

Jamestown Masterplan Strategic Flood Risk Assessment

Report

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Purpose

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Abbreviations

1D	One Dimensional (modelling)
2D	Two Dimensional (modelling)
AEP	Annual Exceedance Probability
AFA	Area for Further Assessment
CFRAM	Catchment Flood Risk Assessment and Management
DCC	Dublin City Council
DCDP	Dublin County Development Plan
DTM	Digital Terrain Model
EPA	Environmental Protection Agency
FEH	Flood Estimation Handbook
FFL	Finished Floor Level
FRA	Flood Risk Assessment
FRMP	Flood Risk Management Plan
FRR	Flood Risk Review
FSU	Flood Studies Update
GIS	Geographical Information System
HEFS	High End Future Scenario
HPW	High Priority Watercourse
JFLOW	2-D hydraulic modelling package developed by JBA
JT	Justification Test
LA	Local Authority
MPW	Medium Priority Watercourse
MRFS	Medium Range Future Scenario
OPW	Office of Public Works
OSi	Ordnance Survey Ireland
PFRA	Preliminary Flood Risk Assessment
RSES	Regional Spatial and Economic Strategy
SEA	Strategic Environmental Assessment
SFRA	Strategic Flood Risk Assessment
SuDS	Sustainable Drainage Systems

1 Introduction

1.1 Terms of Reference

JBA Consulting was appointed by Dublin City Council to carry out the Strategic Flood Risk Assessment to inform the Masterplan for the Jamestown Lands. Hereafter, this will be referred to as an SFRA.

1.2 Background

In June 2021, DCC re-zoned 43Ha of industrial lands between Jamestown Road and St Margaret's Road/McKee Avenue, Finglas from Land Use Zoning Objective Z6 to Land Use Zoning Objective Z14 and designated the lands a Strategic Development and Regeneration Area (SDRA). The objective that underpinned this decision was "to seek the social, economic and physical development and/or rejuvenation of an area with mixed-use, or with mixed use, of which residential and Z6 would be the predominant uses". These lands are hereafter defined as the Jamestown Lands. These lands have subsequently been designated as part of an extended SDRA in the Dublin City Development Plan 2022-2028. The extent of the lands subject to the Masterplan is identified in Figure 1-1.



Figure 1-1 Jamestown SDRA Lands

This report details the SFRA for this area and has been prepared in accordance with the requirements of the DoEHLG and OPW Planning Guidelines, The Planning System

and Flood Risk Management¹; these guidelines were issued under the Planning and Development Act 2000 and recognise the significance of proper planning to manage flood risk.

1.3 SFRA Overview

The Jamestown Masterplan will be the key document for setting out a vision for the development of the area. It should be noted that the Masterplan SFRA sits under the Dublin City Development Plan 2022-2028 and its SFRA. The strategy and Policy outlined in the City Development Plan written statement and SFRA is consistently applied in this document; more specifically in relation to SDRA 3 and Area 22A of the Finglas Stream.

To avoid unnecessary duplication of the policy background and descriptions of the context of the Planning System and Flood Risk management Guidelines it is recommended that this document is read in conjunction with the Dublin City Development Plan 2022-2028 SFRA. Section 1.3 and 1.4 of the SFRA document cover the background to the Policy and Planning Guidelines.

1.3.1 Purpose

The purpose of this work is to provide a broad assessment of flood risk to inform strategic land-use planning decisions and the master planning of the Jamestown lands. This is in accordance with The Planning System and Flood Risk Management Guidelines for Planning Authorities and Technical Appendices, 2009.

Within the SFRA the Justification Test for SDRA 3 and Area 22A clarifies that.

- 1 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.
- 2 Residential development would be a natural extension of existing development in the vicinity of Flood Zones A and B.
- 3 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.**
- 4 The floodplain lands should be retained as their current water compatible uses.**

Furthermore, the Masterplan is seen as an opportunity to implement best practise in terms of both flood risk management and stormwater management. As such under Section 13.5 of the DCDP Written Statement it is further clarified that in terms of the consideration of Green Infrastructure the following should be considered:

- 5 Retention of existing open watercourses with an appropriate riparian zone**
- 6 The exploration of opportunities to de-culvert existing watercourses and their incorporation into the Masterplan where possible,**
- 7 Extensive tree planting including along street avenues.
- 8 Biodiversity planting.
- 9 Play.

The key items above are highlighted in bold and confirm the general application of the sequential approach combined with the additional objective of de-culverting and creating an appropriate riparian zone.

¹ DoHELG and OPW (2009) The Planning System and Flood Risk Management: Guidelines for Planning Authorities

Guidance and Policy on the riparian zone is provided by Section 9.5.2 and 10.5.5 of the CDP Written Statement as well as the IFI publication 'Planning for Watercourses in the Urban Environment'.

Key requirements are;

- Policy SI10 - 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.
- The riparian zone is considered on a zonal basis that incorporates the watercourse, streamside, middle and outer zones.
- SuDS features can be incorporated into the outer zone.

Building on the requirements of the DCDP the SFRA and Surface Water Management Strategy will seek to initially identify the watercourses through the Jamestown Lands, investigate the flow and routes, make an initial estimate of flood risk and suggest potential ways in which the watercourse can be de-culverted through an appropriate riparian zone.

1.4 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.

1.5 Technical Principles

1.5.1 Return Periods

The probability of a flood event is classified by its annual exceedance probability (AEP) or return period (in years). A 1% AEP flood will occur on average once every 100 years and has a 1 in 100 chance (or 1%) of occurring in any given year.

AEP can be a helpful concept as return period is often misunderstood to be the period between large flood events rather than an average recurrence interval. Annual exceedance probability is the inverse of return period as shown in Table 1-1.

Table 1-1 Return Periods & Annual Exceedance Probabilities

Return Period (Years)	Annual Exceedance Probability (%)
2	50
10	10
30	3.3
50	2
100	1
200	0.5

1.5.2 Climate Change

The Planning Guidelines (originally published in 2009) recommend that a precautionary approach to climate change is adopted due to the level of uncertainty involved in the potential effects.

OPW climate change guidance is documented in the “Flood Risk Management Climate Change Sectoral Adaptation Plan”, and recommends two climate change scenarios for consideration. These are the Mid-Range Future Scenario (MRFS) and the High-End Future Scenario (HEFS). The MRFS is intended to represent a “likely” future scenario based on the wide range of future predictions available. The HEFS represents a more “extreme” future scenario at the upper boundaries of future projections. Based on these two scenarios the OPW recommended allowances for climate change are given in Table 1-2.

Table 1-2 Future Condition Adjustments

	MRFS	HEFS
Extreme Rainfall Depths	+20%	+30%
Flood Flows	+20%	+30%
Mean Sea Level Rise	+500mm	+1000mm
Land Movement	-0.5mm / year*	-0.5mm / year*
Urbanisation	No General Allowance - Review on Case by Case Basis	No General Allowance - Review on Case by Case Basis
Forestation	-1/6 Tp**	-1/3 Tp** +10% SPR***

Notes:

* Applicable to the southern part of the country only (Dublin - Galway and south of this)

** Reduce the time to peak (Tp) by a third; this allows for potential accelerated runoff that may arise as a result of drainage of afforested land

*** Add 10% to the Standard Percentage Runoff (SPR) rate; this allows for increased runoff rates that may arise following felling of forestry

2 Jamestown Study Area

2.1 Introduction

The Masterplan area is located on the border with Fingal County Council and is located in the Finglas Stream catchment which is part of the wider Tolka Catchment.

