



# DRAFT COUNTY DEVELOPMENT PLAN **2016-2022**

*Proposed Amendments  
November 2015*





## Contents

---

		<b>Page No.</b>
<b>Part 1:</b>	<b>Outlines the Purpose of this Document and the Relevant Legislative Requirements</b>	<b>3-6</b>
<b>Part 2:</b>	<b>Proposed Amendments to Written Statement of the Draft County Development Plan</b>	<b>7-102</b>
<b>Part 3:</b>	<b>Proposed Amendments to Certain Appendices of Draft County Development Plan</b>	<b>103-294</b>





## **Part 1**

**Outlines the Purpose of this Document and the  
Relevant Legislative Requirements**



## Introduction

---

The Draft Dún Laoghaire-Rathdown County Development Plan 2016-2022 was put on public display for a 10-week period between 2<sup>nd</sup> March and 11<sup>th</sup> May 2015. At the end of the display period a total of 708 no. submissions had been received in response to that public consultation process.

This document focuses on the proposed amendments made by the Elected Members of Dún Laoghaire-Rathdown County Council following consideration of the Draft County Development Plan 2016-2022 and the Chief Executive's Report on the various submissions received.

Having considered the Draft County Development Plan 2016-2022 and the Chief Executive's Report on submissions received it was resolved by the Elected Members at Council meetings on 13th, 15th, 19th, and 22nd of October 2015 to amend the Draft Development Plan. At the meetings the Council resolved that as a number of these amendments constitute a Material Alteration to the Draft Development Plan, the proposed amendments would be placed on public display for a period of not less than 4 weeks in accordance with Section 12(7)(b) of the Planning and Development Act 2000 (as amended).

---

## Purpose of this Document

The purpose of this report is to help inform and assist the public and other interested parties in consideration of the proposed amendments to the Draft County Development Plan.

In accordance with Section 12(7)(ab) of the Planning and Development Act 2000 (as amended), the Chief Executive made a determination that a Strategic Environmental Assessment and Appropriate Assessment were required to be carried out for certain of the proposed Material Amendments (Chief Executive's Order No. P.Gen 31/15).

A copy of the Proposed Amendments, the determination and the Strategic Environmental Assessment and Appropriate Assessment of the amendments are on display from Tuesday 24th November, 2015 to Tuesday 22nd December, 2015, inclusive, Monday to Friday.

Written observations or submissions regarding the Material Amendments to the Draft County Development Plan or the Assessments made under Section 12 (7) of the Planning and Development Acts 2000 (as amended) are invited from members of the public and other interested parties. Written submissions or observations must be received between Tuesday the 24<sup>th</sup> November and Tuesday the 22<sup>nd</sup> December 2015. The Chief Executive will then prepare a further report on all submissions or observations received during the above time period and subsequently submit this to the Members for their consideration. Having considered the amendments to the Draft Plan and the Chief Executive's Report on submissions received, Members will make the new Dún Laoghaire-Rathdown County Development Plan 2016-2022 in late February 2016.



## How this Document is Organised

The adopted amendments to the Plan are set out in Parts 2 and 3. They include changes to the text of the Draft Dún Laoghaire-Rathdown County Development Plan Written Statement and certain Appendices which were also subject to amendments. An amended SEA Environmental Report - which assesses the significance of Environmental Impacts of the proposed amendments to the Draft Plan and an amended Appropriate Assessment Report – called a Natura Impact Report – are also on public display but these are bound separately.

**Amendments** to the text are 'signalled' through the use of black print italics, like this:

*"Add the following text at the end of Section 6.1.2(ii) as follows:"* or

*"Insert additional bullet point to Section 8.2.3.1"*

**Deletions** to the text are shown in blue print with strikethrough, for example:

~~"The Council has prepared an Interim Housing Strategy in anticipation of the Department of Environment Community and Local government forthcoming planning Bill and subsequent Act which will include a review of Part V. It is the intention to review and finalise the Housing Strategy if and when Part V is altered during the lifetime of this Plan. Any review shall take into account the Government's 'Social housing Strategy 2020'"~~

**Additions** to the text are shown in red print, for example:

"It is Council policy to support the development **improvement** and provision of a wide range of community facilities distributed in an equitable manner throughout the County".

**Mapping** - The Amendments Document is accompanied by 14 no. Amendments Maps (A1 format) showing the location of objectives that were included, altered or omitted – including roads and other objectives – and the sites subject to rezoning. It is important that the Amendments Documents are read in conjunction with the accompanying Amendments Maps.

## **Part 2**

### **Proposed amendments to Written Statement of the Draft County Development Plan**





## Acronyms (page v)

---

*Insert text after DTTaS as follows:*

ECFRAM – Eastern Catchment Flood Risk Assessment and Management



# Section 1: Strategic Overview





## **Section 1.1 Introduction and Context**

### **Section 1.1.3.2 Regional Policy and Guidelines (page 5)**

*Amend text of Section 1.1.3.2 as follows:*

"This Draft County Development Plan ~~had been prepared having regard to the~~ **has been prepared to be consistent with the** current 'Regional Planning Guidelines for the Greater Dublin Area' and **having regard to** the National Transport Authority (NTA) 'Greater Dublin Area Draft Transport Strategy'".

---

## **Section 1.2 Core Strategy**

### **Section 1.2.6.2 Demand for Employment Zoned Lands (page 18)**

*Amend last sentence of Section 1.2.6.2 as follows:*

"The largest single employer in the County – UCD – remained largely unchanged at ~~€5,500~~ **€4,000**."

