DRAFT PARK WEST – CHERRY ORCHARD

LOCAL AREA PLAN 2019

Strategic Flood Risk Assessment

Prepared by
Dublin City Council
Planning and Property
Development Department

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Comhairle Cathrach
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Dublin City Council

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1 Policy Context

1.1 Introduction

Dublin City Council has prepared a draft Local Area Plan for Park West – Cherry Orchard. The preparation of the Local Area Plan has undergone an appropriate level of Strategic Flood Risk Assessment (SFRA) and this document sets out the findings.

The SFRA was prepared by Dublin City Council and was informed by the DEHLG Guidelines for Planning Authorities (DEHLG & OPW, 2009) on 'The Planning System and Flood Risk Management 'and Technical Appendices, *see Figure 1*. 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.

Fig 1: The Planning System and Flood Risk Management Guidelines for Planning Authorities & Technical Appendices, 2009

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 updated 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.

1.3 Flood Risk Management Policy

As part of the Dublin City Development Plan 2016-2022, Dublin City Council undertook a Strategic Flood Risk Assessment (SFRA) which informed the Development Plan (see volume 7). The preparation of the Park West – Cherry Orcahrd LAP has been informed by the City SFRA.

European Directive 2007/60/EC on the assessment and management of flood risk aims to reduce and manage the risks that flooding poses on human health, the environment, cultural heritage and economic activity. The Directive applies to inland waters as well as all coastal waters across the whole territory of the EU. The Directive requires Member States to carry out preliminary assessment by 2011 in order to identify the river basins and associated coastal areas at risk of flooding. Flood risk maps are required to be drawn up for such zones by 2013. Flood risk management plans focused on prevention, protection and preparedness must be established by 2015.

Under the EU 'Floods' Directive, the national Catchment Flood Risk Assessment and Management (CFRAM) programme is being rolled out to review flood risk across the country and produce flood hazard mapping and flood risk management plans for tidal and main rivers. Dublin City is covered by the ongoing Eastern CFRAM study, which includes 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.

The OPW is the lead agency for flood risk management in Ireland**.** The coordination and implementation of Government policy on the management of flood risk in Ireland is part of its responsibility. The European Communities (Assessment and Management of Flood Risks) Regulations 2010 (S.I. No. 122) identifies the Commissioners of Public Works as the 'competent authority' with overall responsibility for implementation of the Floods Directive 2007/60/EC. The Office of Public Works is the principal agency involved in the preparation of Flood Risk Assessment and Management studies (FRAMs).

1.4 The 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 formulation of 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: -

(a) Avoid developments in areas at 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.

(b) Adopt a sequential approach to flood risk management when assessing the location for new development based on avoidance, reduction and mitigation of flood risk, and

(c) Incorporate flood risk assessment into the process of making decisions on planning applications and planning appeals.

1.5 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 exceedence 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

1.6 Definition of Flood Zones and Flood Risk

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

- Coastal & estuarine flooding of areas adjacent to the coast or tidal estuaries.
- Fluvial or river 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 & 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 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, only water compatible development would normally be allowed.
- **Zone B:** Moderate probability of flooding – Flood risk is between 0.1% (or 1 in 1000 years) and 1 % (or 1 in 100 years) annually for river flooding, and between 0.1% (or 1 in a 1000 years) and 0.5% (or 1 in 200 years) annually for coastal flooding. Highly vulnerable development including hospitals, residential care homes, Garda buildings, car parks, fire and ambulance stations, dwelling houses and primary strategic transport and utilities infrastructure would generally be considered inappropriate unless the requirements of the justification test are met. Less vulnerable development such as retail, commercial and industrial uses 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 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] Proposed develpments in defended areas will depend on the quality of the flood defences.

1.7 Consequences of Flood Risk

The consequences of flooding depends 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.

'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: -

- Highly vulnerable
- Less vulnerable
- Water compatible

Tables 1 and 2 taken from *'The Planning System and Flood Risk Management Guidelines for Planning Authorities and Technical Appendices, 2009*' illustrate 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.

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

Table 1: Classification of vulnerability of different types of development.[2]

Vulnerability Class	Lane 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 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	

[2] Source: The Planning System and Flood Risk Management Guidelines for Planning Authorities, 2009

Table 2: Matrix of vulnerability versus flood zone to illustrate appropriate development and that required to meet the Justification Test.[3]

	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

1.8 Climate Change

Climate change is one of the biggest potential risks over the lifetime of flood 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. For this reason, it is important that the standard of protection provided by the defences is reviewed over time, and if necessary, increased to ensure the 1 in 100-year standard of protection is maintained. The CFRAM study, when completed, will include recommendations for the likely impact of two climate change scenarios.

1.9 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 to a proposed or existing development or land to be zoned,

[3] Source: The Planning System and Flood Risk Management Guidelines for Planning Authorities, 2009

of its potential impact on flood risk elsewhere and the effectiveness of any proposed mitigation measures.[4]

For the purposes of the Dublin City Development Plan 2016-2022, the Strategic Flood Risk Assessment covers stages 1 and 2, i.e. Flood Risk Identification and Initial Flood Risk 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.

1.10 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/ assemblies. 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.

Strategic Flood Risk Assessment (SFRA): The SFRA provides a broad basis (area-wide or county wide) 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 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 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.[5]

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.

1.11 Sequential Approach to Flood Risk Management & Justification Test

The sequential approach is the key tool in ensuring that development, particulary new development, first and foremost is directed towards land that is at low risk.[6]

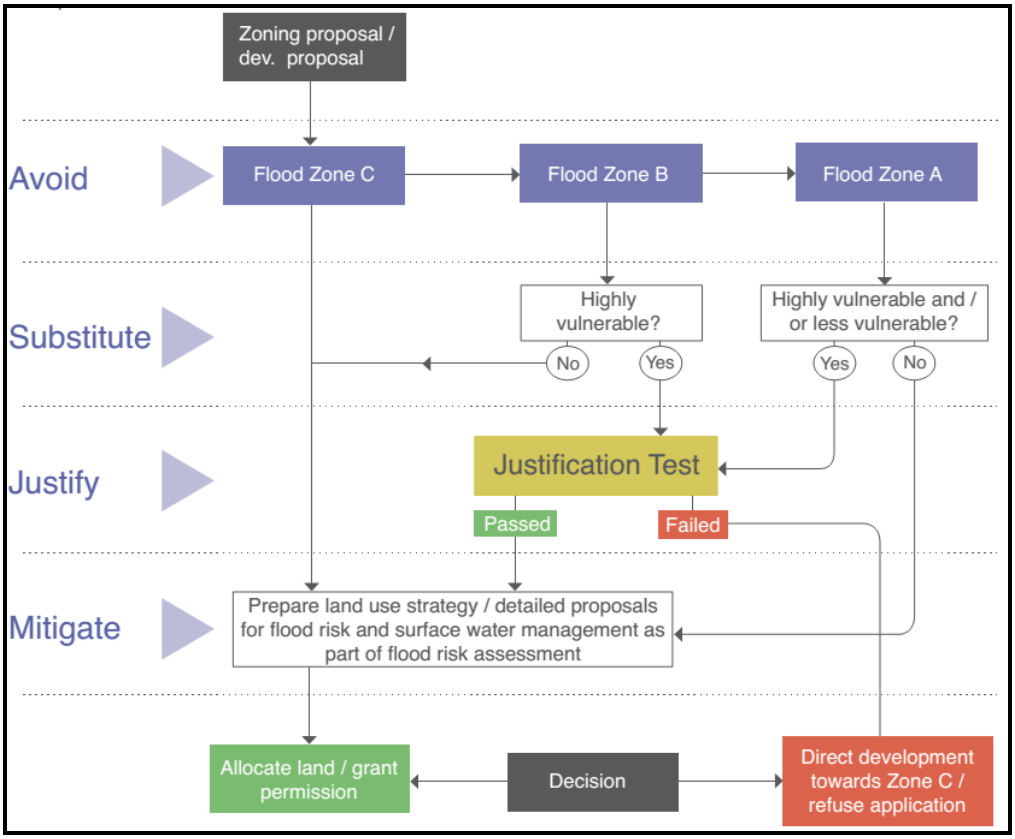
Figure 2 taken from *'The Planning System and Flood Risk Management Guidelines for Planning Authorities and Technical Appendices, 2009*' sets out the broad philoposhy underpinnng the sequential approach.

[4] The Planning System and Flood Risk Management Guidelines for Planning Authorities, 2009

[5] The Planning System and Flood Risk Management Guidelines for Planning Authorities, 2009

[6] Source: The Planning System and Flood Risk Management Guidelines for Planning Authorities, 2009

Fig 2: Sequential Approach (from The Planning Systeme 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 de-zoning lands within the development plan. If dezoning is not possible, then rezoning from a higher vulnerability land use, such as residential, to a less vulnerable use, such as open space may be required. Where rezoning is not possible, development restrictions are provided for through the application of the 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.

As part of the preparation of the Dublin City Development Plan 2016-2022, the various flood cells identified were subject to the justification test, and this LAP has been informed by this.

2 Stage 1 - Flood Risk Identification

2.1 Introduction

A Stage 1 Strategic Flood Risk Assessment (SFRA) was undertaken in order to identify whether there may be any flooding or surface water management issues within or adjacent to the LAP lands and consequently whether a Stage 2 (initial flood risk assessment) should be proceeded to. Stage 1 was based on information supplied from the SFRA for the City Development Plan and historical factors.

2.2 Site Description

Park West- Cherry Orchard is located c. 9 km west of Dublin City Centre (O'Connell Street). The LAP lands are bounded to the north, west and south by the administrative boundary between Dublin City Council and South Dublin County Council. The M50 forms a hard boundary to the west while the Grand Canal forms the southern boundary.

