Strategic Flood Risk Assessment for South Dublin County Council Development Plan 2016-2022

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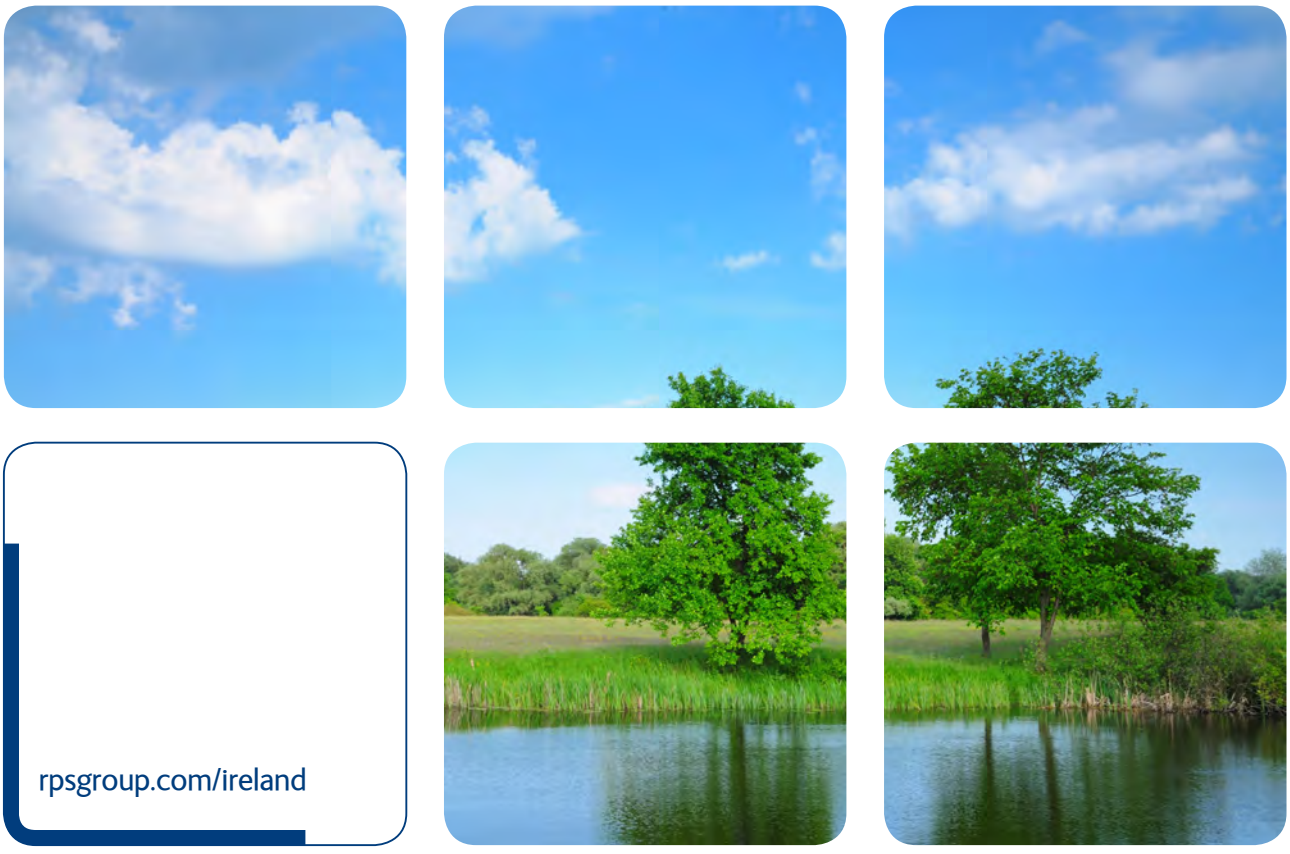

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TABLE OF CONTENTS

APPENDICES

LIST OF FIGURES

LIST OF TABLES

1 INTRODUCTION

1.1 COUNTY DEVELOPMENT PLAN

In accordance with the Planning and Development Act 2000 (as amended) South Dublin County Council (SDCC) commenced a review the existing 2010-2016 County Development Plan and the preparation of a new County Development Plan for the period 2016–2022 in September 2014. The County Development Plan review process will take up to two years, concluding with the adoption of the new plan in 2016. The SDCC Chief Executive submitted a draft County Development Plan to the elected members of SDCC for agreement in May 2015. The agreed draft Plan was subject to public consultation from July 2015 to September 2015. A Chief Executives Report summarising the issues raised in submissions and observations received in respect of the Draft Plan was submitted to the elected members in December 2015. The elected members will consider the draft Plan and the Chief Executives Report in spring 2016 and formally make or amend the Plan.

In compliance with the Strategic Environmental Assessment Directive and the Planning and Development (Strategic Environmental Assessment) Regulations 2004-2011, the Planning Authority carried out a Strategic Environmental Assessment (SEA) of the new Plan and prepared an Environmental Report of the likely significant effects on the environment of implementing the new Plan.

The Environmental Protection Agency (EPA) SEA Scoping Guidance Document outlines that the SEA should adopt policies to avoid and restrict the zoning of lands in flood prone areas. It should also adopt a policy that requires flood risk assessments to be undertaken for developments and zoning being proposed in flood prone areas. These policies should be prepared in accordance with the requirements of The Planning System and Flood Risk Assessment Guidelines for Planning Authorities (2009) and Circular PL02/2014 (August 2014) referred to hereafter as 'The Guidelines'. 'The Guidelines' recommend that a Strategic Flood Risk Assessment (SFRA) Report be undertaken to support the SEA of proposed development plans. As recommended, SDCC commissioned a SFRA to inform the policy and land use decisions in areas at risk of flooding within the County.

1.2 REPORT OBJECTIVES

The objective of this report is to prepare a SFRA for the South Dublin County Development Plan 2016-2022. The Report was prepared in accordance with the requirements of The Planning System and Flood Risk Assessment Guidelines for Planning Authorities (2009) and Circular PL02/2014 (August 2014). The SFRA provides an assessment of all types of flood risk within the County and assisted SDCC to make informed strategic land-use planning decisions and formulate flood risk policies. A Stage 1 Flood Risk Identification was undertaken to identify any flooding or surface water management issues related to the County that may warrant further investigation. As part of this stage the best available data at the time of preparation was acquired from the Office of Public Works (OPW) Eastern Catchment Flood Risk Assessment Management (CFRAM) Study. The Eastern CFRAM has generated draft flood zone mapping which has been deemed suitable as a Stage 2 Initial Flood Risk Assessment. This flood risk information has enabled SDCC to apply 'The Guidelines' sequential approach, and where necessary the Justification Test, to appraise sites for suitable land zonings and identify how flood risk can be managed as part of the development plan. Appendix A outlines the approach undertaken by SDCC in application of the sequential approach and details the Justification Tests where necessary.

1.3 DISCLAIMER

The SFRA has been prepared in compliance with the Guidelines but the SFRA remains a living document and is based on the best available data at the time of preparation. It is subject to change based on more up to date and relevant flood risk information becoming available during the lifetime of the County Development Plan. All information in relation to flood risk is provided for general policy guidance only. All landowners and developers are instructed that South Dublin County Council and their consultants can accept no responsibility for losses or damages arising due to assessments of the vulnerability to flooding of lands, uses and developments. Furthermore owners, users and developers are advised to take all reasonable measures to assess the vulnerability to flooding of lands in which they have an interest prior to making planning or development decisions.

It should be noted that the Eastern CFRAM mapping used to define the flood zones for this SFRA are at Draft Final stage and are subject to change following a stakeholder and public consultation process. However the CFRAM mapping is the most comprehensive flood zone mapping available for the county and is considered appropriate for use as a strategic overview of flood risk within the county. Further information on the Eastern CFRAM study is available at www.cfram.ie. The flood maps are 'predictive' flood maps, as they provide predicted flood extent and other information for a flood event that has an estimated probability of occurrence (the 1% AEP and 0.1% AEP events – see section 3.2.3 below), rather than information for floods that have occurred in the past.

South Dublin County Council makes no representations, warranties or undertakings about any of the information provided on these draft maps including, without limitation, their accuracy, their completeness or their quality or fitness for any particular purpose. To the fullest extent permitted by applicable law, South Dublin County Council nor any of its members, officers, associates, consultants, employees, affiliates, servants, agents or other representatives shall be liable for loss or damage arising out of, or in connection with, the use of, or the inability to use, the information provided on the draft flood maps including, but not limited to, indirect or consequential loss or damages, loss of data, income, profit, or opportunity, loss of, or damage to, property and claims of third parties, even if South Dublin County Council has been advised of the possibility of such loss or damages, or such loss or damages were reasonably foreseeable.

South Dublin County Council reserves the right to change the content and / or presentation of any of the information provided on the draft flood maps at its sole discretion, including these notes and disclaimer. This disclaimer, guidance notes and conditions of use shall be governed by, and construed in accordance with, the laws of the Republic of Ireland. If any provision of these disclaimer, guidance notes and conditions of use shall be unlawful, void or for any reason unenforceable, that provision shall be deemed severable and shall not affect the validity and enforceability of the remaining provisions.

1.4 REPORT STRUCTURE

The South Dublin County Study area and its primary watercourses are identified in **Section 2**. A summary of the Planning System and Flood Risk Management Guidelines and the procedure for undertaking a SFRA is presented in **Section 3**. **Section 4** outlines a broad overview of the requirements of Flood Risk Assessments (FRA) which should accompany planning applications. The available flood risk information used to identify the flood risk zones is discussed in **Section 5**. Potential zoning areas at risk from flooding are examined and recommendations for Flood Risk Assessments are made in **Section 7**. **Section 7** details the flood risk management policies and

objectives being brought forward to the County Development Plan and lastly **Section 8** provides a summary.

2 STUDY AREA

2.1 INTRODUCTION

The South Dublin County Council (SDCC) administrative area is shown Figure 2.1 SDCC Extent and Watercourses below. The County has an extent of approximately 223 km^2. The County extends from the Dublin Mountains to the River Liffey (as shown in Figure 2.1 below) and includes principal population areas such as Lucan, Palmerstown, Adamstown, Clondalkin, Newcastle, Rathcoole, Saggart, Templeogue, Rathfarnham, Firhouse, Knocklyon, Bohernabreena, Tallaght and Brittas. The County has a population of 265,205 and the Regional Planning Guidelines population target is 308,467 by 2022.

2.2 WATERCOURES

The County has numerous watercourses which are all contained within or influence the Liffey River catchment. The approximate total length of watercourses is 265 km. The principal rivers include the Liffey, the Griffeen, the Camac, the Poddle, the Dodder and the Owendoher. Other notable streams include the Tobermaclugg, the Whitechurch, the Tallaght Stream and the Robinhood Stream. Figure 2.1 below shows the watercourses and principal rivers in the County. All of the watercourses lie within the Hydrometric Area (HA) 09 (Liffey-Dublin Bay). The catchments of the County are highly urbanised but there is rural land in the west and south containing agriculture, forestry and the Dublin & Wicklow Mountains.

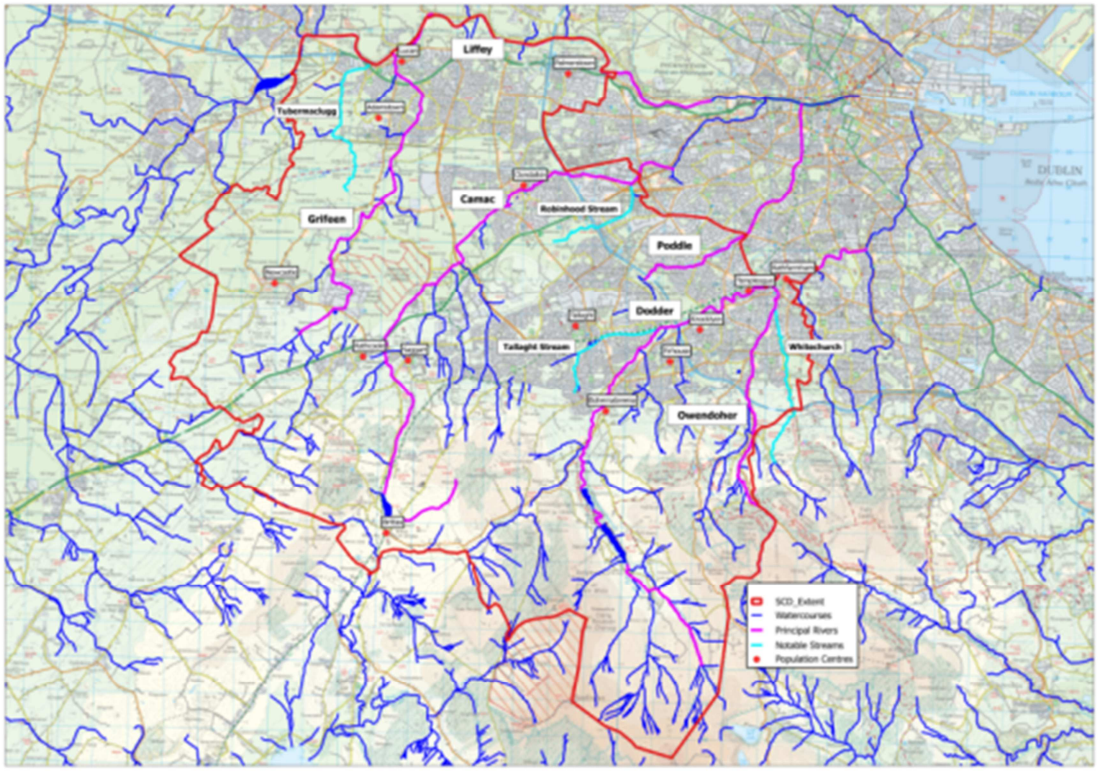


Figure 2.1 SDCC Extent and Watercourses

3 THE PLANNING SYSTEM AND FLOOD RISK MANAGEMENT GUIDELINES FOR PLANNING AUTHORITIES

3.1 INTRODUCTION

In 2009 the Department of Environment, Heritage and Local Government in conjunction with the Office of Public Works published The Planning System and Flood Risk Management: Guidelines for Planning Authorities. The purpose of the Guidelines is to ensure that flood risk is considered by all levels of government when preparing development plans and planning guidelines. They should also be used by developers when addressing flood risk in development proposals. The Guidelines should be implemented in conjunction with the relevant flooding and water quality EU Directives including the Water Framework Directive (River Basin Management Plans (RBMPs)) and the Floods Directive (Catchment Flood Risk Assessment and Management Studies (CFRAMS)).

The core objectives of the Guidelines are to:

- Avoid inappropriate development in areas at risk of flooding.
- Avoid new developments increasing flood risk elsewhere, including that which may arise from surface water run-off.
- Ensure effective management of residual risks for development permitted in floodplains.
- Avoid unnecessary restriction of national, regional or local economic and social growth.
- Improve the understanding of flood risk among relevant stakeholders; and
- Ensure that the requirements of EU and national law in relation to the natural environment and nature conservation are complied with at all stages of flood risk management.

The Guidelines recommend that Flood Risk Assessments (FRA) be carried out to identify the risk of flooding to land, property and people. FRAs should be carried out at different scales by government organisations, local authorities and for proposed developments appropriate to the level of information required to implement the core objectives of the Guidelines. The FRA scales are:

- **Regional Flood Risk Appraisal (RFRA)** – a broad overview of flood risk issues across a region to influence spatial allocations for growth in housing and employment as well as to identify where flood risk management measures may be required at a regional level to support the proposed growth. Currently being undertaken by the OPW through the CFRAMs process.
- **Strategic Flood Risk Assessment (SFRA)** – an assessment of all types of flood risk informing land use planning decisions. This will enable the Planning Authority to allocate appropriate sites for development, whilst identifying opportunities for reducing flood risk. This SFRA will revisit and develop the flood risk identification undertaken in the RFRA, and give consideration to a range of potential sources of flooding. An initial flood risk assessment, based on the identification of Flood Zones, will also be carried out for those areas, which will be zoned for development. Where the initial flood risk assessment highlights the potential for a significant level of flood risk, or there is conflict with the proposed vulnerability of development, then a site specific FRA will be recommended, which will necessitate a detailed flood risk assessment.
- **Site Specific Flood Risk Assessment (FRA)** – site or project specific flood risk assessment to consider all types of flood risk associated with the site and propose appropriate site management and mitigation measures to reduce flood risk to and from.

3.2 FLOOD RISK ASSESSMENT

3.2.1 Flood Risk Assessment Approach

The Guidelines recommend that Flood Risk Assessments (FRA) be carried out to identify the risk of flooding to land, property and people. FRAs should use the Source-Pathway-Receptor (S-P-R) Model to identify the sources of flooding, the flow paths of the floodwaters and the people and assets impacted by the flooding. Figure 3.1 shows the SPR model that should be adopted in FRAs.

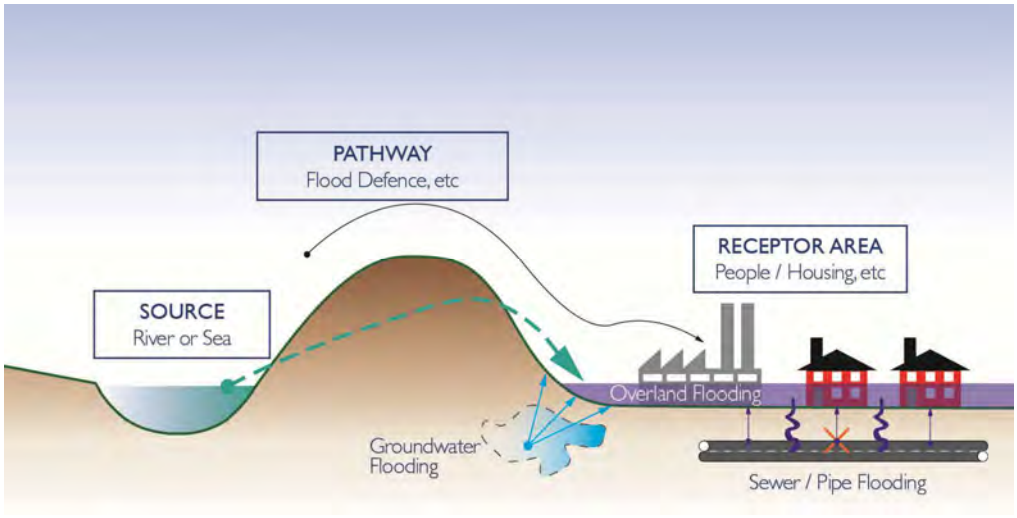


Figure 3.1 Flood Risk Assessment Source – Pathway – Receptor Model

FRAs should be carried out using the following staged approach;

- **Stage 1 Flood Risk Identification** – to identify whether there may be any flooding or surface water management issues related to either the area of regional planning guidelines, development plans and LAP's or a proposed development site that may warrant further investigation at the appropriate lower level plan or planning application levels.
- **Stage 2 Initial Flood Risk Assessment** – to confirm sources of flooding that may affect a plan area or proposed development site, to appraise the adequacy of existing information and to scope the extent of the risk of flooding which may involve preparing indicative flood zone maps. Where hydraulic models exist the potential impact of a development on flooding elsewhere and of the scope of possible mitigation measures can be assessed. In addition, the requirements of the detailed assessment should be scoped.
- **Stage 3 Detailed Flood Risk Assessment** – 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, of its potential impact on flood risk elsewhere and of the effectiveness of any proposed mitigation measures.

3.2.2 Types of Flooding

There are two main sources of flooding inland and coastal. Inland flooding is caused by prolonged and/or intense rainfall. This results in fluvial, pluvial or ground water flooding acting independently or in combination. Coastal flooding is not a concern for SDCC as it is a landlocked county however a

combination of high flow in rivers and a high tide may prevent the river from discharging into the sea thus increasing water levels inland causing rivers to overtop their banks.

- Fluvial flooding occurs when a river overtops its banks due to a blockage in the channel or the channel capacity is exceeded.
- Pluvial flooding occurs when overland flow cannot infiltrate into the ground, when drainage systems exceed their capacity or are blocked and when and when the water cannot discharge due to a high water level in the receiving watercourse.
- Groundwater flooding occurs when the level of water stored in the ground rises as a result of prolonged rainfall to meet the ground surface and flows out over it.

3.2.3 Flood Risk

Guidelines state flood risk is a combination of the likelihood of flooding and the potential consequences arising. Flood risk is expressed as:

Flood risk = Likelihood of flooding x Consequences of flooding

The Guidelines define the likelihood of flooding as the percentage probability of a flood of a given magnitude as occurring or being exceeded in any given year. A 1% probability indicates the severity of a flood that is expected to be exceeded on average once in 100 years, i.e. it has a 1 in 100 (1%) chance of occurring in any one year. Table 3.1 shows flood event probabilities used in flood risk management.

Annual Exceedance Probability (%)	Return Period (Years)
50	2
10	10
1	100
0.1	1000

Table 3.1 Flood Event Probabilities

The consequences of flooding depend on the hazards associated with the flooding (e.g. depth of water, speed of flow, rate of onset, duration, wave action effects, water quality), and the vulnerability of people, property and the environment potentially affected by a flood (e.g. the age profile of the population, the type of development, presence and reliability of mitigation measures etc.).

3.3 FLOOD ZONES

The Guidelines recommend identifying flood zones which show the extent of flooding for a range flood event probabilities. The Guidelines identify three levels of flood zones:

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

The flood zones are generated without the inclusion of climate change factors. The flood zones only account for inland and coastal flooding. They should not be used to suggest that any areas are free from flood risk as they do not account for potential flooding from pluvial and groundwater flooding. Similarly flood defences should be ignored in determining flood zones as defended areas are still carry a residual risk of flooding from overtopping, failure of the defences and deterioration due to lack of maintenance. Figure 3.2 shows a typical flood zone map.

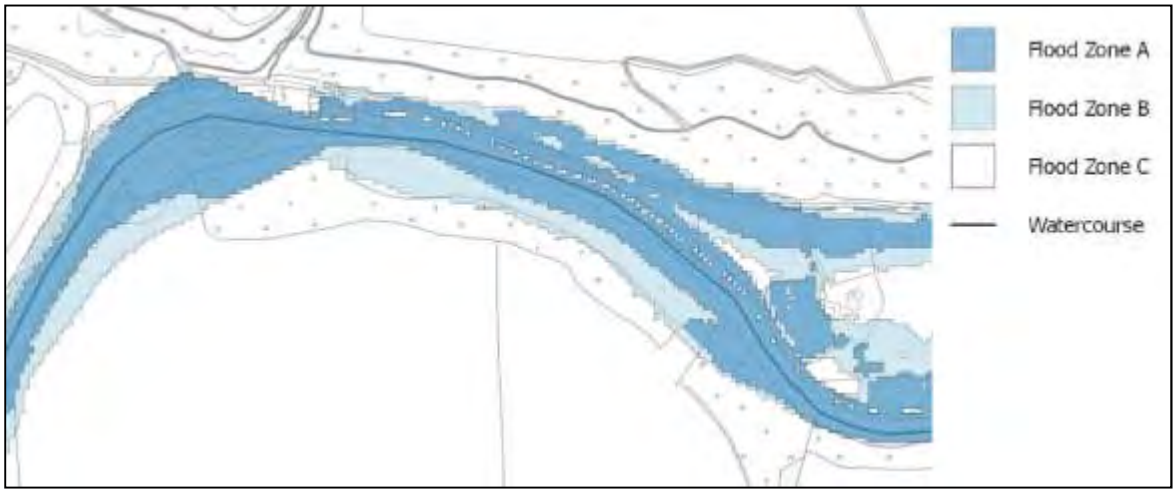


Figure 3.2 Typical Flood Zone Map

3.4 CLIMATE CHANGE

Climate Change is expected to increase flood risk. It could lead to more frequent flooding and increase the depth and extent of flooding. Due to the uncertainty surrounding the potential effects of climate change a precautionary approach is recommended in the Guidelines:

- Recognise that significant changes in the flood extent may result from an increase in rainfall or tide events and accordingly adopt a cautious approach to zoning land in these potential transitional areas.
- Ensure that the levels of structures designed to protect against flooding, such as flood defences, land-raising or raised floor levels are sufficient to cope with the effects of climate change over the lifetime of the development they are designed to protect.
- Ensure that structures to protect against flooding and the development protected are capable of adaptation to the effects of climate change when there is more certainty about the effects and still time for such adaptation to be effective.

3.5 STRATEGIC FLOOD RISK ASSESSMENT

The purpose of this report is to carry out a SFRA at county scale for South Dublin but also to assess particular areas of interest at town scale. The Guidelines recommend a series of outputs for a SFRA. These outputs in board terms include:

- Identify principal rivers, sources of flooding and produce flood zone maps for across the local authority area and in key development areas.
- An appraisal of the availability and adequacy of the existing information.
- Assess potential impacts of climate change to demonstrate the sensitivity of an area to increased flows or sea levels. Where mathematical models are not available climate change flood extents can be assessed by using the Flood Zone B outline as a surrogate for Flood Zone A with allowance for the possible impacts of climate change.
- Identify the location of any flood risk management infrastructure and the areas protected by it and the coverage of flood-warning systems.
- Consider, where additional development in Flood Zone A and B is planned within or adjacent to an existing community at risk, the implications of flood risk on critical infrastructure and services across a wider community-based area and how the emergency planning needs of existing and new development will be managed.
- Identify areas of natural floodplain, which could merit protection to maintain their flood risk management function as well as for reasons of amenity and biodiversity.
- Assess the current condition of flood-defence infrastructure and of likely future policy with regard to its maintenance and upgrade.
- Assess the probability and consequences of overtopping or failure of flood risk management infrastructure, including an appropriate allowance for climate change.
- Assess, in broad terms, the potential impact of additional development on flood risk elsewhere and how any loss of floodplain could be compensated for.
- Assess the risks to the proposed development and its occupants using a range of extreme flood or tidal events.
- Identify areas where site-specific FRA will be required for new development or redevelopment.
- Identify drainage catchments where surface water or pluvial flooding could be exacerbated by new development and develop strategies for its management in areas of significant change.
- Provide guidance on the likely applicability of different Sustainable Drainage Systems (SUDS) techniques for managing surface water run-off at key development sites as determined by surface water and drainage strategies developed within the SFRA.
- Identify where integrated and area based provision of SUDS and green infrastructure are appropriate in order to avoid reliance on individual site by site solutions; and,
- Provide guidance on appropriate development management criteria for zones and sites.

3.6 SEQUENTIAL APPROACH AND JUSTIFICATION TEST

The Guidelines recommend using a sequential approach to planning to ensure the core objectives (as described in Section 3.1) are implemented. Development should be avoided in areas at risk of flooding, where this is not possible, a land use that is less vulnerable to flooding should be considered. If the proposed land use cannot be avoided or substituted a Justification Test must be applied and appropriate sustainable flood risk management proposals should be incorporated into the development proposal. Figure 3.3 shows the sequential approach principles in flood risk management. Table 3.2 and Table 3.3 outline recommendations from the Guidelines for the types of development that would be appropriate to each flood zone and those that would be required to meet the Justification Test.

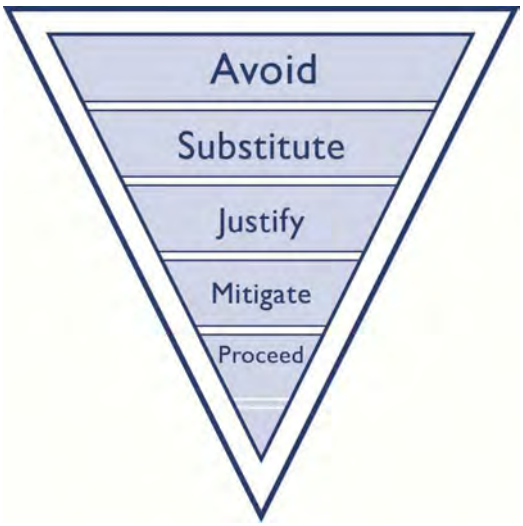


Figure 3.3 Sequential approach principles in flood risk management

	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

Table 3.2 Matrix of vulnerability versus flood zone to illustrate appropriate development and that required to meet the Justification Test.

The Justification Test is used to assess the appropriateness of developments in flood risk areas. The test is comprised of two processes. The first is the Plan-making Justification Test and is used at the plan preparation and adoption stage where it is intended to zone or otherwise designate land which is at moderate or high risk of flooding. The second is the Development Management Justification Test and is used at the planning application stage where it is intended to develop land at moderate or high risk of flooding for uses or development vulnerable to flooding that would generally be inappropriate for that land.

Vulnerability Class	Land uses and types of development which include*:
Highly vulnerable development (including essential infrastructure)	▪ Garda, ambulance and fire stations and command centres required to be operational during flooding; ▪ Hospitals; ▪ Emergency access and egress points; ▪ Schools; ▪ Dwelling houses, student halls of residence and hostels; ▪ Residential institutions such as residential care homes, children's homes and social services homes; ▪ Caravans and mobile home parks; ▪ Dwelling houses designed, constructed or adapted for the elderly or, other people with impaired mobility; and ▪ Essential infrastructure, such as primary transport and utilities distribution, including electricity generating power stations and sub-stations, water and sewage treatment, and potential significant sources of pollution (SEVESO sites, IPPC sites, etc.) in the event of flooding.
Less vulnerable development	▪ Buildings used for: retail, leisure, warehousing, commercial, industrial and non-residential institutions; ▪ Land and buildings used for holiday or short-let caravans and camping, subject to specific warning and evacuation plans; ▪ Land and buildings used for agriculture and forestry ▪ Waste 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 merit	

Table 3.3 Classification of vulnerability of different types of development

3.7 DEVELOPMENT PLAN JUSTIFICATION TEST

The Development Plan Justification Test (or Plan–making Justification Test) should be carried out as part of the SFRA using mapped flood zones. It applies where land zonings have been reviewed with respect to the need for development of areas at a high or moderate risk of flooding for uses which are vulnerable to flooding and which would generally be inappropriate, as set out in Table 3.2, and where avoidance or substitution is not appropriate. Where land use zoning objectives are being retained, they must satisfy all of the following criteria as per Table 3.4.

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

Table 3.4 Justification Test for Development Plans

In cases where existing zoned lands are discovered to be within flood zones, the Development Plan Justification Test has been applied, and it is demonstrated that it cannot meet the specified requirements it is recommend that planning authorities reconsider the zoning by implementing the following:

- Remove the existing zoning for all types of development on the basis of the unacceptable high level of flood risk;
- Reduce the zoned area and change or add zoning categories to reflect the flood risk; and/or
- Replace the existing zoning with a zoning or a specific objective for less vulnerable uses;
- Prepare a local area plan informed by a detailed flood risk assessment to address zoning and development issues in more detail and prior to any development; and/or
- If the criteria of the Justification Test have been met, design of structural or non-structural flood risk management measures as prerequisites to development in specific areas, ensuring that

flood hazard and risk to other locations will not be increased or, if practicable, will be reduced. The mitigation measures are required prior to development taking place.

The application of the sequential approach in the preparation of the Development Plan is shown in Appendix A. The 2010-2016 County Development Plan Zonings and the proposed 2016–2022 County Development Plan Zonings are shown in Appendix A in Figure A.1 and Figure A.2.