### **Section 1.2.6.3(i) Employment Land (page 19)**

*Amend fifth sentence of Section 1.2.6.3(i) as follows:*

"UCD currently has a workforce of ~~€5,500~~ **€4,000** and is located in lands..."

---

## **Section 1.3 Development Areas and Regeneration**

### **Section 1.3.3 Local Area Plans (page 22)**

*Insert the following text to the end of the first paragraph of Section 1.3.3 as follows:*

**"In accordance with Section 10 (2) (h) of the Planning and Development Act 2010 (as amended), the following areas are considered to contain lands in need of regeneration/renewal – Dún Laoghaire, Dundrum, Sallynoggin and Stillorgan. There are differing definitions of regeneration in urban planning but it is taken to mean the integrated local redevelopment of an area".**

**Section 1.3.4 Local Area Plans in Dun Laoghaire-Rathdown (page 22)**

*Amend Table 1.3.1: Local Area Plans as follows:*

<b>Table 1.3.1: Local Area Plans</b>				
<b>Local Area Plan</b>	<b>Plan Period</b>	<b>Adopted</b>	<b>Extended</b>	<b>Compliance with Core Strategy</b>
Woodbrook/ Shanganagh 2006 - 2016	10 years	November 2006	November 2016 (To be reviewed during the lifetime of the County Development Plan).	Quantum and type of development is in accordance with the Core Strategy.
Kiltiernan/ Glenamuck 2013	5 years	September 2013		Quantum and type of development is in accordance with the Core Strategy although some elements will be delivered over a longer horizon.
Stillorgan 2007 - 2017	10 years	October 2007	October 2017 (To be reviewed during the lifetime of the County Development Plan).	Quantum and type of development is in accordance with the Core Strategy.
Glencullen 2008 - 2018	10 years	March 2008	March 2018 (To be reviewed during the lifetime of the County Development Plan).	No major development proposed.
Deansgrange 2010 - 2020	10 years	June 2010		Quantum and type of development is in accordance with the Core Strategy. Only a small amount of residential infill is proposed.
Goatstown 2012 - 2018	6 years	April 2012		Quantum and type of development is in accordance with the Core Strategy. Only a small amount of residential infill is proposed.
<del>Draft</del> Blackrock Local Area Plan	6 years	March 2015		
Dundrum Local Area Plan.	New Plan to be prepared.			
Sallynoggin	New Plan to be prepared.			
Old Conna	New Plan to be prepared when infrastructural constraints are overcome.			Quantum and level of development will be in accordance with the Core Strategy.
Stepaside Action Area Plan area to be extended to include parts of Carrickmines and Glenamuck	New Plan to be prepared (Ballyogan and Environs LAP).			Quantum and level of development will be in accordance with the Core Strategy.
Dun Laoghaire and Environs	New Plan to be prepared			
<del>Clonskeagh/UCD Local Area Plan</del>	<del>New Plan to be prepared</del>			
Ballybrack/ Loughlinstown Local Area Plan	New Plan to be prepared			



**Section 1.3.4.1 Woodbrook-Shanganagh (page 24)**

*Addition of an extra sentence at the end of section as follows:*

However, the Local Area Plan is due for review in 2016 and it is recommended that this review be carried out during the lifetime of this County Development Plan.

**Section 1.3.4.3 Kiltiernan-Glenamuck (page 25)**

*Addition of an extra sentence at the end of section as follows:*

The Plan is due for review in 2017 and it is recommended that this review be carried out during the lifetime of this County Development Plan.

**Section 1.3.4.8 Blackrock (page 27)**

*Amend section 1.3.4.8 as follows*

Following on from an objective contained in the County Development Plan 2010 - 2014 a ~~draft Local Area Plan has been prepared for Blackrock.~~ the Blackrock Local Area Plan 2015 – 2021 was adopted in March 2015.

**Section 1.3.4.9 Stepside (page 27)**

*Addition of an extra sentence at the end of section as follows:*

As part of the Local Area Plan process the Planning Authority will explore the opportunity for the reuse of the old Garda Station in Stepside for community use.

**Section 1.3.4.10 Dundrum (page 28-29)**

*Insertion of additional bullet point as follows:*

Support and promotion of Dundrum Town Centre in general, and the Pembroke District in particular, as an important focus of restaurant, leisure and evening uses subject to the safeguarding of surrounding residential amenity.

**Section 1.3.4.13 Clonskeagh/UCD (page 29)**

*Delete text as follows:*

~~1.3.4.13 Clonskeagh/UCD~~

~~It is the intention of the Council to prepare a Local Area Plan for the Clonskeagh/UCD area. The boundary of this Plan will be decided at the pre-draft Local Area Plan stage.~~

**Section 1.3.4.14 Ballybrack/Loughlinstown (page 29)**

*Insert text as follows:*

It is the intention of the Council to prepare a Local Area Plan for the Ballybrack area during the life time of the Development Plan. The boundary of this Plan will be decided at the pre-draft Local Area Plan stage.

## **Section 2:** Sustainable Communities Strategy



## 2.1 Residential Development

---

### **Section 2.1.2 Housing Strategy (page 33-34)**

*Amend text as follows*

"The preparation of a Housing Strategy is a mandatory requirement under the Planning and Development Act 2000 - 2012. An ~~Interim~~ Housing Strategy for the period 2016-2022 has been prepared ~~taking account of the changes to Part V as outlined in the Urban Regeneration and Housing Act 2015~~ and is included as Appendix 2 accompanying the Written Statement. The primary objectives of the ~~Interim~~ Housing Strategy are:

- to enable every household to have available to it a good quality dwelling, suited to its needs, and in the context of a high quality environment, and
- to ensure that Dún Laoghaire-Rathdown County Council provides for the development of sufficient housing to meet its obligations as set out in the Regional Planning Guidelines for the Greater Dublin Area 2010 - 2022.

