality and durable materials and green infrastructure. New development should create linkages and connections and improve accessibility.. See Chapter 7 of CDP.

5.1.6 Green Infrastructure Objectives

Chapter 10 - Green Infrastructure and Recreation

Green Infrastructure objectives included in the Development Plan, are:

- GIO2: Preparation of a Green Infrastructure Strategy for Dublin City - To prepare a Green Infrastructure Strategy for Dublin City that will include a newly developed set of green micro areas.

6 Responsibility for Flood Risk Management

6.1 Introduction

Flood events can be caused by a complex set of interactions of flood source(s), pathway(s) and receptor(s), the responsibility for managing which can often lie with a number of different organisations or individuals.

6.1.1 Office of Public Works

The Office of Public Works (OPW), part of the Department of Finance, is the lead State body for the co-ordination and implementation of Government policy on the management of flood risk in Ireland. The OPW is also the national authority for the implementation of the EU Directive on the Assessment and Management of Flood Risks [2007/60/EC], SI122/2010, and the previously discussed CFRAM studies and FRMPs. Through this programme of work, OPW has become a source of flood risk data, including flood maps and reports.

The Minister for the Environment, Community and Local Government in conjunction with the Competent Irish Flood Authority, the OPW, in 2009 jointly published The Planning System and Flood Risk Management Guidelines for Planning Authorities and Technical Appendices, 2009, which aimed at ensuring a more consistent and rigorous and systematic approach to fully incorporating flood risk assessment and management into the planning system.

The OPW funds investment in capital works projects and measures to reduce the likelihood of flooding in areas at risk of flooding, it has €1bn to spend on flood schemes over the next 12 years. This investment is provided for major urban fluvial and tidal flood relief projects (carried out by the OPW directly or by local authorities acting on the OPW's behalf) and for localised minor flood mitigation works which are undertaken by local authorities with funding provided by the OPW.

OPW Flood Defence Schemes are generally carried out under the Arterial Drainage Act 1945 and the Arterial Drainage Amendment Act 1995, although in recent years some phases of schemes have been carried out by the Local Authorities under the Planning and Development Regulations 2001, as amended.

The OPW Minor Flood Mitigation Works and Coastal Protection Scheme provides funding to local authorities to undertake minor flood mitigation works or studies, costing less than €0.5 million, to address localised fluvial flooding and coastal protection problems within their administrative areas.

On behalf of the DECLG, the OPW also allocate funding in exceptional circumstances for repairs to infrastructure as a result of storm damage. This occurred in 2014 following the storms in the period from 13 December 2013 to 6 January 2014.

6.1.2 Irish Water

From January 2014 Irish Water became responsible for all public water services, involving the supply of drinking water and effective management of wastewater. Their Water Services Strategic Plan (2015) sets out the strategic objectives for the delivery of water services over the next 25 years up to 2040.

Some of the combined sewers (pipes for collection of both wastewater and rainfall run-off from roads and other hard surface areas) do not have the capacity to cope with heavy rainfall and this can result in flooding. During intense rainfall, the combined sewer overflows (CSOs) discharge excess flows into nearby watercourses. Irish Water is proposing a number of strategies to deal with these issues, including identifying and recording properties at risk of flooding from combined sewers and implementing measures to reduce and mitigate the risk, and also to deliver measures to reduce the pollution impact from combined sewer overflows. It is also noted that in their plan, Irish Water recognise that climate change will cause greater frequency of extreme weather events and it will be important to adapt their assets to be resilient to climate change impacts and to mitigate their impact by reducing their carbon footprint.

The surface water drainage network and fluvial and tidal flood alleviation works remain the responsibility of the relevant Local Authority or the OPW. Irish Water's responsibility in this area relates only to flooding from the combined sewers that are generally found in older urban areas.

6.1.3 Dublin City Council

DCC has introduced flood risk assessment in accordance with The Planning System and Flood Risk Management Guidelines for Planning Authorities and Technical Appendices, 2009, as an integral and leading element of the Development Planning function under the Planning and Development Act 2000 (as amended). DCC is responsible for overall flood risk assessment for their functional area and any local area plans (LAPs) or Strategic Development Zones (SDZs) which may be supplemented by more detailed Site Specific Flood Risk Assessments.

DCC is responsible for the repair and maintenance of flood and coastal defence structures in the ownership and management of the local authority.

DCC have produced a number of guidance leaflets on flooding, which are available to download on www.dublincity.ie:

- Dublin City Council Flood Forum – Property Flood Protection Guide.
- Dublin City Council Basement Flooding

DCC works closely with the DHLGH and the OPW in the planning of new developments in flood risk areas of Dublin City. Through Section 50 Consents, the OPW is required to approve new bridges and culverts, or changes to existing structures on watercourses within Dublin City. DCC also liaises with neighbouring and other local authorities on significant flood alleviation and early weather warning schemes.

6.1.4 Developers / Applicants

Developers / applicants are obliged to carefully examine their development proposals to ensure consistency with the requirements set out in The Planning System and Flood Risk Management Guidelines for Planning Authorities and Technical Appendices, 2009 and within this SFRA. This includes carefully researching whether there have been instances of flooding on specific sites and declaring any known flood history in the planning application form as required.

Developers are encouraged to engage with the local authority at an early stage with regard to any flood risk assessment issues that may arise. They are required to carry out a Site Specific Flood Risk Assessment, as appropriate to the development proposal and location, and comply with the terms and conditions of any grant of planning permission with regards to the minimisation of flood risk.

6.1.5 Property Owners, Businesses and Residents

It is the responsibility of householders and businesses to look after their property, including protecting it from flooding. It is important that householders, whose homes are at risk of flooding, take steps to ensure that their home is protected. DCC recognises the vital role individuals, communities and businesses have in managing flood risk and the requirement for more information to be available to support these initiatives.

6.1.6 Riparian Owners

Property or land owners who own land which is adjacent to a watercourse, or which has a watercourse running through it, are riparian owners and have certain legal responsibilities to maintain the watercourse. Where a watercourse marks the boundary between adjoining properties, it is normally presumed the riparian owner owns the land up to the centre line of the watercourse.

7 SFRA Review

7.1 Triggers for Review

An update to the SFRA will be triggered by the six-year review cycle that applies to local authority Development Plans. In addition, there are a number of other potential triggers for an SFRA review and these are listed in Table 7-1.

There are a number of key outputs from possible future studies and datasets, which should be incorporated into any update of the SFRA as availability allows. Not all future sources of information should trigger an immediate full update of the SFRA; however, new information should be collected and kept alongside the SFRA until it is updated.

Additional information will arise from the OPW and DCC flood relief schemes over the period of this Development Plan on schemes such as Dodder Phase 3, the Camac and others. Not only will these studies revisit the CFRMP assessment, but once schemes are in place the definition of risk will change significantly for existing development, and possibly also for undeveloped lands.

The CFRMP themselves also run on a six yearly cycle, so updates arising from future iterations and extensions of the CFRMP should be incorporated into SFRA updates.

Detailed, site specific FRAs may be submitted to support planning applications. Whilst these reports will not trigger a review of the Flood Zone maps or SFRA, they should be retained and reviewed as part of the next Development Plan cycle.

Table 7-1: SFRA Review Triggers

Trigger	Source	Possible Timescale
Catchment Flood Risk Management Plans (CFRMP)-updates.	OPW	At least 2026
OPW Flood Relief Scheme outputs	OPW	Unknown
Flood maps of other sources, such as drainage networks	Various	Unknown
Significant flood events	Various	Unknown
Changes to Planning and / or Flood Management Policy	DHLGH / OPW	Unknown
Construction / completion of flood relief schemes	OPW / DCC	Unknown

7.2 Conclusion

This SFRA has been developed to inform the preparation of land-use zoning, policies and objectives for the Dublin City Development Plan 2022-2028, which have been reviewed against the recommendations set out in The Planning System and Flood Risk Management Guidelines for Planning Authorities and Technical Appendices, 2009. The land-use zoning allocations aim to avoid areas of high flood risk and where this is not achieved, but the land-use zoning has passed Parts 1 and 2 of the Justification Test, recommendations have been made in Part 3 of the Justification Test, relating to flood risk (see Appendices B and C). It is noted the Flood Zones are based on best currently available data, but that a

more detailed, site specific, flood risk assessment may produce locally varying flood outlines. There are a number of triggers which may prompt a review of the SFRA, or will require a slight change in specification for site specific flood risk assessments, including the completion of various ongoing schemes.

8 Glossary of Terms – Flood Risk Assessment

Appropriate Assessment: An assessment based on best scientific knowledge, by a person with ecological expertise, of the potential impacts of the plan on the conservation objectives of any Natura 2000 Environmentally Protected sites (including, Natura 2000 sites not situated in an area encompassed by the plan or scheme) and the development, where necessary of mitigation or avoidance measures to preclude negative effects.

Catchment: The area that is drained by a river or artificial drainage system.

Catchment Flood Risk Assessment and Management Studies (CFRAMS): A catchment-based study involving an assessment of the risk of flooding in a catchment and the development of a strategy for managing that risk in order to reduce adverse effects on people, property and the environment. CFRAMS precede the preparation of Catchment Flood Risk Management Plans (see entry for FRMP).

Climate change: Long-term variations in global temperature and weather patterns, which occur both naturally and as a result of human activity, primarily through greenhouse gas emissions.

Coastal erosion: The gradual wearing away of the coastline through a combination of wave attack and, in the case of coastal cliffs, slope processes (e.g., high groundwater levels). This may include cliff instability, where coastal processes result in the periodic reactivation of landslide systems or promote rock falls.

Coastal flooding: Flooding from the sea which is caused by higher than normal sea levels and/or high waves resulting in the sea overflowing onto the land.

Detailed flood risk assessment: A methodology to assess flood risk issues in sufficient detail and to provide a quantitative appraisal of flood hazard and potential risk to an existing or proposed development, of its potential impact on flood elsewhere and of the effectiveness of any proposed measures.

Dublin Coastal Flood Protection Project: The Dublin Coastal Flooding Protection Project started in May 2003, and resulted in a detailed analysis of flood risk to Dublin and of measures that can be undertaken to alleviate the risk; one of the measures that came forward is the use of an Early Warning System for coastal flooding.

Flash Flood: A flash flood is a rapid flooding of an area of land as a result of intense or extreme rainfall events or failure of infrastructure designed to store or carry water or protect against flooding and is distinguished from general flooding by the sudden onset.

Flood Alleviation Scheme(FAS): A Flood Alleviation Scheme is a study and possible construction of flood alleviation measures to try and reduce actual or estimated flood risk in a river catchment or coastal area.

Flooding (or inundation): Flooding is the overflowing of water onto land that is normally dry. It may be caused by overtopping or breach of banks or defences, inadequate or slow drainage of rainfall, underlying groundwater levels or blocked

drains and sewers. It presents a risk only when people, human assets and ecosystems are present in the areas that flood.

Flood defence: A man-made structure (e.g., embankment, bund, sluice gate, reservoir or barrier) designed to prevent flooding of areas adjacent to the defence.

Flood Risk Assessment (FRA): FRA can be undertaken at any scale from the national down to the individual site and comprises three stages: flood risk identification, initial flood risk assessment and detailed flood risk assessment.

Flood Risk Identification: A desk-based study to identify whether there may be any flooding or surface water management issues related to a plan area or proposed development site that may warrant further investigation.

Flood Risk Management (FRM): FRM combines the function of mitigating and monitoring flood risks and may include pre-flood, flood event or post flood activities.

Flood Risk Management Plans (FRMP): Plans which are developed in accordance with national flood policy and the EU Floods Directive and which provide the strategic direction for flood risk management decisions in a catchment. These will describe a range of traditional river or coastal defences to non-structural responses such as flood warning and resilience measures at property level.

Flood Hazard: The features of flooding which have harmful impacts on people, property or the environment (such as the depth of water, speed of flow, rate of onset, duration, water quality, etc.).

Flood Plain: A floodplain is any low-lying area of land next to a river or stream, which is susceptible to partial or complete inundation by water during a flood event.

Flood Risk: An expression of the combination of the flood probability, or likelihood and the magnitude of the potential consequences of the flood event.

Flood Storage: The temporary storage of excess run-off, or river flow in ponds, basins, reservoirs or on the floodplain.

Flood Zones: A geographic area for which the probability of flooding from rivers, estuaries or the sea is within a particular range.

Flooding Directive: The EU Directive 2007/ 60/ EC of 23 October 2007 on the assessment and management of flood risks which is aimed at integrating the way flood risk is managed throughout the European Union transposed into Irish Law under SI122/2010.

Fluvial Flooding: Flooding from a river or other non-tidal watercourse.

Freeboard: Freeboard is a factor of safety expressed in a height (usually mm) above a flood level for purposes of floodplain management. "Freeboard" tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood, such as wave action, bridge openings, and hydrological uncertainty. Defines the distance between

normal water level and the top of a structure, such as a dam, that impounds or restrains water.

Groundwater Flooding: Flooding caused by groundwater escaping from the ground when the water table rises to or above ground level.

Indicative Floodplain Map (IFM): A map that delineates the areas estimated to be at risk of flooding during an event of specified flood probability. Being indicative, such maps only give an indication of the areas at risk but, due to the scale and complexity of the exercise, cannot be relied upon to give precise information in relation to individual sites.

Initial flood risk assessment: A qualitative or semi-quantitative study to confirm sources of flooding that may affect a plan area or proposed development site, to appraise the adequacy of existing information, to provide a qualitative appraisal of the risk of flooding to development, including the scope of possible mitigation measures, and the potential impact of development on flooding elsewhere, and to determine the need for further detailed assessment.

Green Infrastructure: This term is used in two ways. It can describe a network of connected, high quality, multifunctional open spaces, corridors, and the links in between that provide environmental services and multiple benefits for people and wildlife. It is also used to describe a broad range of design measures, techniques and materials that have a sustainable character and have a beneficial environmental impact such as solar panels, wind turbines, etc.

Green Roof: A green roof is a roof or deck onto which vegetation is grown, or habitats for wildlife are established. There are various types of green roofs including: extensive and intensive roofs, roof gardens, biodiverse roofs and brown roofs. Green roofs can also serve an amenity function where designed for this purpose.

Habitat: A place in which a particular plant or animal lives. Often used in the wider sense referring to major assemblages of plants and animals found together.

High end future scenario (HEFS): One of the climate change scenarios described in the OPW Guidance note on climate change (Assessment of Potential Future Scenarios for Flood Risk Management, 2019), which indicates a 30% increase in river flows and a 1m increase in sea level rise. This is intended to represent a more extreme potential future scenario, but one that is nonetheless not significantly outside the range of accepted predictions available, and with the allowances for increased flow, sea level rise, etc. at the upper bounds of widely accepted projections.

Justification Test: An assessment of whether a development proposal within an area at risk of flooding meets specific criteria for proper planning and sustainable development and demonstrates that it will not be subject to unacceptable risk nor increase flood risk elsewhere. The Justification Test should be applied only where development is within flood risk areas that would be defined as inappropriate under the screening test of the sequential risk based approach adopted by this guidance.

Likelihood (probability) of Flooding: A general concept relating to the chance of an event occurring. Likelihood is generally expressed as a probability or a frequency of a flood of a given magnitude or severity occurring or being exceeded in any given year. It is based on the average frequency estimated, measured or extrapolated from records over a large number of years and is usually expressed as the chance of a particular flood level being exceeded in any one year. For example, a 1 in 100 or 1% flood is that which would, on average, be expected to occur once in 100 years, though it could happen at any time.

Ordnance Datum (or OD) Malin: is a vertical datum used by an ordnance survey as the basis for deriving altitudes on maps. A spot height may be expressed as AOD for 'above ordnance datum'. Usually mean sea level (MSL) is used for the datum. In the Republic of Ireland, OD for the Ordnance Survey of Ireland is Malin Ordnance Datum: the MSL at Portmoor Pier, Malin Head, County Donegal, between 1960 and 1969. Prior to 1970, Poolbeg Ordnance Datum was used: the low water of spring tide at Poolbeg lighthouse, Dublin, on 8 April 1837. Poolbeg OD was about 2.7 m lower than Malin OD.

Medium range future scenario (MRFS): One of the climate change scenarios described in the OPW Guidance note on climate change (Assessment of Potential Future Scenarios for Flood Risk Management, 2019), which indicates a 20% increase in river flows and a 0.5m increase in sea level rise. This is intended to represent a 'likely' future scenario, based on the wide range of predictions available and with the allowances for increased flow, sea level rise, etc. within the bounds of widely accepted projections.

Mitigation: The term is used to describe an action that helps to lessen the impacts of a process or development on the receiving environment. It is used most often in association with measures that would seek to reduce negative impacts of a process or development.

Natura 2000: The EU-wide network of protected areas, recognised as 'sites of Community importance' under Council Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (the Birds Directive) and Council Directive 92 /43 /EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive). In Ireland, European sites include Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

Pathways: These provide the connection between a particular source (e.g., high river or tide level) and the receptor that may be harmed (e.g., property). In flood risk management, pathways are often 'blocked' by barriers, such as flood defence structures, or otherwise modified to reduce the incidence of flooding.

Pluvial flooding: Usually associated with convective summer thunderstorms or high intensity rainfall cells within longer duration events, pluvial flooding is a result of rainfall-generated overland flows which arise before run-off enters any watercourse or sewer. The intensity of rainfall can be such that the run-off totally overwhelms surface water and underground drainage systems.

Precautionary approach: The approach to be used in the assessment of flood risk which requires that lack of full scientific certainty, shall not be used to assume

flood hazard or risk does not exist, or as a reason for postponing cost-effective measures to avoid or manage flood risk.

River Basin Management Plan (RBMP): Required by the EU Water Framework Directive (2000/ 60/ EC), these plans will establish a strategic plan for the long-term management of the River Basin District, set out objectives for waterbodies, and in broad terms identify what measures are planned to meet these objectives, and act as the main reporting mechanism to the European Commission.

Regional Flood Risk Appraisal: A desk-based study to provide a broad overview of the source and significance of flooding across a region and identify potential conflicts with existing and proposed areas of development, thus highlighting areas where further studies will be required at county or city scale as part of Development Plan preparation.

Resilience: Sometimes known as ‘wet-proofing’, resilience relates to how a building is constructed in such a way that, although flood water may enter the building, its impact is minimised, structural integrity is maintained, and repair, drying and cleaning and subsequent reoccupation are facilitated.

Resistance, sometimes known as ‘dry-proofing’, this relates to how a building is constructed to prevent flood water entering the building or damaging its fabric.

Receptors: are things that may be harmed by flooding (e.g., people, houses, buildings or the environment).

Residual risk: The risk which remains after all risk avoidance, substitution and mitigation measures have been implemented, on the basis that such measures can only reduce risk, not eliminate it.

Sequential Approach: The sequential approach is a risk-based method to guide development away from areas that have been identified through a flood risk assessment as being at risk from flooding. Sequential approaches are already established and working effectively in the plan making and development management processes.

Site-Specific Flood Risk Assessment: An examination of the risks from all sources of flooding of the risks to and potentially arising from development on a specific site, including an examination of the effectiveness and impacts of any control or mitigation measures to be incorporated in that development.

Source: Refers to a source of hazard (e.g., the sea, heavy rainfall).

Strategic Environment Assessment: This is a statutory process of assessment to examine the likely significant environmental effects of a plan or programme, prior to their adoption. It identifies consequences of actions prior to implementation and requires appropriate mitigation measures to remove identified impacts as part of the plan or programme. The SEA process came into force in July 2001 from an EU Directive (EU Directive 2001/42/EC).

Strategic Flood Risk Assessment: The assessment of flood risk on a wide geographical area against which to assess development proposed in an area (e.g., region, county, town).

Surface water management: This activity focuses on the assessment and management of flood risk within the urban environment from sources primarily resulting from intense rainfall. Surface water management should understand the performance of the urban drainage network, where exceedance flow routes would form and what impact this would have. Solutions to surface water flood risk can involve green infrastructure provision to capture and direct these exceedance flows to lower vulnerable areas or open space. New development can provide solutions to reducing run-off not only from the proposed development but also from existing areas. This should be considered in the SFRA in critical areas where development is planned upstream of flooding hotspots.

Sustainable Development: Sustainable development is a very important term in planning and development policies and is used to describe the character of development that minimises negative impacts on the environment and its natural resources. The definition of Sustainable Development comes from the Brundtland Commission (1983), which states it as development 'that meets the needs of the present without compromising the ability of future generations to meet their own needs'. The Brundtland Commission was convened as a world commission on the environment amid growing concern for the deterioration of the natural environment, the depletion of natural resources and consequences for social and economic development.

Sustainable Drainage Systems (SuDS): Sustainable Drainage or SuDS is a way of managing rainfall that minimises the negative impacts on the quantity and quality of run-off whilst maximising the benefits of amenity and biodiversity for people and the environment.

Vulnerability: The resilience of a particular group of people or types of property or habitats, ecosystems or species to flood risk, and their ability to respond to a hazardous condition and the damage or degree of impact they are likely to suffer in the event of a flood. For example, elderly people may be more likely to suffer injury, and be less able to evacuate, in the event of a rapid flood than younger people.

Water Framework Directive (WFD): A European Community Directive (2000/ 60/ EC) designed to integrate the way we manage water bodies across Europe. It requires all inland and coastal waters to reach 'good status' or 'good ecological potential' in the case of heavily modified water bodies by 2027 through a catchment-based system of River Basin Management Plans (RBMP), incorporating a programme of measures to improve the status of all natural water bodies.

Source: Most of the definitions above are from The Planning System and Flood Risk Management Guidelines for Planning Authorities and Technical Appendices, 2009.

Appendices

A Flood Defence Infrastructure

A.1 Tolka River

The River Tolka Flooding Study was used to calculate the hundred-year river flow and two hundred-year tidal events. A summary of upgrade work and previously existing flood defences along the length of the river Tolka is as follows:-

- East Point Business Park Bridge to John McCormack Bridge: two hundred-year tidal flood contained by embankment on the north side and alternating embankment and retaining wall defence on south side.
- John McCormack Bridge to Railway Bridge: Retaining walls left and right sides looking downstream contain the estimated two hundred-year tidal flood.
- Railway Bridge to Annesley Bridge: Retaining walls left and right contain two hundred-year tidal flood. Flood gate on south side at pedestrian bridge.
- Annesley Bridge to Luke Kelly Bridge: Retaining walls left and right contain the estimated two hundred-year tidal flood event with the exception of one 50 m stretch on the north side which contains the estimated 50 year flood event.
- Luke Kelly Bridge to New Distillery Road Bridge: Retaining walls left and right contain the estimated two hundred-year flood event.
- New Distillery Road Bridge to Drumcondra Bridge: Retaining wall north side protects this stretch from the estimated hundred-year flow. Parkland on south side allowed to flood and will do so at the estimated thirty-year flood level.
- Drumcondra Bridge to new Woodville Bridge: Retaining walls left and right contain the estimated hundred-year flow.
- New Woodville Bridge to Griffith Park footbridge: Combination of existing retaining walls and new set-back embankments contain the estimated hundred-year flow.
- Griffith Park Footbridge to Dean Swift Bridge: retaining walls on both banks contain the estimated hundred-year flow.
- Dean Swift Bridge to Glasnevin Bridge: Combination of retaining walls and embankments left and right contain the estimated hundred-year flow.
- Botanic Gardens: Retains its natural floodplain.
- Finglas Road Bridge to Finglas Wood Bridge: Tolka Valley Road protected by large embankment on north side. South side protected to the estimated fifty-year event by existing retaining wall.
- Finglas Wood Bridge to Ratoath Road Bridge: Large fifty-year floodplain out of bank. On north side protected by embankment and a small stretch of retaining wall, and on south side protected by retaining wall.
- Ratoath Road Bridge to Scribblestown Road Bridge: Large fifty-year flood plain contained on both sides by retaining walls.

A.2 Dodder River

The Dodder, including the estuary, is the subject of ongoing flood defence works. The two hundred-year flood event, including for global warming to the year 2100, is taken as 4.15 m at the confluence with the Liffey. This defence level increases significantly going up the estuary due to the river influence.

- Confluence with Liffey to Ringsend Bridge: Right-hand side looking downstream (east in this case) is protected to the estimated two hundred-year level to the year 2100. Left-hand side is defended to the estimated two hundred-year level with the exception of South Dock Road which is defended to the estimated two hundred-year level to 2050.
- Ringsend Bridge to London Bridge: Retaining walls and embankments left and right contain the estimated two hundred-year tidal level plus estimated global warming to the end of the century. All outlets are tidal flapped.
- London Bridge: Parapets have been raised to cater for estimated two hundred-year tidal event and global warming to the year 2100. Flood defences include upstream glass and metal panels.
- London Bridge to Newbridge: Both sides of the river are defended to the estimated two hundred-year level plus estimated global warming to the year 2100 by embankments and retaining walls. All outlets are tidal flapped. A number of flood gates are closed in extreme flood events.
- Newbridge: Current parapets will contain the estimated two hundred-year tidal and river event; and have been strengthened in the future to cater for global warming.
- Newbridge to Ballsbridge: Right-hand side looking downstream defended by retaining walls and flood gates which cater for the estimated two hundred-year tidal and river event plus global warming to the year 2100. Glass panels have to be installed at Beatty's Avenue to cater for estimated global warming. Left-hand side defended by a series of retaining walls and embankments. One flood gate is downstream of railway bridge.
- Ballsbridge to Angelsea Bridge (Donnybrook): Series of embankments and retaining walls protect to the 100 year river flood event except for section on Anglesea Road opposite RDS which is being upgraded, estimated completion in Q3 2023
- Anglesea Bridge to Lower Smurfit Weir: Retaining walls afford good protection left and right to the estimated 100 year flood event. Section at Beech Hill Road under construction, programmed for completion in Q4 2022.
- Lower Smurfit Weir to Clonskeagh Bridge: Level of south bank is sufficient to contain hundred-year flood. North bank development of Smurfit site and future flood works required to protect to hundred-year flood level; however, existing banks and walls beside river offer some flood protection to 30 year flood event on this site.
- Clonskeagh Bridge to Milltown Bridge: Series of lengthy embankments and retaining walls protect property and roads on both sides of the river. Further works required to bring this to the estimated hundred-year flood defence level. New study ongoing.

- Milltown Bridge to Classon's Bridge: Embankments both sides to Packhorse Bridge. Shanagary apartments' embankment and boundary wall, Milltown Road wall from Shanagarry to Classon's Bridge. All of these provide significant flood protection, however further works are required to bring up to the estimated national hundred-year standard. New study ongoing.
- Classon's Bridge to Orwell Road Bridge: Pair of long embankments protecting right-hand side. Orwell Gardens situated inside embankments and protected by river wall; identified as requiring upgrading. Dartry Park embankment protecting left-hand side although height of Orwell Weir is an issue. New study ongoing.
- Orwell Road Bridge to Pearse Bridge north side: Natural embankments, flood plains and river walls from Orwell Bridge to Pearse Bridge protect to the estimated 1% AEP fluvial event.
- Pearse Bridge to Bushy Park north side: Floodplain to steep embankment including pond. River embankment and Bushy Park wall to boundary protect to the 100 year flood event.

A.3 River Liffey

The Liffey is the subject of recently started works. A good portion of the Liffey fluvial area in the Dublin City Council area is well defended by the steep Liffey valley. Most of the city is relatively well defended by the quay walls. There are, however, a number of low points such as the Campshires, Victoria Quay, Wolfe Tone Quay and Matt Talbot Bridge. Some seepage has occurred elsewhere along the quays. All bridges are able to convey the 0.5% AEP (200 year) tidal flood event.

- Tom Clarke Bridge to Sean Heuston Bridge: City on both sides defended by quay walls. South Campshires is a low point, however, recent flood alleviation works protect this area from Butt Bridge to Cardiff Lane up to the estimated 0.5% AEP (200 year) tidal flood plus climate change (MRFS). Matt Talbot Bridge is the lowest bridge. Victoria Quay and two lanes of Wolfe Tone Quay are subject to significant flooding in a 1% AEP event.
- Seán Heuston Bridge to Sarah Bridge (South Circular Road): Defended by a combination of embankments and retaining walls.
- Sarah Bridge to Laurence Road: Massive embankment on right-hand side looking downstream protecting to ten thousand-year level. Some works required to protect all of Islandbridge to 1% AEP fluvial flood event along millrace.
- Laurence Road to Chapelizod Road Bridge: Good level of protection given by retaining wall. Defended by embankment and flooding of park areas on north side.
- Chapelizod Road Bridge (Anna Livia) to city boundary: Poor protection on north side. Martin's Row area defended by retaining walls which require upgrading. Industrial estate downstream some areas at risk in hundred-year event; existing embankment is critical.

A.4 Other Rivers

- The River Poddle is largely culverted in the city area north of the Grand Canal. Existing embankments and walls are significant flood defences; these require some extra defences in Mount Argus, St. Martin's Drive, Poddle Park and Ravensdale Park as well as storage in South Dublin County Council to provide estimated flood protection to the 1% AEP fluvial level. Study completed awaiting decision from An Bord Pleanála to progress.
- The River Santry – existing embankments, walls (including garden and private boundary walls) and bridge parapets are significant flood defences. The reduction in flow area upstream of Harmonstown Road is a flood protection. Extra defences are required to provide estimated flood protection to the 1% AEP fluvial flood level at Raheny village and Watermill Road; design of these are ongoing.
- The River Camac - Existing river embankments, walls, bridges (including garden and private boundary walls) and bridge parapets are significant flood defences. A new study is underway over the whole of the catchment to provide flood defences up to the estimated 1% AEP fluvial and 0.5% AEP tidal flood events. River corridors and natural flood retention measures are also being looked at in this context.
- Existing river embankments, walls and bridges on the Camac, Phoenix Park streams, Mayne river and Naniken river provide significant flood defence; however, feasibility of further works to bring these up to the national standard is ongoing. Works to the Phoenix Park streams are completed.

A.5 Sandymount

All existing coastal defences, rock armour, sandbanks, embankments, promenades and sea walls provide significant flood protection to roads, property and buildings behind them, by keeping out the tide and breaking up waves which might otherwise over-top them.

- Booterstown Marsh to Merrion Gates: Existing sea wall and embankment protects railway line.
- Merrion Gates: New flood wall and flood gate protects railway line and local houses to the estimated 0.5% AEP tidal flood event.
- Merrion Gates to Promenade: Existing garden walls and sea wall protect houses and roadway from flooding to the estimated 0.5% AEP tidal event.
- Promenade: Rock armour, promenade and old sea wall reduce flooding risk. Seventeen openings need flood protection to cater for 0.5% AEP tidal flood event plus wave action. Project to strengthen existing sea wall, put flood gates on most openings, raise locally and put new flood wall to protect Martello Tower is due to go to construction in 2024.
- Promenade to Sean Moore Park: Existing sea wall provides significant flood alleviation. Needs to be raised and strengthened or new promenade plus lesser rising of wall to protect up to the estimated 0.5% AEP tidal event plus wave over-topping.

- Sean O'Moore Park: Southern end is flood plain for tidal over-topping. New steps and wheelchair access provide significant flood alleviation to Marine Drive up to the estimated 0.5% AEP tidal event.

A.6 Clontarf to Kilbarrack

All existing coastal defences, rock armour, sandbanks, embankments, promenades, breakwaters, Bull Island, North Bull wall and sea walls provide significant flood protection to roads, property and buildings behind them, by keeping out the tide or by breaking up waves which might otherwise over-top them.

- Alfie Byrne Road to Wooden Bridge: Existing sea wall, rock armour, promenade and existing walls and embankments provide significant flood alleviation to Clontarf Road, houses and businesses adjoining them. Proposals are being developed to upgrade these, subject to local approval. Temporary flood defences are required in the interim as the area beside Alfie Byrne Road has the lowest tidal flood defence level in the city.
- Dollymount: Wooden Bridge to Causeway: Existing sea walls and embankments as well as Bull Island reduce flood risk in this area. A flood alleviation scheme to protect the roadway and some buildings to a level of 4.25 m OD (Malin Head) is completed. One section 300m long will require to be raised by 150mm to 300mm in 10-15 years to combat estimated sea level rise.
- Causeway to Kilbarrack Road. Existing seawall, promenade, cycle track, Bull Island and pedestrian wall provide flood defence to roadway up to two hundred-year flood event. Some wave over-topping can occur in high winds with easterly component.

A.7 Dublin Port

- Sean O'Moore Park to Irishtown Nature Park: Existing rock armour, embankments and low walls are at the estimated 200 year flood defence level.
- Irishtown Park to South Bull Wall: Existing rock armour, embankments, sea walls and low walls are flood defences.
- South Bull Wall: This is a significant coastal defence which breaks up waves which would increase flood risk in portions of the city.
- South Bull Wall to Wastewater Treatment Plant: Existing rock armour, embankments, jetty, weir, sea walls and low walls are flood defences. The storm tanks of the wastewater treatment plant may require additional defences to bring to national standards.
- Wastewater Treatment Plant to Tom Clarke Bridge: Existing rock armour, embankments, sea walls and low walls are flood defences.
- Tom Clarke Bridge to Alexandra Basin: Existing quay walls are flood defences.
- Alexandra Basin to Passenger Terminal: Existing quay walls and low walls are flood defences. Alexandra Basin and Passenger Terminal to provide increased flood protection as part of Dublin Port Masterplan 2040.

- Passenger Terminal to Tolka Estuary. Existing rock armour, embankments, sea walls and low walls are flood defences.
- Tolka Estuary to Alfie Byrne Road: Existing rock armour, embankments, sea walls and low walls are flood defences.

A.8 Canals

Walls, bridges, locks, weirs and embankments on the Royal and Grand Canals, including the Grand Canal Dock, are significant flood protection structures.

A.9 Pluvial Flood Defences

There are local areas where pluvial flood defences are in place, such as Clontarf Golf club pond, Killala Road, Drumcliffe Road, Glendhu Park, Park Road, Cabra and Glasanon roads where flood retention ponds have been installed to reduce local flooding in heavy rainfall events.

There are some areas in the city prone to ground water flooding where underground flood defences are in place such as between the River Dodder and Anglesea Road.

B - Area Assessment and Justification Test Tables

Area Assessment Index

(32 in Total incl. 16A and 22A)

1. Dublin Port South of the Liffey from Tom Clarke Bridge
2. Dublin Port North of the Liffey to Tom Clarke Bridge
3. Liffey: O'Connell Bridge to Tom Clarke Bridge
4. Liffey: Sean Heuston Br. - O'Connell Bridge
5. Liffey: Sean Heuston Br. – Sarah Bridge, South Circular Road
6. Liffey: Sarah Bridge, South Circular Road - Anna Livia Br. Chapelizod
7. Liffey: Anna Livia Br. Chapelizod - City Boundary
8. Coastal: Sandymount
9. Dodder: Liffey to Ballsbridge
10. Dodder: Ballsbridge to Donnybrook Bridge
11. Dodder: Donnybrook Bridge – Dundrum Road
12. Dodder: Dundrum Road – Bushy Park Boundary
13. Poddle: Inside Canal
14. Poddle: Culverts outside Canal
15. Poddle: Grand Canal to Sundrive Road
16. Poddle: Sundrive Road – Kimmage Road West

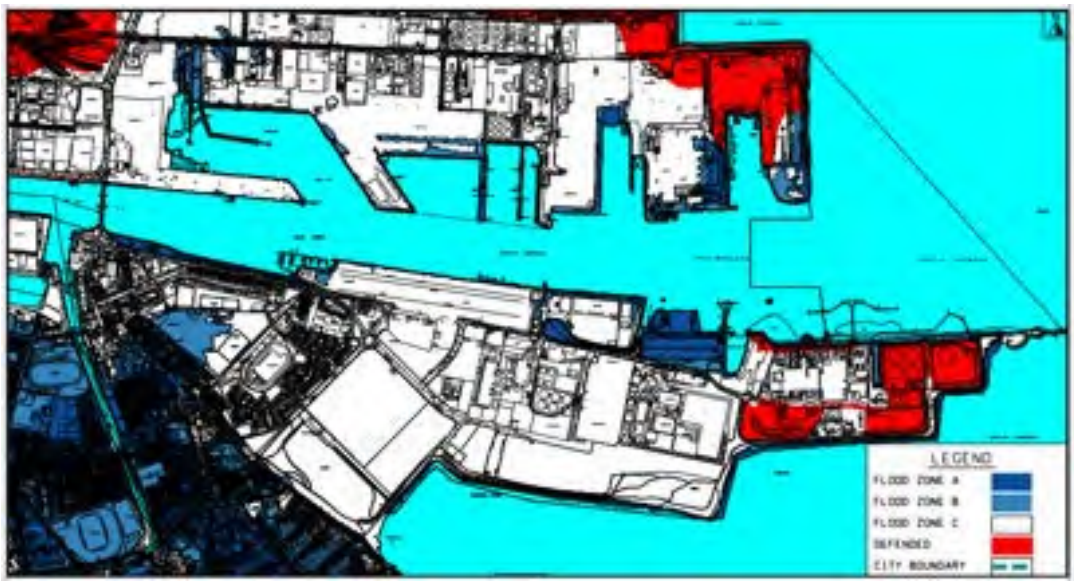
16 A. Poddle: Terenure Road West, Templeogue Road to City Boundary

17. Lower Camac: South Circular Road to Liffey Estuary
18. Middle Camac: Davitt Road to South Circular Road
19. Upper Camac: Old Naas Road Boundary to Davitt Road
20. Tolka: Dublin Port to Drumcondra Bridge
21. Tolka: Drumcondra Bridge to St. Mobhi Road
22. Tolka: St. Mobhi Road – Finglas Road

22A. Finglas Stream: East of Finglas Road and West of North Road

23. Tolka: Finglas Road – City Boundary
24. Wad: Clontarf Road to Collins Avenue East
25. Wad: Collins Avenue East to Collins Park
26. Coastal: Clontarf Alfie Byrne Road to Wooden Bridge
27. Santry River: James Larkin Road to DART Railway Line and Dollymount Wooden Bridge to Clontarf Road Coastal Zone
28. Santry River: DART Railway – Boundary
29. Mayne: Dublin Belfast Railway line – M50
30. Coastal: Bull Island

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 indicates lands defended to the 1% AEP fluvial and/or the 0.5% AEP tidal flood events and should therefore be considered also to be Flood Zone A.

Area: 1. Dublin Port South of the Liffey from Tom Clarke Bridge	
	
For Land Use Zoning Maps Overlaid with Flood Zones see Dublin City Council Development Plan 2022 - 2028, Flood Map F.	
Area Description	The area comprises the Poolbeg Peninsula, including Port lands and Irishtown Nature Park. In the wider area there are built up residential areas and amenities/ sports facilities (Ringsend/ Sean Moore Parks) at Ringsend. The area is served by Dublin Bus with DART and Luas stops in the wider area. The southern part of Dublin Port is used for storage associated with port operations and load on and off operations. The Ringsend Waste Water Treatment Plant, Poolbeg Power Station, Covanta Dublin Waste to Energy facility, a Cement Works Plant and Pigeon House electricity works are some of the land uses / buildings on the peninsula. There are also a number of COMAH (SEVESO) establishments. The area also includes a major brownfield site which is earmarked for significant residential and commercial development under the Poolbeg West SDZ Planning Scheme, 2019. Most of the area is reclaimed from the sea. The areas at high flood risk are in the vicinity of the stormwater tanks at the Ringsend Wastewater Treatment Plant, Pigeon House and the inlet in the centre of the ESB Power Generating Station.
SDRAs within this Area	Strategic Development and Regeneration Area (SDRA) No. 6 Docklands.
Benefitting from Defences (flood relief scheme	The portion of the sea wall along the western end of Pigeon House Road offers some protection to properties to the south of it. The rest of the area is

Area: 1. Dublin Port South of the Liffey from Tom Clarke Bridge	
works)	largely undefended. Much of the residential development is also defended from tidal flooding from the River Dodder Estuary. Dublin Port Master Plan, 2040, incorporates new flood alleviation. Existing flood defences reduce flood risk significantly.
Sensitivity to Climate Change	The area is highly sensitive to climate change and an increase of 0.5m on top of the 200 year tide level would put much of it underwater.
Residual Risk	Any proposed developments in the protected areas on the west side of Pigeon House Road will require a detailed assessment of current defences and will have to consider the impact of a defence breach, particularly where it relates to high vulnerability industrial development.
Historical Flooding	The SFRA flood maps are consistent with previous flooding of this section of Dublin Port. The road to the east of the toll plaza is at high flood risk, as well as a portion of roadway in front of Portview House.
Surface Water	All surface water in this area needs to be carefully managed and provision made for significant rainfall events during high tides. A one year high tide event should be assumed during a 100-year rainfall event. Should development be permitted, best practice with regard to surface water management should be implemented across the development area to limit surface water run-off to current values. The use of SuDS and green infrastructure should be considered in the first instance to reduce flooding. All developments shall have regard to the Pluvial Flood Maps in their Site Specific Flood Risk Assessment, see Flood ResilientCity Project**,** Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.
Commentary on Flood Risk: The flood extents indicate flow paths generally coming directly out of the tidal region. The flood maps are based on the OPW CFRAM Plan and checked against historic flooding in the area.	
Development Options: This area forms part of the wider Docklands area. This area forms part of an identified Strategic Development and Regeneration Area (SDRA 6 Docklands, see section 13.8 of the Written Statement) under the Core Strategy. A separate statutory development framework has been prepared for a 34 ha brownfield site at Poolbeg under the Poolbeg West SDZ	

Area: 1. Dublin Port South of the Liffey from Tom Clarke Bridge

Planning Scheme 2019 which will deliver a new residential community supported by commercial, community, recreational, retail and service uses. This Planning Scheme was subject to SFRA. The Dublin Port Company published the Dublin Port Masterplan 2040 in 2012 and this was reviewed in 2018. This identifies the following future uses in this part of the port: container terminal and RO-RO freight terminal, bulk commodities, and a new deep water multi-purpose berth. Major infrastructure proposed in the wider area includes a proposed District Heating Scheme as part of the Covanta Dublin Waste to Energy facility, the extension of Luas to Poolbeg, Bus Connects routes and coastal cycle routes.
Outside of the peninsula, a mix of residential and commercial infill and redevelopment/ regeneration is likely to come forward in the area also.