2.2 Watercourses

The main watercourse traversing the Jamestown Lands is the Finglas Stream. The Greater Dublin Strategic Drainage Strategy (GSDSDS) studies identified that the Finglas Stream originates north of the M50 as a series of undefined channels. The stream is culverted under the M50 and through the Charlestown Shopping Centre. Flowing in a general north-south direction.

North of the M50 the Finglas Stream is more rural in nature but after flowing under the motorway it goes through a series of culvert transitions between limited open channel sections before discharging to the River Tolka via bifurcation. The catchment area at the junction with the Tolka River is approx. 1,080ha (10km²).

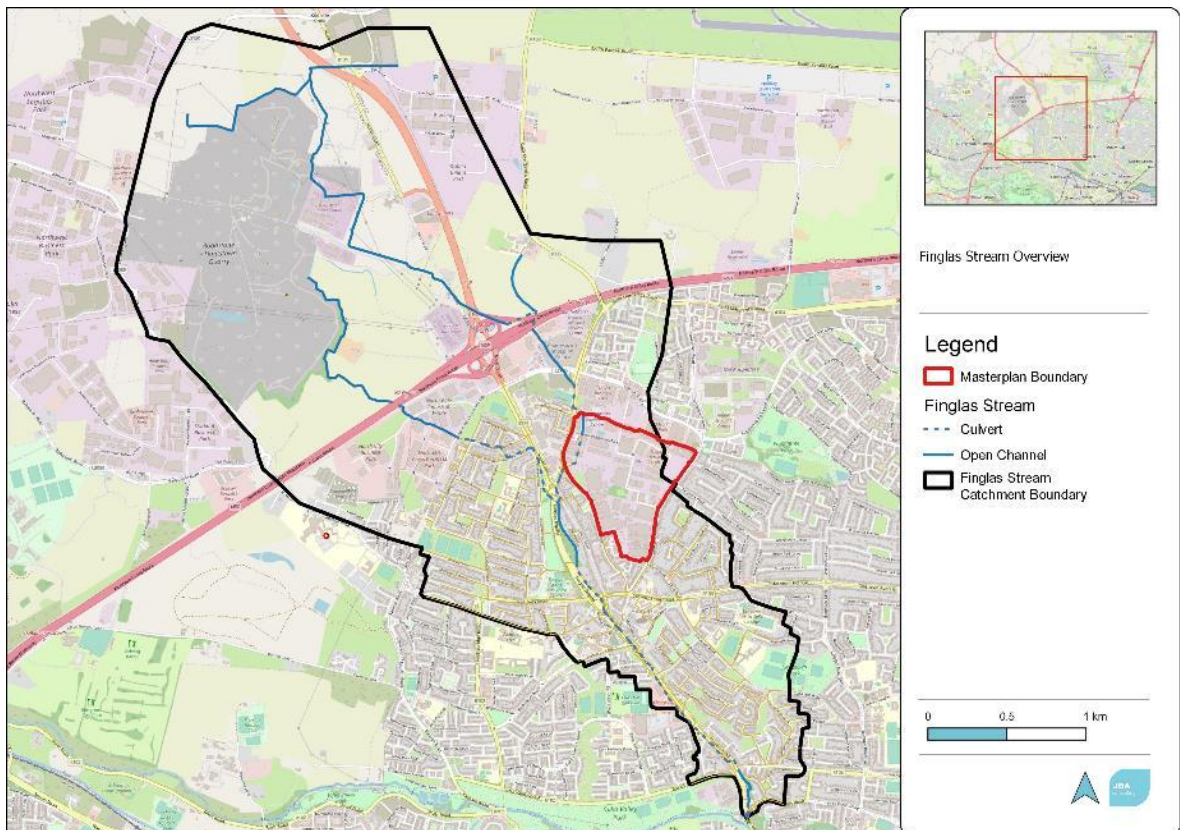


Figure 2-1: Jamestown wider settlement and rivers

The Finglas Stream enters the Jamestown Lands via a c.700mmX1230mm culvert along the northern boundary before discharging to an open channel section behind a series of warehouses. This open channel and wider riparian area is heavily overgrown and has restricted access. The channel dimensions are c.3m wide by c.1m depth to bed level.

The Finglas Stream gets re-culverted c.120m to the south as it passes under the Jamestown entrance road beside Van Signs Ltd. This culvert is 1200mmØ circular and runs for c.260m, emerging from the Jamestown Lands at the roundabout on St. Margaret's Road and McKee Avenue. The culvert goes through a series of transitions between circular and rectangular shapes before discharging to open channel beside the

R135 / Finglas Bypass. Refer to Figure 2-2 for a more detailed view of the Masterplan area.

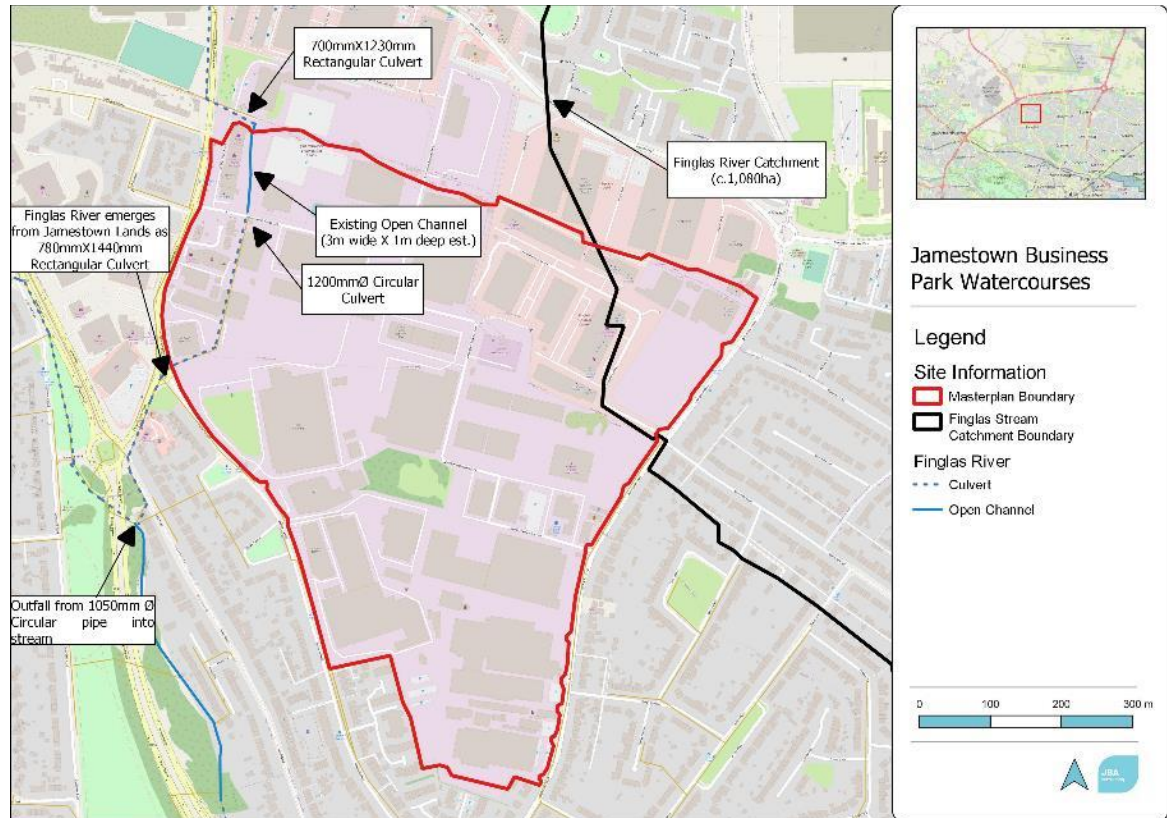


Figure 2-2: Pathway of the Finglas Stream through Jamestown Lands (Source: GSDS and Site Walkover)