The Housing Strategy is a pivotal component of the Development Plan process as it must:

- Estimate housing needs, and ensure that zoned and serviced land is available. (Refer to Core Strategy Section 1.2).
  - Provide, as a general policy, that a specific percentage (not exceeding ~~20~~ 10%) of land zoned for residential use, or for a mixture of residential and other uses, be reserved for social/affordable housing.
  - Ensure a mix of house types and sizes for different categories of households.
  - Counteract undue segregation between different social backgrounds."
- 

### **Section 2.1.3. Housing – Supply and Demand**

#### **Section 2.1.3.2 RES2: Implementation of ~~Interim~~ Housing Strategy (page 35)**

*An additional bullet point at the end of Section 2.1.3.2 as follows:*

- "semi-independent or supported living accommodation for people with intellectual and/or physical disabilities"

*Amend text as follows:*

"It is Council policy to facilitate the implementation and delivery of the ~~Interim~~ Housing Strategy 2016 – 2022.

The Council has prepared an ~~Interim~~ Housing Strategy ~~in anticipation of the Department of Environment Community and Local government forthcoming planning Bill and subsequent Act which will include a review of Part V . It is the intention to review and finalise the Housing Strategy if and when Part V is altered during the lifetime of this Plan. Any review shall take into account the Government's 'Social housing Strategy 2020' in accordance with the Planning and Development Act 2000 (as amended) and the Urban Regeneration and Housing Act 2015.~~ The ~~Interim~~ Housing Strategy provides that a 10% social housing requirement will be applied in relation to all sites that are:

- i) residentially zoned, or
- ii) mixed use development proposals including residential on any zoning in the County, unless it is of a type otherwise stated to have a reduced/ modified obligation or is otherwise exempted.

The application of the 10% requirement to particular lands, will be determined both by the provisions of the Acts and the requirements of the Housing Strategy.

In deciding upon the type of agreement to be entered into, the Planning Authority shall consider, in accordance with the Planning and Development Act and the Urban Regeneration and Housing Act 2015, whether the agreement:

- Will contribute effectively and efficiently to the achievement of the objectives of the Housing Strategy”.

### **Section 2.1.3.8 Policy RES8: Provision of Social Housing (page40)**

*Amend the text as follows:*

**“It is Council policy to promote the provision of social housing in accordance with the projects outlined in the Council’s Interim Housing Strategy and Government policy as outlined in the DoECLG ‘Social Housing Strategy 2020’.**

Government policy seeks to ensure that each household has accommodation appropriate to its needs at a price or rent it can afford, and to provide for persons who are unable to provide accommodation from their own resources. Part V of the Planning and Development Act 2000 (as amended) and the Urban Regeneration and Housing Act 2015 are is only one such means through which the Local Authority can seek to address demand for social housing in the County. Emphasis has shifted from Council-driven building programmes to provision by Approved Housing Bodies (AHBs) and rental schemes in recent years. In addition, and in furtherance of Policy RES8, the Council will inter alia:

- Support the work of the Dublin Social Housing Delivery Taskforce (DSHDT).
- Acquire land or buildings for future housing and community facilities where services exist/or are planned.
- Make sites available in serviced areas for housing development for persons in need of housing, including homeless accommodation.
- Rehabilitate its housing stock where necessary, and encourage same in private housing.
- Utilise the private rental sector, and continue to work with Approved Housing Bodies (AHBs).
- Continue to house persons through the Rental Accommodation Scheme (RAS), the Housing Assistance Payments Scheme (HAP) and the Social Housing Leasing Initiative (SHLI).
- Ensure provision of a range of house types/sizes to cater for different needs, including sheltered and special needs housing.

The Interim Housing Strategy contained in Appendix 2 identifies the need for 4,531 new social housing units over the lifetime of the Plan”.

**Section 2.1.3.9 Policy RES9: Housing for People with Disabilities (page43)**

*Addition of the following text at the end of section 2.1.3.9:*

“It is an objective of the Council to encourage the provision of suitable housing for people with intellectual disabilities which will allow them to live within their communities in an appropriately independent or supported manner”.





## 2.2 Sustainable Travel and Transportation

---

### **Section 2.2.2 Policy Context (page 49)**

*Add an additional bullet point at the end of the list, as follows:*

**"Spatial Planning and National Roads, Guidelines for Local Authorities 2012"**

*Delete photo on page 49 as follows:*



*Add new photo on page 49 as follows:*



### **Section 2.2.5 Current Public Transport Networks (page 54)**

*Amend text within the 'Roads' Section of Section 2.2.5 as follows:*

"There are three significant National Road corridors that operate through the County – M50, N11/M11 and ~~N32~~ N31."

---

### **Section 2.2.6 Planning for Sustainable Living (page 54)**

*Add the following Policy at the start of Section 2.2.6 as follows:*

#### **"Policy ST1: Future Transport Infrastructure and the Requirements of EU Directives**

**It is Council policy to require that all developments relating to the provision of future transport infrastructure integrate the requirements of the EIA Directive, Habitats Directive, Water Framework Directive and Floods Directive, as appropriate."**