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: This area is essential to facilitate regeneration and/or the expansion of Dublin City. This area forms part of the wider Docklands area which the development plan has designated as a Strategic Development and Regeneration Area (SDRA). The National Planning Framework (NPF), the Regional Spatial and Economic Strategy (RSES) and the Core Strategy of the Development Plan identify the Docklands as critical to the economic prosperity of Dublin and the country as a whole. The Docklands accommodates many thousands of people living and working in the area. The build out of Poolbeg West will provide a new residential quarter and a people intensive high tech and services based business district in the city.

The development plan has identified the Poolbeg peninsula as a Strategic Sustainable Infrastructure Hub for the city with a strategic role in accommodating the city's critical hard infrastructure (see Policy SI52 of the Written Statement). This area is also essential for the future expansion and operation of Dublin Port and its related operations.

The Port is the largest freight and passenger port in the country and it is a critical part of the national infrastructure in terms of trade and tourism and

employment. Its strategic transport and function role is recognised in the NPF and the RSES.

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

Answer: Yes: Most of the lands would comprise existing and former industrial/ Port/ infrastructural / residential and other mixed-service uses. The 34 ha landbank at Poolbeg West is a brownfield site.

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

Answer: Yes: These lands are located in Dublin Docklands in Dublin City centre. Some of the area forms part of Strategic Development and Regeneration Area No. 6 Docklands. These are important brownfield sites with the potential to deliver a significant quantum of mixed uses. Point Village/Poolbeg is designated as a Key Urban Village in the development plan under the Core Strategy. This area is also essential for the future expansion and operation of Dublin Port and its related operations.

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

Answer: Yes: Strategic Development and Regeneration Area No. 6 Docklands forms part of this area. These are important brownfield sites with the potential to deliver a significant and intensive quantum of mixed uses. The build out of Poolbeg West will provide a new residential led intensification of the area and the development of a people intensive high tech and services based business district in the city. The Development Plan prioritises the renewal and regeneration of SDRA areas and their compact and sustainable growth through the development of Framework Plans / guiding principles (see SDRA 6 Docklands, section 13.8 of the Written Statement).

(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

- See Justification Test for Strategic Development and Regeneration Area No. 6 Docklands in Appendix C2 for specific recommendations in relation to that area.
- Some of the lands shown in the above flood cell are directly connected with Dublin Port and its related facilities. The lands are zoned Z7 in the Development Plan which is to provide for the protection and creation of industrial uses and facilitate opportunities for employment creation

Area: 1. Dublin Port South of the Liffey from Tom Clarke Bridge
including Port Related Activities. The types of uses that generally go into this area would be heavy industrial port-related uses/ infrastructural uses. There are a number of existing COMAH (SEVESO) establishments located in the Port area, and fuel storage depots etc. Part of the lands above are included in the Docklands Strategic Development and Regeneration Area (SDRA 6) which will provide a significant amount of mixed uses. • Use Classes considered as 'Vulnerable Development' shall not be permitted in Flood Zone A or B (this includes essential infrastructure such as primary transport and utilities distribution including electricity generating power stations and sub stations, water and sewage treatment, and potential significant sources of pollution (SEVESO sites, IPPC sites etc.). • Within this area it is essential that the impact of sea level rise by 0.5m for ordinary sites and 1.0m for critical/ highly vulnerable infrastructure and high risk chemical sites is carried out as detailed in this SFRA. For some developments, it may be appropriate to include a more detailed assessment of likely climate change impacts, including the frequency of lower high tide return periods with wave action. • As the flood risks are tidal, mitigation through land raising (or bunding for smaller developments) will have no impact on neighbouring development, so compensatory storage will not be required. The focus of the FRA will be to ensure the safety and long-term operability of the development and safety of operatives. • Where development will be in the defended area, consideration should be given to the likelihood of the defences failing (either through overtopping or breach) and how the operation will ensure it can retain functionality/ recover following an extreme flood event. Buildings should be of flood resilient construction. • Proposals for residential development should be treated in accordance with the guidance in this SFRA. • Special FRA's should be carried out for all basements and underground structures with respect to any human access. No underground offices or residential units (whether temporary or permanent) will be allowed. • Groundwater flooding particularly during high tide should be considered in all development flood risk assessments in this site area.
Conclusion: The subject area <u>passes</u> the Justification Test for Development Plans.

Area: 2. Dublin Port North of the Liffey to Tom Clarke Bridge	
	
For Land Use Zoning Maps Overlaid with Flood Zones see Dublin City Council Development Plan 2022 - 2028, Flood Map E and Flood Map F.	
Area Description	This area comprises Dublin Port lands on the north side of Dublin Harbour. The area is served by the Dublin Port Tunnel and the national rail network (freight). The Luas red line at the Point also makes the Port accessible. The area is heavily developed with industrial units related to Dublin Port and other industrial related activities. Activities include ferry services, petroleum storage and RO-RO and LO-LO as well as logistics companies and bitumen importation facilities. There are a number of COMAH (SEVESO) establishments in this area. Likely developments are industrial/ port related infill or brownfield developments. The areas at highest risk are to the south in the vicinity of Alexandra Basin and near the passenger terminal of Dublin Port. These areas will see significant reductions in flood risk as a result of proposed port development works (see below).
SDRAs within this Area	N/A
Benefitting from Defences (flood relief scheme works)	To the north and east of this area existing embankments and rock armour significantly reduce the flooding risk from high tides and wave action. The south of this area requires direct access to shipping and thus relies on ground level as a flood

Area: 2. Dublin Port North of the Liffey to Tom Clarke Bridge	
	defence. Wave action is much lower in this area. Dublin Port's Development Masterplan incorporates new flood alleviation.
Sensitivity to Climate Change	High – an increase of 0.5m on top of the 200-year tide level would put most of this area under water.
Residual Risk	The protected areas to the north require existing embankments and rock armour to be monitored on a regular basis and particularly after a very high tide or significant storm event. Residual risks associated with failure would be high, and will increase with sea level rise and more frequent storms.
Historical Flooding	The SFRA flood maps are consistent with previous flooding of this section of Dublin Port.
Surface Water	All surface water in this area needs to be carefully managed and provision made for significant rainfall events during high tides. A one year high tide event should be assumed during a 100-year rainfall event. Should development be permitted, best practice with regard to surface water management should be implemented across the development area, to limit surface water run-off to current values. All developments shall have regard to the Pluvial Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project**,** Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.
Commentary on Flood Risk: The flood extents indicate flow paths generally coming directly out of the tidal region. The flood maps were produced based on the OPW CFRAM Plan and checked against historic flooding in the area.	
Development Options: The Dublin Port Company published the Dublin Port Masterplan 2040 in 2012 and this was reviewed in 2018 and it was subject to SFRA. This report sets out the development options on the port lands – see Dublin Port Masterplan. The National Transport Authority Strategy for the Greater Dublin Area includes proposals for a new Road - Southern Port Access Route (SPAR) (linking the national road network at the Dublin Tunnel to serve the southern port lands). The Luas red line is to be extended to Poolbeg. Bus Connects routes and coastal cycle routes are proposed/ being rolled out in this area. A Greenway running along the northern boundary of the Port lands has been approved. Port/ industrial development (some infill) would be the obvious continuation of land use from the adjoining existing	

development. Any development could reasonably be accommodated within the extents of Flood Zone C, and it is possible that with consideration of landscaping, additional development land could be released; however, the influence of sea level rise by 0.5m for ordinary sites and 1.0m for critical infrastructure and high risk chemical sites has to be considered and mitigated against. Commercial/ industrial development may be allowed in Flood Zone B if appropriate but subject to comments on likely climate change above. Commercial/ industrial development in Flood Zone A will not be allowed. No residential development will be allowed in this area.

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: Dublin Port is the largest freight and passenger port in the country and it is a critical part of the national infrastructure in terms of trade, tourism and employment. Its strategic transport and function role is recognised in the NPF, the RSES and in this Development Plan. The Dublin Port Company published the Dublin Port Masterplan 2040 in 2012 and this was reviewed in 2018. Dublin Port will have a significant role to play in the future development and growth of the city and the Development Plan seeks to integrate the Port, including the proposed public transport network, with the developing city structure and character, while having regard to the Dublin Port Company Masterplan.

This area is essential for the future expansion and operation of Dublin Port and its related operations. The area comprises brownfield sites. There would also be a number of COMAH (SEVESO) establishments located in this area.

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

Answer: Yes: Most of the lands would comprise industrial uses directly related to the Port use. There would be large sites in the Port area, but these mainly comprise of brownfield sites.

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

Area: 2. Dublin Port North of the Liffey to Tom Clarke Bridge

Answer: Yes: This area is essential for the future expansion and operation of Dublin Port and its related operations.

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

Answer: Yes: This area is essential for the future expansion and operation of Dublin Port and its related operations.

(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.

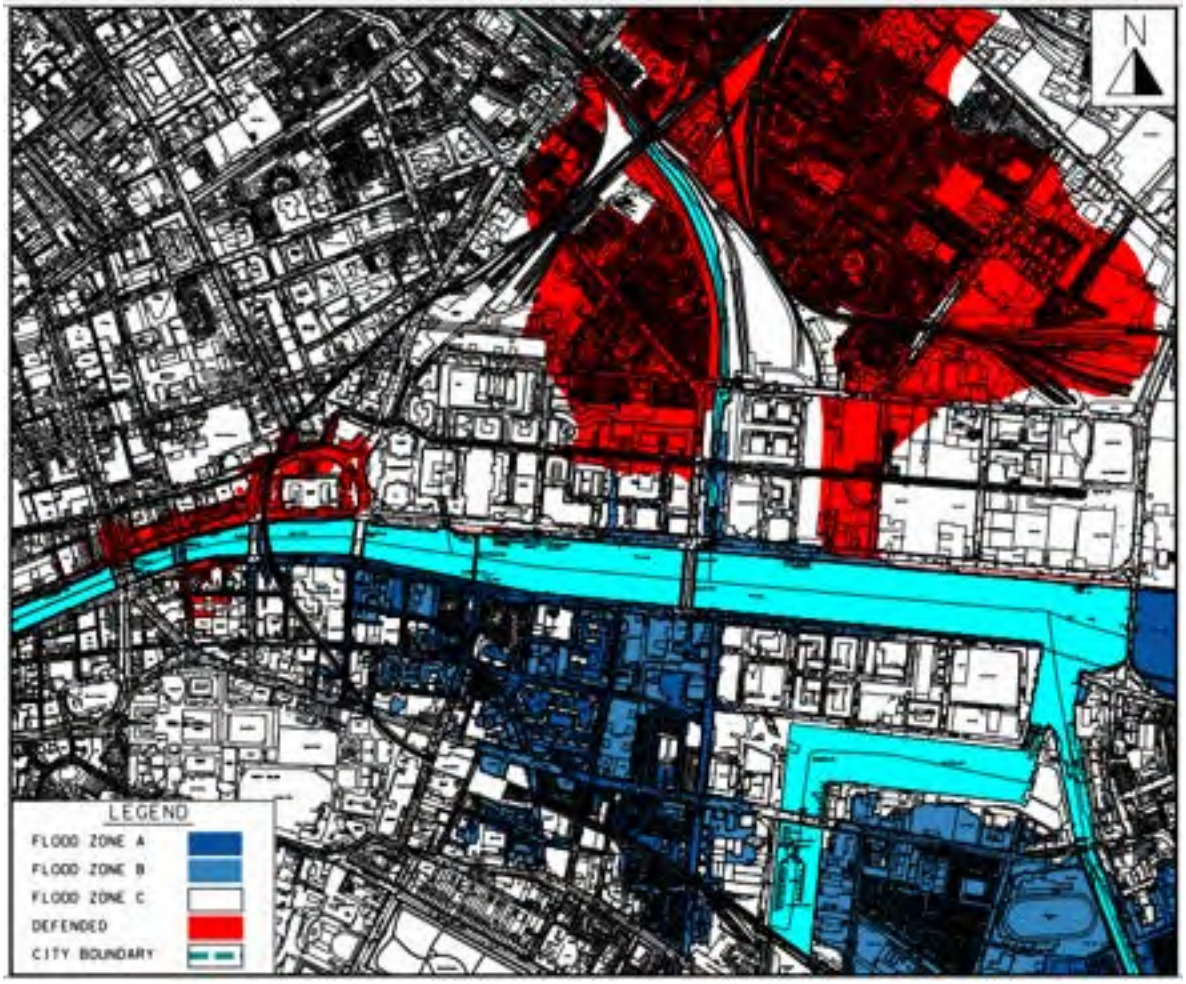
Answer: There are no suitable alternative lands for the particular uses or development type in areas at lower risk of flooding, within or adjoining the urban settlement. This area is essential for the future expansion and operation of Dublin Port and its related operations.

3. Specific Flood Risk Assessment

- Use classes considered as 'Highly Vulnerable Development' shall not be permitted in Flood Zone A or B (this includes essential infrastructure such as primary transport and utilities distribution including electricity generating power stations and sub stations, water and sewage treatment, and potential significant sources of pollution (SEVESO, IPPC sites etc.).
- Within this area it is essential that the impact of sea level rise by 0.5m for ordinary sites and 1.0m for critical/ highly vulnerable infrastructure and high risk chemical sites is carried out, even for development in Flood Zone C. For some developments it may be appropriate to include a more detailed assessment of likely climate change impacts, including the frequency of lower return periods and wave action. There may also be a flood route through this site to areas outside of it.
- As the flood risks are tidal, mitigation through land raising (or bunding for smaller developments) will have no impact on neighbouring development, so compensatory storage will not be required. The focus of the FRA will be to ensure the safety and long-term operability of the development.
- Where development will be in the defended area, consideration should be given to the likelihood of the defences failing (either through overtopping or breach) and how the operation will ensure it can retain functionality/ recover following an extreme flood event. Buildings should be of flood resilient construction.
- Special FRA's should be carried out for all basements and underground structures with respect to any human access. No underground offices or residential units (whether temporary or permanent) will be allowed.
- Groundwater flooding particularly during high tide should be considered in all development flood risk assessments in this site area.

Area: 2. Dublin Port North of the Liffey to Tom Clarke Bridge
Conclusion: The subject area passes the Justification Test for Development Plans for less vulnerable development. Highly vulnerable development should be avoided in Flood Zone A and B.

Area: 3. Liffey: O'Connell Bridge to Tom Clarke Bridge



For Land Use Zoning Maps Overlaid with Flood Zones see Dublin City Council Development Plan 2022 - 2028, Flood Map E and Flood Map F.

Area Description	The area comprises the Docklands together with a portion of the City Centre. The area is served by Dublin Bus / DART / Main Line Rail / Luas. There is an existing development framework for lands to the north and south of the River Liffey called the North Lotts and Grand Canal Dock SDZ Planning Scheme 2014. The development of the North Lotts and Grand Canal Dock area has significantly progressed in recent years. The area on the south side (right bank) of the River Liffey includes Sir John Rogerson's Quay, City Quay, George's Quay and Burgh Quay and areas south of these roughly to the railway line. On the north side (left bank) of the Liffey it includes North Wall Quay, Custom House Quay, Eden Quay and areas north of these including areas adjacent to the Royal Canal which flooded in 2002. The Docklands area extends northwards to the junction of North Strand Road and East Wall Road. Development in this area is a mixture

Area: 3. Liffey: O'Connell Bridge to Tom Clarke Bridge	
	of high density commercial and residential development.
SDRAs within this Area	Strategic Development and Regeneration Area (SDRA) No. 6 Docklands. Strategic Development and Regeneration Area (SDRA) No.10 North East Inner City (NEIC)
Benefitting from Defences (flood relief scheme works)	Some areas to the west of this area have existing Quay Walls but their design standards and capacity for flood defence is unknown. Georges Quay has recently had flood defences constructed to a level of 4.0m Malin head. A new sea lock (triple gate) was installed at Spencer Dock to reduce the risk of tidal waters flooding houses and commercial building to the north of it. This sea lock is maintained by Waterways Ireland. City Quay and Sir John Rogerson's Quay to Cardiff Lane have flood defences constructed, and with temporary defences protect from Butt Bridge to 100m east of Cardiff Lane up to the estimated 200 year tidal flood event. Most of the new buildings in this area have floor levels of 4.0mOD or higher to reduce their flood risk. Some speed ramps and footpaths also provide elements of flood defence.
Sensitivity to Climate Change	Climate change impacts of +0.5-1.0m on sea levels would have a significant impact on the area.
Residual Risk	Any proposed developments in the protected areas on George's Quay and elsewhere require residual risk from overtopping or other cause to be mitigated against. Where defences are formal, of recent construction and maintained by DCC/ OPW, the risk of breach is likely to be low and assessment can be quantitative rather than involving detailed modelling. New bridges, over the Dodder Estuary and Blood Stoney Bridge require detailed flood risk assessment in their design.
Historical Flooding	The SFRA flood maps are consistent with previous flooding of this section of the Liffey Estuary and Dodder Estuary.
Surface Water	All surface water in this area needs to be carefully managed and provision made for significant rainfall events during high tides. A one year high tide event should be assumed during a 100-year rainfall event. Should development be permitted, best practice with regard to surface water management should be implemented across the development area, to limit surface water run-off to current values.

Area: 3. Liffey: O'Connell Bridge to Tom Clarke Bridge	
	All developments shall have regard to the Pluvial Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project**,** Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.

Commentary on Flood Risk:

The flood extents indicate flow paths generally coming directly out of the tidal region, some are through quay walls and underground chambers near quay walls.

The flood maps were produced based on the OPW CFRAMS Study and checked against historic flooding in the area. The south Campshires area which has a flood defence under construction from Butt Bridge to Cardiff Lane is the most at risk area. The North Campshires will require flood defences to combat 0.5-1.0m estimated climate change in the future. This was further reviewed under the Eastern CFRAM Study, and recommendations for defence works were reported on in the resulting Flood Risk Management Plan.

Development Options:

This area forms part of the wider Docklands area / Inner City. There are two Strategic Development and Regeneration Areas in this area.

SDRA No. 6 Docklands (section 13.8 in Chapter 13 of the Written Statement)

This SDRA includes the North Lotts and Grand Canal Dock SDZ area and it identifies 15 opportunity sites for development. New Infrastructure proposals in the Docklands include: New Park along Royal Canal between Sheriff Street and Newcomen Bridge; Bridge from North Wall Quay at Point Depot and the widening of Tom Clarke Bridge; Dodder Bridge, pedestrian / cycle bridge between Samuel Beckett Bridge and Tom Clarke Bridge; extension of Luas; A DART Interconnector / DART + projects; and the Southern Port Access Route.

SDRA No. 10 North East Inner City (see section 13.12 of the Written Statement)

This SDRA identifies 17 opportunity sites for development / redevelopment.

High density commercial and residential development (some infill and some redevelopment) would be a natural extension of existing development in the Docklands / North East Inner City and Central City areas.

Development will be required within both Flood Zones A and B so the Justification Test has been applied. Development will be permitted in Flood Zone C.

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.**

Area: 3. Liffey: O'Connell Bridge to Tom Clarke Bridge

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: This area comprises a substantial part of the Docklands / North Inner City and City Centre. The lands form part of an established built up part of the City Centre close to Strategic Rail Infrastructure (Luas and Connolly Station). The Docklands area is undergoing significant redevelopment through the build out of the North Lotts and Grand Canal Dock SDZ Planning Scheme area.

Important brownfield lands (outside of the SDZ area) with the potential to deliver a significant quantum of mixed-uses are identified under SDRA 6 and 10. To guide the development of these lands, Framework Plans and guiding principles are set out for each SDRA area in Chapter 13 of the Written Statement.

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

Answer: Yes: There are a few large key brownfield development sites within this area– see SDRA No. 6 (Section 13.8 of the Written Statement) and SDRA No. 10 (section 13.12 of the Written Statement).

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

Answer: Yes: This area is located adjacent to the core of the city, and located in a strategic position in close proximity to major transport infrastructure. The North Lotts Grand Canal Dock SDZ lands extend north and south of the river at a strategic location; North Lotts immediately adjoins the IFSC and Grand Canal Dock is in close proximity to the city's central business district and south city retail core area. Point Village in the Docklands is designated as a Key Urban Village in the Development Plan (KUV Point Village and Poolbeg).

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

Answer: Yes: This area is a key redevelopment area in the city. This area is key in achieving compact and sustainable urban growth.

(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. This area is essential for the future expansion of Dublin City.

3. Specific Flood Risk Assessment

Area: 3. Liffey: O'Connell Bridge to Tom Clarke Bridge

- See Justification Test for Strategic Development and Regeneration Area No. 6 Docklands in Appendix C2 for specific recommendations in relation to that area.
- Where possible, small scale redevelopment and refurbishment should be focused behind flood defences where flood risks are more limited. Such development should be accompanied by a site-specific flood risk assessment which should consider the likelihood and impact of defence failure, which may be through overtopping (either due to an extreme event in the current situation or through sea level risk linked to climate change). Where appropriate, consideration should be given to the impacts of demountable sections of flood defence not being erected. Whilst it is unlikely that the findings of such an assessment will indicate development should not go ahead, an emergency plan will be required, fully considering the issue and receipt of flood warnings and emergency evacuation routes and procedures as well as how the operation will ensure it can retain functionality/ recover following an extreme flood event.
- In undefended areas, the risk to small scale redevelopments and refurbishments will need to be assessed and a decision made as to whether the risks can be managed through design and emergency planning, or whether permissions are premature pending construction of defences. Management of risks may be through design of access levels, flood resilient construction techniques and avoiding locating vulnerable development at ground flood level. Climate change risks will need to be considered, but it may not be possible to fully mitigate against these in an already developed situation.
- Larger scale redevelopment, involving new building, can be facilitated within undefended Flood Zone A and B through masterplanning and landscaping rather than through reliance on flood walls. The assessment and design should include appropriate consideration of sea level rise and climate change impacts.
- Compensatory storage is not required as risks along the Quays are linked to tidal flooding.
- Climate change risks are significant and need to be assessed under the site specific FRA with guidance on finished floor levels applied as detailed in the SFRA.
- Specific FRA's should be carried out for all basements and underground structures with respect to any human access. No underground offices or residential units (whether temporary or permanent) will be allowed.
- Groundwater flooding particularly during high tide should be considered in all development flood risk assessments in this site area.

Conclusion: The subject area <u>passes</u> the Justification Test for Development Plans.

Area: 4. Liffey: Sean Heuston Br. - O'Connell Bridge	
 Council Development Plan 2022 - 2028, **Flood Map E.**	
Area Description	The area comprises the City centre. The area is served by Dublin Bus / DART / Main Line Rail / Luas. The area on the south side includes Burgh Quay, Aston Quay, Crampton Quay, Wellington Quay, Essex Quay, Wood Quay, Merchants Quay, Usher's Quay, Ushers Island and Victoria Quay and areas south of these. On the north side it includes Wolfe Tone Quay, Ellis Quay, Arran Quay, Inn's Quay, Ormond Quays Upper & Lower, Bachelor's Walk and areas north of these. The area includes the City Centre retail core centred on Henry Street and Grafton Street, a number of the City's cultural quarters including around Dublin Castle, the north and south Inner City (including part of the north east Inner City), the Liberties and Guinness lands, Smithfield / Markets Area and Grangegorman Lower. Development in this area is a mixture of high density commercial and residential.
SDRAs within this Area	SDRA 7 Heuston and Environs (part of) SDRA 10 North East Inner City (part of) SDRA 13 Markets Area and Environs SDRA 15 Liberties and Newmarket Square (part of) SDRA 17 Werburgh Street
Benefitting from Defences (flood relief scheme works)	All of this area has existing Quay Walls but their design standards and capacity for flood defence is unknown. Dutch Dam defences have been incorporated into openings in the Quay Walls along the boardwalk. These are raised out of the ground to combat high tides and generally afford 750mm of flood protection.
Sensitivity to Climate Change	The River Liffey at this location is tidally influenced, and is as vulnerable to climate change as per its

Area: 4. Liffey: Sean Heuston Br. - O'Connell Bridge	
	downstream limits. Increases in river levels could have significant consequences if quay walls are overtopped more frequently.
Residual Risk	Given the unknown standard of defences, risk should be assessed based on a fully undefended scenario so no specific assessment of defence failure will be required.
Historical Flooding	The SFRA flood maps are consistent with previous flooding of this section of the Liffey Estuary. The main flood risk zones are sections of the north and south quay roads and some roadways off these as outlined on above map, Victoria Quay, sections of the Diageo site, Wolfe Tone Quay and sections of the Esplanade.
Surface Water	All surface water in this area needs to be carefully managed and provision made for significant rainfall events during high tides. A one year high tide event should be assumed during a 100-year rainfall event. Should development be permitted, best practice with regard to surface water management should be implemented across the development area, to limit surface water run-off to current values. All developments shall have regard to the Pluvial Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project**,** Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.
Commentary on Flood Risk: The flood extents indicate flow paths generally coming directly out of the tidally influenced River Liffey. Some flow routes are through quay walls and underground chambers and pipelines near quay walls. All known outlets have been flapped to reduce the tidal influence on other types of flooding. The flood maps were produced based on the OPW CFRAM Plan and checked against historic flooding in the area. Fluvial influences in the Liffey Estuary are estimated to contribute significantly to flood water levels upstream of Rory O'Moore Bridge.	
Development Options: Infill development / redevelopment proposals are likely to come forward in the City Centre Retail Core and the wider City Centre area during the lifetime of the Plan. In addition, there are a number of Strategic Development and Regeneration Areas (SDRA's) located / forming part of this area: SDRA 7 Heuston and Environs, SDRA 10 North East Inner City, SDRA 13 Markets Area and Environs, SDRA 15 Liberties and Newmarket Square, and SDRA 17 Werburgh Street. Specific development proposals	

Area: 4. Liffey: Sean Heuston Br. - O'Connell Bridge

/ opportunity sites are identified in these SDRA's - see sections 13.9, 13.12, 13.15, 13.17 and 13.19 respectively, of the Written Statement.

The main flood cell is located along Victoria Quay on the south side of the river, which is currently zoned Z7 '*To provide for the protection and creation of industrial uses and facilitate opportunities for employment creation including Port Related Activities*' and currently forms part of St. James Gate Brewery in the Development Plan.

The areas shown along Wolfe Tone Quay generally coincide with Z9 zoning which is '*To preserve, provide and improve recreational amenity, open space and ecosystem services'*. Water compatible uses will be permitted in this area or uses permissible under the Z9 objective. Uses to the south side of the River at the Guinness lands should be compatible with the Z7 zoning for the site. However, any development could reasonably be accommodated within the extents of Flood Zone C and should not need to extend into Flood Zone A or B.

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 ongoing redevelopment of this area is essential to facilitate the regeneration, consolidation and expansion of the City Centre**.** Existing development in this area is a mixture of high density and intensive commercial, industrial, employment and residential development.

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

Answer: Yes: The area is intensively developed, however there are some underutilised brownfield lands in the area. It is likely that underutilised lands will be developed within the Plan period and existing developed sites could be redeveloped. Most of the lands within Flood Zone A and B are already built up or comprise brownfield sites.

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

Area: 4. Liffey: Sean Heuston Br. - O'Connell Bridge

Answer: Yes: This area forms part of the City Centre and the City Centre Retail Core.

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

Answer: Yes: The ongoing development/ redevelopment of land in the City Centre is essential to achieving compact and sustainable urban growth.

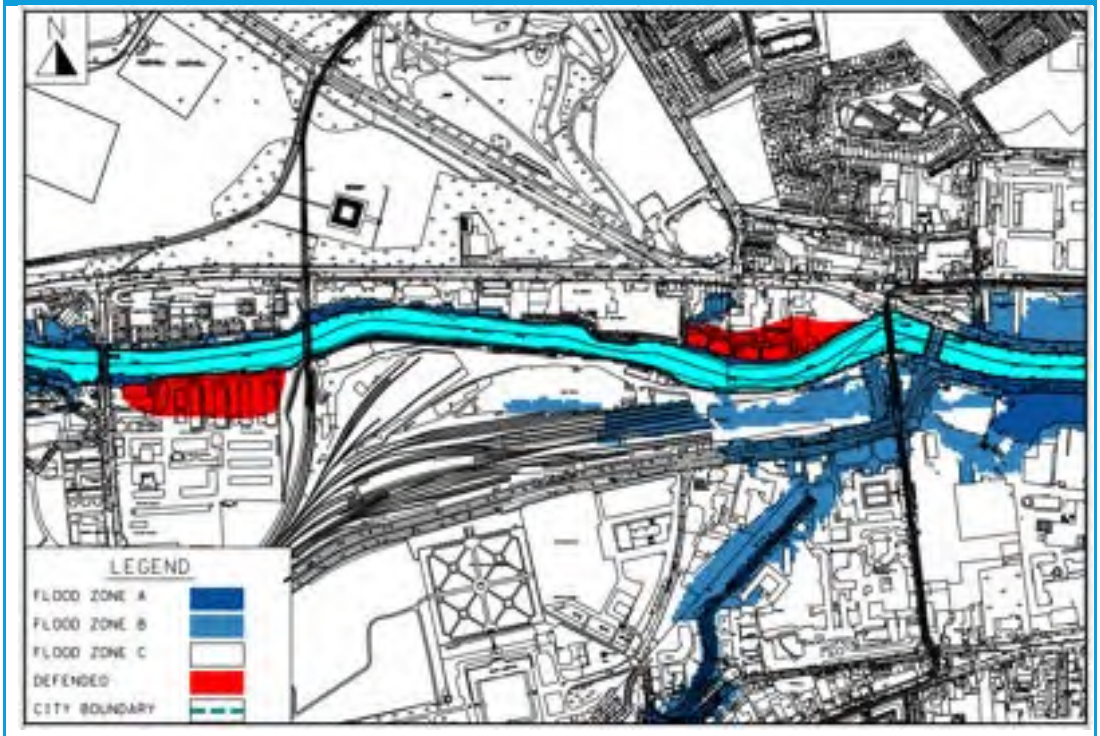
(v) There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement.

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. There are only limited areas idenitifed as being in Flood Zones A and B and they are considered essential to achieving a consolidated urban centre and to comply with the NPF and RSES.

3. Specific Flood Risk Assessment

- See Justification Test for Strategic Development and Regeneration Areas No's. 7 (Heuston and Environs) and 15 (Liberties and Newmarket Square) in Appendix C2 for specific recommendations in relation to those areas.
- To a large extent, the areas indicated as being within Flood Risk Areas are generally built out or are existing brownfield sites and the opportunities for future development are limited.
- The extents of Flood Zone A and B are relatively limited but there may be situations where large sites come up for redevelopment which encroach partly into the Flood Zones A or B. In such cases, the guidance on FRA should be followed, and water compatible or less vulnerable elements of the development located within Flood Zone A / B and along the river side.
- Climate change risks should be assessed and appropriately mitigated in all development.
- It is an objective of DCC in conjunction with the OPW to look at identified flood cells as above, and to look at overall flood alleviation scheme for the catchment. However, the extents of the Flood Zones are not significant enough to prevent infill development and well planned larger scale regeneration from occurring.
- Specific FRA's should be carried out for all basements and underground structures with respect to any human access. No underground offices or residential units (whether temporary or permanent) will be allowed.
- Groundwater flooding particularly during high tide should be considered in all development flood risk assessments in this area.

Area: 4. Liffey: Sean Heuston Br. - O'Connell Bridge
Conclusion: The subject area passes the Justification Test for Development Plans.

Area: 5. Liffey: Sean Heuston Br. – Sarah Bridge, South Circular Road	
	
For Land Use Zoning Maps Overlaid with Flood Zones see Dublin City Council Development Plan 2022 - 2028, Flood Map E.	
Area Description	The area on the south side includes Heuston Railway Station to St. John's Road West, Clancy Quay, the Camac outfall tunnel to the Liffey Estuary, the south City interceptor sewer in the south bank of the Liffey Estuary and areas south of these. On the north side it includes Parkgate, Conyngham Road and developments between these and the river estuary. Development in this area is a mixture of commercial, high density residential, cultural development and rail infrastructure around Heuston Station.
SDRAs within this Area	Strategic Development and Regeneration Area SDRA 7 Heuston and Environs.
Benefitting from Defences (flood relief scheme works)	Some of this area has existing quay walls to ground level and above but their design standards and capacity for flood defence is unknown and is therefore not used when estimating flood risk. In addition, their capacity is limited to the channel dimensions. Existing embankments would also need to be assessed before any further development is carried out behind them.
Sensitivity to	Moderate to high – the river in this location has combined fluvial and tidal influences which could

Area: 5. Liffey: Sean Heuston Br. – Sarah Bridge, South Circular Road	
Climate Change	result in greater increases in water level than elsewhere.
Residual Risk	Not applicable as existing defences are the channel walls to ground level.
Historical Flooding	The SFRA flood maps are consistent with previous flooding of this section of the Liffey Estuary. The main flood risk zones are sections of the north and south quays adjacent to the Liffey Estuary and areas connected with the Camac River junction.
Surface Water	All surface water in this area needs to be carefully managed and provision made for significant rainfall events during high tides. A one year high tide event should be assumed during a 100-year rainfall event. Should development be permitted, best practice with regard to surface water management should be implemented across the development area, to limit surface water run-off to current values. All developments shall have regard to the Pluvial Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project, Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.
Commentary on Flood Risk: The flood extents indicate flow paths generally coming directly out of the tidal region, some are through quay walls and underground chambers and pipelines near quay walls. The flood maps were produced based on the OPW CFRAM Plan and checked against historic flooding in the area. Flooding from the River Camac is discussed in its assessment area.	
Development Options: Infill development / redevelopment proposals are likely to come forward in this area during the lifetime of the Plan. A Strategic Development and Regeneration Area (SDRA), as designated in the Development Plan, forms part of this area - SDRA 7 Heuston and Environs, see section 13.9 of the Written Statement. No new development should be allowed in green areas. Irish Rail developments at Heuston Station lands should have cognisance of current estuary planning levels. High density commercial, infrastructural and residential development (some infill) would be a natural extension of existing development. However, any development could reasonably be accommodated within the extents of Flood Zone C and should not need to extend into Flood Zone A	

Area: 5. Liffey: Sean Heuston Br. – Sarah Bridge, South Circular Road

or B.

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: This area forms part of the central area of the city. The lands form part of an established built-up part of the city close to strategic rail infrastructure. The area around Heuston Station is identified as Strategic Development and Regeneration Area (SDRA) 7 - Heuston and Environs - see section 13.9 of the Written Statement, under the Core Strategy. These are important brownfield sites with the potential to deliver a significant quantum of mixed-uses and create synergies to regenerate the wider area. This area has undergone significant redevelopment, including much of the Heuston South Quarter and development at Clancy Barracks. A number of significant land banks still remain to be developed and for these guiding principles have been set out in section 13.9 of the Written Statement.

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

Answer: Yes: Most of the lands within Flood Zone A and B are already built up or comprise of brownfield sites.

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

Answer: Yes: This area forms part of the Central Core of the City.

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

Answer: Yes: This area is essential to achieving compact and sustainable urban growth.

(v) There are no suitable alternative lands for the particular use or development type, in areas at lower risk of

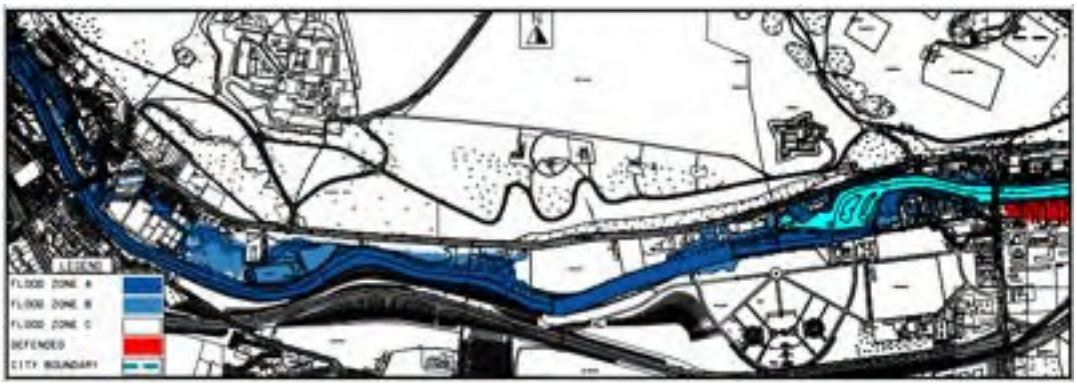
flooding within or adjoining the core of the urban settlement.

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. Areas idenitifed as being in Flood Zones A and B are considered essential to achieving a consolidated urban centre and to comply with the NPF and RSES.

3. Specific Flood Risk Assessment

- See Justification Test for Strategic Development and Regeneration Area No. 7 in Appendix C2 for specific recommendations in relation to that area.
- To a large extent the areas indicated as being within Flood Risk Areas are generally built out or are existing brownfield sites and the opportunities for future development are limited. The extents of Flood Zone A and B are not significant along much of this reach of the Liffey, with most flood risk arising from the River Camac.
- There are a number of identified flood cells along this stretch of the River Liffey, and these cover areas currently zoned Z5 which is '*To consolidate and facilitate the development of the central areas and to identify, reinforce and strengthen and protect its civic design character and dignity*'. There are some areas zoned Z1 which is '*To protect, provide and improve residential amenities*'.
- Given the combined tidal and fluvial influences in this section of the River Liffey, a joint probability assessment should be carried out to determine finished floor levels. The assessment should take into account the combined impacts of a peak tide and a peak flow occurring at the same time. Given that an event such as this would have a greater rarity than either event occurring individually, a pragmatic approach should be taken to applying the findings. For example, whilst it would be appropriate to consider joint probability levels in the redevelopment of brownfield sites, for individual or infill developments such allowances may prohibit connection with the existing streetscape.
- The River Camac is currently subject to further assessment in a study which is reviewing the need for, and potential options for, flood risk management. Development at the downstream end of the Camac (around Heuston Station and St. James's Gate) should take into account the findings of the CFRAM Study incorporated in the Flood Risk Management Plan and any recommendations implemented.
- Large scale development in this area should be proceeded with caution with a detailed approved FRA.
- Climate change risks are significant and need to be assessed under the site specific FRA with guidance on finished floor levels applied as detailed in the SFRA.
- Specific FRA's should be carried out for all basements and underground structures with respect to any human access. No underground offices or residential units (whether temporary or permanent) will be allowed.
- Where development is proposed behind an existing embankment the applicant should consult with DCC to determine the extent of

Area: 5. Liffey: Sean Heuston Br. – Sarah Bridge, South Circular Road
geotechnical investigation and residual risk assessment that is appropriate. • Groundwater flooding particularly during high tide should be considered in all development flood risk assessments in this site area.
Conclusion: The subject area <u>passes</u> the Justification Test for Development Plans.

Area: 6. Liffey: Sarah Bridge, South Circular Road - Anna Livia Br. Chapelizod	
	
For Land Use Zoning Maps Overlaid with Flood Zones see Dublin City Council Development Plan 2022 - 2028, Flood Map D and Flood Map E.	
Area Description	From Islandbridge to Chapelizod to south of Phoenix Park/ south of National War Memorial Gardens. The area on the south side includes Islandbridge, the National War Memorial Park, Chapelizod By-pass, and residential development which ranges from high density to one off houses. On the north side, it includes Chapelizod Road and recreational uses such as playing fields and rowing clubs. There is an industrial estate on the north side of the river to the east of Anna Livia (Chapelizod Bridge). The Magazine Stream outlet from Phoenix Park is also in this area.
SDRAs within this Area	N/A
Benefitting from Defences (flood relief scheme works)	Some of this area has existing quay walls and embankments above ground level but their design standards and capacity for flood defence is unknown and is, therefore, not used when estimating flood risk. In addition, their capacity is limited to the channel dimensions.
Sensitivity to Climate Change	Moderate to high. This area is tidal generally up to the Islandbridge weir. However, an increase in sea level would extend this influence further upstream and put some more of this area underwater. There is some fluvial influence in this area at very high tide and the joint occurrence of a peak tide and peak flow presents a greater risk than either event occurring alone.

Area: 6. Liffey: Sarah Bridge, South Circular Road - Anna Livia Br. Chapelizod	
Residual Risk	Not applicable generally as existing defences are the channel walls and other walls are not considered as viable flood defences.
Historical Flooding	The flood maps are consistent with historic flooding. The main flood risk zones are portions of the north and south quays adjacent to the Liffey Estuary and areas connected with the junction of the Magazine stream and River Liffey.
Surface Water	All surface water in this area needs to be carefully managed and provision made for significant rainfall events during high tides and high river flows. A one year high tide event should be assumed during a 100-year rainfall event. Should development be permitted, best practice with regard to surface water management should be implemented across the development area to limit surface water run-off to current values. All developments shall have regard to the Pluvial Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project, Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.
Commentary on Flood Risk: The flood extents indicate flow paths generally coming directly out of the tidal and fluvial regions, some are through quay walls and underground chambers and pipelines near quay walls. At Islandbridge the mill race has tidal influence. The industrial estate east of Anna Livia Bridge embankment requires detailed assessment for any further development in this area. The flood maps were produced based on the OPW CFRAM Study and checked against historic flooding in the area.	
Development Options: The main flood cells are located just north and south of the River Estuary. At Islandbridge the lands are zoned Z1 Residential '*To protect, provide and improve residential amenities*'. Between Islandbridge and Chapelizod the lands are zoned Z9 Open Space 'To preserve, provide and improve recreational amenity, open space and ecosystem services'. As the river flows out of Chapelizod, part of the lands are zoned Z6 which is '*To provide for the creation and protection of enterprise and facilitate opportunities for employment creation*'. The river also flows through areas zoned for residential uses (Zone Z1 and	

Area: 6. Liffey: Sarah Bridge, South Circular Road - Anna Livia Br. Chapelizod
Z2). No new development should be allowed in green areas (Z9 zonings) except for water compatible ones, such as boat clubs. Commercial, industrial, and residential development (mainly infill) would be a natural extension of existing development downstream of Anna Livia Bridge. However, any development could reasonably be accommodated within the extents of Flood Zone C and should not need to extend into Flood Zone A or B.
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 areas located in Flood Zones A and B are primarily parkland floodplains but also include built-up areas, especially around Islandbridge. There would be limited large development sites within this area, possible development of these sites will be infill or extensions onto existing properties. This area is an established recreational and built-up part of the city. **(ii) Comprises significant previously developed and/or under-utilised lands** **Answer: Yes.** Most of the lands within Flood Zone A and B are open space, already built up or comprise of brownfield sites. **(iii) Is within or adjoining the core of an established or designated urban settlement.**

Answer: Yes: The area comprises part of the established / designated urban settlement of Dublin City.