4 DEVELOPMENT MANAGEMENT AND FLOOD RISK

4.1 OVERVIEW

All development in flood risk areas should be supported by an appropriately detailed Flood Risk Assessment (FRA). The level of detail within the FRA will depend on the risks identified and the proposed land use. Applications should demonstrate the use of the sequential approach in terms of the site layout and design and, in satisfying the Justification Test (where required), the proposal will demonstrate that appropriate mitigation and management measures are put in place. For any development areas that meet the Development Plan Justification Test, a Development Management Justification Test must then be applied. Development must satisfy all of the criteria of the Development Management Justification Test as per Table 4.1 below. Development in flood risk areas can broadly be classified as:

- Existing, developed, zoned areas at risk of flooding
- Undeveloped lands at risk of flooding

This chapter provides a broad overview of the requirements of Flood Risk Assessments which should accompany planning applications. Section 5.10 outlines more specific requirements for areas identified at risk from flooding.

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

Table 4.1 Justification Test for Development Management

4.2 SURFACE WATER AND DRAINAGE

All development proposals shall carry out a surface water and drainage assessment and shall be compliant with the Greater Dublin Strategic Drainage Study (GDSDS) (2005) and the Greater Dublin Regional Code of Practice for Drainage Works (2012) to ensure that drainage from the site is managed sustainably. The requirements below provide an overview of drainage requirements for development in SDCC. It is noted that the GDSDS and Code of Practice remain the overriding policy documents.

4.2.1 Drainage

1. The proposed development shall be drained on a completely separate system. All new developments must incorporate Sustainable Drainage Systems (SuDS). In the unlikely event of this not being feasible the Developer must provide alternative means of dealing with pollutants. Rainwater should be infiltrated to the ground and/or discharged via a SuDS system to a surface water drain or watercourse. Other effluent, including wastewater, shall discharge to the foul drainage systems.

2. In general, watercourses are not to be culverted or piped. They should remain open in their natural valley, which should be incorporated into the public open space. Culverting should be confined to road crossings and should be sufficiently large to prevent blockage, allow runoff from a one in a hundred rain event and to allow for man entry for maintenance purposes. Permission must be obtained from the OPW (under a section 50 licence) to construct any culvert or bridge.

3. All proposed structures must be set back from the edge of any watercourse to allow access for channel cleaning/maintenance. A 15 meters wide riparian buffer strip each side of the watercourse is recommended. In dense urban areas the width of the riparian buffer strip is to be agreed with SDCC.

4. All new development must allow for climate change as set out in the GDSDS Technical Document, Volume 5, Climate Change.

    i. River flows 20% increase in flows for all return periods up to 100 years
    ii. Rainfall 10% increase in depth (factor all intensities by 1.1)

5. Surface water outfalls to streams, rivers, etc. should be unobtrusive and not cause erosion of the bed and banks. A suitable non-return device should be fitted on the outfall pipeline. SDCC must approve all design details.

Further guidance on the use of SuDS is given in the GDSDS Technical Documents Vol. 2 New Development and Vol. 3 Environmental Management and in the Design and Best Practice manuals produced by CIRIA in the UK.

4.2.2 Storm water management

1. Development shall comply with the Greater Dublin Strategic Drainage Study, Volume 2, New Development Policy.

2. The maximum permitted surface water outflow from any new development is to be restricted to that of a Greenfield site before any development took place.

3. All new development must allow for climate change as set out in the GDSDS Technical Document, Volume 5, Climate Change.

4. In general, all new developments must incorporate Sustainable Drainage Systems (SuDS).

5. Sustainable Drainage Systems include devices such as: Swales, Permeable Pavements, Filter Drains, Storage Ponds, Constructed Wetlands, Soakaways, etc. SuDS devices such as permeable paving or swales/ ponds etc. may require the approval of SDCC.

6. In some exceptional cases it may not be feasible to use the above devices and at the discretion of the SDCC, approval may be given to install underground attenuation tanks or enlarged pipes in conjunction with other devices to achieve the required water quality. These should only be considered as a last resort where it can be shown that SuDS measures are not achievable

7. Attenuation tanks shall normally be located in green areas; any other location requires the approval from SDCC.

8. Where a tank is to be constructed in a trafficked area, a standard minimum depth of cover from road level to top of the roof of the tank should be 1.2m.

9. All enlarged pipes and associated manholes must comply with the GDSDS and the Code pf Practice.

10. In order to isolate and carry out maintenance of the flow control device a penstock valve (or similar approved) shall be installed within the outfall manhole, on the upstream end of the manhole.

11. For gravity systems a Hydrobrake (or similar approved flow control device) shall be installed in the last manhole.

12. The opening to be large enough to facilitate the extraction of the flow control device.

13. An overflow from the flow control manhole to the public drainage network is not allowed.

The key design criteria for development are shown in Table 4.2 but readers are advised to consult the technical document, Greater Dublin Strategic Drainage Study, Volume 2, New Development Policy.

Criteria	Sub-Criterion	Return Period (Years)	Design Objective
Criterion 1: River Water Quality Protection	1.1	< 1	Interception storage of at least 5mm, and preferably 10mm, of rainfall where runoff to the receiving water can be prevented.
	1.2	< 1	Where initial runoff from at least 5mm of rainfall cannot be intercepted, treatment of runoff (treatment volume) is required. Retention pond (if used) is to have minimum pool volume equivalent to 15mm rainfall.
Criterion 2: River Regime Protection	2.1	1	Discharge rate equal to 1-year greenfield site peak runoff rate or 2l/s/ha; whichever is the greater. Site critical duration storm to be used to assess attenuation storage volume.
	2.2	100	Discharge rate equal to 1 in 100 year greenfield site peak runoff rate. Site critical duration storm to be used to assess attenuation storage volume.
Criterion 3: Level of service (Flooding) for the site	3.1	30	No flooding on site except where specifically planned flooding is approved. Summer design storm of 15 or 30 minutes are normally critical.
	3.2	100	No internal property flooding. Planned flood routing and temporary flood storage accommodated on site for short high intensity storms. Site critical duration events.
	3.3	100	No internal property flooding. Floor levels at least 500mm above maximum river level and adjacent on-site storage retention.
	3.4	100	No flooding of adjacent urban areas. Overland flooding managed within the development
Criterion 4: River Flood Protection	4.1	100	"Long-term" floodwater accommodated on site for development runoff volume which is in excess of the greenfield runoff volume. Temporary flood storage drained by infiltration on a designated flooding area brought into operation by extreme events only. 100 year, 6 hour duration storm to be used for assessment of the additional volume of runoff.
	4.2	100	Infiltration storage provided equal in volume to "long-term" storage Usually designed to operate for all events. 100year, 6-hour duration storm to be used for assessment of the additional volume of runoff.
	4.3	100	Maximum discharge rate of QBAR or 2 l/s/ha, whichever is the greater, for all attenuation storage where "long-term" storage cannot be provided.

Table 4.2 Key Design Criteria for Storm Water Management for Development

4.3 RESIDUAL RISK

As well as assessing the surface water management risk for a site, all development including that in Flood Zone C, should consider residual risk factors such as culvert / bridge blockages and the effects of climate change which may expand the extents of Flood Zones A and B. These residual risk factors should influence the potential mitigation measures for a site which could include setting the finished floor levels.

4.4 DEVELOPMENT PROPOSALS IN FLOOD ZONES

4.4.1 Overview

It is recommended that any planning applications in flood risk areas are accompanied by a supporting appropriately detailed flood risk assessment. This is to ensure a conservative approach and that consideration is given to new development within Flood Zones where mitigation measures may still be required to ensure an appropriate level of flood protection and/or resilience. The detailed assessment should include at a minimum Stage 1 - Identification of Flood Risk. Where flood risk is identified a Stage 2 - Initial FRA will be required, and depending on the scale and nature of the risk a Stage 3 - Detailed FRA may be required.

Detailed FRAs should be carried out in accordance with the Guidelines and should present in sufficient detail the potential flood risk to a proposed development, the potential increase in flood risk elsewhere, any proposed mitigation measures and proposals for sustainable surface water management. The surface water drainage must be compliant with the GDSDS and the Code of Practice. The FRA should also consider the impacts of climate change, residual risk associated with culvert blockages and freeboard in setting the finished floor levels (FFLs) of new development.

4.4.2 Assessment of Proposals for Minor Development

The Justification Test does not apply to applications for minor development to existing buildings in areas of flood risk such as small extensions and most changes of use. However, a flood risk assessment of appropriate detail should accompany such applications to demonstrate that they would not have adverse flood risk impacts e.g. affect existing watercourses, floodplains or flood relief works. These proposals should follow best practice in the management of health and safety for users and residents of the proposal.

4.4.3 Assessment of Proposals for Highly Vulnerable Development

Highly vulnerable development proposals should not be considered in flood risk areas. Any applications for Highly Vulnerable Development shall be supplemented by an appropriately detailed FRA and meets the criteria of the Development Management Justification Test. The following considerations should be addressed in applications for highly vulnerable development in flood risk areas:

- The minimum finished floor level for highly vulnerable development should be above the Flood Zone B (0.1% AEP) level plus suitable freeboard. The recommended level of freeboard is 500 mm for fluvial flood levels.

- Applications should outline the emergency procedures that will be applied in the event of a flood. Evacuation routes should be identified but if this is not possible then containment may be considered if is considered safe and practical to do so. If either safe evacuation or containment is not possible, then the development proposal should be refused.
- The site layout should follow the sequential approach to allocate land within a development based on the vulnerability class of the development i.e. more vulnerable development should be placed on higher ground while water compatible development e.g. car parking, greenfield space can placed in the flood zones.
- Compensatory storage for development that results in a loss of floodplain within Flood Zone A must be provided on a level for level basis, the lands should be in close proximity to the area that storage is being lost from, the land must be within the ownership of the developer and the land given to storage must be land which does not flood in the 1% AEP event. Also the compensatory storage area should be constructed before land is raised to facilitate development.

4.4.4 Assessment of Proposals for Less Vulnerable Development

Less vulnerable development proposals should not be considered in Flood Zone A area unless supplemented by an appropriately detailed FRA and meets the criteria of the Development Management Justification Test. The minimum finished floor level for less vulnerable development should be above the Flood Zone A (1% AEP) level plus suitable freeboard. The recommended level of freeboard is 500 mm for fluvial flood levels.

4.4.5 Extension of Duration in Flood Risk Areas

In areas where recent and more up to date flood risk information subsequently finds that a site has a flood risk, applications for extension of duration or new applications within the zoning will require appropriately detailed FRA at development management stage. If the permitted development is found not to conform with the Planning Guidelines then the application should be refused on flood risk grounds and a new application submitted, allowing for appropriate design and a FRA.

5 FLOOD RISK INFORMATION

5.1 INTRODUCTION

There are several sources of relevant flood risk information available for South Dublin County. The information reviewed for the completion of this report is summarised in Appendix C. This information was used to generate the fluvial flood zone maps as shown in Appendix B. Figure 5.1 below shows an overview of the flood zones, historical flooding spots and indicative pluvial flooding for the entire county.

5.2 HISTORICAL FLOODING

A review of historical flood data was carried out for the Eastern and Dodder CFRAMs using information provided on floodmaps.ie and in consultation with SDCC. Where flood extents were provided they were validated and incorporated into the flood zone maps. This includes the significant flooding that occurred in the County in 2011. Figure 5.1 below shows that the majority of historical flooding areas are adjacent to the counties main rivers the Griffeen, the Camac, the Poddle and the Dodder. The main sources of flooding in the county are fluvial and pluvial.

5.3 CFRAM STUDIES

5.3.1 Background

The OPW is currently leading the development of Catchment Flood Risk Assessment and Management Studies (CFRAMS). The aim of these studies is to assess flood risk, through the identification of flood hazard areas and the associated impacts of flooding. The flood hazard areas have been identified as being potentially at risk from significant flooding, including areas that have experienced significant flooding in the past. They will also take account of issues such as climate change, land use practices and future development. These studies have been developed to meet the requirements of the EU Directive on the assessment and management of flood risks (the Floods Directive). The Floods Directive was transposed into Irish law by SI 122 of 2010 “European Communities (Assessment and Management of Flood Risks) Regulations 2010”.

CFRAMS will establish long-term Flood Risk Management Plans (FRMP) to manage flood risk within the relevant river catchment. Flood maps are one of the main outputs of the studies. The maps indicate modelled flood extents for flood events of a range of annual exceedance probability (AEP).

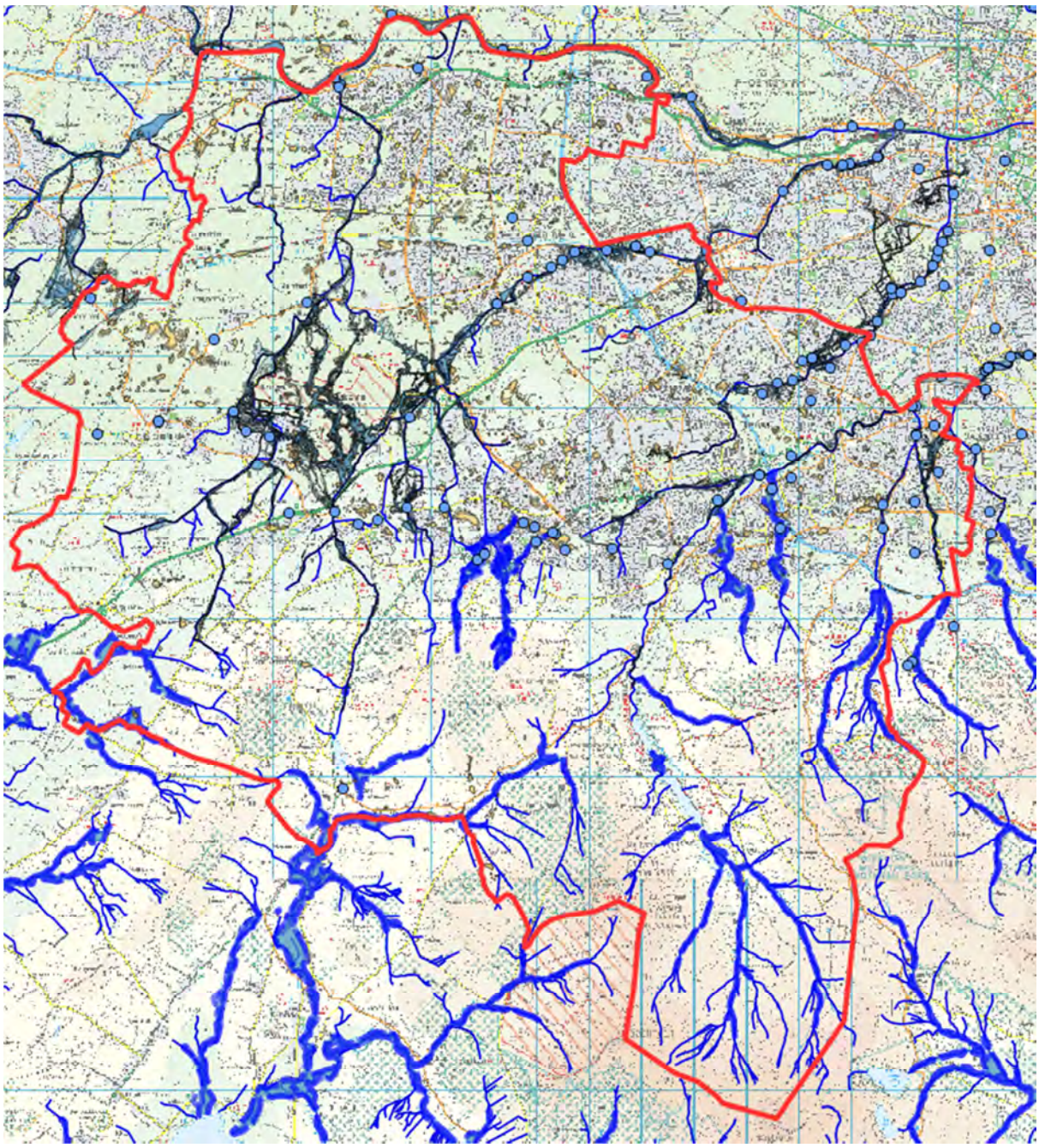


Figure 5.1 Flood Risk Overview for SDCC

The Areas for Further Assessment (AFAs) designated for South Dublin County where reviewed as part the CFRAM process. The finalised AFAs within SCD are listed in Table 5.1 below.

CFRAM	AFAs
East	Hazelhatch
East	Lucan to Chapelizod
East	Rathcoole, Saggart & Baldonnel
Dodder	St. Enda's and Tara Hill (Rathfarnham)

Table 5.1 South Dublin County AFAs

5.3.2 Flood Risk Management Plans

The Dodder FRMP is complete and its recommendations are discussed in Section 7.3. The Eastern CFRAM Flood Risk Management Plan (FRMP) is ongoing and if it is deemed necessary, flood risk management objectives, options and plans will be developed for the Eastern CFRAM AFAs.

5.3.3 CFRAM Fluvial Flood Zone Mapping

South Dublin County and all its watercourses lie within the Eastern CFRAM Study and the River Dodder CFRAM Study. All the principal watercourses and notable streams (as shown in Figure 2.1) are accounted for within these studies and associated flood extent mapping has been produced. The mapping takes into account historical flood risk information (Section 5.2).

It should be noted that the Eastern CFRAM mapping used to define the flood zones for this SFRA are at Draft Final stage and are subject to change following a stakeholder and public consultation process. However the CFRAM mapping is the most comprehensive flood zone mapping available for the county and is considered appropriate for use as a strategic overview of flood risk within the county. Further information on the Eastern CFRAM study is available at www.cfram.ie.

5.4 FLOOD DEFENCE WORKS

5.4.1 Flood Defence Schemes

To counteract the known flood risk areas in the County river/stream improvement works have been carried out in the last 20 years. These include:

- Camac River Phase I Improvement Scheme (1995).
- Shinkeen Stream (Hazelhatch) Drainage Scheme (2001).
- Camac River Phase II Improvement Scheme (2001).
- Griffeen River Flood Alleviation Scheme (2005).
- Tubermaclugg Improvement Scheme (2008).
- Robinhood Stream Improvement Scheme (2008).
- Whitehall Road Flood Alleviation Scheme (2009).

Any planning decisions should also be cognisant of future works in the catchment. Current proposals include:

- Defence works in Rathfarnham along the Whitechurch Stream at St. Enda's and Tara Hill (as part of the Dodder CFRAM).
- Poddle Flood Alleviation Scheme (SDCC submission currently being considered by the OPW).
- Ballycullen Flood Alleviation Scheme.

5.4.2 Flood Zone Mapping for Flood Defence Schemes

The Guidelines state that the effect of formal flood defences should be ignored when determining flood zones as defended areas still carry a residual risk from overtopping and failure of the defences. Because this residual risk of flooding remains, the sequential approach and the Justification Test apply to such defended locations.

In the CFRAM Studies flood defences are defined as structures or features that were constructed to provide a formal flood defence function ('formal flood defences'), including those that may be in poor condition, and also those that may have been built for other purposes but that, in the opinion of a Consultant, would provide a flood defence function ('informal effective flood defences'). They do NOT include structures that were not constructed to provide a formal flood defence function and that, in the opinion a Consultant, would fail to provide a flood defence function due to structural weakness, porosity or other such reasons ('informal ineffective flood defences'), such as garden walls or embankments perforated by uncontrolled culverts.

The best available information regarding flood zones is the draft CFRAM flood mapping. The draft flood mapping has incorporated the effect of formal flood defences within the flood zones. It is part of the CFRAM programme to generate undefended scenarios but these will not be completed within the timeframe of this County Development Plan Review. The CFRAM outputs will be monitored and when undefended scenarios are generated a review of the SFRA will be undertaken.

Only one location in South Dublin County has been identified in the Eastern CFRAM Study as having formal defences, New Nangor Road - Embankments & Flood Walls (Camac Catchment), and a defended area has been delineated on the draft CFRAMs maps. Using the Flood Zone B extents and climate as an indicator, the undefended scenario would result in the defended area and other areas of the same site being inundated. Any residual risk associated with the defences is isolated to the one site. Therefore it was not deemed necessary to carry out a strategic assessment of the undefended scenario at this location due to the limited impact on the catchment. The residual risk of defence failure can be addressed at site-specific scale and any further development on the site should be accompanied by an appropriately detailed FRA addressing the risk.

5.5 OPW PRELIMINARY FLOOD RISK ASSESSMENT INDICATIVE FLUVIAL FLOOD MAPS

The Preliminary Flood Risk Assessment (PFRA) is a national screening exercise completed by the OPW in 2012 based on available and readily-derivable information. The PFRA aimed to identify areas where there may be a significant risk associated with flooding. Indicative fluvial flood maps where produced to help identify these areas. The mapping did not account for flood defences, channel structures or channel works. Areas where the risks associated with flooding might be significant were identified and are referred to as Areas for Further Assessment, or 'AFAs'. More detailed assessment of the AFA's is being undertaken through the CFRAM Studies to more accurately assess the extent and degree of flood risk, and, where the risk is significant, to develop where possible measures to manage and reduce the risk.

The PFRA mapping has been used to define the flood zones in places outside of the scope of the CFRAM studies. These areas should be treated with caution as the PFRA mapping is not as comprehensive as the CFRAM mapping. The flood zone mapping for the rural and mountainous areas in the south of the county are largely comprised of the PFRA mapping. The PFRA flood zone

mapping is provided for information purposes to help identify areas where flood risk should be explored in greater detail. The PFRA mapping should not be solely used to define flood zones for an area as it is not considered suitable as a Stage 2 assessment.

5.6 EXISTING SOUTH DUBLIN DEVELOPMENT PLANS

Existing SDCC Development Plans and Local Area Plans were reviewed to provide information on historic flood areas, flood defence works and any existing flood zone mapping. The Flood zones and flood locations were largely identified using the PFRA Mapping and information from floodmaps.ie. The Plans reviewed are listed in Appendix B.

The Fortunestown LAP had some indicative flood mapping carried out by JBA Consultants. Some of the Fortunestown area is outside of the scope of the CFRAM process. Flood zones identified in the JBA report have been incorporated into this Report.

Similarly the Ballycullen Stream is outside the scope of the CFRAM process. The flood zones identified in the Ballycullen / Oldcourt LAP are incorporated using the PFRA mapping. The GAA pitches and adjacent section of Oldcourt Road were identified as floodplains based on information submitted through public consultation on the draft Local Area Plan.

5.7 SFRA FLUVIAL FLOOD ZONE MAPPING SUMMARY

The flood zones are largely derived from the Draft Final Eastern CFRAM maps and Dodder CFRAM maps. These maps are the most comprehensive flood maps produced for South Dublin County since the introduction of the Guidelines and the Floods Directive. Flood extents for areas that are outside of the scope of CFRAMs are supplemented by fluvial mapping from the earlier OPW Preliminary Flood Risk Assessment (PFRA) Report and the Fortunestown Local Area Plan SFRA. The flood zones only account for inland flooding. Table 5.2 highlights the adequacy and confidence of the information used in the Flood Zone mapping. The flood zone maps are shown in Appendix B. **As described in Section 5.3.3 the Eastern CFRAM mapping is at Draft Final stage. Further information on the Eastern CFRAM study is available at www.cfram.ie.**

Flood Zone Mapping Source	Confidence	Comments
Eastern CFRAM	High / Moderate	These maps are used for the majority of the county. The maps are still at draft final stage and subject to change following a public consultation process. More recent updates to flood defences, channel structures or channel works may not be accounted for.
Dodder CFRAM	High / Moderate	These maps were used along the Dodder catchment. More recent updates to flood defences, channel structures or channel works may not be accounted for.
OPW PFRA	Moderate / Low	These are indicative flood zone maps and should be used with caution. They do not account for flood defences, channel structures or channel works. They have been used to infill flood zones in areas outside of the scope of the CFRAM mapping. Areas include: ▪ Ballycullen / Oldcourt ▪ Brittas ▪ Dublin / Wicklow Mountains

SDCC LAPs	Moderate / Low	The flood zones generated for the Fortunestown LAP are indicative flood zone maps and should be used with caution. They do not account for flood defences, channel structures or channel works. They have been used to infill flood zones in areas outside of the scope of the CFRAM mapping. The GAA pitches and adjacent section of Oldcourt Road were also designated as floodplains based on information submitted through public consultation. The frequency of the flooding at that location is uncertain and the lands are designated as a flood plain as a precaution.

Table 5.2 Adequacy of information for flood zone mapping

5.8 OTHER SOURCES OF FLOODING

5.8.1 Overview

The flood zones only account for inland flooding. However they should not be used to suggest that any areas are free from flood risk as they do not account for potential flooding from other sources. Hence a review of other sources of flooding was carried out to identify potential areas of risk.

5.8.2 Coastal Flooding

Coastal flooding is not a concern for SDCC as it is a landlocked county however a combination of high flow in rivers and a high tide may prevent the river from discharging into the sea thus increasing water levels inland causing rivers to overtop their banks. This has been incorporated in the CFRAM mapping using joint probability analysis, hence any impact coastal influences may have upstream along the Dodder and the Liffey are accounted for in the mapping.

A review of existing indicative coastal flooding mapping from the Irish Coastal Protection Strategy Study (ICPSS) also shows that coastal flooding does not extend upstream as far as the South Dublin County boundary on the Liffey, Poddle or Dodder Rivers.

5.8.3 Ground Water Flooding

The OPW Preliminary Flood Risk Assessments Groundwater Flooding Report concludes that ground water flooding is largely confined to the West Coast of Ireland due to the hydrogeology of the area. Figure 5.2 below shows that ground water flooding is not a risk for South Dublin County.

Figure 5.2 OPW Preliminary Flood Risk Assessments Groundwater Flooding Hazard Map

5.8.4 Pluvial Flooding

5.8.4.1 PFRA Mapping

The OPW Pluvial Flooding Risk Assessment (PFRA) study provides a national level pluvial screening of areas that are at potential risk of pluvial flooding. For a thorough assessment of pluvial risk in South Dublin a more detailed assessment at a countywide scale (taking into consideration of local factors and parameters) would need to be carried out. Nonetheless, the national PFRA maps can be used to identify areas that may be at risk and that may require a pluvial flooding assessment to be carried out for planning applications. These include:

- Hazelhatch
- Baldonnel
- Jobstown
- Tallaght
- Kilmanagh
- Clonburris

Recommendations and guidelines from the GDSDS should be implemented in these areas to reduce the risk of pluvial flooding. The PFRA pluvial flood zones are shown in Appendix D.

5.8.4.2 Greater Dublin Strategic Drainage Study

The Greater Dublin Strategic Drainage Study (GDSDS) (2005) undertook analysis of the drainage infrastructure in SDC. Hydraulic models were run for a series of design events and current and

future development scenarios up until 2031. Areas susceptible to flooding were identified along the foul and surface water systems.

The surface water and foul drainage catchments relevant to SDC include:

- F003 Grand Canal
- F007 Dodder SDCC
- F008 Lucan Clondalkin
- S1004 Camac River
- S1005 Poddle River
- S2001 Lyreen Rye Water SWS
- S2009 Dodder Owendoher SWS
- S2010 Dodder Whitechurch SWS

5.9 CLIMATE CHANGE SENSITIVE AREAS

5.9.1 Overview

The flood zones are generated without the inclusion of climate change factors. Due to the uncertainty surrounding the potential effects of climate change a precautionary approach is recommended. Areas that are potentially sensitive to climate change were reviewed and are discussed below.

5.9.2 CFRAM Climate Change Scenarios

Climate change scenarios from the CFRAMs are not yet available for all areas within South Dublin County. The available areas include the Dodder, the Poddle and the Camac. These extents account for implementation of SuDs, future development until 2100, increased rainfall and sea level rise. Table 5.3 outlines areas that are potentially sensitive to climate change impacts.

River	Affected Areas	Comments
Dodder	Dodder Park Road (Rathfarnham) Old Bawn Road (Tallaght)	Increase in extent for the 1% event
Owendoher	Willbrook Road , Glenbrook, Otterbrook & Beaufort Downs (Rathfarnham)	Increase in extent for the 0.1% event
Camac	Baldonnel Aungierstown Ballybane Woodford (Clondalkin) Western Business Park (Fox & Geese)	Increase in extent for the 1% event
Camac	All the areas listed previously for the 1% event but also including Old Nangor Road, Tower Road, Oakfield, & Riverside (Clondalkin) Kileen Road (Fox & Geese).	Increase in extent for the 0.1% event

Poddle	Willington (Templeogue) Whitehall Road (Kimmage)	Increase in extent for the 1% event
Poddle	Whitehall Road, Fortfield Road & Wainsfort (Kimmage) Willington (Templeogue) Castletymon Road (Balrothery)	Increase in extent for the 0.1% event

Table 5.3 Areas sensitive to climate change flood risk

Climate change scenarios for the remaining areas in South Dublin will be available as outputs from the CFRAM process due for completion in 2016. Any planning decisions in these areas should be cognisant of the effect of climate change on the risk of flooding.

5.9.3 Non-Modelled Areas

The guidelines recommend where mathematical models are not available climate change flood extents can be assessed by using the Flood Zone B outline as a surrogate for Flood Zone A with allowance for the possible impacts of climate change. The non-modelled climate change areas include the Griffeen catchment, Tubermaclugg Stream, Shinkeen Stream and Dublin / Wicklow Mountains. Table 5.4 Areas sensitive to climate change flood risk using Flood Zone B as an indicator outlines areas that are potentially sensitive to climate change impacts using Flood Zone B as an indicator.

River	Affected Areas	Comments
Griffeen	Adamstown (Upstream of the railway) Grange Castle Kilmactalway Greenogue Business Park	Increase in extent for the 1% event
Shinkeen	Hazelhatch	Increase in extent for the 1% event

Table 5.4 Areas sensitive to climate change flood risk using Flood Zone B as an indicator

6 DEVELOPMENT PLAN ZONING

6.1 INTRODUCTION

The initial SFRA reviewed areas of interest in terms of fluvial flood zones, historical flooding spots and the PFRA indicative pluvial flooding mapping. The fluvial flood zones are largely derived from the Draft Final Eastern CFRAM maps and Dodder CFRAM maps. As described in Section 5.3. The Eastern CFRAM mapping is at Draft Final stage but it is the most comprehensive flood zone mapping available for the Griffeen River, Camac River and Poddle River Catchments and is considered appropriate for use as a strategic overview of flood risk. Flood extents for areas that are outside of the scope of CFRAMs are supplemented by fluvial mapping from the earlier OPW Preliminary Flood Risk Assessment (PFRA) Report and the Fortunestown Local Area Plan SFRA. The fluvial flood zones only account for inland flooding. The fluvial flood zone maps are shown in Appendix B.

This flood risk information has enabled SDCC to apply 'The Guidelines' sequential approach to both zoned and non-zoned land, and where necessary the Justification Test, to appraise sites for suitable land zonings and identify how flood risk can be managed as part of the development plan. Appendix A outlines the approach undertaken by SDCC in application of the sequential approach and details the Justification Tests where necessary. The 2010-2016 County Development Plan Zonings and the proposed 2016–2022 County Development Plan Zonings are shown in Appendix A in Figure A.1 and Figure A.2.

Development in flood risk areas can broadly be classified as:

- Existing, developed, zoned areas at risk of flooding
- Undeveloped lands at risk of flooding

6.2 EXISTING, DEVELOPED, ZONED AREAS AT RISK OF FLOODING

The SFRA identifies several areas of existing development which are at risk of flooding. In accordance with Circular PL2/2014 a Justification Test should be carried out to assess the appropriateness of the existing zoning for existing, developed, zoned areas and proposed areas of regeneration at risk of flooding. If still deemed appropriate the Justification Test should outline flood risk management measures to ensure that flood risk is not increased in the areas and to other adjoining areas. These include existing highly vulnerable development in Flood Zones A and B and existing less vulnerable development in Flood Zone B.