#### **Section 2.2.6.1 Policy ST1: Integration of Land Use and Transportation Policies (page 54)**

*Amend text to Policy ST1 as follows:*

**"Section 2.2.6.~~1~~2 Policy ~~ST1~~ ST2"**

#### **Section 2.2.6.2 Policy ST2: Development of Sustainable Travel and Transportation Policies (page 54)**

*Amend text to Policy ST2 as follows:*

**"Section 2.2.6.~~2~~3 Policy ~~ST2~~ ST3"**

#### **Section 2.2.6.3 Policy ST3: Accessibility (page 55)**

*Amend text to Policy ST3 as follows:*

**"Section 2.2.6.~~3~~4 Policy ~~ST3~~ ST4"**

---

### **Section 2.2.7 Walking and Cycling**

#### **Section 2.2.7.1 Policy ST4: Walking and Cycling (page 56)**

*Amend text to Policy ST4 as follows:*

**"Policy ~~ST4~~ ST5"**

**Section 2.2.7.1 Policy ST5: Walking and Cycling (page 56)**

*Insert text to Policy ST5 as follows:*

"The Council will continue to promote and provide for the development of cycling and walking as healthy sustainable attractive transport modes in the County for commuting, short utility trips, recreation trips and trips to schools/colleges. **It is proposed that, over the lifetime of the Plan, the Council will develop a Walking and Cycling Policy for the County. This will be undertaken in conjunction with all interested stakeholders and will incorporate items such as mountain trails, cycle tourism and cycling promotion".**

*Insert text to Policy ST5 as follows:*

"As part of the Development Management process, new development will be required to maximise permeability and connectivity for pedestrians and cyclists to create direct attractive links to adjacent road and public transport networks in accordance with in the 'Urban Design Manual – A Best Practice Guide', (2008) and 'Design Manual for Urban Roads and Streets' (DMURS) (2013). **Where practicable, retrospective implementation of walking and cycling routes - to maximise permeability and connectivity - may also be required within existing neighbourhoods."**

**Section 2.2.7.2 Policy ST5: Footways and Pedestrian Routes (page 56)**

*Amend text to Policy ST5 as follows:*

**"Policy ~~ST5~~ ST6"**

**Section 2.2.7.3 Policy ST6: County Cycle Network (page 56)**

*Amend text to Policy ST6 as follows:*

**"Policy ~~ST6~~ ST7"**

**Section 2.2.7.4 Policy ST7: Public Bike Facilities (page 57)**

*Amend text to Policy ST7 as follows:*

**"Policy ~~ST7~~ ST8"**

**Section 2.2.7.5 Policy ST8: Directional/Information/Waymarking Signage (page 58)**

*Amend text to Policy ST8 as follows:*

**"Policy ~~ST8~~ ST9"**

**Section 2.2.7.5 Policy ST9: Directional/Information/Waymarking Signage (page 58)**

*Insert text to Policy ST9 as follows:*

"Due consideration should be given to the location of street signage, particularly in urban areas, in the interest of minimising street clutter. Due cognizance shall also be taken of the signage requirements in Section 3.8 of 'Spatial Planning and National Roads Guidelines for Planning Authorities' (2012) relating to signage along National Roads."

#### **Section 2.2.7.6 Policy ST9: Street Lighting (page 58)**

*Amend text to Policy ST9 as follows:*

**"Policy ~~ST9~~ ST10"**

---

### **Section 2.2.8 Public Transport**

#### **Section 2.2.8.1 Policy ST10: Public Transport Improvements (page 59)**

*Amend text to Policy ST10 as follows:*

**"Policy ~~ST10~~ ST11"**

#### **Section 2.2.8.2 Policy ST11: Quality Bus Network (page 59)**

*Amend text to Policy ST11 as follows:*

**"Policy ~~ST11~~ ST12"**

#### **Section 2.2.8.3 Policy ST12: Bus Rapid Transit (BRT) (page 60)**

*Amend text to Policy ST12 as follows:*

**"Policy ~~ST12~~ ST13"**

#### **Section 2.2.8.3 Policy ST13: Bus Rapid Transit (BRT) (page 60)**

*Insert text to Policy ST13 as follows:*

"In addition, the NTA's 'Greater Dublin Area Draft Transport Strategy 2011-2030', makes reference to the Proposed Blue Line BRT route linking the DART line at Sydney Parade Avenue to Sandyford/Dundrum Town Centre via UCD utilizing, where possible, parts of the Eastern Bypass reservation corridor. Any potential additional future short-term uses of the reservation corridor will be subject to a joint feasibility study to be undertaken by the NRA and NTA".

#### **Section 2.2.8.4 Policy ST13: Public Transport Interchanges (page 61)**

*Amend text to Policy ST13 as follows:*

**"Policy ~~ST13~~ ST14"**

**Section 2.2.8.4 Policy ST13: Public Transport Interchanges (page 61)**

*Amend text within Table 2.2.4: Public Transport Interchanges, as follows:*

<b>Table 2.2.4 Public Transport Interchanges</b>	
<b>Location</b>	<b>Public Transport Modes</b>
Blackrock	Suburban Rail – QBN
Dún Laoghaire	Suburban Rail – QBN
Sandyford	Luas – QBN - BRT
Cherrywood	Luas – QBN
Woodbrook	Suburban Rail – QBN
Dundrum	Luas - QBN