Fig 3: Park West – Cherry Orchard LAP in context of Dublin City

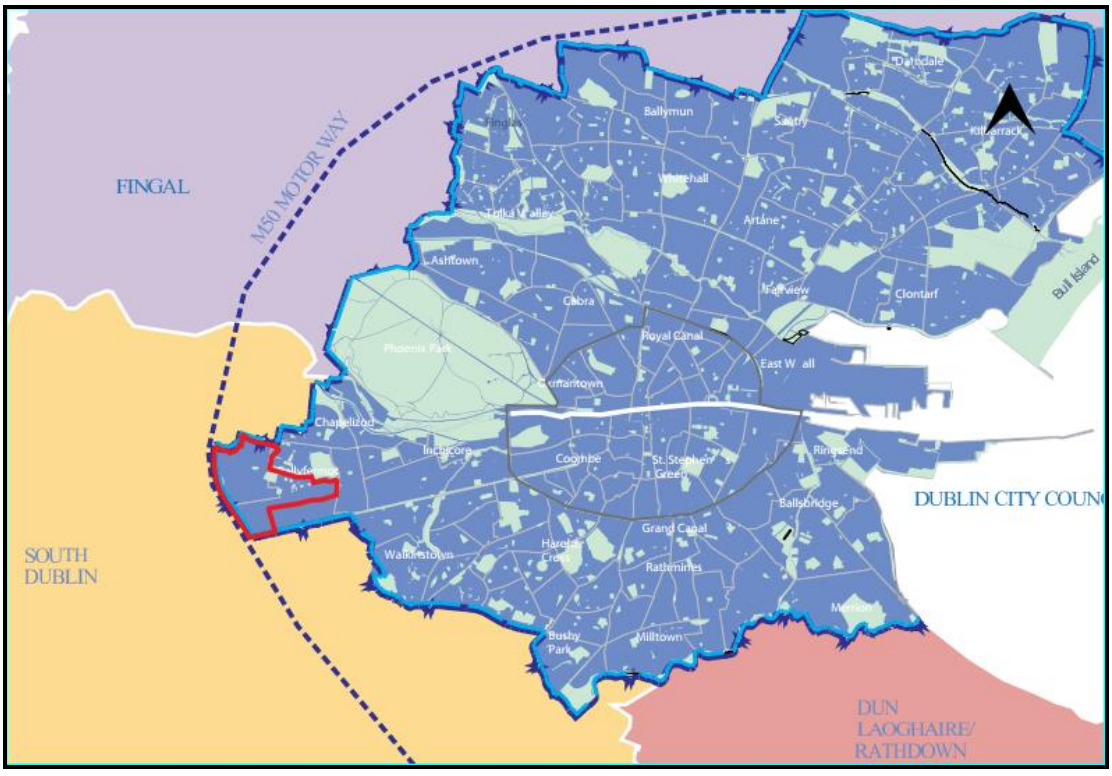


Fig 4: Aerial View of LAP

The Park West - Cherry Orchard developed area is characterised by three distinct land uses, in the form of office, residential and institutional, the latter comprising the Wheatfield and Cloverhill prisons and Courthouse and the Cherry Orchard Hospital. Located on the edge of the City Council administrative area the area is significantly surrounded by large scale industrial estates creating a somewhat isolated feeling. This is reinforced by a number of impenetrable barriers including the M50, the Canal and the railway line, and also the Hospital and the Prisons which together significantly impact on the permeability throughout the area. While Cherry Orchard benefits from its close ties and links with the more established Ballyfermot area, the residential areas of Park West are surrounded by vacant sites, thus limiting integration with the residential areas of Cherry Orchard.

The existing urban and residential typology differs between the two areas of Cherry Orchard and Park West. Cherry Orchard, developed predominantly in the 1960's to 1980's is largely characterised by 3-bed, two-storey terraced houses constructed around large open green spaces. Newer development at Cedar Brook in c. 2003/20004 introduced some variety in housing typology. South of the rail line the residential development at Park West is comprised solely of apartment developments (with a mix of 1, 2 and 3-bed units), in 6-8 storey residential blocks.

Adjoining the new residential development in Park West Business Park is a modern office development (of c. 80,000 sq.m. commercial floorspace). Developed between 2000 and 2008, the residential and commercial blocks are set out within a landscaped setting which incorporates numerous pieces of public art sculptures. The area also incorporates a water theme, carried through to the relationship with the Canal and the location of the landmark "wave" sculpture. Moving east the landuse changes to industrial uses, with both light and heavy industry present.

A number of supporting retail and community uses can be found in both Park West and Cherry Orchard with two distinct areas currently forming hubs of activity; one at the Plaza mixed-use neighbourhood centre in Park West and the second focusing on St. Ultans NS, the Orchard Community Centre and adjoining play and park facilities.

Within the LAP area there is approximately 46 hectares of undeveloped land available for development; c. 31.7 ha in Cherry Orchard and c. 14.3 ha in Park West. The lands within Cherry Orchard are currently all vacant sites under the ownership of Dublin City Council. The lands in Park West are largely vacant with some sites in use for car parking. These lands are also under a single ownership.

Dublin City Development Plan 2016-2022 (DCDP)

The entire LAP area is governed by the existing Dublin City Development Plan 2016-2022, which designates Park West – Cherry Orchard as a Strategic Development and Regeneration Area (SDRA), i.e. a focus for investment and growth, and an area for which a Local Area Plan shall be prepared.

Chapter 15 of the DCDP Written Statement sets out the following guiding principles for Park West - Cherry Orchard: -

1. To create a vibrant and sustainable new urban area with work, living and recreational opportunities, based around high-quality public transport nodes.
2. To create a place with distinctive urban character based on urban design principles with strong physical and psychological linkages to the city.
3. To provide for sufficient densities of development, to sustain public transport and a viable mix of uses.
4. To provide for an integrated public transport system, with bus and commuter rail as the main components.
5. To provide for the integration of the new community with the established community.
6. To provide for a balanced mix of residential tenure.
7. To develop a coherent spatial framework, incorporating the following elements
   - Two axial routes, defined by buildings, providing the main structuring components, linking the proposed new rail station with Ballyfermot Road to the north and Park West Road to the south
   - A Main Street at the intersection of the two axial routes, providing a safe and vibrant mixed-use environment, incorporating provision of a supermarket and associated retail and service facilities
   - A new civic space next to the main street, linking to the civic place adjacent to the rail station, creating a high profile for public transport and a strong sense of place for the local resident and working population.
8. To enhance the new identity of the area by providing for 2-3 mid-rise buildings at nodal spaces in the vicinity of the railway station or adjoining the M50 to act as place markers.
9. That in the creation of the 'new town' in the Park West/Cherry Orchard area as a policy and priority that the key historic and existing deficits with regard to layout, community under-development, policing, anti-social activity, lack of provision for childcare etc. be factored in to be provided for in the new proposed development and that a new charter for Cherry Orchard be articulated and become an integral part of the overall plans and initiatives for the area.
10. To provide for a supermarket and other local shopping.

As set out above the LAP area contains c. 46 hectares of undeveloped land available for development. The draft Local Area Plan breaks this down into 8 "key development sites" (Fig 5) setting out overall development objectives and site specific guiding principles for each site.

The 8 no. sites have been identified as follows:

1. Elmdale-Hospital Site
2. North of Cherry Orchard Avenue

3a. M50-Cloverhill Site (Local Enterprise Units)
3b. M50-Cloverhill Site (Housing Units)

4. M50-Cedarbrook Avenue Site
5. Barnville Neighbourhood Site
6. Park West Avenue/Road Site (formerly 'Sector 3')
7. M50-Park West Site (formerly 'Sector 1A')
8. M50-Park West Site (formerly 'Sector 1B')

In Additional 2 no. Key Amenity development sites are identified as follows:

A. Cherry Orchard Park
B. Gallenstown Waterworks /Canal Basin

The eight sites have the capacity to deliver between 2,000-2,700 new residential units, ranging in heights from 2-storey to landmark buildings of up to c. 60 meters in height. The sites shall also provide new commercial and employment opportunities, in particular along the boundary with the M50 motorway and in the vicinity of the train station. Offices and enterprise space will serve to act as a noise buffer to the motorway and provide a key source of local employment.

The development of the new sites will place sustainability at their core in terms of design and construction. Streets will place a focus on pedestrian and cycle amenity encouraging more sustainable patterns of travel, and parks and open spaces will be linked by "green" routes. It is a key objective of the Plan to seek a strategic green route through the plan area, linking Le Fanu Park to the Canal, with a new pedestrian/ cycle bridge in the location of the waterworks site.

The delivery of the objectives of the Local Area Plan is considered essential to meet the City's great need for housing at present. Park West and Cherry Orchard has the capacity to provide over 2,000 new homes for people, in an area served by public transport, with good access to parks and schools and along one of the City's greatest amenities in the form of the Grand Canal. Delivering these objectives will be a key focus of Dublin City Council, as both the Planning Authority and as a key landowner in the area over the next 6-10 years of the Plan.