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

Answer: Yes: The area comprises part of the established / designated urban settlement of Dublin City.

(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.

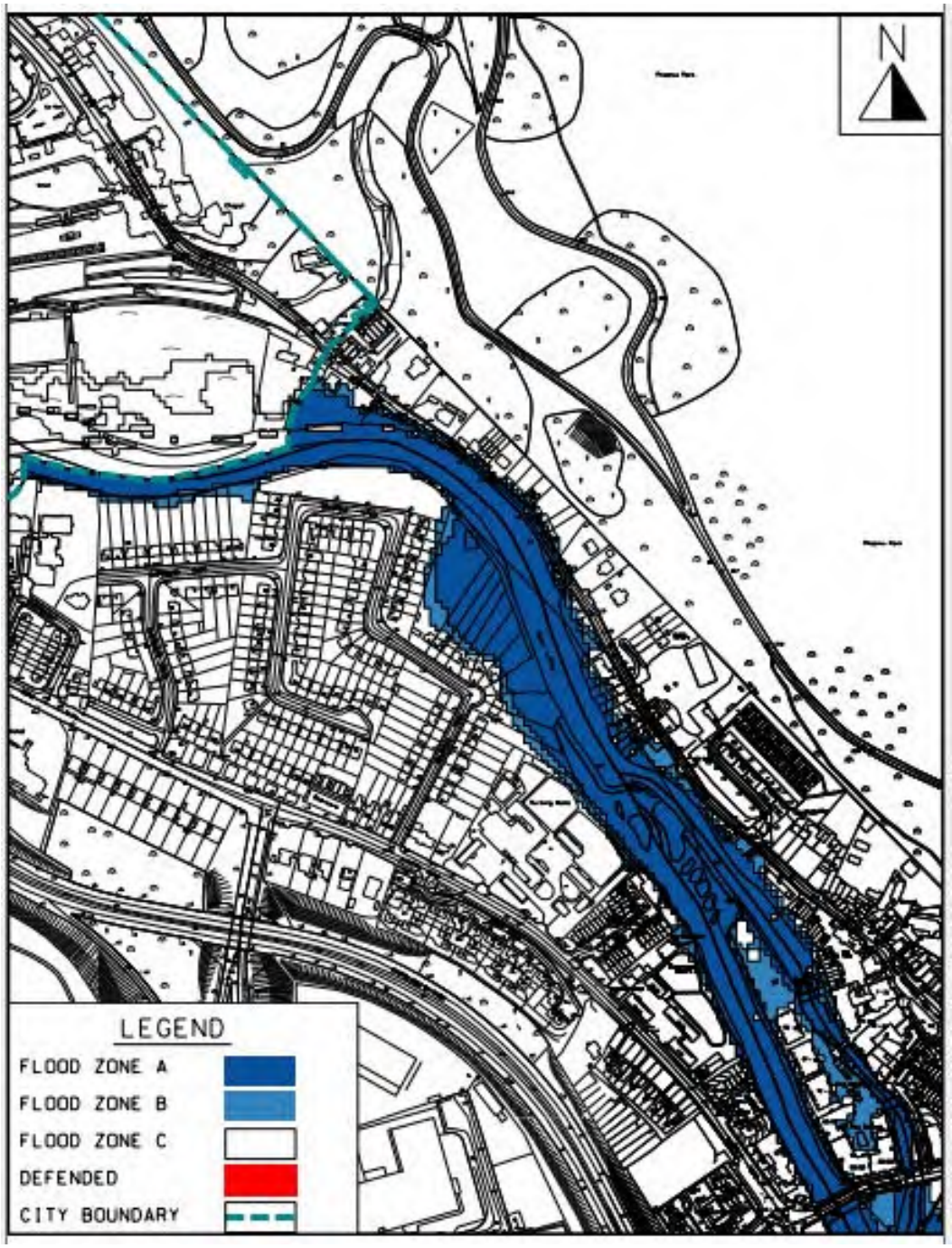
Answer: There are no suitable alternative lands for the particular uses or development type in areas at lower risk of flooding, within or adjoining the urban settlement. Areas idenitifed as being in Flood Zones A and B are considered essential to achieving a consolidated urban centre and to comply with the NPF and RSES.

3. Specific Flood Risk Assessment

- To a large extent, the areas indicated as being within Flood Risk Areas are generally built-out or are existing brownfield sites and the opportunities for future development are limited. Much of the land within Flood Zones A and B is zoned for water compatible uses, and this should be retained.
- Where development will be in the defended area, consideration should be given to the likelihood of the defences failing (either through overtopping or breach) and how the operation will ensure it can retain functionality/ recover following an extreme flood event. Buildings should be of flood resilient construction. This is particularly applicable behind informal embankments which are of unknown condition. The impact of failure of these defences should be assessed as part of a flood risk assessment; at the simplest, this may be through projection of in-channel levels across the floodplain to give depth of inundation. A precautionary (higher) finished floor level should be applied to compensate for residual risks.
- Given the combined tidal and fluvial influences in this section of the River Liffey, a joint probability assessment should be carried out to determine finished floor levels. The assessment should take into account the combined impacts of a peak tide and an associated river flow occurring at the same time. Given that an event such as this would have a greater rarity that either event occurring individually a pragmatic approach should be taken to applying the findings using joint probability. For example, whilst it would be appropriate to consider joint probability levels in the redevelopment of brownfield sites, for individual or infill developments such allowances may prohibit connection with the existing street scape.
- Climate change risks are significant and need to be assessed under the site specific FRA with guidance on finished floor levels applied as detailed in the SFRA.

Area: 6. Liffey: Sarah Bridge, South Circular Road - Anna Livia Br. Chapelizod
• Where development is proposed behind an existing embankment the applicant should consult with DCC to determine the extent of geotechnical investigation and residual risk assessment that is appropriate. • It is an objective of DCC in conjunction with the OPW to look at identified flood cells as above, and to look at overall flood alleviation scheme for the catchment. Where flood risk (either existing or residual) is high it would be considered premature to proceed with development until a flood relief scheme has been completed.
Conclusion: The subject area passes the Justification Test for Development Plans.

Area: 7. Liffey: Anna Livia Br. Chapelizod – City Boundary



For Land Use Zoning Maps Overlaid with Flood Zones see Dublin City Council Development Plan 2022 - 2028, Flood Map D.

Area Description	The area on the south side includes Lucan Road, Laurence Brook, Belgrove Park and Glenaulin. On the north side it includes Chapelizod Village, St. Martin's Road and developments between these and the River Liffey. In the middle, it includes the Island between the Millrace and the Liffey. Development in this area is mainly residential

Area: 7. Liffey: Anna Livia Br. Chapelizod – City Boundary	
	with some high density residential. A large weir between Laurence Brook and Martins Row provides a significant difference in water levels in low flows but is often drowned out in higher flows. Flood waters from the Furry Glen stream out of the Phoenix Park meet the Liffey adjacent to the city boundary.
SDRAs within this Area	N/A
Benefitting from Defences (flood relief scheme works)	Some of this area has existing concrete and other walls as well as embankments but their design standards and capacity for flood defence are unknown.
Sensitivity to Climate Change	This area is in the fluvial zone so impacts arising from climate change will be less than in the tidal risk areas, but could be significant where walls are overtopped with increased water levels.
Residual Risk	There are some walls on the north bank which are of unknown standard of design and protection. Risk of failure (through overtopping/ breach) of the defences should be assessed. Some areas in Glenaulin and Belgrove directly adjacent to the river are experiencing significant erosion to back gardens and this should be taken into account in any proposed development to them.
Historical Flooding	The SFRA flood maps are consistent with previous flooding of this section of the Liffey River. The main flood risk zones are portions of the north and south river banks with low lying house levels and underground car parks on the Island and adjacent to St. Martin's Road. Pluvial flooding down the steep hill onto St. Martin's Road combined with high river flows can add to fluvial flooding in the area. The Furry Glen stream can also cause flooding particularly at the northern end of St. Martin's Road.
Surface Water	All surface water in this area needs to be carefully managed and provision made for significant rainfall events during high river flows, particularly a 100-year rainfall event. Should development be permitted, best practice with regard to surface water

Area: 7. Liffey: Anna Livia Br. Chapelizod – City Boundary	
	management should be implemented across the development area, to limit surface water run-off to current values. All developments shall have regard to the Pluvial Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project**,** Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.

Commentary on Flood Risk:

The flood extents indicate flow paths generally coming directly out of the river or seeping through structures from the river, some are through river walls and underground chambers and pipelines near river walls. Water backs up from the river in the Island bypass weir during significant flood events.

The flood maps were produced based on the OPW CFRAM Plan and checked against historic flooding in the area.

Development Options:

The main flood cells are located on the Island, on the southern end of Chapelizod Village and St. Martin's Road nearest the Liffey bypass of the River and to the rear of the Lucan Road nearest Anna Livia bridge. No new development should be allowed in these areas unless protected or water compatible.

Residential development (mainly infill) would be a natural extension of existing development upstream of Anna Livia bridge. Any development could reasonably be accommodated within the extents of Flood Zone C provided estimated climate change is catered for.

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 areas located in Flood Zones A and B are primarily built-up, especially around Chapelizod where the area is an established built-up residential area, with some commercial properties. There would be limited large development sites within this area, the possible

development of these sites will be infill or extensions onto existing properties. This area is an established built-up part of the city.

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

Answer: Most of the lands within Flood Zone A and B are already built-up or comprise of brownfield sites.

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

Answer: Yes: The area comprises part of the established / designated urban settlement of Dublin City.

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

Answer: Yes: The area comprises part of the established / designated urban settlement of Dublin City.

(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.

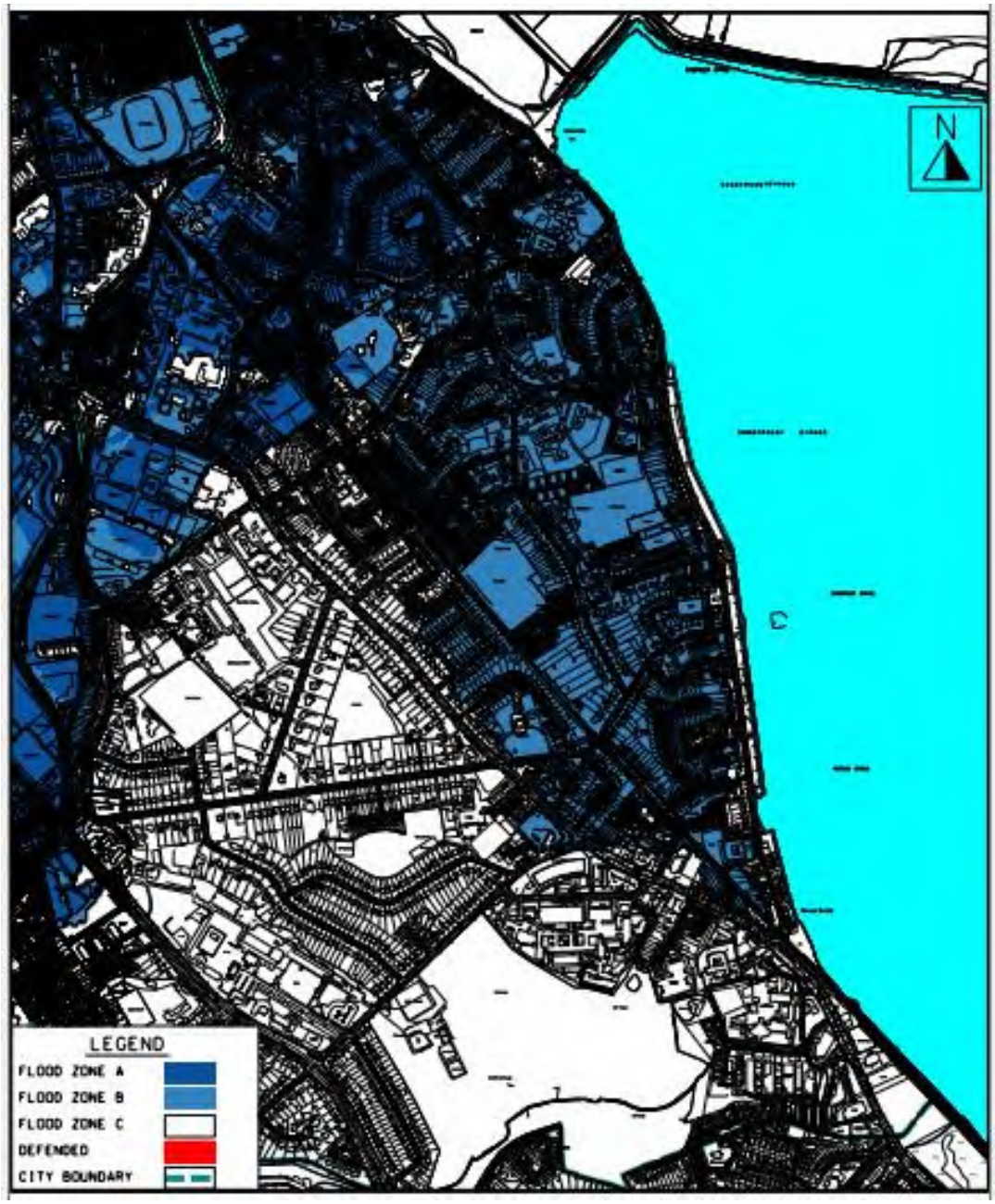
Answer: There are no suitable alternative lands for the particular uses or development type in areas at lower risk of flooding, within or adjoining the urban settlement. Areas idenitifed as being in Flood Zones A and B are considered essential to achieving a consolidated urban centre and to comply with the NPF and RSES.

3. Specific Flood Risk Assessment:

- Some of the land within Flood Zones A and B are open space, which is a water compatible use and should be retained.
- Residential developments within Flood Zone A and B are likely to be limited to small infill development or extensions onto existing residential properties. For extensions onto existing residential properties in Flood Zone A or B, it should be noted that bedroom accommodation shall not be permitted at basement or ground floor.
- There should be no new residential developments within Flood Zone A or B (whether large scale or one-off developments to the rear of existing properties).
- Redevelopment of areas for less vulnerable uses in Flood Zone A and B is acceptable, subject to specific considerations, as set out below.
- Re-development of the industrial units upstream of Chapelizod Road will require particularly careful consideration to ensure risks are mitigated to an acceptable level.
- Where development will be in the defended area, consideration should be given to the likelihood of the defences failing (either through overtopping or breach) and how the operation will ensure it can retain functionality/ recover following an extreme flood event. Buildings should be of flood resilient construction. This is particularly applicable

Area: 7. Liffey: Anna Livia Br. Chapelizod – City Boundary
behind informal embankments which are of unknown condition. The impact of failure of these defences should be assessed as part of a flood risk assessment; at the simplest, this may be through projection of in-channel levels across the floodplain to give depth of inundation. A precautionary (higher) finished floor level should be applied to compensate for residual risks. • It is an objective of DCC in conjunction with the OPW to look at identified flood cells as above, and to look at overall flood alleviation scheme for the catchment. Where flood risk (either existing or residual) is high, it would be considered premature to proceed with development until a flood relief scheme has been completed. • It is recognised that there are existing basements in the area. Any proposals for new basements should take into account the specific requirements of this SFRA, and should include assessment of the impacts of defence failure on operability, with particular consideration to the required speed of emergency response. • Where development is proposed behind an existing embankment the applicant should consult with DCC to determine the extent of geotechnical investigation and residual risk assessment that is appropriate.
Conclusion: The subject area <u>passes</u> the Justification Test for Development Plans for less vulnerable development. Highly vulnerable development should be avoided Flood Zone A and B.

Area: 8. Coastal: Sandymount



For Land Use Zoning Maps Overlaid with Flood Zones see Dublin City Council Development Plan 2022 - 2028, Flood Map F and Flood Map H.

Area Description	The area includes Beach Road and Strand Road from Sean Moore Park to the Merrion Gates and includes some of the Elm Park Stream flooding with a high tide. The area extends inland generally around the DART Line from Merrion Road near the

Area: 8. Coastal: Sandymount	
	Merrion Gates to the Dodder River and Newbridge Avenue and south of Leahy Terrace on the north of the area. The area includes Sandymount Village. All of this area has been reclaimed from the sea in the last 200 years. Development in this area is mainly low to medium density residential with some commercial, some schools, community uses, open space areas and sports areas.
SDRAs within this Area	N/A
Benefitting from Defences (flood relief scheme works)	The area behind Beach Road and Strand Road is generally very low and is protected by the existing seawall above ground level. This combined with new works adjacent to Merrion Gates and Marine Drive protects many of the inland areas at flood risk. The seawall provides differing standards of protection along its length so a uniform assessment of its benefit cannot be provided. There are 14 openings in this sea wall which, following receipt of a tidal surge warning are normally blocked with sandbags to reduce the flood risk inland, however as these are very temporary defences they are not considered in this assessment. Planning permission has been granted to put flood gates on these 14 openings and strengthen the sea wall along the Promenade. A consultant is being procured to look at options for the 700m section of sea wall north of the promenade to Sean Moore Park.
Sensitivity to Climate Change	Extreme, due to the proximity to the sea and varying level of the flood defences and the very low level of buildings inland of existing flood defences.
Residual Risk	Residual risks associated with overtopping/ breach and ingress through gaps in the defences are high. See comments in Specific FRA (below) in relation to the assessment of same.
Historical Flooding	The SFRA flood maps are consistent with previous flooding of this section of Sandymount, however, the map show potential for flooding in an undefended scenario.
Surface Water	All surface water in this area needs to be carefully managed and provision made for significant rainfall events during high tides. A one year high tide event should be assumed during a 100-year

Area: 8. Coastal: Sandymount	
	rainfall event. Should development be permitted, best practice with regard to surface water management should be implemented across the development area, to limit surface water run-off to current values. Some existing developments have pumped pipelines to the sea. All developments shall have regard to the Pluvial Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project, Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.

Commentary on Flood Risk:

The flood extents indicate flow paths generally coming directly out of the tidal region by over ground routes following direct inundation from the sea. Extra flood defences are required raising the level of the existing sea wall and closing openings during times of high tides particularly with strong easterly winds. Flooding from wave overtopping is a significant risk in this area. The flood maps were produced based on the OPW CFRAM Plan and checked against historic flooding in the area.

Development Options:

Residential development, either small scale infill or extensions to existing buildings, with some infill commercial development would be a natural extension of existing development in this area.

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 areas located in Flood Zones A and B are primarily residentially developed areas/ built-up and established, with some commercial properties and community uses. There would be limited large development sites within this area. The possible development of infill sites will be small scale infill development or extensions onto existing properties. This area is an established built-up part of the city reclaimed from the sea.

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

Area: 8. Coastal: Sandymount

Answer: Yes. Most of the lands within Flood Zone A and B are already built-up or comprise of brownfield sites.

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

Answer: Yes: Yes: The area comprises part of the established / designated urban settlement of Dublin City.

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

Answer: Yes: The area comprises part of the established / designated urban settlement of Dublin City.

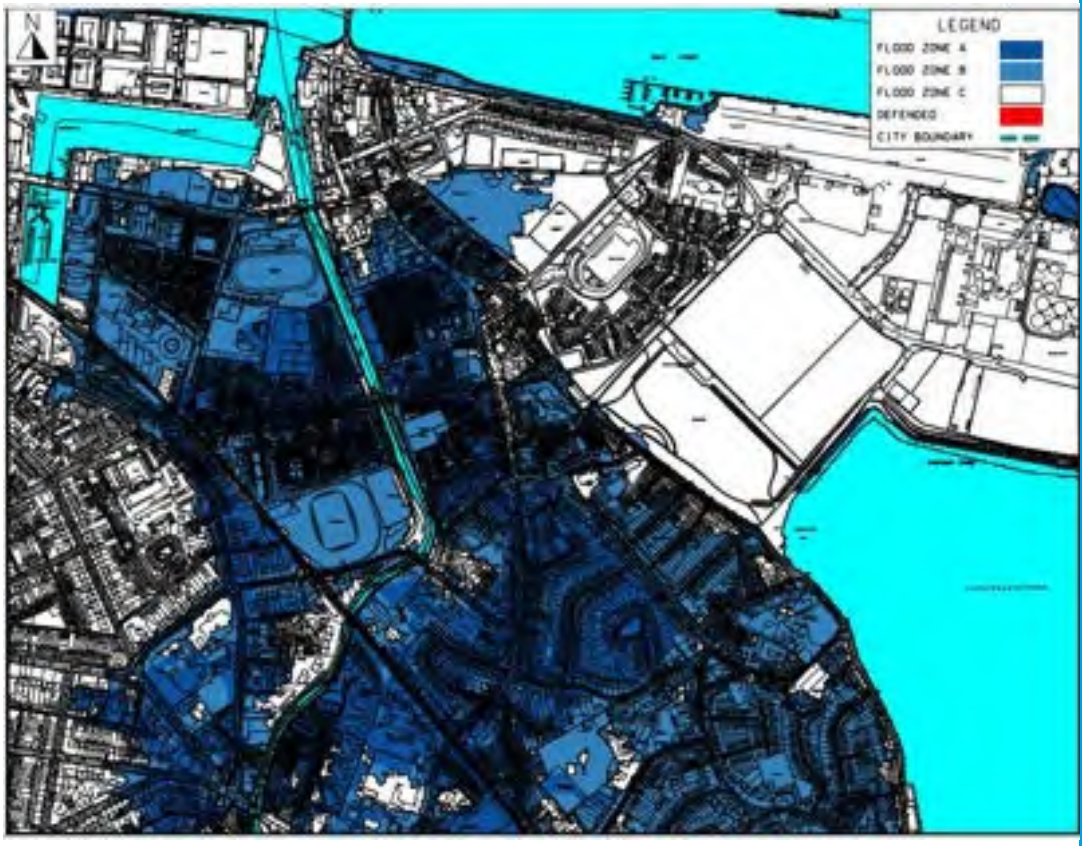
(v) There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement.

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. Areas denitifed as being in Flood Zones A and B are considered essential to achieving a consolidated urban centre and to comply with the NPF and RSES.

3. Specific Flood Risk Assessment:

- Given the high risk of tidal inundation in Sandymount, coupled with the varying standard of the flood defences and the high vulnerability nature of the current land use, the specific flood risk assessment has found that further development in Flood Zone A and B should not be progressed prior to proposed flood defences being completed. Small scale development, such as extensions, is acceptable, but larger scale development is premature. Once completed, new flood defences may alter restrictions on such developments and a reappraisal of flood risk would be appropriate as per this SFRA and the main Development Plan.
- Climate change risks are significant and need to be assessed under the site specific FRA with guidance on finished floor levels applied as detailed in the SFRA.
- Groundwater flooding particularly during high tide, should be considered in all development flood risk assessments in this site area.

Conclusion: The subject area <u>passes</u> the Justification Test for Development Plans.

Area: 9. Dodder: Liffey to Ballsbridge	
	
For Land Use Zoning Maps Overlaid with Flood Zones see Dublin City Council Development Plan 2022 - 2028, Flood Map E, Flood Map F and Flood Map H.	
Area Description	The area on the Dodder Estuary goes from the Liffey to Ballsbridge. On the western side of the Dodder the area extends from the Hanover / Charlotte's / Grand Canal Quays to south of the DART line to around Grand Canal Street / Shelbourne Road. This area includes the Aviva Stadium and Shelbourne Stadium. The area extends down to Ballsbridge and this includes Ballsbridge Gardens/ Wood, Lansdowne Woods, the Oval Shopping Centre and Estate Cottages. This area is characterised by high density commercial development and office HQ's such as Google HQ on Barrow Street and by low medium to high density residential development and shopping and community uses. On the eastern side of the Dodder, the area incudes south of East Link Toll Bridge, Ringsend Village, Park and Stadium, Irishtown Road, London Bridge Road and the Marian College and then toward Ballsbridge the Sweepstakes Site, Dodder View Cottages and Beatty's Avenue and Facebook

Area: 9. Dodder: Liffey to Ballsbridge	
	Ballsbridge Campus. This area is characterised by a mixture of low/ medium scale residential development with commercial and community uses including open space areas and then more commercial and higher density residential development at Ballsbridge. It is currently tidal to 30m above Ballsbridge. Development in this area is a mixture of high density commercial and residential with infill development of both. This area also forms part of the Docklands Strategic Development and Regeneration Area (See Section Chapter 13 of the Written Statement section 13.8 SDRA 6: Docklands).
SDRAs within this Area	Strategic Development and Regeneration Area (SDRA) No. 6 Docklands.
Benefitting from Defences (flood relief scheme works)	Flood defences incorporating the estimated 200-year tide level, plus 650mm for climate change, plus 300mm freeboard, plus allowance for fluvial surcharge at high tide have been constructed from Ringsend Bridge to Ballsbridge. These defences incorporate the latest design and together with 10 flood gates, which are generally closed the day before significant high tides, protect a large flood risk area which includes Stella Gardens, Irishtown Road, Derrynane Gardens, Bath Avenue, South Lotts, Lansdowne Village, Newbridge Avenue, Marian College, Aviva Stadium, Lansdowne Road, Sweepstakes Site, Dodder View cottages, Beatty's Avenue, Oval Shopping Centre, Ballsbridge Gardens, Ballsbridge Wood and Lansdowne Woods from extreme tidal flood events while also significantly reducing fluvial flood risk. The potential for tidal inundation directly from the sea still exists, as discussed in Area 8, Coastal: Sandymount. Below the railway bridge flood defences are in place protecting existing and proposed developments up to the 200-year flood level. Above this to Ballsbridge, new flood defences are under construction to protect to this standard.
Sensitivity to Climate Change	An increase of 0.65m for climate change, on top of the 200-year tide level, has been catered for in all of the flood wall and embankment designs. However, the potential impact of climate change in undefended areas, or in the event of defence overtopping or failure, is significant.

Area: 9. Dodder: Liffey to Ballsbridge	
Residual Risk	A structural inspection of all new defences is carried out each year and the defences are of known standard of protection. For the majority of developments, residual risk assessment can be limited to a qualitative assessment of risks. If particularly highly vulnerable or long term development is proposed it would be essential to review residual risks in more detail. This should include assessment of risks linked to coastal inundation as well as from the Dodder itself.
Historical Flooding	The SFRA flood maps are consistent with previous flooding of this section of the River Dodder in 1923 and 2002. The highest tide ever recorded on 3rd January 2014 was completely catered for by the new flood defences (apart from some small seepage at Fitzwilliam Quay through an old section of defences). A new scheme to reduce Fitzwilliam Quay seepage is at construction.
Surface Water	All surface water in this area needs to be carefully managed and provision made for significant rainfall events during high tides. A five year high tide event should be assumed during a 100-year rainfall event. Should development be permitted, best practice with regard to surface water management should be implemented across the development area, to limit surface water run-off to green/ brownfield values. Separation of surface and foul should be carried out where possible. All developments shall have regard to the Pluvial Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project**,** Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.
Commentary on Flood Risk: The flood extents indicate flow paths generally coming directly out of the tidal region of the Dodder. These can be compounded with local pluvial flooding or high river flows if heavy rainfall run-off coincides with a high tide. On the seaward (east) side, risk associated with direct inundation from the sea also arises. The flood maps were produced based on the OPW CFRAM Plan and checked against historic flooding in the area.	
Development Options: The main flood cells are located to the east and west of the River Estuary, which is currently zoned for a variety of different zonings, including residential uses (Z1 and Z2), part Z15 lands which would be for social/community uses, Z9 which would be to protect amenity and open	

space, and also some pockets of Z6 zoned land which would be to provide for the creation and protection of enterprise and facilitate opportunities for employment creation.

Commercial, industrial, and residential development (mainly infill) would be a natural extension of existing development. However, any development could reasonably be accommodated within the extents of Flood Zone C. Proposed development in Flood Zone A or B should be evaluated whether currently defended to this level or not.

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: This area is essential for the future expansion of the City. Development in this area is a mixture of low to high density commercial and residential with infill development of both. Development in the area is centred on urban villages such as Ringsend and Ballsbridge.

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

Answer: There would be a number of sites to be redeveloped in this area but these would be brownfield sites.

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

Area: 9. Dodder: Liffey to Ballsbridge

Answer: Yes: The lands form part of the established / designated urban settlement of Dublin City.

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

Answer: Yes: (see response to (iii) above).

(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.

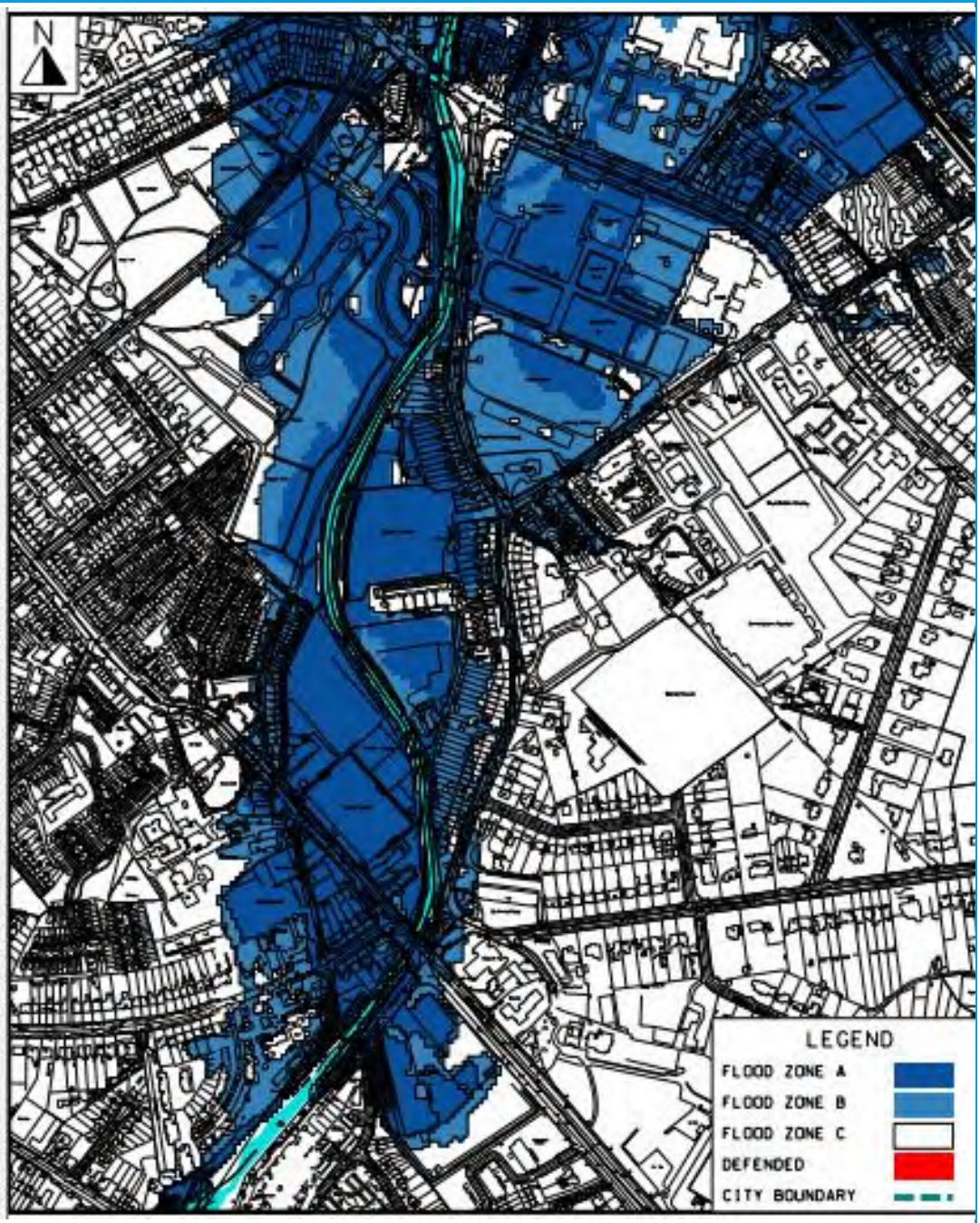
Answer: There are no suitable alternative lands for the particular uses or development type in areas at lower risk of flooding, within or adjoining the urban settlement.

3. Specific Flood Risk Assessment

- See Justification Test for Strategic Development and Regeneration Area No. 6 Docklands in Appendix C2 for specific recommendations in relation to that area.
- On the west side of the Dodder, development proposals should follow the general requirements for FRAs in the SFRA. On the east, potential flood mechanisms are more complex and the FRA should be prepared with consideration of the risks from the Dodder and from the sea.
- Even in areas which are defended from the tidal extents of the Dodder, given the high risk of tidal inundation in Sandymount, coupled with the varying standard of the flood defences and the high vulnerability nature of the current land use, the specific flood risk assessment has found that further development in Flood Zone A and B should not be progressed prior to the completion of flood defences at Sandymount, where relevant. Small scale development, such as extensions, is acceptable, but larger scale development is premature in areas with lower defence status. Once completed, new flood defences may alter restrictions on such developments and a reappraisal of flood risk would be appropriate as per this SFRA and the main Development Plan.
- Where development is proposed behind an existing embankment the applicant should consult with DCC to determine the extent of geotechnical investigation and residual risk assessment that is appropriate.
- Climate change risks are significant and need to be assessed under the site specific FRA with guidance on finished floor levels applied as detailed in the SFRA.
- Groundwater flooding particularly during high tide should be considered in all development flood risk assessments in this site area.

Area: 9. Dodder: Liffey to Ballsbridge
Conclusion: The subject area passes the Justification Test for Development Plans.

Area: 10. Dodder: Ballsbridge to Donnybrook Bridge



For Land Use Zoning Maps Overlaid with Flood Zones see Dublin City Council Development Plan 2022 - 2028, Flood Map E, Flood Map F and Flood Map H.

Area Description	This area on the Dodder River goes from the tidal weir upstream of Ballsbridge to Donnybrook (Anglesea Bridge). To the east, it includes Anglesea Road and areas between it and the river as well as some Flood Zones outside of this. To the west it includes

Area: 10. Dodder: Ballsbridge to Donnybrook Bridge	
	Herbert Park Hotel, Herbert Park and Old Wesley Rugby Football Club. Herbert Park Bridge, the RDS, Merrion Cricket Club and the Licensed Vintners HQ are in this area. This area has only fluvial and pluvial rainfall influences. Development in this area is a mixture of high density commercial and residential with infill development of both. There are a number of hotels, large residential buildings as well as high profile buildings and embassies in its area of significant flooding influence.
SDRAs within this Area	N/A
Benefitting from Defences (flood relief scheme works)	Flood defences incorporating 100-year river flow, plus 300mm freeboard have been constructed in this section of the Dodder except for the RDS wall which is operational and a section in Bective Rangers which is temporarily defended to the 50 year flood level. This section is programmed for completion in 2022-2023. There will be no flood gates in this section of the Dodder.
Sensitivity to Climate Change	An increase of 20% on top of the estimated 100-year fluvial level is planned to be catered for by storage upstream of where the Tallaght Stream joins the Dodder River.
Residual Risk	A structural inspection of all new defences is carried out each year and the defences are of known standard of protection. For the majority of developments, residual risk assessment can be limited to a qualitative assessment of risks. If particularly highly vulnerable or long term development is proposed it would be prudent to review residual risks in more detail.
Historical Flooding	The SFRA flood maps are consistent with previous flooding of this section of the River Dodder in 1986 and 2011.
Surface Water	All surface water in this area needs to be carefully managed and provision made for significant rainfall events during high river flows. Should development be permitted, best practice with regard to surface water management should be implemented across the development area, to limit surface water run-off to current values. Separation of surface water and foul sewage flows should be carried out where possible.

Area: 10. Dodder: Ballsbridge to Donnybrook Bridge	
	All developments shall have regard to the Pluvial Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project**,** Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.

Commentary on Flood Risk:

The flood extents indicate flow paths generally coming directly out of the river channel. These can be compounded with local pluvial flooding if heavy rainfall coincides with high river flows. Backing up of the local combined and surface water network can occur when heavy rainfall coincides with high river flows.

The flood maps were produced based on the OPW CFRAM Dodder Pilot Study and checked against historic flooding in the area. The fluvial risk in this area is defended to the estimated 50-year risk in Bective Rangers and to the estimated 100-year fluvial level elsewhere in this section.

Development Options:

The main flood cells are located to the east and west of the River; existing parkland and green spaces should be retained. All existing embankments and walls should be evaluated for new developments behind them.

Commercial, industrial, and residential development would be a natural extension of existing development. However, any development could reasonably be accommodated within the extents of Flood Zone C and should not need to extend into Flood Zone A or B unless defended.

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: This area is an established residential suburb of Dublin City. This area on the Dodder river goes from the tidal weir upstream of Ballsbridge to Donnybrook (Anglesea Bridge).

To the east, it includes Anglesea Road and areas between it and the river as well as some flood Zones outside of this. To the west, it includes Embassy House, Herbert Park and Old Wesley Rugby Football Club. Herbert Park Bridge, the RDS, Merrion Cricket Club, and the Licensed Vintners HQ are in this area. Development in this area is a mixture of high

density commercial and residential with infill development of both.

There are a number of hotels, large residential buildings as well as high profile buildings and embassies. This area is considered essential to the expansion of city.

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

Answer: The river along this stretch primarily flows through built up established residential suburbs of Donnybrook and Ballsbridge and contains a number of high profile sites, including the Royal Dublin Society (RDS), Herbert Park, Old Wesley Rugby Football Club, Merrion Cricket Club, and the Licensed Vintners HQ to name a few. Most of the lands in this area would be built up residential and or Open Space (Herbert Park). The Flood Cell also covers some lands owned by the RDS which is zoned Z15 (Community and Social Infrastructure) and Z9 (Open Space) uses.

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

Answer: Yes: The lands form part of the established / designated urban settlement of Dublin City.

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

Answer: Yes: (see response to (iii) above).

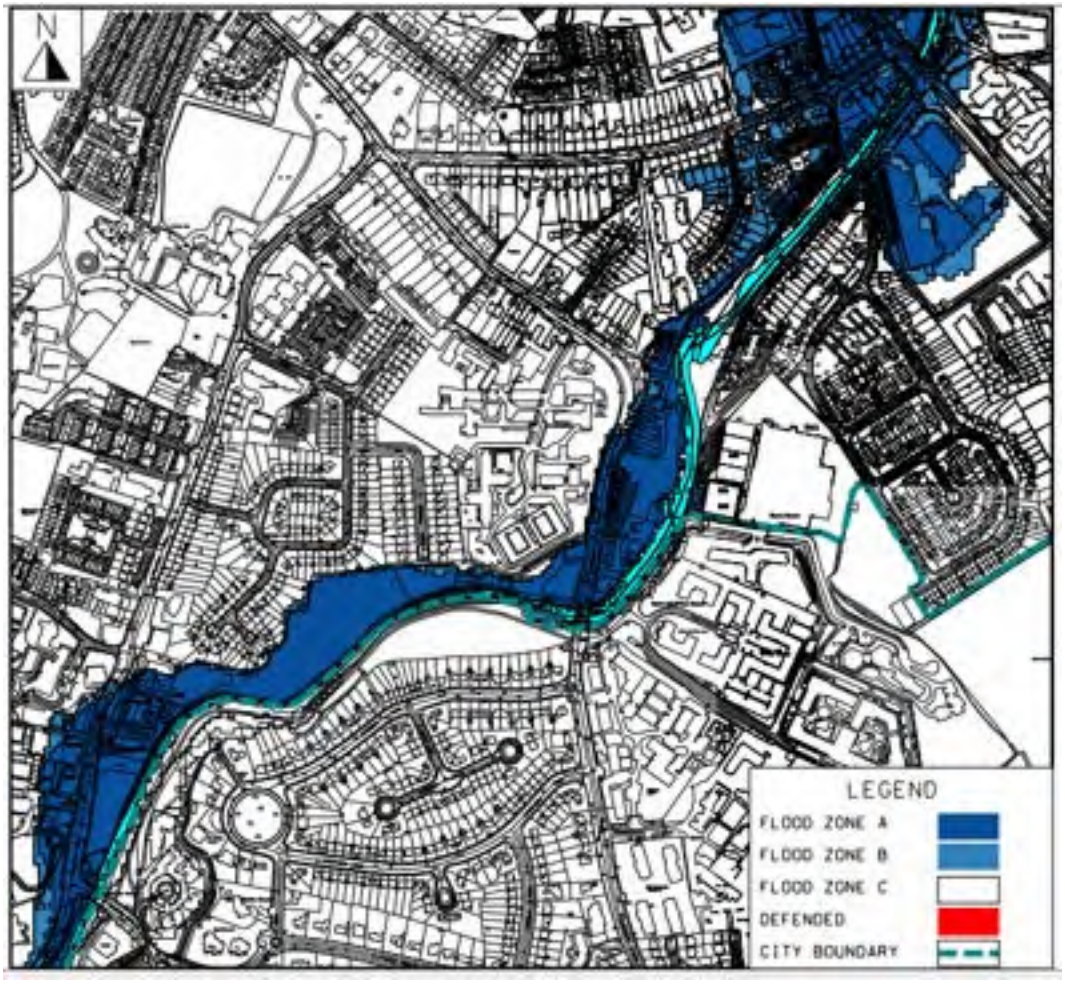
(v) There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement.