**Section 2.2.8.5 Policy ST14: Luas Extension (page 61)**

*Amend text to Policy ST14 as follows:*

**“Policy ~~ST14~~ ST15”**

**Section 2.2.8.6 Policy ST15: Rail Stations/Luas Stops (page 61)**

*Amend text to Policy ST15 as follows:*

**“Policy ~~ST15~~ ST16”**

**Section 2.2.8.7 Policy ST16: Park and Ride (page 62)**

*Amend text to Policy ST16 as follows:*

**“Policy ~~ST16~~ ST17”**

**Section 2.2.8.7 Policy ST17: Taxi/Minibus/Hackney Transport (page 62)**

*Amend text to Policy ST17 as follows:*

**“Policy ~~ST17~~ ST18”**

**Section 2.2.9 Travel Demand Management****Section 2.2.9.1 Policy ST18: Travel Demand Management (page 63)**

*Amend text to Policy ST18 as follows:*

**“Policy ~~ST18~~ ST19”**

**Section 2.2.9.2 Policy ST19: Travel Plans (page 63)**

*Amend text to Policy ST19 as follows:*

**“Policy ~~ST19~~ ST20”**

**Section 2.2.9.3 Policy ST20: Electric Vehicles (page 63)**

*Amend text to Policy ST20 as follows:*

**"Policy ~~ST20~~ ST21"**

**Section 2.2.9.4 Policy ST21: Low Emission Vehicles (page 64)**

*Amend text to Policy ST21 as follows:*

**"Policy ~~ST21~~ ST22"**

**Section 2.2.9.5 Policy ST22: Car Clubs (page 64)**

*Amend text to Policy ST22 as follows:*

**"Policy ~~ST22~~ ST23"**

**Section 2.2.9.6 Policy ST23: Control of On-Street Parking (page 64)**

*Amend text to Policy ST23 as follows:*

**"Policy ~~ST23~~ ST24"**

**Section 2.2.9.6 Policy ST24: Control of On-Street Parking (page 64)**

*Insert text to Policy ST24 as follows:*

"Areas in the County will be identified for the provision of Heavy Goods Vehicle parking when/if the need arises. ~~The Council will also facilitate the provision of car parking spaces for the charging of electric vehicles at appropriate locations.~~"

---

**Section 2.2.10 Roads****Section 2.2.10.1 Policy ST24: Roads (page 64-65)**

*Amend text to Policy ST24 as follows:*

**Policy ~~ST24~~ ST25**

*Amend a textbox within Table 2.2.5 as follows:*

"M50 Junction 14 Diverge, ~~ESB Link Road and Link to Arena Road~~ ramp access to Sandyford (provided via a free flow slip to ESB Link Road (preferred option) or Heather Road".

*Insert a new textbox within Table 2.2.5 as follows:*

**"ESB Link Road and Link to Arena Road".**

**Section 2.2.10.2 Policy ST25: Motorways and National Routes (page 66)**

*Amend text to Policy ST25 as follows:*

**"Policy ~~ST25~~ ST26"**

**Section 2.2.10.2 Policy ST26: Motorway and National Routes (page 66)**

*Insert text to Policy ST26 as follows*

"The Council will facilitate the protection of all National Routes from frontage access and to minimize the number of junctions in accordance with the National Roads Authority's Policy and the Department of Environment, Community and Local Government's 'Spatial Planning and National Roads Guidelines for Planning Authorities' (2012).

The Council will take due cognisance of the M50 Demand Management Report (April 2014) and work alongside all other stakeholders – including the NRA and NTA - in implementing the various measures required to ensure that the strategic function of the M50 is protected and growth in travel demand is managed as set out in the Report."

**Section 2.2.10.3 Policy ST26: Traffic and Transport Assessments and Road Safety Audits (page 66)**

*Amend text to Policy ST26 as follows:*

**"Policy ~~ST26~~ ST27"**

**Section 2.2.10.4 Policy ST27: Traffic Noise (page 66)**

*Amend text to Policy ST27 as follows:*

**"Policy ~~ST27~~ ST28"**

**Section 2.2.10.5 Policy ST28: Road Safety (page 67)**

*Amend text to Policy ST28 as follows:*

**"Policy ~~ST28~~ ST29"**

**Section 2.2.10.5 Policy ST29: Road Safety (page 67)**

*Amend text to Policy ST29 as follows:*

**"It is Council policy to implement the ~~National Road Safety Plan 2013–2020~~ Road Safety Authority's, Road Safety Strategy 2013-2020 in conjunction with relevant stakeholders and agencies."**

**Section 2.2.10.6 Policy ST29: Traffic Management (page 67)**

*Amend text to Policy ST29 as follows:*



**"Policy ~~ST29~~ ST30"****Section 2.2.10.6 Policy ST30: Traffic Management (page 67)**

*Insert text to Policy ST30 as follows:*

"Over the lifetime of this Plan, a 'Countywide Speed Limit Review' will be undertaken in accordance with National Guidelines. In addition, an Accident Investigation and Prevention (AIP) Programme - that will examine in detail road safety issues throughout the County - will be introduced by the Transportation Department over the lifetime of this Plan."

**Section 2.2.10.6 Policy ST29: Traffic Management (page 67)**

*Amend text to Policy ST29 as follows:*

**"Policy ~~ST29~~ ST30"**

---

**Section 2.2.11 Ports****Section 2.2.11.1 Policy ST30: Ports (page 67)**

*Amend text to Policy ST30 as follows:*

**"Policy ~~ST30~~ ST31"****Section 2.2.12.1 Policy ST31: Ports (page 68)**

*Amend text to Policy ST31 as follows:*

**"Policy ~~ST31~~ ST32"**



## **Section 3:** Enterprise and Employment



## Section 3.1 Enterprise and Employment

---

### **Section 3.1.2 Strategy, Policies and Objectives**

#### **Section 3.1.2.14 Policy E14: Tourism and Recreation (page 81)**

*Add the following text at end of paragraph two of Section 3.1.2.14:*

"...will visit the town as part of their cruise tour.