Fig 5: Draft LAP Key Development and Amenity Sites

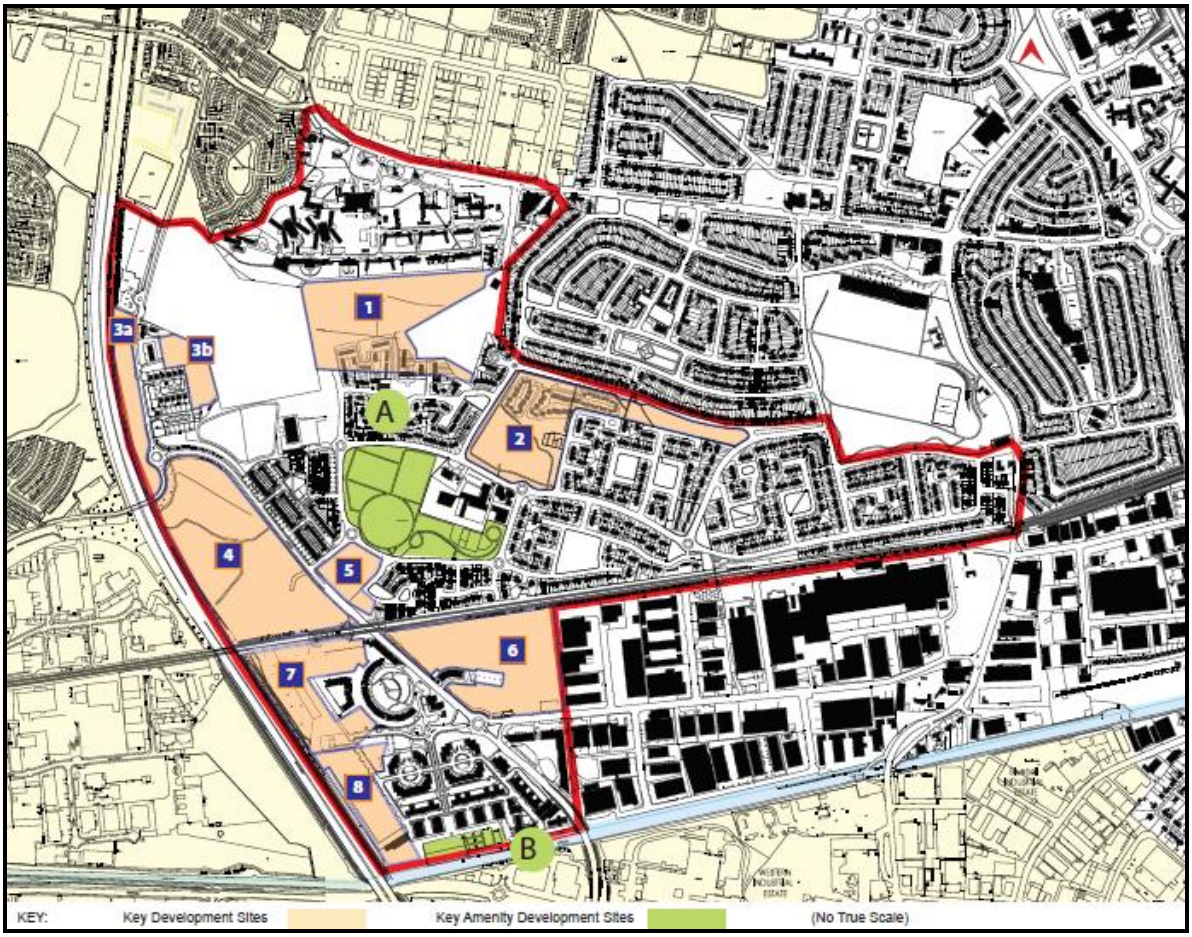
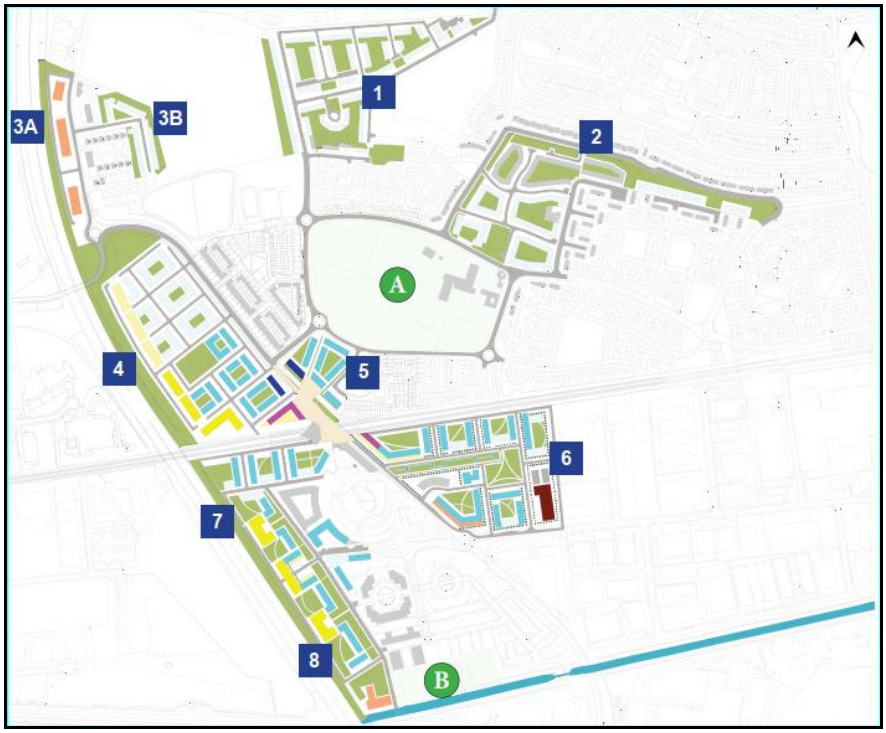


Fig 6: Draft LAP Overall Indicative Plan for Sites



2.3 Drainage & Water

The majority of the LAP lands are located within the catchment of the River Camac, which rises in the Dublin Mountains, and runs in close proximity to the southern boundary of the lands, see Fig 7 below. A small area near the northern boundary of the LAP lands (mainly the Cherry Orchard Hospital lands), and another small area near the eastern boundary of the lands north of the railway line and adjacent to Killeen Road are located within the Lower Liffey Lyreen Ryewater catchment (see Fig 8). In the Water Framework Directive status phase 2010-015 the Camac River is classified as 'at risk'. The ecological, biological and invertebrate status or potential are all classified as 'poor'.

The lands within The River Camac Catchment drain to a single outfall (Outfall A) at the south-eastern corner of the Park West Industrial lands. The two smaller areas of land which lie within The Lower Liffey Lyreen Ryewater Catchment drain to two separate outfalls; lands within the northern section of the LAP in the vicinity of the Cherry Orchard Hospital drains to (Outfall B) at Kileen Road while the smaller area of land within the eastern section of the LAP drains to (Outfall C) at Le Fanu Road (Fig 8 & 10).

A number of tributaries of the Camac River traverse the LAP lands. The Gallanstown stream rises west of the M50, is piped in a 1.7m diameter sewer beneath Hume Avenue in the Park West Business Park adjacent to the Grand Canal, and exits the LAP lands at Killeen Road at the south-east corner of the lands, where it meets with the piped Blackditch Stream. Once these two streams meet they are referred to as the Galback Stream (Fig 9).

The entirety of the Park West area, south of the railway line, drains to the piped Gallanstown Stream, which exits the LAP lands at the south-east corner (Outfall A) and eventually drains to the Camac River. The majority of the Cherry Orchard area, north of the railway line, drains to the piped Blackditch stream, which also exits the LAP lands at their south-east corner (Outfall A) and eventually drains to the Camac River. As previously alluded to, a small portion of the Cherry Orchard area drains to Le Fanu Road, exiting the LAP lands at Outfall C. The area in the vicinity of the Cherry Orchard Hospital and the Ballyfermot Primary Care Centre drain to a 1.5m sewer which runs along the southern boundary of the hospital and exits the LAP lands at Outfall B.

A network of surface water sewers feed into this strategic network which is well developed in the built-out areas of the Park West Industrial Estate and Business Campus and the Cherry Orchard residential area, however there is a lack of existing drainage infrastructure in the vicinity of some of the proposed development sites, in particular in the vicinity of the M50 at the western boundary of the LAP lands.

Fig 7: Camac River Catchment (from the Greater Dublin Strategic Drainage Study)

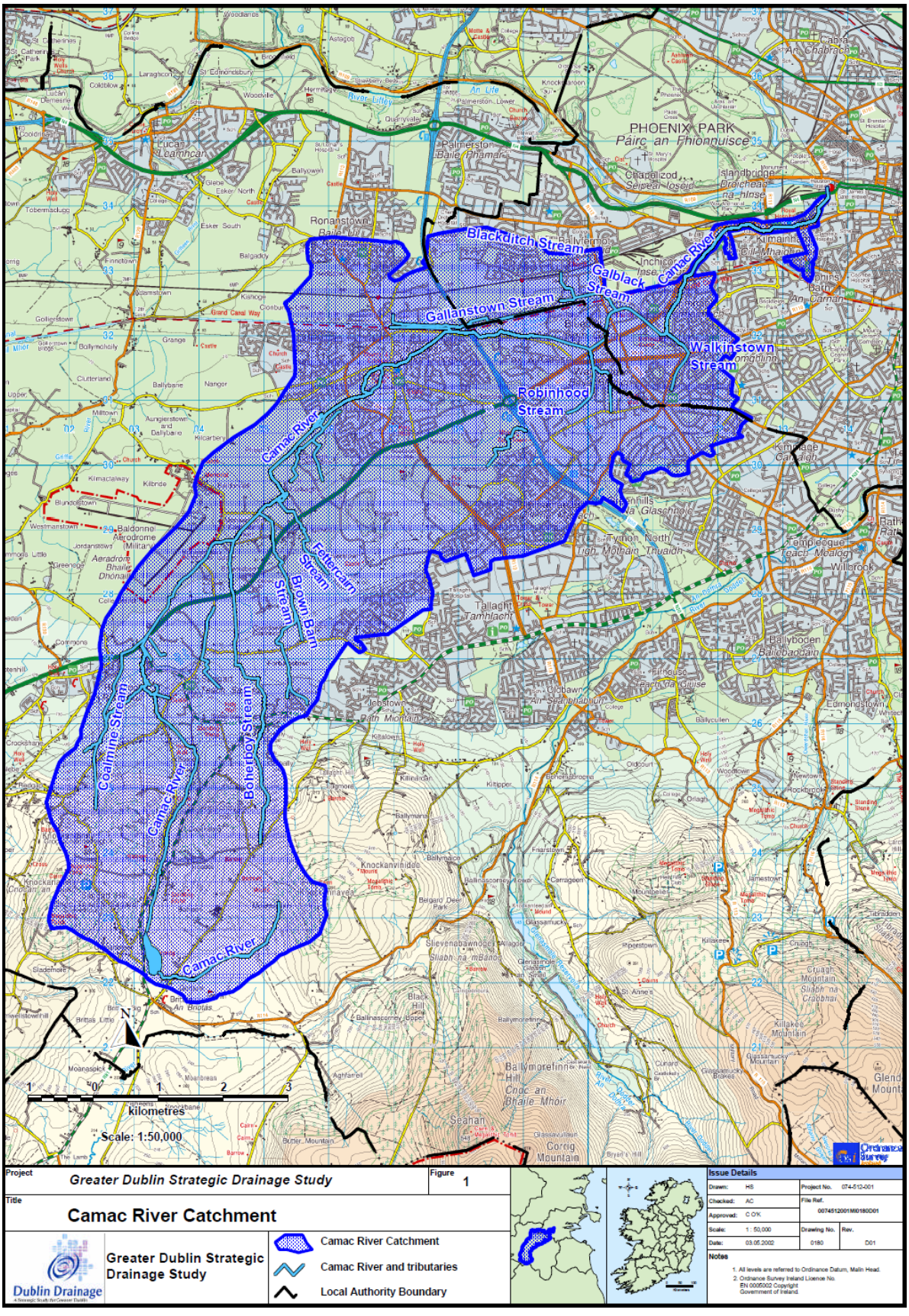


Fig 8: Existing Surface Water Catchments (ARUP Aug 2018)