The limited section of open channel within the Masterplan lands was believed to have been de-culverted in the 1990s, is heavily overgrown and largely inaccessible. Figure 2-3 shows the outlet of the Finglas Stream in the northern section of the open channel section, south of the ESB Archives. Figure 2-4 shows a view across the open channel section at the southern extent of the open area.



Figure 2-3 Finglas Stream Open Channel Section Outlet (Facing East)



Figure 2-4 Open Channel Southern Section (Facing East)

2.3 Stormwater Data

Dublin City Council provided the local stormwater network in GIS format to JBA Consulting. A review shows the network is largely incomplete through the Jamestown Lands. Refer to Figure 2-5.

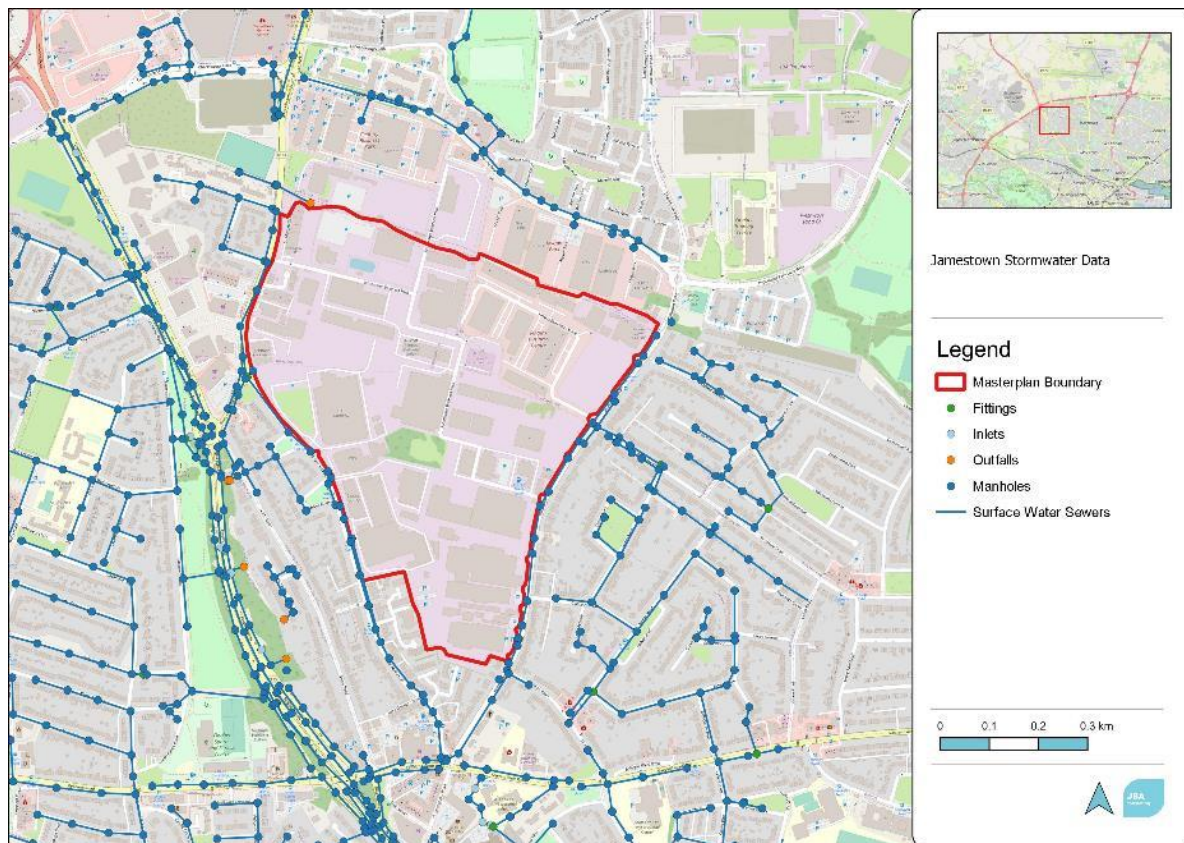


Figure 2-5 DCC Surface Water Network (Source: DCC)

3 Data Collection and Review

This section reviews the data collection and the flood history for the settlements so that any additional information on flooding can be included within this SFRA. It will confirm the extent of extreme flooding (through the Flood Zone mapping) and key sources of flood risk.

Table 3-1: Available Flood Data for Flood Zone Development

Description	Coverage	Robustness	Comment on usefulness
OPW NIFM Flood Mapping	Covers the River Finglas and tributaries.	Moderate	Shows flooding in the local area outside the Masterplan boundary.
Pluvial Flood Mapping	City wide model EU Interreg IVB FloodResilienCity	Moderate	Shows many accumulations of stormwater in many isolated pockets.
DCC SFRA Flood Mapping	City wide coverage	Moderate	Shows flood extents closer to the site than the NIFM modelling, but still no coverage within the Masterplan boundary.
JBA 2D hydraulic model	Coverage of the Finglas Stream from the M50 to the outfall south of study lands.	Moderate	Provides the first indicative flood model of the Finglas Stream through the Masterplan boundary. Built from data provided under the GSDSDS and updated hydrology. Suitable for screening of flood risk and consideration of preliminary mitigation measures prior to further, more detailed analysis.

Table 3-2 Other Available Data

Description	Coverage	Robustness	Comment on usefulness
GSI Groundwater and Surface Water flood information	Full Study Area	Moderate	Provides both historic and predictive flood extents for groundwater and historic surface water flooding.
IW stormwater network	Full Study Area	Low	No record of any network in the Jamestown Masterplan area.
GSDSDS Network Model	Full Study Area	Moderate	Used to show the existence of the Finglas Stream culverts and pathway.
GSDSDS Watercourse Mapping	Full Study Area	Moderate	The most accurate representation of the watercourses around the site.
Groundwater vulnerability maps	Broadscale, County wide	Moderate	Initial assessment of groundwater vulnerability. Provides a screening tool for use in FRA.
Site Walkover	Specific areas of interest	Moderate	Helpful for assessing flood risk in areas where mapping is unavailable. Used to verify existing mapping and discovery of unmapped piping.

Historic Flood Records including photos, aerial photos and reports.	Coverage of most of Masterplan area from 2009 flood event and spot coverage for other events	Various	Shows no historical events in proximity to the site.
LiDAR height model	Jamestown area	High	Aerial survey is used to appraise the topography and identify low spots, floodplain and areas potentially susceptible to flooding.