It is Council policy to continue to work in collaboration with other key stakeholders to implement the programmes and plans of the GROW Dublin initiative over the lifetime of the Plan to maximise the tourism potential of the County. Established in 2012 to focus on the marketing and branding of Dublin city and region, the Grow Dublin Tourism Alliance has been tasked with the role of identifying how the city and county could deliver substantial growth based on tourism by 2020. The forum is a major collaborative initiative by the key interested parties including the Dublin Local Authorities, Fáilte Ireland, Dublin Chamber of Commerce, and the tourist industry & development organisations. 'Dublin ' in the context of the Alliance's remit refers to the wider Dublin region comprising Dublin City Council and South Dublin, Fingal and Dún Laoghaire-Rathdown County Councils. The report, 'Destination Dublin - A Collective Strategy for Growth to 2020' was launched in 2014.

The report states the Dublin Region needs to differentiate itself as a 'must-visit' destination. As trips become shorter, particularly to cities, Dublin must distinguish itself as a stand-alone destination and an aspirational European short-break destination. If the variety and vibrancy of the City and County's attractions can be communicated to potential visitors in key target markets, this is where return on investment is likely to be greatest.

The Alliance has identified five key sectors that offer the best potential for significant growth and the best return on investment:

- Holidaymakers identified as 'Social Energisers' - young couples and adult groups looking for excitement, new experiences, and fun, social getaways to novel destinations;
- Holidaymakers identified as 'Culturally Curious' - mostly older couples or solo travellers with time (and money) to spend - independent active sightseers looking to explore new places and broaden their minds
- Business Tourism - where visitor expenditure is amongst the highest of all visitors and who are more prone to visit in times when cash flow for Dublin businesses is critical – in the shoulder and off-seasons;
- Cruise Tourism - who come to the Dublin Region as part of a European cruise;
- Event Tourism - coming to the Dublin Region specifically to attend an event or festival, whether sporting, cultural, business or any other type of event.

The tourism potential of the Dublin Mountains..."

*Add the following text at end of Section 3.1.2.14:*

"The Council will encourage and support the enhancement of the tourism potential of the Dublin Mountains Way including promotion of public transport linkages including Bus, DART and Luas."



## **Section 3.2 Retail and Major Town Centres**

---

There are no amendments to Section 3.2 of the Draft Plan.



## **Section 4:** Green County Strategy





## Section 4.1 Landscape, Heritage and Biodiversity

---

### Section 4.1.2 Landscape

#### Section 4.1.2.1 Policy LHB2: Preservation of Landscape Character Areas\* (page 97)

*Amend text in Policy LHB2 as follows;*

**"It is Council policy to continue to preserve and enhance the character of the County's landscapes in accordance with the recommended strategies as originally outlined in the Landscape Character Assessment (2002 and since updated), in accordance with the 'Draft Guidelines for Landscape and Landscape Assessment' (2000) as issued by the Department of Environment and Local Government, in accordance with the European Landscape Convention (Florence Convention) and in accordance with 'A National Landscape Strategy for Ireland – Strategy Issue Paper for Consultation' (2011). The Council shall implement any relevant recommendations contained in the Department of Arts, Heritage and the Gaelteacht's National Landscape Strategy for Ireland, 2014 5- 20245 as and when it is finalised and published."**

#### Section 4.1.2.2 Policy LHB3: Seascape (page 98)

*Amend text in Policy LHB3 as follows;*

**"It is Council policy to carry out a Seascape Assessment in accordance with any relevant recommendations contained in the Department of Arts, Heritage and the Gaelteacht's 'National Landscape Strategy for Ireland, 2014 5- 20245 as and when it is finalised and published."**

Seascape Assessment is an extension of Landscape Character Assessment and, with 17km of coastline, Seascape is a crucial element of the County's history, identity and culture. It is recognised that a study of Seascape Assessment for parts of the County should be carried out, as there is a need to protect the character and visual potential of the coast and conserve the character and quality of seascapes.

The Planning Acts do not to date contain a legal definition of Seascape. ~~but given the extent of coastal Seascape asset for which the Country is internationally famed it is envisaged that the forthcoming Landscape Strategy for Ireland, will address Seascape Assessment."~~

#### Section 4.1.2.4 Policy LHB5: Historic Landscape Character Areas (page 99)

*Amend text in Policy LHB5 as follows;*

**"In assessing development proposals and in the preparation of plans it is Council policy to have regard to the recommendations and findings of the Historic Landscape Character Assessments (HLCA) already undertaken for a number of the urban-rural fringe areas of the County most likely to come under development pressure."**

#### **Section 4.1.2.6 Policy LHB7: Coastal Zone Management and Dublin Bay (page 100-101)**

*Add additional paragraph to Policy LHB7 as follows:*

"The Council will have regard to any relevant requirements of the EU Maritime Spatial Planning Directive which acknowledges the interrelationship between marine and coastal activities and aims to find coherence between marine spatial planning and integrated coastal management processes".

*Amend text in last line of Policy LHB7 as follows:*

"(Refer also to Section 5.2.5.34 Policy CC1617: Coastal Defence)".

#### **Section 4.1.2.7 Policy LHB8: Development in the 'Nearshore' area (page 101)**

*Add sentence to the end of Policy LHB8 as follows:*

"The Council are cognisant of the requirements and obligations of "The Foreshore and Dumping at Sea (Amendment) Act 2009".