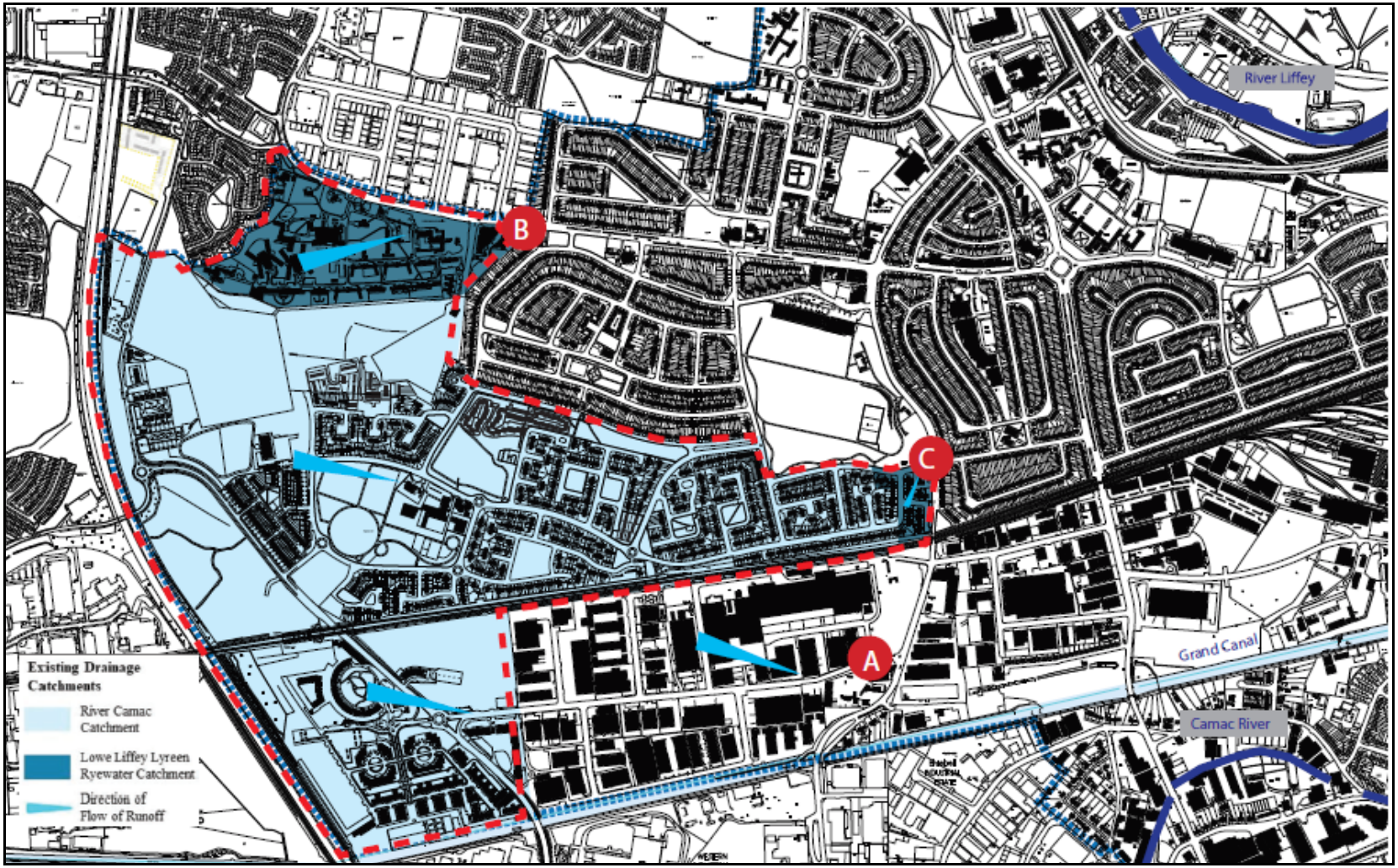


Fig 9: Existing Watercourses (ARUP Aug 2018)

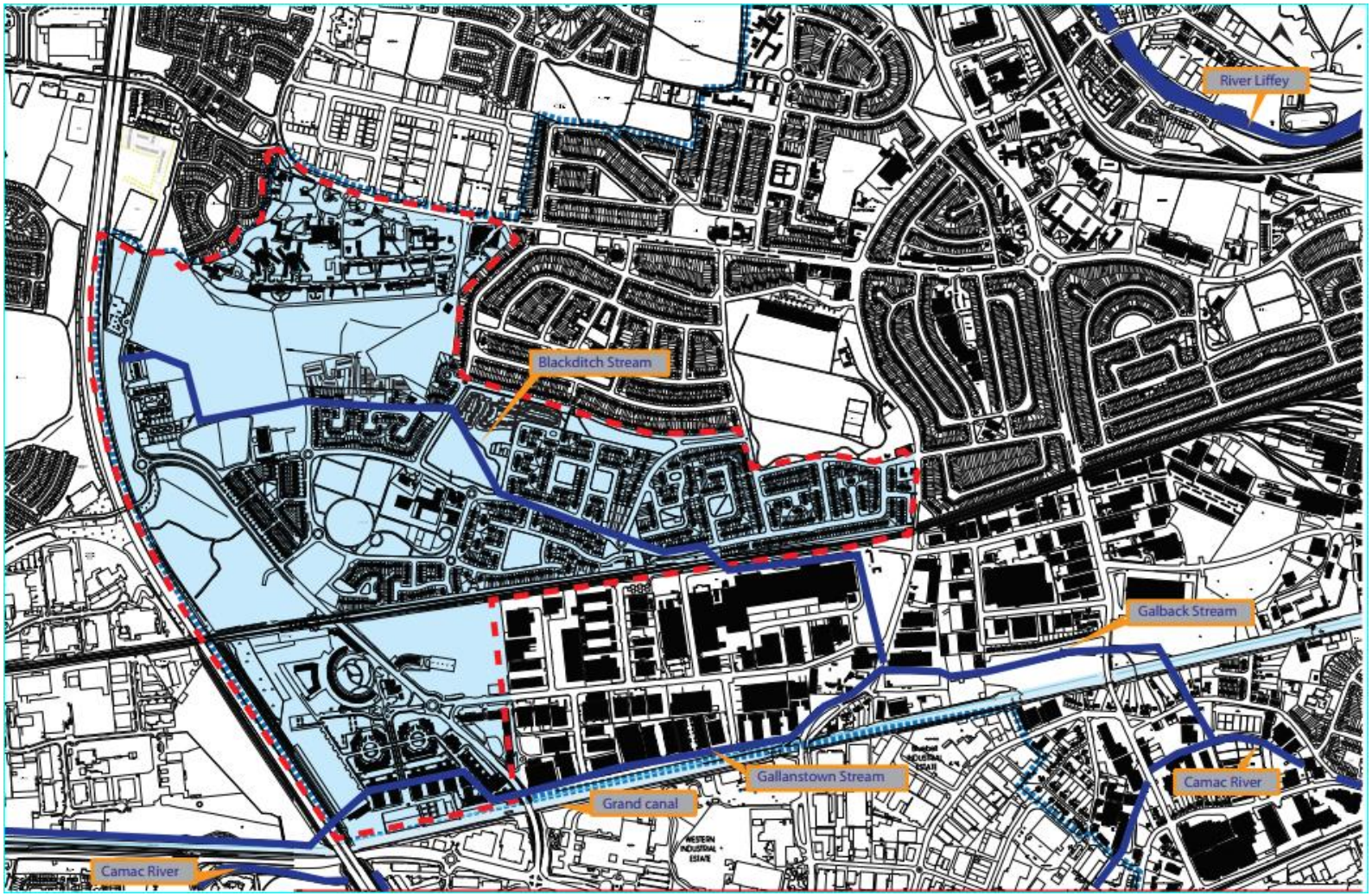
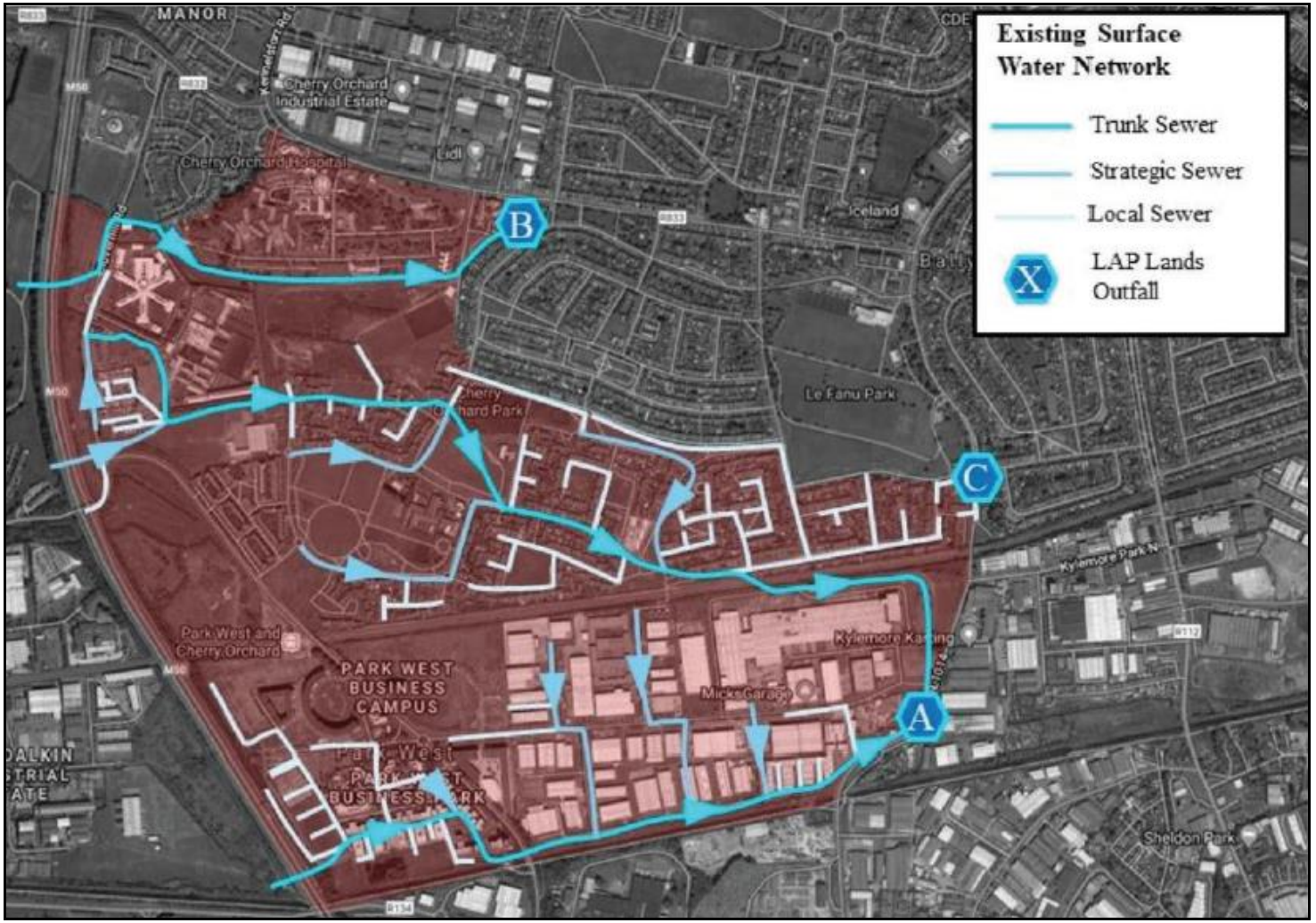