6.2.1 Existing Highly Vulnerable Development

Areas of highly vulnerable development include existing housing in Clondalkin (Camac), Rathfarnham (Dodder & Whitechurch Stream), Kimmage/ Templeogue (Poddle), Jobstown/ Killinarden and Ballycullen. These areas are shown in Figures 6.1 to 6.5 inclusive. It is considered that it would be unrealistic to rezone these lands for less vulnerable uses as they are fully developed. Therefore SDCC carried out a justification test for these areas of existing housing in the County which is shown in Appendix A. A FRA of appropriate detail should accompany applications for development on these sites to demonstrate that they would not have adverse flood risk impacts. Table 6.1 outlines recommendations for The FRAs and County Development Plan.

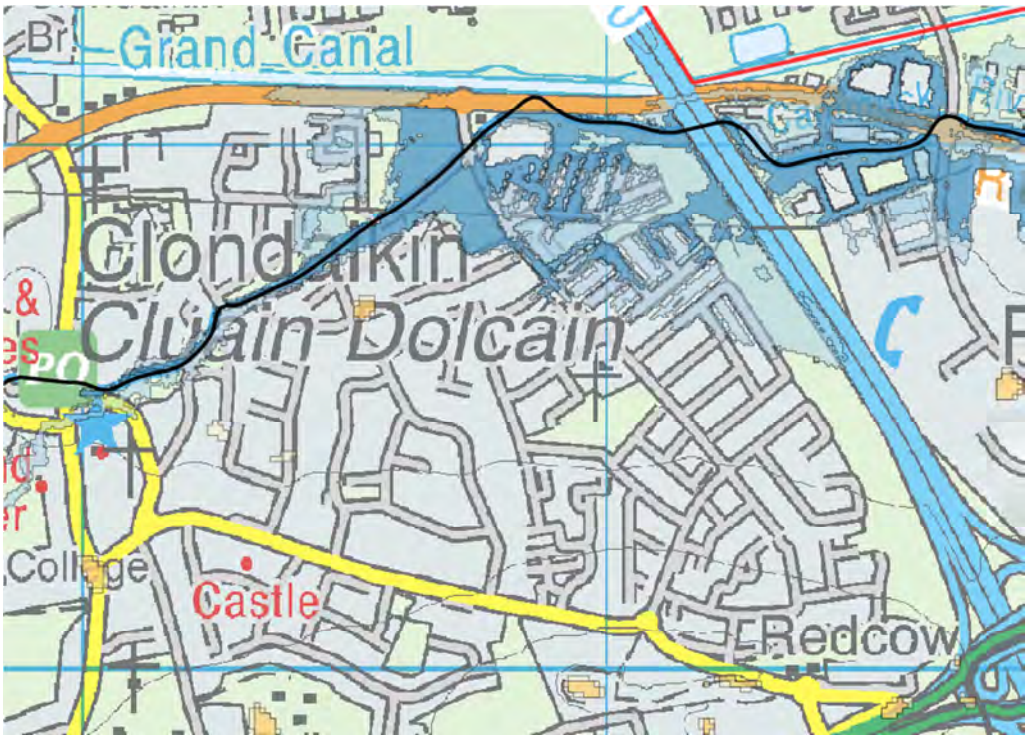


Figure 6.1 Fluvial Flood Zones in Clondalkin

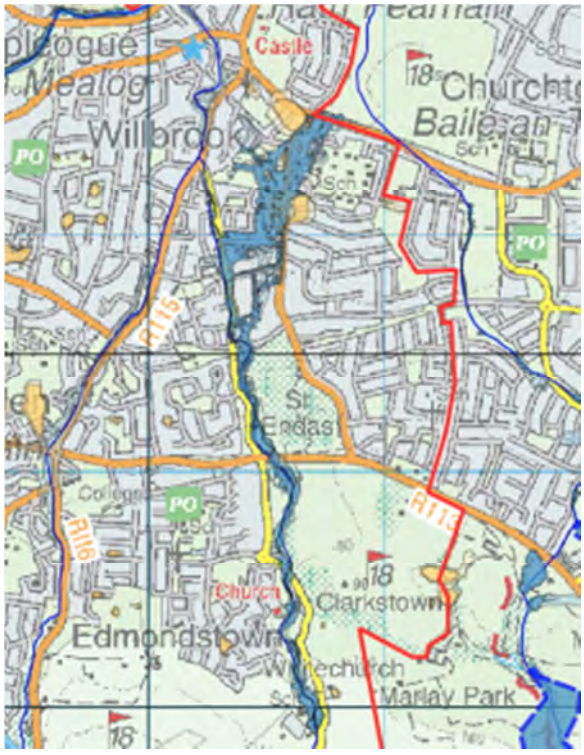


Figure 6.2 Flood zones at St. Enda's and Tara Hill where there is proposed flood alleviation works

Figure 6.3 Fluvial Flood Zones along the Poddle (Kimmage and Templeogue)

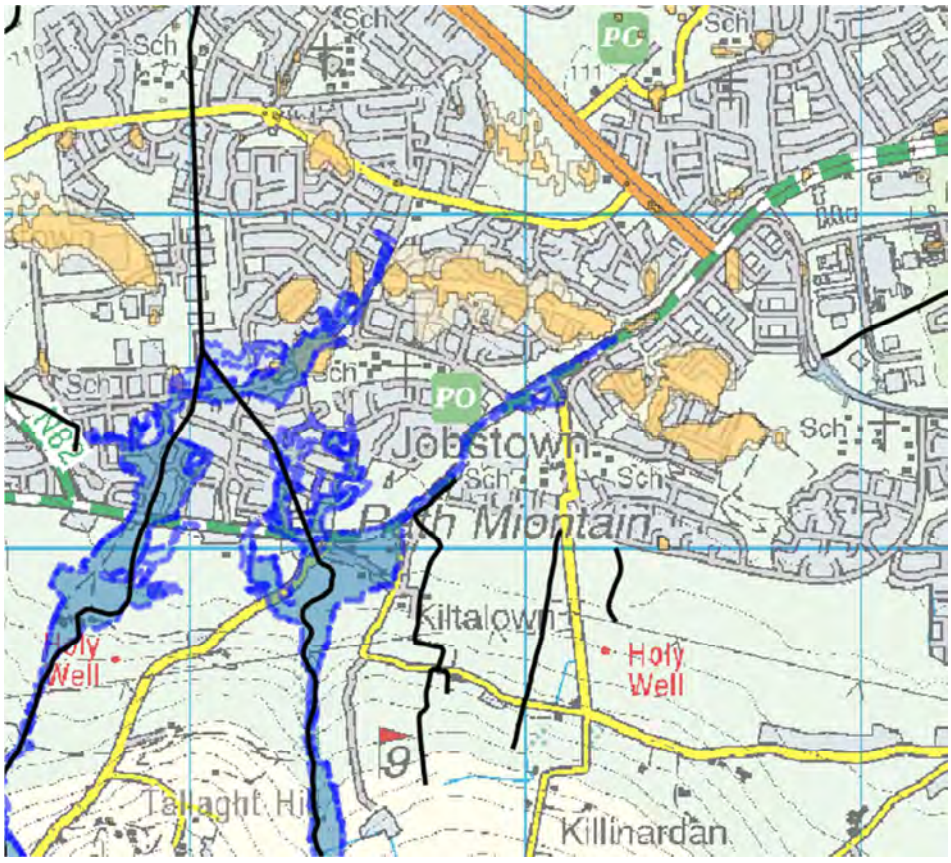


Figure 6.4 Indicative fluvial & pluvial flood zones in Jobstown

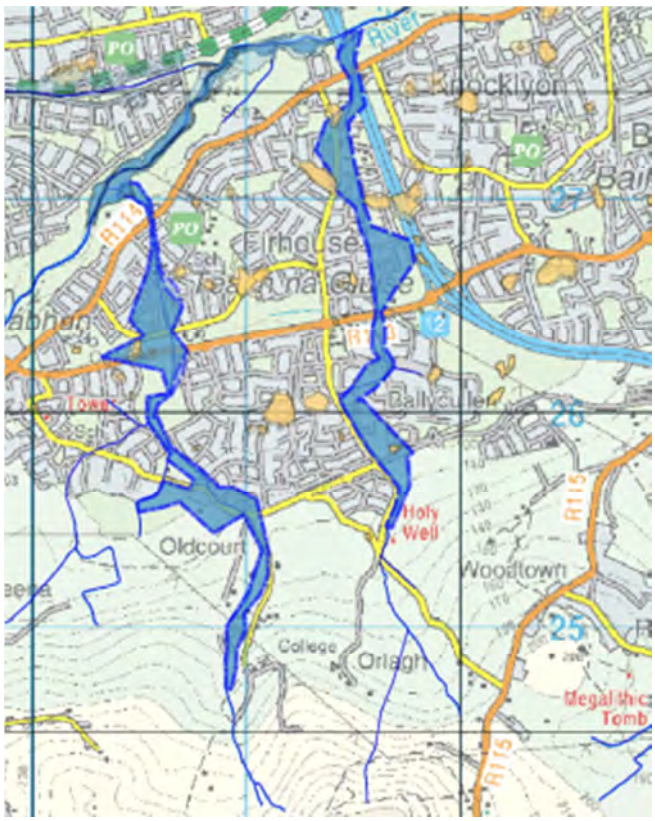


Figure 6.5 Indicative fluvial, pluvial flood zones and 2011 flood locations in Ballycullen & Oldcourt

6.2.2 Existing Less Vulnerable Development

Areas of less vulnerable development accommodating existing industrial development include areas in proximity to the New Nangor Road, Naas Road and Greenogue Industrial Estate. These areas are shown in Figures 6.6 to 6.7. It is considered that it would be unrealistic to rezone these lands for water compatible uses as they are fully developed. Therefore SDCC carried out a justification test for these areas which is shown in Appendix A. A FRA of appropriate detail should accompany applications for development on these sites to demonstrate that they would not have adverse flood risk impacts. Table 6.1 outlines recommendations for The FRAs and County Development Plan.

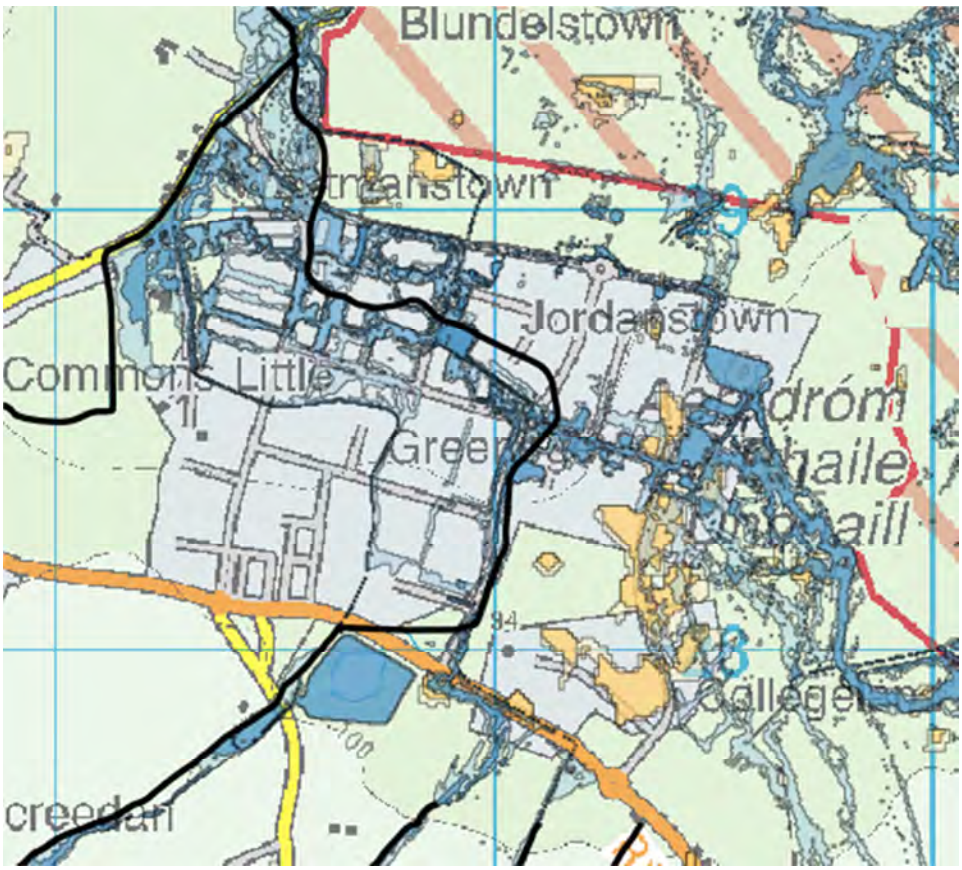


Figure 6.6 Fluvial flood zones in Greenogue

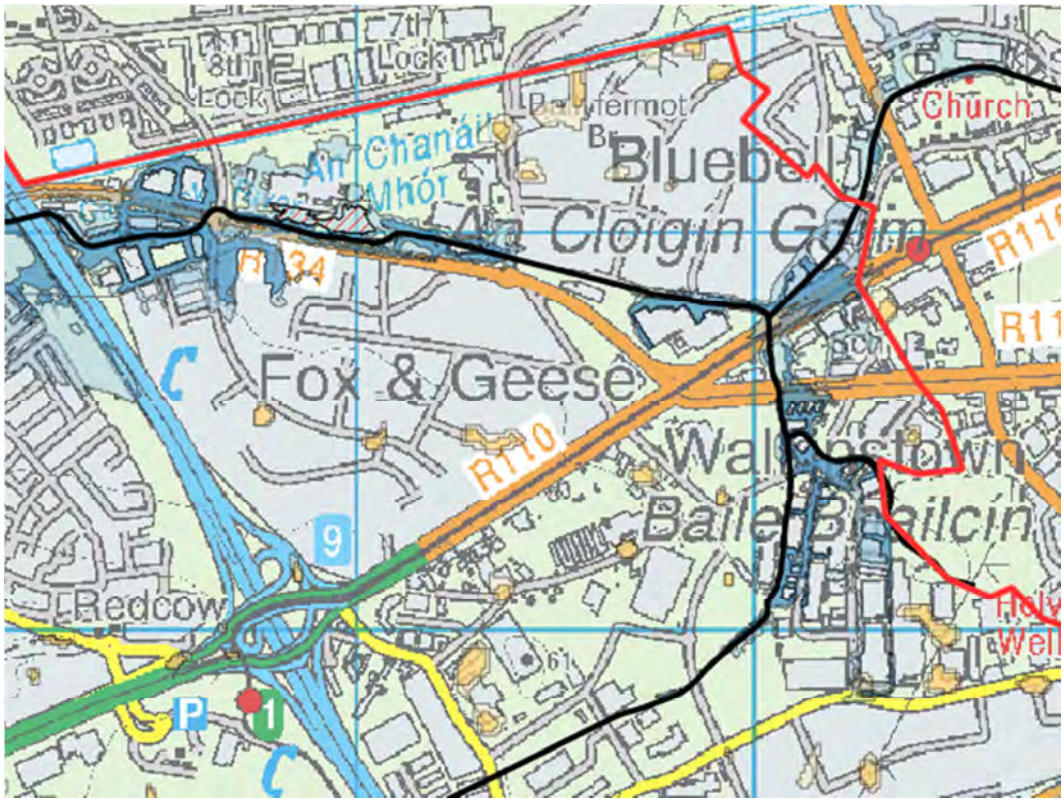


Figure 6.7 Fluvial flood zones in along New Nangor Road and Nass Road

6.3 UNDEVELOPED LANDS AT RISK OF FLOODING

The SFRA identified several areas of undeveloped land which are at risk of flooding that required a review of the appropriateness of the land use following 'The Guidelines' sequential approach. The Planning Authority had regard to Section 4.26 and 4.27 of the Guidelines in reconsidering the zoning. Following this reconsideration, the Planning Authority implemented a range of decisions in various areas of the County:

- Removed the existing zoning for all types of development on the basis of the unacceptable high level of flood risk;
- Required the preparation of an approved area plan on strategic residential zonings. Local Area Plans, SDZs and other land use plans shall be required to include a detailed flood risk assessment to prepare a strategy for development in more detail and prior to any development.
- Where the criteria of the Justification Test have been met, retain the zoning and require a detailed flood risk assessment and the application of Section 5 of the Guidelines.

6.3.1 Avoidance

In several areas including Brittas, Hazelhatch, Rathcoole, Saggart, Clondalkin (Watery Lane) and Moneenalion Commons (Baldonnel) flood risk has been avoided by recommending zoning them with water compatible land uses. These areas have varying degrees of fluvial & pluvial flood risk and could also be impacted by changes to the floodplains due to climate change. Development in the Moneenalion Commons (Baldonnel) could have downstream effects by removing large areas of flood storage and obstructing overland flow paths. Figures 6.8 to 6.12 inclusive show the areas where flood risk has been avoided by zoning the land for water compatible uses.

All development in these areas should still consider flood risk. Development should be supported by an appropriately detailed Flood Risk Assessment (FRA). The level of detail within the FRA will depend on the risks identified and the proposed land use. All development proposals shall carry out a surface water and drainage assessment and shall be compliant with the Greater Dublin Strategic Drainage Study (GDSDS) (2005) and the Greater Dublin Regional Code of Practice for Drainage Works (2012) to ensure that drainage from the site is managed sustainably.

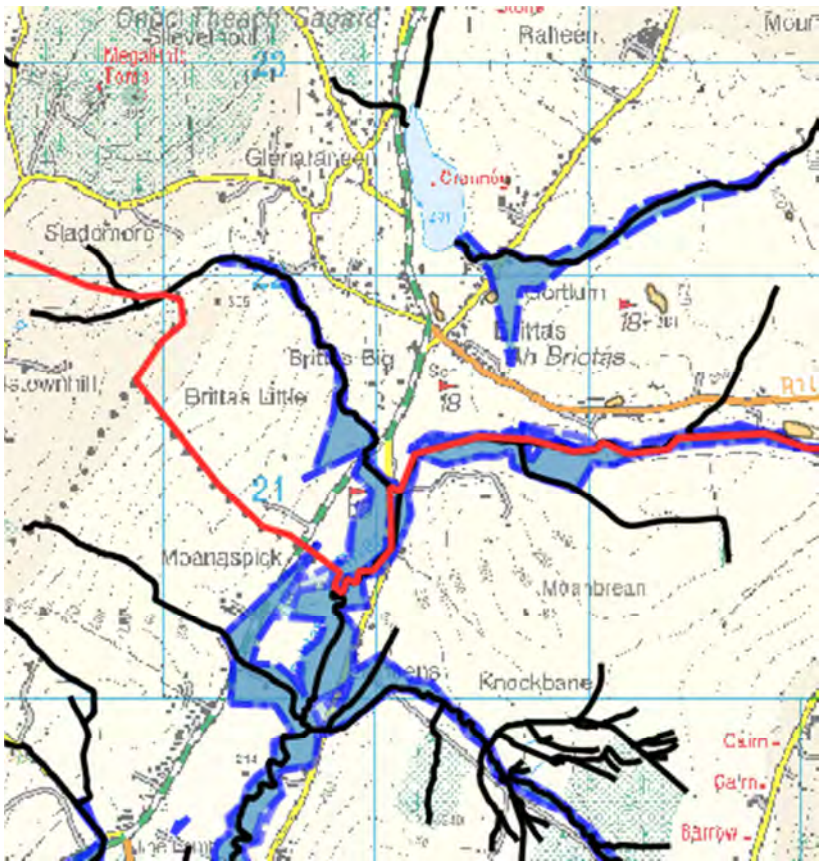


Figure 6.8 Indicative fluvial flood zones in Brittas

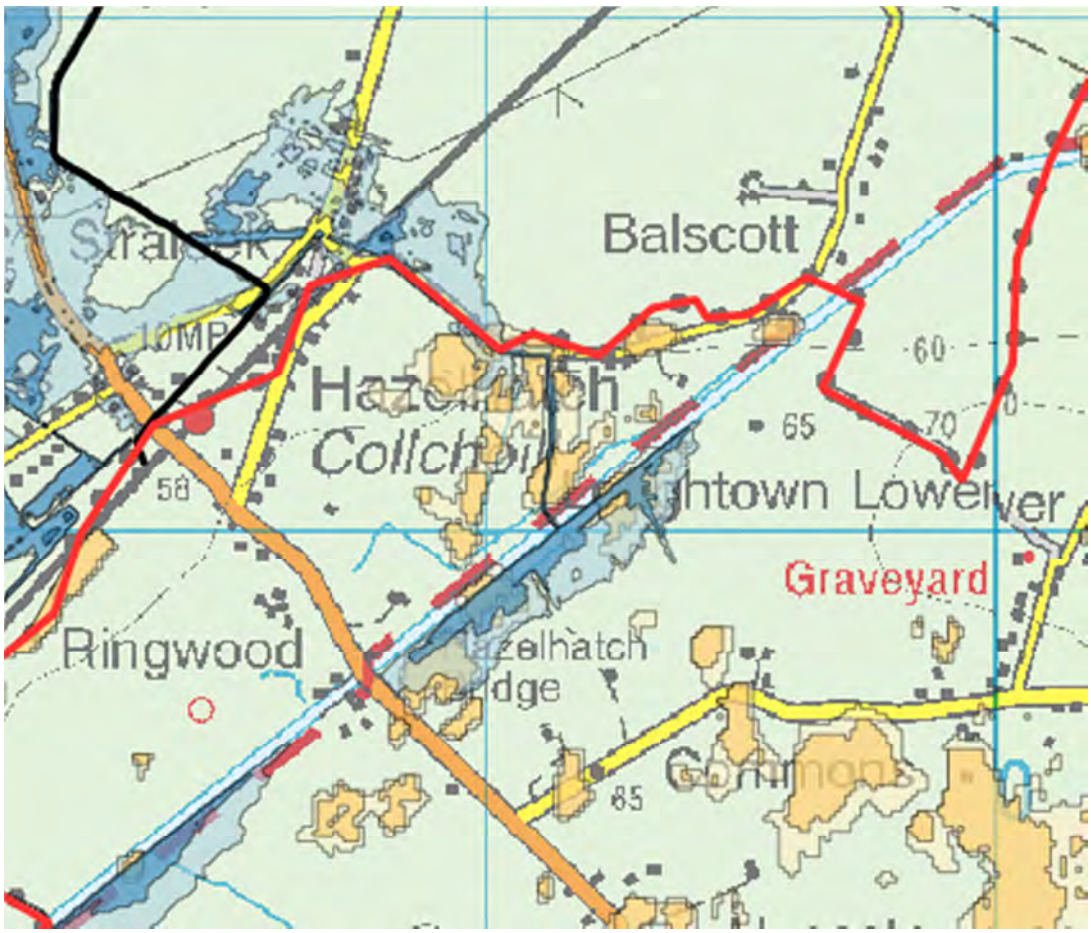


Figure 6.9 Fluvial & indicative pluvial flood zones in Hazelhatch

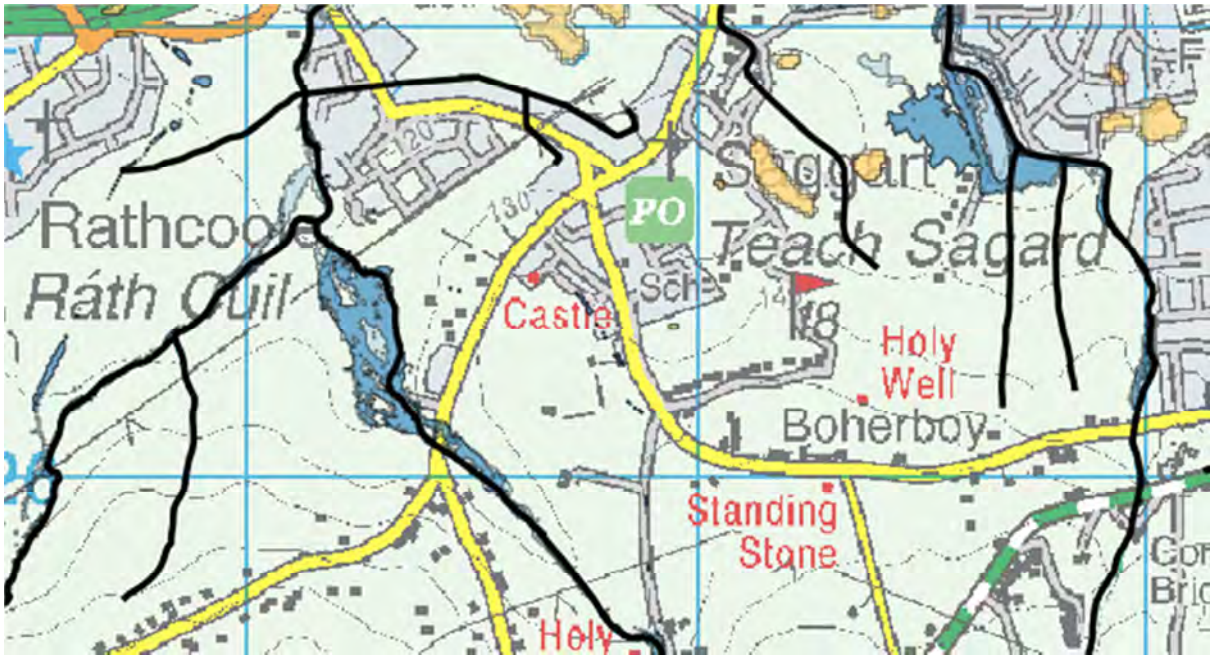


Figure 6.10 Fluvial & indicative pluvial flood zones in Rathcoole & Saggart

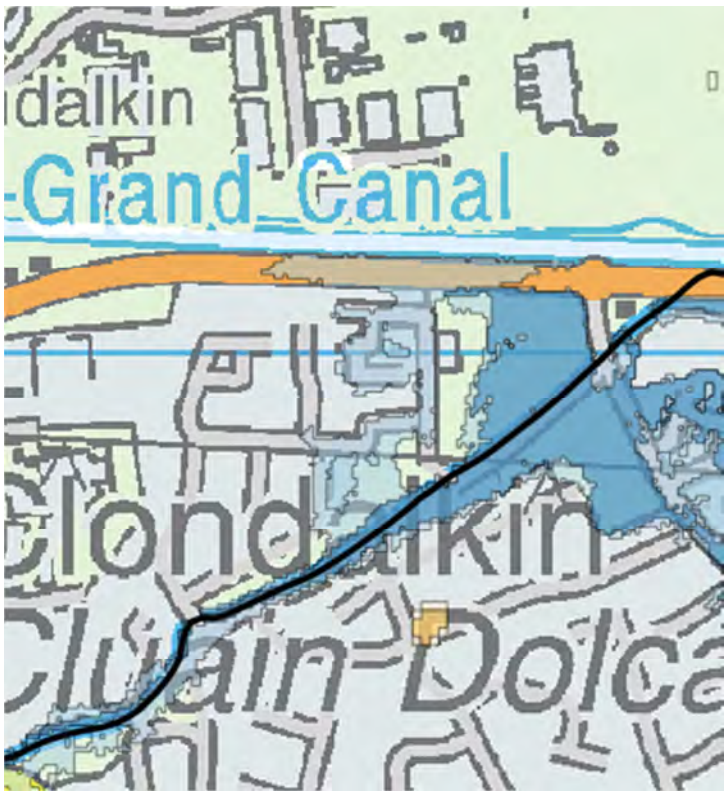


Figure 6.11 Fluvial & indicative pluvial flood zones in Clondalkin (Watery Lane)

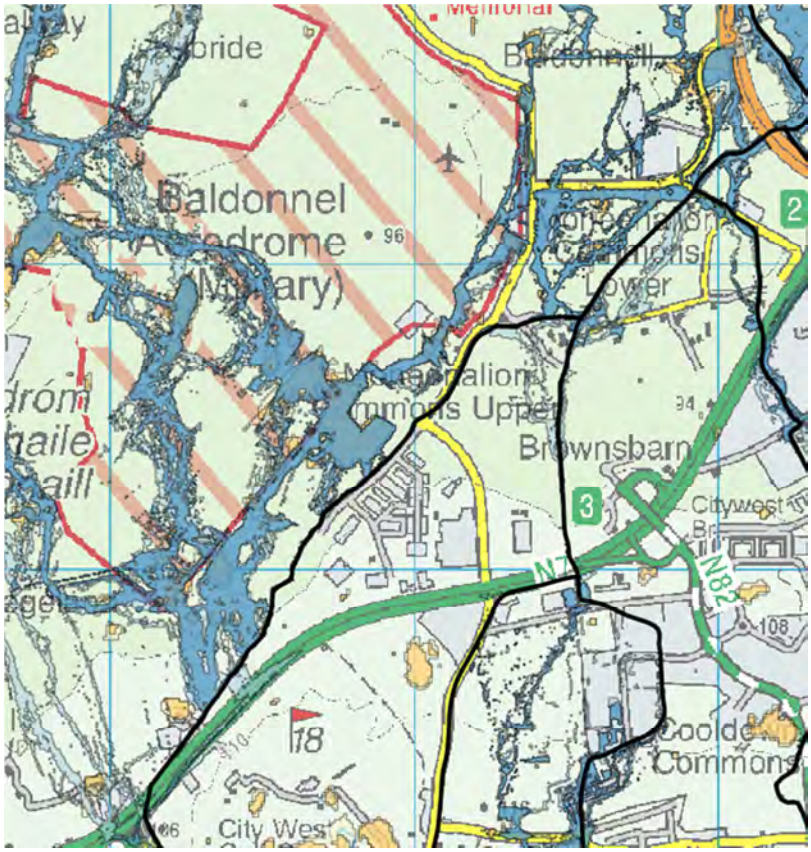


Figure 6.12 Fluvial & indicative pluvial flood zones in Moneenalion Commons

6.3.2 Highly Vulnerable Development

SDCC has identified undeveloped areas for residential development which include portions of lands in flood risk areas. The locations include Adamstown South (Beattie Field), Ballycullen-Oldcourt, Clonburris and Fortunestown in the Draft Plan. In these instances, the extent of the lands within Flood Zones A or B is insignificant in the context of the wider overall lands zoned at the location. Justification Tests for these sites are included in Appendix A. All the areas are being retained with a zoning objective which includes development, applying the Guidelines to the formulation of local area plans and at Development Management stage means such development will be restricted to Flood Zone C, with less vulnerable and/or water compatible uses located within Zone A and B as appropriate.

6.3.2.1 Adamstown South

The subject lands are zoned for Rural Amenity in the 2010 – 2016 Development Plan and are zoned as 'RES-N' under the Draft Plan. A review of the draft CFRAM flood zones shows an overlap with Flood Zone A and B extents as shown in Figure 6.13. Climate change scenarios are not currently available for the Griffeen. Using Flood Zone B as a climate change indicator would show an increase in the 1% flood extent upstream of the railway line. RES-N is a highly vulnerable land use and a Justification Test has been applied as shown in Appendix A. A FRA of appropriate detail should accompany applications for development on this site to demonstrate that they would not have adverse flood risk impacts. Table 6.1 outlines recommendations for FRAs.

The Draft Development Plan outlines planning requirements for this site including

- Objective C12 SLO 1 to provide a full size playing pitch,
- A minimum of 14% public open space as part of a residential development
- A setback of development from the Griffeen River and
- Development of this site will be in accordance with an SD Planning Scheme or a RES-N Zoning. It is considered that the future development of the zoned land should be subject to a Flood Risk Assessment (FRA) in preparation of the approved plan, the application of the sequential approach in the land use strategy of the approved plan and appropriate assessment at planning application stage.