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

- Most of the flood cell is defended against the estimated 100 year fluvial flooding from the Dodder. As the progression of the flood defence works is ongoing, any site specific FRA should include a review and commentary on up-to-date risks.
- Where the defences have been completed, the FRA should follow the general guidance for development in defended locations.
- Where the defences have not been completed, all but very small scale extensions and changes of use would be considered premature. Once completed, new flood defences may alter restrictions on such developments and a reappraisal of flood risk would be appropriate at

Area: 10. Dodder: Ballsbridge to Donnybrook Bridge
the design stage for a development proposal, as per this SFRA and the main Development Plan. • A flood storage area upstream of the Tallaght stream junction with the main river has been identified to provide additional protection against increase river flows arising from climate change. • It is essential that this land, which sits within the functional area of South Dublin County Council, is protected for this function.
Conclusion: The subject area <u>passes</u> the Justification Test for Development Plans.

Area: 11. Dodder: Donnybrook Bridge – Dundrum Road	
	
For Land Use Zoning Maps Overlaid with Flood Zones see Dublin City Council Development Plan 2022 - 2028, Flood Map H.	
Area Description	This area on the Dodder river goes from Donnybrook (Anglesea) Bridge to Clonskeagh Bridge to Dundrum Road Bridge. To the southeast it includes Beaver Row and Beech Hill Road (in Dun Laoghaire-Rathdown County Council). To the northwest it includes the rear of the lower part of Eglington Road, Dunbar, Brookvale Road, two Smurfit Weirs, Ashton's Pub and the Smurfit Site. Upstream of Clonskeagh Bridge it includes Clonskeagh House, Scully's Field, Strand Terrace in Milltown. The southern floodplains are in Dun Laoghaire-Rathdown County Council's area and it should be consulted on any proposed development in or adjacent to its area. The area has only fluvial and pluvial rainfall influences. Development in this area is a mixture of low to high density commercial and residential with infill development of both.

Area: 11. Dodder: Donnybrook Bridge – Dundrum Road	
SDRAs within this Area	N/A
Benefitting from Defences (flood relief scheme works)	Defences up to the first Smurfit Weir are under construction.
Sensitivity to Climate Change	An increase of 20% on top of the estimated 100-year fluvial level is planned to be catered for by storage upstream of where the Tallaght Stream joins the River Dodder. A 30% increase in fluvial flows should be used when assessing the viability of any critical development/ infrastructure.
Residual Risk	As no existing defences are utilised this is not currently applicable, but assessment of residual risks will be required when new flood defences are in place.
Historical Flooding	The SFRA flood maps are consistent with previous flooding of this section of the River Dodder in 1986 and 2011.
Surface Water	All surface water in this area needs to be carefully managed and provision made for significant rainfall events during high river flows. Should development be permitted, best practice with regard to surface water management should be implemented across the development area, to limit surface water run-off to current values. Separation of surface water and foul sewage flows should be carried out where possible. All developments shall have regard to the Pluvial Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project**,** Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.
Commentary on Flood Risk: The flood extents indicate flow paths generally coming directly out of the river channel. These can be compounded with local pluvial flooding if heavy rainfall coincides with high river flows. Backing up of the local combined and surface water network can occur when heavy rainfall coincides with high river flows. Some fluvial flood routes are modelled to leave upstream of the Lower Smurfit Weir and carry on down Beaver Row flooding Simmonscourt Terrace before draining slowly back into the river. Pluvial flooding in the past has exacerbated this flooding. Another flood route is from Strand Terrace through Scully's Field and down	

Area: 11. Dodder: Donnybrook Bridge – Dundrum Road
to Clonskeagh House, across the Clonskeagh Road into the Smurfit site and back into the river. Any development to alter these flood routes needs to be carefully planned. These flood maps were produced based on the OPW CFRAM Dodder Pilot Study and checked against historic flooding in the area. A new flood study for this site started in 2020 and remains ongoing.
Development Options: The main flood cells in this area are located in parkland and in small residential developments. No new development should be allowed in these green areas unless they are water compatible. All existing embankments and walls should be evaluated for new developments behind them. Residential development (mainly infill) with a small amount of commercial would be a natural extension of existing development in this area. However, any development could reasonably be accommodated within the extents of Flood Zone C and should not need to extend into Flood Zone A or B unless defended. Some development may require to await future flood defence works in this area.
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:** This area is an established residential suburb of Dublin City. This stretch of the Dodder goes from Donnybrook (Anglesea) Bridge to Clonskeagh Bridge to Dundrum Road Bridge. To the southeast, it includes Beaver Row and Beech Hill Road (in Dun Laoghaire Rathdown County Council's area). To the northwest, it includes the rear of lower part of Eglington Road, Dunbar, Brookvale Road, two Smurfit Weirs, Ashton's Pub and the Smurfit Site. Upstream of Clonskeagh Bridge it includes the Clonskeagh House, Scully's field, Strand Terrace in Milltown. This area is essential to facilitate the expansion of the city. **(ii) Comprises significant previously developed and/or under-utilised lands.** **Answer: Yes:** The River along this stretch primarily flows through built-up established residential suburbs. Sites would generally consist of brownfield sites.

Area: 11. Dodder: Donnybrook Bridge – Dundrum Road

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

Answer: Yes: The lands form part of the established / designated urban settlement of Dublin City.

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

Answer: Yes: (see response to (iii) above).

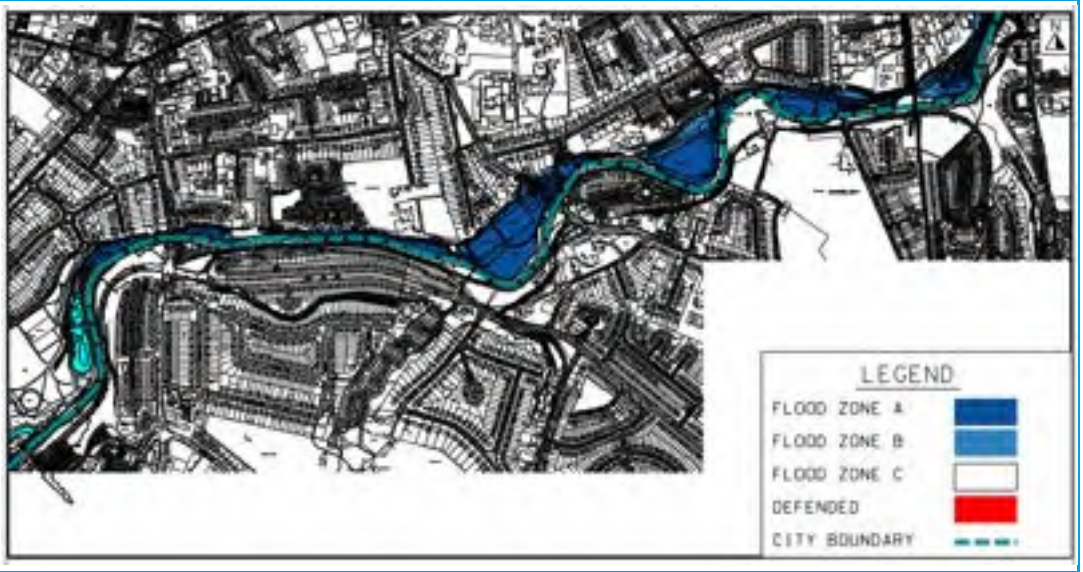
(v) There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement.

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

- Some areas within Flood Zone A and B are open space, providing a river corridor along the Dodder. These lands should be retained as they will provide moderation of flows to currently developed areas.
- Larger scale development or regeneration should be configured to avoid development within Flood Zone A and B, thus reconnecting the floodplain and minimising downstream flows.
- Development within Flood Zone A and B should be limited to small residential/ commercial extensions or changes of use. Surface water and overland flows have been identified as being important in this area, so should be fully assessed in any site specific flood risk assessment.
- Liaison with Dun Laoghaire-Rathdown County Council is required for any proposed development which may have cause a change in flood risk in its area.

Conclusion: The subject area passes Part 1 and 2 of the Justification Test for Development Plans and although Part 3 has found that new development should be located in Flood Zone C and avoid Flood Zone A and B, in situations where the applicant can demonstrate compliance with the Development Management Justification Test in Box 5.1 of the Flood Risk Management Guidelines, applications will be considered on their merits, having regard to the mitigation and management measures which the development can put in place.

Area: 12. Dodder: Dundrum Road – Bushy Park Boundary	
	
For Land Use Zoning Maps Overlaid with Flood Zones see Dublin City Council Development Plan 2022 - 2028, Flood Map G and Flood Map H.	
Area Description	This area on the River Dodder goes from Dundrum Road Bridge to the western end of Bushy Park on the north side of the river. This includes areas adjacent to Milltown Road, Shanagarry Apartments, the Dropping Well Pub, Classon's Bridge, Dartry Cottages, Dartry Park, Orwell Bridge, Rathfarnham Bridge and Bushy Park. The southern floodplains are in the functional areas of Dun Laoghaire-Rathdown County Council and South Dublin County Council and they should be consulted on any proposed development in this area. The area has only fluvial and pluvial rainfall influences. Development in this area is mainly parkland which has some frequently flooded areas. There is a mixture of low density residential and community with infill development of both.
SDRAs within this Area	N/A
Benefitting from Defences (flood relief scheme works)	Existing flood defences above ground level in this area generally have openings in them and therefore are not taken into consideration in the zoned maps. New flood defences in this area will not be constructed for a number of years.
Sensitivity to Climate Change	Moderate to high. An increase of 20% on top of the estimated 100-year fluvial level is planned to be

Area: 12. Dodder: Dundrum Road – Bushy Park Boundary	
	catered for by storage upstream of where the Tallaght Stream joins the River Dodder. A 30% increase in fluvial flows should be used when assessing the viability of any critical development/infrastructure.
Residual Risk	As no existing flood defences are in place this is not currently applicable but will apply when new flood defences are constructed.
Historical Flooding	The SFRA flood maps are consistent with previous flooding of this section of the River Dodder in 1986 and 2011 and at other times of high river flows.
Surface Water	All surface water in this area needs to be carefully managed and provision made for significant rainfall events during high river flows. Should development be permitted, best practice with regard to surface water management should be implemented across the development area, to limit surface water run-off to current values. Separation of surface and foul should be carried out where possible. All developments shall have regard to the Pluvial Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project**,** Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.
Commentary on Flood Risk: The flood extents indicate flow paths generally coming directly out of the river channel. These can be compounded with local pluvial flooding if heavy rainfall coincides with a high river flow. Backing up of the local combined and surface water network can occur when heavy rainfall coincides with high river flows. Some fluvial flood routes are modelled to leave upstream of the pedestrian bridge adjacent to Orwell Gardens and back into the river before Dartry Cottages. Any development to alter these flood routes needs to be carefully planned. The flood maps were produced based on the OPW CFRAM Dodder Pilot Study and checked against historic flooding in the area. A new study for this area commenced in 2020 and remains ongoing.	
Development Options: The main flood cells in this area on the DCC side are located in parkland. No new development should be allowed in these green areas unless they are water compatible ones. Residential development (mainly infill) with a small amount of commercial would be a natural extension of existing development in this area.	

Area: 12. Dodder: Dundrum Road – Bushy Park Boundary

However, any development could reasonably be accommodated within the extents of Flood Zone C and should not need to extend into Flood Zone A or B unless defended. Some development may have to await future flood works in this area.

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: This area is an established residential suburb of Dublin City. This stretch of the River Dodder runs along the boundary with Dun Laoghaire-Rathdown County Council and South Dublin County Council, and flows from Dundrum Road Bridge to the western end of Bushy Park on the north side of the river. This includes areas adjacent to Milltown Road, Shanagarry Apartments, Dropping Well Pub, Classon's Bridge, Dartry Cottages, Dartry Park, Orwell Bridge, Rathfarnham Bridge and Bushy Park. This area is an established residential suburb of Dublin City and is essential to facilitate the future expansion of the city.

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

Answer: The river along this stretch primarily flows through parkland which is zoned Z9 in the Plan which is '*To preserve, provide and improve recreational amenity, open space and ecosystem services'*. This land is unlikely to be redeveloped. Part of the river crosses over school grounds which appear to be in use as sports grounds for the schools, these lands are zoned Z15 in the current plan, which is '*To protect and provide for community uses and social infrastructure*'. There would be limited large sites for redevelopment along this stretch. Primarily development is likely to be small infill commercial or residential.

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

Area: 12. Dodder: Dundrum Road – Bushy Park Boundary

Answer: Yes: The lands form part of the established / designated urban settlement of Dublin City.

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

Answer: Yes: (see response to (iii) above).

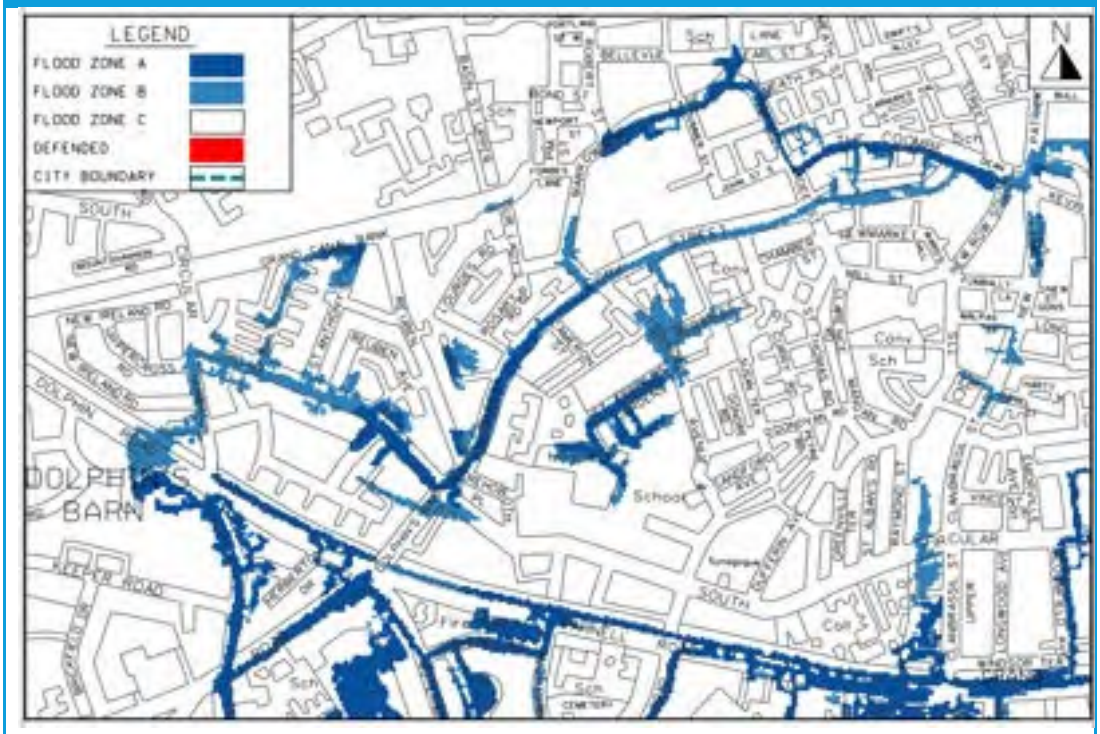
(v) There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement.

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

- Lands within Flood Zones A and B are zoned for water compatible uses, which are appropriate and provide greater benefits in retaining out of bank storage areas and facilitating the operation of downstream flood defences.
- New development will not be permitted within Flood Zone A or B. Any extension of existing uses (such as changing facilities associated with the school playing pitches for example) should undergo a suitable flood risk assessment, which should be aimed at setting finished floor levels and demonstrating no increase in flood risk elsewhere.

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.

Area: 13. Poddle: Inside Canal	
	
For Land Use Zoning Maps Overlaid with Flood Zones see Dublin City Council Development Plan 2022 - 2028, Flood Map E.	
Area Description	The area on the Poddle River culvert goes from the Grand Canal, to the South Circular Road to Donore Avenue, the Coombe, Cork Street and Marrowbone Lane and over to the Patrick Street/ Clanbrassil Street area. It is mainly fluvial with some tidal influence at its lower end. Development in this area is a mixture of low to high density residential and commercial with infill development of both.
SDRAs within this Area	SDRA 11 St. Teresa's Gardens and Environs SDRA 12 Dolphin House SDRA 15 Liberties and Newmarket Square
Benefitting from Defences (flood relief scheme works)	An overflow into the Grand Canal Sewer (surface water section) reduces flow in the Poddle River into the City Centre inside the Grand Canal. Construction of a new flood scheme on the Poddle River in both the areas of DCC and South Dublin County Council is due to start in 2023 (pending ABP final decision), which will change flood protection on this site and local flood risks.
Sensitivity to Climate Change	An increase of 20% for estimated climate change on top of the estimated 100 year river flow will

Area: 13. Poddle: Inside Canal	
	cause extra flooding in this area. A 30% increase in river flow on top of the estimated 100-year river will cause significant extra flooding.
Residual Risk	Any proposed developments in the protected areas require residual risk for blockage of Grand Canal overflow or other cause to be mitigated against, which may be an assessment of flowpaths and setting of appropriate finished floor levels. A structural inspection of this overflow will be carried out each year.
Historical Flooding	The SFRA flood maps are consistent with previous flooding of this section of the River Poddle.
Surface Water	All surface water in this area needs to be carefully managed and provision made for significant rainfall events during high river flows. Should development be permitted, best practice with regard to surface water management should be implemented across the development area, to limit surface water run-off to current values. Separation of surface water and foul sewage flows should be carried out where possible. All developments shall have regard to the Pluvial Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project**,** Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.
Commentary on Flood Risk: The flood extents indicate flow paths generally coming directly out of the river culvert through manholes and gully grids. These can be compounded with local pluvial flooding if heavy rainfall coincides with high river culvert flows. The flood maps were produced based on the OPW CFRAM Plan and they have been checked against historic flooding in the area.	
Development Options: The main flood cells in this area are located on roadways and in small residential, commercial and industrial developments. No new development should be allowed in these areas unless they are defended except for extensions and small infill provided the number of people at flood risk is not increased. There are three designated Strategic Development and Regeneration Areas within this area - SDRA 11 St. Teresa's Gardens and Environs, SDRA 12 Dolphin House and SDRA 15 Liberties and Newmarket Square.	

Area: 13. Poddle: Inside Canal

The first two are major residential development sites and the latter is a major residential and employment area.

Outside of the SDRA's residential development (mainly infill) with a small amount of commercial would be a natural extension of existing development in this area.

In all cases, any development could reasonably be accommodated within the extents of Flood Zone C and should not need to extend into Flood Zone A or B unless defended. Some development may be required to await future flood defence works on the Poddle River.

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: This area is an established built up part of the Inner City which is served by high quality public transport – Luas and Bus Connects. Three major regeneration areas have been designated in this area:

SDRA 11 St. Teresa's Gardens and Environs – this is identified for primarily residential development.

SDRA 12 Dolphin House – this is identified for primarily residential development

SDRA 15 Liberties and Newmarket Square - this is identified for residential and employment/ mixed uses.

The regeneration of these older social housing projects (former PPP's) and the Diageo lands are identified in the RSES / MASP as crucial for the creation of sustainable compact communities with improved housing choice, access to social and economic opportunities, enhanced services and amenities. Outside of these areas, development in this area is a mixture of low to high density residential and commercial with infill development of both. This area would be essential for the future expansion of the urban settlement.

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

Answer: Yes. Sites would predominately be brownfield sites. Development in this area will be a mixture of residential, commercial/ retail, community uses.

Area: 13. Poddle: Inside Canal

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

Answer: Yes: The lands are located within the canals and form part of the Inner City.

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

Answer: Yes: (see response to (iii) above).

(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.

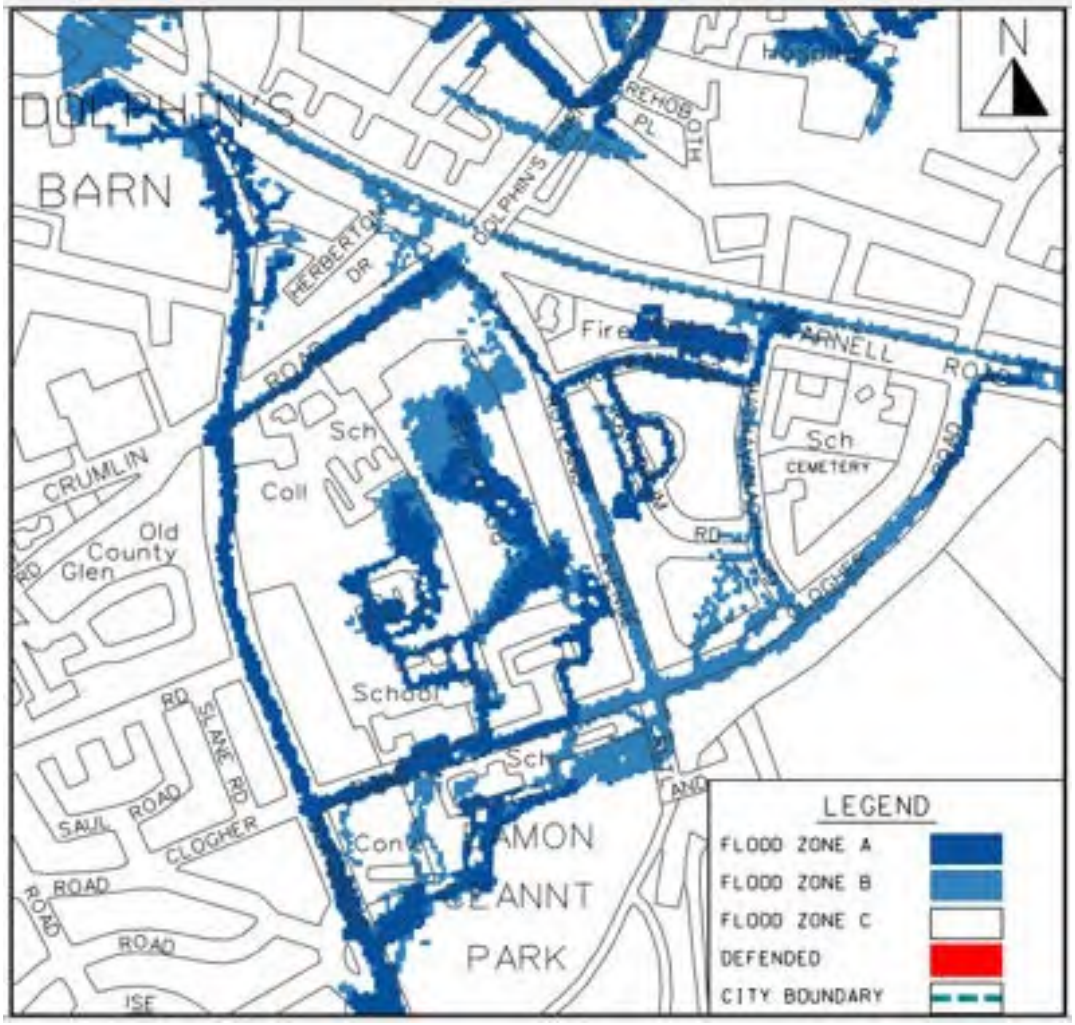
Answer: There are no suitable alternative lands for the particular uses or development type in areas at lower risk of flooding, within or adjoining the urban settlement.

3. Specific Flood Risk Assessment

- See Justification Test for Strategic Development and Regeneration Areas No's. 11 (St. Teresa's Gardens and Environs) and 15 (Liberties and Newmarket Square) in Appendix C2.
- Modelling shows that risks are primarily linked to the development of overland flow paths which progress along roads. FRAs for developments should specifically address this risk, both to ensure flow paths do not become obstructed and to ensure an appropriate standard of flood resilient construction, which should include (where possible) raising finished floor levels to a minimum of 300mm above road / pavement height.
- Particular attention to the design of any proposed basements should be carried out with full recognition of DCC policies and objectives and the detail in the SFRA, in this regard.

Conclusion: The subject area passes the Justification Test for Development Plans.

Area: 14. Poddle: Culverts outside Canal



For Land Use Zoning Maps Overlaid with Flood Zones see [Dublin City Council Development Plan 2022 - 2028](), Flood Map E, Flood Map G and Flood Map H.

Area Description	This area on the Poddle River goes from Sundrive Road and Clogher Road, to Lower Crumlin Road, to Rutland Avenue, to Keeper Road and the Grand Canal. Development in this area is a mixture of low to high density residential and commercial with infill development of both.
SDRAs within this Area	N/A
Benefitting from Defences (flood relief scheme works)	No existing defences are present. Construction of a new flood scheme on the Poddle in the areas of both DCC and South Dublin County Council is due to start in 2023 (subject to a final decision by ABP).
Sensitivity to Climate Change	An increase of 20% flow on top of the estimated 100-year culvert flow will cause more flooding in this area. A 30% increase in river flow on top of the estimated

	100-year culvert flows will cause significant flooding.
Residual Risk	There are no defences, but residual risks arising from blockage of the culverts is possible and should be assessed to determine how flow paths and water depths may be changed.
Historical Flooding	The SFRA flood maps are consistent with previous flooding of this section of the River Poddle.
Surface Water	All surface water in this area needs to be carefully managed and provision made for significant rainfall events during high river flows. Should development be permitted, best practice with regard to surface water management should be implemented across the development area, to limit surface water run-off to current values. Separation of surface water and foul sewage flows should be carried out where possible. All developments shall have regard to the Pluvial Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project**,** Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.
Commentary on Flood Risk: Flood risk is a combination of fluvial and pluvial. The flood extents indicate flow paths generally coming directly out of the river culvert through manholes and gully grids as well as some overland flows from the river itself upstream of its crossing on Sundrive Road. These can be compounded with local pluvial flooding if heavy rainfall coincides with high river culvert flows. The flood maps were produced based on the OPW CFRAM Plan and they have been checked against historic flooding in the area. Construction of a new flood scheme on the Poddle both in the areas of DCC and South Dublin County Council is due to start in 2023, pending final decision by ABP, which will change flood protection on this site and local flood risks.	
Development Options: The main flood cells in this area are located on roadways and in small residential and commercial developments. No new development should be allowed in these areas unless they are defended except for extensions and small infill provided the number of people at flood risk is not increased. Residential development (mainly infill/ brownfield development); the redevelopment of the Crumlin Shopping Centre (Crumlin Key Urban Village) and other small commercial developments would be a natural extension of existing development in this area. However, any development could reasonably be accommodated within the extents of Flood Zone C and should not need to extend into Flood Zone A or B unless defended. Some development may require to await future flood works on the River Poddle.	

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: This area is an established residential suburb of Dublin City. Significant residential mixed-use development is envisaged along Herberton Road (former industrial/ employment lands) and significant residential and commercial/ community development is envisaged at the former Crumlin Shopping Centre, a designated Key Urban Village. Development in this area is currently low density residential, commercial and community with infill development of both. This area is essential for the future expansion of the city.

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

Answer: Yes. Sites would predominately be brownfield sites. This area is well serviced in terms of public transport, infrastructure and local services. Development in this area is likely to be a mixture of mainly residential, community and commercial/ local retail. .

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

Answer: Yes: The lands form part of the established / designated urban settlement of Dublin City.

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

Answer: Yes: (see response to (iii) above).

    (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.

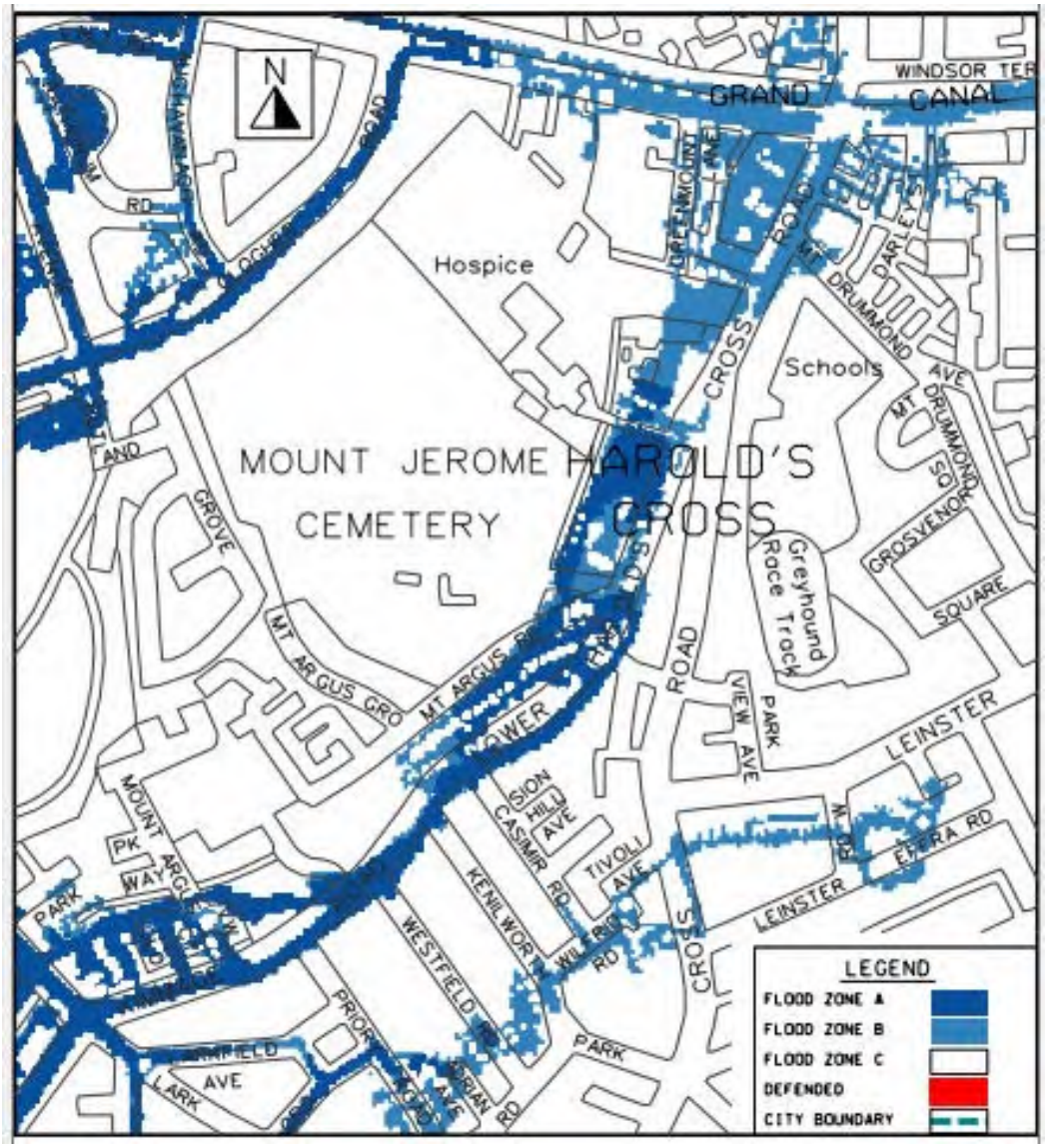
3. Specific Flood Risk Assessment

- Modelling shows that risks are primarily linked to the development of

overland flow paths which progress along roads. FRAs for developments should specifically address this risk, both to ensure flow paths do not become obstructed and to ensure an appropriate standard of flood resilient construction, which should include (where possible) raising finished floor levels to a minimum of 300mm above road/ pavement height.

- Particular attention to the design of any proposed basements should be carried out with full recognition of DCC policies and objectives, and the detail in the SFRA, in this regard.

Conclusion: The subject area <u>passes</u> the Justification Test for Development Plans.

Area: 15. Poddle: Grand Canal to Sundrive Road	
	
For Land Use Zoning Maps Overlaid with Flood Zones see[Dublin City Council Development Plan 2022 - 2028](), Flood Map E. Flood Map H and Flood Map G.	
Area Description	This area on the Poddle River goes from Sundrive Road to Eamon Ceannt Park and from Sundrive Road to Parnell Road beside the Grand Canal and includes a stretch from Larkfield Avenue/ Park in Kimmage to south of Leinster Road in Harolds Cross. Development in this area is a mixture of mainly low density residential development with some commercial uses and community/ open space uses. There are also examples of high density residential infill.
SDRAs within this	N/A

Area: 15. Poddle: Grand Canal to Sundrive Road	
Area	
Benefitting from Defences (flood relief scheme works)	No existing defences are present. Construction of a new flood scheme on the River Poddle in the areas of both DCC and South Dublin County Council is due to start in 2023, subject to ABP final decision.
Sensitivity to Climate Change	An increase of 20% flow on top of the estimated 100-year river flow will cause more flooding in this area. A 30% increase in river flow on top of the estimated 100-year culvert flow will cause significant flooding.
Residual Risk	Not applicable
Historical Flooding	The SFRA flood maps are consistent with previous flooding of this section of the River Poddle.
Surface Water	All surface water in this area needs to be carefully managed and provision made for significant rainfall events during high river flows. Should development be permitted, best practice with regard to surface water management should be implemented across the development area, to limit surface water run-off to current values. Separation of surface water and foul sewage flows should be carried out where possible. All developments shall have regard to the Pluvial Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project**,** Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.
Commentary on Flood Risk: The flood extents indicate flow paths generally coming directly out of the River Poddle at Gandon Close, Mount Argus Road and re-entering the river downstream either directly or through the drainage network. These can be compounded with local pluvial flooding if heavy rainfall coincides with high river flows. The flood maps were produced based on the OPW CFRAM Plan and they have been checked against historic flooding in the area. Construction of a new flood scheme on the River Poddle in the areas of both DCC and South Dublin County Council is due to start in 2023, subject to ABP final decision, which will change flood protection on this site and local flood risks.	
Development Options: The main flood cells in this area are located in residential areas with some in community/ commercial areas. No new development should be allowed	

Area: 15. Poddle: Grand Canal to Sundrive Road

in these areas unless they are defended except for extensions and small infill provided the number of people at flood risk is not increased.

Residential development (mainly infill) with community and a small amount of commercial would be a natural extension of existing development in this area. However, any development could reasonably be accommodated within the extents of Flood Zone C and should not need to extend into Flood Zone A or B unless defended. Some development may require to await future flood defence works on the River Poddle.

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: This area is an established residential suburb of Dublin City. The River Poddle in this section flows from Sundrive Road to around Eamon Ceannt Park and Sundrive Road to Parnell Road beside the Grand Canal and from Larkfield Avenue / Park in Kimmage to south of Leinster Road in Harolds Cross. Development in this area is a mixture of mainly residential, community and some commercial with infill development of both. This area is essential to the future expansion of the City.

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

Answer: Yes: There would be limited large development sites. Any sites for redevelopment would predominately be infill brownfield sites. Development in this area is likely to be a mixture of mainly residential, community and some commercial.

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

Area: 15. Poddle: Grand Canal to Sundrive Road

Answer: Yes: The lands form part of the established / designated urban settlement of Dublin City.

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

Answer: Yes: (see response to (iii) above).

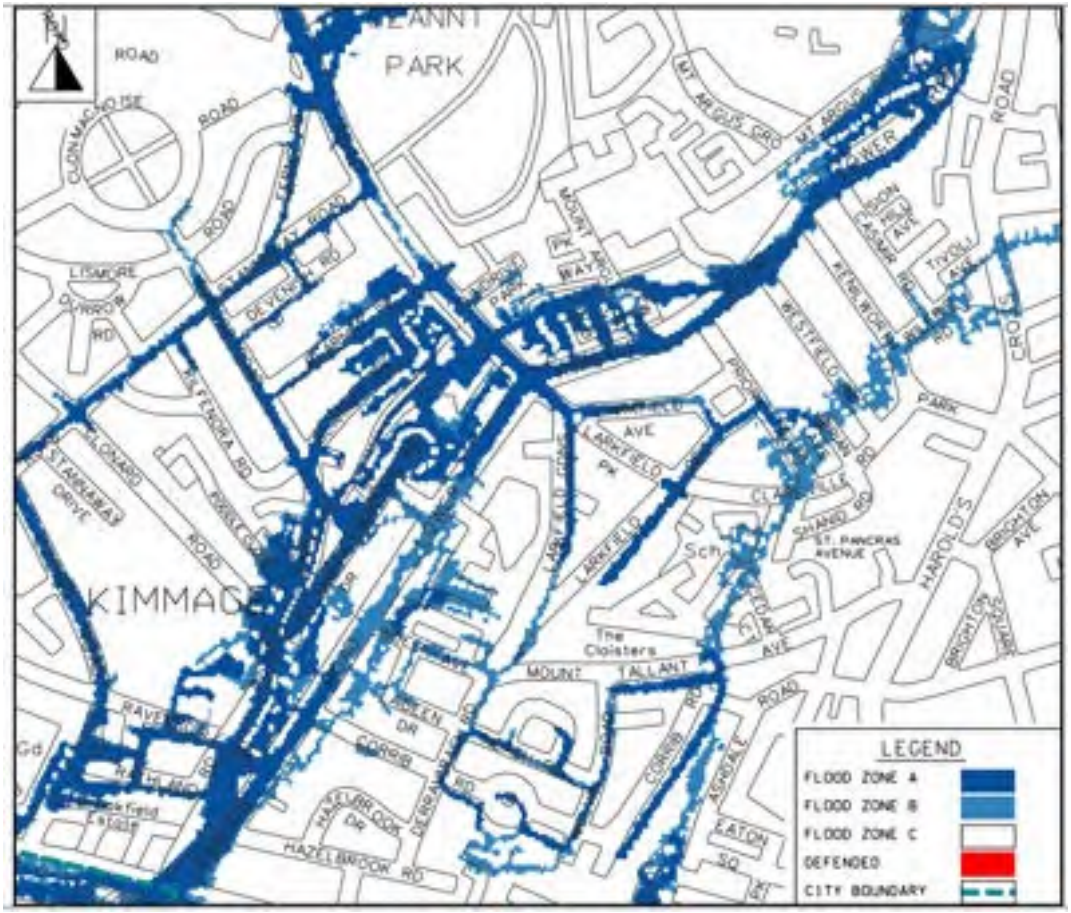
(v) There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement.

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

- Flood risks in this area are through a combination of direct channel capacity exceedance and the resulting overland flows, both from a natural lack of capacity and through potential blockage of culverts.
- Modelling also shows that risks are primarily linked to the development of overland flow paths which progress along roads and pond in both undeveloped and developed sites. FRAs for developments should specifically address this risk, both to ensure flow paths do not become obstructed and to ensure an appropriate standard of flood resilient construction, which should include (where possible) raising finished floor levels to a minimum of 300mm above road/ pavement height. Given the importance of retaining overland flow paths and current storage areas within the existing developed lands, new highly or less vulnerable development within Flood Zones A or B cannot be justified and should be avoided. Water compatible development, such as parks and playing fields are permitted, provided there is no loss in storage capacity or obstruction of flow routes where development in Flood Zone C is proposed, overland flow routes arising from culvert blockage should also be assessed and any resulting flow paths (which may not be highlighted in the Flood Zone Maps) should also be protected.
- Construction of a new flood scheme on the River Poddle in the areas of both DCC and South Dublin County Council is due to start in 2023, subject to ABP final decision, which will change flood protection on this site and local flood risks.
- Development proposals for sites in Greenmount Industrial Estate and surrounding area encompassed by Flood Zones A and B shall have an emergency plan in place, including the issue and receipt of flood warnings as well as emergency evacuation procedures and recovery plans following an extreme flood event.

Area: 15. Poddle: Grand Canal to Sundrive Road
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.

Area: 16. Poddle: Sundrive Road – Kimmage Road West	
	
For Land Use Zoning Maps Overlaid with Flood Zones see[Dublin City Council Development Plan 2022 - 2028](), Flood Map G and Flood Map H.	
Area Description	This area on the Poddle River goes from Kimmage Road / Terenure Road West to Sundrive Road Larkfield Park. The area stretches from St. Annaway Road in the north to the west of Terenure Road North. Development in this area is a mixture of mainly residential, community and some commercial with infill development of both.
SDRAs within this Area	N/A
Benefitting from Defences (flood relief scheme works)	There is a length of embankment and low flood wall within Poddle Park, but this is incomplete and does not function as a flood defence. It does influence flow paths, particularly in lower return period events, so has been retained in the model that produced the Flood Zone Maps. Construction of a new flood scheme on the River Poddle both in the areas of DCC and South Dublin County Council is due to start in 2023, subject to

Area: 16. Poddle: Sundrive Road – Kimmage Road West	
	final decision by ABP.
Sensitivity to Climate Change	An increase of 20% flow on top of the estimated 100-year river flow will cause more flooding in this area. A 30% increase in river flow on top of the estimated 100-year culvert flow will cause significant flooding.
Residual Risk	Risks associated with culvert blockage should be investigated and appraised and this assessment should be used to inform site layout and building finished floor levels. It is important that overland flow routes are not blocked as a result of development.
Historical Flooding	The SFRA flood maps are consistent with previous flooding of this section of the River Poddle. There is a history of flooding at Harold's Cross and this has been reflected in the Flood Zones based on records of the events.
Surface Water	All surface water in this area needs to be carefully managed and provision made for significant rainfall events during high river flows. Should development be permitted, best practice with regard to surface water management should be implemented across the development area, to limit surface water run-off to current values. Separation of surface water and foul sewage flows should be carried out where possible. All developments shall have regard to the Pluvial Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project**,** Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.
Commentary on Flood Risk: The flood extents indicate flow paths generally coming directly out of the river at Poddle Park and Ravensdale Park and re-entering the river downstream either directly or through the drainage network. Other flow routes stay out of the river and enter the drainage network elsewhere. Further fluvial flows are estimated to come down Whitehall Road, in South Dublin and into the Dublin City area. These can be compounded with local pluvial flooding if heavy rainfall coincides with high river culvert and river flows. The flood maps were produced based on the OPW CFRAM Plan and they have been checked against historic flooding in the area. Construction of a new flood scheme on the Poddle both in the areas of DCC and South	

Area: 16. Poddle: Sundrive Road – Kimmage Road West

Dublin County Council is due to start in 2023, subject to ABP final decision, which will change flood protection on this site and local flood risks.