Fig 10: **Existing Surface Water Network** (ARUP Aug 2018)



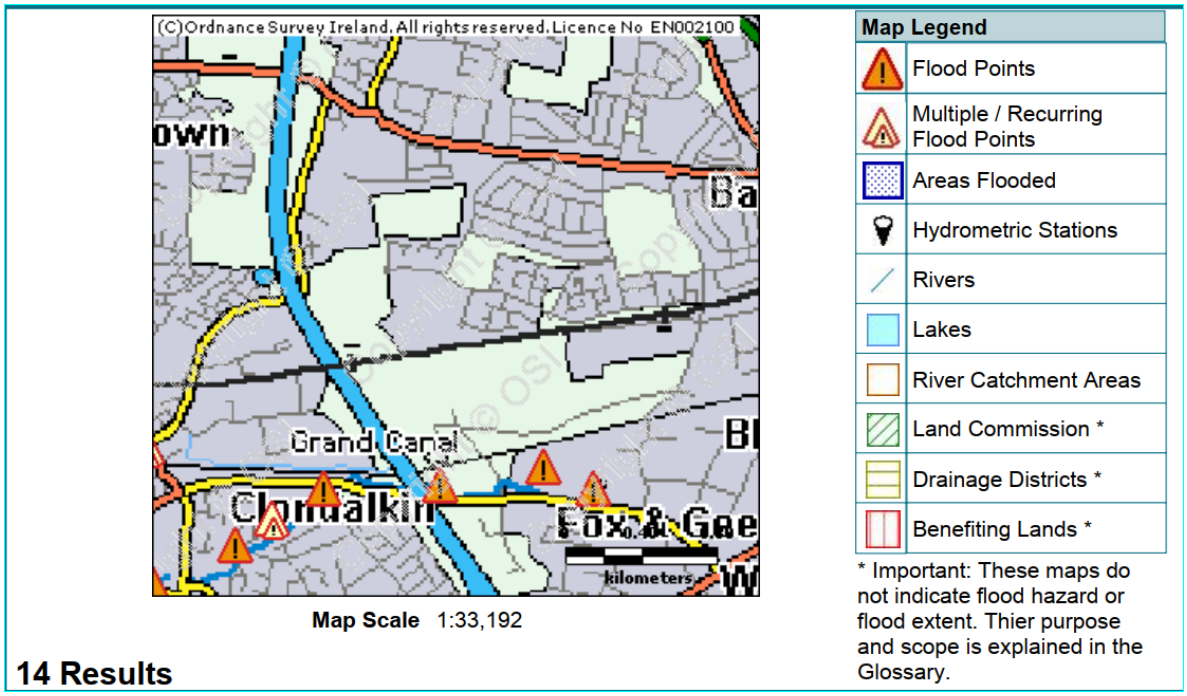
2.4 Flood Risk Indicators

2.4.1 Historical Flood Risk Indicators

The main risk to the Park West – Cherry Orchards LAP is mainly **pluvial (rainfall**) resulting in surface water flooding.

The OPWs national flood hazard mapping was examined to determine frequencies of flooding reports in the area, (floormaps.ie, see Appendix 1 and Fig 11 below). This showed no reported incidents within the LAP area, but did show flood points in the area of the Nagor Road and along the Camac, notably in Clondalkin and at the Old Naas Road, i.e. downstream of the LAP area.

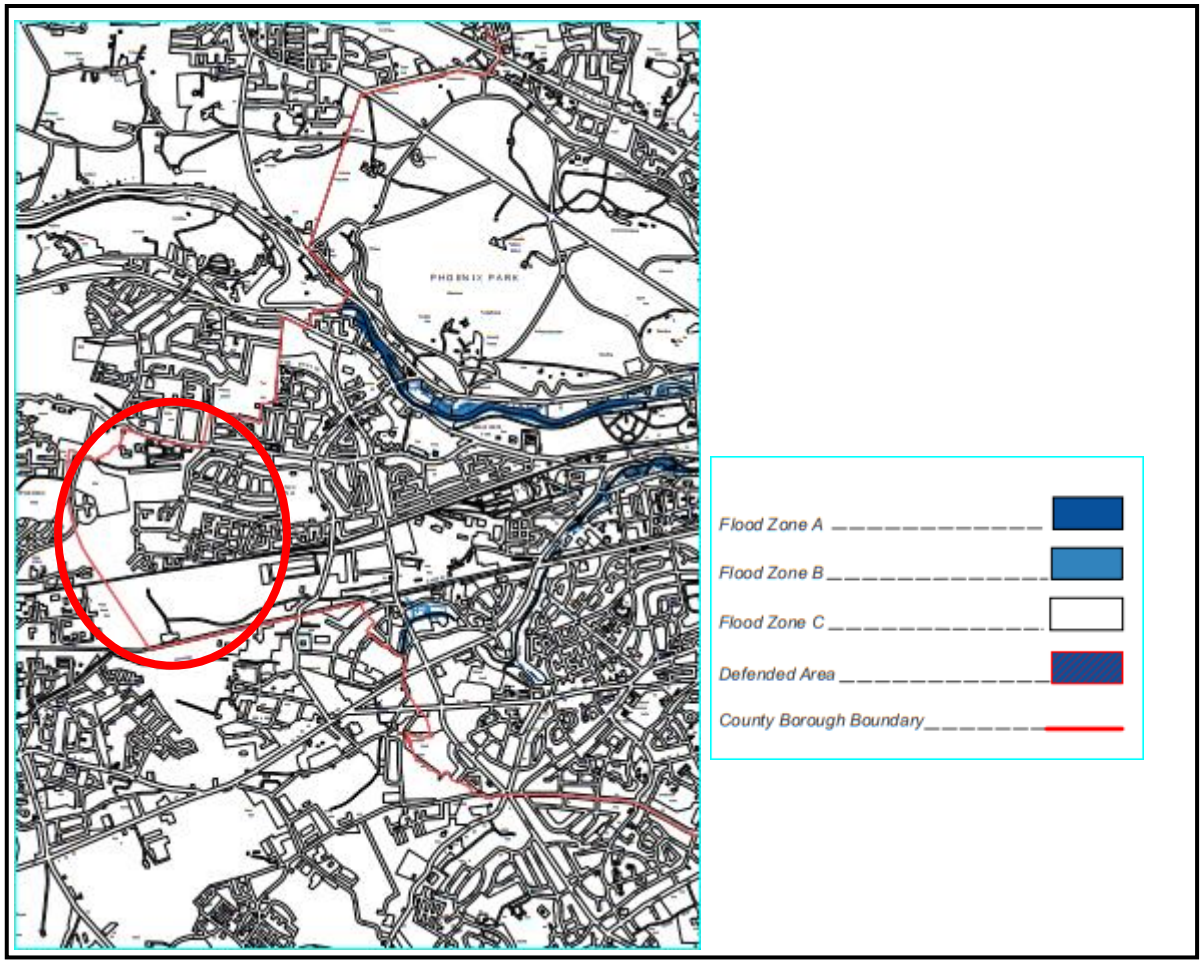
Fig 11: OPW Flood Hazard Maps



Strategic Flood Risk Assessment for the Dublin City Development Plan 2016-2022

The SFRA for the Dublin City Development Plan 2016-2019 produced a composite flood zone map for the City using best data available, including historical records and considering all sources of flooding (appendix 5 of the DCDP SFRA), see Fig 12 for extract showing the LAP area. The map shows the entire LAP area located within Flood Zone C.

Fig 12: Composite flood map, extract from DCDP 2016-2022



Pluvial Flood Risk (Monster Rain)/Storm (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 storm (surface) water flooding, which is a combination of true pluvial flooding, sewer flooding (due to heavy rainfall), groundwater flooding and flooding from urban watercourses.