All sources of available flood mapping were reviewed and at an early stage in the project it was identified that there was a requirement to model and provide indicative flood mapping for the Finglas Stream.

Specific guidance is provided for the parts of the Masterplan area potentially impacted by flooding. During the site visit the flood mapping was appraised on site by an experienced flood risk manager and professional opinion and judgement has been used to develop the recommendations within the Settlement Review of Section 8.

The review of the flood risk data has been developed as a spatial planning tool to guide DCC in making land-use zoning and development management decisions. The data sets have been deemed appropriate for the planning decisions being made at this stage of the masterplanning process and where flood risk is identified the following approach has been undertaken;

- Application of the Justification Test and/or;
- Further detailed analysis, or;
- Identification of a less vulnerable use, or;
- Further assessment at detailed design stage in the Masterplan process where it has been determined that development should be possible in principle.

3.1 Site Walkover

As part of the SFRA process a site walkover and consultation was undertaken for Jamestown by suitably experienced staff. The site walkover took place on 25/01/2023 and aimed to assess risks presented by potentially unmapped watercourses, to verify NIFM mapping and confirm the extent for the modelling.

3.2 Historic Flooding

Finglas is only mentioned in the pluvial flood events of 2008 and 2009.

Table 3-3 provides details of recent flood events that have impacted on Dublin City, arising from a range of source but primarily fluvial, pluvial and coastal. Finglas is only mentioned in the pluvial flood events of 2008 and 2009.

Table 3-3: Summary of Recent Flood Events in Dublin ²

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	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

² Source: Met Éireann Major Weather Events.

Date	Source of Flooding	Areas impacted
	city only indicate 40% of this precipitation.	no 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.

3.1 Dublin FloodResilienCity Pluvial Mapping

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 were identified for further detailed investigation of potential pluvial flood risk i.e. Type 2 modelling. Figure 3-1 below shows a map with the pluvial flood outlines. The mapping indicates accumulations of stormwater in many isolated pockets throughout the Jamestown lands. The granularity of the base topographic data is coarse and the detail of the stormwater network is also not explicitly modelled the Surface Water Management Strategy will provide further insight into the management of pluvial risk and the existing stormwater system.

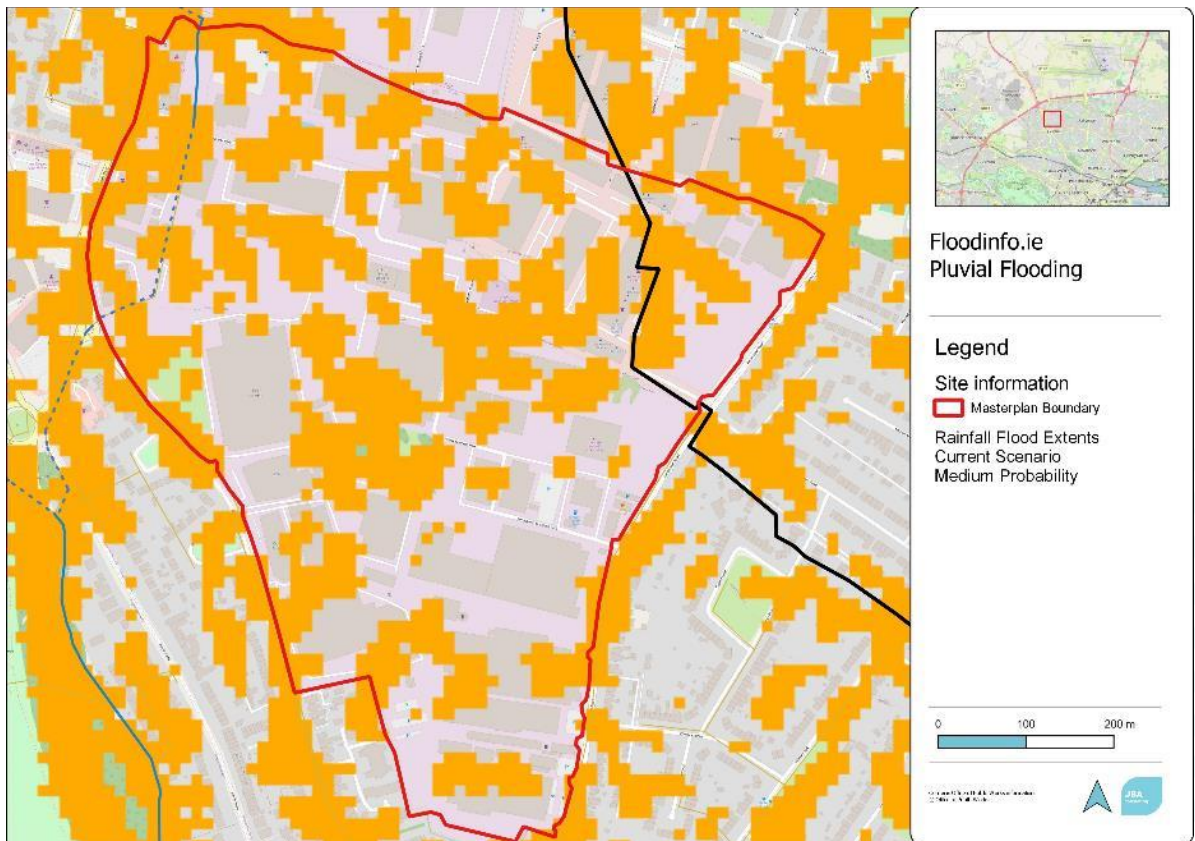


Figure 3-1: FloodResilienCity Flood Map

3.2 CFRAM

In 2011 the OPW commenced appointment of consultants to carry out a more detailed flood risk assessment on key flood risk areas. This work was undertaken under the CFRAM programme across seven river basin districts in Ireland.

Under the Eastern CFRAM Jamestown/Finglas was not identified as an AFA (Area for Further Assessment). Therefore, no CFRAM mapping exists for the Finglas Stream at this location.

3.3 PFRA & NIFM

The Preliminary Flood Risk Assessment (PFRA) is a national screening exercise that was undertaken to identify areas at potential flood risk. The PFRA is a requirement of the EU Floods Directive and the publication of this work has led to, and has informed, more detailed assessment, which is being undertaken as part of the Catchment Flood Risk Assessment and Management (CFRAM) studies. The PFRA study considered flooding from several sources, including fluvial, tidal, pluvial and groundwater, and resulted in a suite of broadscale flood maps.

The PFRA fluvial data has now been replaced by NIFM fluvial flood extents, however this is only the case where CFRAM flood outlines are not provided and where the catchment is greater than 5km². Since the catchment area of the Finglas Stream is less than 5km² though the Masterplan site there is no publicly available flood mapping.