Development Options:

The main flood cells in this area are located in residential, commercial, industrial and community developments. No new development should be allowed in these areas unless they are defended except for extensions and small infill provided the number of people at flood risk is not increased.

Residential development (mainly infill) with a small amount of commercial and industrial would be a natural extension of existing development in this area. However, any development could reasonably be accommodated within the extents of Flood Zone C and should not need to extend into Flood Zone A or B unless defended. Some development may be required to await future flood defence works on the River Poddle.

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: This area is an established residential suburb of Dublin City. The Poddle River in this area flows through mainly residential areas from Kimmage Road West to Sundrive Road. Development in this area is a mixture of mainly residential, with some commercial/ industrial and community.

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

Answer: Sites would predominately be brownfield sites. Development in this area is likely to be a mixture of mainly residential, community and some commercial.

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

Area: 16. Poddle: Sundrive Road – Kimmage Road West

Answer: Yes: The lands form part of the established / designated urban settlement of Dublin City.

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

Answer: Yes: (see response to (iii) above).

(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

- Flood risks in this area are through a combination of direct channel capacity exceedance and the resulting overland flows, both from culvert overtopping and through potential blockage of culverts.
- Modelling also shows that flood risks are primarily linked to the development of overland flow paths which progress along roads and pond in both undeveloped and developed sites. FRAs for developments should specifically address this risk, both to ensure flow paths do not become obstructed and to ensure an appropriate standard of flood resilient construction, which should include (where possible) raising finished floor levels to a minimum of 300mm above road/ pavement height.
- Given the importance of retaining overland flow paths and current storage areas within the existing developed lands, new highly or less vulnerable development within Flood Zones A or B cannot be justified and should be avoided. Water compatible development, such as parks and playing fields are permitted, provided there is no loss in storage capacity or obstruction of flow routes.
- Where development in Flood Zone C is proposed, overland flow routes arising from culvert blockage should also be assessed and any resulting flow paths (which may not be highlighted in the Flood Zone Maps) should also be protected.
- In Harold's Cross, where it is known that culvert blockage is a significant risk, the outlines have been amended to take into account the possible impacts of a blocked culvert. In this area it will not be appropriate to refer to the CFRAM Study in relation to climate change extents. Instead, a combined culvert blockage and climate change run should be carried out as part of the Site Specific Flood Risk Assessment. A typical blockage factor of 50% should be assessed.
- Construction of a new flood scheme on the River Poddle in the areas of both DCC and South Dublin County Council is due to start in 2023, subject to ABP approval, which will change flood protection on this site and local flood risks.

Area: 16. Poddle: Sundrive Road – Kimmage Road West
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.

Area: 16A. Poddle: Terenure Road West, Templeogue Road to City Boundary	
	
For Land Use Zoning Maps Overlaid with Flood Zones see [Dublin City Council Development Plan 2022 - 2028](), Flood Map G and Flood Map H.	
Area Description	This area between Terenure Road West, Templogue Road and Fortfield Road and the city boundary south of Bushy Park consists of existing residential development, Terenure College, Bushy Park and small infill sites. Most of the flood risk is fluvial flood Zone B from the River Poddle so commercial development is allowed but new residential development will have to be cognisant of this flood zoning.
SDRAs within this Area	N/A
Benefitting from Defences (flood relief scheme	There are no constructed flood defences for this area, the existing drainage system does reduce flood risk in the areas.

works)	
Sensitivity to Climate Change	Climate change will increase flood risk in this area also blockage of some river screens.
Residual Risk	There is no residual risk as there are no existing flood defences in this area.
Historical Flooding	The flood maps for the River Poddle are generally consistent with historic flooding.
Surface Water	All surface water in this area needs to be carefully managed and provision made for significant rainfall events during high tides. A one year high tide event should be assumed during a 100-year rainfall event. Should development be permitted, best practice with regard to surface water management should be implemented across the development area to limit surface water run-off to current values. The use of SuDS and green infrastructure should be considered in the first instance to reduce flooding. All developments shall have regard to the Pluvial Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project**,** Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.
Commentary on Flood Risk: The flood extents indicate flow paths generally coming directly out of the fluvial region. The flood maps are based on the latest information from the current River Poddle Flood Alleviation Scheme.	
Development Options: The main flood cells in this area are located in residential and community developments such as open space. Residential development (mainly infill) with a small amount of commercial would be a natural extension of existing development in this area. However, any development could reasonably be accommodated within the extents of Flood Zone C and should not need to extend into Flood Zone A or B until the Poddle Flood Alleviation Scheme is constructed. Pluvial flooding to be managed on site.	
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: This area is an established residential suburb of Dublin City. The River Poddle in this area flows through mainly residential areas from Kimmage Road West to Sundrive Road. Development in this area is a mixture of mainly residential, with some commercial/ industrial and community.

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

Answer: Yes: Sites would predominately be brownfield sites. Development in this area is likely to be a mixture of mainly residential, community and some commercial.

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

Answer: Yes: The lands form part of the established / designated urban settlement of Dublin City.

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

Answer: Yes: (see response to (iii) above).

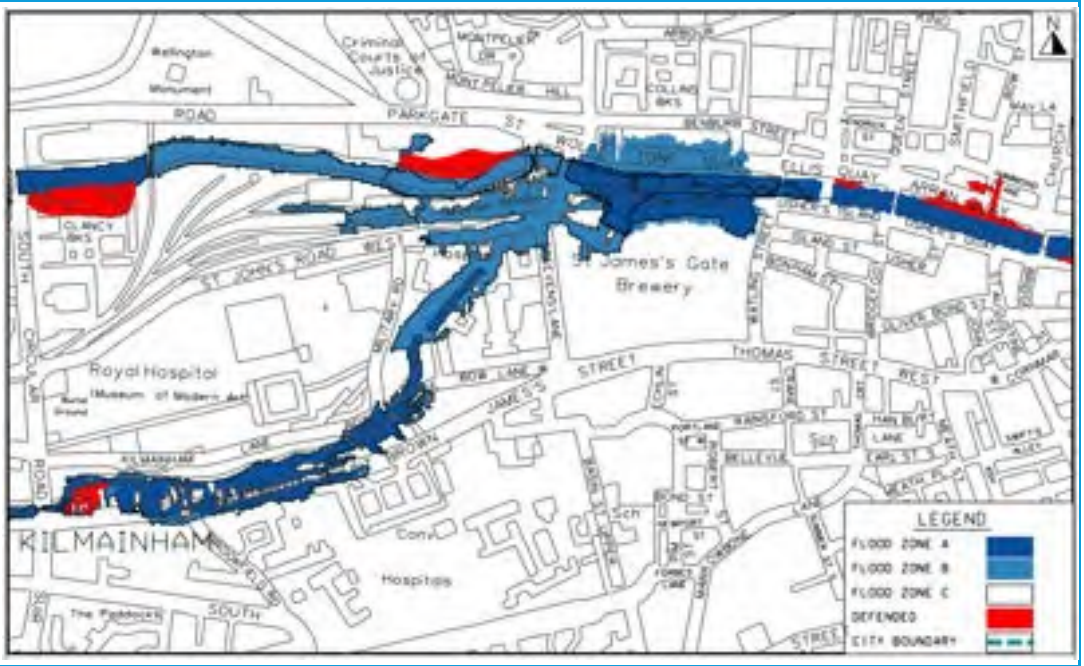
(v) There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement.

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 area is mainly located within Flood Zone C for fluvial flooding. Some portions of the lands are within Flood Zones B and a very small amount in flood Zone A. Most development could reasonably be accommodated within the extents of Flood Zone C, so there should be no highly vulnerable development in Flood Zone A or B, and less vulnerable development should be limited to Flood Zone B or C.
The construction of the River Poddle FAS may change development possibilities in the lifetime of this Development Plan.

Conclusion: The subject area <u>passes</u> the Justification Test for Development Plans.

Area: 17. Lower Camac: South Circular Road to Liffey Estuary	
	
For Land Use Zoning Maps Overlaid with Flood Zones see Dublin City Council Development Plan 2022 - 2028, Flood Map E.	
Area Description	In this section the River Camac flows through residential areas and industrially zoned lands in Kilmainham where it then runs behind the St. Patricks Hospital before entering the Liffey alongside Heuston Station. The area is characterised by residential development, emerging urban quarters such as the Heuston Quarter, the St. James/ St. Patrick's Hospitals and the National Children's Hospital. The areas primarily located in Flood Zone A lie between Kilmainham Lane and Old Kilmainham Road/ Mount Brown Road (north of National Children's Hospital) and Bow Lane which are currently zoned/developed for residential and employment purposes. Some lands owned by the OPW north of the river is one of the few exceptions where Zone B encroaches on part of the site and climate change may affect more of it in the future. Most developments are likely to be infill/ brownfield.
SDRAs within this Area	SDRA 7 Heuston and Environs. SDRA 14 St. James's Medical Campus and Environs.
Benefitting from	Apart from the most westerly section at Lady's

Area: 17. Lower Camac: South Circular Road to Liffey Estuary	
Defences (flood relief scheme works) and residual risk	Lane and Castleforbes Terrace, shown red, the area does not benefit from defences. The protected areas at Lady's Lane and Castleforbes Terrace have residual risk for the 100-year fluvial event, and will flood through overtopping during any event greater than the 1 in 100-year flood. The CFRAM Study for the River Camac did not reveal any overall flood alleviation scheme for the catchment, except for flood awareness and flood warning systems. A new flood study is underway since 2019.
Sensitivity to Climate Change	Slight to moderate - there is little difference between the extents of Flood Zone A and B in most locations. Sea level rise is likely to have more of an impact on water levels at the downstream end. For large scale development within areas shown to be vulnerable to climate change a more detailed hydraulic study may be required to fully understand the risks. The standard of protection given by existing defences will also be reduced as climate change impacts are felt. Climate change flood extents can be seen on www.floodinfo.ie
Residual Risk	The protected areas at Lady's Lane and Castleforbes Terrace have residual risk for the 100-year fluvial event, and will flood through overtopping during any event greater than the 1 in 100-year flood.
Historical Flooding	The flood maps attached are consistent with previous flooding of this section of the River Camac.
Surface Water	This portion of the River Camac catchment is susceptible to pluvial flooding from intense rainfall events, particularly the section along Old Kilmainham Road and Mount Brown from the South Circular road to Cromwell's Quarters. Should development be permitted, best practice with regards to surface water management should be implemented across the development area, to limit surface water run-off to current values. All developments shall have regard to the Pluvial Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project**,** Volume 2 City Wide Pluvial Flood Risk

Area: 17. Lower Camac: South Circular Road to Liffey Estuary	
	Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.

Commentary on Flood Risk:

The flood extents indicate flow paths generally coming directly out of the river channel. Pluvial flooding may increase flooding risk if it occurs during high river flows.

The flood maps were produced based on the OPW CFRAM Plan and checked against historic flooding in the area.

Development Options:

The main flood cells in this area are located in residential and small commercial and industrial developments. No new development should be allowed in these areas unless they are defended except for extensions and small infill provided the number of people at flood risk is not increased.

There are two designated Strategic Development and Regeneration Areas within this Area - SDRA 7 Heuston and Environs and SDRA 14 St. James's Healthcare Campus and Environs. SDRA 7 Heuston and Environs seeks the creation of a mixed use quarter centred on a multi-modal public transport hub and SDRA 14 St. James's Healthcare Campus and Environs seeks the development of a leading health and innovation hub.

Residential and employment development (infill) and as per that detailed for the SDRA's as set out in Chapter 13 of the Written Statement of the Development Plan would be a natural extension of existing development in this area. However, any significant development could reasonably be accommodated within the extents of Flood Zone C and should not need to extend into Flood Zone A or B unless defended. Some development may require to await future flood defence works on the River Camac.

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:

This area is an established built-up part of the Inner City which is served by high quality public transport – Main Line Rail/ Luas and Bus Connects. Two major regeneration areas have been designated in this area - SDRA 7

Area: 17. Lower Camac: South Circular Road to Liffey Estuary

Heuston and Environs and SDRA 14 St. James's Healthcare Campus and Environs.

The regeneration of lands at Heuston Station and at St. James's Healthcare Campus for mixed use and employment purposes are identified in the RSES/ MASP as crucial for the creation of sustainable compact communities with improved housing choice, access to social and economic opportunities, enhanced services and amenities.

The areas located in Flood Zones A and B are primarily built-up, especially around Kilmainham/ Mount Brown Road/ Bow Lane/ Heuston, where the area comprises established built-up residential areas, industrial / employment lands and commercial properties. Aside from the SDRA lands within this area development could come forward on underutilised infill/brownfield lands or extensions onto existing properties. This area is an established built-up part of the city.

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

Answer: Yes. Most of the lands within Flood Zone A and B are already built up or comprise of infill or brownfield sites which could be redeveloped.

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

Answer: Yes: The lands form part of an established built-up part of the Inner City close to Strategic Rail Infrastructure. The area around Heuston and St. James's Hospital are identified as Strategic Development and Regeneration Areas (SDRAs) under the Core Strategy, designated parts of the city with substantial development capacity and the potential to contribute to the delivery of the residential, employment and recreational needs of the city. The Heuston Area has the potential to deliver a significant quantum of mixed-uses. St. James's Healthcare Campus and Environs seeks the development of a leading health and innovation hub.

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

Answer: Yes: The lands form part of an established built-up part of the city close to Strategic Rail Infrastructure. The intensification and development of lands at Heuston and lands at St. James's Healthcare Campus as well as the intensification of development on infill brownfield lands would represent appropriately high-density use of lands within the city. The lands are served by the Luas Red Line. Multiple bus routes operated by Dublin Bus serve the area. The lands are within walking distance of Heuston Railway Station. High density development on the lands will contribute to sustainable travel patterns. The lands are well

serviced by existing utilities and water services infrastructure, so a minimum of new infrastructure will be required.

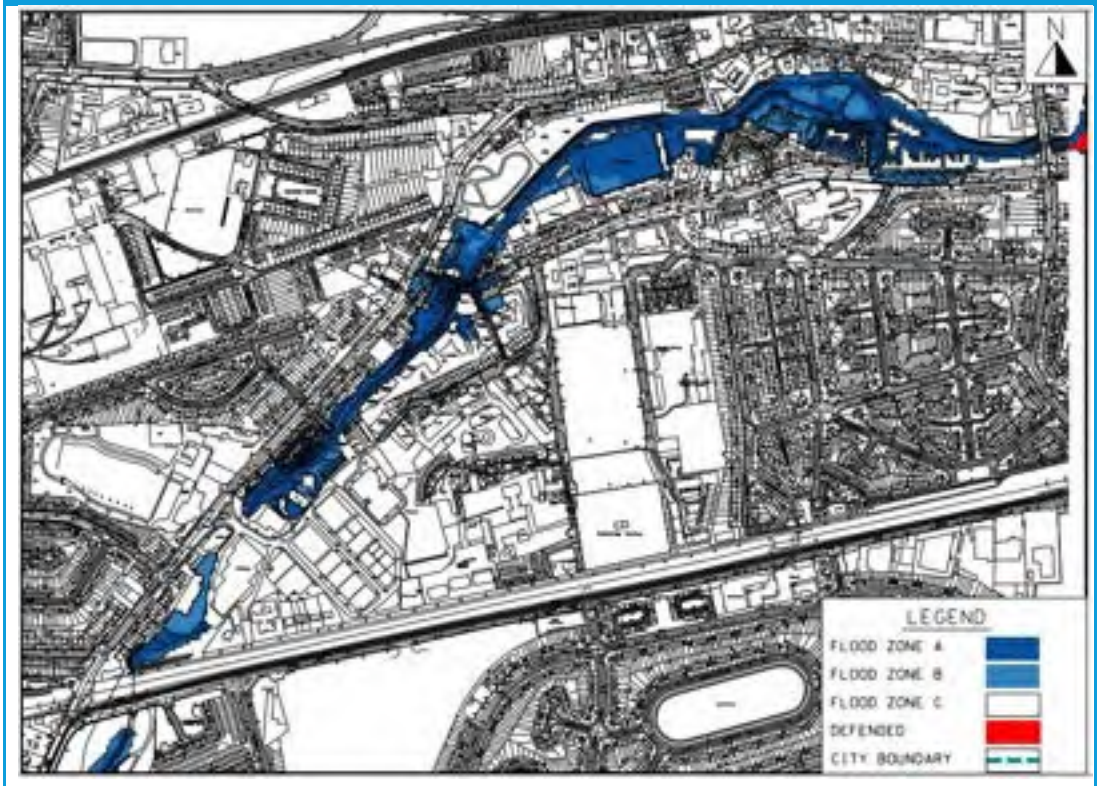
(v) There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement.

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. Areas idenitifed as being in Flood Zones A and B are considered essential to achieving a consolidated urban centre and to comply with the NPF, RSES and MASP.

3. Specific Flood Risk Assessment

- This section should be read in conjunction with the comments on the relevant reaches of the Liffey (see Area Assessment 5 Liffey: Sean Heuston Bridge – Sarah Bridge, South Circular Road).
- See Justification Test for Strategic Development and Regeneration Area No. 7 (Heuston and Environs) in Appendix C2 for specific recommendations in relation to that area.
- Developments within Flood Zone A should be limited to extensions onto existing buildings, or some changes of use. For extensions onto existing residential properties in Flood Zone A or B, it should be noted that bedroom accommodation shall not be permitted at basement or ground floor. There should be no increase in flood risk (through increased numbers of occupiers or increased vulnerability) where changes of use are proposed.
- Commercial development within previously developed parts of Flood Zone B may be justified, provided property resilient construction is carried out, and no increase in flood risk elsewhere can be developed. Evacuation procedures will be required.
- In the absence of a preferred flood management scheme arising from the Eastern CFRAM Study, any larger scale development within Flood Zone A, or highly vulnerable in Flood Zone B, will not be justified.

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 avoid Flood Zone A and only less vulnerable development is appropriate in previously developed parts of Flood Zone B.

Area: 18. Middle Camac: Davitt Road to South Circular Road	
	
For Land Use Zoning Maps Overlaid with Flood Zones see Dublin City Council Development Plan 2022 - 2028, Flood Map E and Flood Map D.	
Area Description	This section of the middle River Camac flows from the Grand Canal at Blackhorse Bridge, through Goldenbridge Industrial Estate to the south of Tyrconnell Road/Inchicore Road (Inchicore Village) before flowing to the South Circular Road north of Emmet Road. The area is centred on Inchicore Village. The land uses are residential, commercial, open space and industrial. The Council owns lands at Emmet Road (former PPP site) and these are designated as part of a Strategic Development and Regeneration Area (SDRA No. 9). Richmond Park is required for flood storage. Developments are likely to be infill or brownfield sites.
SDRAs within this Area	SDRA 9 Emmet Road.
Benefitting from Defences (flood relief scheme works) and residual Risk	The area does not benefit from formal flood defences.
Sensitivity to Climate Change	Slight-moderate - there is significant difference between the extents of Flood Zone A and B in a number of locations which indicates an increase in

Area: 18. Middle Camac: Davitt Road to South Circular Road	
	flood risk as river flows increase.
Residual Risk	There are no formal flood defences in this area and new developments must consider the benefits from any informal ones.
Historical Flooding	The flood maps attached are consistent with previous flooding of this section of the River Camac.
Surface Water	As this portion of the River Camac catchment is susceptible to pluvial flooding from intense rainfall events, particularly the section around Turvey Avenue, should development be permitted, best practice with regards to surface water management should be implemented across the development area, to limit surface water run-off to current values. Underground developments such as car parks should be designed to mitigate against flood risk. All developments shall have regard to the Pluvial Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project**,** Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.
Commentary on Flood Risk: The flood extents indicate flow paths generally coming directly out of the river channel. The flood maps were produced based on the OPW CFRAM Plan and checked against historic flooding in the area. Many areas remain at significant flood risk pending further studies. A new flood study is underway since 2019.	
Development Options: The main flood cells in this area are located in residential, community development/open space areas and in commercial industrial developments. No new development should be allowed in these areas unless they are defended, except for extensions and small infill provided the number of people at flood risk is not increased. Part of Strategic Development and Regeneration Area (SDRA) No. 9 Emmet Road is located within this area. The SDRA identifies Goldenbridge Industrial Estate lands and lands at Emmet Road as having the capacity to deliver strategic mixed use/residential and regeneration opportunities for the area as set out in Chapter 13 of the Development Plan (see section 13.11 of the Written Statement). Residential development (mainly infill) and community development with a small amount of commercial development would be a natural extension of	

existing development in this area. However, any development could reasonably be accommodated within the extents of Flood Zone C and should not need to extend into Flood Zone A or B unless defended. Some development may require to await future flood defence works on the River Camac.

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: This area is an established built-up part of the inner suburbs which is served by high quality public transport – Luas and proposed Bus Connects. SDRA No. 9 Emmet Road forms part of this area. The regeneration of the older social housing project (former PPP) at Emmet Road and brownfield development such as the mixed-use intensification of lands at Goldenbridge are identified in the RSES/ MASP as crucial for the creation of sustainable compact communities with improved housing choice, access to social and economic opportunities, enhanced services and amenities. Outside of these areas development in this area is a mixture of low to high density residential and commercial with infill development of both. The redevelopment/ consolidation of this area would be essential for the future consolidation and expansion of the urban settlement.

The areas located in Flood Zones A and B are primarily built-up or are open space areas. The area is considered essential to facilitate the regeneration and expansion of the urban settlement.
Some of Flood Zones A and B are located within Z9 zoning lands (open space) including Richmond Park, which is open space, and water compatible uses would be acceptable within this zoning.
The River Camac as it flows between Davitt Road and Tyrconnell Road passes though Goldenbridge Industrial Estate, and is largely built up.
The river then flows through a relatively built up area to the south of Tyrconnell Road in Inchicore, with mainly residential and some commercial units. Outside of the SDRA lands there would be limited large development sites within this area.

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

Answer: Yes: Most of the lands within Flood Zone A and B are already built-up or comprise of underutilised brownfield sites such as the DCC Housing lands at Emmet Road and the Goldenbridge Industrial Estate which has been identified for redevelopment in the Core Strategy.

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

Answer: Yes: The lands form part of an established built up part of the inner suburbs of the city which are centred on Inchicore Village and which are served by Luas / Bus. Lands at Emmet Road and Goldenbridge Industrial Estate are identified as part of a wider Strategic Development and Regeneration Areas (SDRAs) under the Core Strategy. These lands have substantial development capacity and the potential to contribute to the delivery of the residential, employment and recreational needs of the City.

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

Answer: Yes: The lands form part of an established built-up part of the city. The intensification and development of lands at Emmet Road and Goldenbridge Industrial Estate would represent appropriately high-density use of lands within the city. The lands are served by the Luas Red Line and Dublin Bus. High density development on the lands will contribute to sustainable travel patterns. The lands are well serviced by existing utilities and water services infrastructure, so a minimum of new infrastructure will be required.

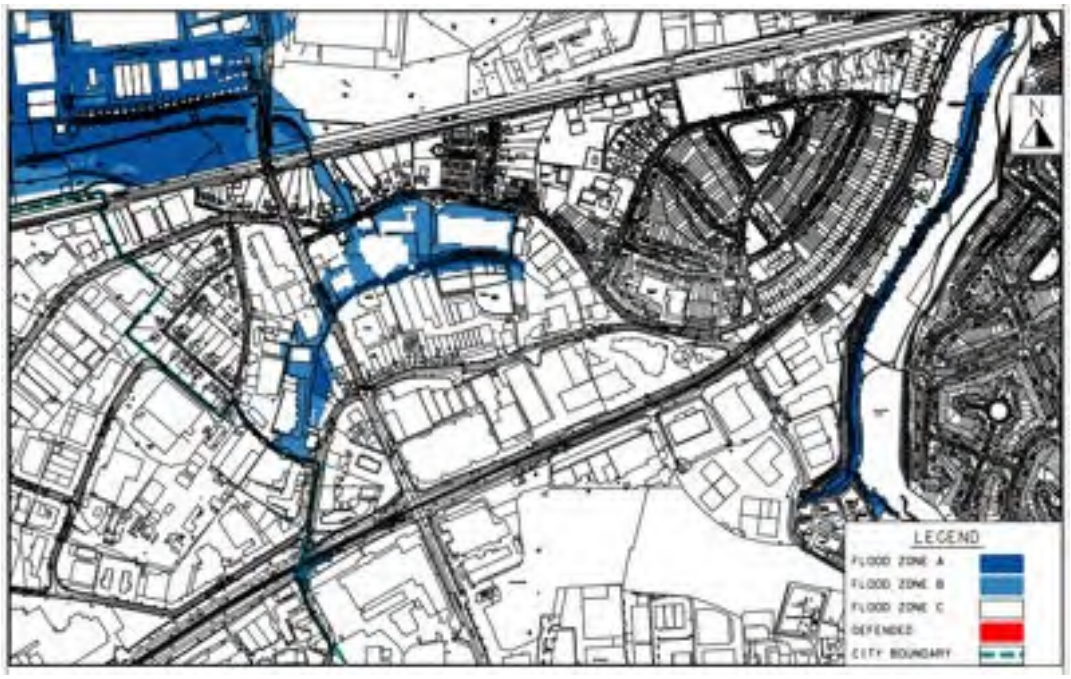
(v) There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement.

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.
Areas idenitifed as being in Flood Zones A and B are considered essential to achieving a consolidated urban centre and to comply with the NPF, RSES and MASP.

3. Specific Flood Risk Assessment

- Lands which are within Flood A and B that are currently open space should be retained as such.
- Developments within Flood Zone A should be limited to extensions onto existing buildings, or some changes of use. For extensions onto existing residential properties in Flood Zone A or B, it should be noted that bedroom accommodation shall not be permitted at basement or ground floor. There should be no increase in flood risk (through increased numbers of occupiers or increased vulnerability) where changes of use are proposed.

Area: 18. Middle Camac: Davitt Road to South Circular Road
• Commercial development within previously developed parts of Flood Zone B may be justified, provided property resilient construction is carried out, and no increase in flood risk elsewhere can be developed. • In the absence of a preferred flood management scheme arising from the Eastern CFRAM Study, any larger scale development within Flood Zones A, or highly vulnerable in Flood Zone B, would not be justified. A new flood study is underway since 2019.
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 avoid Flood Zone A and only less vulnerable development is appropriate in previously developed parts of Flood Zone B.

Area: 19. Upper Camac: Old Naas Road Boundary to Davitt Road	
	
For Land Use Zoning Maps Overlaid with Flood Zones see Dublin City Council Development Plan 2022 - 2028, Flood Map D and Flood Map G.	
Area Description	The River Camac in this section flows from the South Dublin County Council area at the Old Naas Road. There are four stretches where the river channel is open and natural but these are so short and far apart that the river is essentially a heavily modified water body and has been designated as such in the River Basin Management Plan. The river passes through a number of industrial estates and then flows through Lansdowne Valley Park. The Robinhood Stream, the Gallblack River (including the Blackditch and Gallanstown streams) and the Walkinstown Stream all discharge to the River Camac. An extensive surface water drainage network discharges to the River Camac and a significant number of combined sewer

Area: 19. Upper Camac: Old Naas Road Boundary to Davitt Road	
	overflows also discharge to the river and its tributaries. The area is heavily developed by a mixture of industrial and commercial development. Increasingly residential development is being built in this area. Some land owned by DCC and others near the river are required for flood storage. Developments are likely to be infill or brownfield sites. A significant portion of the river is culverted under the old and new Naas Roads as well as under Davitt Road and the Grand Canal.
SDRAs within this Area	SDRA No. 5 Naas Road.
Benefitting from Defences (flood relief scheme works) and residual risk	The area does not benefit from formal defences and all informal defences have been omitted in the flood mapping. The CFRAM Study for the River Camac did not reveal any overall flood alleviation scheme for the catchment, except for flood awareness and flood warning systems. An ongoing flood study started in 2019.
Sensitivity to Climate Change	Moderate to high. There are extensive parts of the upstream commercial areas within Flood Zone B, indicating climate change is likely to give a significant increase in risk.
Residual Risk	There is no residual risk as there are no existing flood defences in this area.
Historical Flooding	The flood maps attached are consistent with previous flooding of this section of the River Camac.
Surface Water	As this portion of the River Camac catchment is susceptible to pluvial flooding from intense rainfall events, particularly the low section on the Old Naas Road, should development be permitted, best practice with regards to surface water management should be implemented across the development area, to limit surface water run-off to current values. All developments shall have regard to the Pluvial Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project, Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-

Area: 19. Upper Camac: Old Naas Road Boundary to Davitt Road	
	menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.

Commentary on Flood Risk:

The flood extents indicate flow paths generally coming directly out of the river channel.

The flood maps were produced based on the OPW CFRAM Plan and checked against historic flooding in the area. A new flood study is underway since 2019.

Development Options:

The main flood cells in this portion of the River Camac catchment are located in industrial/commercial areas and green areas. No new development should be allowed in these green areas. A flood plan for the area is to be completed by the current DCC Flood Study. Extensions and small infill developments may be allowed provided the number of people at flood risk is not increased and every effort is made to reduce flood risk.

Lands outside the main flood cells include lands identified for large scale redevelopment under Strategic Development and Regeneration Area SDRA No. 5 Naas Road.

The NPF, RSES and the Core Strategy identify the wider Kylemore Road/ Naas Road / Ballymount area (DCC and South Dublin County Council) as a major regeneration area for the region. Masterplanning of the Kylemore Road / Naas Road / Ballymount area will be subject to feasibility studies and rezoning where required and Flood Risk Assessment.

Commercial and industrial would be a natural extension of existing development in the areas that are subject to flooding. In terms of residential/vulnerable development, this could reasonably be accommodated within the extents of Flood Zone C and should not need to extend into Flood Zone A or B unless defended. Some development may require to await future flood defence works on the River Camac.

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 lands are located in the outer suburbs adjacent to the city boundary with South Dublin County Council.
The area is characterised by low scale and low intensity industrial/ employment lands. The lands also form part of SDRA No. 5 Naas Road and bound lands identified for strategic residential and employment uses in the South Dublin County Council area. The lands are served by Luas Red Line and the future Luas Extension to Lucan.

The areas located in Flood Zones A and B while primarily built-up are low scale in nature and underutilised. The areas identified as being mainly within Flood Zone A and B are primarily located in Z6 zoned lands (industrial/ employment).

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

Answer: Most of the lands within Flood Zone A and B are already built-up or comprise of brownfield sites.

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

Answer: Yes: SDRA No. 5 Naas Road forms part of this area. This is one of the areas identified to deliver the Core Strategy. Naas Road is also a designated Key Urban Village in the RSES and under the Core Strategy.

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

Answer: Yes: This area is essential in achieving the compact and sustainable growth of the city. The Naas Road SDRA is one of the areas identified to deliver the Core Strategy.

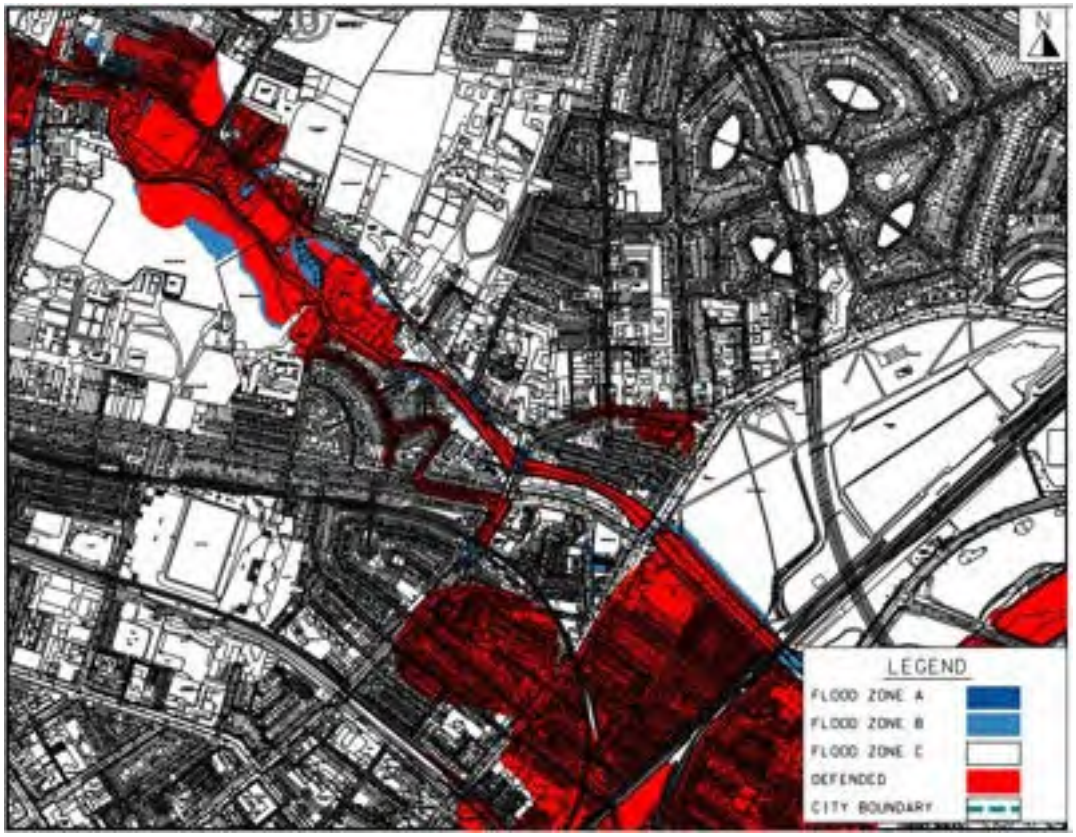
(v) There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement.

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. Areas idenitifed as being in Flood Zones A and B are considered essential to achieving a consolidated urban centre and to comply with the NPF and RSES.

3. Specific Flood Risk Assessment

- Lands which are within Flood Zones A and B and are currently open space should be retained as well as river corridors.
- Developments within Flood Zone A should be limited to extensions onto existing buildings, or some changes of use. For extensions onto existing residential properties in Flood Zone A or B, it should be noted that bedroom accommodation shall not be permitted at basement or

Area: 19. Upper Camac: Old Naas Road Boundary to Davitt Road
ground floor levels. There should be no increase in flood risk (through increased numbers of occupiers or increased vulnerability) where changes of use are proposed. • Commercial development within previously developed parts of Flood Zone B may be justified, provided property resilient construction is carried out, and there is no increase in flood risk elsewhere as a result. • In the absence of a preferred flood management scheme arising from the current flood Study, any larger scale development within Flood Zone A, or highly vulnerable in Flood Zone B, would not be justified. • Climate change risks are significant and need to be assessed under the site specific FRA with guidance on finished floor levels applied as detailed in the SFRA. • Development arising within the Naas Road area should include a detailed flood risk assessment which must demonstrate that risks through the catchment will not be increased. The sequential approach should be applied through site master planning and should avoid encroachment onto, or loss of, the flood plain.
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 avoid Flood Zone A and only less vulnerable development is appropriate in previously developed parts of Flood Zone B.

Area: 20 Tolka: Dublin Port to Drumcondra Bridge	
	
For Land Use Zoning Maps Overlaid with Flood Zones see Dublin City Council Development Plan 2022 - 2028, Flood Map E.	
Area Description	The area on the Tolka Estuary goes from East Wall to Drumcondra Bridge. It crosses under Alfie Byrne Road, the Dublin – Belfast Railway line and Annesley Bridge. It is adjacent to East Wall Road from Alfie Byrne Road, the western end of Fairview Park, Poplar Row, Cadogan Road, Luke Kelly Bridge, Orchard Road, Tolka Road, Distillery Road and Bridge. It is also adjacent to Richmond Road, Tolka Park, the Arch Bishop's House and Cian Park. It is currently tidal to approximately 100m below Drumcondra Bridge. Development in this area is a mixture of high and low density commercial and residential with infill development of both. There are a number of parks beside the Tolka River which are natural flood plains.
SDRAs within this Area	Strategic Development and Regeneration Area (SDRA) 6 Docklands. Strategic Development and Regeneration Area (SDRA) 10 North East Inner City.
Benefitting from	Flood defences incorporating 200-year tide

Area: 20 Tolka: Dublin Port to Drumcondra Bridge	
Defences (flood relief scheme works)	level, plus 300mm freeboard, plus allowance for fluvial surcharge at high tide have been constructed from East Wall Road to Drumcondra Bridge. These defences incorporate the latest design and together with a flood gate at the pedestrian bridge on East Wall Road to Fairview Park provide the statutory level of protection.
Sensitivity to Climate Change	Significant, particularly where likely sea level rise exceeds the height of existing defences.
Residual Risk	An appropriate assessment of residual risk of defence failure should be carried out. A structural inspection of all new defences is carried out each year.
Historical Flooding	The flood maps attached are consistent with previous flooding of this section of the River Tolka in 1954 and 2002. The highest recorded tide (3rd January 2014) was contained by the new flood defences. These maps are under review by the OPW.
Surface Water	All surface water in this area needs to be carefully managed and provision made for significant rainfall events during high tides. A five year high tide event should be assumed during a 100-year rainfall event. Should development be permitted, best practice with regard to surface water management should be implemented across the development area, to limit surface water run-off to current values. Separation of surface water and foul sewage flows should be carried out where possible. Assume 2 year rainfall with the 200 year tidal flood event. All developments shall have regard to the Pluvial Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project**,** Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.
Commentary on Flood Risk: The flood extents indicate flow paths generally coming directly out of the tidal region. These can be compounded with local pluvial flooding if heavy rainfall coincides with a high tide. Wave action is not deemed significant in this section of the Tolka Estuary.	

Area: 20 Tolka: Dublin Port to Drumcondra Bridge

The flood maps were produced based on the OPW CFRAM Plan and checked against historic flooding in the area.

Development Options:

Commercial and residential development (some infill) would be a natural extension of existing development. South of Poplar Row and East Wall Road the lands form part of the North East Inner City Strategic Development and Regeneration Area (SDRA No. 10), and also the Docklands SDRA (No. 6), see sections 13.12 and 13.8 of the Written Statement of the Development Plan.

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: This area is an established residential and mixed-use part of the inner suburbs. The Tolka River flows from Drumcondra Bridge through the Tolka Estuary to Dublin Port. It crosses under Alfie Byrne Road, Dublin – Belfast Railway Line and Annesley Bridge. It flows adjacent to East Wall Road from Alfie Byrne Road, the western end of Fairview Park, Poplar Row, Cadogan Road, Luke Kelly Bridge, Orchard Road, Tolka Road, Distillery Road and Bridge. It is also adjacent to Richmond Road, Tolka Park, the Arch Bishop's House and Cian Park. The area is essential for the expansion of Dublin City and comprises a mixture of high and low density commercial and residential with infill development of both. There are a number of parks which are natural flood plains also in this area.

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

Answer: Yes: Most of the lands within Flood Zone A and B are already built-up or comprise of brownfield sites. The Tolka River also flows through a number of parks which act as natural flood plains.

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

Area: 20 Tolka: Dublin Port to Drumcondra Bridge

Answer: Yes: The lands form part of the established / designated urban settlement of Dublin City.

.

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

Answer: **Yes:** (see response to (iii) above).

(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. Areas idenitifed as being in Flood Zones A and B are considered essential to achieving a consolidated urban centre and to comply with the NPF and RSES.

3. Specific Flood Risk Assessment

- See also Area Assessment No. 3 Liffey: O'Connell Bridge to Tom Clarke Bridge.
- See Justification Test for Strategic Development and Regeneration Area No. 6 Docklands in Appendix C2 for specific recommendations in relation to that area.
- Areas of open space within Flood Zones A and B must be preserved as they supplement the flood defences to provide protection.
- Climate change risks are significant and need to be assessed under the site specific FRA with guidance on finished floor levels applied as detailed in the SFRA.
- Development behind flood defences should proceed in line with the general recommendations flood assessment and management in this SFRA.

Conclusion: The subject area passes the Justification Test for Development Plans.

Area: 21. Tolka: Drumcondra Bridge to St. Mobhi Road

For Land Use Zoning Maps Overlaid with Flood Zones see Dublin City Council Development Plan 2022 - 2028, Flood Map E and Flood Map B.