Extracts from the DCDP SFRA for the LAP area are illustrated below, showing:

1. Pluvial Flood Hazard maps, Fig 13.

2. Pluvial Flood Depth maps, Fig 14.

Fig 13: Type 1 Puvial Flood Hazard Map (1% AEP Event – 3 Hr Duration Model)

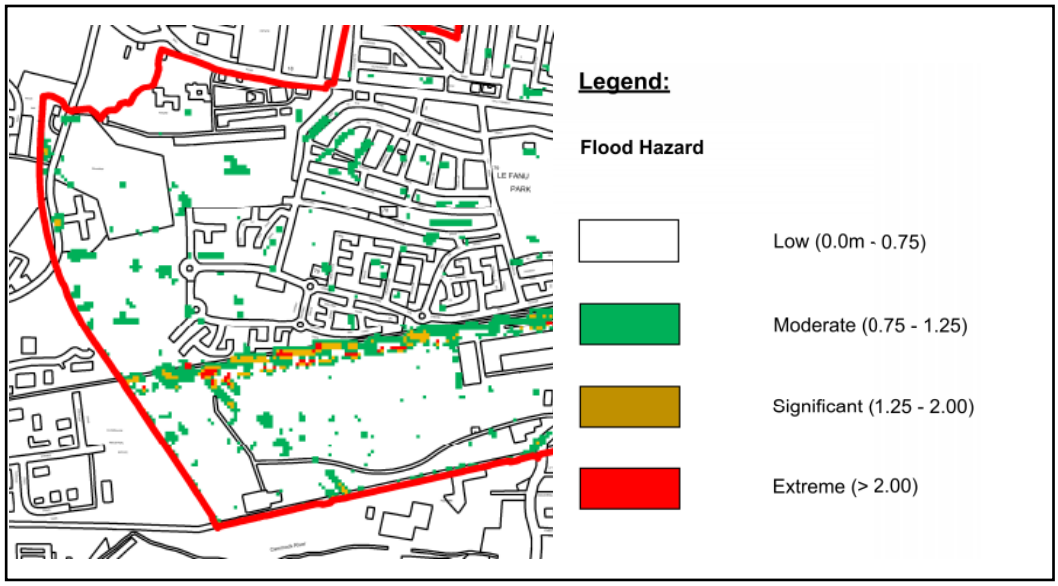
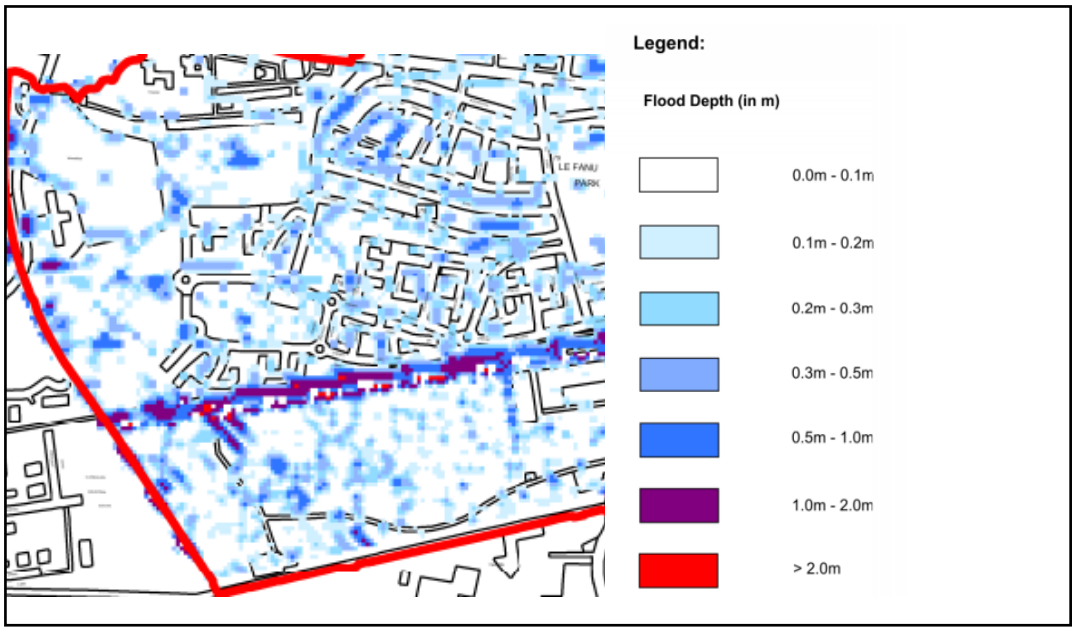


Fig 14: Type 1 Pluvial Flood Depth Map (1% AEP Event – 3 Hr Duration Model)



2.4.2 Fluvial (River) Flooding

The Eastern CFRAM Study was the second River Basin District (RBD) level CFRAM study to be commissioned in Ireland under the EC Directive on the Assessment and Management of Flood Risks 2007, the EU Floods Directive, (Reference 1) as implemented in Ireland by SI 122 of 2010 European Communities (Assessment and Management of Flood Risks) Regulations 2010 (Reference 2). The Eastern CFRAM Study produced Flood Risk Management Plans (FRMPs) for the Camac catchment. Flood maps from this study are shown below in Fig 14 and 15, which show potential for flooding along the Camac, to the south of the Grand Canal.

Dublin City Council's Water Framework Management Strategy provides the following guidelines for development proposals within the Camac Catchment.

Sites directly on the Camac River or tributaries must demonstrate how they are alleviating the confirmed pressures on the Camac Catchment:

i. *Hydromorphological interventions: 'daylighting' of culverts; renaturalising river banks, including providing space for river widening and channel re-profiling; re-establishing natural river floodplains; augmentation of riparian corridor; all and any natural water retention measure deemed necessary to manage flood risk within the catchment etc.*
ii. *Water quality: directing discharges to the river to a minimum of two stages of Sustainable Drainage Systems (SuDS) treatment prior to discharge to tackle diffuse urban pollution (including road run-off).*
iii. *Green infrastructure to slow flows and maximise presence of natural land cover*
iv. *Possible groundwater monitoring: water quality and seasonal variations, where appropriate*

Sites in the Camac River Valley (within 200m of the Camac River or tributaries)

v. *Green infrastructure to address road run-off (and other diffuse urban run-off)*
vi. *Possible groundwater monitoring: water quality and seasonal variations, where appropriate*
vii. *Tagging proposed gullies with "Camac Valley"*

Fig 15: Camac Fluvial Flood Extents, CFRAM (1)

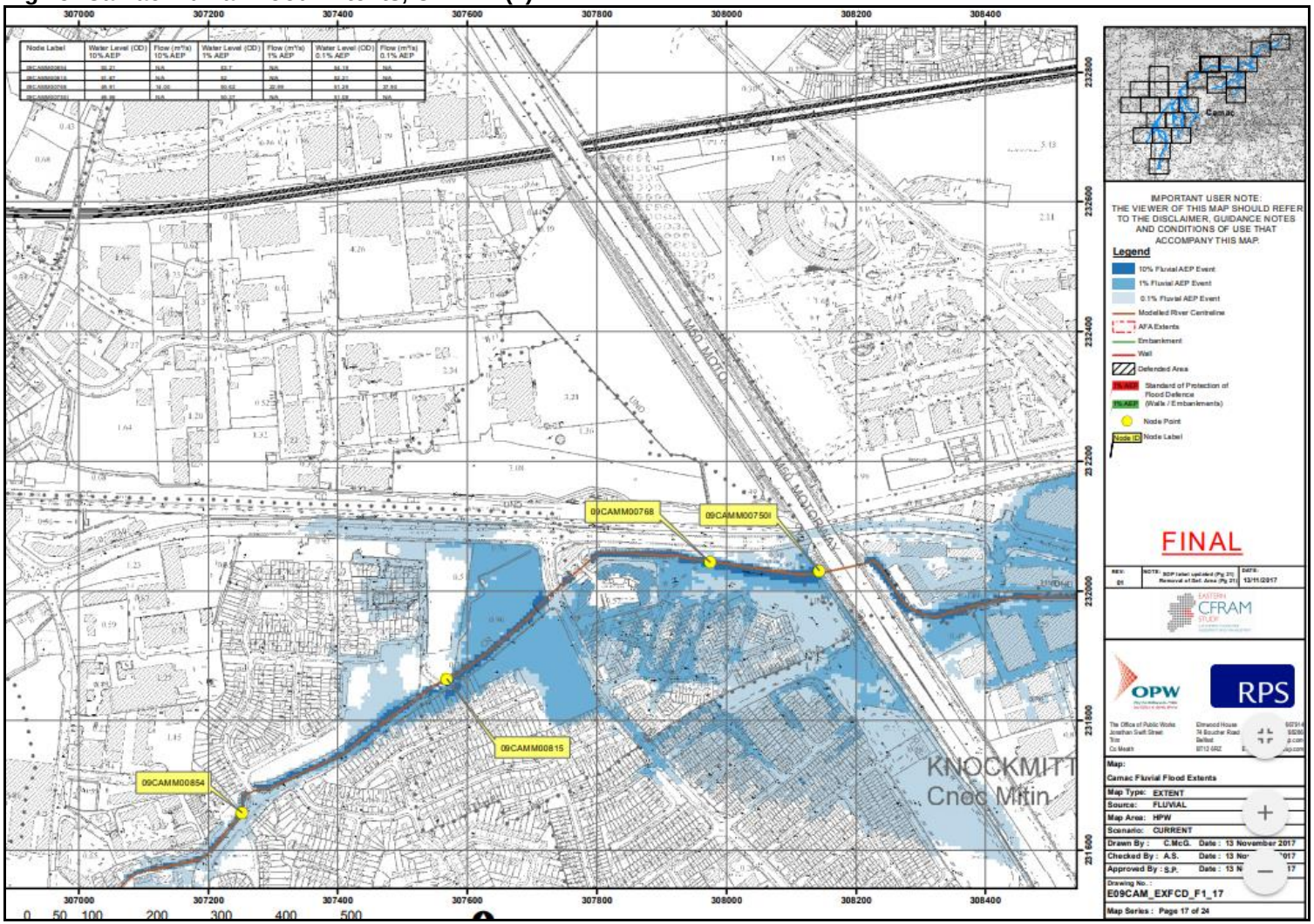
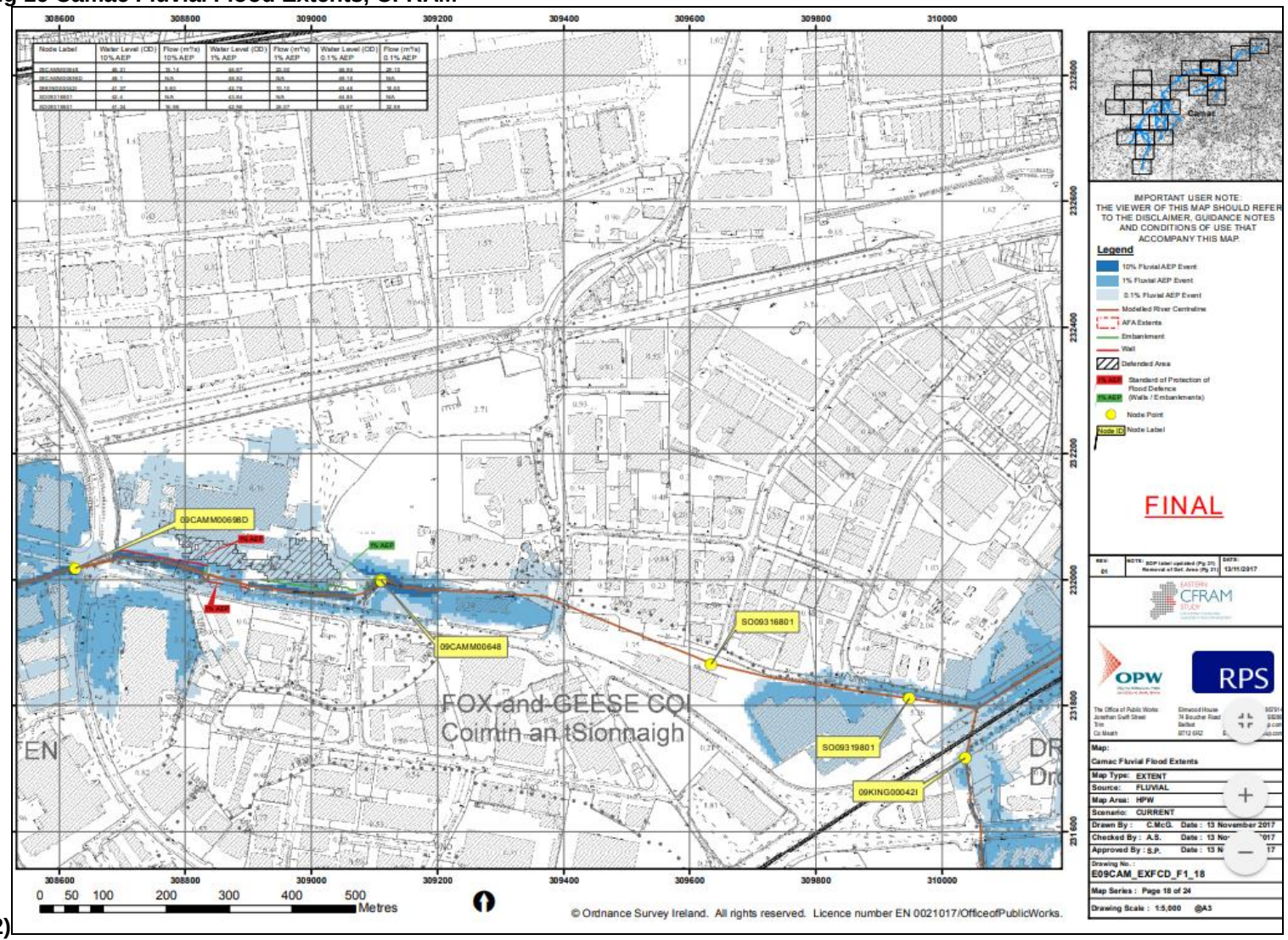