#### **Section 4.1.2.9 Policy LHB10: Beaches (page 101)**

*Introduce an additional Policy after existing policy LHB10:*

#### **"Section 4.1.2.10 Policy LHB11: Dublin Bay Biosphere Reserve**

**It is Council Policy to participate in and actively support the work of the Dublin Biosphere Partnership. In furtherance of this policy the Council will aim to develop and implement a Biosphere work program within the County in Support of the work of the Dublin Bay Biosphere Partnership.**

Biosphere Reserves are places where nature and people connect. They are areas which are internationally recognised for their biological diversity yet also actively managed to promote a positive relationship between people and nature. The Dublin Bay Biosphere Reserve is a special designation awarded by the United Nations Educational, Scientific and Cultural Organisation (UNESCO). It is part of a global network of 651 Biosphere Reserves in 120 countries. The Biosphere designation does not add or detract from the regulatory framework already in place for the Bay but it designed to assist stakeholders in finding sustainable solutions to the management of the Bay which ensure good outcomes for both people and nature. The Biosphere is managed by the Dublin Bay Biosphere Partnership which includes Fingal County Council, Dublin City Council, Dún Laoghaire-Rathdown County Council, Dublin Port, National Parks and Wildlife Service and local community groups and NGO's. The partnership is working to promote the protection of habitats and species, to support education and research within the site and to support a sustainable economy for people living and working in the area in accordance with the Habitats Directive."

*Introduce an additional policy after Policy LHB11 as follows:*

#### **"Section 4.2.11 Policy LHB12: Coastal Area Feasibility Study.**

**It is Council policy to undertake a comprehensive feasibility study on the recreational potential along the coastal area of the County which comprehensively addresses recreational impact – including visitor numbers,**

**mapping and surveying of sensitive habitats and species and identification of significant threats on Natura 2000 sites – and which would allow an assessment of any future proposals, alone or in combination, to assess impact on the coastal and marine zone within and adjacent to the County boundary. The Council will explore the possibility of carrying out this study with adjoining and/or coastal Local Authorities and/or their agencies.”**

**Following on from the above new policies, all subsequent Section and Policy numbers will be renumbered two digits higher.**

#### **Section 4.1.2.13 Policy LHB14: Public Rights-of-Way (page 102-103)**

*Add new text at end of Policy LHB14 as follows:*

“To avoid making any premature decisions which may give rise to judicial challenge it is recommended that, subject to resources, a list of purported additional rights-of-way be investigated during the lifetime of the 2016 - 2022 County Development Plan and that the provision of Section 206 of the Planning and Development Act, which allows for creation of a right-of-way by means of agreement with the landowners consent, also be investigated thus avoiding litigation.”

#### **Section 4.1.2.15 Policy LHB16: National Park\* (page 103)**

*Amend text in Policy LHB16 as follows:*

**“It is Council policy to **promote and to** co-operate in the extension of the Wicklow Mountains National Park.”**

---

### **Section 4.1.3 Biodiversity**

#### **Section 4.1.3.7 Policy LHB25: Rivers and Waterways**

*Amend text in Policy LHB25 as follows:*

“Existing County flood plain management policy seeks to limit development in identified floodplains and to preserve riparian corridors. Development proposals in **river riparian** corridors will be considered providing they:...

- ...Provide **routes** for drainage and flooding.”

**Section 4.1.3.9 Policy LHB27: Geological Sites (page 110).**

*Update Table 4.1.3 as per information submitted by Geological Survey Ireland (GSI).*

<b>Table 4.1.3: Geological Sites</b>							
<b>MAP No.</b>	<b>Site Name</b>	<b>Easting</b>	<b>Northing</b>	<b>Principal characteristics Critical Feature(s) key words</b>	<b>Definite pNHA</b>	<b>Probable pNHA</b>	<b>Definite CGS</b>
8	Three Rock Mountain	717625	723129	Tors			X
13	Ballybetagh Bog	719925	720029	Chronology, Giant Deer	X		
13	The Scalp	720924	720029	Glacial Outwash, Black Scree and spillway		X	
13	Ballycorus	722224	721629	Leinster Granite and associated mineralization			X
7	Killiney Hill	725923	725028	Killinite mineral	X		
7	Killiney Hill	725923	725028	Roche moutonnees, till			X
4, 7	Dalkey Hill	726323	726028	Leinster Granite Quarries		X	
4	<del>Killiney Adit</del>	<del>726423</del>	<del>725728</del>	<del>Phosgenite mineral</del>			<del>X</del>
4	White Rock, Killiney	726423	725728	Leinster Granite contact with Ordovician sediments		X	
7, 10, 14	Killiney Bay (Bray Harbour to Killiney Station)	726023 (Killiney), 3726823 (Bray)	724828 (Killiney), 729329 (Bray)	5.3km long coastal section of glacial sediments (interbedded diamicts)	X		
2	Blackrock Breccia	721424	729627	Granite Breccia			X
4	Dalkey Island	727773	726353	Water Well			X
<del>10</del>	<del>Shankill</del>	<del>726223</del>	<del>722029</del>	<del>Mass wasting (slumping)</del>	<del>X</del>		
5	Murphystone Quarry	717862	724235	Leinster granite quarry			
13,14	Carrickgolloga n	723055	720550	Hill			

*Amend text in Policy LHB27 as follows:*

**"It is Council policy to protect, promote and preserve sites of Geological and Geomorphological importance, in particular the proposed Natural Heritage**

**Areas (NHAs) and any County Geological Sites (CGS) that become designated during the lifetime of this Plan.**

To date, sites of geological interest have not been comprehensively included under the existing nature conservation designations. The Geological Survey of Ireland, in partnership with the National Parks and Wildlife Service (NPWS) are now currently addressing the matter through the identification of the best Nationally significant geological and geomorphological sites for statutory designations as NHAs (National Heritage Areas). Other geological sites of National or local importance are identified as County Geological Sites (CGS) and - by virtue of their recognition in the County/City Development Plans - will be protected from potentially damaging developments through the Development Management system. ~~The list of Geological Sites is set out in Table 4.1.3. The list has been prepared in conjunction with the Geological Survey of Ireland.~~

The Geological Survey of Ireland, in partnership with the Heritage Council and Dún Laoghaire-Rathdown County Council carried out an audit of County Geological Sites in 2014 as an action of the Dún Laoghaire-Rathdown Heritage Plan 2013 – 2019. The audit provides a reliable study of sites and replaces a provisional listing based on a desk top study that was contained in the previous County Development Plan 2010 – 2016. The revised list of Geological Sites is set out in Table 4.1.3”.