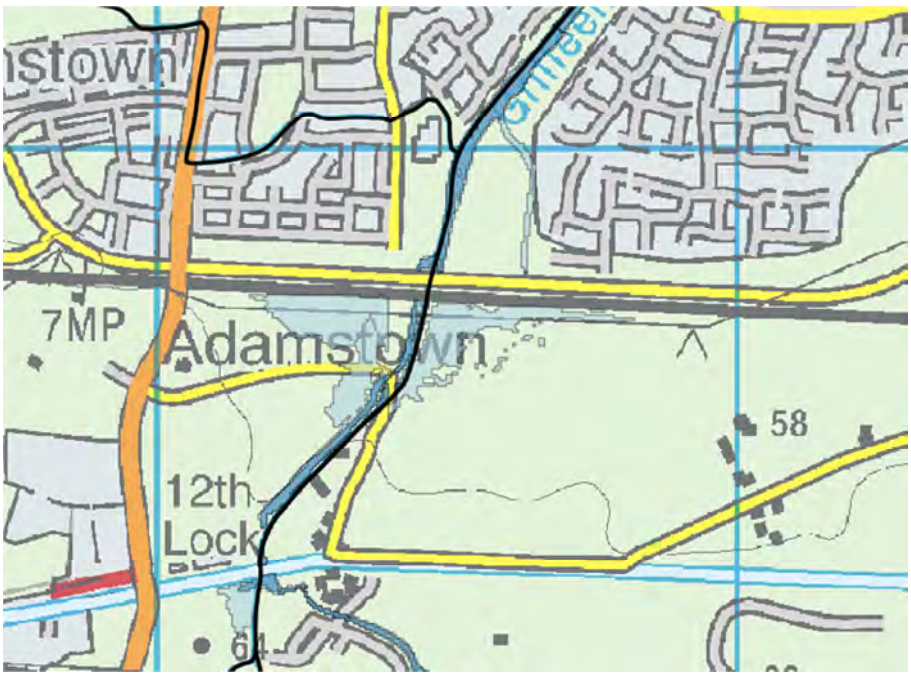


Figure 6.13 Fluvial flood zones in Adamstown South

6.3.2.2 Ballycullen & Oldcourt

The subject lands are zoned 'A1' in the 2010 – 2016 Development Plan and are zoned as 'RES-N' under the Draft Plan. South Dublin County Council completed a Local Area Plan for Ballycullen – Oldcourt in 2014, which sets out a framework for the phased delivery of housing and associated infrastructure and facilities on zoned lands. Figure 6.14 shows indicative flood zones for Ballycullen & Oldcourt. This area was affected by the 2011 flood event as discussed in the Ballycullen Oldcourt LAP - Initial Strategic Flood Risk Assessment and the subsequent addendum report. The Ballycullen Oldcourt SFRA recommended that a Flood Alleviation Scheme be constructed in the area to facilitate future development. Similarly it recommended that GDSDS and SuDs guidelines and practices be implemented to limit the flood risk to the downstream areas of the Dodder.

The Ballycullen Stream was not within the scope of the CFRAM process and the flood zones have been infilled using the PFRA mapping. The GAA pitches and adjacent section of Oldcourt Road have also been designated as floodplains based on information from the LAP. The frequency of the flooding at that location is highly uncertain as it is based on information submitted through public consultation. The indicative pluvial mapping does not highlight these areas as risk areas but appropriate GDSDS and SuDs guidelines should still be implemented in the area.

RES-N is a highly vulnerable land use and a Justification Test has been applied as shown in Appendix A. A FRA of appropriate detail should accompany applications for development on this site to demonstrate that they would not have adverse flood risk impacts. Table 6.1 outlines recommendations for FRAs.

The existing Local Area Plan outlines planning requirements for this area including

- Objective GI8 - All planning applications for development in areas at risk of flooding shall be accompanied by a Flood Risk Assessment carried out at the site-specific level in accordance with The Planning System and Flood Risk Management – Guidelines for Planning Authorities (2009). The scope of flood risk assessment should depend on the type and scale of development and the sensitivity of the area. Site specific flood risk assessment of lands identified as being at risk of flooding will entail Stage 3 Detailed Risk Assessment carried out by suitably qualified and independent hydrological consultants that are acceptable to the Council. Where avoidance of flood risk is not possible, vulnerable uses such as residential, community and commercial uses should be substituted with less vulnerable uses such as parks and open spaces.
- Objective GI9 - All proposals, particularly those within the catchment of the Ballycullen Stream, shall demonstrate and ensure that they do not increase the risk/impact of flooding on downstream estates including Castlefield Manor, Glenvara, Glenlyon and Homeville.
- Objective SSP27 - Any proposed development on the Oldcourt GAA pitches that is potentially sensitive to flooding shall be subject to the sequential approach of avoid, substitute, justify, mitigate and (where the Justification Test has been passed) manage flood risks in accordance with The Planning System and Flood Risk Management– Guidelines for Planning Authorities (2009). These areas will require Site Specific Stage 3 Detailed Flood Risk Assessment including the likely impact of any displaced flood water on third parties. If it cannot be demonstrated that both the actual and residual flooding issues can be dealt with in an acceptable manner including the impact of any displaced flood water on third parties, then the development of these lands shall be confined to water compatible development only (in accordance with the precautionary approach) such as amenity spaces, outdoor sports and recreation spaces that include SUDS elements and integrate with the SUDS strategy for the Plan Lands. Any required works to upgrade or replace existing drainage systems or channels (such as culverts) upstream or downstream of a development shall be borne by the developer and shall adhere to SUDS principles.

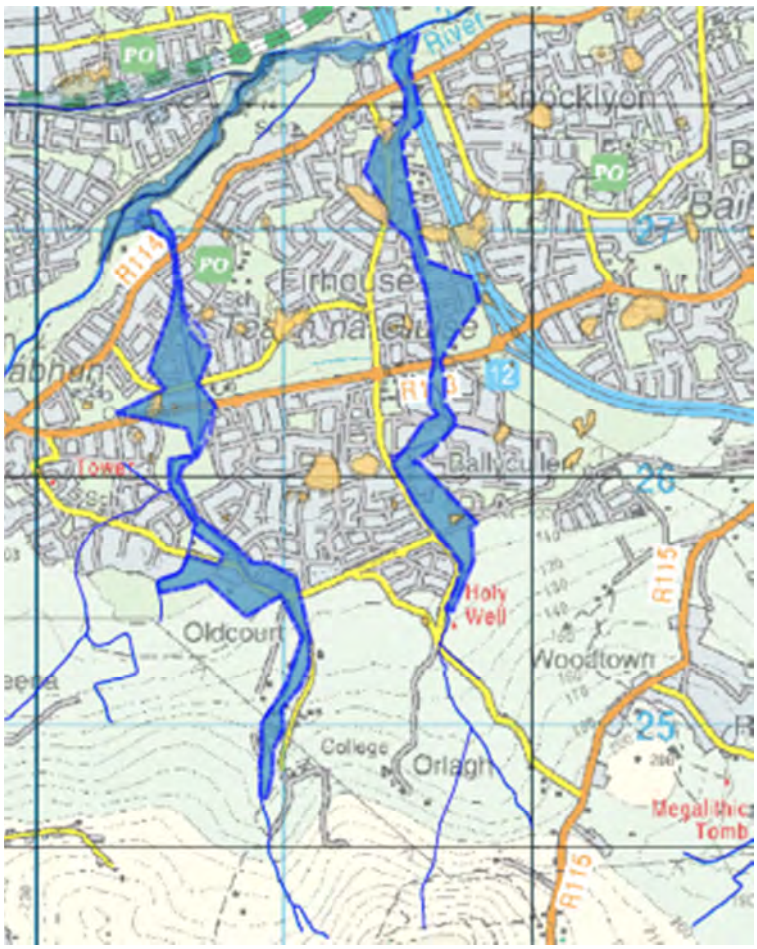


Figure 6.14 Fluvial flood zones in Ballycullen & Oldcourt

6.3.2.3 Clonburris

Greenfield lands at Clonburris are subject to a Government Order for an SDZ and have significant potential to accommodate residential and commercial development. Figure 6.15 shows no current fluvial flood risk within the area. Similarly climate change scenarios for the Camac do not show an increased impact on the area. Indicative pluvial mapping shows clusters of flood risk in this area. The previous Clonburris LAP carried out a stormwater and surface water drainage assessment of the site. It identified drainage ditches that surface water management for development, should demonstrate consideration of GDSDS policies and incorporation of SuDS e.g. Permeable Surfacing and Swales. To determine the appropriateness of the SDZ zoning at Clonburris, the sequential approach has been applied and a Justification Test is included in Appendix A. Any revised SDZ should carry out an appropriately detailed FRA to support development of the site. Table 6.1 outlines recommendations for FRAs.

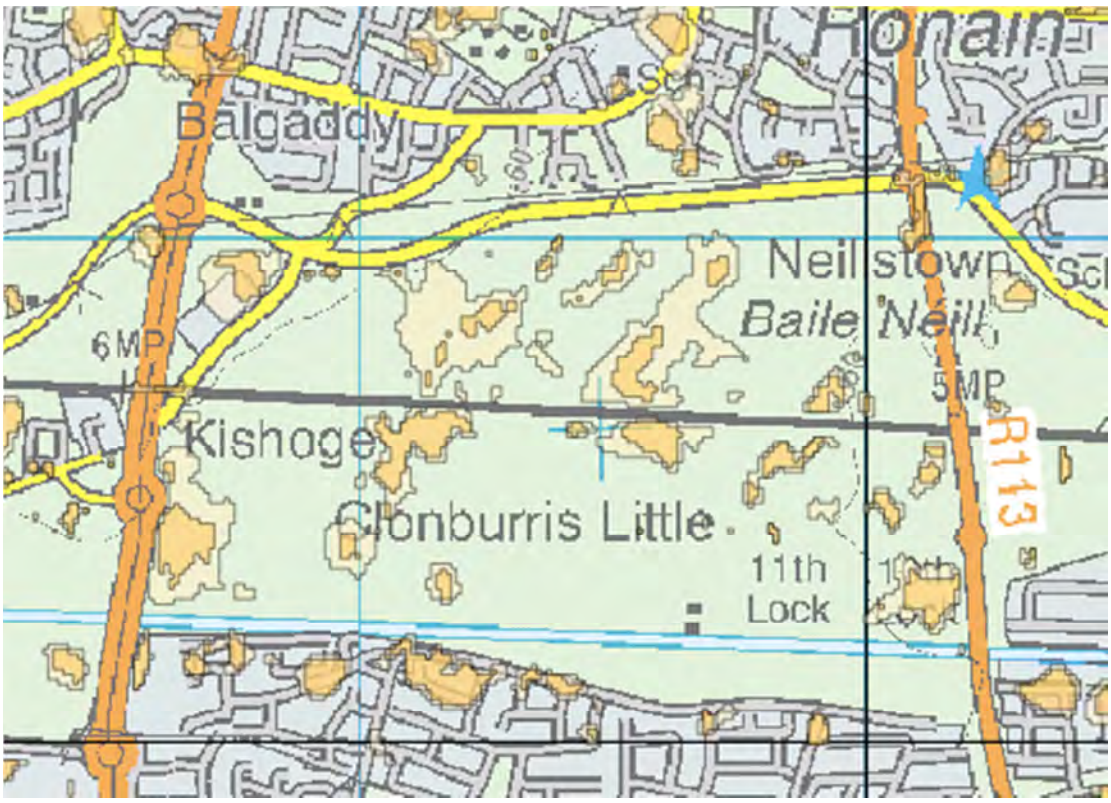


Figure 6.15 Clonburris SDZ has no fluvial flood zones

6.3.2.4 Fortunestown

South Dublin County Council completed a Local Area Plan for Fortunestown in 2012, which sets out a framework for the phased delivery of housing and associated infrastructure and facilities on zoned lands. Figure 6.16 shows flood risk areas within some of the residential zonings. The Fortunestown LAP was subject to SFRA and indicative flood mapping was generated for the area. This mapping is used in the County SFRA along the upstream section of the Moneenalion Stream as this area is outside the scope of the Eastern CFRAM Study. The climate change scenarios do not highlight any significant changes in 0.1% fluvial extent but the 1% extent does increase. The pluvial maps also show some risk in the area. These coincide with an area susceptible to pluvial flooding. RES-N is a highly vulnerable land use and a Justification Test has been applied as shown in Appendix A. A FRA of appropriate detail should accompany applications for development on this site to demonstrate that they would not have adverse flood risk impacts. Table 6.1 outlines recommendations for FRAs.

The existing LAP outlines planning requirements for this area including

- Objective GI7 - All planning applications for residential and/or commercial floorspace on sites in areas at risk of flooding shall be accompanied by a Flood Risk Assessment that is carried out at the site-specific level in accordance with 'The Planning System and Flood Risk Management – Guidelines for Planning Authorities' (2009). The scope of flood risk assessment shall depend on the type and scale of development and the sensitivity of the area.

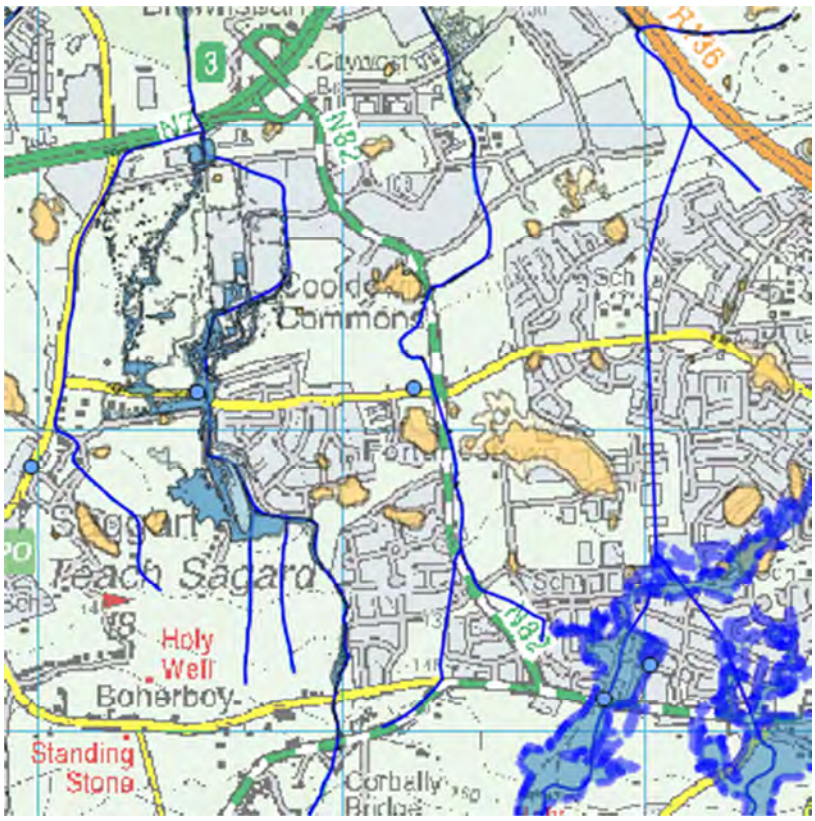


Figure 6.16 Fluvial flood zones in Fortunestown

6.3.3 Less Vulnerable Development

6.3.3.1 Aungierstown & Ballybane

The subject lands are zoned 'EP2' in the 2010 – 2016 Development Plan and as such, are generally categorised as undeveloped, zoned lands at risk of flooding. Figure 6.17 shows that there is fluvial flood risk in this area. The indicative pluvial mapping does not highlight the area as being particularly at risk. The climate change scenarios for the Camac River do not highlight any significant changes in 0.1% fluvial extent but the 1% extent does increase. Climate change scenarios are not currently available for the Griffeen. Using Flood Zone B as a climate change indicator would show an increase in the 1% flood extent in Grange Castle and Kilmactalway. 'EE' is a less vulnerable land use and a Justification Test has been applied as shown in Appendix A for lands within Flood Zone A. A FRA of appropriate detail should accompany applications for development on this site to demonstrate that they would not have adverse flood risk impacts. Table 6.1 outlines recommendations for FRAs.

Figure 6.17 Fluvial flood zones in Aungierstown & Ballybane

Table 6.1 outlines the SFRA proposals and the planning decisions undertaken to address flood risk in the identified areas. Development Plan Justification Tests are shown in Appendix A.

Area	Sequential Approach to Land Use Zoning	FRA Minimum Requirements
Existing Highly Vulnerable Development ▪ **Ballycullen & Oldcourt** ▪ **Clondalkin** ▪ **Jobstown / Killinarden** ▪ **Kimmage / Templeogue** ▪ **Rathfarnham**	Existing Residential, impracticable to rezone for less vulnerable uses. Justification Test applied and zoning maintained. Specific flood risk assessment measures will apply to development in these sites.	▪ Existing open spaces and water compatible uses in Flood Zones A and B should be retained to maintain flood storage areas. ▪ New highly vulnerable development should be avoided in Flood Zones A and B. ▪ Development adjacent to the Whitechurch Stream at St. Enda's and Tara Hill should not be permitted until the completion of the Flood Alleviation Works as part of the Dodder CFRAM. ▪ Development adjacent to the Poddle Stream at Whitehall Road should not be permitted until the completion of the planned Flood Alleviation Works ▪ Development adjacent to the Ballycullen Stream at should not be permitted until the completion of the planned Flood Alleviation Works ▪ FRAs for developments should demonstrate that finished floor levels are designed for the 1% AEP (1 in 100 year) flood level plus an allowance for climate change and a minimum freeboard of 300mm. FRAs should also examine residual risk associated with culvert blockages, defence failure and climate change to set finished flood levels where appropriate. The FRAs should ensure development does not block flow paths, does increase flood risk elsewhere, is designed to appropriate standard of flood resilient construction and demonstrates emergency evacuation procedures during flood events. ▪ FRAs should also address surface water management for development, demonstrating consideration of GDSDS policies and incorporation of SuDS e.g. Green Roofs, Rainwater Harvesting and Permeable Surfacing. ▪ Additional development such as extensions or changes of use can generally be considered appropriate but an appropriately detailed flood risk assessment will be required in support of any planning application. The level of detail will vary depending on the risks identified and the proposed land use. The FRA should be aimed at setting finished floor levels and demonstrating no increase in flood risk elsewhere. ▪ The Development Plan shall incorporate the requirement to consider such measures outlined in the SFRA and provide an objective to support and facilitate the delivery of flood alleviation schemes.
Existing Less Vulnerable	Existing Industrial, impracticable to rezone for less vulnerable uses. Justification Test applied and zoning	▪ The New Nangor Road and Naas Road areas where initially identified as possible residential regeneration areas but due to the associated flood risk it was deemed appropriate to retain the

Development ▪ **Greenogue** ▪ **New Nangor Road & Naas Road Area**	maintained. Specific flood risk assessment measures will apply to development in these sites.	existing land use as an industrial zoning. ▪ Existing open spaces and water compatible uses in Flood Zones A and B should be retained to maintain flood storage areas. ▪ New less vulnerable development should be avoided in Flood Zone A. ▪ FRAs for developments should demonstrate that finished floor levels are designed for the 1% AEP (1 in 100 year) flood level plus an allowance for climate change and a minimum freeboard of 300mm. FRAs should also examine residual risk associated with culvert blockages, defence failure and climate change to set finished flood levels where appropriate. The FRAs should ensure development does not block flow paths, does increase flood risk elsewhere, is designed to appropriate standard of flood resilient construction and demonstrates emergency evacuation procedures during flood events. ▪ FRAs should also address surface water management for development, demonstrating consideration of GDSDS policies and incorporation of SuDS e.g. Green Roofs, Rainwater Harvesting, Permeable Surfacing and Swales. ▪ Additional development such as extensions or changes of use can generally be considered appropriate but an appropriately detailed flood risk assessment will be required in support of any planning application. The level of detail will vary depending on the risks identified and the proposed land use. The FRA should be aimed at setting finished floor levels and demonstrating no increase in flood risk elsewhere.
Undeveloped Lands At Risk Of Flooding - Avoid ▪ **Baldonnel** ▪ **Brittas** ▪ **Clondalkin (Watery Lane)** ▪ **Hazelhatch** ▪ **Rathcoole & Saggart**	Avoid, water compatible zonings applied. Development in these areas should still consider flood risk and surface water drainage.	All development in these areas should still consider flood risk. Development should be supported by an appropriately detailed FRA. The level of detail within the FRA will depend on the risks identified and the proposed land use. All development proposals shall carry out a surface water and drainage assessment and shall be compliant with the Greater Dublin Strategic Drainage Study (GDSDS) (2005) and the Greater Dublin Regional Code of Practice for Drainage Works (2012) to ensure that drainage from the site is managed sustainably.
Undeveloped Lands At Risk Of Flooding –	Justification test applied to zone for new residential. Specific flood risk assessment measures will apply to	▪ The sequential approach should be applied through site planning and should avoid encroachment onto, or loss of, the flood plain.

Highly vulnerable ▪ **Adamstown South - (Beattie's Field)**	development in these areas	▪ It is recommended that development in Flood Zone A should be water compatible ▪ Highly Vulnerable Development shall not be permitted in Flood Zone A or B. ▪ Less Vulnerable Development may be considered in Flood Zone B but should incorporate flood resilient design principles ▪ FRAs for developments should demonstrate that finished floor levels are designed for the 1% AEP (1 in 100 year) flood level plus an allowance for climate change and a minimum freeboard of 300mm. FRAs should also examine residual risk associated with culvert blockages, and climate change to set finished flood levels where appropriate. The FRAs should ensure development does not block flow paths and does increase flood risk elsewhere. ▪ FRAs should also address surface water management for development, demonstrating consideration of GDSDS policies and incorporation of SuDS e.g. Green Roofs, Rainwater Harvesting and Permeable Surfacing. ▪ Compensatory storage for development that results in a loss of floodplain must be provided on a level for level basis s and the land given to storage must be land which does not flood in the 1% AEP flood event.
Undeveloped Existing Zoned Lands At Risk Of Flooding– Highly vulnerable ▪ **Ballycullen & Oldcourt**	Justification test applied to zone for new residential. Specific flood risk assessment measures will apply to development in these areas	▪ Development adjacent to the Ballycullen Stream should not be permitted until the completion of the planned Flood Alleviation Works ▪ The sequential approach should be applied through site planning and should avoid encroachment onto, or loss of, the flood plain. ▪ It is recommended that development in Flood Zone A should be water compatible ▪ Highly Vulnerable Development shall not be permitted in Flood Zone A or B. ▪ Less Vulnerable Development may be considered in Flood Zone B but should incorporate flood resilient design principles ▪ FRAs for developments should demonstrate that finished floor levels are designed for the 1% AEP (1 in 100 year) flood level plus an allowance for climate change and a minimum freeboard of 300mm. FRAs should also examine residual risk associated with culvert blockages, and climate change to set finished flood levels where appropriate. The FRAs should ensure development does not block flow paths and does increase flood risk elsewhere. ▪ FRAs should also address surface water management for development, demonstrating consideration of GDSDS policies and incorporation of SuDS e.g. Green Roofs, Rainwater Harvesting and Permeable Surfacing. ▪ Compensatory storage for development that results in a loss of floodplain must be provided on a level for level basis s and the land given to storage must be land which does not flood in the 1% AEP flood

		event.
Undeveloped Existing Zoned Lands At Risk Of Flooding– Highly vulnerable ▪ **Clonburris**	Justification test applied to maintain zone for new residential. Specific flood risk assessment measures will apply to development in these sites.	▪ A stage 1 Flood Risk Identification to identify any flooding or surface water management issues related to the lands ▪ The sequential approach should be applied through site planning and should avoid encroachment onto, or loss of, the flood plain. ▪ FRAs for developments should demonstrate that finished floor levels are designed for the 1% AEP (1 in 100 year) flood level plus an allowance for climate change and a minimum freeboard of 300mm. FRAs should also examine residual risk associated with culvert blockages, and climate change to set finished flood levels where appropriate. The FRAs should ensure development does not block flow paths and does increase flood risk elsewhere. ▪ FRAs should also address surface water management for development, demonstrating consideration of GDSDS policies and incorporation of SuDS e.g. Green Roofs, Rainwater Harvesting and Permeable Surfacing.
Undeveloped Existing Zoned Lands At Risk Of Flooding– Highly vulnerable ▪ **Fortunestown**	Justification test applied to maintain zone for new residential. Specific flood risk assessment measures will apply to development in these sites.	▪ The sequential approach should be applied through site planning and should avoid encroachment onto, or loss of, the flood plain. ▪ It is recommended that development in Flood Zone A should be water compatible ▪ Highly Vulnerable Development shall not be permitted in Flood Zone A or B. ▪ Less Vulnerable Development may be considered in Flood Zone B but should incorporate flood resilient design principles ▪ FRAs for developments should demonstrate that finished floor levels are designed for the 1% AEP (1 in 100 year) flood level plus an allowance for climate change and a minimum freeboard of 300mm. FRAs should also examine residual risk associated with culvert blockages, and climate change to set finished flood levels where appropriate. The FRAs should ensure development does not block flow paths and does increase flood risk elsewhere. ▪ FRAs should also address surface water management for development, demonstrating consideration of GDSDS policies and incorporation of SuDS e.g. Green Roofs, Rainwater Harvesting and Permeable Surfacing. ▪ Compensatory storage for development that results in a loss of floodplain must be provided on a level for level basis s and the land given to storage must be land which does not flood in the 1% AEP flood.
Undeveloped Existing Zoned Lands At Risk Of Flooding–	Justification test applied to zone for new industrial. Specific flood risk assessment measures will apply to development in these sites.	▪ The sequential approach should be applied through site planning and should avoid encroachment onto, or loss of, the flood plain and obstruction of the overland flow paths. ▪ Development in Flood Zone A should primarily consist of water compatible development

Less vulnerable ▪ **Aungierstown & Ballybane**		▪ FRA should address residual risk of increased flood extents under climate change scenarios which should be aimed at setting finished floor levels. ▪ Compensatory storage for development that results in a loss of floodplain must be provided on a level for level basis s and the land given to storage must be land which does not flood in the 1% AEP flood event.

Table 6.1 FRA Recommendations

7 FLOOD RISK MANAGEMENT POLICIES AND OBJECTIVES

7.1 GENERAL DEVELOPMENT PLAN STRATEGIES

The County Development Plan outlines flood risk management strategies for management of development, these include:

7.1.1 Flood Risk Assessment

Flood risk management will be carried out in accordance with the Flood Risk Management Guidelines for Planning Authorities, DOECLG (2009) and Circular PL2/2014. The Dodder CFRAMS, Eastern CFRAMS and the South Dublin Strategic Flood Risk Assessment provide information in relation to known flood risk in South Dublin County. Development proposals on lands that may be at risk of flooding should be subject to a flood risk assessment, prepared by an appropriately qualified Chartered Engineer, in accordance with the Flood Risk Management Guidelines. Detailed flood risk assessments should be cognisant of possible pluvial flood risk and appropriate drainage proposals should be implemented to reduce the risk of pluvial flooding. Proposals for minor development to existing buildings in areas of flood risk (e.g. extensions or change of use) should include a flood risk assessment of appropriate detail.

7.1.2 Surface Water

Development proposals should provide suitable drainage measures in compliance with the Greater Dublin Strategic Drainage Study (GDSDS) and Greater Dublin Regional Code of Practice for Drainage Works. The maximum permitted surface water outflow from any new development should not exceed the existing situation. On Greenfield lands the permitted outflow of a development should be the equivalent to a Greenfield Site. All new development must allow for climate change as set out in the GDSDS Technical Document, Volume 5 Climate Change. Development proposals should not give rise to the pollution of ground or surface waters either during construction phases or subsequent operation. This will be achieved through the adherence to best practice in the design, installation and management of systems for the interception, collection and appropriate disposal or treatment of all surface water and effluents.

7.1.3 Sustainable Urban Drainage System (SUDS)

In general all new developments will be required to incorporate Sustainable Urban Drainage Systems (SuDS). Sustainable Drainage Systems include devices such as swales, permeable pavements, filter drains, storage ponds, constructed wetlands, soakways and green roofs. In some exceptional cases and at the discretion of the Planning Authority, where it is demonstrated that SuDS devices are not feasible, approval may be given to install underground attenuation tanks or enlarged pipes in conjunction with other devices to achieve the required water quality. Such alternative measures will only be considered as a last resort. Watercourses should remain open in their natural valley and culverting shall be confined to road crossings. In exceptional circumstances and at the discretion of the Planning Authority, approval may be given to install a culvert within a development where it is demonstrated that this is the most appropriate design response based on site specific constraints/circumstances.

7.2 FLOOD RISK MANAGEMENT OBJECTIVES

The County Development Plan outlines core flood risk management policies which have been strengthened and improved upon since the previous Development Plan. These have also been updated based on the information provided in the SFRA process.

Planning Policy ID No.	Policy Description
IE2 Objective 3	To maintain and enhance existing surface water drainage systems in the County and promote and facilitate the development of Sustainable Urban Drainage Systems (SUDS), including integrated constructed wetlands, at a local, district and County level, to control surface water outfall and protect water quality.
IE2 Objective 4	To incorporate Sustainable Urban Drainage Systems (SUDS) as part of Local Area Plans, Planning Schemes, Framework Plans and Design Statements to address the potential for Sustainable Urban Drainage at a site and/or district scale, including the potential for wetland facilities.
IE2 Objective 5	To limit surface water run-off from new developments through the use of Sustainable Urban Drainage Systems (SUDS) and avoid the use of underground attenuation and storage tanks.
IE2 Objective 6	To promote and support the retrofitting of Sustainable Urban Drainage Systems (SUDS) in established urban areas, including integrated constructed wetlands.
IE3 Objective 1	To support and co-operate with the Office of Public Works in delivering the Catchment-Based Flood Risk Assessment and Management Programme and in particular the Eastern District CFRAMS and associated Flood Risk Management Plan (FRMP), the River Dodder CFRAMS and associated Flood Risk Management Plan (FRMP). The recommendations and outputs arising from the CFRAM study for the Eastern District shall be considered in preparing plans and assessing development proposals.
IE3 Objective 2	To support the implementation of the EU Flood Risk Directive (2007/60/EC) on the assessment and management of flood risks and the Flood Risk Regulations (SI No 122 of 2010).
IE3 Objective 3	To manage flood risk in the County in accordance with the requirements of The Planning System and Flood Risk Management Guidelines for Planning Authorities, DECLG and OPW (2009) or any updated version of these guidelines, and Circular PL02/2014 (August 2014) when preparing plans and programmes and assessing development proposals. For lands identified as at risk of flooding in (but not limited to) the Strategic Flood Risk Assessment, a site-specific Flood Risk Assessment (FRA) to an appropriate level of detail, addressing all potential sources of flood risk, is required, demonstrating compliance with the aforementioned Guidelines or any updated version of these guidelines, paying particular attention to residual flood risks and any proposed site specific flood management measures.
IE3 Objective 4	To support and facilitate the delivery of flood alleviation schemes in South Dublin County, including the following schemes: ▪ Poddle Flood Alleviation Scheme, ▪ Ballycullen Flood Alleviation Scheme ▪ Whitechurch River Flood Alleviation (at Rathfarnham) - part of the Dodder CFRAMS.
Action	Local area plans or other land use plans or policies shall be subject to a flood risk assessment as appropriate in accordance with the Flood Risk Guidelines (2009).
G3 Objective 3	To ensure the protection, improvement or restoration of riverine floodplains and to promote strategic measures to accommodate flooding at appropriate locations, to protect ground and surface water quality and build resilience to climate change.