Fig 16 Camac Fluvial Flood Extents, CFRAM



(2)

The Grand Canal:

Walls, bridges, locks, weirs and embankments on the canals are considered adequate flood protection structures.

2.5 LAP Local Drainage Improvements Sought

The LAP identifies a number of potential interventions to support opportunities to allow for Surface Water Management Protection of existing watercourses and to support opportunities to build further resilience into the surface water drainage network to aid the delivery of additional development in the area.

Potential interventions include: -

(a) Support opportunities to allow for Surface Water Management Protection of existing watercourses and the reopening (re-lighting) of covered or culverted watercourses e.g. Gallanstown Streem, Blackditch stream and Galback streams.

(b) Support opportunities to build further resilience into the surface water drainage network.

Whilst in general there is well developed infrastructure in the area, in order to service the identified development sites additional surface water infrastructure will be required in order to convey runoff from these sites to the existing surface water sewer network and connect to existing outfalls. A survey should be carried out to determine if the existing surface water infrastructure is adequate to serve the both the existing and future surface water volumes. Development within the LAP lands must take cognisance of the impact on downstream receiving watercourses, the Camac River and the River Liffey, which discharges into Dublin Bay. It may be necessary to carry out upgrades of the existing surface water drainage network, pending a more detailed assessment of the capacity and condition of the existing infrastructure.

River Camac Drainage Catchment

As noted previously, the majority of the LAP lands fall within the River Camac Drainage Catchment. Dublin City Councils Environmental Services section are currently examining the River Camac under the Water Framework Directive as part of implementing the Camac Greenway. There is an objective of DCC to improve its status from “Poor Status” up to “Good Status”. DCC WFM Strategy guidelines for developments proposals within the Camac Catchment, set out above which are included in the Draft LAP.

It is an objective of the LAP to support the implementation of the Water Framework Directive to improve the status of the Camac, through implementing best practice SuDS and potential works to streams as part of any future development within the LAP area and to support and facilitate the upgrade of existing surface water infrastructure where possible.

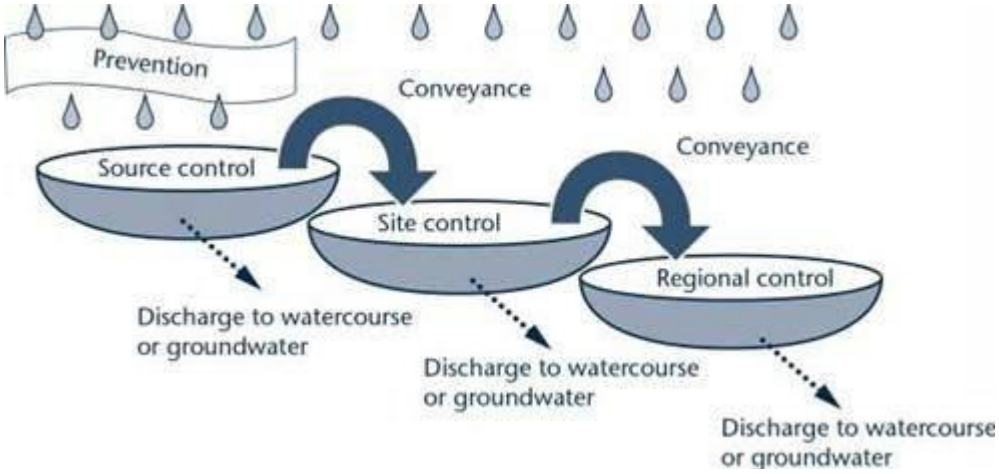
SuDS Infrastructure

The development of the LAP lands affords the opportunity to implement best practice SuDS features in order to reduce the volume and increase the quality of outflow from the public open spaces and roads. One of the guiding objectives of the proposed Park West -

Cherry Orchard Local Area Plan is “to create a vibrant and sustainable new urban area”. The implementation of SuDS principles within the LAP lands will support this vision, ensuring that surface water is managed in a positive and sustainable manner within the lands, reclaiming water as an asset for the area. SuDS approaches are holistic in their management of surface water, considering not only the volume of water to be accommodated, but also the quality of this water as well as the amenity and habitat functions that these features can often perform.

A core objective of the strategy is to manage surface water in a sustainable way, ensuring there is no unacceptable residual risk of flooding to the LAP lands as well as ensuring no increased flood risk up or downstream of the lands. A fundamental pillar of the strategy is the provision of adequate levels of treatment of the surface water as it is proposed to discharge to existing watercourses. Surface water discharges shall be limited to 2l/s/ ha for proposed development. With the above objectives in mind, it is recommended that a SuDS treatment train approach be implemented across the LAP lands.

Figure 13: SuDS Management Train



DCC requires this softer engineered approach to be used to manage surface water at source as it is a greener, more environmentally effective approach for managing stormwater on developed lands. Over ground soft engineering solutions are necessary and a minimum 2-staged treatment approach in accordance with best SuDs practice would be the preferred. Management of surface water at source is the priority and ideally, only overflow in extreme weather events shall be directed to main surface water infrastructure.

Sustainable Urban Drainage Systems (SUDS) measures shall, where feasible be incorporated into new developments in line with appropriate sustainable drainage practices, and including the following options:

- Infiltration systems including infiltration trenches, infiltration basins, permeable paving, soakways, green roofs and green gardens,
- Filtration systems, including swales, bio retention systems and filter strips,
- Retention systems including retention swales,
- Detention systems including underground tanks, underground attenuation, detention basins and filter drains
- In addition to the above, in extreme storm events, flood waters can be accommodated by designing landscaped areas to flood temporarily and thus control the rate of outflow from the site.

For smaller developments the following drainage requirements are sought:

- Permeable paving
- Rainwater harvesting
- Use of appropriately designed soakaways.

Potential SuDS Locations

Based on the SuDS strategy outlined above, the topography of the LAP lands, the flood risk identified within the LAP lands and the ground conditions encountered during the ground investigations which have been carried out within the LAP lands, the following areas have been identified as appropriate for SuDS features within public realm areas. The final location and design of these features will require further geotechnical assessment:

1. Public Road Cross-Sections

A number of existing roads within the LAP area, particularly the Park West Business Park and Industrial areas have cross sections which include trees and grassed verges and this provides the opportunity to implement SuDS features such as tree pits, street planters and swales as a source control measure whilst improving the landscape and amenity value of these areas.

The introduction of such features into the existing roads in the area which are wide such as Cherry Orchard Avenue shall also be explored as along with reducing the volume and increasing the quality of runoff they would greatly help improve the landscape and visual amenities of these areas.

2. Public Open Spaces

SuDS features should also be incorporated within public open spaces where appropriate to reduce the volume and increase the quality of runoff from these areas, as well as to improve their landscape and amenity value. A number of public open spaces exist within the LAP lands, in particular within the Cherry Orchard residential area. These public open spaces afford the opportunity to implement further SuDS features within the LAP lands.

Two significant public open spaces exist within the LAP lands, namely Cherry Orchard Park and Old Cherry Orchard Park. These areas afford the opportunity to implement larger SuDS features such as detention basins to collect runoff from public roads and public open spaces. Based on site specific investigation, infiltration trenches and basins could also be implemented in locations where the required infiltration rates can be achieved as well as swales to convey runoff through the open spaces.

There is an existing SuDS feature Within Cherry Orchard Park which currently provides compensatory flood volume storage relating to the Cedarbrook development. The draft LAP proposes to relocate this flood storage area to allow for the provision of community and sporting facilities within the Park, for example through the provision of a swale along the southern end of the park, or to an underground storage facility. The Making Cherry Orchard Better Action Area Plan has previously identified this site location for the provision of proposed community and social enterprise hub as part of creating a new town centre area. This matter shall be subject to detailed assessment as part of any future redesign of Cherry Orchard Park and/or as part of a more detailed review of surface water drainage network in the area.