Area Description	This area on the Tolka River catchment goes from Drumcondra Bridge to St. Mobhi Road. It runs adjacent to Botanic Avenue, Millmount Avenue, Terrace & Place, St. Ita's Road, St. Michael's Road, St. Malachi's Road and Griffith Park. There is no tidal influence on this length of the river. Development in this area is a mixture of low density residential and commercial with infill development of both. Griffith Park is a natural flood plain.
SDRAs within this Area	N/A
Benefitting from Defences (flood relief scheme works)	Flood defences incorporating 100-year river level, plus 300mm freeboard (500mm for embankments), have been constructed over this section from 2003 to 2006. The lower bridge in Griffith Park was removed and a new one was put in at a higher level. These defences incorporate the latest design and provide the statutory level of protection. A pumping station

	has been constructed near the junction of Drumcondra Road and Botanic Avenue to mitigate against pluvial flooding behind the new embankment during high river flows.
Sensitivity to Climate Change	Significant - particularly increases in river and pluvial flows.
Residual Risk	An assessment of residual risk of defence failure should be carried out. A structural inspection of all new defences is carried out each year.
Historical Flooding	The flood maps attached are consistent with previous flooding of this section of the River Tolka in 1954 and 2002. Large fluvial floods since new flood defence construction in 2003-2006 have passed without significant incident.
Surface Water	All surface water in this area needs to be carefully managed and provision made for significant rainfall events during high river flows. Should development be permitted, best practice with regard to surface water management should be implemented across the development area, to limit surface water run-off to current values. Separation of surface water and foul sewage flows should be carried out where possible. All developments shall have regard to the Pluvial Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project**,** Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.
Commentary on Flood Risk: The flood extents indicate flow paths generally coming directly out of the river channel travelling down Botanic Avenue and Millmount Avenue before finding their way back into the river channel. These can be compounded with local pluvial flooding if heavy rainfall coincides with high river flows. This risk has been reduced by the presence of flood defences. The flood maps were produced based on the Greater Dublin Strategic Drainage Study and have been verified by the OPW CFRAM Plan team as being largely consistent with current methodologies and they have been checked against historic flooding in the area.	
Development Options: Residential development (some infill) and some commercial would be a natural extension of existing development.	
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: This area is an established residential suburb of Dublin City. In this stretch, the Tolka River flows from Drumcondra Bridge to St. Mobhi Road. It runs adjacent to Botanic Avenue, Millmount Avenue, Terrace & Place, St. Ita's, St. Michael's, St. Malachi's Road and Griffith Park. Development in this area is a mixture of low density residential and commercial.

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

Answer: Yes: Most of the lands within Flood Zone A and B are already built up or comprise of brownfield sites. The river also flows through Griffith Park which is a natural flood plain.

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

Answer: Yes: The lands form part of the established / designated urban settlement of Dublin City.

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

Answer: Yes: (see response to (iii) above).

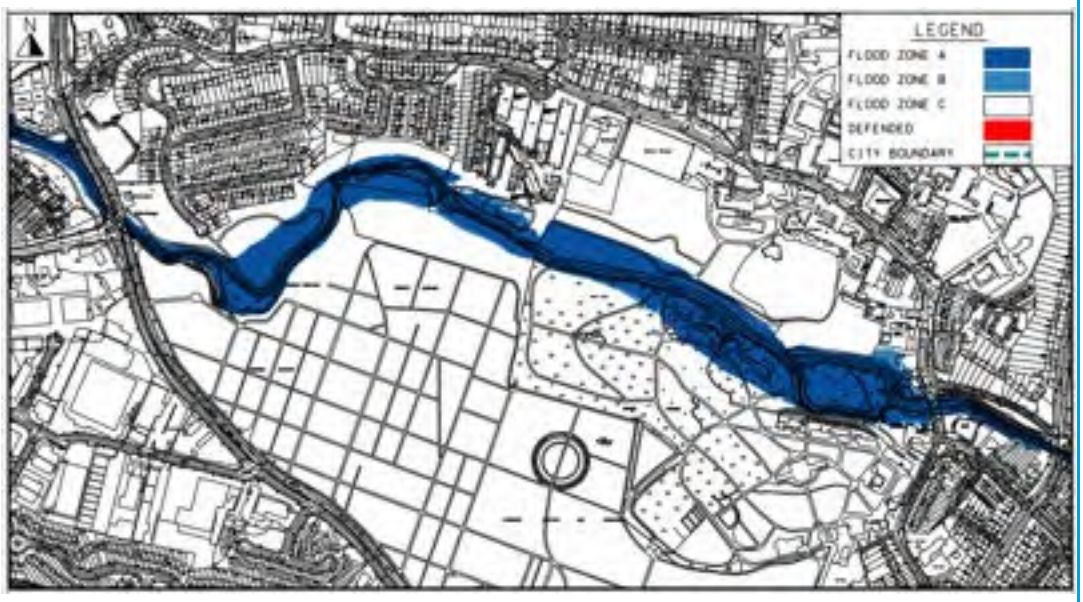
v) There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement.

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. Areas idenitifed as being in Flood Zones A and B are considered essential to achieving a consolidated urban centre and to comply with the NPF and RSES.

3. Specific Flood Risk Assessment

- Areas of open space within Flood Zones A and B must be preserved as they supplement the flood defences to provide protection.
- In this area, the development is likely to take the form of extensions to existing development. New development within undefended parts of Flood Zones A & B will not be justified.
- Development behind defences should proceed in line with the general recommendations for flood assessment and management in this SFRA.
- Climate change risks are significant and need to be assessed under

the site specific FRA with guidance on finished floor levels applied as detailed in the SFRA.
Conclusion: The subject area <u>passes</u> the Justification Test for Development Plans only where development is in previously defended parts of Flood Zone A/B, and the standard of protection and residuals risks are assessed and meet the requirements laid out in the SFRA.

Area: 22. Tolka: St. Mobhi Road – Finglas Road	
	
For Land Use Zoning Maps Overlaid with Flood Zones see Dublin City Council Development Plan 2022 - 2028, Flood Map A and Flood Map B.	
Area Description	The area on the Tolka River goes from St. Mobhi Road Bridge to Glasnevin Hill Bridge to Finglas Road Bridge. It runs adjacent to Botanic Avenue, St. Mobhi Drive, through the Botanic Gardens and Glasnevin Cemetery. Development in this area is a mixture of low density residential and community with infill development of both. The Botanic Gardens is a natural flood plain.
SDRAs within this Area	N/A
Benefitting from Defences (flood relief scheme works)	The open space through the Botanic Gardens provides a natural flood plain upstream of the man-made defences.
Sensitivity to Climate Change	Low – there is little difference between Flood Zone A and B, and is within areas of open space.
Residual Risk	Not applicable
Historical Flooding	The flood maps attached are consistent with previous flooding of this section of the River Tolka in 1954 and 2002.
Surface Water	Run-off from the parkland is natural and should be retained as such.

Area: 22. Tolka: St. Mobhi Road – Finglas Road	
	All developments shall have regard to the Pluvial Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project, Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.

Commentary on Flood Risk:

The flood extents indicate flow paths generally coming directly out of the river channel travelling down Botanic Avenue before finding their way back into the river channel at its lower end. These can be compounded with local pluvial flooding if heavy rainfall coincides with high river flows.

The flood maps were produced based on the Greater Dublin Strategic Drainage Study and have been verified by the OPW CFRAM Study team as being largely consistent with current methodologies and they have been checked against historic flooding in the area.

Development Options:

The flood cells in this area are mostly in green spaces which must be retained to maintain reduced flood risk elsewhere. Only water compatible developments will be allowed.

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:** This area is an established residential suburb of Dublin City. The River Tolka in this section flows from St. Mobhi Road Bridge to Glasnevin Hill Bridge to Finglas Road Bridge. It runs adjacent to Botanic Avenue, St. Mobhi Drive, through the Botanic Gardens and Glasnevin Cemetery. Development in this area is a mixture of low density residential and community with infill development of both commercial, industrial, and residential development would be a natural extension of existing development. Any development could reasonably be accommodated within the extents of Flood Zone C and should not need to extend into Flood Zone A or B.
  The floodplain lands should be retained as their current water compatible uses.

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

Area: 22. Tolka: St. Mobhi Road – Finglas Road

lands.

Answer: Most of the lands within Flood Zone A and B are open space areas which act as natural flood plains.

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

Answer: Yes: The lands form part of the established / designated urban settlement of Dublin City.

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

Answer: **Yes:** (see response to (iii) above).

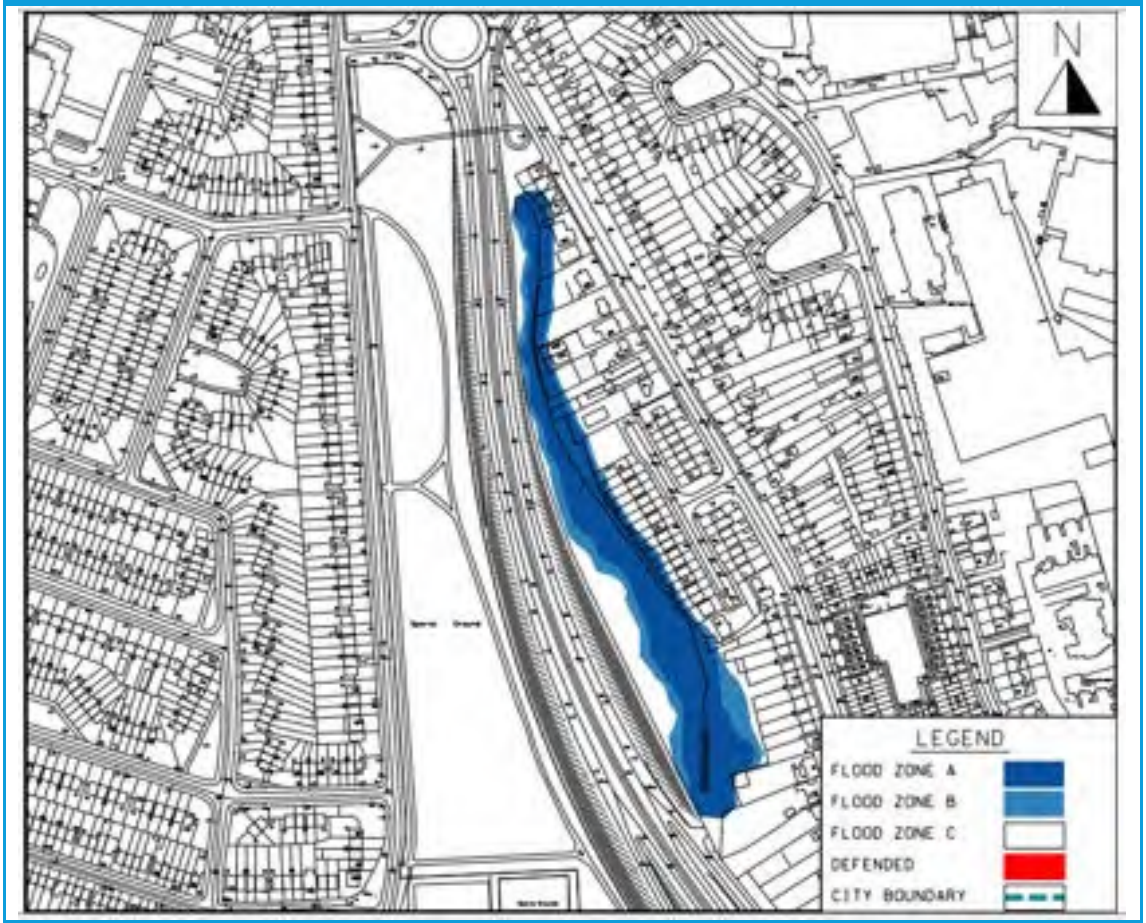
(v) There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement.

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. Areas idenitifed as being in Flood Zones A and B are considered essential to achieving a consolidated urban centre and to comply with the NPF and RSES.

3. Specific Flood Risk Assessment

- The floodplain lands should be retained as their current water compatible uses.

Conclusion: The subject area <u>passes</u> the Justification Test for Development Plans.

Area: 22A Finglas Stream: East of Finglas Road and West of North Road	
	
For Land Use Zoning Maps Overlaid with Flood Zones see Dublin City Council Development Plan 2022 - 2028, Flood Map A.	
Area Description	This area between Finglas Road, Brookville and North Road consists of existing residential development and green spaces. There is a very small amount of fluvial Flood Zone B risk from the Finglas Stream and backing up of the Tolka River. Virtually all of fluvial Flood Zone A is green space or garden space so no significant development is recommended in either of these zones. Any commercial development in or adjacent to Flood Zone B will require a Site Specific Flood Risk Assessment. The Finglas Stream flows from the Finglas area to the Tolka River near the Finglas Road. The stream is culverted except for a stretch located to the north west of Finglas Village. The open section of river flows through a green area to the rear of residential property on North Road.
SDRAs within this Area	SDRA 3 Finglas Village Environs and Jamestown Lands.

Benefitting from Defences (flood relief scheme works)	There are no constructed flood defences for this area.
Sensitivity to Climate Change	Climate change will increase flood risk in this area and may increase the risk of blockage of some river screens.
Residual Risk	There is no residual risk as there are no existing flood defences in this area.
Historical Flooding	The flood maps for the Finglas Stream are generally consistent with historic flooding.
Surface Water	All surface water in this area needs to be carefully managed and provision made for significant rainfall events. Should development be permitted, best practice with regard to surface water management should be implemented across the development area to limit surface water run-off to current values. The use of SuDS and green infrastructure should be considered in the first instance to reduce flooding. All developments shall have regard to the Pluvial Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project, Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.

Commentary on Flood Risk:
The flood extents indicate flow paths generally coming directly out of the fluvial region.
The flood maps are based on the latest information.

Development Options:
This area is located in the outer suburbs broadly near Finglas Village. The lands form part of an established built-up part of the city.
The Luas Green Line is to be extended to this area. Finglas Village and lands at Jamestown Road are identified as a Strategic Development and Regeneration Area (SDRA 3) under the Core Strategy, see section 13.5 of the Written Statement. Development should be located in Flood Zone C. Pluvial flooding should be managed on site.

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: This area is an established residential suburb of Dublin City. Development in this area is a mixture of low density residential and community with infill development of both**.** Finglas Village and lands at Jamestown Road are identified as a Strategic Development and Regeneration Area (SDRA 3) under the Core Strategy, see section 13.5 of the Written Statement. SDRA 3 identifies brownfield sites with the potential to deliver a significant quantum of residential and mixed-use development and it sets out a framework plan and guiding principles to guide the development of the area, see section 13.5 of the Written Statement. Residential development would be a natural extension of existing development in the vicinity of Flood Zones A and B. Any development could reasonably be accommodated within the extents of Flood Zone C and should not need to extend into Flood Zone A or B. The floodplain lands should be retained as their current water compatible uses.

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

Answer: The lands within Flood Zone A and B is an open space area which acts as natural flood plain.

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

Answer: Yes: The lands form part of an established suburb of the city in proximity to Finglas Village which is designated as a Key Urban Village in the Development Plan. Finglas Village and lands at Jamestown Road are identified as a Strategic Development and Regeneration Area (SDRA 3) under the Core Strategy, see section 13.5 of the Written Statement.

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

Answer: **Yes:** (see response to (iii) above).

(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. Areas idenitifed as being in Flood Zones A and B are considered essential to achieving a consolidated urban centre and to comply with the NPF and RSES.

3. Specific Flood Risk Assessment

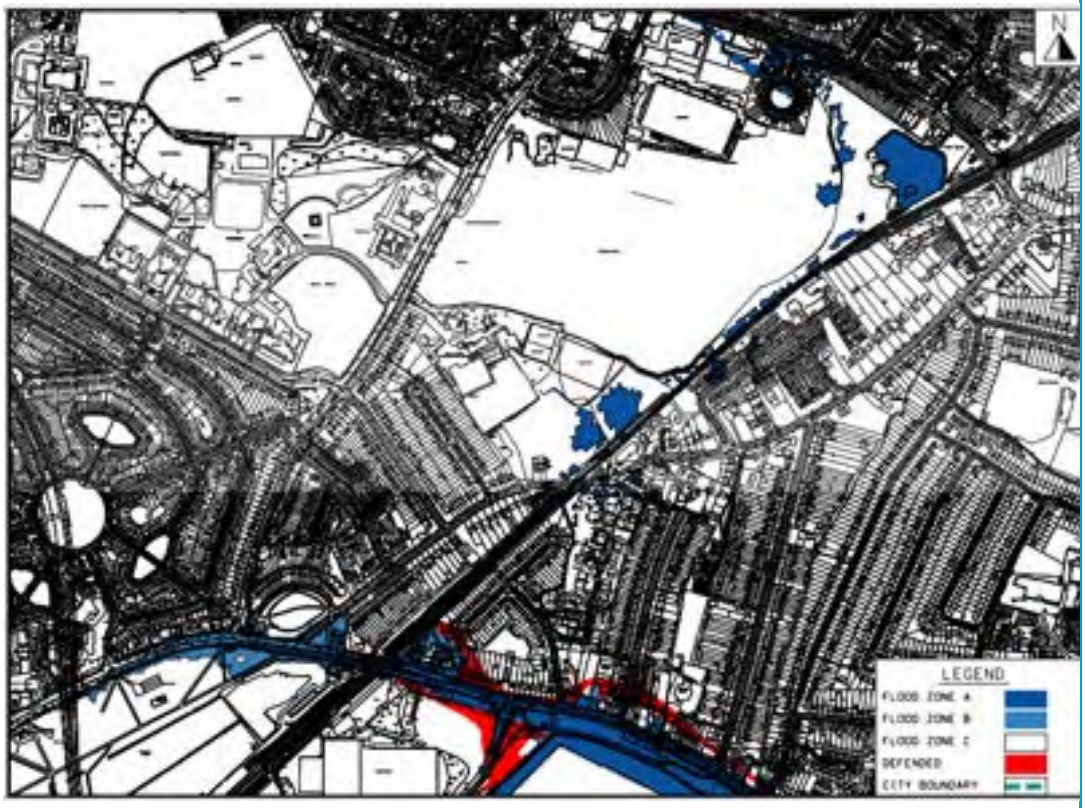
The area is mainly located within Flood Zone C for fluvial flooding. Some small portions of the lands are within Flood Zone A and Flood Zone B. Most development could reasonably be accommodated within the extents

of Flood Zone C so highly or less vulnerable development in Flood Zone A and B must be avoided or limited to Minor Development (Section 5.28 of the Planning Guidelines.
Conclusion: The subject area <u>passes</u> 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.

Area: 23. Tolka: Finglas Road – City Boundary	
	
For Land Use Zoning Maps Overlaid with Flood Zones see Dublin City Council Development Plan 2022 - 2028, Flood Map A.	
Area Description	This area on the Tolka River goes from Finglas Road Bridge through the Tolka Valley Park to the city boundary. It runs adjacent to Ballyboggan Road and Rivermount. It also includes the Finglas Stream. Development in this area is parkland with some residential to the south. The park is a natural flood plain.
SDRAs within this Area	N/A
Benefitting from Defences (flood relief scheme works)	None. The park provides a natural flood plain.
Sensitivity to Climate Change	Low – there is little difference between Flood Zones A and B, and is within areas of open space.
Residual Risk	Not applicable.
Historical Flooding	The flood maps attached are consistent with previous flooding of this section of the River Tolka in 1954 and 2002.
Surface Water	Run-off from the parkland is natural and should be retained as such. All developments shall have regard to the Pluvial Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project**,** Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.

Area: 23. Tolka: Finglas Road – City Boundary
Commentary on Flood Risk: The flood extents indicate flow paths generally coming directly out of the river channel and finding their way back into the river channel slightly downstream. The Finglas Stream flows into the Tolka River near Finglas Road. The flood maps were produced based on the Greater Dublin Strategic Drainage Study and have been verified by the OPW CFRAM Study team as being largely consistent with current methodologies and they have been checked against historic flooding in the area.
Development Options: Most of the flood cells are in parkland flood plains which must be retained, only water compatible development should be allowed here. Community, commercial and residential development (some infill) would be a natural extension of existing development just upstream of Finglas Road. The Core Strategy identifies the Dublin Industrial Estate as a 'Future Development Area' in the City – see section 2.4.5 of the Written Statement. It is the intent of the Council that, following feasibility studies, that these wider industrial lands will be brought forward as regeneration lands during the lifetime of the Development Plan. Any such change would require an amendment to the zoning of the lands and would be subject to a SFRA as part of that process.
Justification Test for Development Plans • The area within Flood Zones A and B is within park land (water compatible) so the Justification Test is not applicable. • The floodplain lands should be retained as their current water compatible uses.
Conclusion: Justification Test <u>Not Applicable</u>

Area: 24. Wad: Clontarf Road to Collins Avenue East



For Land Use Zoning Maps Overlaid with Flood Zones see Dublin City Council Development Plan 2022 - 2028, Flood Map B and Flood Map F.

Area Description	The area on the culverted Wad River goes from Collins Avenue East through the grounds of a primary school, across Clanmoyle Road, into Clontarf Golf Club, under the Howth Road, Glaslyn, Brooklawn, across the Clontarf Road and into the Port Area 200m east of Alfie Byrne Road. There is a Garda Station close to the line of the Wad south of Brooklawn. Development in this area is a

Area: 24. Wad: Clontarf Road to Collins Avenue East	
	mixture of low to medium density residential development with community uses and some commercial and infill development.
SDRAs within this Area	N/A
Benefitting from Defences (flood relief scheme works)	Flood defences have been installed in the form of a storage pond in Clontarf Golf Club. These come into operation even if penstocks fail to operate. New elements of this flood alleviation scheme are being designed, a tunnel under the Howth Road and new drainage in Clontarf Promenade.
Sensitivity to Climate Change	Slight to moderate - new flood defences will take a 20% increase in river flows.
Residual Risk	Failure of the new drainage system (including the new flood defences) is unlikely as it is in the form of a pond rather than walls or embankment. Climate change causing an increase in flows greater than 20% will cause further flooding. A structural inspection of the overflow from Clanmoyle Road to the storage pond in the Clontarf Golf Club will be carried out each year.
Historical Flooding	The flood maps attached are consistent with previous flooding of this section of the River Wad.
Surface Water	All surface water in this area needs to be carefully managed and provision made for significant rainfall events during high river flows. Should development be permitted, best practice with regard to surface water management should be implemented across the development area, to limit surface water run-off to current values. Separation of surface water and foul sewage flows should be carried out where possible. All developments shall have regard to the Pluvial Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project**,** Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.
Commentary on Flood Risk: The flood extents indicate flow paths generally coming directly out of the river culvert through manholes and gully grids. These can be compounded with local pluvial flooding if heavy rainfall coincides with high river culvert flows. The flood maps were produced based on the Wad Catchment	

Area: 24. Wad: Clontarf Road to Collins Avenue East

Flood Study and they have been checked against historic flooding in the area.

It should be noted that information in relation to the extent of Flood Zone B is not available for this river reach. Whilst flood risk is generally limited, it is important that the impact of a more extreme event is investigated through a Site Specific Flood Risk Assessment.

Development Options:

Residential, community and small scale commercial/ retail development in the form of infill would be a natural extension of existing development.

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: This area is an established residential suburb of Dublin City. The Wad River in this section which is culverted goes from Collins Avenue East through the grounds of a primary school, across Clanmoyle Road, into Clontarf Golf Club, under the Howth Road, Glaslyn, Brooklawn, across the Clontarf Road and into the Port Area 200m east of Alfie Byrne Road. This area is essential for the future expansion of the north east of the city.

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

Answer: Most of the lands within Flood Zones A and B are already built-up or comprise of brownfield sites. Some of the lands comprise the Clontarf Golf Club, and school lands.

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

Area: 24. Wad: Clontarf Road to Collins Avenue East

Answer: Yes: The lands form part of the established / designated urban settlement of Dublin City.

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

Answer: Yes: (see response to (iii) above).

(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. Areas idenitifed as being in Flood Zones A and B are considered essential to achieving a consolidated urban centre and to comply with the NPF and RSES.

3. Specific Flood Risk Assessment

- Area of open space in floodplains and storage areas must be retained.
- New development should avoid Flood Zones A or B.
- Flood risk is generally limited in this area, and development opportunities are likely to involve redevelopment and small extensions which should follow the requirements for flood risk assessment detailed in this SFRA.

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.

Area: 25. Wad: Collins Avenue East to Collins Park	
	
For Land Use Zoning Maps Overlaid with Flood Zones see Dublin City Council Development Plan 2022 - 2028, Flood Map B.	
Area Description	The area on the culverted Wad River goes from Collins Park, crosses the Malahide Road near the Topaz garage and onto Collins Avenue East. Development in this area is a mixture of residential with some commercial with infill development of both.
SDRAs within this Area	N/A
Benefitting from Defences (flood relief scheme works)	There are no flood defences installed in this area, but there is a downstream storage area in Clontarf Golf Club.
Sensitivity to Climate Change	High, particularly if the capacity of the culvert is exceeded more frequently.
Residual Risk	There are no flood defences to overtop, but blockage of the culvert could lead to increased flood risk, and new risk to areas shown within Flood Zone C currently.
Historical Flooding	The flood maps attached are consistent with previous flooding of this section of the River Wad.
Surface Water	All surface water in this area needs to be carefully managed and provision made for significant rainfall

Area: 25. Wad: Collins Avenue East to Collins Park	
	events during high river flows. Should development be permitted, best practice with regard to surface water management should be implemented across the development area, to limit surface water run-off to current values. Separation of surface water and foul sewage flows should be carried out where possible. All developments shall have regard to the pluvial Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project**,** Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.
Commentary on Flood Risk: The flood extents indicate flow paths generally coming directly out of the river culvert through manholes and gully grids. These can be compounded with local pluvial flooding if heavy rainfall coincides with high river culvert flows. The flood maps were produced based on the Wad Catchment Flood Study and they have been checked against historic flooding in the area. It should be noted that information in relation to the extent of Flood Zone B is not available for this river reach. Whilst flood risk is generally limited, it is important that the impact of a more extreme event is investigated through a Site Specific Flood Risk Assessment.	
Development Options: Residential with some commercial development (some infill) would be a natural extension of existing development.	
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:** This area is an established residential suburb of Dublin City. This stretch of the culverted Wad River goes from Collins Park, crosses the Malahide Road near the Topaz garage and onto Collins Avenue East. Development in this area is primarily residential with some	

commercial and community and infill development. This area is essential to facilitate the expansion of the city.

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

Answer: Most of the lands within Flood Zones A and B are already built-up or comprise of brownfield sites.

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

Answer: Yes: The lands form part of the established / designated urban settlement of Dublin City.

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

Answer: Yes: (see response to (iii) above).

(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. Areas idenitifed as being in Flood Zones A and B are considered essential to achieving a consolidated urban centre and to comply with the NPF and RSES.

3. Specific Flood Risk Assessment

- Modelling shows that risks are primarily linked to the development of overland flow paths which progress along roads. FRAs for developments should specifically address this risk, both to ensure flow paths do not become obstructed and to ensure an appropriate standard of flood resilient construction, which should include (where possible) raising finished floor levels to a minimum of 300mm above road/ pavement height. An assessment of culvert performance with climate change increases should also be undertaken.
- Particular attention to the design of any proposed basements should be carried out with full recognition of DCC policies and objectives, and the detail in this SFRA, in this regard.
- Whilst flood risk is generally limited, it is important that the impact of a more extreme event is investigated through a Site Specific Flood Risk Assessment as climate change and Food Zone B have not been modelled as part of the Wad Flood Relief Scheme.

Conclusion: The subject area passes the Justification Test for Development Plans.

Area: Coastal: 26. Clontarf Alfie Byrne Road to Wooden Bridge	
	
For Land Use Zoning Maps Overlaid with Flood Zones see Dublin City Council Development Plan 2022 - 2028, Flood Map E and Flood Map F.	
Area Description	This area includes the eastern end of Fairview and Clontarf Road from the Malahide Road to the Wooden Bridge. Inland flood risk areas include the culverted Wad River 200m east of Alfie Byrne Road, lower ends of Strandville Road, Hollybrook Road, St. Laurence Road and Seaview Road North as well as the junctions with Oulton road, Belgrove Road and Vernon Avenue, Conquer Hill Road and Kincora Court as per above map. Development in this area is mainly low to medium density residential with some commercial and sports areas. All of the parks have a significant bio-diversity and amenity value.
SDRAs within this Area	N/A
Benefitting from Defences (flood relief scheme works)	This area is protected by the existing sea wall to a level of 3.1m to 3.2m Malin Head except for the last 250m east of Alfie Byrne Road which apart from rock armour offers no additional protection to the promenade. Some flood defence options are being considered, however, if feasible, it will be a number of years before they can be implemented. Wave action is a significant element in any flooding of this area.
Sensitivity to Climate Change	Extreme, both for direct tidal inundation and overtopping of sea walls, and through increased and more severe wave action.
Residual Risk	Any proposed developments in the protected areas require residual flood risk from overtopping or other cause to be assessed and mitigated against.

Area: Coastal: 26. Clontarf Alfie Byrne Road to Wooden Bridge	
Historical Flooding	The defended flood maps attached are consistent with previous flooding of this section of Clontarf.
Surface Water	All surface water in this area needs to be carefully managed and provision made for significant rainfall events during high tides. A one year high tide event should be assumed during a 100-year rainfall event. Should development be permitted, best practice with regard to surface water management should be implemented across the development area, to limit surface water run-off to current values. All developments shall have regard to the Pluvial Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project**,** Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.
Commentary on Flood Risk: The flood extents indicate flow paths generally coming directly out of the tidal region by over ground routes. Pluvial rainfall during a high tide can increase flood risk. The flood maps were produced based on the OPW CFRAM Plan and checked against historic flooding in the area.	
Development Options: Residential with some commercial development (some infill) would be a natural extension of existing development. Existing green areas in floodplains should only be developed with water compatible ventures.	
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:** This area comprises of an established residential suburb of Clontarf. The area includes the eastern end of Fairview and Clontarf Road from the Malahide Road to the Wooden Bridge. This area is essential for the future expansion of the urban settlement as a residential suburb.	

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

Answer: Yes. The area shown in the Flood Zone is mainly built out; there may be small infill sites or brownfield sites to be redeveloped.

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

Answer: Yes: The lands form part of the established / designated urban settlement of Dublin City.

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

Answer: Yes: This area is essential in achieving compact and sustainable urban growth.

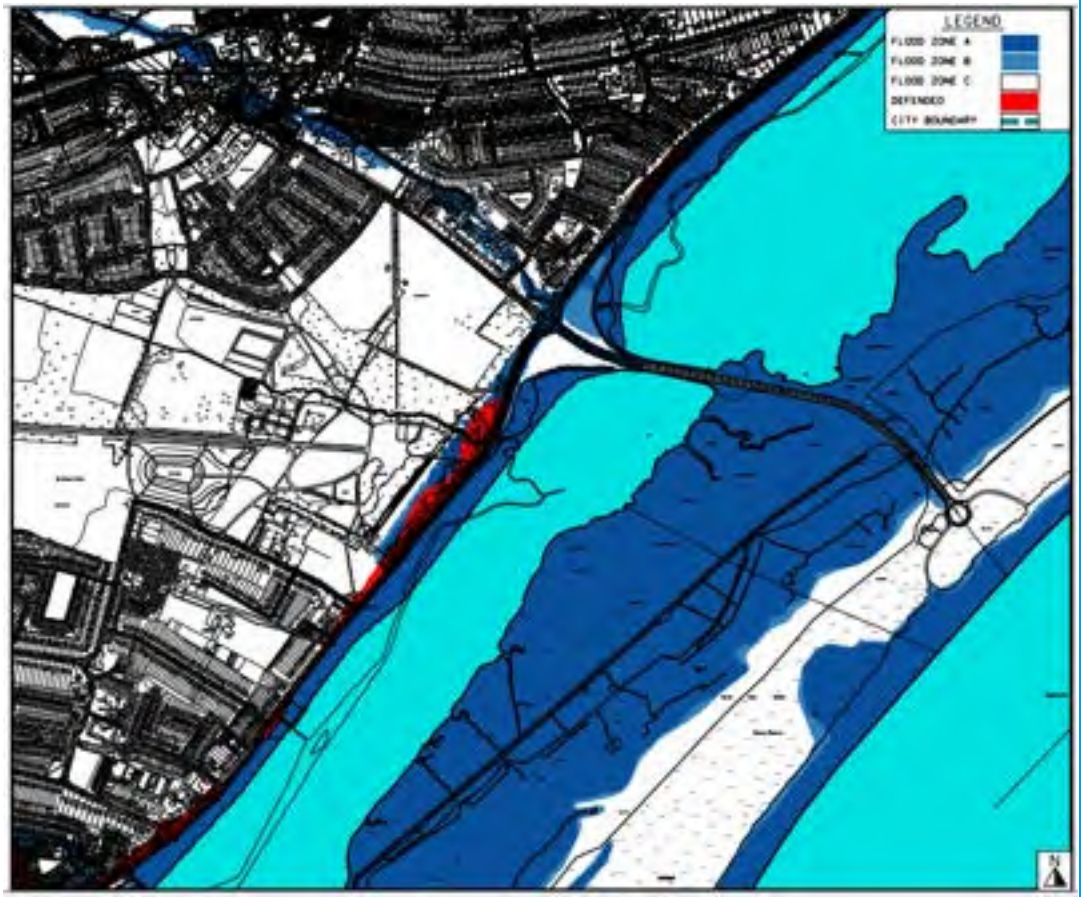
v) There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement.

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. This area is essential for the future expansion of Dublin City.

3. Specific Flood Risk Assessment

- Residential and small scale commercial/ retail development in the form of infill would be a natural extension of existing development.
- Small scale extensions/ change of use may be justified provided there is no increase in flood risk, which includes no increase in vulnerability of development and no increase in numbers of people within the Flood Zone A or B extent.
- Major new, highly or less vulnerable development, in Flood Zone A or B should be avoided.
- The residual risk of sea wall overtopping should be assessed, and it should be assumed that direct inundation to the height of the tide will occur.
- Climate change risks are significant and need to be assessed under the site specific FRA with guidance on finished floor levels applied as detailed in the SFRA.
- Emergency procedures, both during and for the recovery phase of a tidal event, should be detailed.
- New development (infill) should progress following the guidance in this SFRA, with finished floor levels set at a level which takes into account climate change.
- Large scale new development should incorporate flood management within the design (through landscaping and ground rising).
- There is no requirement to provide compensatory storage for land

Area: Coastal: 26. Clontarf Alfie Byrne Road to Wooden Bridge
raising within the tidal flood risk zone.
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.

Area: 27. Santry River: James Larkin Road to DART Railway and Dollymount Wooden Bridge to Clontarf Road Coastal Zone	
	
For Land Use Zoning Maps Overlaid with Flood Zones see Dublin City Council Development Plan 2022 - 2028, Flood Map C and Flood Map F.	
Area Description	The area is adjacent to Watermill Road, includes Bedford Lodge, Manor House Girls Secondary School, Raheny Village both sides of low point on Main Street, Watermill Court, rear of 407-419 Howth Road, rear of River House, Raheny Shopping Centre. Areas of flood risk include green areas adjacent to river and sea which act as flood plains. The Naniken in St. Anne's Park can flood due to fluvial or fluvial plus high tides. The Santry River can have additional flooding during high tides. Development in this area is mainly low to medium density residential with some commercial areas close to the river.
SDRAs within this Area	N/A
Benefitting from Defences (flood relief	There are no formal defences on the Santry River. There is a sea wall and embankment in

Area: 27. Santry River: James Larkin Road to DART Railway and Dollymount Wooden Bridge to Clontarf Road Coastal Zone	
scheme works)	the green area either side of the Causeway which defends from coastal flooding. A new sea flood wall to a level of 4.25m Malin Head from the Wooden bridge to the Causeway is constructed, with embankment height 4.45mOD Malin Head in green areas.
Sensitivity to Climate Change	Significant, particularly along the sea front and on the tidally influenced parts of the Santry River.
Residual Risk	Blockage of existing structures should be reduced by good river maintenance, however the residual risk of this should be considered in developments downstream of Harmonstown Road. There is also a risk of overtopping of the sea wall and embankment, which can be simulated by direct propagation of sea levels inland.
Historical Flooding	The defended flood maps attached are consistent with previous flooding of this section of the Santry River, pre and post new defence works.
Surface Water	All surface water in this area needs to be carefully managed and provision made for significant rainfall events during high tides. A one year high tide event should be assumed during a 100-year rainfall event. Should development be permitted, best practice with regard to surface water management should be implemented across the development area and in the catchments of the Naniken and Santry Rivers, to limit surface water run-off to current values. All developments shall have regard to the Pluvial Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project**,** Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.
Commentary on Flood Risk: The flood extents indicate flow paths generally coming directly out of the river channel by over ground routes and then returning to the river the same way or via the existing drainage network. Tidal inundation occurs through over ground routes or up the Naniken and Santry culverts under James Larkin Road and then out of the rivers. Coastal flooding is directly from the sea flooding parts of James Larkin Road. The flood maps were produced based on the OPW CFRAM Plan and	

Area: 27. Santry River: James Larkin Road to DART Railway and Dollymount Wooden Bridge to Clontarf Road Coastal Zone

checked against historic flooding in the area.

Development Options:

Small scale residential/ infill development would be the natural extension of existing development. Existing green areas in flood plains should only be developed with water compatible uses consistent with the Z9 zoning.

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: This area is an established built-up residential area of the city. Along the coast to the south there is St. Anne's Park and Bull Island. Along James Larkin Road, there are mainly built up residential sites. Development along the coastal road and lower Santry River is likely to be small infill residential and or extensions onto existing properties. This area is essential to facilitate the expansion of the urban settlement. However, the areas located in coastal Flood Zones A and B are primarily parkland and roadways.

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

Answer: The area shown in the fluvial flood zone is mainly built out; there may be small infill sites or brownfield sites to be redeveloped.

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

Answer: Yes: The lands form part of the established / designated urban settlement of Dublin City.

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

Area: 27. Santry River: James Larkin Road to DART Railway and Dollymount Wooden Bridge to Clontarf Road Coastal Zone

Answer: Yes: This area is essential in achieving compact and sustainable urban growth.

(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.

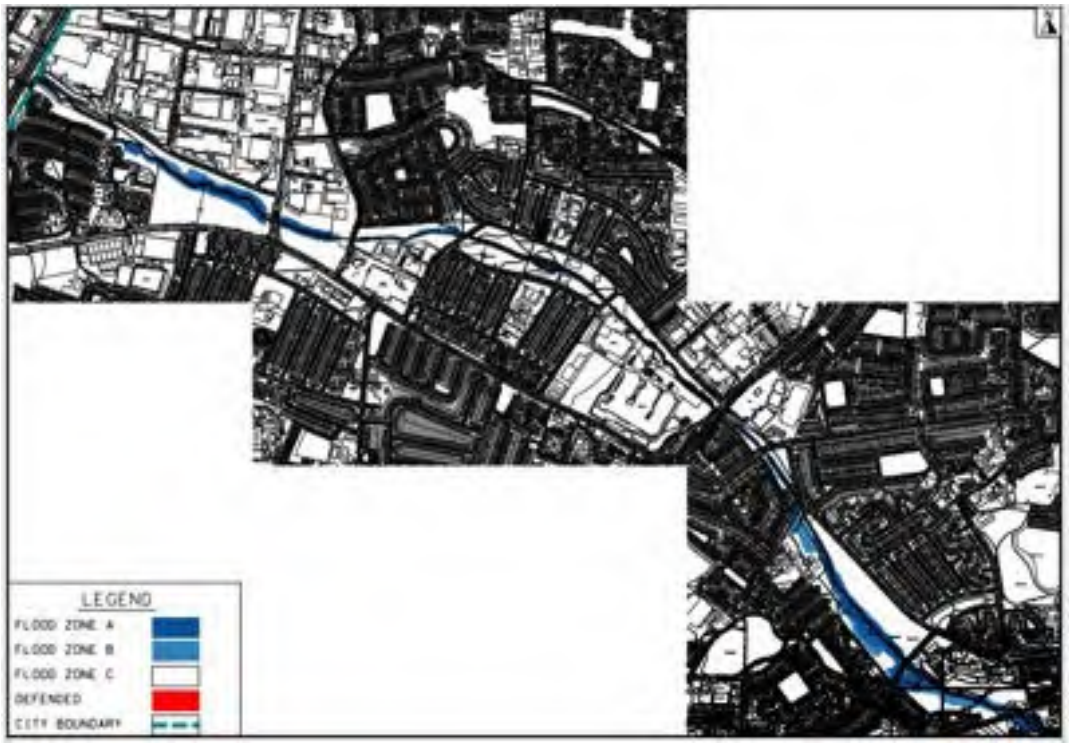
Answer: There are no suitable alternative lands for the particular uses or development type in areas at lower risk of flooding, within or adjoining the urban settlement. This area is essential for the future expansion of Dublin City.

3. Specific Flood Risk Assessment.

- There is no development within the tidal extents currently and existing water compatible uses should be retained, both along the coast and up the Santry River.
- Along the Santry River, development may be progressed according to the guidance in this SFRA. Particular attention should be given to joint probability events, where a high tide coincides with high river flows.
- The impact of sea level rise on development currently within Flood Zone C should be assessed and mitigated.
- Raheny village has a proposed flood alleviation scheme to protect existing properties at significant flood risk, any development in this area will require a Site Specific Flood risk Assessment. New development prior to the completion of the flood alleviation scheme may be considered premature and should be avoided in Flood Zone A and B.

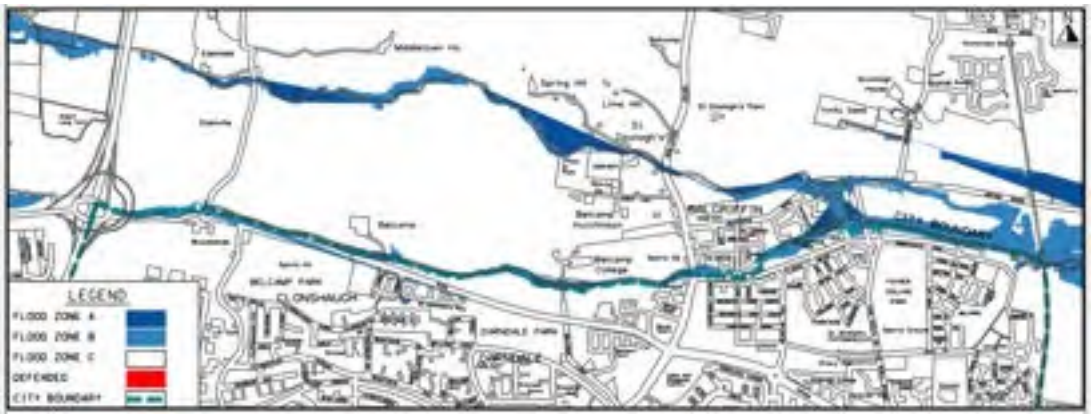
Conclusion: The subject area passes the Justification Test for Development Plans.

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.