Table 7.1 SDCC Existing Flood Risk Management Policies

An objective IE3 SLO was included in the Draft Plan which would require the preparation of a site specific Flood Risk Assessment and Mitigation Strategy to be submitted with any proposal for development on the 'EE' zoned lands at Moneenalion Commons Upper at Baldonnel.

It is not recommended that the EE zoning of the relevant site and this SLO objective be retained for the Final Plan. As discussed in section 6.3.1, it is recommended that this area avoid the flood risk as development in the Moneenalion Commons (Baldonnel) area could have downstream effects by removing large areas of flood storage and obstructing overland flow paths.

7.3 FLOOD RISK MANAGEMENT PLANS

The Development Plan already has a commitment to assist with the implementation of the relevant CFRAMs. The Dodder CFRAM has been completed since the previous development plan and the following recommendations for flood risk management should be supported:

- Implement the Guidelines to avoid inappropriate development in flood plains, or development that can increase runoff rates and volumes, can create flood risk to the properties being built and potentially increase the risk to other areas.
- Implement the Guidelines to prevent loss of floodplain storage and conveyance.
- SuDS should be applied to all new developments.

8 SUMMARY

8.1 OVERVIEW

The SFRA Report has been prepared in accordance with the requirements of The Planning System and Flood Risk Assessment Guidelines for Planning Authorities (2009) and Circular PL02/2014 (August 2014). The SFRA has provided an assessment of all types of flood risk within the County to assist SDCC to make informed strategic land-use planning decisions. The flood risk information has enabled SDCC to apply the Guidelines sequential approach, and where necessary the Justification Test, to appraise sites and areas for development and identify how flood risk can be reduced as part of the development plan.

8.2 FLOOD ZONES AND FLOOD RISK

South Dublin County is susceptible to several types of flood risk, including:

- Fluvial - Flooding occurs when a river overtops its banks due to a blockage in the channel or the channel capacity is exceeded.
- Pluvial - Flooding occurs when overland flow cannot infiltrate into the ground, when drainage systems exceed their capacity or are blocked and when the water cannot discharge due to a high water level in the receiving watercourse.

The flood zones extents have been prepared in accordance the Planning System and Flood Risk Assessment Guidelines identifying Flood Zones A, B and C. The flood zone maps are largely derived from the draft Eastern CFRAM and the Dodder CFRAM mapping. These maps are the most comprehensive flood maps produced for South Dublin since the introduction of the Guidelines and the Floods Directive. Flood extents for areas that are outside of the scope of the CFRAM Studies and are supplemented by fluvial mapping from the earlier OPW Preliminary Flood Risk Assessment (PFRA) Report and existing Local Area Plans.

The Flood Zone mapping is based on the best currently available data and a more detailed, site specific FRA may generate localised flood extents. Following their completion the final flood zone mapping areas covered by the Eastern CFRAM programme will be reviewed and adopted into the current or future County Development Plan SFRAs. The flood zones only account for inland flooding and are generated without the inclusion of climate change factors. They should not be used to suggest that any areas are free from flood risk as they do not account for potential flooding from pluvial and groundwater flooding.

8.3 FLOOD MANAGEMENT POLICIES & OBJECTIVES

The County Development Plan outlines flood risk management strategies and objectives that incorporate Flood Risk Management into the spatial planning of the County, to meet the requirements of the EU Floods Directive and the EU Water Framework Directive. Appropriate Flood Risk Management strategies and objectives are detailed in Section 6.1 and Section 6.2 respectively Flood risk management will be carried out in accordance with the Flood Risk Management Guidelines for Planning Authorities, DOECLG (2009) and Circular PL2/2014. The Dodder CFRAMS, Eastern CFRAMS and the South Dublin Strategic Flood Risk Assessment provide information in relation to known flood risk in South Dublin County. Development proposals on lands that may be at risk of flooding should be subject to a flood risk assessment, prepared by an appropriately qualified Chartered Engineer, in accordance with the Flood Risk Management Guidelines. Detailed flood risk assessments should be cognisant of possible pluvial flood risk and appropriate drainage proposals should be implemented to reduce the risk of pluvial flooding. Proposals for minor development to existing buildings in areas of flood risk (e.g. extensions or change of use) should include a flood risk assessment of appropriate detail.

8.4 SFRA REVIEW AND MONITORING

The SDCC SFRA will be reviewed and updated every six years in line the County Development Plan review process. Additionally, outputs from future studies and datasets may trigger a review and update of the SFRA during the lifetime of the 2016-2022 Development Plan. These include the outputs from the ECFRAM FRMP. Other sources of information may not lead to an update of the SFRA during the lifetime of the plan but they should be retained and collected to supplement the future County SFRAs.

APPENDIX A

DEVELOPMENT PLAN PREPARATION

A strategic approach to the management of flood risk is a high priority for South Dublin, this is especially so given the strategic importance of the County in the Greater Dublin Area.

The Guidelines outline that the sequential approach should be applied to all stages of planning and it is of particular importance at the plan making stage.

As part of the Development Plan review process, having prepared an initial Strategic Flood Risk Assessment and overlaying the flood maps on the 2010-2016 Development Plan zoning map and on the emerging Draft Plan zoning maps, the Planning Authority considered the zoning of areas at a high or moderate risk of flooding.

In relation to existing undeveloped zoning lands at risk of flooding, the Planning Authority had regard to Section 4.26 and 4.27 of the Guidelines in reconsidering the zoning. Following this reconsideration, the Planning Authority implemented a range of decisions in various areas of the County:

- Removed the existing zoning for all types of development on the basis of the unacceptable high level of flood risk;
- Required the preparation of an approved area plan on strategic residential zonings. Local Area Plans, SDZs and other land use plans shall be required to include a detailed flood risk assessment to prepare a strategy for development in more detail and prior to any development.
- Where the criteria of the Justification Test have been met, retain the zoning and require a detailed flood risk assessment and the application of Section 5 of the Guidelines.

When applications are being considered at Development Management stage, the sequential approach and Justification Test for Development Management will be applied on a site by site basis and with reference to SFRA and the Flood Risk Management Guidelines. Notwithstanding the land use zoning, not all uses will be appropriate on flood risk grounds. For example, a proposal in zoning objective Town Centre (TC) could include a highly vulnerable crèche, less vulnerable retail and water compatible car parking but they would not be equally permissible on the ground floor within a Flood Zone A or B.

A summary of predominant land use and flood risks associated with each of the zoning objectives has been provided in the Table below. It should be noted that this table is intended as a guide only and should be read in conjunction with the detailed assessment of risks and the overall SFRA. The 2010-2016 County Development Plan Zonings and the proposed 2016–2022 County Development Plan Zonings are shown in Figure A.1 and Figure A.2.

Land Use Zoning Vulnerability

Zone Abbreviation	Objective	Indicative Primary Vulnerability	Flood Risk Comment
RES	To protect and/or improve residential amenity	Highly Vulnerable	RES zoning generally not appropriate in areas at risk of flooding.
RES-N	To provide for new residential communities in accordance with approved area plans	Highly Vulnerable	RES-N zoning generally not appropriate for extensive areas at risk of flooding. Sequential approach may be applied in the strategy of the approved plan to locate water compatible elements within Flood Zone A or B. Flood Risk should be assessed and managed in accordance with the SFRA and Guidelines, and applying the sequential approach.
SDZ	To provide for strategic development in accordance with approved planning schemes	Less/ Highly Vulnerable	Mixes of uses within this zoning objective are possible and SDZs are generally not appropriate for extensive areas at risk of flooding. Sequential approach may be applied to the SDZ scheme to locate water compatible and less vulnerable elements within Flood Zone A or B. Flood Risk should be assessed and managed in accordance with the SFRA and Guidelines, and applying the sequential approach.
REGEN	To facilitate enterprise and/or residential led regeneration	Less / Highly Vulnerable	A mix of uses within this zoning objective are possible, including residential. REGEN zoning generally not appropriate in areas at risk of flooding.
TC	To protect, improve and provide for the future development of Town Centres	Less Vulnerable/ Highly Vulnerable	A mix of uses within this zoning objective are possible. Flood Risk should be assessed and managed in accordance with the SFRA and Guidelines, and applying the sequential approach.
DC	To protect, improve and provide for the future development of District Centres	Less / Highly Vulnerable	A mix of uses within this zoning objective are possible. Flood Risk should be assessed and managed in accordance with the SFRA and Guidelines, and applying the sequential approach.
VC	To protect, improve and provide for the future development of Village Centres	Less / Highly Vulnerable	A mix of uses within this zoning objective are possible. Flood Risk should be assessed and managed in accordance with the SFRA and Guidelines, and applying the sequential approach.
MRC	To protect, improve and provide for the future development of a	Less Vulnerable	Generally appropriate in Flood Zone B and extensions of existing development in Flood Zone A are justified, subject to site specific FRA.

	Major Retail Centre		
LC	To protect, improve and provide for the future development of Local Centres	Less / Highly Vulnerable	A mix of uses within this zoning objective are possible. Flood Risk should be assessed and managed in accordance with the SFRA and Guidelines, and applying the sequential approach.
EE	To provide for enterprise and employment related uses	Less Vulnerable	EE zoning is generally appropriate in Flood Zone B. Zoning in Flood Zone A subject to sequential approach and justification test.
RW	To provide for and consolidate retail warehousing	Less Vulnerable	Generally appropriate in Flood Zone B and extensions of existing development in Flood Zone A are justified, subject to site specific FRA.
HA-DM	To protect and enhance the outstanding natural character of the Dublin Mountains Area	Water compatible	Land use zone appropriate for all Flood Zones. Ancillary development to be assessed in accordance with the sequential approach.
HA-LV	To protect and enhance the outstanding character and amenity of the Liffey Valley	Water compatible	Land use zone appropriate for all Flood Zones. Ancillary development to be assessed in accordance with the sequential approach.
HA-DV	To protect and enhance the outstanding character and amenity of the Dodder Valley	Water compatible	Land use zone appropriate for all Flood Zones. Ancillary development to be assessed in accordance with the sequential approach.
OS	To preserve and provide for open space and recreational amenities	Water compatible	Land use zone appropriate for all Flood Zones. Ancillary development to be assessed in accordance with the sequential approach.
RU	To protect and improve rural amenity and to provide for the development of agriculture	Water compatible	In general, the rural zone will include water compatible uses, but individual and clusters of residential and other developments may arise. Development to be assessed in accordance with the sequential approach.

Note: Table is intended as a guide only and should be read in conjunction with the detailed assessment of risks and the overall SFRA.

Flood Risk Areas

The initial SFRA to inform the Draft Plan focused on a number of areas of specific interest in the County. The selection of these areas were informed by the development scenarios considered for the formulation of the Core Strategy, known flood risk areas and the overlaying of the preliminary flood risk mapping on the 2010-2016 Development Plan zonings. Further areas of interest have emerged during the preparation of the Draft Plan in addition to the specific areas of interest selected for the initial SFRA to inform the Draft Plan.

The table below summaries the application of the Sequential Approach to the Land Use Zoning Objectives for these areas:

Area	Sequential Approach to Land Use Zoning	Recommended Land Use Zoning Strategy
Adamstown South, south of Adamstown Link Road and north of Grand Canal **(Beattie's Field)**	Justification Test (see below)	RES-N
Aungierstown & Ballybane	Justification Test (see below)	EE
Baldonnel	Avoid	These areas are existing zoned undeveloped lands zoned EP1 in the 2010 – 2016 Development Plan. Rural (RU) zoning is recommended. Section 4.26 & 4.27 of Guidelines applicable.
Ballycullen & Oldcourt	Justification Test (see below)	RES-N on undeveloped lands and RES on existing, developed, zoned areas
Brittas	Avoid	Lands in vicinity of Brittas zoned for HA-DM
Clonburris	Justification Test (see below)	SDZ
Clondalkin	Justification Test (see below)	RES on existing, developed, zoned areas
Clondalkin (Watery Lane)	Avoid	Circa 70% of the 3.1ha lands zoned RES identified within Flood Zones. RU recommended on undeveloped land zoned RES in 2010 – 2016 Development Plan.
Fortunestown	Justification Test (see below)	RES-N
Greenogue	Justification Test (see below)	EE – existing, developed, zoned areas
Hazelhatch	Avoid	Lands in vicinity of Hazelhatch zoned for HA-DM
Jobstown / Killinarden	Justification Test (see below)	RU and RES on existing, developed, zoned areas
Kimmage / Templeogue	Justification Test	RES – existing, developed, zoned areas

	(see below)	
New Nangor Road & Naas Road	Avoid & Justification Test (see below)	EE zoning on existing, developed, zoned areas retained. Regeneration (REGEN) zoning avoided.
Rathcoole & Saggart	Avoid	Relevant lands zoned RU & OS
Rathfarnham	Justification Test (see below)	RES – existing, developed, zoned areas

Justification Test

The areas requiring a Justification Test above can be divided into the following categories:

- Existing, developed, zoned areas at risk of flooding
- Undeveloped lands at risk of flooding

Existing, developed, zoned areas at risk of flooding

Circular PL02/2014 states that "In some instances, particularly in older parts of cities and towns, an existing land use may be categorised as a "highly vulnerable development" such as housing, be zoned for residential purposes and also be located in flood zone A/B. Additional development such as small scale infill housing, extension or changes of use that could increase the risk or number of people in the flood-prone are can be expected in such a zone into the future. In these instances, where the residential/vulnerable use zoning has been considered as part of development plan preparation, including uses of the Justification Test as appropriate, and it is considered that the existing use zoning is still appropriate, the development plan must specify the nature and design of structural or non-structural flood risk management measures prior to future development in such areas in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced"

There are a number of such areas in the County identified on the Flood Zone maps, including existing housing areas at Clondalkin (Camac), Rathfarnham (Dodder & Whitechurch Stream), Kimmage/ Templeogue (Poddle), Jobstown/ Killinarden and Ballycullen,

It is considered that it would be unrealistic to rezone these lands for less vulnerable uses as they are fully developed. The Justification Test in relation to these areas of existing housing in the County is outlined below in the Table.

In applying the Justification Test Part 3, consideration has been given to structural and non-structural measures identified in the SFRA which may be required prior to further development taking place. The Draft Plan shall include details of requirements for applicants in flood risk areas. In most locations, future opportunities for development are likely to be limited to small extensions, infill houses or small commercial units and changes of use. As such, in most of these built up areas, flood risk can be addressed through requiring a site specific flood risk assessment which will identify appropriate mitigation measures such as retaining flow paths, flood resilient construction and emergency planning.

Justification Test for zoning objectives RES areas in the County that are already developed and include existing vulnerable uses in Zone A and /or B

Criteria		Response
1.	The urban settlement is targeted for growth under the National Spatial Strategy, regional planning guidelines, statutory plans or under the Planning Guidelines or Planning Directives provisions of the Planning and Development Act 2000, as amended.	The National Spatial Strategy 2002-2022 is a twenty year plan for the Country and consolidating the Greater Dublin Area, a Gateway, is a primary policy of this Strategy. The Consolidation Area within the Gateway of Dublin is identified within the top tier of the settlement hierarchy in accordance with the Regional Planning Guidelines in order to promote the consolidation and sustainable intensification of the existing urban/built form to the east of the M50 thereby maximising efficiencies from establishing physical and social infrastructure. Lucan, Tallaght and Clondalkin are designated Metropolitan Consolidation Towns in the Regional Planning Guidelines for the Greater Dublin Area 2010 – 2022. (see Core Strategy Map- page 10 of Draft Plan)
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:	
2(i)	Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement:	All of these areas are developed areas that include suburban housing and are essential in order to support the continued viability of the urban centres in the County.
2(ii)	Comprises significant previously developed and/or under-utilised lands:	The subject lands accommodate existing development and are therefore previously developed lands.
2(iii)	Is within or adjoining the core of an established or designated urban settlement:	The subject developed lands are within the Metropolitan Area of the Greater Dublin Area.
2(iv)	Will be essential in achieving compact and sustainable urban growth; and,	The subject lands accommodate existing development and are therefore previously developed lands. These lands are already essential in achieving and maintaining compact and sustainable urban growth.
2(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.	The subject lands accommodate existing development and are therefore previously developed lands. This criterion is set aside in accordance with the Circular PL 2/2014.
3.	A flood risk assessment to an appropriate level of detail has been carried out as part of the Strategic Environmental Assessment as part of the development plan preparation process, which demonstrates that flood risk to the development can be adequately managed and the use or development of the	

	lands will not cause unacceptable adverse impacts elsewhere. N.B. The acceptability or otherwise of levels of any residual risk should be made with consideration for the proposed development and the local context and should be described in the relevant flood risk assessment.
	A SFRA has been carried out as part of the Strategic Environmental Assessment as part of the development plan preparation process. The SFRA outlines how development can be adequately managed. The main points include: ▪ Existing open spaces and water compatible uses in Flood Zones A and B should be retained to maintain flood storage areas. ▪ New highly vulnerable development should be avoided in Flood Zones A and B. ▪ Development adjacent to the Whitechurch Stream at St. Enda's and Tara Hill should not be permitted until the completion of the Flood Alleviation Works as part of the Dodder CFRAM. ▪ Development adjacent to the Poddle Stream at Whitehall Road should not be permitted until the completion of the planned Flood Alleviation Works ▪ Development adjacent to the Ballycullen Stream at should not be permitted until the completion of the planned Flood Alleviation Works ▪ FRAs for developments should demonstrate that finished floor levels are designed for the 1% AEP (1 in 100 year) flood level plus an allowance for climate change and a minimum freeboard of 300mm. FRAs should also examine residual risk associated with culvert blockages, defence failure and climate change to set finished flood levels where appropriate. The FRAs should ensure development does not block flow paths, does increase flood risk elsewhere, is designed to appropriate standard of flood resilient construction and demonstrates emergency evacuation procedures during flood events. ▪ FRAs should also address surface water management for development, demonstrating consideration of GDSDS policies and incorporation of SuDS e.g. Green Roofs, Rainwater Harvesting and Permeable Surfacing. ▪ Additional development such as extensions or changes of use can generally be considered appropriate but an appropriately detailed flood risk assessment will be required in support of any planning application. The level of detail will vary depending on the risks identified and the proposed land use. The FRA should be aimed at setting finished floor levels and demonstrating no increase in flood risk elsewhere. ▪ The Development Plan shall incorporate the requirement to consider such measures outlined in the SFRA and provide an objective to support and facilitate the delivery of flood alleviation schemes.

There are a number of areas in the County identified on the Flood Zone maps accommodating existing industrial development, namely sections in proximity to the New Nangor Road, Naas Road and Greenogue Industrial Estate. It is noted that the areas are zoned EE and generally provides for less vulnerable uses. It is considered that it would be unrealistic to rezone these lands for water compatible uses as they are fully developed. The Justification Test in relation to these areas of existing developed zoned lands in the County is outlined below in the Table.

In applying the Justification Test Part 3, consideration has been given to structural and non-structural measures identified in the SFRA which may be required prior to further development taking place. The Development Plan shall include details of requirements for applicants in flood risk areas. In most locations, future opportunities for development are likely to be limited to extensions, replacement units, small commercial units, changes of uses or water compatible uses. As such, in most of these built up areas, flood risk can be addressed through requiring a site specific flood risk

assessment which will identify appropriate mitigation measures such as retaining flow paths, flood resilient construction and emergency planning.

Justification Test for zoning objectives EE areas in the County that are already developed and include existing less vulnerable uses in Zone A

Criteria		Response
1.	The urban settlement is targeted for growth under the National Spatial Strategy, regional planning guidelines, statutory plans or under the Planning Guidelines or Planning Directives provisions of the Planning and Development Act 2000, as amended.	The National Spatial Strategy 2002-2022 is a twenty year plan for the Country and consolidating the Greater Dublin Area, a Gateway, is a primary policy of this Strategy. The Consolidation Area within the Gateway of Dublin is identified within the top tier of the settlement hierarchy in accordance with the Regional Planning Guidelines in order to promote the consolidation and sustainable intensification of the existing urban/built form to the east of the M50 thereby maximising efficiencies from establishing physical and social infrastructure. The NSS favours the physical consolidation of Dublin's Metropolitan Area as an essential requirement for a competitive Dublin. It seeks to sustain Dublin's role as the engine of the national economy and seeks to bring people, employment and services closer together to create a better quality of life, less congestion, reduced commuting distances, more regard to the quality of the environment and increased access to services like health, education and leisure These established areas are key strategic locations for enterprise and employment within the Metropolitan Area of Dublin.
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:	
2(i)	Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement:	All of these areas are developed areas and are essential in order to support the continued economic viability of the Metropolitan Area.
2(ii)	Comprises significant previously developed and/or under-utilised lands:	The subject lands accommodate existing development and are therefore previously developed lands.
2(iii)	Is within or adjoining the core of an established or designated urban settlement:	The subject developed lands are predominantly within the Metropolitan Area of the Greater Dublin Area.
2(iv)	Will be essential in achieving compact	The subject lands accommodate existing development.

	and sustainable urban growth; and,	
2(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.	The subject lands accommodate existing development and are therefore previously developed lands. This criterion is set aside in accordance with the Circular PL 2/2014.
3.	A flood risk assessment to an appropriate level of detail has been carried out as part of the Strategic Environmental Assessment as part of the development plan preparation process, which demonstrates that flood risk to the development can be adequately managed and the use or development of the lands will not cause unacceptable adverse impacts elsewhere. N.B. The acceptability or otherwise of levels of any residual risk should be made with consideration for the proposed development and the local context and should be described in the relevant flood risk assessment.	
	A SFRA has been carried out as part of the Strategic Environmental Assessment as part of the development plan preparation process. The SFRA outlines how development can be adequately managed. The main points include: ▪ The New Nangor Road and Naas Road areas where initially identified as possible residential regeneration areas but due to the associated flood risk it was deemed appropriate to retain the existing land use as an industrial zoning. ▪ Existing open spaces and water compatible uses in Flood Zones A and B should be retained to maintain flood storage areas. ▪ New less vulnerable development should be avoided in Flood Zone A. ▪ FRAs for developments should demonstrate that finished floor levels are designed for the 1% AEP (1 in 100 year) flood level plus an allowance for climate change and a minimum freeboard of 300mm. FRAs should also examine residual risk associated with culvert blockages, defence failure and climate change to set finished flood levels where appropriate. The FRAs should ensure development does not block flow paths, does increase flood risk elsewhere, is designed to appropriate standard of flood resilient construction and demonstrates emergency evacuation procedures during flood events. ▪ FRAs should also address surface water management for development, demonstrating consideration of GDSDS policies and incorporation of SuDS e.g. Green Roofs, Rainwater Harvesting, Permeable Surfacing and Swales. ▪ Additional development such as extensions or changes of use can generally be considered appropriate but an appropriately detailed flood risk assessment will be required in support of any planning application. The level of detail will vary depending on the risks identified and the proposed land use. The FRA should be aimed at setting finished floor levels and demonstrating no increase in flood risk elsewhere.	

Undeveloped lands at risk of flooding

The Justification Test was carried out for the entire RES-N, EE & SDZ zoned lands located at Ballycullen-Oldcourt, Clonburris, Beattie Field, Grange Castle and Fortunestown in the Draft Plan. In these instances, the extent of the lands within Flood Zones A or B is insignificant in the context of the wider overall lands zoned at the location. Whilst lands are being retained with a zoning objective which includes development, applying the Guidelines to the formulation of local area plans and at

Development Management stage means such development will be restricted to Flood Zone C, with less vulnerable and/or water compatible uses located within Zone A and B as appropriate.

Adamstown South, south of R120 and north of Grand Canal - (Beattie's Field)

The subject lands are zoned for Rural Amenity in the 2010 – 2016 Development Plan and are zoned as 'RES-N' under the Draft Plan. Beattie's Field is identified as an extension to the strategic growth area of Clonburris within the Metropolitan Consolidation Town of Clondalkin as identified under the Regional Planning Guidelines. Objective RES-N 'to provide for new residential communities in accordance with approved area plans' is applied to 16.75 ha of land in the area. A small section of the lands adjacent to the banks of the Griffeen River are identified as Flood Zone A and part of the overall zoned lands in the north east sector as a Flood Zone B. Flood Zone B accounts for 2.81 ha of the zoned lands, representing 16.75% of the overall lands. Flood Zone A accounts for a minor element of the site adjoining the river bank. To determine the appropriateness of the RES-N zoning at Beattie's Field, the sequential approach has been applied, which has culminated in application of the Justification Test.

It is a requirement under the Planning and Development Act 2000 (as amended) for the County Development Plan including its Core Strategy to be consistent with the Regional Planning

Guidelines for the Greater Dublin Area 2010 – 2022 and to ensure that there are sufficient and suitable lands zoned to meet the population and housing requirements for the County. The Core Strategy in the Draft Plan identifies a growth in population of over 26,300 people and a need for over 32,000 dwellings during the lifetimes of the County Development Plan and it is a requirement to ensure that enough lands are zoned for such need and in appropriate places.

In the context of the RES-N zoning, it is noteworthy that a range of both highly vulnerable and less vulnerable land uses are 'permitted in principle' and that development shall be in accordance with an approved plan.

Having regard;

a) to the percentage of the overall lands identified as flood risk,
b) the range of both highly vulnerable and less vulnerable land uses 'permitted in principle' in the RES-N zone,
c) the requirement of Objective C12 SLO 1 to provide a full size playing pitch,
d) the requirement for a minimum of 14% public open space as part of a residential development,
e) the requirement of a setback of development from the Griffeen River and
f) the requirement for development on RES-N to be in accordance with an approved area plan, it is considered that the future development of the zoned land should be subject to a Flood Risk Assessment (FRA) in preparation of the approved plan, the application of the sequential approach in the land use strategy of the approved plan and appropriate assessment at planning application stage.

As such, it is considered that there are no alternative unzoned lands available for development such as that envisaged at Beattie's Field with equivalent proximity to developing areas, infrastructure and services. The preparation of a revised SDZ Planning Scheme and/or LAP for the area should be cognisant of the flood risk.

Criteria		Response
1.	The urban settlement is targeted for growth under the National Spatial Strategy, regional planning guidelines, statutory plans or under the Planning Guidelines or Planning Directives provisions of the Planning and Development Act 2000, as amended.	The National Spatial Strategy 2002-2022 is a twenty year plan for the Country and consolidating the Greater Dublin Area, a Gateway, is a primary policy of this Strategy. The subject lands and Clonburris form part of the Metropolitan Consolidation Town of Clondalkin within the settlement hierarchy of the Regional Planning Guidelines.
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:	
2(i)	Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement:	It is considered that the lands and Clonburris are essential to allow for growth and expansion of South Dublin in order to meet the targets as set out in the RPGs.
2(ii)	Comprises significant previously developed and/or under-utilised lands:	The subject lands consist of significant underutilised land suitable for a residential and mixed use type development, proximate to the existing services.
2(iii)	Is within or adjoining the core of an established or designated urban settlement:	The lands and Clonburris are a designated urban settlement and form part of the Metropolitan Consolidation Town of Clondalkin.
2(iv)	Will be essential in achieving compact and sustainable urban growth; and,	The future development of these lands is essential in achieving compact and sustainable urban growth.
2(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.	There are no alternative unzoned lands available for significant development with equivalent proximity to developing areas, infrastructure and services.
3.	A flood risk assessment to an appropriate level of detail has been carried out as part of the Strategic Environmental Assessment as part of the development plan preparation process, which demonstrates that flood risk to the development can be adequately managed and the use or development of the lands will not cause unacceptable adverse impacts elsewhere. N.B. The acceptability or otherwise of levels of any residual risk should be made with consideration for the proposed development and the local context and should be described in the relevant flood risk assessment.	

	A SFRA has been carried out as part of the Strategic Environmental Assessment as part of the development plan preparation process. The preparation of a revised SDZ Planning Scheme and/or LAP for the wider area should be cognisant of the flood risk. The future development of the zoned land should be subject to a Flood Risk Assessment (FRA) in preparation of the approved plan, the application of the sequential approach in the land use strategy of the approved plan and appropriate flood risk assessment at planning application stage. A FRA of appropriate detail should accompany applications for development on this site to demonstrate that they would not have adverse flood risk impacts. The FRA should consider the following: ▪ The sequential approach should be applied through site planning and should avoid encroachment onto, or loss of, the flood plain. ▪ Development in Flood Zone A should primarily consist of water compatible development ▪ Highly Vulnerable Development shall not be permitted in Flood Zone A or B. ▪ Less Vulnerable Development may be considered in Flood Zone B but should incorporate flood resilient design principles ▪ FRAs for developments should demonstrate that finished floor levels are designed for the 1% AEP (1 in 100 year) flood level plus an allowance for climate change and a minimum freeboard of 300mm. FRAs should also examine residual risk associated with culvert blockages, and climate change to set finished flood levels where appropriate. The FRAs should ensure development does not block flow paths and does increase flood risk elsewhere. ▪ FRAs should also address surface water management for development, demonstrating consideration of GDSDS policies and incorporation of SuDS e.g. Green Roofs, Rainwater Harvesting and Permeable Surfacing. ▪ Compensatory storage for development that results in a loss of floodplain must be provided on a level for level basis s and the land given to storage must be land which does not flood in the 1% AEP flood event.

Aungierstown & Ballybane Lands

The subject lands are zoned 'EP2' in the 2010 – 2016 Development Plan and as such, are generally categorised as undeveloped, zoned lands at risk of flooding. The subject undeveloped lands at Aungierstown & Ballybane form a strategic employment landbank to the west of the County known as Grange Castle. Objective EE 'To provide for enterprise and employment related uses' is applied to circa 455 ha of land in the area. The zoning objective is indicatively categorised as accommodating less vulnerable land uses such as warehousing, commercial and industrial. The provision of these uses is generally appropriate in Flood Zone B but requires a Justification Test in Flood Zone A. Approximately 3 % of the overall EE lands at this location have been identified to be at risk of flooding within Flood Zone A. The area impacted by Flood Zone A is linear in nature and runs adjacent to the Griffeen Stream. To determine the appropriateness of the zoning at Grange Castle, the sequential approach has been applied, which has culminated in application of the Justification Test.

The Core Strategy Guidance Notes, DECLG (2010) state that the Core Strategy should incorporate 'an appropriate level of analysis to ensure that sufficient lands are identified for employment purposes at suitable locations, taking account of National planning policies...and the availability of the required physical infrastructure'. (pg. 8)

South Dublin is an integral part of the Dublin City Region, a city region of international scale. There is a flow of employees across the various counties of the GDA and industries tend to cluster based on geographic characteristics, with Dublin City Centre serving as the commercial core and accommodating higher order commercial activities and edge of city locations accommodating larger scale enterprises. In South Dublin economic activity is focused into employment lands that are proximate to key centres of population and into the main urban centres. The subject lands form a key element of the Economic Strategy for the County which seeks to ensure that there is a sufficient supply of zoned and serviced lands at suitable locations to accommodate future demand for enterprise and employment investment across a diverse range of sectors. The strategy also seeks to strengthen the alignment between employment, population and transport services.

The proposed lands are situated in a strategic location within the Metropolitan Consolidation Town of Clondalkin, adjoining existing employment uses and with high quality road access. There are no other suitable lands available for the development of strategic employment at locations which are not at risk of flooding.