Some additional potential interventions/objectives

As discussed above there are a number of tributary streams that run through the LAP are which feed into the Camac river. In most instances, these streams are culverted through the LAP area. The LAP seeks to support opportunities to allow for Surface Water Management Protection of existing watercourses and the reopening (re-lighting) of covered or culverted watercourses as part of all new development e.g. Gallanstown Streem, Blackditch stream and Galback streams. There are significant potential benefits when daylighting streams especially within green corridors, allowing for the creation of ecological synergies between the fresh water systems within the LAP lands.

New planted edges and/or buffer treatments will be provided between contrasting land uses at part of new developments, for example, at established industrial areas and surrounding residential areas at Broomhill and Greenhills. These areas will emphasise enhancement of local biodiversity and local surface water management. They may also provide a visual, screening function. Surface water management will form part of a range of open spaces and green corridors which will form the green infrastructure strategy in the LAP area.

The development of the LAP lands also affords the opportunity to build further resilience into the surface water drainage network through the provision of an additional surface water sewer crossing under the railway tracks, or as may be required to support future developments subject to detail design.

SuDS in an urban environment

Draft Local Area Plan Objectives:

Chapter 4 of the LAP identifies specific objectives to support the overall development strategies that will support the development of the Park West Cherry Orchard LAP lands.

Specific objectives of note included within the LAP are

It is an objective of Dublin City Council to:-

INF1 Support opportunities to upgrade the existing surface water and foul drainage systems to relieve potential constraints in the existing drainage systems and to future proof the drainage infrastructure required to support the full development of the LAP lands.

INF2 Support opportunities to upgrade the existing potable water supply network to future proof water supply to support the full development of the LAP lands.

INF3 Support the Water Framework Directive for the rehabilitation of the Camac River through implementation of best practice SuDS infrastructure throughout the LAP lands in order to improve quality and control of outflow to the river Camac from the LAP land.

INF4 Support opportunities to upgrade the existing combined drainage systems to provide separate storm and foul drainage networks.

GI1 To encourage the development of opportunities for green infrastructure, both within the LAP area and connecting to the surrounding lands.

GI2 To enhance the planting and biodiversity value of existing local parks.

GI3 To seek the provision of "Green Corridors" as per the Green Infrastructure Strategy of the LAP, notably:

(i) Green link from Le Fanu park to the Grand Canal

(ii) Along the northern boundary of the Grand Canal

(iii) Along the boundary of the M50.

GI4 To enhance the biodiversity value of the local area by protecting habitats, in particular historic hedgerows and along the Canal, and create opportunities for new habitats through appropriate landscaping schemes to integrate the natural environment into the existing and future urban environment.

GI5 To work in collaboration with all stakeholders including the National Park and Wildlife Service, Waterways Ireland and South Dublin County Council to protect and enhance the Grand Canal Green Corridor which is designated as a proposed Natural Heritage area.

GI6 To ensure that all new streets are appropriately landscaped and tree lined and where feasible seek the upgrading of existing streets to incorporate landscaping, appropriate tree planting and SuDS features.

Further development objectives for specific sites to support the overall strategies of the LAP are set out in Chapter 5.

Based on the above provisions of the Draft LAP, all new developments will be required to ensure substantial water quality and quantity control, including SUDS features, are in line with best practice guidance to meet legislative standards prior to discharge.

The LAP lands are not identified as areas at risk of flooding; Dublin City Council will adopt a risk-based sequential and balanced approach, with development proposals required to carry out to an appropriate level of detail, a Site-Specific Flood Risk Assessment (SSFRA) that complies with the 'Planning System and Flood Risk Management – Guidelines' and pays attention to site specific risks to ensure that flood risk can be managed to an acceptable level without increasing flood risk upstream or downstream as a result of development.

Image: Swale surrounding DCC's Coultry Park in Ballymun

2.6 Conclusion of Stage 1 SFRA

The information provided from a desktop study shows the primary flood risk within the Park West Cherry Orchard LAP is from pluvial (rainfall) surface water flooding, with fluvial flooding downstream of the Camac tributaries. It is not considered necessary at this stage to proceed to a Stage 2 Flood Risk Assessment as all developments sites are located within Flood Zone C. All sites for redevelopment will be assessed on their merits and will have to comply with the Strategic Flood Risk Assessment for the Dublin City Development Plan 2016-2022.

All developments within the LAP shall have regard to the following: -

- Objectives of the Park West – Cherry Orchard Local Area Plan.

- Requirement to implement the flood management policies and objectives as set out in the Dublin City Development Plan 2016-2022 (see Chapter 9) and any guidance provided in the Strategic Flood Risk Assessment (Volume 7), and to implement the 'Guidelines on the Planning System and Flood Risk Management' (DoEHLG/OPW, 2009).

- Notwithstanding the identification of an area being at low risk of flooding, where Dublin City Council is of the opinion that flood risk may arise or new information has come to light that may alter the flood designation of the land, an appropriate flood risk assessment may be required to be submitted as part of a planning application.

- All planning applications shall be accompanied by a Storm-Water Management Plan. All development proposals shall have regard to surface water management policies contained in the Greater Dublin Strategic Drainage Study, and Chapter 9 of the Dublin City Development Plan 2016-2022, and any information contained in the Strategic Flood Risk Assessment (Vol. 7, Chapter 4).

- All development shall ensure the protection of water quality of existing water bodies and ground water sources, and retrofitting best practice SUDS techniques on existing sites where possible.

Appendix 1: OPW National Flood Hazard Mapping

OPW *National Flood Hazard Mapping*

Summary Local Area Report

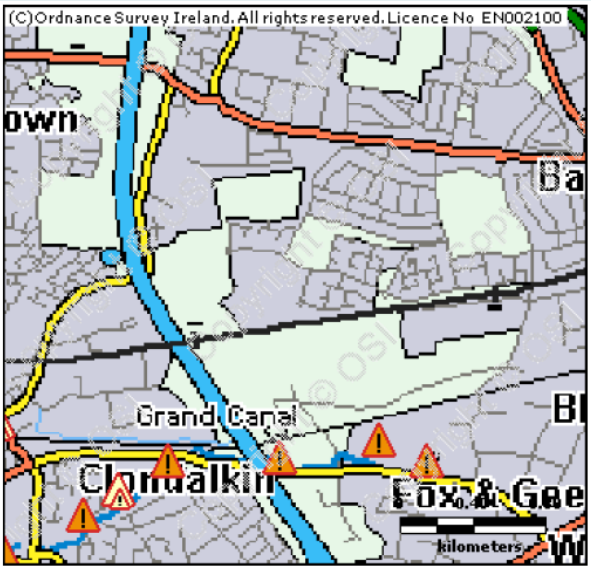
This Flood Report summarises all flood events within 2.5 kilometres of the map centre.

The map centre is in:

County: Dublin

NGR: O 084 329

This Flood Report has been downloaded from the Web site www.floodmaps.ie. The users should take account of the restrictions and limitations relating to the content and use of this Web site that are explained in the Disclaimer box when entering the site. It is a condition of use of the Web site that you accept the User Declaration and the Disclaimer.



Map Scale 1:33,192

Map Legend	
	Flood Points
	Multiple / Recurring Flood Points
	Areas Flooded
	Hydrometric Stations
	Rivers
	Lakes
	River Catchment Areas
	Land Commission *
	Drainage Districts *
	Benefiting Lands *

* Important: These maps do not indicate flood hazard or flood extent. Thier purpose and scope is explained in the Glossary.

14 Results

1. Flooding at Diageo, Nangor Road, Dublin 12 on 24th Oct 2011
County:Dublin
Start Date: 24/Oct/2011
Flood Quality Code:3
Additional Information: Reports (1) More Mapped Information

2. Liffey Lower - Dec 1954
County:Kildare, Dublin
Start Date: 08/Dec/1954
Flood Quality Code:2
Additional Information: Reports (4) Press Archive (2) More Mapped Information

3. Flooding at Junction of Watery Lane and Riversdale Road, Clondalkin, Dublin 22 on 24th Oct 2011
County:Dublin
Start Date: 24/Oct/2011
Flood Quality Code:2
Additional Information: Reports (1) More Mapped Information

4. Liffey Chapelizod St Martins Row Nov 2000
County:Dublin
Start Date: 05/Nov/2000
Flood Quality Code:3
Additional Information: Reports (1) More Mapped Information

5. Camac November 2000
County:Dublin
Start Date: 05/Nov/2000
Flood Quality Code:4

Report Produced: 06-Jun-2019 12:07

Additional Information: Reports (1) More Mapped Information

6. Camac Clondalkin June 1993 — Start Date: 11/Jun/1993

County: Dublin — Flood Quality Code:3

Additional Information: Reports (1) More Mapped Information

7. Camac Watery Lane Clondalkin Recurring — Start Date:

County: Dublin — Flood Quality Code:4

Additional Information: Reports (1) Press Archive (1) More Mapped Information

8. Flooding at Robinhood Industrial Estate, Clondalkin, Dublin 12 on 24th Oct 2011 — Start Date: 24/Oct/2011

County: Dublin — Flood Quality Code:2

Additional Information: Reports (1) More Mapped Information

9. Flooding at Riverview Business Centre, New Nangor Road, Dublin 12 on 24th Oct 2011 — Start Date: 24/Oct/2011

County: Dublin — Flood Quality Code:2

Additional Information: Reports (1) More Mapped Information

10. Flooding at Yellow Meadow Apartments, Off Nangor/Yellow Meadows Road, Dublin 22 on 24th Oct 2011 — Start Date: 24/Oct/2011

County: Dublin — Flood Quality Code:2

Additional Information: Reports (1) More Mapped Information

11. Beech Row Ronanstown Recurring — Start Date:

County: Dublin — Flood Quality Code:3

Additional Information: Reports (2) More Mapped Information

12. Cappaghmore Ronanstown Recurring — Start Date:

County: Dublin — Flood Quality Code:4

Additional Information: Reports (1) More Mapped Information

13. Camac Culvert Old Naas Road recurring — Start Date:

County: Dublin — Flood Quality Code:4

Additional Information: Reports (1) More Mapped Information

14. Palmerston Mill Lane Recurring — Start Date:

County: Dublin — Flood Quality Code:4

Additional Information: Reports (1) More Mapped Information