3.4 JBA Hydraulic Modelling

To provide indicative Flood Zones for the Finglas Stream a hydraulic model of the watercourse was constructed using the culvert/network data from the GSDSDS, LiDAR data and hydrological estimation of flow volumes. The model runs from upstream of the M50 culvert and has a downstream boundary to the south of the Masterplan lands where the Finglas Stream enters open channel. The modelling was undertaken using the ESTRY-TuFLOW software package and is sufficient in detail to represent the hydraulic effects of the local culverts and in particular the potential surcharging of the downstream 1200mm diameter culvert at the downstream extent of the open channel section. The hydrology has been undertaken using the IH124 urban methodology and will therefore not fully represent the attenuation impacts of the upstream drainage network within this heavily urbanised area. There is scope for future updates to the hydrology and modelling with the construction of a more detailed integrated drainage/catchment model. This could be undertaken at a stage when more detailed design is being undertaken.

3.4.1 Current Scenario Flood Zones

The results of the hydraulic modelling are displayed below in Figure 3-2. The Finglas Stream enters the Masterplan lands through the culvert outlet pictured in Figure 2-3. The flow then enters the riparian zone which is poorly represented by the OPW LiDAR data, never the less it is clear that the downstream culvert is only able to convey 66% of the total flow with the remaining surcharging overland (in the 1% AEP event). This overland flow route bypasses the culvert and follows the above ground topographic surface in a south south-westerly direction back towards the open channel adjacent to the Finglas bypass. It represents a potential flood risk to property within and beyond the boundary of the Masterplan area.

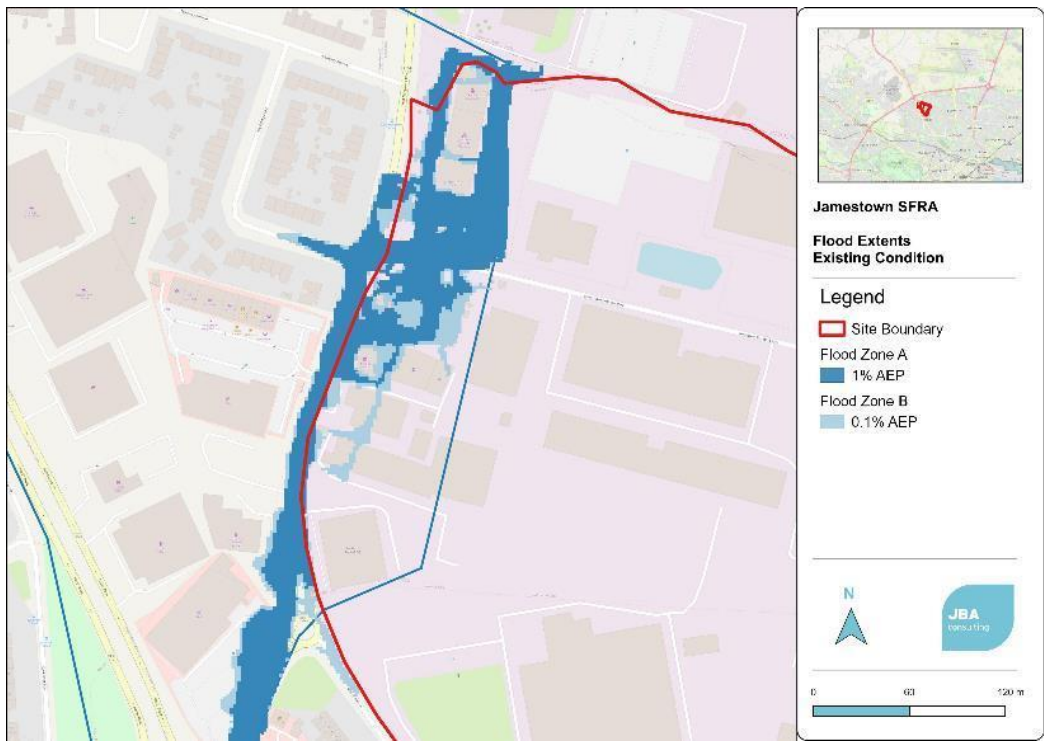


Figure 3-2: Finglas Stream Indicative Flood Zone Mapping

3.4.2 Climate Change Flood Mapping

Climate change has also been considered during the hydraulic analysis and Figure 3-3 below includes a representation of the MRFS and HEFS climate change, see Section 1.5.2 for further details on climate change allowances. The 1% AEP climate change outlines are generally still less than the extent of Flood Zone B and are indicative of increased surcharging at the 1200mm diameter culvert inlet at the downstream of the existing open channel section.

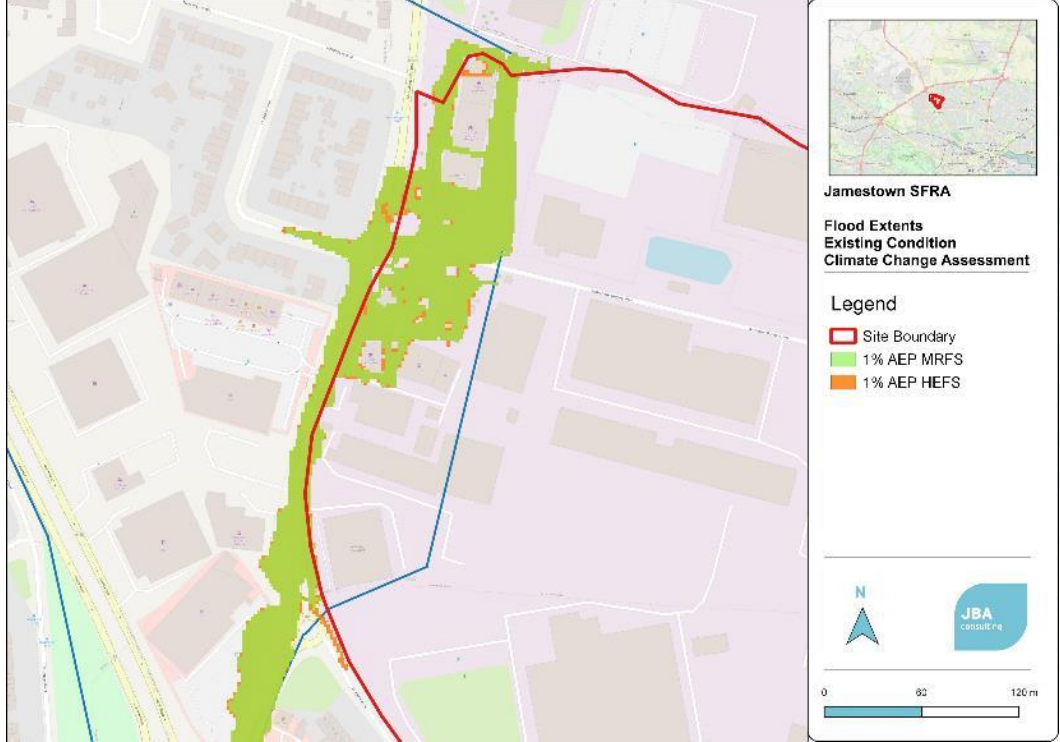


Figure 3-3: Finglas Stream Climate Change Flood Mapping 1% AEP

3.5 Sources of Flooding

This SFRA has reviewed flood risk from fluvial and pluvial flooding. The principal risk to the Masterplan lands is fluvial flooding from the Finglas Stream, but this only impacts the north west corner of the Masterplan lands. Pluvial flooding is predicted by the FloodResilienCity mapping but it is really an identification of topographic depressions and is not a detailed representation of risk. It will be for the SWMP to further investigate the risk and develop management options. Further comment on fluvial flood risk and development will be undertaken in Section 17.