Criteria		**Response**
1.	The urban settlement is targeted for growth under the National Spatial Strategy, regional planning guidelines, statutory plans or under the Planning Guidelines or Planning Directives provisions of the Planning and Development Act 2000, as amended.	The National Spatial Strategy 2002-2022 is a twenty year plan for the Country and consolidating the Greater Dublin Area, a Gateway, is a primary policy of this Strategy. The NSS favours the physical consolidation of Dublin's Metropolitan Area as an essential requirement for a competitive Dublin. It seeks to sustain Dublin's role as the engine of the national economy and seeks to bring people, employment and services closer together to create a better quality of life, less congestion, reduced commuting distances, more regard to the quality of the environment and increased access to services like health, education and leisure Grange Castle is a key strategic location for enterprise and employment within the within the Metropolitan Consolidation Town of Clondalkin and the wider Metropolitan Area of Dublin. The subject lands enable an extension of the business park.
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:	
2(i)	Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement:	It is considered that the lands at Grange Castle are essential to allow for growth and expansion of Clondalkin.
2(ii)	Comprises significant previously developed and/or under-utilised lands:	The subject lands consist of underutilised land suitable for business park development, proximate to existing services and within the Metropolitan Area.

2(iii)	Is within or adjoining the core of an established or designated urban settlement:	The subject lands are within the Metropolitan Consolidation Town of Clondalkin within the Metropolitan Area of the Greater Dublin Area
2(iv)	Will be essential in achieving compact and sustainable urban growth; and,	The subject lands are essential in the economic growth of Clondalkin and the wider County and achieving sustainable urban growth.
2(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.	There are no alternative more suitable strategic lands identified within the County
3.	A flood risk assessment to an appropriate level of detail has been carried out as part of the Strategic Environmental Assessment as part of the development plan preparation process, which demonstrates that flood risk to the development can be adequately managed and the use or development of the lands will not cause unacceptable adverse impacts elsewhere.	
	A SFRA has been carried out as part of the Strategic Environmental Assessment as part of the development plan preparation process. The identified flood risk A on the lands represents a small proportion of the overall lands and the extent of the flood risk lands are linear and clustered in nature. Having regard to the nature of development in the area and the quantum of water compatible uses associated with predominant EE uses, it is considered that the application of the sequential approach at site design and development management stage can adequately manage development subject to an appropriately detailed flood risk assessment in support of any planning application. The level of detail will vary depending on the risks identified and the proposed land use. The FRA should consider the following: The sequential approach should be applied through site planning and should avoid encroachment onto, or loss of, the flood plain and obstruction of overland flow paths. Development in Flood Zone A should primarily consist of water compatible development FRA should address residual risk of increased flood extents under climate change scenarios which should be aimed at setting finished floor levels. Compensatory storage for development that results in a loss of floodplain must be provided on a level for level basis s and the land given to storage must be land which does not flood in the 1% AEP flood event.	

Ballycullen - Oldcourt Local Area Plan Lands

The subject lands are zoned 'A1' in the 2010 – 2016 Development Plan and as such, are generally categorised as undeveloped, zoned lands at risk of flooding. Ballycullen - Oldcourt is an area within the Metropolitan Consolidation Area of the Dublin Gateway as identified under the Regional Planning Guidelines. Objective RES-N 'to provide for new residential communities in accordance with

the appropriateness of the RES-N zoning at Ballycullen - Oldcourt, the sequential approach has been applied, which has culminated in application of the Justification Test.

It is a requirement under the Planning and Development Act 2000 (as amended) for the County Development Plan including its Core Strategy to be consistent with the Regional Planning

Guidelines for the Greater Dublin Area 2010 – 2022 and to ensure that there are sufficient and suitable lands zoned to meet the population and housing requirements for the County. The Core Strategy in the Draft Plan identifies a growth in population of over 26,300 people and a need for over 32,000 dwellings during the lifetimes of the County Development Plan and it is a requirement to ensure that enough lands are zoned for such need and in appropriate places.

Ballycullen - Oldcourt is an area within the Metropolitan Consolidation Area of the Dublin Gateway as identified under the Regional Planning Guidelines. It is policy of the Regional Planning Guidelines (RPGs) to gain maximum benefit from existing assets in the Metropolitan Consolidation Area, including public transport and social infrastructure, through consolidation within the exiting built footprint of the City and the Inner Suburbs. This is seen as particularly important as falling occupancy levels and aging populations are placing the viability existing services and facilities such as schools across the Metropolitan Area at risk.

As such, it is considered that there are no alternative unzoned lands available for significant development such as that envisaged at Ballycullen - Oldcourt with equivalent infrastructure and services. The Ballycullen - Oldcourt Local Area Plan 2014 was prepared having regard to the best available flood data (OPW PFRA) at the time and consideration of the land use strategy and objectives in the LAP included for directing water compatible elements in Flood Zones.

The LAP includes the following objectives:

- Objective GI8 - All planning applications for development in areas at risk of flooding shall be accompanied by a Flood Risk Assessment carried out at the site-specific level in accordance with The Planning System and Flood Risk Management – Guidelines for Planning Authorities (2009). The scope of flood risk assessment should depend on the type and scale of development and the sensitivity of the area. Site specific flood risk assessment of lands identified as being at risk of flooding will entail Stage 3 Detailed Risk Assessment carried out by suitably qualified and independent hydrological consultants that are acceptable to the Council. Where avoidance of flood risk is not possible, vulnerable uses such as residential, community and commercial uses should be substituted with less vulnerable uses such as parks and open spaces.
- Objective GI9 - All proposals, particularly those within the catchment of the Ballycullen Stream, shall demonstrate and ensure that they do not increase the risk/impact of flooding on downstream estates including Castlefield Manor, Glenvara, Glenlyon and Homeville.
- Objective SSP27 - Any proposed development on the Oldcourt GAA pitches that is potentially sensitive to flooding shall be subject to the sequential approach of avoid, substitute, justify, mitigate and (where the Justification Test has been passed) manage flood risks in accordance with The Planning System and Flood Risk Management– Guidelines for Planning Authorities (2009). These areas will require Site Specific Stage 3 Detailed Flood Risk Assessment including the likely impact of any displaced flood water on third parties. If it cannot be demonstrated that both the actual and residual flooding issues can be dealt with in an acceptable manner including the impact of any displaced flood water on third parties,

then the development of these lands shall be confined to water compatible development only (in accordance with the precautionary approach) such as amenity spaces, outdoor sports and recreation spaces that include SUDS elements and integrate with the SUDS strategy for the Plan Lands. Any required works to upgrade or replace existing drainage systems or channels (such as culverts) upstream or downstream of a development shall be borne by the developer and shall adhere to SUDS principles.

The Guidelines state that where an Authority is considering the future development of areas in an urban settlement that are at moderate or high risk of flooding, for uses or development vulnerable to flooding that would generally be inappropriate, it must be satisfied that it can clearly demonstrate on a solid evidence base that the zoning or designation for development will satisfy the 'Justification Test'.

Section 4.23 of the Flooding Guidelines relate to the 'Justification Test' and outline the three criteria that must be satisfied.

Criteria		**Response**
1.	The urban settlement is targeted for growth under the National Spatial Strategy, regional planning guidelines, statutory plans or under the Planning Guidelines or Planning Directives provisions of the Planning and Development Act 2000, as amended.	The National Spatial Strategy 2002-2022 is a twenty year plan for the Country and consolidating the Greater Dublin Area, a Gateway, is a primary policy of this Strategy. The Consolidation Area within the Gateway of Dublin is identified within the top tier of the settlement hierarchy in accordance with the Regional Planning Guidelines in order to promote the consolidation and sustainable intensification of the existing urban/built form thereby maximising efficiencies from establishing physical and social infrastructure.
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:	
2(i)	Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement:	It is considered that the lands at Ballycullen - Oldcourt are essential to allow for growth and expansion of South Dublin in order to meet the targets as set out in the RPGs.
2(ii)	Comprises significant previously developed and/or under-utilised lands:	The subject lands consist of significant underutilised land suitable for a residential type development, proximate to the existing services.
2(iii)	Is within or adjoining the core of an established or designated urban settlement:	The lands at Ballycullen-Oldcourt fall within the Metropolitan Consolidation Area of the Dublin Gateway.
2(iv)	Will be essential in achieving compact and sustainable urban growth; and,	The future development of these lands will be in accordance with the approved Ballycullen – Oldcourt 2014 prepared in accordance with Ministerial guidance documents. The implementation of the LAP is essential in

		achieving compact and sustainable urban growth.
2(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.	There are no alternative unzoned lands available for significant development such as that envisaged at Ballycullen – Oldcourt with equivalent established infrastructure and services.
3.	A flood risk assessment to an appropriate level of detail has been carried out as part of the Strategic Environmental Assessment as part of the development plan preparation process, which demonstrates that flood risk to the development can be adequately managed and the use or development of the lands will not cause unacceptable adverse impacts elsewhere. N.B. The acceptability or otherwise of levels of any residual risk should be made with consideration for the proposed development and the local context and should be described in the relevant flood risk assessment.	
	A SFRA has been carried out as part of the Strategic Environmental Assessment as part of the development plan preparation process. The OPW Preliminary Flood Risk Assessment (PFRA) identified flood risk on a portion of the overall lands within the Ballycullen - Oldcourt LAP boundary. The RES-N lands within flood risk zones are undeveloped. The Ballycullen - Oldcourt Local Area Plan 2014 was prepared having regard to the best available flood data and consideration of the land use strategy in the LAP included for the flood risk and promotes a sequential approach to land uses in the Plan. A FRA of appropriate detail should accompany applications for development on this site to demonstrate that they would not have adverse flood risk impacts. The FRA should consider the following: ▪ Development adjacent to the Ballycullen Stream should not be permitted until the completion of the planned Flood Alleviation Works ▪ The sequential approach should be applied through site planning and should avoid encroachment onto, or loss of, the flood plain. ▪ Development in Flood Zone A should primarily consist of water compatible development ▪ Highly Vulnerable Development shall not be permitted in Flood Zone A or B. ▪ Less Vulnerable Development may be considered in Flood Zone B but should incorporate flood resilient design principles ▪ FRAs for developments should demonstrate that finished floor levels are designed for the 1% AEP (1 in 100 year) flood level plus an allowance for climate change and a minimum freeboard of 300mm. FRAs should also examine residual risk associated with culvert blockages, and climate change to set finished flood levels where appropriate. The FRAs should ensure development does not block flow paths and does increase flood risk elsewhere. ▪ FRAs should also address surface water management for development, demonstrating consideration of GDSDS policies and incorporation of SuDS e.g. Green Roofs, Rainwater Harvesting and Permeable Surfacing. ▪ Compensatory storage for development that results in a loss of floodplain must be provided on a level for level basis s and the land given to storage must be land which does not flood in the 1% AEP flood event.	

Clonburris

The subject lands are delineated as 'SDZ' in the 2010 – 2016 Development Plan and as such, are generally categorised as undeveloped, zoned lands at risk of flooding. Clonburris is a strategic growth area within the Metropolitan Consolidation Town of Clondalkin as identified under the Regional Planning Guidelines. Objective SDZ 'to provide for strategic development in accordance with approved planning schemes' is applied to 180 ha of land in the area. The SFRA indicative pluvial mapping shows cluster of flood risk in the area. The SFRA shows no current fluvial flood risk within the area. To determine the appropriateness of the SDZ zoning at Clonburris, the sequential approach has been applied, which has culminated in application of the Justification Test.

The Planning and Development Act, 2000 (as amended) introduced Strategic Development Zones (SDZs). Where, in the opinion of the Government, specified development is of economic or social importance to the State, the Government may by order designate sites for the establishment of a Strategic

Development Zone (SDZ) to facilitate such development. A Planning Scheme must be prepared for the SDZ to indicate the extent and type of development that will take place and proposals relating to supporting infrastructure and facilities. Development within a SDZ must be consistent with the relevant

Planning Scheme. The Government designated 180 hectares of land at Clonburris as a Strategic Development Zone in 2006. The Planning Scheme forms part of the County Development Plan for the area and any contrary provisions of the Development Plan are superseded by the Planning Scheme. Clonburris represents a major expansion of the footprint of Clondalkin along the Dublin-Cork rail corridor and development in Clonburris will be subject to an approved SDZ Planning Scheme.

It is a requirement under the Planning and Development Act 2000 (as amended) for the County Development Plan including its Core Strategy to be consistent with the Regional Planning

Guidelines for the Greater Dublin Area 2010 – 2022 and to ensure that there are sufficient and suitable lands zoned to meet the population and housing requirements for the County. The Core Strategy in the Draft Plan identifies a growth in population of over 26,300 people and a need for over 32,000 dwellings during the lifetimes of the County Development Plan and it is a requirement to ensure that enough lands are zoned for such need and in appropriate places. The Clonburris SDZ Planning Scheme 2008, sets out a planning framework to support the delivery of 11,505 dwelling units and supporting infrastructure and facilities.

As such, it is considered that there are no alternative unzoned lands available for significant development such as that envisaged at Clonburris with equivalent infrastructure and services. The preparation of a revised SDZ Planning Scheme and/or LAP for Clonburris should be cognisant of the pluvial flood risk and the recommendations and guidelines from the GDSDS should be implemented in the area to reduce the risk of pluvial flooding.

Criteria		Response
1.	The urban settlement is targeted for growth under the National Spatial Strategy, regional planning guidelines, statutory plans or under the Planning Guidelines or Planning Directives provisions of the Planning and Development Act 2000, as amended.	The National Spatial Strategy 2002-2022 is a twenty year plan for the Country and consolidating the Greater Dublin Area, a Gateway, is a primary policy of this Strategy. Clonburris forms part of the Metropolitan Consolidation Town of Clondalkin within the settlement hierarchy of the Regional Planning Guidelines.
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:	
2(i)	Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement:	It is considered that the lands at Clonburris are essential to allow for growth and expansion of South Dublin in order to meet the targets as set out in the RPGs.
2(ii)	Comprises significant previously developed and/or under-utilised lands:	The subject lands consist of significant underutilised land suitable for a residential and mixed use type development, proximate to the existing services.
2(iii)	Is within or adjoining the core of an established or designated urban settlement:	The lands at Clonburris are a designated urban settlement and form part of the Metropolitan Consolidation Town of Clondalkin.
2(iv)	Will be essential in achieving compact and sustainable urban growth; and,	The future development of these lands is essential in achieving compact and sustainable urban growth.
2(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.	There are no alternative unzoned lands available for significant development such as that envisaged at Clonburris with equivalent established infrastructure and services.
3.	A flood risk assessment to an appropriate level of detail has been carried out as part of the Strategic Environmental Assessment as part of the development plan preparation process, which demonstrates that flood risk to the development can be adequately managed and the use or development of the lands will not cause unacceptable adverse impacts elsewhere. N.B. The acceptability or otherwise of levels of any residual risk should be made with consideration for the proposed development and the local context and should be described in the relevant flood risk	

	assessment.
	A SFRA has been carried out as part of the Strategic Environmental Assessment as part of the development plan preparation process. Any revised SDZ Planning Scheme or LAP should be cognisant of the flood risk, in particular, the recommendations and guidelines from the GDSDS should be implemented in the area to reduce the risk of pluvial flooding. GDSDS and SuDs practices should be implemented in the SDZ. Any revised SDZ Planning Scheme or LAP should carry out an appropriately detailed FRA to support development of the site. The FRA should consider the following: ▪ A stage 1 Flood Risk Identification to identify any flooding or surface water management issues related to the lands ▪ The sequential approach should be applied through site planning and should avoid encroachment onto, or loss of, the flood plain. ▪ FRAs for developments should demonstrate that finished floor levels are designed for the 1% AEP (1 in 100 year) flood level plus an allowance for climate change and a minimum freeboard of 300mm. FRAs should also examine residual risk associated with culvert blockages, and climate change to set finished flood levels where appropriate. The FRAs should ensure development does not block flow paths and does increase flood risk elsewhere. ▪ FRAs should also address surface water management for development, demonstrating consideration of GDSDS policies and incorporation of SuDS e.g. Green Roofs, Rainwater Harvesting and Permeable Surfacing.

Fortunestown Local Area Plan Lands

The subject lands are zoned 'A1' in the 2010 – 2016 Development Plan and as such, are generally categorised as undeveloped, zoned lands at risk of flooding. Fortunestown is an area within the identified Moderate Sustainable Growth Town of Saggart/ Citywest. Objective RES-N 'to provide for new residential communities in accordance with approved area plans' is applied to 108 ha of land in the area. Approximately 7.5 % of the overall RES-N lands have been identified to be at risk of flooding and are within both Flood Zone A and B. To determine the appropriateness of the zoning at Fortunestown, the sequential approach has been applied, which has culminated in application of the Justification Test.

It is a requirement under the Planning and Development Act 2000 (as amended) for the County Development Plan including its Core Strategy to be consistent with the Regional Planning Guidelines for the Greater Dublin Area 2010 – 2022 and to ensure that there are sufficient and suitable lands zoned to meet the population and housing requirements for the County. As outlined in the Core Strategy and in accordance with housing targets set by the Regional Planning Guidelines, South Dublin County Council are obliged to provide zoned lands in appropriate locations to accommodate for over 32,000 dwellings during the lifetimes of the County Development Plan.

Saggart-Citywest is identified in the Core Strategy as a Moderate Sustainable Growth Town as defined by the Guidelines. The designation as a "Moderate Sustainable Growth Town" acknowledges the range of local services that have developed within the settlement area including high quality public transport connections with Dublin City Centre and Tallaght (Luas Red Line), which support existing high level employment (Citywest Business Park and Hotel) and retail (Saggart Village and Citywest S.C.) functions.

As such, it is considered that there are no alternative unzoned lands available for significant development such as that envisaged at Saggart/ Citywest with equivalent infrastructure and services. The Fortunestown Local Area Plan 2012 was prepared having regard to the best available flood risk data at the time and consideration of the land use strategy in the LAP included for flood risk and advocates the application of the sequential test to direct water compatible elements of the LAP to the Flood Zone A areas. The flood risk information for the LAP in relation to the catchment included alluvial soils as a surrogate for Flood Risk, OPW recorded Flood Events, other information from the OPW website www.floodmaps.ie, the Preliminary Floor Risk Assessment (PFRA) carried out by the OPW and indicative Flood Risk mapping for the Fortunestown LAP area modelled by JBA Consulting. The flood risk mapping information from JBA Consulting and the OPW PFRA identify sites for detailed site-specific Flood Risk Assessment and appropriate responses at planning application stage in accordance with 'The Planning System and Flood Risk Management Guidelines for Planning Authorities' (2009) is provided in the Local Area Plan. Furthermore, the Fortunestown LAP states:

In assessing development proposals in areas identified at risk of flooding, South Dublin County Council will adopt a risk-based sequential and balanced approach, while at the same time allowing consideration of appropriate and necessary development, including the application of the Justification Test in accordance with Polices WD13 (Risk of Flooding) and WD14 (Identified Flood Risk Areas) of the South Dublin County Council Development Plan 2010 - 2016. It is therefore an objective of the Local Area Plan that:

- Objective GI7 - All planning applications for residential and/or commercial floorspace on sites in areas at risk of flooding shall be accompanied by a Flood Risk Assessment that is carried out at the site-specific level in accordance with 'The Planning System and Flood Risk Management – Guidelines for Planning Authorities' (2009). The scope of flood risk assessment shall depend on the type and scale of development and the sensitivity of the area.

The Guidelines state that where an Authority is considering the future development of areas in an urban settlement that are at moderate or high risk of flooding, for uses or development vulnerable to flooding that would generally be inappropriate, it must be satisfied that it can clearly demonstrate on a solid evidence base that the zoning will satisfy the 'Justification Test'. Section 4.23 of the Guidelines relate to the 'Justification Test' and outline the three criteria that must be satisfied.

Criteria		**Response**
1.	The urban settlement is targeted for growth under the National Spatial Strategy, regional planning guidelines, statutory plans or under the Planning Guidelines or Planning Directives provisions of the Planning and Development Act 2000, as amended.	The National Spatial Strategy 2002-2022 is a twenty year plan for the Country and consolidating the Greater Dublin Area, a Gateway, is a primary policy of this Strategy. The Consolidation Area within the Gateway of Dublin is identified within the top tier of the settlement hierarchy in accordance with the Regional Planning Guidelines in order to promote the consolidation and sustainable intensification of the existing urban/built form thereby maximising efficiencies from establishing physical and social infrastructure. Saggart-Citywest is identified in the Core Strategy as a Moderate Sustainable Growth Town as defined by the

		Guidelines. The designation as a "Moderate Sustainable Growth Town" acknowledges the range of local services that have developed within the settlement area since the adoption of the Regional Planning Guidelines for the Greater Dublin Area 2010 – 2022 including high quality public transport connections with Dublin City Centre and Tallaght (Luas Red Line), which support existing high level employment (Citywest Business Park and Hotel) and retail (Saggart Village and Citywest S.C.) functions
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:	
2(i)	Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement:	It is considered that the lands at Saggart/ Citywest (Fortunestown LAP 2012) are essential to allow for growth and expansion of South Dublin in order to meet the targets as set out in the RPGs.
2(ii)	Comprises significant previously developed and/or under-utilised lands:	The subject lands consist of significant underutilised land suitable for a higher density type development, proximate to the Luas.
2(iii)	Is within or adjoining the core of an established or designated urban settlement:	The lands at Saggart/ Citywest fall within the Metropolitan Area of the GDA.
2(iv)	Will be essential in achieving compact and sustainable urban growth; and,	The future development of these lands will be in accordance with the approved Fortunestown LAP 2012 prepared in accordance with Ministerial guidance documents.
2(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.	There are no alternative unzoned site available for significant development such as that envisaged at Saggart/ Citywest with equivalent established infrastructure and services.
3.	A flood risk assessment to an appropriate level of detail has been carried out as part of the Strategic Environmental Assessment as part of the development plan preparation process, which demonstrates that flood risk to the development can be adequately managed and the use or development of the lands will not cause unacceptable adverse impacts elsewhere. N.B. The acceptability or otherwise of levels of any residual risk should be made with consideration for the proposed development and the local context and should be described in the relevant flood risk assessment.	
	A SFRA has been carried out as part of the Strategic Environmental Assessment as part of the development plan preparation process. The SFRA mapping identifies Flood Zone A and B on a portion of the overall RES-N lands within the Fortunestown LAP boundary. The lands within Flood Zone A are undeveloped. The Fortunestown Local Area Plan 2012 was prepared	

	having regard to the best available flood data at the time and consideration of the strategy in the LAP. Although residential uses have been identified for the overall area, the LAP identified flood risk areas and the overall strategy was prepared having regard to the sequential approach within the plan boundary, focusing the residential housing in Flood Zone C and directing open space, roads and gardens in Flood Zones A and B. Objective GI7 of the LAP states that all planning applications for residential and/or commercial floorspace on sites in areas at risk of flooding shall be accompanied by a Flood Risk Assessment that is carried out at the site-specific level in accordance with 'The Planning System and Flood Risk Management – Guidelines for Planning Authorities' (2009). The scope of flood risk assessment shall depend on the type and scale of development and the sensitivity of the area. The FRA should consider the following: ▪ The sequential approach should be applied through site planning and should avoid encroachment onto, or loss of, the flood plain. ▪ Development in Flood Zone A should primarily consist of water compatible development ▪ Highly Vulnerable Development shall not be permitted in Flood Zone A or B. ▪ Less Vulnerable Development may be considered in Flood Zone B but should incorporate flood resilient design principles ▪ FRAs for developments should demonstrate that finished floor levels are designed for the 1% AEP (1 in 100 year) flood level plus an allowance for climate change and a minimum freeboard of 300mm. FRAs should also examine residual risk associated with culvert blockages, and climate change to set finished flood levels where appropriate. The FRAs should ensure development does not block flow paths and does increase flood risk elsewhere. ▪ FRAs should also address surface water management for development, demonstrating consideration of GDSDS policies and incorporation of SuDS e.g. Green Roofs, Rainwater Harvesting and Permeable Surfacing. ▪ Compensatory storage for development that results in a loss of floodplain must be provided on a level for level basis s and the land given to storage must be land which does not flood in the 1% AEP flood event.

FIGURE A.1

2010-2016 COUNTY DEVELOPMENT PLAN ZONINGS

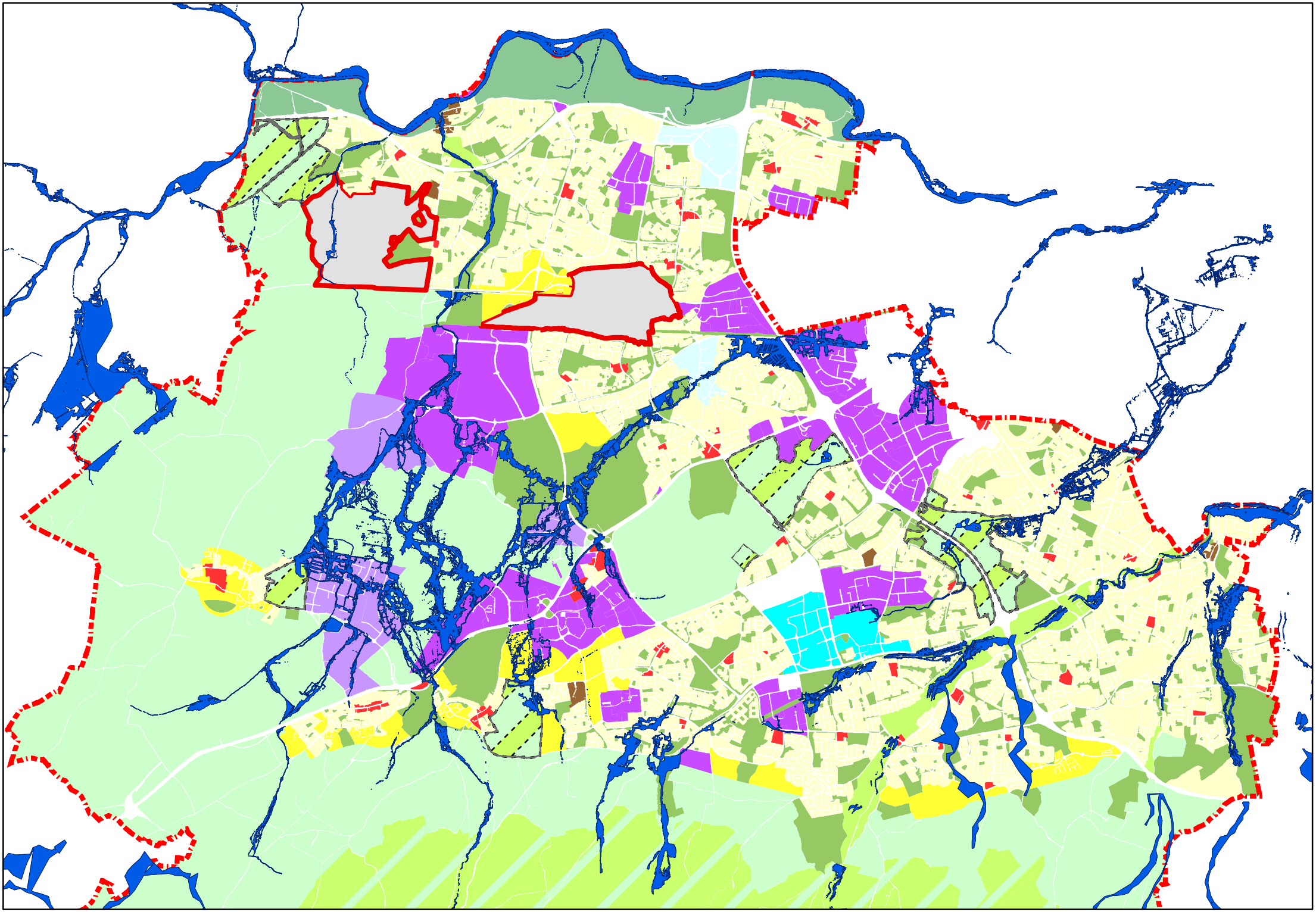
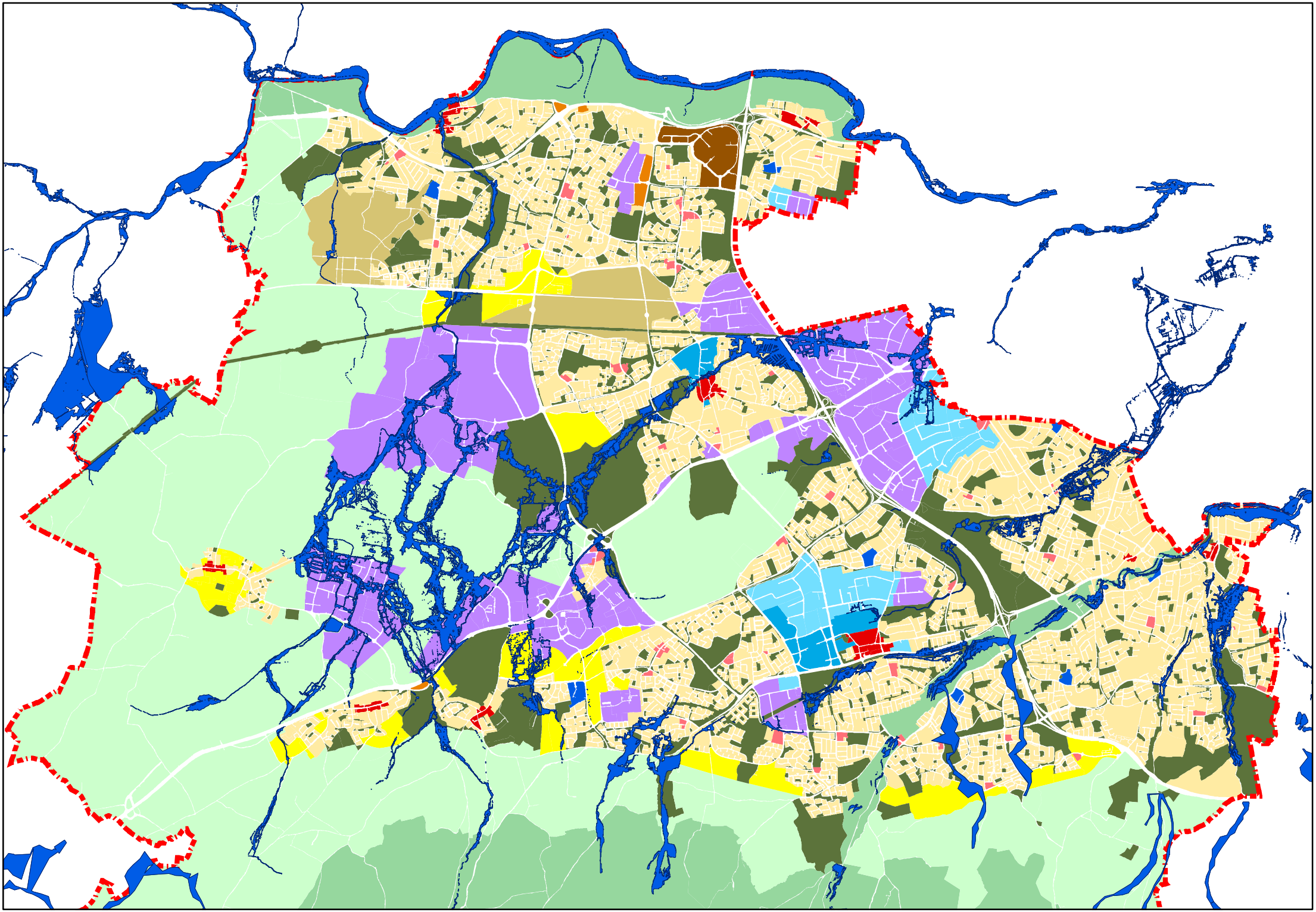