Area: 28. Santry River: DART Railway - Boundary	
	
For Land Use Zoning Maps Overlaid with Flood Zones see Dublin City Council Development Plan 2022 - 2028, Flood Map B and Flood Map C.	
Area Description	This area is upstream of the DART line and includes a park with small pedestrian bridge, which is a flood plain to Harmonstown Road which has a flood defence incorporated in it. It runs to the rear of Moatfield Road to Tonlegee Road to the Malahide Road, to Barryscourt Road, Clonshaugh Road and south of Clonshaugh Industrial Estate to M1/ M50 boundary. Flood risk areas include green areas adjacent to river which act as flood plains. Development in this area is mainly low to medium density residential with some commercial areas close to the river but current flood risk appears to be outside of existing development areas.
SDRAs within this Area	N/A
Benefitting from Defences (flood relief scheme works)	This area of parkland downstream of Harmonstown Road to the DART line benefits from new flood defences up to the 100-year flood level. The rest of this area apart from bridge restrictions does not benefit from flood defences.
Sensitivity to Climate Change	Generally low – Flood Zones A and B show some difference in extent, but this is largely within open

Area: 28. Santry River: DART Railway - Boundary	
	space and parkland so will not impact on existing development.
Residual Risk	There is residual risk downstream of new flood restriction at Harmonstown road.
Historical Flooding	The flood maps attached are consistent with previous flooding of this section of the Santry River, pre and post new defence works.
Surface Water	At low portions of Moatfield Road, high river flows combined with heavy rainfall have caused some backing up of the drainage network and largely pluvial flooding. All surface water in this area needs to be carefully managed and provision made for significant rainfall events during high river flows. Should development be permitted, best practice with regard to surface water management should be implemented across the development area and in the catchments of the Naniken and Santry Rivers which have some interlinkage, to limit surface water run-off at least to current values. All developments shall have regard to the Pluvial Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project**,** Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.
Commentary on Flood Risk: The flood extents indicate flow paths generally coming directly out of the river channel by over ground routes and then returning to the river the same way or via the existing drainage network. The flood maps were produced based on the OPW CFRAM Plan and checked against historic flooding in the area.	
Development Options: Most of the Flood Zones in this portion of the Santry Catchments are in green areas which should be maintained. Residential with some commercial development (some infill) would be a natural extension of existing development in this portion of the Santry River.	
Justification Test for Development Plans • The areas located in Flood Zones A and B are primarily parkland, which is water compatible and should be retained. **The Justification Test is <u>not applicable</u>.** • New development within Flood Zone A or B cannot be justified.	

Area: 28. Santry River: DART Railway - Boundary
Conclusion: The Justification Test is not applicable.

Area: 29. Mayne: Dublin Belfast Railway Line – M50	
	
For Land Use Zoning Maps Overlaid with Flood Zones see Dublin City Council Development Plan 2022 - 2028, Flood Map B and Flood Map C.	
Area Description	This area on the River Mayne which forms some of the boundary between Fingal County Council and DCC goes from the Dublin-Belfast Railway line in the east through Father Collins Park, south of Belcamp College adjacent to the R139 to Junction 3 on the M50. It has tidal influence roughly to the Malahide Road and fluvial and pluvial west of this. Development in this area is a mixture of mainly residential with some commercial and industrial. Parkland and sports development also features.
SDRAs within this Area	SDRA No. 1 Clongriffin/Belmayne and Environs
Benefitting from Defences (flood relief scheme works)	There are no formal defences in this area.
Sensitivity to Climate Change	Low – there is little difference in flood extents of Flood Zones A and B.
Residual Risk	Not applicable.
Historical Flooding	The flood maps attached are consistent with previous flooding of this section of the River Mayne.
Surface Water	All surface water in this area needs to be carefully managed and provision made for significant rainfall events during high river flows. Should development be permitted, best practice with regards to surface water management should be implemented across the development area, to limit surface water run-off to current values. Separation of surface water and foul sewage flows should be carried out where possible. All developments shall have regard to the Pluvial

Area: 29. Mayne: Dublin Belfast Railway Line – M50	
	Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project**,** Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.

Commentary on Flood Risk:

The flood extents indicate flow paths generally coming directly out of the river and re-entering the river downstream either directly or through the drainage network. These can be compounded with local pluvial flooding if heavy rainfall coincides with high river flows and high tides.

The flood maps were produced based on the OPW CFRAM Plan for Fingal East Meath Catchments and they have been checked against historic flooding in the area.

Development Options:

The River Mayne flows along the boundary between DCC and Fingal County Council. Most of the Flood Risk Areas would be located outside of the DCC boundary. Part of the river within DCC's boundary is covered by the Clongriffin - Belymayne (North Fringe) LAP 2012 (due to expire 2023) and SDRA No. 1 Clongriffin/Belmayne and Environs. The Clongriffin/ Belmayne area is identified as a major residential growth area in the city by the NPF, the RSES and in the Core Strategy of the Development Plan.

Open space areas and lands zoned for industrial purposes are also located in this area.

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 land to the south of the River Mayne which forms the boundary with Fingal County Council is one of the areas identified as a Strategic Development and Regeneration Area (SDRA) in the current plan. These are the designated growth areas of the city and they have substantial development capacity and the potential to contribute to the delivery of the residential, employment and recreational needs of the City. The River Mayne runs along the boundary of DCC and Fingal County Council and it forms the northern boundary of SDRA No. 1 Clongriffin/ Belmayne and Environs.

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

Area: 29. Mayne: Dublin Belfast Railway Line – M50

Answer: The lands adjacent the River Mayne comprise lands identified at national, regional and local level for strategic residential development.

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

Answer: Yes: The area forms part of an incomplete developing area.

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

Answer: Yes: This area is essential in achieving compact and sustainable urban growth.

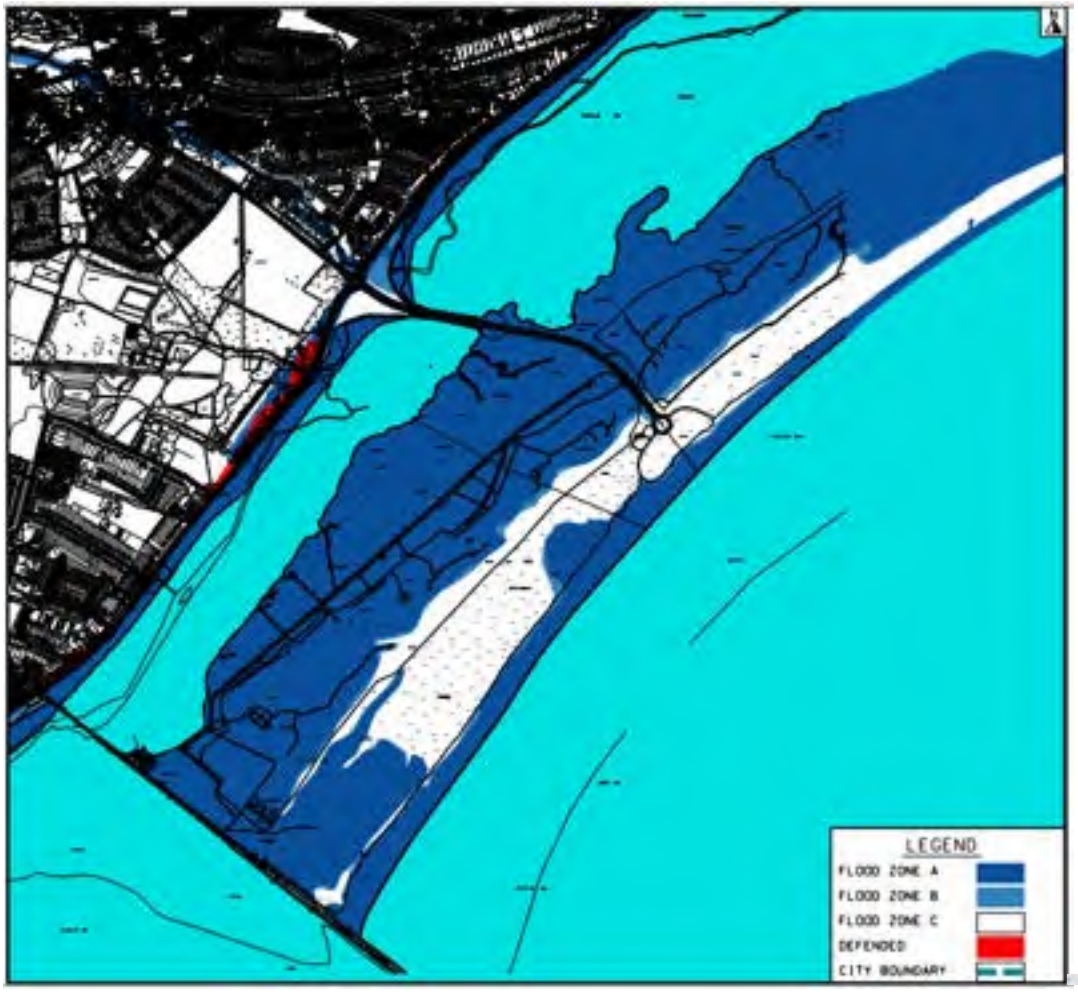
(v) There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement.

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. This area is essential for the future expansion of Dublin City.

3. Specific Flood Risk Assessment.

- See Justification Test for Strategic Development and Regeneration Area No. 1 Clongriffin/ Belmayne and Environs in Appendix C2 for specific recommendations in relation to that area.
- The proposed River Mayne Greenway/ Linear park as identified in SDRA No. 1 will coincide with Flood Risk Areas within DCC's area. This linear park will form part of the wider green infrastructure network.
- The areas located in Flood Zones A and B are primarily open space, which is water compatible and should be retained.
- New development within Flood Zone A or B cannot be justified. Fingal County Council Planning Department should be consulted of any development close to its border which might have current or future flooding implications in Fingal.

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.

Area: 30. Coastal:	Bull Island
	
For Land Use Zoning Maps Overlaid with Flood Zones see Dublin City Council Development Plan 2022 - 2028, Flood Map C and Flood Map F.	
Area Description	North Bull Island is an important amenity attraction that incorporates two golf courses, Dollymount Beach and the North Bull Island Nature Reserve. The island was declared a Bird Sanctuary in the 1930s and, following the construction of the Causeway Road in 1962, a UNESCO Biosphere Reserve was established here in 1981 to be followed by a Nature Reserve in 1988. A Visitor and Interpretative Centre was built here in 1986 but is now closed. There are a small number of dwellings on the island, located near the bridge at Bull Wall Cottages. It is a dynamic environment that is continually changing. It is the only site

Area: 30. Coastal:	Bull Island
	on the east coast of Ireland where sand dunes are accreting.
SDRAs within this Area	N/A
Benefitting from Defences (flood relief scheme works)	There are no designed flood defences on the North Bull Island. It provides significant flood defence for Dollymount and James Larkin Road.
Sensitivity to Climate Change	High – with sea level rise of 0.5m the majority of the island will be below water.
Residual Risk	N/A
Historical Flooding	High tides frequently inundate the margins of the island.
Surface Water	As no development is planned, management of surface water is not an issue.

Commentary on Flood Risk:

The whole island is vulnerable to inundation from the sea.

Development Options:

There is a specific objective in the Development Plan GIO37 – 'To develop an accessible Discovery Centre for Dublin Bay for education, interpretation, visitor management and research to support the nature conservation objectives of the North Bull Island Nature Reserve, the vision of the Dublin Bay UNESCO Biosphere and the criteria for biosphere reserves of the UNESCO Man and the Biosphere (MAB) Programme'.

All development should be water compatible. Evacuation plans for high tides with large wave action should be included with any proposed development.

Justification Test for Development Plans

- Nearly the whole island is within Flood Zone A and the island is a nature reserve. DCC is proposing to replace the existing 'Interpretive and Education centre', which is no longer fit for purpose, with a new 'Discovery Centre'. New development is not proposed on the island. The Justification Test is not required.
- Refurbishment of existing less vulnerable buildings, such as the visitors centre, may be accommodated, but flood risk management, through setting finished floor levels should be given due regard, particularly in relation to the potential impacts of climate change. Visitor safety should also be considered, particularly when storm surges and high tides are forecast.
- Significant refurbishment or extensions to existing highly vulnerable developments should not be permitted given the high level of current risk, and the significant impacts of climate change.

Conclusion: Justification Test <u>Not Applicable</u>

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 1 – Clongriffin/ Belmayne and Environs

See Section 13.3 of the Written Statement

Zoning Maps B and C of the Development Plan:

The lands are subject to land use zoning objective:

Z14: To seek the social, economic and physical development and/or regeneration of an area with mixed use, of which residential would be the predominant use.

SFRA Area Assessment: No. 29 Mayne: Dublin Belfast Railway line - M50 (River Mayne)

Flood Zones:

SDRA 1	Clongriffin/Belmayne and Environs	Flood Zone A	Flood Zone B	Flood Zone C
		Z14	Z14	Z14

Table 2. SDRA 1 Relationship with Flood Zones

	FLOOD ZONE A	FLOOD ZONE B	FLOOD ZONE C
Highly vulnerable development	**JUSTIFICATION TEST**	**JUSTIFICATION TEST**	**APPROPRIATE**
SDRA 1	Z14	Z14	Z14
Less vulnerable development	**JUSTIFICATION TEST**	**APPROPRIATE**	**APPROPRIATE**
SDRA 1	Z14	Z14	Z14
Water compatible development	**APPROPRIATE**	**APPROPRIATE**	**APPROPRIATE**
SDRA 1	Z14	Z14	Z14

Table 3. SDRA 1 Matrix of Vulnerability Versus Flood Zones

Conclusion:

SDRA 1	Clongriffin / Belmayne and Environs	Justification Test: **Required**

SDRA 3 - Finglas Village Environs and Jamestown Lands

See Section 13.5 of the Written Statement

Zoning Map A of the Development Plan:

The lands are subject to land use zoning objectives:

Z1: To protect, provide and improve residential amenities.

Z4: To provide for and improve mixed-services facilities.

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.

Z14: To seek the social, economic and physical development and/or regeneration of an area with mixed use, of which residential would be the predominant use.

Z15: To protect and provide for community uses and social infrastructure.

SFRA Area Assessment: No. 22A Tolka: Finglas Stream

Flood Zones:

SDRA 3	Finglas Village Environs and Jamestown Lands	Flood Zone A	Flood Zone B	Flood Zone C
Area 1	Finglas Village Environs	Z1	Z1	Z1, Z4, Z9, Z10, Z14, Z15
Area 2	Jamestown Lands			Z1, Z4, Z9, Z10, Z14, Z15

Table 4. SDRA 3 Development Areas Relationship with Flood Zones

	FLOOD ZONE A	FLOOD ZONE B	FLOOD ZONE C
Highly vulnerable development	**JUSTIFICATION TEST**	**JUSTIFICATION TEST**	**APPROPRIATE**
1 Finglas Village and Environs	Z1	Z1	Z1, Z4, Z9, Z10, Z14, Z15

Table 4. SDRA 3 Matrix of Vulnerability Versus Flood Zones

Conclusion:

SDRA 3	Finglas Village Environs and Jamestown Lands	Justification Test: **Required – See SFRA Area Assessment No. 22A Tolka: Finglas Stream**

SDRA 5 - Naas Road

See Section 13.7 of the Written Statement

Zoning Maps D and G of the Development Plan:

The lands are subject to land use zoning objectives:

Z1: To protect, provide and improve residential amenities.

Z6: To provide for the creation and protection of enterprise and facilitate opportunities for employment creation.

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

Z14: To seek the social, economic and physical development and/or regeneration of an area with mixed use, of which residential would be the predominant use.

SFRA Area Assessment: No. 19. Upper Camac: Old Naas Road Boundary to Davitt Road

Flood Zones:

SDRA 5	Naas Road	Flood Zone A	Flood Zone B	Flood Zone C
Site 1	Royal Liver Retail Park			Z14 and Z6
Site 2	Motor Distributors Ltd site (Volkswagon factory)			Z14
Site 3	Former Nissan Plant Site			Z14
Site 4	Bluebell Avenue			Z14
Site 5	Former Bluebell Road Regeneration Area			Z1, Z9
Site 6	Nass Road Industrial Estate and surrounding lands			Z14

Table 5. SDRA 5 Development Areas Relationship with Flood Zones

Conclusion:

SDRA 5	Naas Roads	Justification Test: Not Required –

SDRA 6 - Docklands

See Section 13.8 of the Written Statement

Zoning Maps E and F of the Development Plan:

The lands are subject to land use zoning objectives:

Z1: To protect, provide and improve residential amenities.

Z4: To provide for and improve mixed-services facilities.

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.

Z14: To seek the social, economic and physical development and/or regeneration of an area with mixed use, of which residential would be the predominant use.

Z15: To protect and provide for community uses and social infrastructure.

SFRA Area Assessment:

No. 1 Dublin Port South of the Liffey from Tom Clarke Bridge

No. 3 Liffey: O'Connell Bridge to Tom Clarke Bridge

No. 9 Dodder: Liffey to Ballsbridge

No. 20 Tolka: Dublin Port to Drumcondra Bridge

Flood Zones:

SDRA 6	Docklands	Flood Zone A	Flood Zone B	Flood Zone C
Site 1	Connolly Station	Z5 (defended)		Z5
Site 2	Site between 52 Oriel Street Lower, the Royal Canal Greenway and the canal rail bridge	Z1 (defended)		
Site 3	Shamrock Place	Z1 (defended) by works at Spencer Dock		
Site 4	Ossory Industrial Estate	Z14 (defended)		
Site 5	Coady's Yard, Ossory Road	Z14 (defended)		
Site 6	North Strand Fire Station/Former Readymix Site	Z4 (defended)		
Site 7	Docklands Innovation Park	Z14 (defended)		Z14, Z15
Site 8	Chadwick's Yard	Z14 (defended)		Z14
Site 9	East Road	Z14 (defended)		
Site 10	Castleforbes	Z14 (defended)		Z14

	Business Park			
Site 11	Trinity College Innovation District	Z14 (defended) but relies somewhat on temporary flood defences.	Z14	Z14
Site 12	ESB Complex, South Lotts Road	Z1 (defended)	Z1	
Site 13	George Reynolds House, Oliver Plunkett Avenue	Z1 (defended)		
Site 14	Former Power Station and Pigeon House Hotel, Poolbeg	Z14 (partly defended) and Z9	Z14 and Z9	Z14
Site 15	Shelbourne Stadium, South Lotts Road		Z14/Z9	

Table 6. SDRA 6 Development Areas Relationship with Flood Zones

	FLOOD ZONE A	**FLOOD ZONE B**	**FLOOD ZONE C**
Highly vulnerable development	**JUSTIFICATION TEST**	**JUSTIFICATION TEST**	**APPROPRIATE**
Sites 1 – 10 and 13	Z5, Z1, Z14, Z4 (defended)		Z5, Z14, Z15 (where relevant)
Site 14 Former Power Station and Pigeon House Hotel, Poolbeg	Z14	Z14	Z14
Site 12 ESB Complex, South Lotts Road	Z1 (defended)	Z1	
Site 11 Trinity College Innovation District	Z14 (defended)	Z14	Z14
Site 15 Shelbourne Stadium, South Lotts Road		Z14/Z9	

Table 7. SDRA 6 Matrix of Vulnerability Versus Flood Zones

Conclusion:

SDRA 6	**Docklands**	**Justification Test: Required**

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: Required

SDRA 9 - Emmet Road

See Section 13.11 of the Written Statement

Zoning Maps E and D of the Development Plan:

The lands are subject to land use zoning objectives:

Z1: To protect, provide and improve residential amenities.

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.

Z14: To seek the social, economic and physical development and/or regeneration of an area with mixed use, of which residential would be the predominant use.

SFRA Area Assessment: No. 18 Middle Camac: Davitt Road to South Circular Road

Flood Zones:

SDRA 9	Emmet Road	Flood Zone A	Flood Zone B	Flood Zone C
Site 1	Goldenbridge Industrial Estate	Z10, Z9	Z9, Z10	Z10
Site 2	Davitt Road West			Z10
Site 3	Emmet Road Regeneration Site			Z14, Z1
Site 4	Davitt Road East			Z1 and Z9

Table 10. SDRA 9 Development Areas Relationship with Flood Zones

	FLOOD ZONE A	FLOOD ZONE B	FLOOD ZONE C
Highly vulnerable development	**JUSTIFICATION TEST**	**JUSTIFICATION TEST**	**APPROPRIATE**
1 Goldenbridge Industrial Estate	Z10	Z10	Z10
Less vulnerable development	**JUSTIFICATION TEST**	**APPROPRIATE**	**APPROPRIATE**
1 Goldenbridge Industrial Estate	Z10	Z9	Z10
Water compatible development	**APPROPRIATE**	**APPROPRIATE**	**APPROPRIATE**
1 Goldenbridge Industrial Estate	Z9	Z9	Z10

Table 11. SDRA 9 Matrix of Vulnerability Versus Flood Zones

The SDRA is primarily located within Flood Zones (FZ) C for fluvial flooding. Lands adjacent the River Camac at Goldenbridge Industrial Estate are zoned Z9 (Open Space) to coincide with Flood Zone A/ B. The flood mapping shows small incursions of floodwater on development lands on the northern fringe of the estate (FZA/B). The sequential approach will be followed to ensure no vulnerable development is located in FZA/B.

Conclusion:

SDRA 9	Emmet Road	Justification Test: Not Required

SDRA 10 - North East Inner City

See Section 13.12 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.

Z4: To provide for and improve mixed-services facilities.

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.

Z15: To protect and provide for community uses and social infrastructure.

SFRA Area Assessment:

No. 3 Liffey: O'Connell Bridge to Tom Clarke Bridge

No. 4 Liffey: Sean Heuston Br. - O'Connell Bridge

No. 20 Tolka: Dublin Port to Drumcondra Bridge

Flood Zones:

SDRA 10	North East Inner City	Flood Zone A	Flood Zone B	Flood Zone C
Site 1	O'Connell Street to Moore Lane incorporating Carlton Site			Z5
Site 2	Lands to west of existing Hotel off Jones Road			Z10
Site 3	Russell St/North Circular Road			Z10, Z1, Z9
Site 4	Croke Park lands to the south of Croke Park Stadium			Z10, Z9
Site 5	Fitzgibbon Street Flats			Z1
Site 6	Charles St. Great			Z1
Site 7	Matt Talbot Court			Z1
Site 8	Bus Depot, Summerhill			Z5
Site 9	Lands on the Northern side of Sean McDermott			Z5, Z15, Z1

	Street			
Site 10	Convent Lands, Sean McDermott St.			Z5
Site 11	Railway Street			Z1
Site 12	Aldborough House			Z5
Site 13	Backlands and Health Centre site at Portland Row/North Strand Road.			Z1
Site 14	Clarence/Dunne Street Flat Complexes			Z1
Site 15	Lands off Richmond Street South, south of the Royal Canal			Z10, Z9, Z1
Site 16	North Strand / Poplar Row			Z4
Site 17	Abbey / Peacock Theatres	Z5 Partly Defended, Road Flooding only.	Z5 Partly Defended, Road Flooding only.	Z5

Table 12. SDRA 10 Development Areas Relationship with Flood Zones

Conclusion:

SDRA 10	**North East Inner City**	**Justification Test:** **Not Required**

SDRA 11 - St. Teresa's Gardens and Environs

See Section 13.13 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.

Z14: To seek the social, economic and physical development and/or regeneration of an area with mixed use, of which residential would be the predominant use.

Z15: To protect and provide for community uses and social infrastructure.

SFRA Area Assessment: No. 13 Poddle: Inside Canal

Flood Zones:

SDRA 11	St. Teresa's Gardens and Environs	Flood Zone A	Flood Zone B	Flood Zone C
		Z14	Z14	Z14, Z15, Z1

Table 13. SDRA 11 Development Area Relationship with Flood Zones

	FLOOD ZONE A	FLOOD ZONE B	FLOOD ZONE C
Highly vulnerable development	**JUSTIFICATION TEST**	**JUSTIFICATION TEST**	**APPROPRIATE**
SDRA 11	Z14	Z14	Z14, Z15, Z1,
Less vulnerable development	**JUSTIFICATION TEST**	**APPROPRIATE**	**APPROPRIATE**
SDRA 11	Z14	Z14	Z14, Z15, Z1
Water compatible development	**APPROPRIATE**	**APPROPRIATE**	**APPROPRIATE**
SDRA 11	Z14	Z14	Z14, Z15, Z1

Table 14. SDRA 11 Matrix of Vulnerability Versus Flood Zones

Conclusion:

SDRA 11	St. Teresa's Gardens and Environs	Justification Test: **Required**

SDRA 12 - Dolphin House

See Section 13.14 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.

Z4: To provide for and improve mixed-services facilities.

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

Z14: To seek the social, economic and physical development and/or regeneration of an area with mixed use, of which residential would be the predominant use.

SFRA Area Assessment: No. 13 Poddle: Inside Canal

SDRA 12 Dolphin House

Flood Zones:

SDRA 12	**Dolphin House**	**Flood Zone A**	**Flood Zone B**	**Flood Zone C**
		Z14, Z4, Z1	Z14, Z4, Z1	Z14, Z4, Z1, Z9

Table 15. SDRA 12 Development Area Relationship with Flood Zones

	FLOOD ZONE A	**FLOOD ZONE B**	**FLOOD ZONE C**
Highly vulnerable development	**JUSTIFICATION TEST**	**JUSTIFICATION TEST**	**APPROPRIATE**
SDRA 12	Z14, Z4, Z1	Z14, Z4, Z1	Z14, Z4, Z1
Less vulnerable development	**JUSTIFICATION TEST**	**APPROPRIATE**	**APPROPRIATE**
SDRA 12	Z14, Z4, Z1	Z14, Z4, Z1,	Z14, Z4, Z1
Water compatible development	**APPROPRIATE**	**APPROPRIATE**	**APPROPRIATE**
SDRA 12	Z14, Z4, Z1	Z14, Z4, Z1, Z9	Z14, Z4, Z1,Z9

Table 16. SDRA 1 Matrix of Vulnerability Versus Flood Zones

The SDRA is located within Flood Zones C for fluvial flooding. The areas located in Flood Zones A/B comprise the canal and public roads and lands already developed. The Framework Plan under Section 13.14 of the Written Statement shows an indicative

layout. The sequential approach will be followed to ensure no vulnerable development is located in Flood Zone A/B.

Conclusion:

SDRA 12	**Dolphin House**	**Justification Test:** **Not Required**

SDRA 13 - Markets Area and Environs

See Section 13.15 of the Written Statement

Zoning Map E of the Development Plan:

The lands are subject to land use zoning objectives:

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

Z8: To protect the existing architectural and civic design character, and to allow only for limited expansion consistent with the conservation objective.

SFRA Area Assessment: No. 4 Liffey: Sean Heuston Br. - O'Connell Bridge

SDRA 13	Markets Area and Environs	Flood Zone A	Flood Zone B	Flood Zone C
Site 1	'Total Produce' Site			Z5
Site 2	Fish Market Site			Z5
Site 3	TU Dublin Site			Z5
Site 4	Site adjacent to the Courthouse/Debtor's Prison			Z8
Site 5	Ryders Row			Z5

Table 17. SDRA 13 Development Area Relationship with Flood Zones

Conclusion:

SDRA 13	Markets Area and Environs	Justification Test: Not Required

SDRA 14 – St. James's Healthcare Campus and Environs

See Section 13.16 of the Written Statement

Zoning Maps E of the Development Plan:

The lands are subject to land use zoning objectives:

Z1: To protect, provide and improve residential amenities.

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

Z15: To protect and provide for community uses and social infrastructure.

SFRA Area Assessment: No. 17. Lower Camac: South Circular Road to Liffey Estuary

SDRA 14	St. James's Healthcare Campus and Environs	**Flood Zone A**	**Flood Zone B**	**Flood Zone C**
		Z15	Z15	Z15, Z9, Z1

Table 18. SDRA 14 Development Area Relationship with Flood Zones

	FLOOD ZONE A	**FLOOD ZONE B**	**FLOOD ZONE C**
Highly vulnerable development	**JUSTIFICATION TEST**	**JUSTIFICATION TEST**	**APPROPRIATE**
SDRA 14	Z15	Z15	Z15, Z1
Less vulnerable development	**JUSTIFICATION TEST**	**APPROPRIATE**	**APPROPRIATE**
SDRA 14	Z15	Z15	Z15, Z9, Z1
Water compatible development	**APPROPRIATE**	**APPROPRIATE**	**APPROPRIATE**
SDRA 14	Z15	Z15	Z15, Z9

Table 19. SDRA 14 Matrix of Vulnerability Versus Flood Zones

The SDRA is located within Flood Zones C for fluvial flooding. The flood mapping shows some incursion of floodwater onto the north western fringe of the SDRA lands on Mount Brown Road which is located within Flood Zones A and B.

Mitigation conditions attached to the National Children's Hospital development planning decision involve new drainage elements which will alter the flood zoning map along Mount Brown Road at the northern side of the SDRA lands, thereby reducing flood risk.

Conclusion:

SDRA 14	**St. James's Healthcare Campus and Environs**	**Justification Test: Not Required**

SDRA 15 - Liberties and Newmarket Square

See Section 13.17 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.

Z2: To protect and/or improve the amenities of residential conservation areas.

Z3: To provide for and improve neighbourhood facilities.

Z4: To provide for and improve mixed-services facilities.

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

Z7: To provide for the protection and creation of industrial uses, and facilitate opportunities for employment creation including Port Related Activities.

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.

Z14: To seek the social, economic and physical development and/or regeneration of an area with mixed use, of which residential would be the predominant use.

Z15: To protect and provide for community uses and social infrastructure.

SFRA Area Assessment:

No. 13 Poddle: Inside Canal

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

Flood Zones:

SDRA 15	Liberties and Newmarket Square	Flood Zone A	Flood Zone B	Flood Zone C*
Site 1	Iveagh Market			Z5
Site 2	Vicar Street			Z1,Z5, Z4,Z9
Site 3	Newmarket		Z4, Z10	Z1,Z4,Z10
Site 4	Pimlico	Z1, Z9, Z2	Z1, Z9, Z2	Z1, Z2, Z9
Site 5	Digital Hub			Z5
Site 6	Marrowbone Lane	Z14, Z15, Z9	Z1, Z4, Z9, Z10, Z14, Z15	Z1, Z4, Z9, Z10, Z14, Z15

Site 7	St. James' Harbour			Z1, Z5, Z9, Z10, Z15
Site 8	Maryland	Z4	Z4, Z1, Z9	Z1, Z4, Z9,
Site 9	Guinness Lands	Z7 (Tidal Flooding) partly defended	Z7	Z5, Z4, Z7, Z9, Z3, Z15

Table 20. SDRA 15 Development Area Relationship with Flood Zones

* It should be noted that within Flood Zone C in this area there is the potential for extreme depths of flooding arising from pluvial sources, particularly in Sites 1, 5 and 7. This should be assessed at development management stage through a site specific flood risk assessment.

	FLOOD ZONE A	FLOOD ZONE B	FLOOD ZONE C
Highly vulnerable development	**JUSTIFICATION TEST**	**JUSTIFICATION TEST**	**APPROPRIATE**
Site 3 Newmarket		Z4, Z10	Z1,Z4,Z10
Site 4 Pimlico	Z1, Z2	Z1, Z2	Z1, Z2, Z9
Site 6 Marrowbone Lane	Z14, Z15	Z1, Z4, Z10, Z14, Z15	Z1, Z4, Z9, Z10, Z14, Z15
Site 8 Maryland	Z4	Z4, Z1	Z1, Z4, Z9
Site 9 Guinness			Z5, Z4,Z7, Z9, Z3, Z15
Less vulnerable development	**JUSTIFICATION TEST**	**APPROPRIATE**	**APPROPRIATE**
Site 3 Newmarket		Z4, Z10	Z1,Z4,Z10
Site 4 Pimlico	Z1, Z2	Z1, Z2	Z1, Z2, Z9
Site 6 Marrowbone Lane	Z15, Z14	Z1, Z4, Z9, Z10, Z14, Z15	Z1, Z4, Z9, Z10, Z14, Z15
Site 8 Maryland	Z4	Z4, Z1	Z1, Z4, Z9
Site 9 Guinness	Z7 partly defended	Z7	Z5, Z4, Z7, Z9, Z3, Z15

Table 21. SDRA 15 Matrix of Vulnerability Versus Flood Zones

Conclusion:

SDRA 15	**Liberties and Newmarket Square**	**Justification Test: Required**

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 1: Clongriffin/Belmayne and Environs

Area Description	These greenfield and brownfield lands are located on the north eastern fringe of the city adjoining Fingal County Council. They are centred on the Key Urban Village at Clongriffin Railway Station and the Malahide Road Junction R139/ R107. The River Mayne forms the boundary between the two Local Authorities as well as the northern boundary of the SDRA. The development of these lands as a new urban quarter has been ongoing since 2000, guided initially by a framework plan and then in 2012 by a statutory plan (the Clongriffin – Belmayne Local Area Plan, 2012, as extended). This statutory plan was subject to a Strategic Flood Risk Assessment.
Land Use Zoning:	Lands to be developed adjacent to the River Mayne are primarily subject to land-use zoning objective Z14: To seek the social, economic and physical development and/or regeneration of an area with mixed use, of which residential would be the predominant

SDRA 1: Clongriffin/Belmayne and Environs	
	use.
SDRA 1 Clongriffin/ Belmayne and Environs:	The SDRA Guiding Principles (see Section 13.3 of the Written Statement) anticipate the completion of the Key Urban Village (Clongriffin and Malahide Road Junction), new roads/ links/ cycleways/ amenity routes, open space/ squares and community infrastructure.
Benefitting from Defences (flood relief scheme works)/ **Sensitivity to Climate Change/** **Residual Risk/** **Surface Water/** **Historical Flooding**	See Area Assessment No. 29. Mayne: Dublin Belfast Railway line – M50 (River Mayne)

Commentary on Flood Risk:

The SDRA lands are primarily located in Flood Zone C. The flood mapping shows some incursion of floodwater along the northern edge of the lands (to the south of the river). Small sections of the northern edge of the SDRA are, therefore, located within Flood Zones A and B (primarily Flood Zone B).

The SDRA Framework Plan shows the following in Flood Zones A and B:

- LAP Phase 6 Lands
- Proposed Pedestrian/ Cycle/ Amenity Route
- Proposed Key Links across the River Mayne into Fingal County Council
- Existing/ Proposed Open Space
- River Mayne Greenway
- Retention of Hedgerows

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 lands are identified in the NPF and the RSES and MASP as playing a strategic role in facilitating the consolidation of the Dublin Metropolitan Area through the provision of new homes and communities that are focused on existing and proposed public transport corridors / new urban centres. The development of the lands is essential to facilitate the completion of this developing area / the Key Urban Village at Clongriffin and Belmayne.

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

lands.

Answer: Yes: There is approximately 52 ha of undeveloped land within this developing area. These comprise greenfield lands in the main. The build out of the lands are required to complete the settlement - the Key Urban Village at Clongriffin and the Malahide Road Junction, the Phase 6 lands at Belcamp and the provision of critical infrastructure to serve this developing area including green infrastructure. The intensive development of these lands for homes, community uses, Key Urban Village uses (including commercial and retail), open spaces and green infrastructure represents an appropriate use of the lands on major public transport corridors within the city.

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

Answer: Yes: The SDRA lands form part of a developing neighbourhood / designated Key Urban Village, the development of which commenced in 2000 and which has yet to be built out / completed. Significant housing, roads/movement infrastructure, open space, community infrastructure and economic/retail (Town Centre) objectives remain to be achieved.

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

Answer: Yes: The lands form part of a developing part of the city. The build out of this area, which will include new housing, infrastructure, Key Urban Village uses, open space and recreational areas and a green infrastructure network, 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.

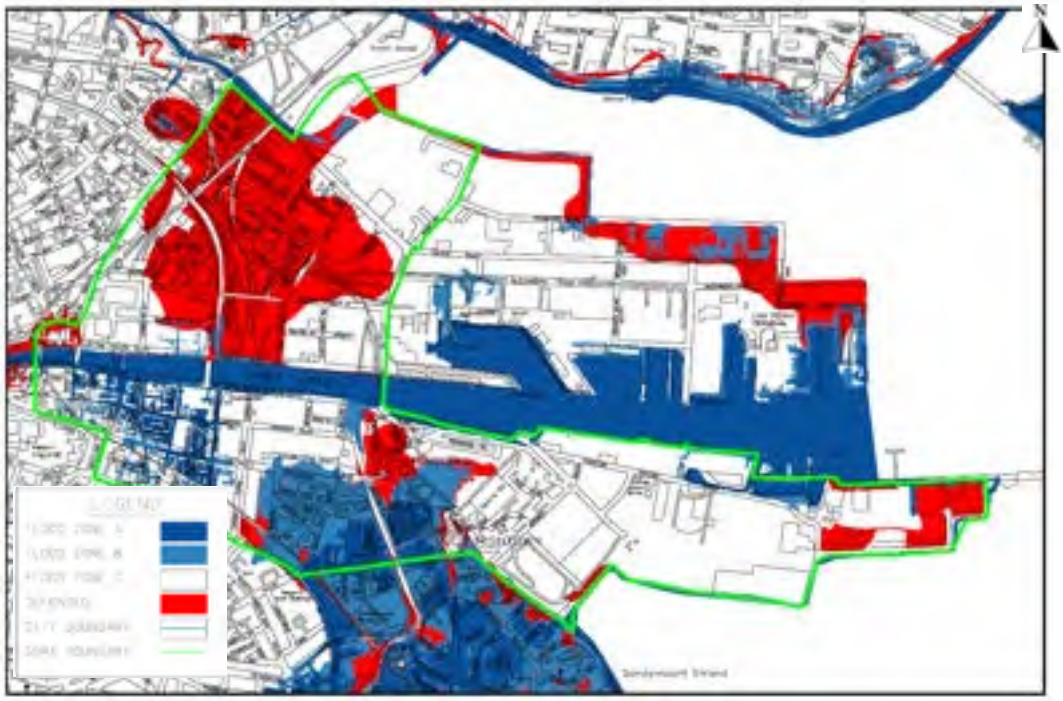
Answer: The lands are identified in the NPF and the RSES and MASP as playing a strategic role in facilitating the consolidation of the Dublin Metropolitan Area by providing new homes and communities that are focused on existing and proposed public transport corridors. There are no suitable alternative lands for the particular uses or development type in areas at lower risk of flooding, within or adjoining the urban settlement. The build out of the SDRA lands are considered essential to achieving a consolidated urban centre and to comply with the NPF and the RSES.

3. Specific Flood Risk Assessment

The SDRA is located primarily within Flood Zone C. A very small part of the lands along the northern edge are within Flood Zones A & B and these form part of the existing and proposed River Mayne Greenway / amenity route / green infrastructure network which are water compatible uses. These lands currently comprise undeveloped greenfield lands, open space areas, water attenuation infrastructure, public realm and fields. The lands located along the River Mayne in Flood Zones A and B form part / will form part of the wider green infrastructure network which will support this developing urban quarter. Any other development could reasonably be accommodated within the extents of Flood Zone C and must not extend into Flood Zones A and B.

SDRA 1: Clongriffin/Belmayne and Environs
Conclusion: The subject SDRA 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.

SDRA 6: Docklands



Area Description	The Docklands area extends to 520 ha and incorporates the south port area and the north and south docklands. It extends up to the edge of Fairview Park and to the Tolka Estuary in the north and over to Burgh Quay/ Customs House in the west. Two existing statutory development frameworks relate to the majority of the developable area and these are (i) The North Lotts and Grand Canal Dock Planning Scheme 2014 and (ii) the Poolbeg West Planning Scheme 2019. All development proposals within the area of these schemes must comply with the relevant Planning

SDRA 6: Docklands	
	Scheme. Both Planning Schemes were subject to Strategic Flood Risk Assessment. The Rivers Liffey, Dodder and Tolka traverse/ border this area as well as the Grand and Royal Canals.
Land Use Zoning:	Z1: To protect, provide and improve residential amenities. Z4: To provide for and improve mixed-services facilities. 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 Z14: To seek the social, economic and physical development and/or regeneration of an area with mixed use, of which residential would be the predominant use. Z15: To protect and provide for community uses and social infrastructure.
SDRA 6 Docklands:	The Framework Plan above, identifies 15 opportunity sites for development in addition to the areas subject to the Planning Schemes as outlined above. Section 13.8 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. New infrastructure proposals in the Docklands include: New Park along Royal Canal between Sheriff Street and Newcomen Bridge; The Port Greenway; Bridge from North Wall Quay at Point Depot and the widening of Tom Clarke Bridge; Dodder Bridge, pedestrian/ cycle bridge between Samuel Beckett Bridge and Tom Clarke Bridge; extension of Luas; A DART Interconnector/ DART + projects; and, the Southern Port Access Route.

SDRA 6: Docklands

Benefitting from Defences (flood relief scheme works)/ Sensitivity to Climate Change/ Residual Risk/ Surface Water/ Historical Flooding	See Area Assessments: No. 1 Dublin Port South of the Liffey from Tom Clarke Bridge No.3 Liffey: O'Connell Bridge to Tom Clarke Bridge No.9 Dodder: Liffey to Ballsbridge No.20 Tolka: Dublin Port to Drumcondra Bridge

Commentary on Flood Risk:
The Opportunity Sites, their zoning and their flood zone are set out below:

	FLOOD ZONE A	FLOOD ZONE B	FLOOD ZONE C
Sites 1 – 10 and 13	Z5, Z1, Z14, Z4, (defended)		Z5, Z14, Z15 (where relevant)
Site 14 Former Power Station and Pigeon House Hotel, Poolbeg	Z14 (partly defended), Z9	Z14, Z9	Z14,
Site 12. ESB Complex, South Lotts Road	Z1 (defended)	Z1	
Site 11. Trinity College Innovation District	Z14 (defended) (defended but relies somewhat on temporary flood defences.	Z14	Z14
Site 15 - Shelbourne Stadium, South Lotts Road		Z14/Z9	

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.