4 Masterplan Review & Mitigation

The purpose of land use zoning objectives is 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, in association with phasing, to ensure that land suitable for development is used to the best advantage of the community as a whole.

This section of the SFRA will:

- Outline the strategic approach to flood risk management.
- Consider the land use zoning objectives utilised within and assess their potential vulnerability to flooding.
- Investigate mitigation options for the management of fluvial flood risk to the Finglas Stream.
- Summarise the stormwater management approach from the Surface Water Management Strategy (separate cover).
- Based on the associated vulnerability of the particular use, the Justification Test is applied.

4.1 A Strategic Approach to Flood Risk Management

A strategic approach to the management of flood risk is important in as the risks are varied, with scales of risk and vulnerability varying across the settlement.

Following the Planning Guidelines, development should always be located in areas of lowest flood risk first, and only when it has been established that there are no suitable alternative options should development (of the lowest vulnerability) proceed. Consideration may then be given to factors which moderate risks, such as defences, and finally consideration of suitable flood risk mitigation and site management measures is necessary.

The SDRA 3 lands are subject to a single 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.**

The Z14 zoning is applied to the entire Masterplan boundary but, the Masterplan itself will set out the development pattern and green space allocation within. A key objective of the Masterplan SFRA and Surface Water Management Strategy is to allow for the sustainable management of both pluvial and fluvial flood risk. As such there is the ability to align the open space and general development layout within the Masterplan to support the strategic objectives for flood risk management.

The following sections set out the assessment and management options for the Masterplan.

4.2 Flood Risk Assessment & Mitigation

Referring back to Section 1.3.1 and the parent document of the Dublin City Development Plan and the associated SFRA it is clear the Justification Test for SDRA 3 and Area 22A requires that:

- **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.**

However, considering the above recommendation and the actual pattern of flooding identified by the new Flood Zone mapping in Figure 3-2 it is clear that there is significant opportunity to adjust the form of development in the Masterplan and provide mitigation.

Therefore, in line with Section 13.5 of the Dublin City Development Plan Written Statement it is proposed that through the masterplan lands:

- **The Finglas Stream should be accommodated within an appropriate riparian zone, and in addition;**
- **The watercourse should be de-culverted where possible.**

4.2.1 Outline Mitigation

Guidance and Policy on the riparian zone is provided by Section 9.5.2 and 10.5.5 of the CDP Written Statement as well as the IFI publication 'Planning for Watercourses in the Urban Environment'. The proposal will be to de-culvert the lands within the Masterplan area as far as possible and create a circa 30m corridor for the Finglas Stream.

Key Policy requirements are;

- Policy SI10 - 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.
- The riparian zone is considered on a zonal basis that incorporates the watercourse, streamside, middle and outer zones.
- SuDS features can be incorporated into the outer zone.

The riparian corridor will need to be punctuated for the provision of key road/infrastructure crossings and/or may need to be curtailed for placement of buildings, as necessary.

An indicative representation of best practise for provision of riparian zones in urban areas is provided by the IFI document 'Planning for Watercourses in the Urban Environment'.

The general approach is effectively summarised in two figures and includes a zonal approach. Given this likely narrow 30m corridor it may not be possible to include all of the features included below, the guidance was developed from a larger watercourse example.



Figure 4-1: Plan View of zonal approach (IFI)

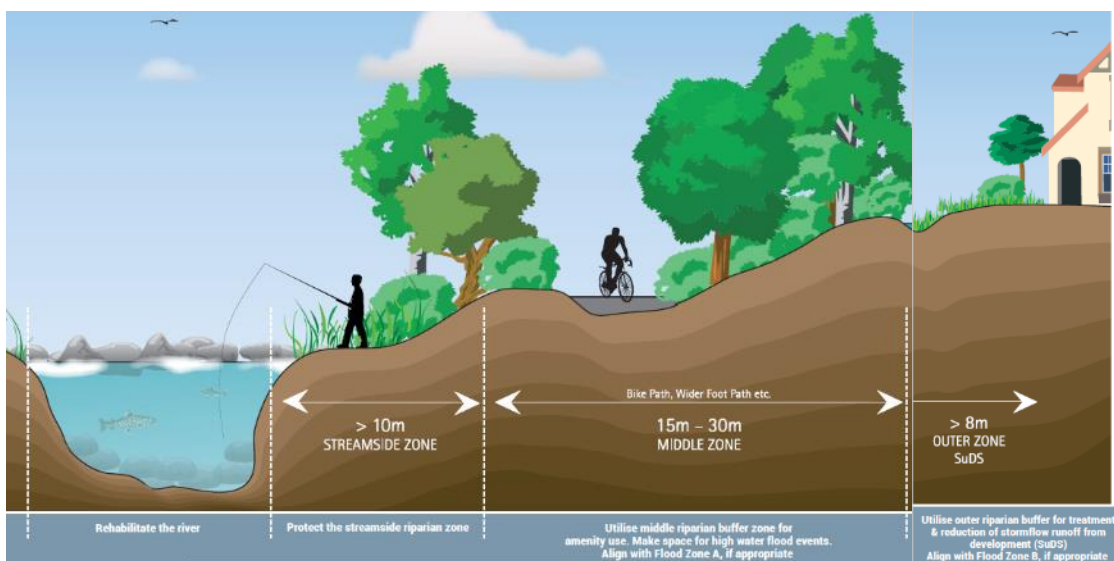


Figure 4-2: Cross Section through zones (IFI)

Table 4-1: IFI Guidance for Function and Use of the Riparian Zones

CHARACTERISTICS	STREAMSIDE ZONE >10M	MIDDLE ZONE 15M-30M	OUTER ZONE >8M
FUNCTION	Protect the physical integrity of the stream ecosystem	Provide distance between upland development and streamside zone. Acts as a sump/filter for nutrients and sediment	Prevent encroachment and filter hard surface runoff
WIDTH	Minimum 10m plus wetland and other habitat	15-30m depending on stream	0m minimum setback to structures
VEGETATIVE TARGET	Native riparian vegetation	Managed woodland, some clearing/open space allowed	Woodland encouraged, but usually-turfgrass
ALLOWABLE USES	Very restricted except for fishing or walking trails	Restricted, e.g. some recreational uses such as bike path or larger footpaths can function as a flood zone*	Unrestricted e.g. residential uses, including lawn, swales, most stormwater treatment will occur here
SUPPORTING OTHER PLANNING OBJECTIVES	All zones but especially the streamside zone should support Biodiversity including EU Habitats Directive objectives		
	Potentially Align with Flood Zones (https://www.floodinfo.ie) & Local Authority information.		
	Walking trails should not run through sensitive ecological habitats. It is recommended that a multi-disciplinary team including an ecologist and flood risk expert determine the appropriate zonation and allowable uses.		
No artificial lighting is recommended for the streamside zone and artificial lighting should be restricted unless absolutely necessary in the middle zone. LEDs should be warm white to minimise disturbance to wildlife			

* Steps 1 (i.e. create stream side zone) and 3 (i.e. create outer zone) are essential for all streams irrespective of size.

* Steps 4 (i.e. rehabilitate channel) and 2 (i.e. create middle zone) are strongly recommended and arguably necessary for rivers with amenity potential, particularly in the context of social cohesion in urban areas.