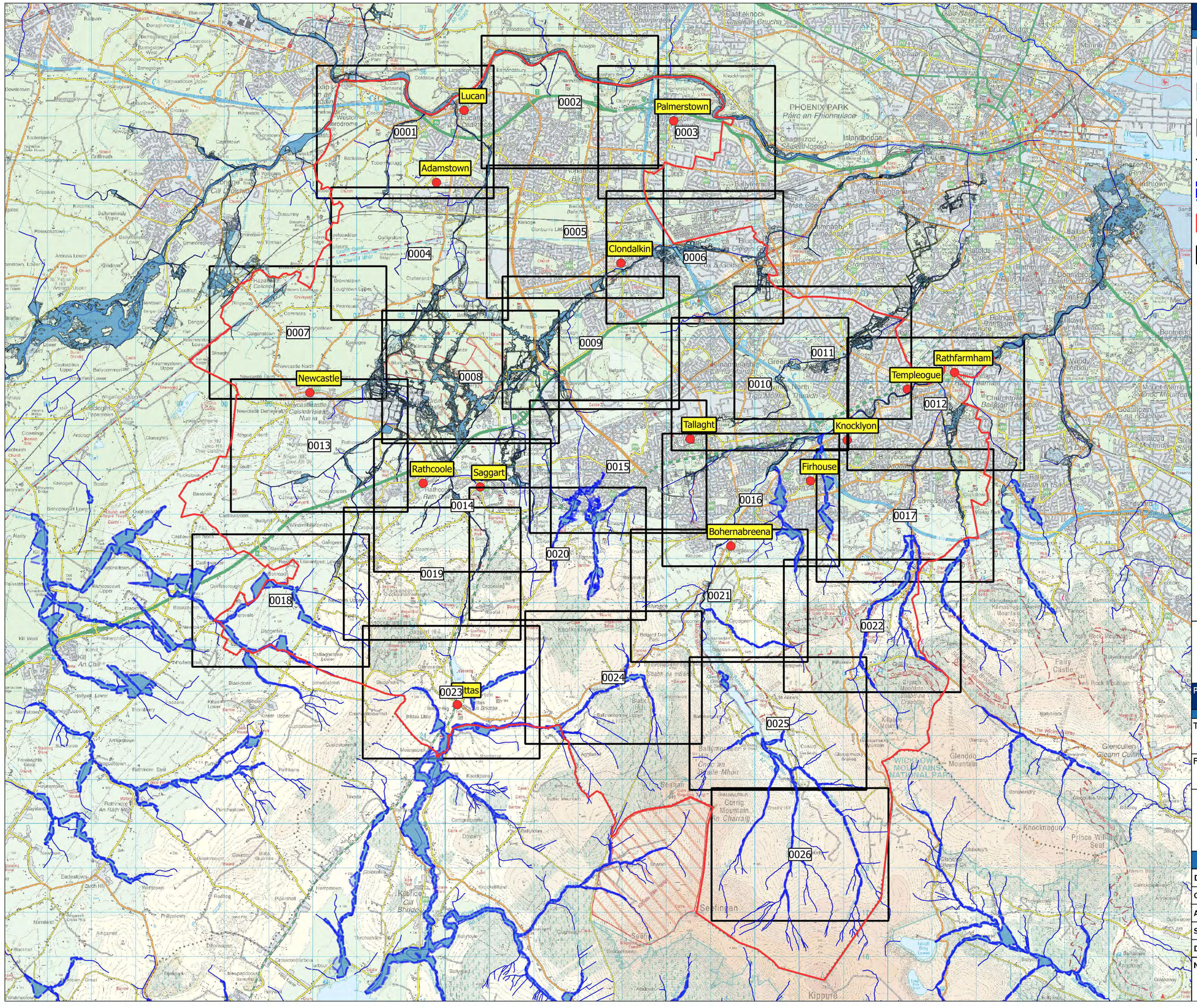
FIGURE A.2

2016-2022 COUNTY DEVELOPMENT PLAN ZONINGS



APPENDIX B

FLUVIAL FLOOD ZONE MAPPING



Legend

- Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- Watercourse Centreline
- Indicative Flood Extents
- County Boundary
- Map Tiles

DRAFT

Comhairle Contae Átha Cliath Theas
South Dublin County Council

Project: Strategic Flood Risk Assessment

Title: Overview Map - Fluvial Flood Zone Mapping

Figure: MDW0657_0000

RPS Consulting Engineers
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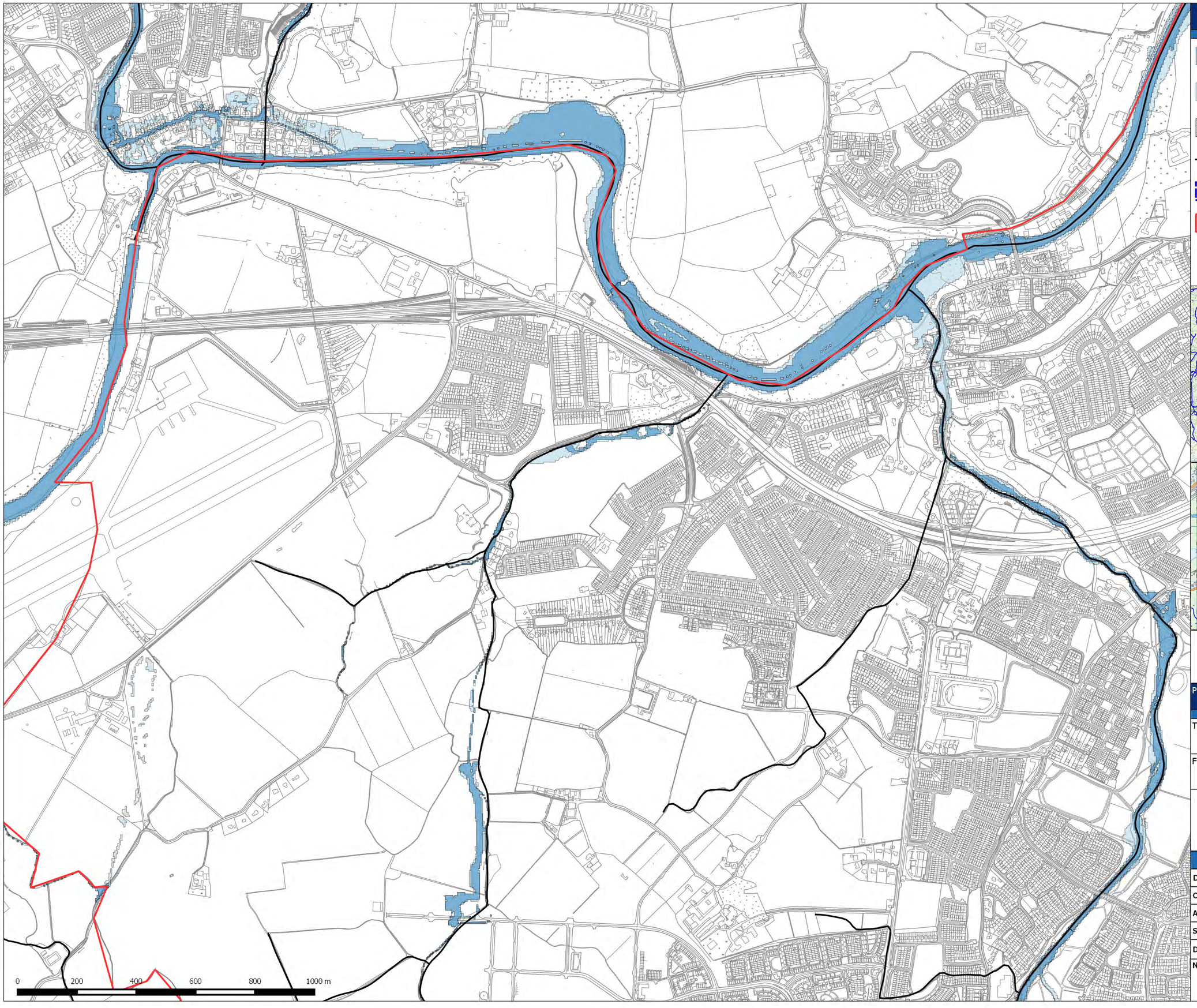
Issue Details			
Drawn:	BT	Project No.	MDW0657
Checked:	JH	File Ref	MDW0657QG0009F02
Approved:	JH		
Scale:	1:40000 @ A1	Drawing No.	Projection
Date:	14/01/2016	1 of 1	IG

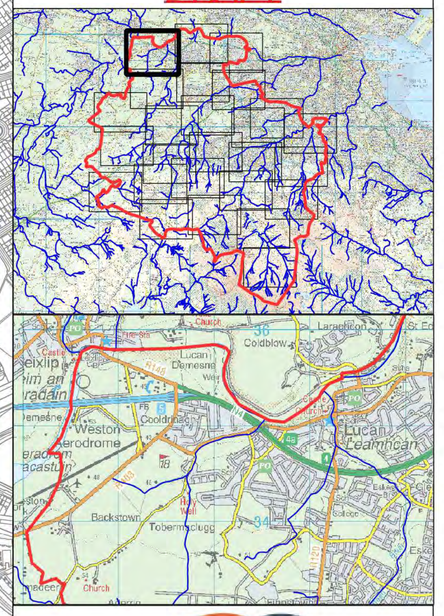
Notes
1. The viewer of this map should refer to the SFRA Report and Disclaimer
2. Ordnance Survey Ireland Licence No. EN 0005016



Legend

- Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- Watercourse Centreline
- Indicative Flood Extents
- County Boundary

DRAFT



Comhairle Contae
Átha Cliath Theas
South Dublin County Council

Project: Strategic Flood Risk Assessment

Title: Fluvial Flood Zone Mapping

Figure: MDW657_0001

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Issue Details

Drawn:	BT	**Project No.**	MDW0657
Checked:	JH	**File Ref**	MDW0657QG0010F02
Approved:	JH		
Scale:	1:6000 @ A1	**Drawing No.**	**Projection**
Date:	14/01/2016	1 of 26	IG

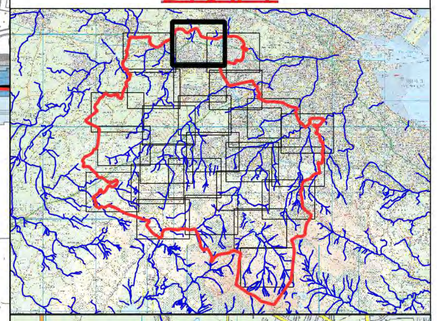
Notes

1. The viewer of this map should refer to the SFRA Report and Disclaimer

Legend

- Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- Watercourse Centreline
- Indicative Flood Extents
- County Boundary

DRAFT



0 200 400 600 800 1000 m

Comhairle Contae Átha Cliath Theas
South Dublin County Council

Project	Strategic Flood Risk Assessment
Title	Fluvial Flood Zone Mapping
Figure	MDW657_0002

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Issue Details

Drawn:	BT	**Project No.**	MDW0657
Checked:	JH	**File Ref**	MDW0657QG0010F02
Approved:	JH		
Scale:	1:6000 @ A1	**Drawing No.**	**Projection**
Date:	14/01/2016	2 of 26	IG

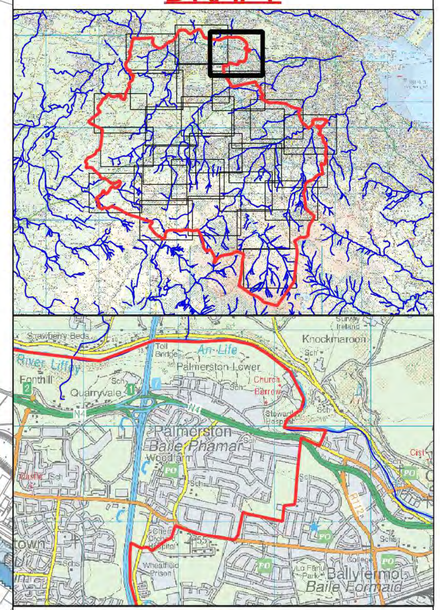
Notes

1. The viewer of this map should refer to the SFRA Report and Disclaimer

Legend

- Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- Watercourse Centreline
- Indicative Flood Extents
- County Boundary

DRAFT



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Comhairle Contae
Átha Cliath Theas
South Dublin County Council

Project: Strategic Flood Risk Assessment

Title: Fluvial Flood Zone Mapping

Figure: MDW657_0003

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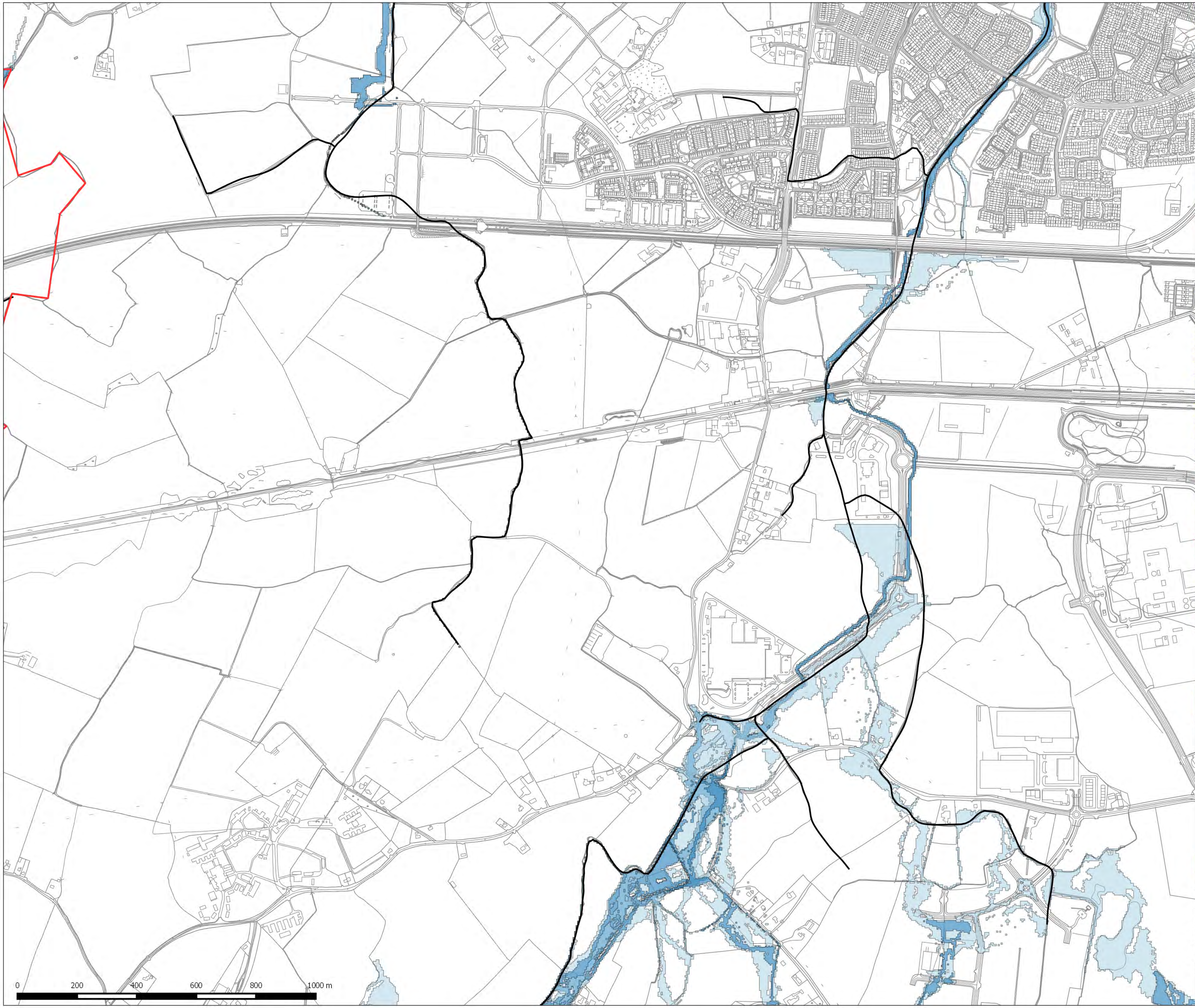
Issue Details

Drawn:	BT	Project No.	MDW0657
Checked:	JH	File Ref	MDW0657QG0010F02
Approved:	JH		
Scale:	1:6000 @ A1	Drawing No.	Projection
Date:	14/01/2016	3 of 26	IG

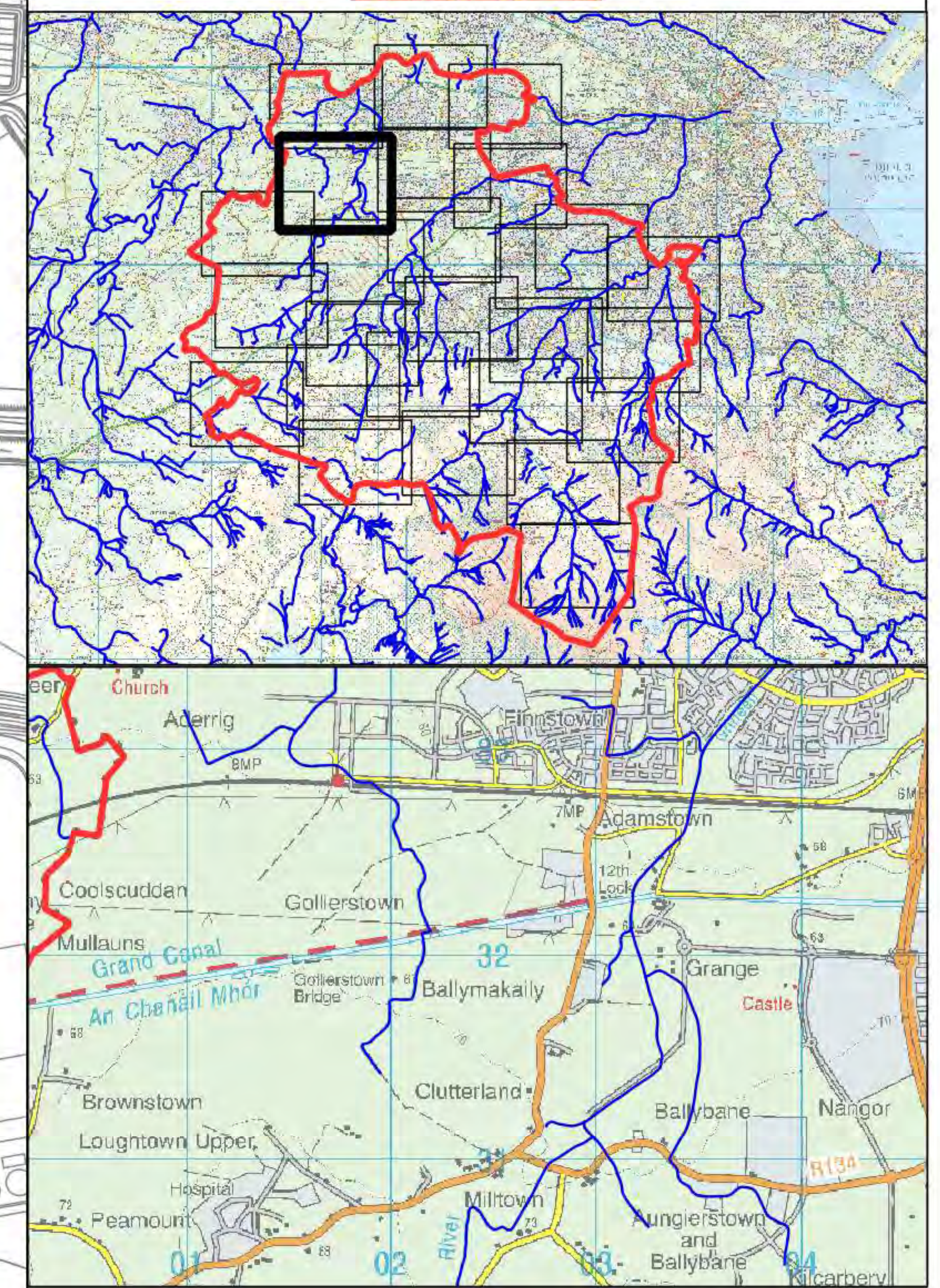
Notes
1. The viewer of this map should refer to the SFRA Report and Disclaimer



Legend

- Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- Watercourse Centreline
- Indicative Flood Extents
- County Boundary

DRAFT



Comhairle Contae Átha Cliath Theas
South Dublin County Council

Project	Strategic Flood Risk Assessment
Title	Fluvial Flood Zone Mapping
Figure	MDW657_0004

RPS

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Issue Details

Drawn:	BT	Project No.	MDW0657
Checked:	JH	File Ref	MDW0657QG0010F02
Approved:	JH		
Scale:	1:6000 @ A1	Drawing No.	Projection
Date:	14/01/2016	4 of 26	IG

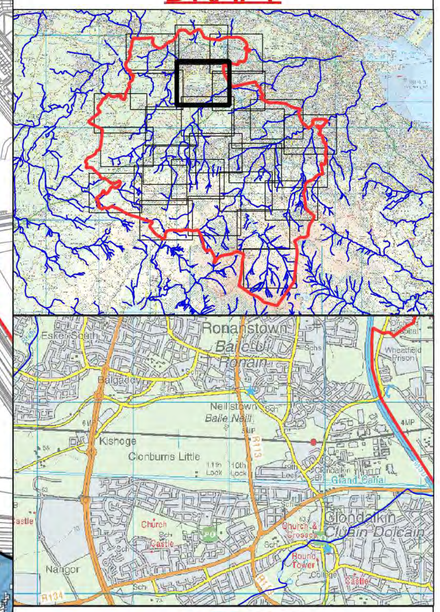
Notes 1. The viewer of this map should refer to the SFRA Report and Disclaimer

2. Ordnance Survey Ireland Licence No. EN 0005016

Legend

- Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- Watercourse Centreline
- Indicative Flood Extents
- County Boundary

DRAFT



0 200 400 600 800 1000 m

Comhairle Contae
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South Dublin County Council

Project: Strategic Flood Risk Assessment

Title: Fluvial Flood Zone Mapping

Figure: MDW657_0005

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Issue Details

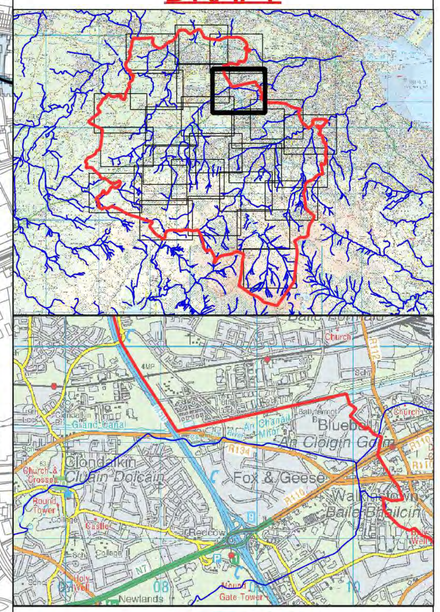
Drawn:	BT	**Project No.**	MDW0657
Checked:	JH	**File Ref**	MDW0657QG0010F02
Approved:	JH		
Scale:	1:6000 @ A1	**Drawing No.**	**Projection**
Date:	14/01/2016	5 of 26	IG

Notes
1. The viewer of this map should refer to the SFRA Report and Disclaimer

Legend

- Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- Watercourse Centreline
- Indicative Flood Extents
- County Boundary

DRAFT



0 200 400 600 800 1000 m

Comhairle Contae Átha Cliath Theas
South Dublin County Council

Project: Strategic Flood Risk Assessment

Title: Fluvial Flood Zone Mapping

Figure: MDW657_0006

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Issue Details

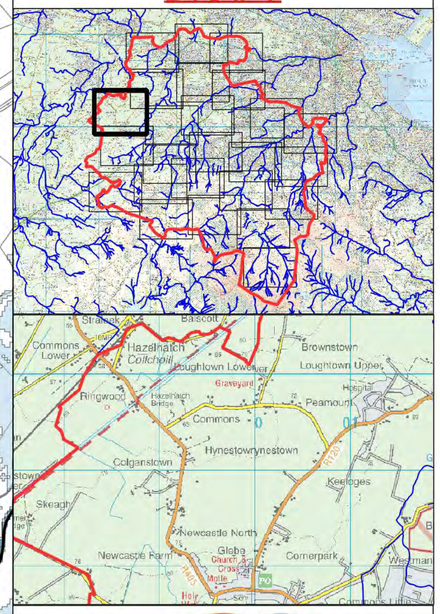
Drawn:	BT	Project No.	MDW0657
Checked:	JH	File Ref	MDW0657QG0010F02
Approved:	JH		
Scale:	1:6000 @ A1	Drawing No.	Projection
Date:	14/01/2016	6 of 26	IG

Notes
1. The viewer of this map should refer to the SFRA Report and Disclaimer

Legend

- Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- Watercourse Centreline
- Indicative Flood Extents
- County Boundary

DRAFT



0 200 400 600 800 1000 m

Comhairle Contae Átha Cliath Theas
South Dublin County Council

Project Strategic Flood Risk Assessment

Title Fluvial Flood Zone Mapping

Figure MDW657_0007

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Issue Details

Drawn:	BT	**Project No.**	MDW0657
Checked:	JH	**File Ref**	MDW0657QG0010F02
Approved:	JH		
Scale:	1:6000 @ A1	**Drawing No.**	**Projection**
Date:	14/01/2016	7 of 26	IG

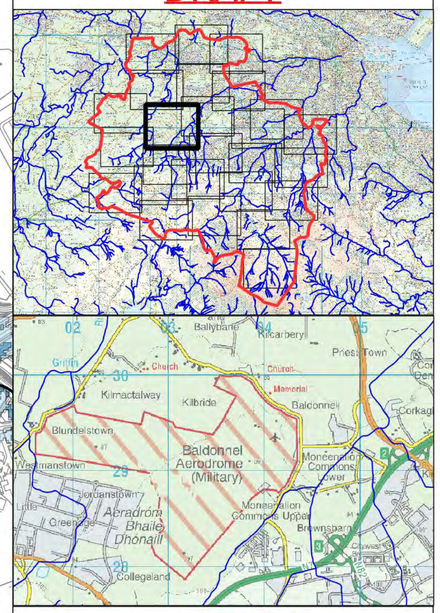
Notes

1. The viewer of this map should refer to the SFRA Report and Disclaimer

Legend

- Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- Watercourse Centreline
- Indicative Flood Extents
- County Boundary

DRAFT



0 200 400 600 800 1000 m

Comhairle Contae Átha Cliath Theas
South Dublin County Council

Project: Strategic Flood Risk Assessment

Title: Fluvial Flood Zone Mapping

Figure: MDW657_0008

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Issue Details

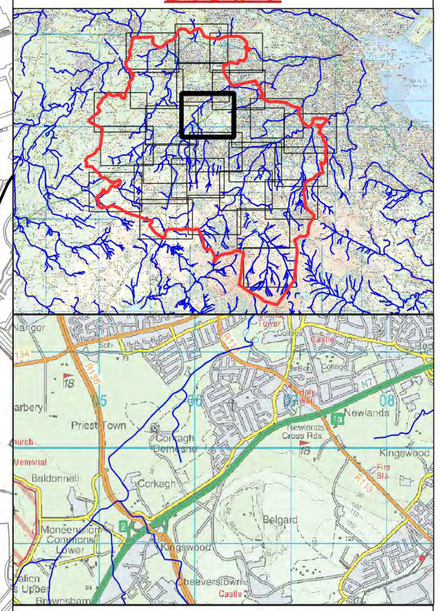
Drawn:	BT	**Project No.**	MDW0657
Checked:	JH	**File Ref**	MDW0657QG0010F02
Approved:	JH		
Scale:	1:6000 @ A1	**Drawing No.**	**Projection**
Date:	14/01/2016	8 of 26	IG

Notes
1. The viewer of this map should refer to the SFRA Report and Disclaimer

Legend

- Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- Watercourse Centreline
- Indicative Flood Extents
- County Boundary

DRAFT



0 200 400 600 800 1,000 m

Comhairle Contae Átha Cliath Theas
South Dublin County Council

Project: Strategic Flood Risk Assessment

Title: Fluvial Flood Zone Mapping

Figure: MDW657_0009

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Issue Details

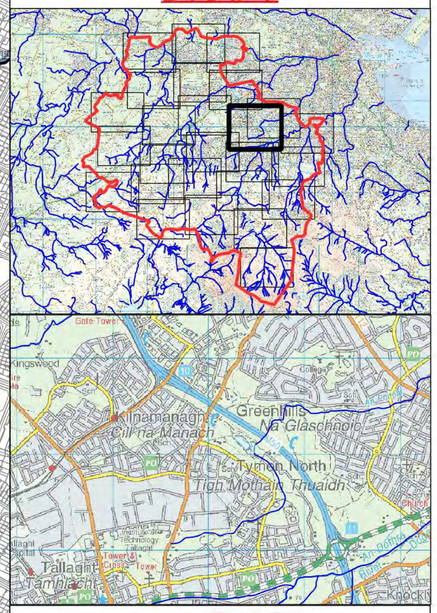
Drawn:	BT	**Project No.**	MDW0657
Checked:	JH	**File Ref**	MDW0657QG0010F02
Approved:	JH		
Scale:	1:6000 @ A1	**Drawing No.**	**Projection**
Date:	14/01/2016	9 of 26	IG

Notes
1. The viewer of this map should refer to the SFRA Report and Disclaimer

Legend

- Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- Watercourse Centreline
- Indicative Flood Extents
- County Boundary

DRAFT



0 200 400 600 800 1000 m

Comhairle Contae Átha Cliath Theas
South Dublin County Council

Project: Strategic Flood Risk Assessment

Title: Fluvial Flood Zone Mapping

Figure: MDW657_0010

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Issue Details

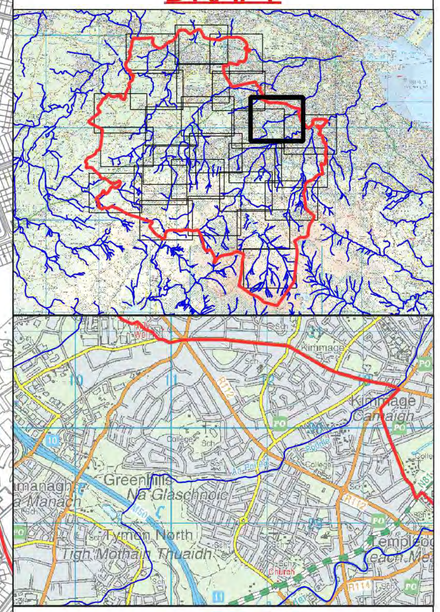
Drawn:	BT	**Project No.**	MDW0657
Checked:	JH	**File Ref**	MDW0657QG0010F02
Approved:	JH		
Scale:	1:6000 @ A1	**Drawing No.**	**Projection**
Date:	14/01/2016	10 of 26	IG

Notes
1. The viewer of this map should refer to the SFRA Report and Disclaimer

Legend

- Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- Watercourse Centreline
- Indicative Flood Extents
- County Boundary