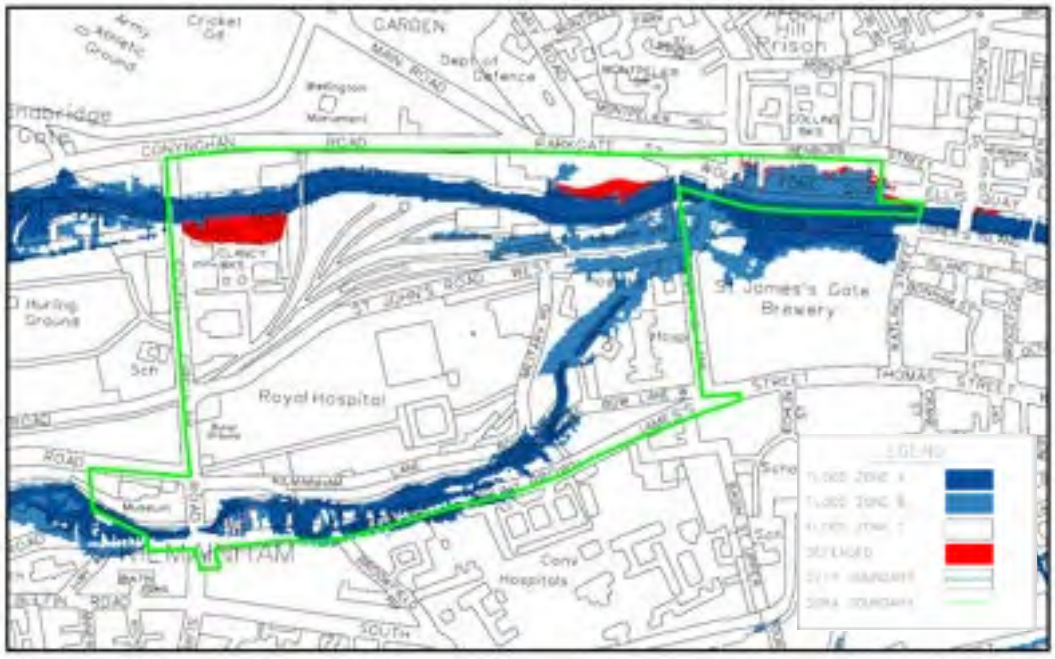
2. The zoning or designation of the lands for the particular use or development type is required to achieve the proper planning and sustainable development of the urban settlement and, in particular:

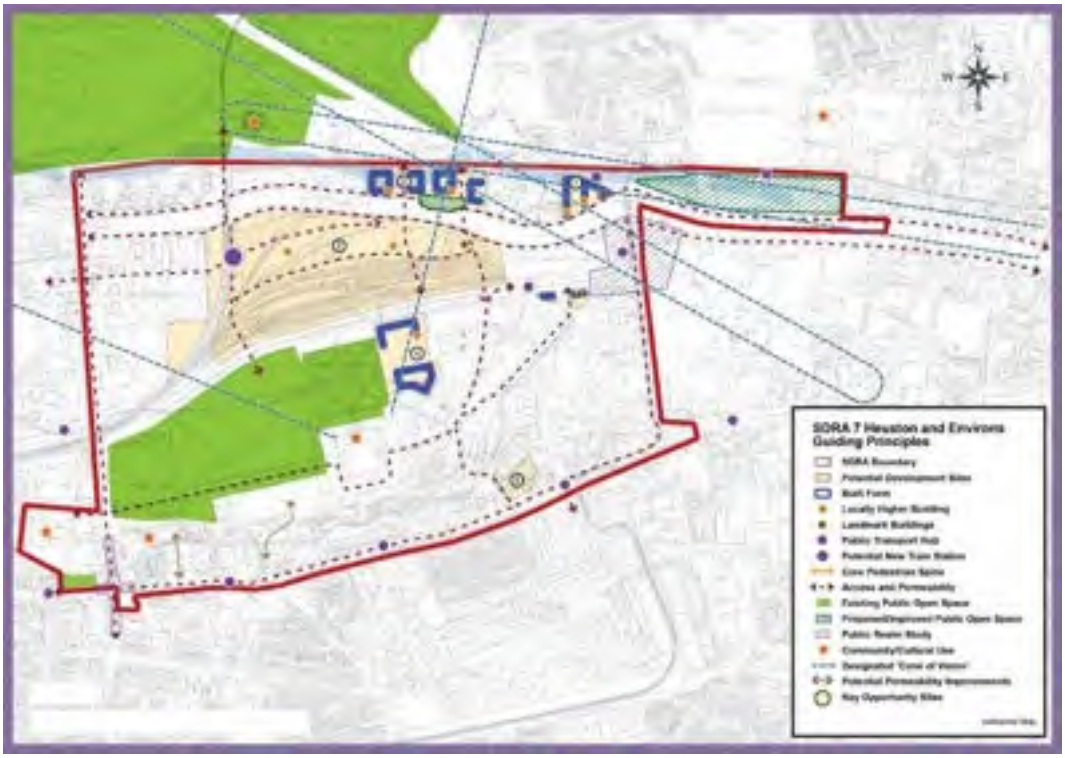
(i) Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement.

SDRA 6: Docklands
Answer: Yes: The continuing redevelopment and regeneration of the docklands is essential to facilitate the regeneration and expansion of Dublin City. The lands are identified at national and regional level as playing a strategic role in facilitating the consolidation of the Dublin Metropolitan Area by providing new homes and employment uses around existing and proposed public transport corridors. The Core Strategy identifies that the Docklands has the capacity to deliver c. 7,900 residential units. The RSES seeks the further development of people intensive high tech and services based business districts in the Docklands and Poolbeg. **(ii) Comprises significant previously developed and/or under-utilised lands.** **Answer: Yes:** The 15 opportunity sites comprise under-utilised lands. The regeneration and redevelopment of these underutilised lands is essential to achieve a more compact urban form to be facilitated through well-designed higher density development. **(iii) Is within or adjoining the core of an established or designated urban settlement.** **Answer: Yes:** The SDRA corresponds to the Dublin Docklands areas as defined by the Dublin Docklands Development Authority Act, 1997. The RSES and MASP has designated Point Village and Poolbeg as a District Centre and the wider Docklands as a strategic development area. The Core Strategy of the Development Plan designates Point Village and Poolbeg as a Key Urban Village (equivalent of District Centre) and as a major growth area in the city. **(iv) Will be essential in achieving compact and sustainable urban growth.** **Answer: Yes:** The SDRA lands have significant potential for further regeneration/ development and can make a valuable contribution to the future physical and social regeneration of this part of the city. 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:** The regeneration/ redevelopment of these lands has been identified at national and regional level as an imperative for the consolidation of Dublin City. 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 While the SDRA is partly located within Flood Zones A and B, it is defended and the primary source of flood risk is tidal. Development could reasonably be accommodated within the extents of Flood Zone C or in areas with defences and should not need to extend into undefended areas of Flood Zones A and B. Regard must be had to the following requirements: • In respect of the following sites in Tidal Flood Zone A with defences, there should be no residential ground floor occupancy: sites 2, 4 and south of 5, and sites 7, 8 and 9. As part of the SSFRA, an assessment should be undertaken of residual risks of defence failure, including overtopping in an extreme or climate change scenario, and breach. • Site 14 Pigeon House lies within Flood Zones A and B. The

SDRA 6: Docklands
development of these lands is premature until the site is defended as part of a development scheme for the site. Any master planning for the site would require a flood defence strategy, which will need to be constructed prior to commencement of the development of the rest of the site.
Conclusion: The subject area <u>passes</u> the Justification Test for Development Plans only where development is in previously defended parts of Flood Zone A / B, and the standard of protection and residuals risks are assessed and meet the requirements laid out in the SFRA.

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	
	recreational amenity, open space and ecosystem services. Z10: To consolidate and facilitate the development of inner city and inner suburban sites for mixed uses.
SDRA 7 Heuston and Environs:	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.
Benefitting from Defences (flood relief scheme works)/ **Sensitivity to Climate Change/** **Residual Risk/** **Surface Water/** **Historical Flooding**	See Area Assessments: 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 Estuary

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.

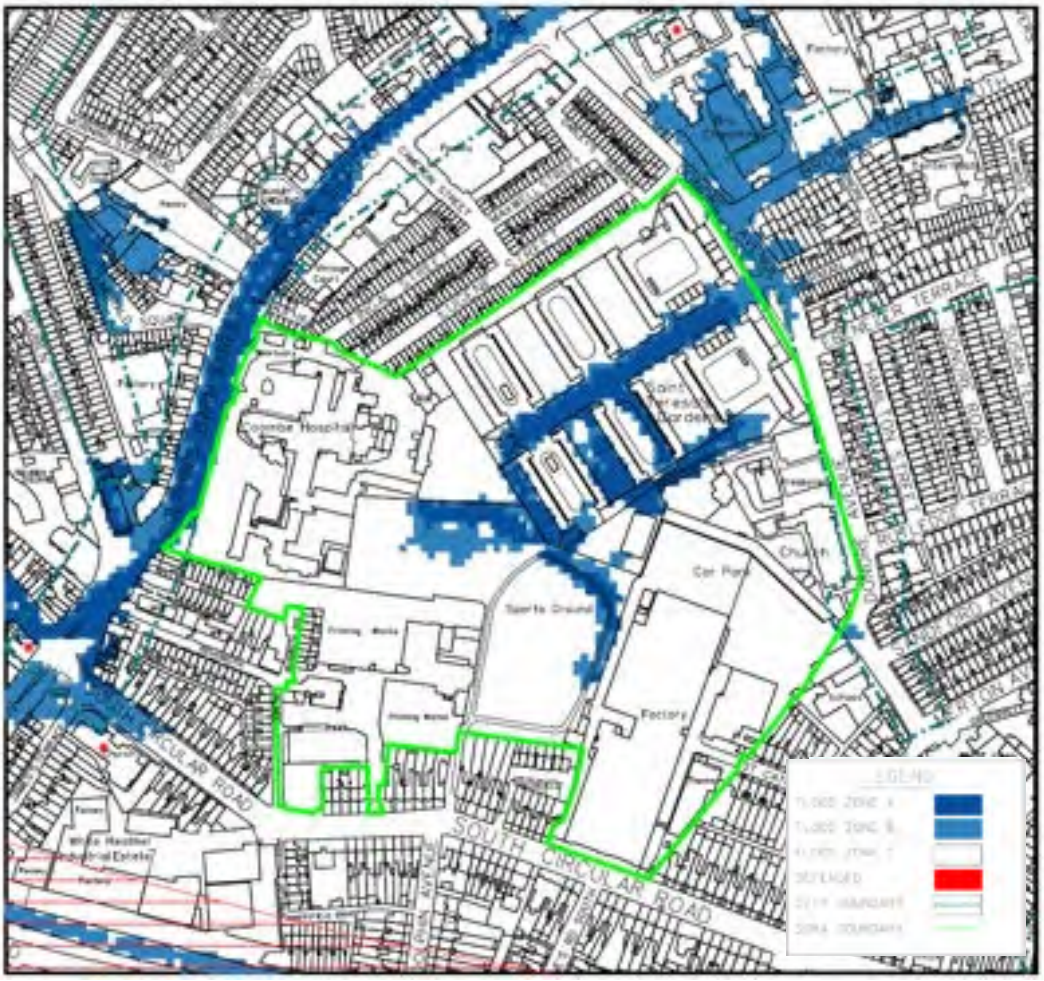
3. Specific Flood Risk Assessment

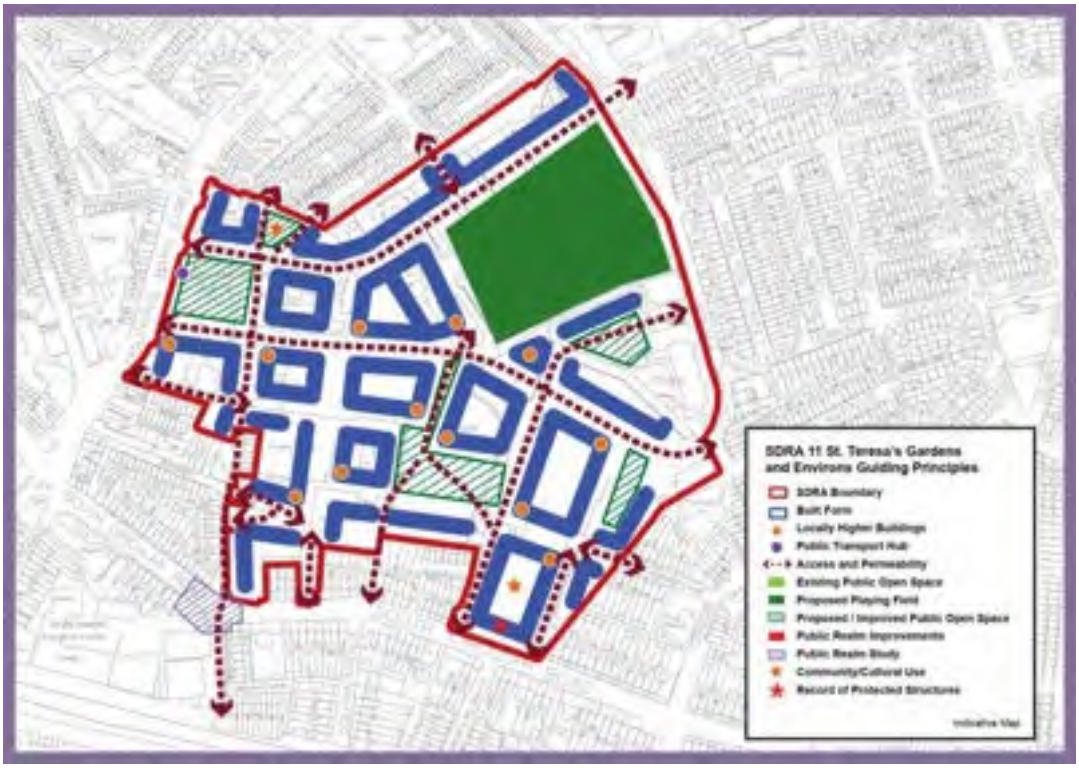
The SDRA is located primarily within Flood Zone C. Development in the main could reasonably be accommodated within the extents of Flood Zone C and should not need to extend into Flood Zones A and B.

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.

SDRA 11: St. Teresa's Gardens and Environs



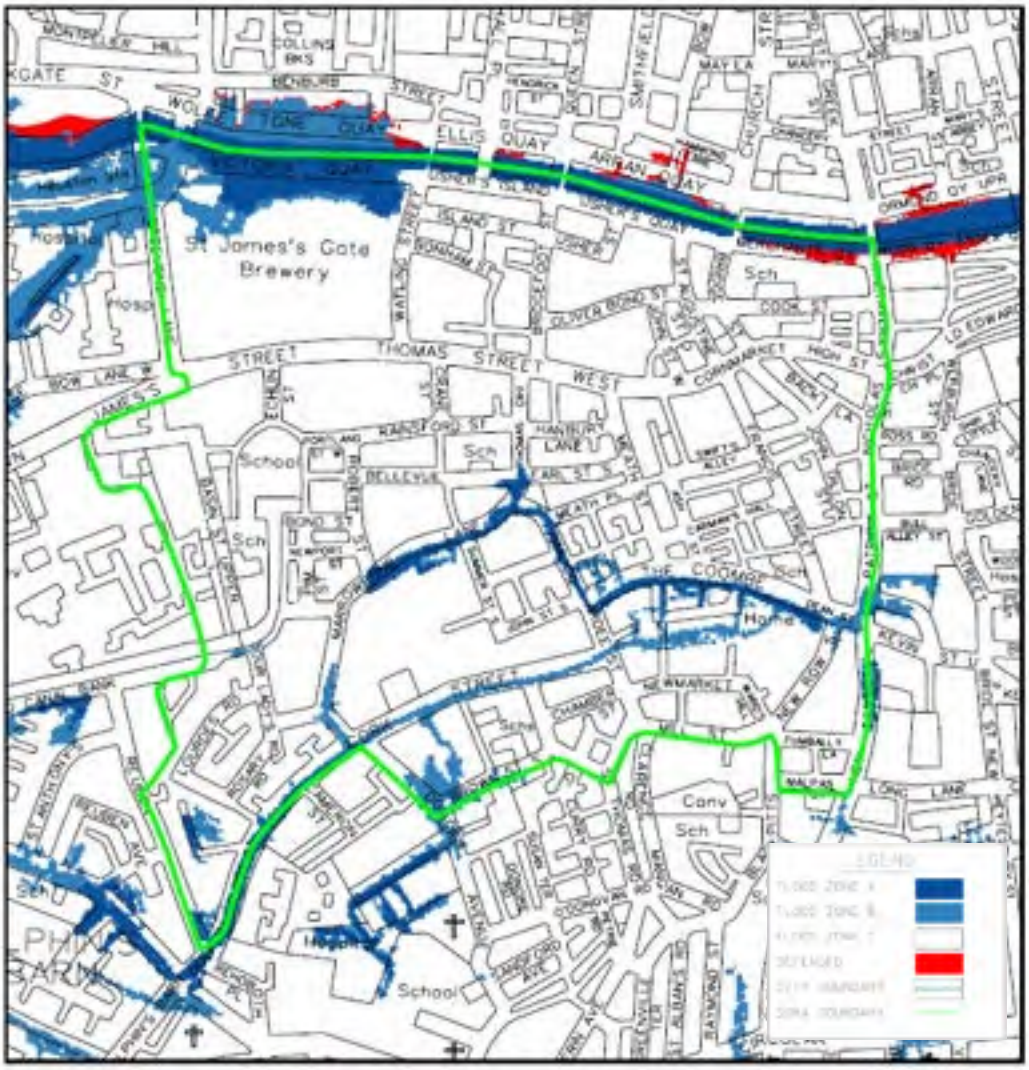


Area Description	The lands comprise St. Teresa's Gardens and Environs, a 6 ha local authority housing site, the former Player Wills and Bailey Gibson Sites, and St. Teresa's church site (c. 4.6ha). The Combe Hospital and other small parcels of land are also within the boundary of the

SDRA 11: St. Teresa's Gardens and Environs	
	SDRA. The lands are located in the Inner City near the canal at Donore Avenue/ Cork Street. The SDRA is located between the Grand Canal to the south and the Poddle to the north-east. The area is mainly residential with some mixed commercial.
Land Use Zoning:	Z1: To protect, provide and improve residential amenities. Z14: To seek the social, economic and physical development and/or regeneration of an area with mixed use, of which residential would be the predominant use. Z15: To protect and provide for community uses and social infrastructure.
SDRA 11 St. Teresa's Gardens:	The Guiding Principles Plan, set out in Chapter 13 under SDRA 11 St. Teresa's Gardens and Environs, outlines redevelopment opportunities for a mixed use quarter for primarily residential use (1,500 units) along with complementary community uses (including the expansion of an existing primary school site) a pitch, open space provision, public realm improvements and infrastructure provision. Connections to the wider area are proposed to ensure physical, social and economic integration of the lands with the surrounding area.
Benefitting from Defences (flood relief scheme works)/ **Sensitivity to Climate Change/** **Residual Risk/** **Surface Water/** **Historical Flooding**	See Area Assessment No. 13 Poddle: Inside Canal
Commentary on Flood Risk: St. Teresa's Gardens and Environs are primarily located in Flood Zone C. The north eastern portion of the lands are located in Flood Zones A and B.	
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 lands are located in the Inner City, inside the Canals. The	

SDRA 11: St. Teresa's Gardens and Environs
Guiding Principles plan for the land outlines their redevelopment potential for new housing and associated facilities in order to maximise the opportunities of this well-connected but underutilised brownfield site. The lands are situated within the built fabric of the city and adjacent to a bus corridor (Bus Connects). The redevelopment of the lands at increased densities is essential to meet national and regional brownfield development objectives as set out in National and Regional planning policy including the Regional MASP and is considered essential to facilitate the regeneration and expansion of the urban settlement. **(ii) Comprises significant previously developed and/or under-utilised lands.** **Answer: Yes:** The lands comprise previously developed and underutilised lands in the city centre in an area well served by public transport. The areas located in Flood Zones A/B have been previously developed / are built-up / are roads. **(iii) Is within or adjoining the core of an established or designated urban settlement.** **Answer: Yes:** The lands form part of an established built up part of the Inner City. **(iv) Will be essential in achieving compact and sustainable urban growth**. **Answer: Yes:** The lands form part of an established built up part of the Inner City and are essential in achieving compact and sustainable urban growth including through the support such development can provide to existing services – transport, service infrastructure and community infrastructure. The development of the lands are required to deliver a sustainable and compact urban form at this location and to achieve the sustainable use of scarce urban land and to respond to climate change. **(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. A section of the north eastern part of the lands is located in Flood Zones A and B. The sequential approach will be adopted and the open space area for the development will be within Flood Zones A and B. The Poddle Flood Alleviation Scheme proposes to adapt portions of the drainage network to reduce flood risk in this area. Although this will be beneficial, the scheme is not required to allow development of the site.
Conclusion: The subject SDRA 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.

SDRA 15: Liberties and Newmarket Square



SDRA 15: Liberties and Newmarket Square	
Area Description	The SDRA relates to lands located in the Liberties/ Newmarket area. The area stretches from the Guinness Lands in the north west over to Patrick Street in the east and south to the South Circular Road. The River Liffey is located to the north of the lands and the River Poddle traverses the lands.
Land Use Zoning:	Z1: To protect, provide and improve residential amenities. Z2: To protect and/or improve the amenities of residential conservation areas. Z3: To provide for and improve neighbourhood facilities. Z4: To provide for and improve mixed-services facilities. Z5: To consolidate and facilitate the development of the central area, and to identify, reinforce, strengthen and protect its civic design character and dignity. Z7: To provide for the protection and creation of industrial uses, and facilitate opportunities for employment creation including Port Related Activities. 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. Z14: To seek the social, economic and physical development and/or regeneration of an area with mixed use, of which residential would be the predominant use. Z15: To protect and provide for community uses and social infrastructure.
SDRA 15 Liberties and Newmarket Square:	The Framework Plan above and as set out in Section 13.17 in Chapter 13 of the Written Statement identifies nine development sites and opportunities for the integration of new development into the area addressing issues such as urban structure, land use, infrastructure, design, movement, permeability, building lines, heights and greening opportunities.

SDRA 15: Liberties and Newmarket Square	
Benefitting from Defences (flood relief scheme works)/ **Sensitivity to Climate Change/** **Residual Risk/** **Surface Water/** **Historical Flooding**	See Area Assessments: No. 4 Liffey: Sean Heuston Br. - O'Connell Bridge No. 13 Poddle: Inside Canal

Commentary on Flood Risk:

Following screening, five of the nine Opportunity Sites have been identified as subject to flood risk.

Opportunity Site	Flood Zone
Site 3 Newmarket	B and C
Site 4 Pimlico	A, B and C
Site 6 Marrowbone Lane	A, B and C
Site 8 Maryland	A, B and C
Site 9 Guinness	A, B and C

Justification Test for Development Plans

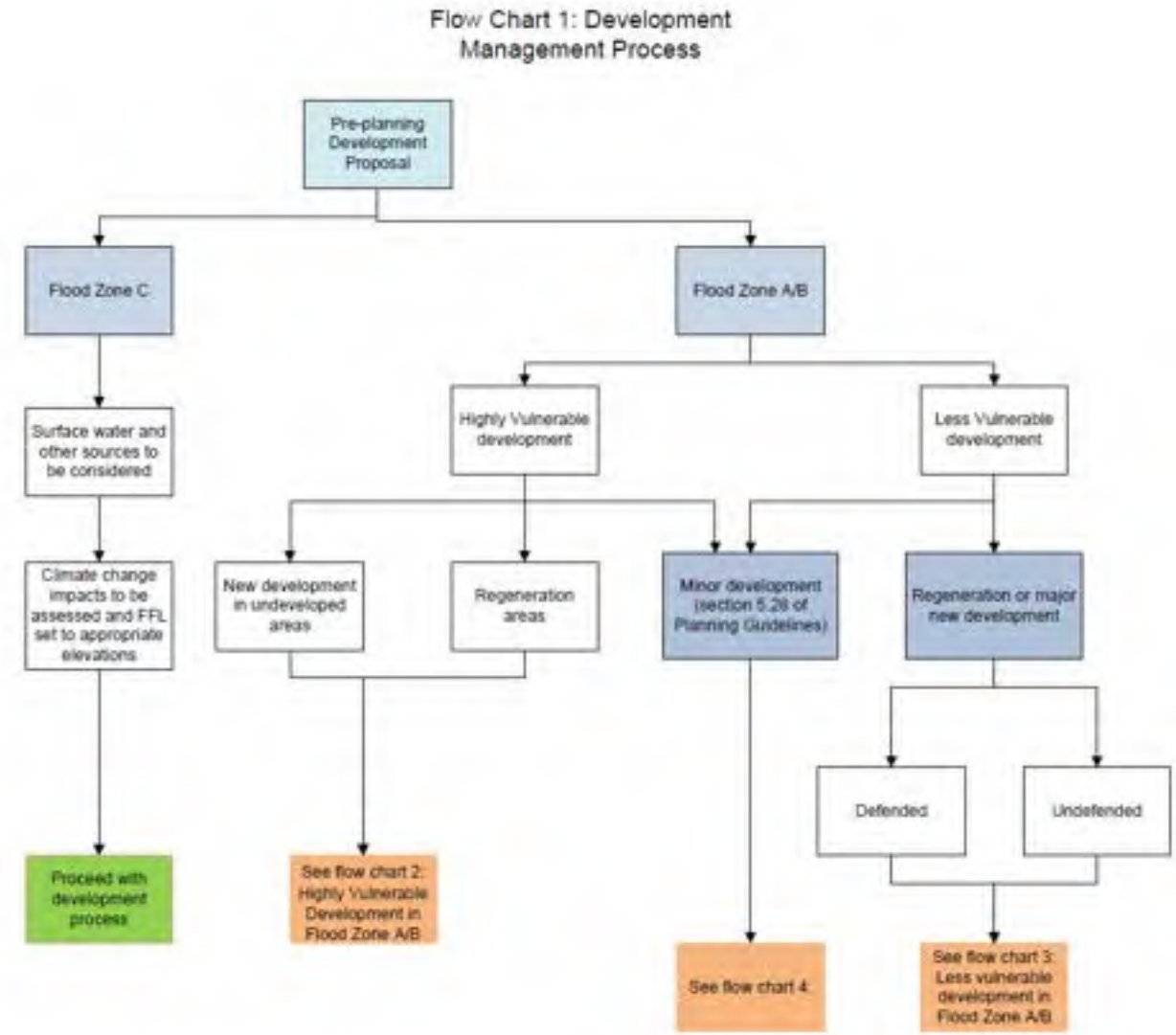
1. Part 1 of the Justification Test is covered under Section 3.2.1 in the main body of the SFRA report.

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:

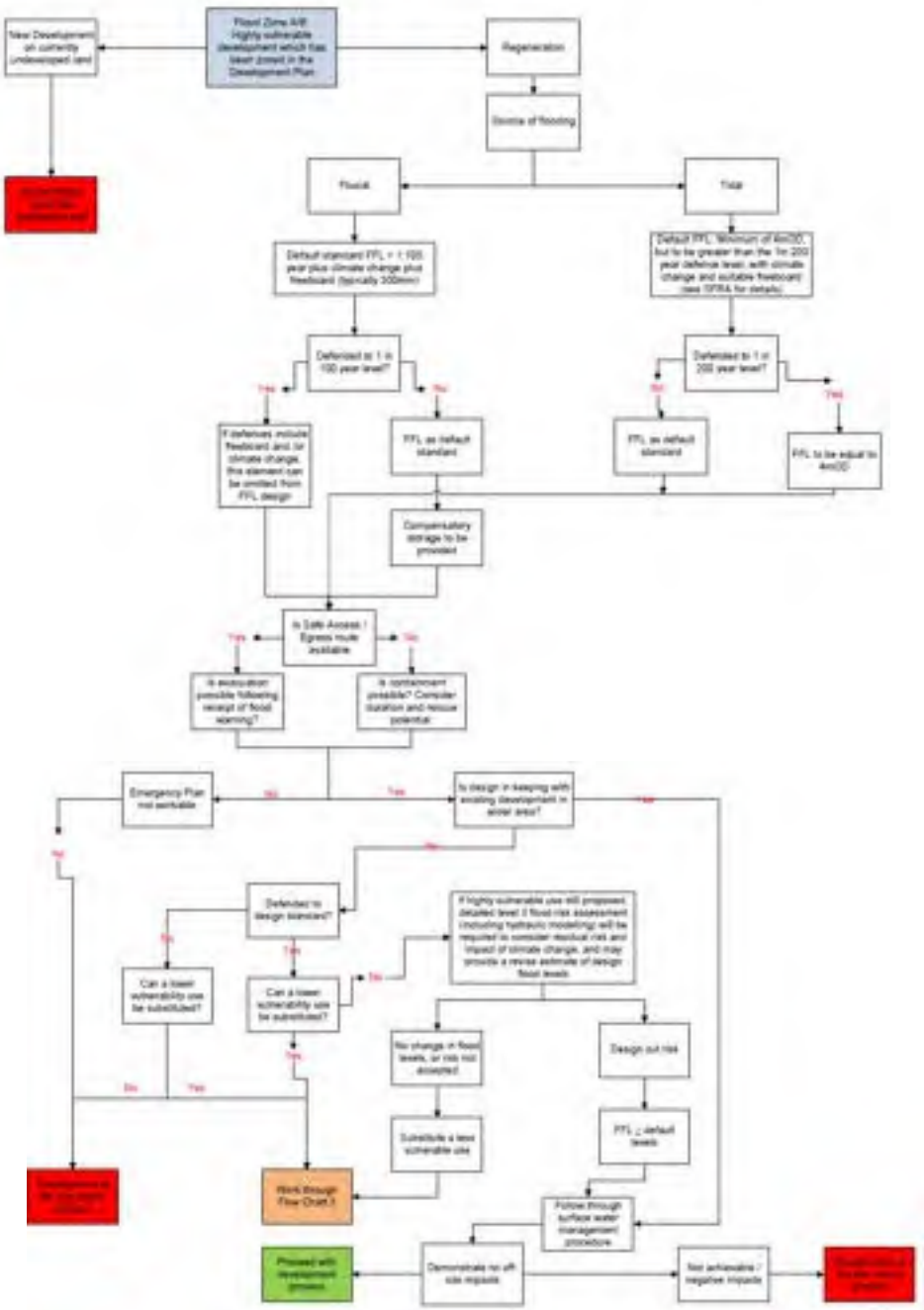
(i) Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement.
Answer: Yes: The lands are located in the Inner City Liberties area of the city. The area is well served by public transport including Luas and local bus services. While the Liberties has seen significant infill/ brownfield development over the last Development Plan period there are a number of opportunity sites in this area, including the Diageo (Guinness) site, which have the potential to contribute of the creation of sustainable compact communities with improved housing choice, access to social and economic opportunities, enhanced services and amenities. According to the Core Strategy, this area has the capacity to deliver some 2,500 residential units. The redevelopment of the lands at increased densities is essential to meet national and regional brownfield development objectives as set out in National and Regional planning policy including the Regional MASP and is considered essential to facilitate the regeneration and expansion of the urban settlement.
(ii) Comprises significant previously developed and/or under-utilised lands
Answer:
Yes: These lands comprise previously developed/ underutilised lands.
(iii) Is within or adjoining the core of an established or designated urban settlement.
Answer: Yes: The lands form part of an established built-up part of the Inner

SDRA 15: Liberties and Newmarket Square
City. **(iv) Will be essential in achieving compact and sustainable urban growth** **Answer: Yes:** The lands form part of an established built-up part of the Inner City and are essential in achieving compact and sustainable urban growth including through the support such development can provide to existing services – transport, service infrastructure and community infrastructure. **(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 following sites lie partly in Flood Zone A - 4. Pimlico, 6 Marrowbone Lane, and 8 Maryland. The Poddle Flood Alleviation Scheme proposes to adapt portions of the drainage network to reduce flood risk in the relevant area. Residential development within these sites on Flood Zone A/ B would be premature. Less vulnerable development would require further detailed modelling and assessment to assess the impacts on neighbouring properties having regard to potential displacement effects. After the flood defence works have been completed, a further assessment of risks will be undertaken to determine the appropriate land use and required mitigation measures in these areas. There is flooding (Zone A and B) (including underground seepage) on the northern side of the Guinness lands from the River Liffey (mainly tidal). As the lands are zoned Z7 there is potential to locate less vulnerable development in Flood Zone B. Highly vulnerable development could reasonably be accommodated within the extents of Flood Zone C and should not need to extend into Flood Zones A and B.
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 avoid Flood Zone A and only less vulnerable development is appropriate in previously developed parts of Flood Zone B.

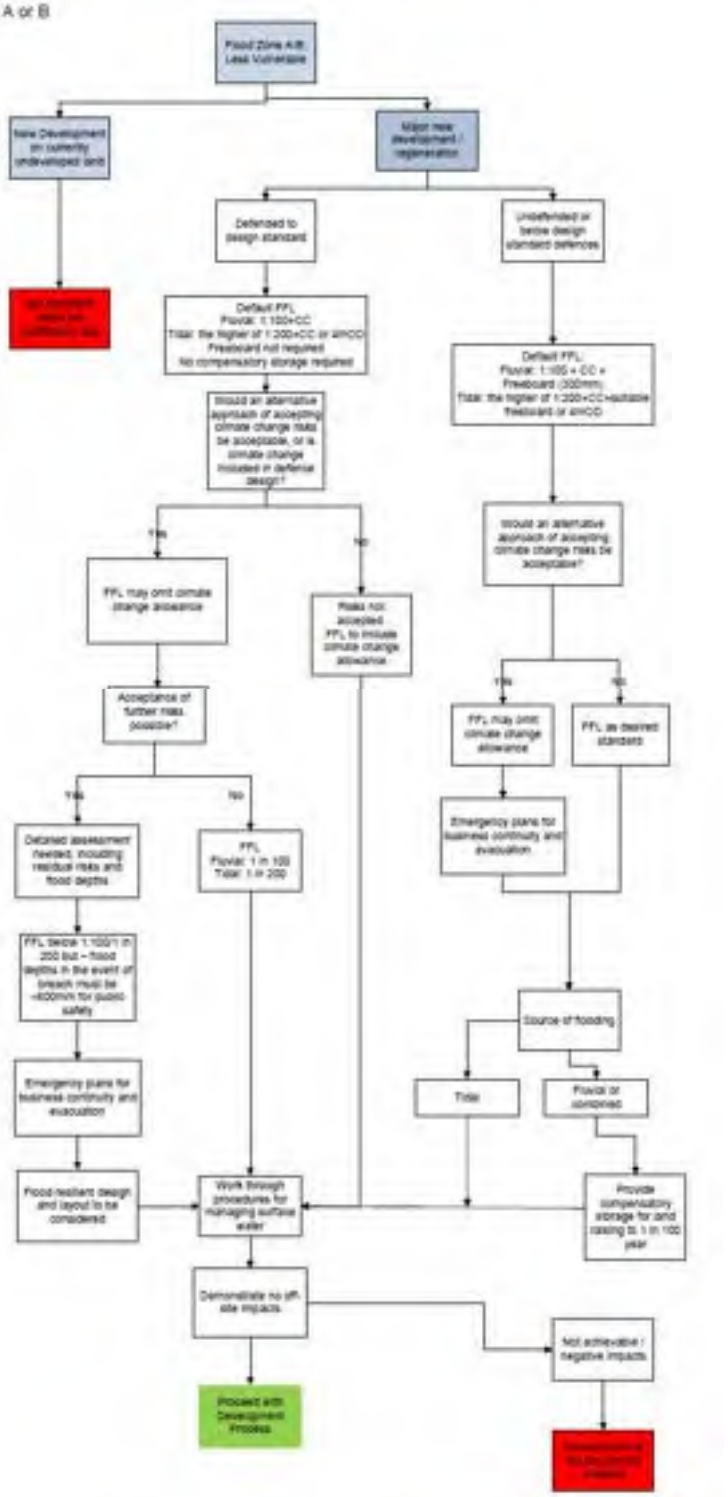
D Flood Risk Assessment Process Flow Charts



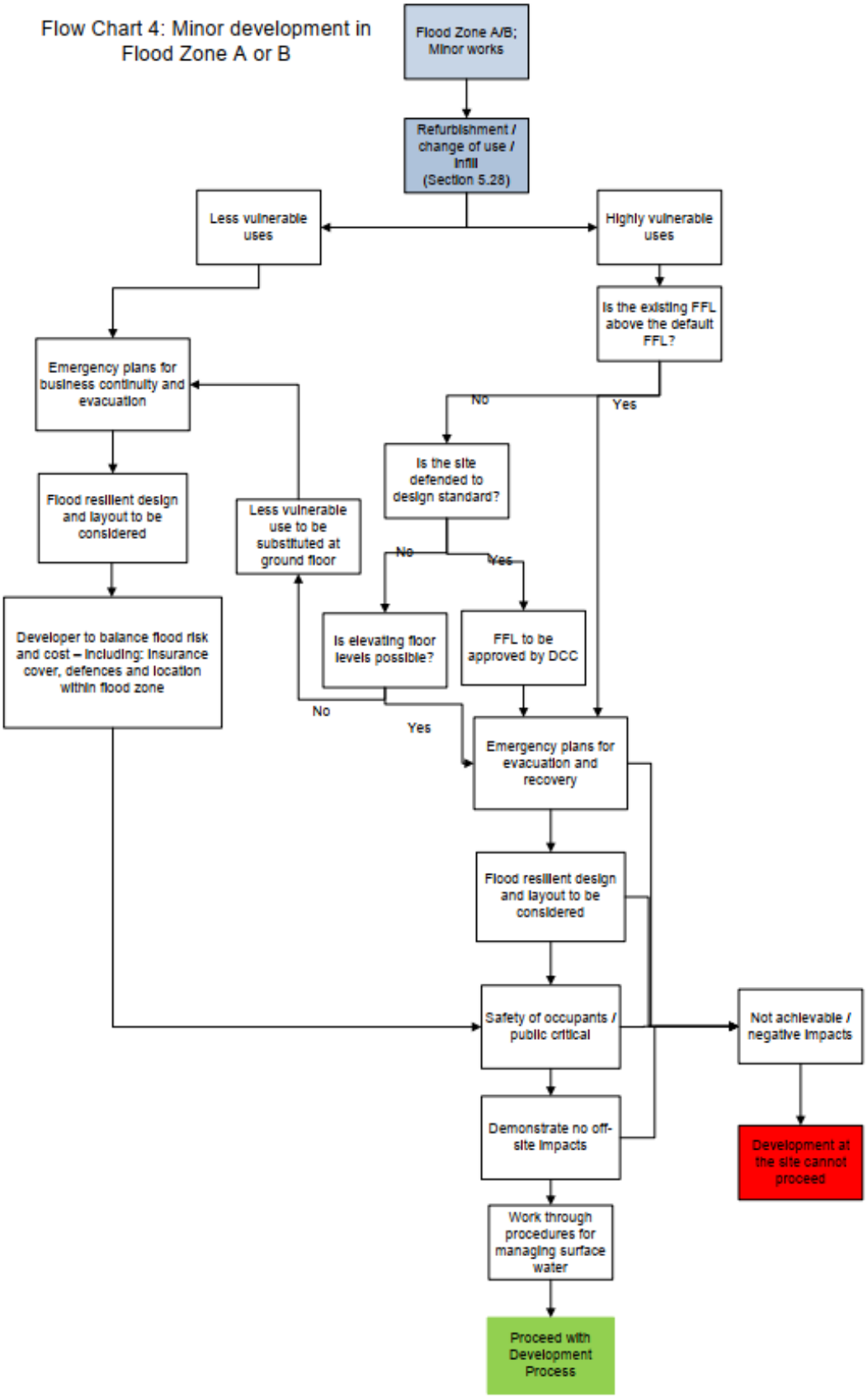
Flow Chart 2: Highly Vulnerable Development in Flood Zone A/B



Flow Chart 3: Less Vulnerable Development in Flood Zone A or B



Flow Chart 4: Minor development in Flood Zone A or B



E Composite Flood Map

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 indicates lands defended to the 1% AEP fluvial and/or the 0.5% AEP tidal flood events and should therefore be considered also to be Flood Zone A.

Comhairle Cathrach Bhaile Átha Cliath
Dublin City Council

Dublin City Development Plan 2022-2028

Composite Flood Map for Dublin City Council

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

Flood Zone A

Flood Zone B

Flood Zone C

Defended

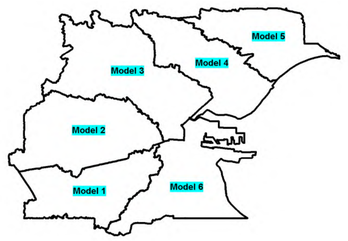
City Boundary

Refer To OPW Website – Floodinfo.ie

John O'Hara
Dublin City Planner

F Pluvial Flood Depth Map

Flood Depth Map



Dublin City Model boundaries

Legend

Flood Depth (in m)

- 0 m to 0.1 m
- 0.1 m to 0.2 m
- 0.2 m to 0.3 m
- 0.3 m to 0.5 m
- 0.5 m to 1.0 m
- 1.0 m to 2.0 m
- > 2.0 m
- Model Boundary

Notes

JACOBS

Client	
Project	FloodResilienCity Project
Title	Type 1 Model - Flood Depth Map Dublin - 1% AEP Event - 3hr Duration
Drawing Status	DRAFT
Job No.	32102500
Figure No.	32102500/D/OV/FD/0010
Revision	0
Scale	
Date :	

Drawn	MM	Checker	MV	Reviewv	PS	Approved	CF

0 1km