4.3 Hydraulic Assessment

The proposed measure of the de-culverting and the provision of the circa 30m riparian boundary has been accommodated within the proposed Masterplan layout. A simple schematic of the riparian zone is displayed below in Figure 4-3.

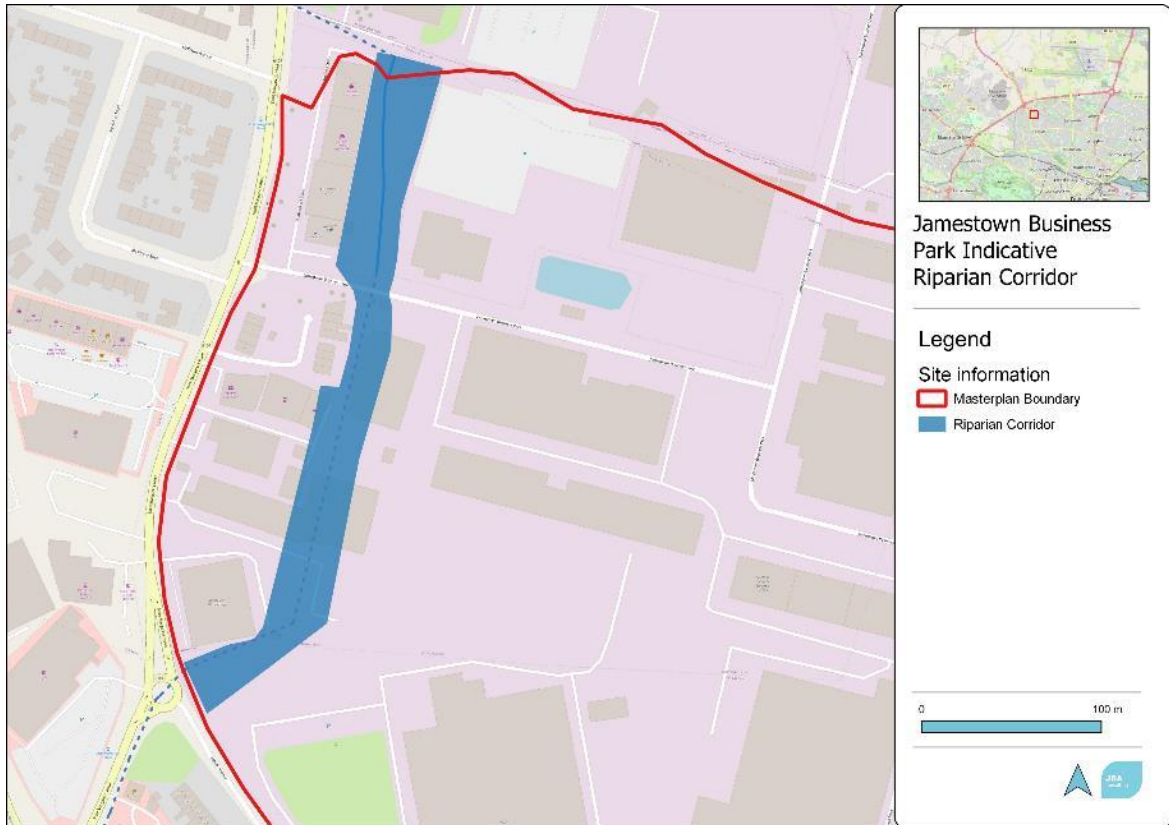


Figure 4-3: Proposed riparian corridor within Masterplan

The 2D hydraulic model that was developed for the provision of the Flood Zones has been updated to present a conceptual version of the post-development Masterplan area.

Findings from the model runs suggest that the proposed riparian zone can potentially contain the flood volumes for the 1% AEP without overspill into surrounding developed lands. Flood levels for the 1% + climate change and 0.1% AEP events are more challenging, but there is significant potential to also contain these flows subject to further assessment and detailed design/landscaping.

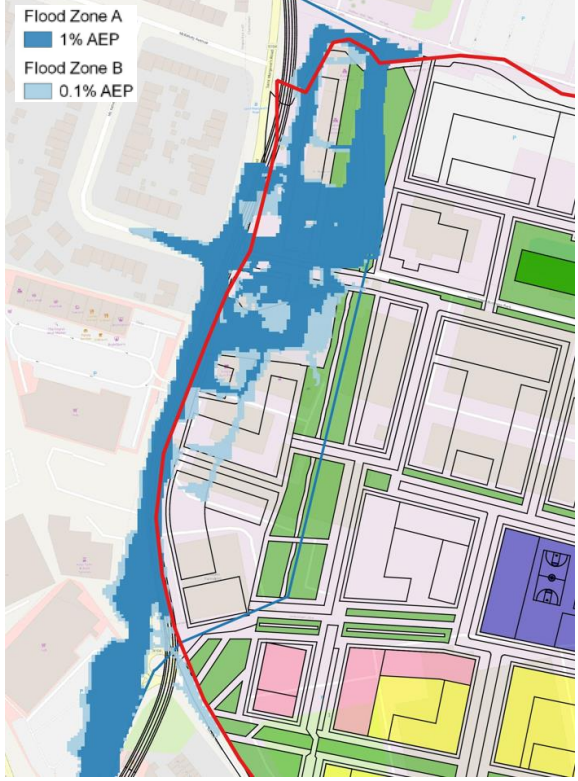
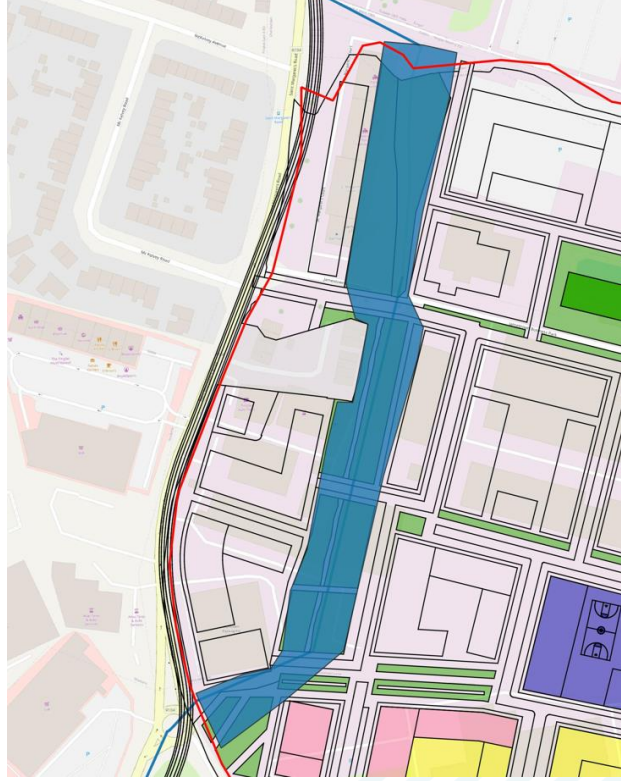
The indicative testing of the post-development scenarios suggests that the containment and storage of flows within the Masterplan lands will reduce the risk of flooding to the local area and also limit the pass-on flows to the downstream open channel watercourse and ultimately the River Tolka. Should it not be possible to contain the flows of the climate change and 0.1% AEP events then there is the possibility to facilitate overland flows towards the existing open channel section to the south of the Masterplan lands within the proposals for the LUAS extension/upgrade work.