DRAFT



0 200 400 600 800 1000 m

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South Dublin County Council

Project: Strategic Flood Risk Assessment

Title: Fluvial Flood Zone Mapping

Figure: MDW657_0011

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Issue Details

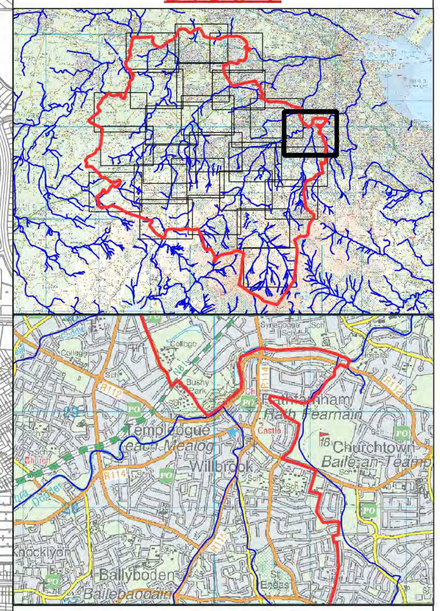
Drawn:	BT	Project No.	MDW0657
Checked:	JH	File Ref	MDW0657QG0010F02
Approved:	JH		
Scale:	1:6000 @ A1	Drawing No.	Projection
Date:	14/01/2016	11 of 26	IG

Notes
1. The viewer of this map should refer to the SFRA Report and Disclaimer

Legend

- Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- Watercourse Centreline
- Indicative Flood Extents
- County Boundary

DRAFT



0 200 400 600 800 1000 m

Comhairle Contae Átha Cliath Theas
South Dublin County Council

Project: Strategic Flood Risk Assessment

Title: Fluvial Flood Zone Mapping

Figure: MDW657_0012

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Issue Details

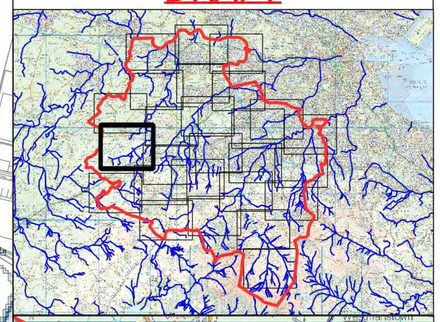
Drawn:	BT	Project No.	MDW0657
Checked:	JH	File Ref	MDW0657QG0010F02
Approved:	JH		
Scale:	1:6000 @ A1	Drawing No.	Projection
Date:	14/01/2016	12 of 26	IG

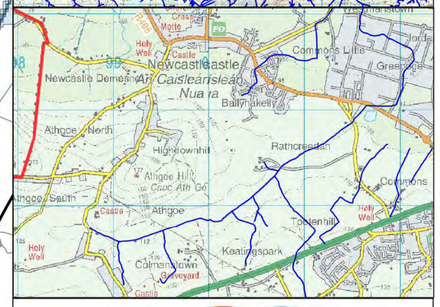
Notes
1. The viewer of this map should refer to the SFRA Report and Disclaimer

Legend

- Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- Watercourse Centreline
- Indicative Flood Extents
- County Boundary

DRAFT





0 200 400 600 800 1000 m

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South Dublin County Council

Project: Strategic Flood Risk Assessment

Title: Fluvial Flood Zone Mapping

Figure: MDW657_0013

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Issue Details

Drawn:	BT	**Project No.**	MDW0657
Checked:	JH	**File Ref**	MDW0657QG0010F02
Approved:	JH		
Scale:	1:6000 @ A1	**Drawing No.**	**Projection**
Date:	14/01/2016	13 of 26	IG

Notes

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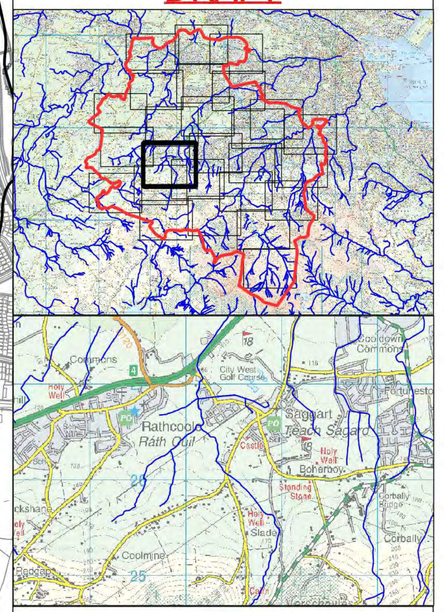
Legend

- Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- Watercourse Centreline
- Indicative Flood Extents
- County Boundary

DRAFT



Comhairle Contae Átha Cliath Theas
South Dublin County Council

Project Strategic Flood Risk Assessment

Title Fluvial Flood Zone Mapping

Figure MDW657_0014

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Issue Details

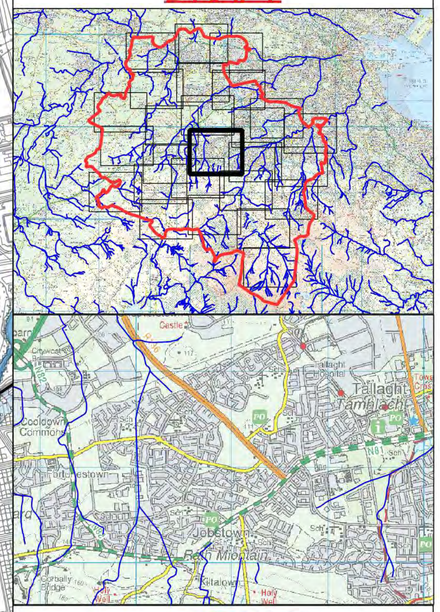
Drawn:	BT	**Project No.**	MDW0657
Checked:	JH	**File Ref**	MDW0657QG0010F02
Approved:	JH		
Scale:	1:6000 @ A1	**Drawing No.**	**Projection**
Date:	14/01/2016	14 of 26	IG

Notes
1. The viewer of this map should refer to the SFRA Report and Disclaimer

Legend

- Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- Watercourse Centreline
- Indicative Flood Extents
- County Boundary

DRAFT



0 200 400 600 800 1000 m

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Project: Strategic Flood Risk Assessment

Title: Fluvial Flood Zone Mapping

Figure: MDW657_0015

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Issue Details

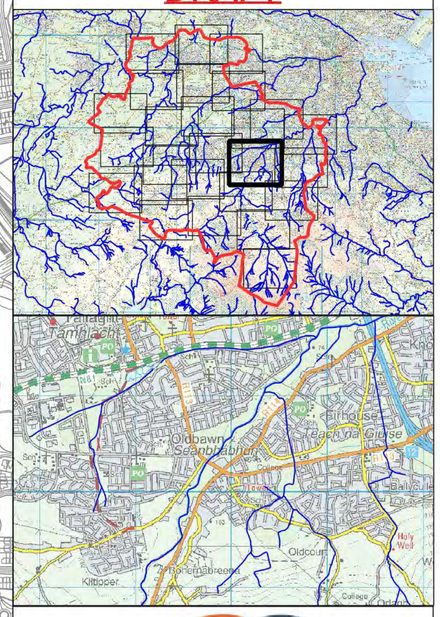
Drawn:	BT	**Project No.**	MDW0657
Checked:	JH	**File Ref**	MDW0657QG0010F02
Approved:	JH		
Scale:	1:6000 @ A1	**Drawing No.**	**Projection**
Date:	14/01/2016	15 of 26	IG

Notes
1. The viewer of this map should refer to the SFRA Report and Disclaimer

Legend

- Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- Watercourse Centreline
- Indicative Flood Extents
- County Boundary

DRAFT



0 200 400 600 800 1000 m

Comhairle Contae Átha Cliath Theas
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Project Strategic Flood Risk Assessment

Title Fluvial Flood Zone Mapping

Figure MDW657_0016

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Issue Details

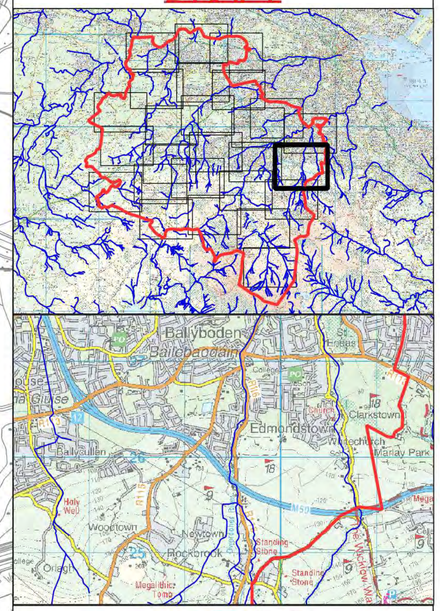
Drawn:	BT	**Project No.**	MDW0657
Checked:	JH	**File Ref**	MDW0657QG0010F02
Approved:	JH		
Scale:	1:6000 @ A1	**Drawing No.**	**Projection**
Date:	14/01/2016	16 of 26	IG

Notes
1. The viewer of this map should refer to the SFRA Report and Disclaimer

Legend

- Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- Watercourse Centreline
- Indicative Flood Extents
- County Boundary

DRAFT



0 200 400 600 800 1000 m

Comhairle Contae Átha Cliath Theas
South Dublin County Council

Project: Strategic Flood Risk Assessment

Title: Fluvial Flood Zone Mapping

Figure: MDW657_0017

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Issue Details

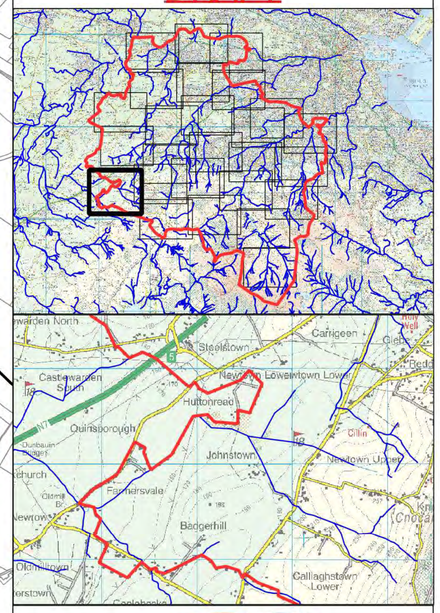
Drawn:	BT	Project No.	MDW0657
Checked:	JH	File Ref	MDW0657QG0010F02
Approved:	JH		
Scale:	1:6000 @ A1	Drawing No.	Projection
Date:	14/01/2016	17 of 26	IG

Notes
1. The viewer of this map should refer to the SFRA Report and Disclaimer

Legend

- Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- Watercourse Centreline
- Indicative Flood Extents
- County Boundary

DRAFT



0 200 400 600 800 1000 m

Comhairle Contae Átha Cliath Theas
South Dublin County Council

Project: Strategic Flood Risk Assessment

Title: Fluvial Flood Zone Mapping

Figure: MDW657_0018

RPS Consulting Engineers
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Issue Details

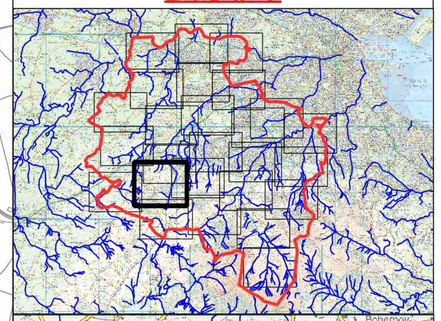
Drawn:	BT	**Project No.**	MDW0657
Checked:	JH	**File Ref**	MDW0657QG0010F02
Approved:	JH		
Scale:	1:6000 @ A1	**Drawing No.**	**Projection**
Date:	14/01/2016	18 of 26	IG

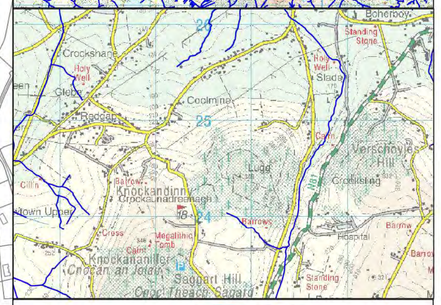
Notes
1. The viewer of this map should refer to the SFRA Report and Disclaimer

Legend

- Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- Watercourse Centreline
- Indicative Flood Extents
- County Boundary

DRAFT





Comhairle Contae Átha Cliath Theas
South Dublin County Council

Project	Strategic Flood Risk Assessment
Title	Fluvial Flood Zone Mapping
Figure	MDW657_0019

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Issue Details

Drawn:	BT	Project No.	MDW0657
Checked:	JH	File Ref	MDW0657QG0010F02
Approved:	JH		
Scale:	1:6000 @ A1	Drawing No.	Projection
Date:	14/01/2016	19 of 26	IG

Notes

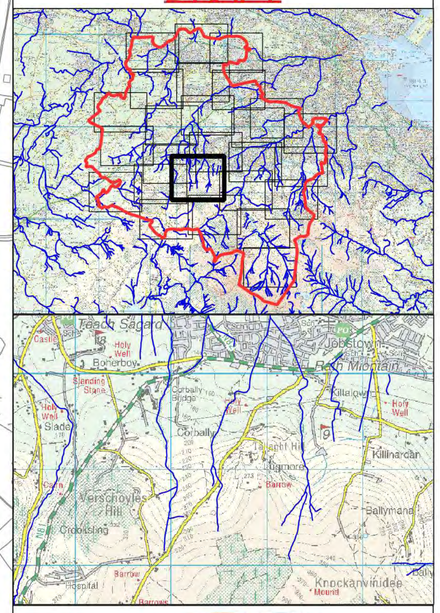
1. The viewer of this map should refer to the SFRA Report and Disclaimer

0 200 400 600 800 1000 m

Legend

- Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- Watercourse Centreline
- Indicative Flood Extents
- County Boundary

DRAFT



Comhairle Contae Átha Cliath Theas
South Dublin County Council

Project: Strategic Flood Risk Assessment

Title: Fluvial Flood Zone Mapping

Figure: MDW657_0020

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Issue Details

Drawn:	BT	Project No.	MDW0657
Checked:	JH	File Ref	MDW0657QG0010F02
Approved:	JH		
Scale:	1:6000 @ A1	Drawing No.	Projection
Date:	14/01/2016	20 of 26	IG

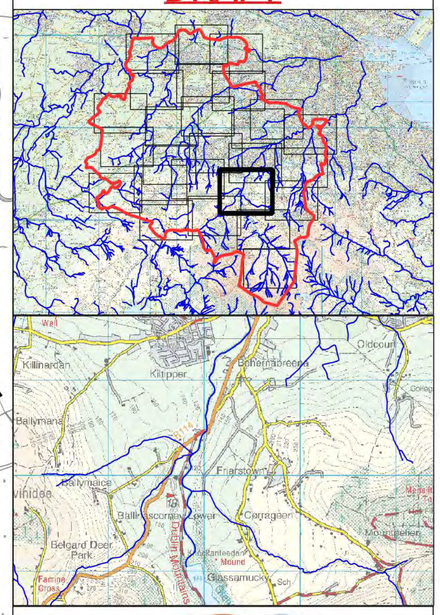
Notes
1. The viewer of this map should refer to the SFRA Report and Disclaimer

0 200 400 600 800 1000 m

Legend

- Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- Watercourse Centreline
- Indicative Flood Extents
- County Boundary

DRAFT



Comhairle Contae Átha Cliath Theas
South Dublin County Council

Project: Strategic Flood Risk Assessment

Title: Fluvial Flood Zone Mapping

Figure: MDW657_0021

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Issue Details

Drawn:	BT	**Project No.**	MDW0657
Checked:	JH	**File Ref**	MDW0657QG0010F02
Approved:	JH		
Scale:	1:6000 @ A1	**Drawing No.**	**Projection**
Date:	14/01/2016	21 of 26	IG

Notes

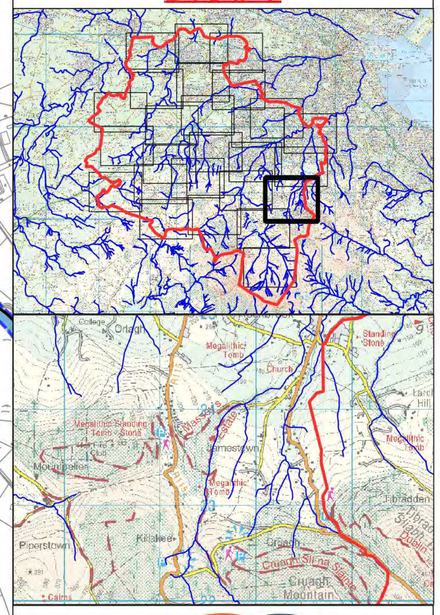
1. The viewer of this map should refer to the SFRA Report and Disclaimer

0 200 400 600 800 1000 m

Legend

- Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- Watercourse Centreline
- Indicative Flood Extents
- County Boundary

DRAFT



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Comhairle Contae Átha Cliath Theas
South Dublin County Council

Project	Strategic Flood Risk Assessment
Title	Fluvial Flood Zone Mapping
Figure	MDW657_0022

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Drawn:	BT	Project No.	MDW0657
Checked:	JH	File Ref	MDW0657QG0010F02
Approved:	JH		
Scale:	1:6000 @ A1	Drawing No.	Projection
Date:	14/01/2016	22 of 26	IG

Notes
1. The viewer of this map should refer to the SFRA Report and Disclaimer

Legend

- Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- Watercourse Centreline
- Indicative Flood Extents
- County Boundary

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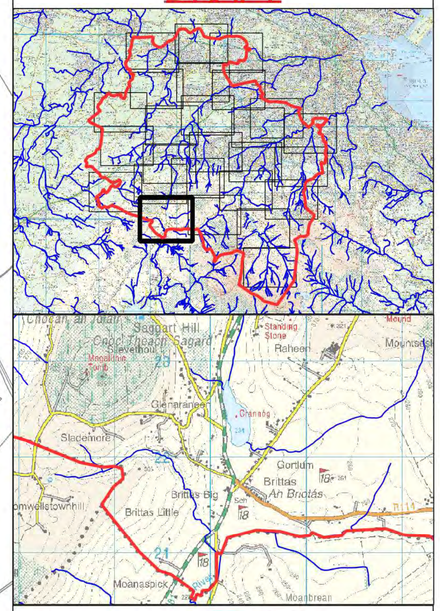

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Comhairle Contae Átha Cliath Theas
South Dublin County Council

Project Strategic Flood Risk Assessment

Title Fluvial Flood Zone Mapping

Figure MDW657_0023

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Issue Details

Drawn:	BT	**Project No.**	MDW0657
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Approved:	JH		
Scale:	1:6000 @ A1	**Drawing No.**	**Projection**
Date:	14/01/2016	23 of 26	IG

Notes
1. The viewer of this map should refer to the SFRA Report and Disclaimer

Legend

- Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- Watercourse Centreline
- Indicative Flood Extents
- County Boundary

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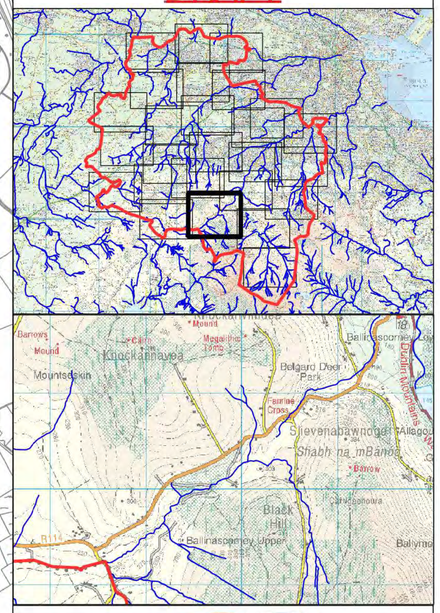

0 200 400 600 800 1000 m

Comhairle Contae Átha Cliath Theas
South Dublin County Council

Project: Strategic Flood Risk Assessment

Title: Fluvial Flood Zone Mapping

Figure: MDW657_0024

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Scale:	1:6000 @ A1	**Drawing No.**	**Projection**
Date:	14/01/2016	24 of 26	IG

Notes
1. The viewer of this map should refer to the SFRA Report and Disclaimer

Legend

- Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- Watercourse Centreline
- Indicative Flood Extents
- County Boundary

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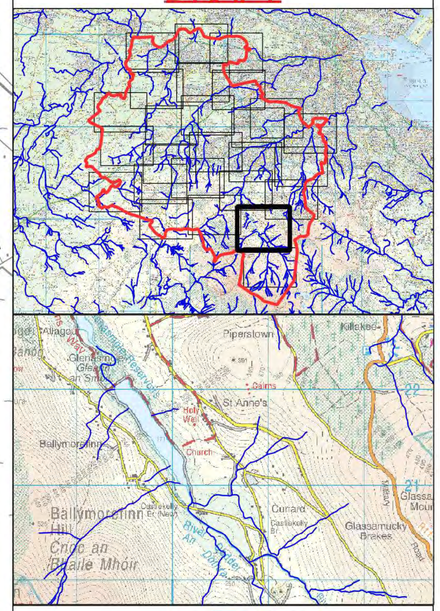

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Comhairle Contae Átha Cliath Theas
South Dublin County Council

Project: Strategic Flood Risk Assessment

Title: Fluvial Flood Zone Mapping

Figure: MDW657_0025

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Scale:	1:6000 @ A1	**Drawing No.**	**Projection**
Date:	14/01/2016	25 of 26	IG

Notes

1. The viewer of this map should refer to the SFRA Report and Disclaimer

Legend

- Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- Watercourse Centreline
- Indicative Flood Extents
- County Boundary

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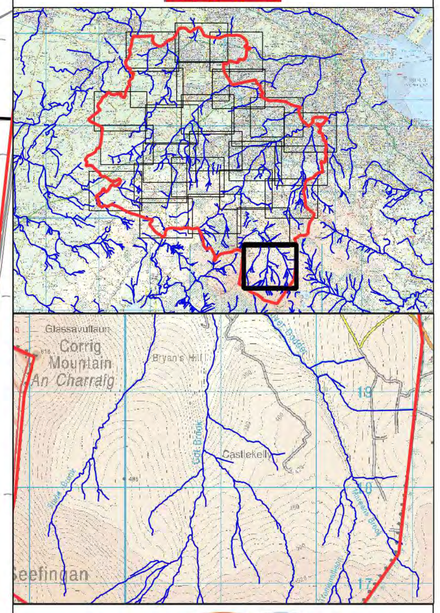

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Comhairle Contae Átha Cliath Theas
South Dublin County Council

Project	Strategic Flood Risk Assessment
Title	Fluvial Flood Zone Mapping
Figure	MDW657_0026

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Scale:	1:6000 @ A1	Drawing No.	Projection
Date:	14/01/2016	26 of 26	IG

Notes
1. The viewer of this map should refer to the SFRA Report and Disclaimer

APPENDIX C

FLOOD RISK INFORMATION SOURCES

Information Source	Comments
Environmental Report of The Draft Amendments to the Approved Adamstown SDZ Planning Scheme, 2003 - Strategic Environmental Assessment	Has details of the storm water drainage system installed in the Adamstown SDZ lands. Flood zones and flood locations were identified using the PFRA Mapping and information from floodmaps.ie Flood Risk Management Policies were adopted for the LAP based on the "The Planning System and Flood Risk Management – Guidelines for Planning Authorities"
Draft Ballycullen Oldcourt Local Area Plan - Initial Strategic Flood Risk Assessment	Flood zones and flood locations were identified using the PFRA Mapping and information from floodmaps.ie. A review of the Dodder CFRAMs found that this area was excluded from the Flood Zone Mapping. Stream improvement and surface water system works were proposed. Flood Risk Management Policies were adopted for the LAP based on the "The Planning System and Flood Risk Management – Guidelines for Planning Authorities"
Addendum to Ballycullen Oldcourt Initial Strategic Flood Risk Assessment following the Public Consultation for the LAP	Additional Flood zones and Flood Risk Management Policies were adopted for the LAP.
Clonburris Proposed SDZ Planning Scheme & Proposed Local Area Plan Environmental Report	Flood Data gathered based on historical information. Flood Management Policies adopted to minimise the surface run-off entering storm water drainage systems.
Environmental Report of the Draft Fortunestown Local Area Plan 2011-2017 Strategic Environmental Assessment	Flood zones and flood locations were identified using the Indicative Flood Zones modelled by JBA Consulting and information from floodmaps.ie. Flood Risk Management Policies were adopted for the LAP based on the "The Planning System and Flood Risk Management – Guidelines for Planning Authorities"
Newcastle Local Area Plan - Initial Strategic Flood Risk Assessment	Flood zones and flood locations were identified using the PFRA Mapping and information from floodmaps.ie. Identified that flood alleviation works were previously carried out on the Griffeen (2005) and the Shinkeen (2001). Flood Risk Management Policies were adopted for the LAP based on the "The Planning System and Flood Risk Management – Guidelines for Planning Authorities"
Environmental Report of the Draft South Dublin County Development Plan 2010-2016 Strategic Environmental Assessment	Flood zones and flood locations were identified using the PFRA Mapping and information from floodmaps.ie. Flood Risk Management Policies were recommended for the CDP based on the "The Planning System and Flood Risk Management – Guidelines for Planning Authorities" Commitment made to assist in the CFRAM programme. Listed a number of schemes that SDCC had initiated: ▪ Robinhood Stream Improvement Scheme ▪ Tubermaclugg Improvement Scheme ▪ Griffeen River Flood Alleviation Scheme ▪ Camac River Phae II Improvement Scheme

	▪ Whitehall Road Flood Alleviation Scheme
South Dublin County Council DEVELOPMENT PLAN 2010 - 2016 Written Statement Including Variations 1 & 2	Flood zones and flood locations were identified using the PFRA Mapping and information from floodmaps.ie. Flood Risk Management Policies were adopted for the CDP based on the "The Planning System and Flood Risk Management – Guidelines for Planning Authorities" Commitment made to assist in the CFRAM programme. Listed a number of schemes that SDCC would undertake subject to approval and finance ▪ Robinhood Stream Improvement Scheme ▪ Dodder River Improvements
OPW Preliminary Flood Risk Assessment Indicative Fluvial Flood Maps	Shows the indicative fluvial flood extent for SDC. These were compared to the CFRAMs to identify any potential data gaps.
Eastern CFRAM Study – Flood Risk Review Final Report	Carried out a flood risk review on a number of areas in SDC including Esker South, Finnstown, Hazelhatch, Lucan to Chapelizod and Rathcoole, Saggart & Baldonnel. Established that some of these areas would require a more detailed assessment of flood risk.
Eastern CFRAM Study – Ha09 Hydrology Report	Shows the extent of modelled river channels and flood plains for areas in SDC. Used to compare against the PFRA maps to infill any excluded areas of interest.
Eastern CFRAM Study Overarching Report On The October 2011 Flood Event	Shows the extent of the flooding that affected areas in SDC during the 2011 event. Used to compare against the CFRAM / PFRA maps to identify potential gaps in the existing mapping.
River Dodder Catchment Flood Risk Assessment And Management Study Draft Flood Risk Assessment And Management Plan	Reviewed to establish which areas in SDC and policies are relevant to the Final Dodder FRMP. Also shows the extent of modelled river channels and flood plains for areas in SDC.
River Dodder Flood Alleviation Works – Phase 2b Additional Flood Cell Analysis	Shows the extent and proposed works for areas in SDC. This includes defence works in Rathfarnham along the Whitechurch River at St. Enda's and Tara Hill (as part of the Dodder CFRAM)
Irish Coastal Protection Strategy Study – Phase 3 – North East Coast	A review of existing indicative coastal flooding mapping from the Irish Coastal Protection Strategy Study (ICPSS) also shows that coastal flooding does not extend upstream as far as the South Dublin County boundary on the Liffey, Poddle or Dodder Rivers.

APPENDIX D

INDICATIVE PLUVIAL FLOOD ZONE MAPPING

Legend

- Pluvial - 1% AEP Flood Extent (1 in100 chance in any given year)
- Pluvial - 0.1% AEP Flood Extent (1 in1000 chance in any given year)
- Watercourses
- County Boundary

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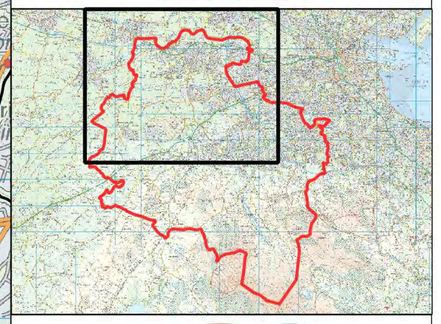

Comhairle Contae Átha Cliath Theas
South Dublin County Council

Project
Strategic Flood Risk Assessment

Title
PFRA Indicative Pluvial Flood Zone Mapping

Figure
MDW0657_00027

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Approved:	JH		
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Date:	14/01/2016	1 of 4	IG

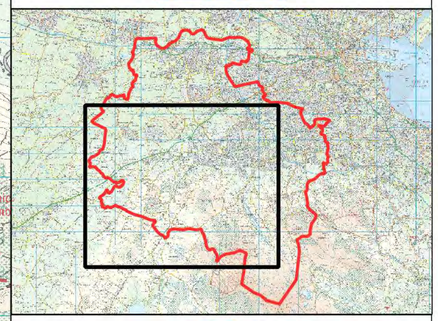
Notes

1. The viewer of this map should refer to the SFRA Report and Disclaimer

Legend

- Pluvial - 1% AEP Flood Extent (1 in100 chance in any given year)
- Pluvial - 0.1% AEP Flood Extent (1 in1000 chance in any given year)
- Watercourses
- County Boundary

DRAFT



Comhairle Contae Átha Cliath Theas
South Dublin County Council

Project Strategic Flood Risk Assessment

Title PFRA Indicative Pluvial Flood Zone Mapping

Figure MDW0657_00028

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Issue Details

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Approved:	JH		
Scale:	1:20000	**Drawing No.**	**Projection**
Date:	14/01/2016	2 of 4	IG

Notes

1. The viewer of this map should refer to the SFRA Report and Disclaimer
2. Ordnance Survey Ireland Licence No. EN 0005016

Legend

- Pluvial - 1% AEP Flood Extent (1 in100 chance in any given year)
- Pluvial - 0.1% AEP Flood Extent (1 in1000 chance in any given year)
- Watercourses
- County Boundary

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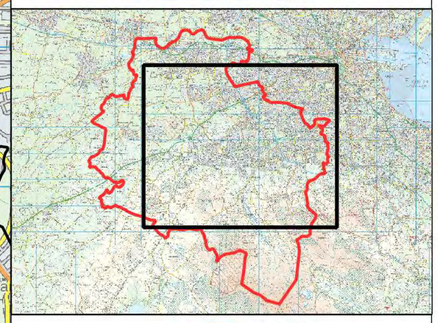

Comhairle Contae Átha Cliath Theas
South Dublin County Council

Project Strategic Flood Risk Assessment

Title PFRA Indicative Pluvial Flood Zone Mapping

Figure MDW0657_00029

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Date:	14/01/2016	3 of 4	IG

Notes

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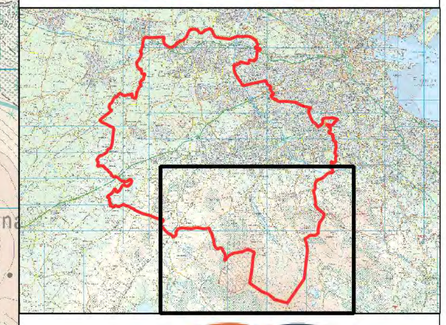
Legend

- Pluvial - 1% AEP Flood Extent (1 in100 chance in any given year)
- Pluvial - 0.1% AEP Flood Extent (1 in1000 chance in any given year)
- Watercourses
- County Boundary

DRAFT



Comhairle Contae Átha Cliath Theas
South Dublin County Council

Project	Strategic Flood Risk Assessment
Title	PFRA Indicative Pluvial Flood Zone Mapping
Figure	MDW0657_00030

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Scale:	1:20000	Drawing No.	Projection
Date:	14/01/2016	4 of 4	IG

Notes

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