It should be noted that;

- The modelling is indicative and to finalise any future detailed design for the Masterplan area would require a detailed integrated catchment/drainage model and further on site survey as part of an updated Flood Risk Assessment.
- This would allow full integration of the impacts of the existing and proposed stormwater networks within both the development area and the critical urban area that extends from the M50 down to the north of the site boundary.

- This may find there is less volume actually reaching the site due to above ground storage in that area, not getting into the system and would allow proper refinement of the solution. We are also not at the level of detail whereby development levels/landscaping is detailed enough so we know what is feasible in terms of landscaping and containing water levels that are much in excess of existing ground levels.

4.4 Settlement Review & Justification Test

	
<p>Existing Flood Zones superimposed on Masterplan layout</p>	<p>Proposed riparian / flooded zone superimposed on Masterplan layout</p>
<p>Area Description and Flood Risk</p>	<p>The Finglas Stream flows in a southerly direction through the north west corner of the SDRA 3 – Jamestown Masterplan lands. Under the existing scenario a surcharging culvert leads to overland flows impacting a significant amount of existing development both within and outside the Masterplan lands. Given the proposed impact on Z14 lands the Justification Test must be applied. The Justification Test will consider the potential mitigation scenario highlighted in the proposed future extent mapping above.</p>
<p>Historic Flooding</p>	<p>Historic flooding (pluvial) is noted in 2008 and 2009.</p>
<p>Climate Change</p>	<p>Under the existing scenario there is a moderate sensitivity to climate change as a result of the restricted capacity of the downstream culvert network. Climate change flood maps are presented in Figure 3-3. Proposed future Masterplan layout offers the opportunity to manage increased volumes as a result of climate change.</p>
<p>Residual Risk</p>	<p>The residual risk from culvert blockage is significant in the existing scenario. The proposed future masterplan layout will de-culvert the Finglas Stream and offer a significant reduction in the potential for culvert blockage and can better manage the impacts of potential surcharging.</p>
<p>Surface Water</p>	<p>There is potential surface water / pluvial flood risk within the Masterplan lands as shown in Figure 3-1. The Surface Water Management Strategy has been developed to provide a strategy for incorporating nature-based solutions into the control of surface water run-off.</p>

<p>Development Strategy</p>	<p>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, in line with Section 13.5 of the Dublin City Development Plan it is proposed that:</p> <ul style="list-style-type: none"> • The Finglas Stream should be accommodated within an appropriate riparian zone, and in addition; • The watercourse should be de-culverted where possible. • In addition the Surface Water Management Strategy should be considered in conjunction with the SFRA and the recommendations within the Strategy must be applied in tandem to ensure that flood risk is appropriately managed. <p>The previous sections of the SFRA and the separate Surface Water Management Strategy document have demonstrated through hydraulic modelling that the proposed Masterplan arrangement has the potential to mitigate risk from both fluvial and stormwater flood risk and substantially reduce risk downstream.</p>
<p>Justification Test for Development Plans</p> <p>1. Part 1 of the Justification Test is covered under Section 3.2.1 in the main body of the SFRA report.</p> <p>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:</p> <p>(i) Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement.</p> <p>Answer: Yes: The lands are located in the outer suburbs adjacent to the city boundary with Fingal County Council. The area is currently characterised by low scale and low intensity industrial/employment lands subject to zoning objective Z14 - Strategic Development and Regeneration Area. The lands also form part of SDRA 3 Finglas Village Environs and Jamestown Lands. The lands will be served by the future Luas extension to Finglas and by BusConnects and have the capacity to accommodate significant new residential and employment development, which aligns the national and regional policy for compact growth, while supporting the principles of transport orientated development (TOD), set out in the NPF and RSES respectively. The Jamestown lands subject to the masterplan are adjacent to Finglas village and established residential areas and represents a sequential expansion of the existing settlement.</p> <p>The areas located in Flood Zone A and B are associated with an area of open channel of the Finglas Stream and are at risk from an existing surcharging culvert which may result in overland flows to the surrounding area. The area is considered essential to facilitate the regeneration and expansion of the urban settlement along a strategic transport corridor. Outside the masterplan lands, there is limited large scale regeneration sites within this area.</p> <p>(ii) Comprises significant previously developed and/or under-utilised lands</p> <p>Answer: Yes. The lands located within Flood Zone A and B are already built-up or comprised of underutilised brownfield sites, identified for regeneration potential in SDRA 3 of the Development Plan.</p> <p>(iii) Is within or adjoining the core of an established or designated urban settlement.</p> <p>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.</p> <p>(iv) Will be essential in achieving compact and sustainable urban growth.</p>	

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 identified 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

Section 3.4, 4.1, 4.2 and 4.3 has set out the strategic approach to development and how the Masterplan lands can incorporate a sustainable approach to fluvial and stormwater management. In applying the guidance set out in the Dublin City Development Plan Section 9.5.2 and 10.5.5, as well as Policy SI10 and the IFI publication 'Planning for Watercourses in the Urban Environment' it has been demonstrated to an appropriate level of detail that flood risk to the Masterplan area can be adequately managed and the development of the lands will not cause unacceptable adverse impacts elsewhere, in fact it is most likely that the proposals will significantly reduce flood risk to the local area and downstream catchment. It is recommended that;

- Prior to the finalisation of any future detailed design for the Masterplan area, a detailed integrated catchment/drainage model and further on site survey is conducted to provide a level of assessment appropriate for the full testing of both the upstream stormwater drainage catchment and the proposed Masterplan lands as part of an updated Flood Risk Assessment. This will allow for the full and detailed design of the Masterplan lands.
- The more detailed assessment will also allow for the alignment with Policy SI10 and the IFI requirements set out for the riparian zone as outlined in Section 4.2.1.
- Any future development planning applications within the Masterplan lands should rely on the updated integrated catchment model and associated FRA and also apply the guidance set out in Section 4 of the Dublin City Council Development Plan SFRA.
- The Surface Water Management Strategy sets out the strategy for the control of surface water run-off and Green Infrastructure. This strategy should be considered in conjunction with the SFRA and the recommendations within the strategy must be applied in tandem to ensure that Part 3 of the Justification Test passes.

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

5 SFRA Review

5.1 Triggers for Review

An update to the SFRA will be triggered by the review cycle that applies to local authority Development Plans, under which this Masterplan sits. In addition, there are a number of other potential triggers for an SFRA review which may include any flood relief or drainage works that are completed upstream of the Jamestown lands by Fingal County Council.

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.

Most importantly the recommendation for the more detailed integrated catchment/drainage model and further on site survey and associated FRA will trigger a review of the SFRA.

5.2 Conclusion

This SFRA has been developed to inform the preparation of the Jamestown Masterplan, which has been reviewed against the recommendations set out in The Planning System and Flood Risk Management Guidelines for Planning Authorities and Technical Appendices, 2009 and the Dublin City Development Plan 2022-2028. The land-use zoning allocation and general strategy of the Masterplan has passed parts 1 and 2 and 3 of the Justification Test, with further recommendations made in part 3 of the Justification Test, relating to further assessment/FRA prior to detailed design.