---

## **Section 4.1.4 Heritage**

### **Section 4.1.4.1 Policy LHB30: Heritage Plan (page 111)**

*Add text to the end of Policy LHB30 as follows:*

“The implementation of the Heritage Plans has resulted in the completion of a number of projects that increased the level of knowledge, awareness and understanding of the heritage of the County. Due regard should be given to these documents in any future development.

These include the:

- Industrial Heritage Survey
- Historic Landscape Character Assessments for Kiltiernan, Glencullen, Rathmichael, Old Conna, Barnacullia and Ballycorus
- Survey of Coastal Architecture
- Habitat Survey
- Hedgerow Survey
- Geological Heritage Survey
- Dublin Uplands Archaeology Survey
- Dalkey Islands Conservation Plan
- Carrickmines Castle Conservation Plan (Draft)

It is the intention of the Council to review the existing Heritage Plan prior to its expiry, if possible”



## 4.2 Open Space and Recreation

---

### **Section 4.2.2 Open Space and Parks**

#### **Section 4.2.2.3 Policy OSR4: Future Improvements (page 115)**

*Amend the wording of Policy OSR4 as follows:*

**“It is Council policy to continue to improve, landscape, plant and develop more intensive recreational and leisure facilities within its parks and open spaces insofar, as resources will permit, while ensuring that the development of appropriate complementary facilities does not detract from the overall amenity of the spaces.**

There are over 800 hectares of parks and open spaces of varying landscape types throughout the County. There are currently five Regional Parks:

- Marlay Demesne
- Cabinteely Park
- The Peoples Park and Seafront, Dún Laoghaire
- Blackrock Park
- Killiney Hill Park

The Regional Parks each have a unique character and theme, which provide an attraction for visitors and tourists. ~~Shanganagh Castle, which was acquired by the Council, may provide an opportunity and catalyst for Shanganagh Park to develop as the sixth Regional Park in the County.~~ A park is designated a Regional Park when it attains the attributes of a Regional Park. These include being a high profile, high quality park with a range of visitor attractions and facilities, including, toilets, tearooms, car parking and play areas.

With the designation of Shanganagh Park as a Gateway Park, as part of the Green Infrastructure Strategy, the proposed addition of Shanganagh Castle and the facilities that will be provided there, and the development of a Master Plan, Shanganagh Park is likely to achieve Regional Park status within the lifetime of the County Development Plan 2016-2022.

The historic houses of Marlay and Cabinteely will continue to be refurbished and available for tours and other activities. With the exception of Killiney Hill Park, all Regional Parks will eventually include public toilets with disabled facilities, event spaces and ornamental gardens.

Fernhill Gardens will be developed into a ‘Gateway’ Park/Regional Park during the period of the County Development Plan 2016-2022. This will involve the preparation of a Master Plan for the site.

In addition there are seven District Parks and fifty Local Parks as indicated in the Open Space Strategy 2012–2015. The seven District Parks – distributed reasonably evenly throughout the County - include Kilbogget Park, Clonkeen Park, Shanganagh Park, Meadowbrook Park, Deerpark, the Dodder Linear Park and the proposed Jamestown Park.

A Parks Master Plan Programme, aimed at upgrading and developing the parks and open spaces throughout Dún Laoghaire-Rathdown, is being implemented on a phased basis as resources permit.”

#### **Section 4.2.2.10 Policy OSR11: Protection of Sports grounds/Facilities (page 118)**

*Add new paragraph to the end of Policy OSR11 as follows:*

"Given the Council's policy to ensure that existing sports facilities and grounds within the established urban area are protected, retained and enhanced, it is recognised that development in the immediate environs of these facilities and grounds may have adverse implications for the achievement of this policy objective. Where therefore development is proposed within 10m of such a facility/grounds there will be an obligation on the developer to undertake such protective measures, as are deemed necessary by the Council, to ensure that the subject development will not interfere with the operational capacity of the sports facility/sports ground to fulfil its recreational/amenity function."

#### **Section 4.2.2.11 Policy OSR12: Water-Based Sports (page 118)**

*Amend the wording of Policy OSR12 as follows:*

**"It is Council policy to support and encourage water-based sports and maritime leisure activities along the coast subject to ~~Beach Bye-Laws~~ Council Bye-Laws. The County features seventeen kilometres of coastline, which is a valuable asset. If utilised to its full potential it can contribute to the health and well being of the residents of, and workers, in the County and can also offer significant potential for tourism growth....."**

*Introduce additional Policy and Section after Section 4.2.2.11 as follows:*

#### **"Section 4.2.2.12 Policy OSR13: To protect Dún Laoghaire as an Outstanding Recreational Harbour and Sporting Amenity of National Significance**

**It is Council policy to protect and enhance the water based recreational amenity of Dun Laoghaire Harbour and its ability to host national and international competitions.**

Any commercial shipping proposals within the Harbour should be required to ensure that there is no material detrimental impact upon the water based recreational amenity facilities of the Harbour and its ability to host national and international competitions."

#### **Section 4.2.2.12 Policy OSR13: Play Facilities**

*Amend Section 4.2.2.12 and Policy OSR13 as follows:*

"Section 4.2.2.1~~23~~ Policy ~~OSR13~~OSR14: Play Facilities"

*Introduce additional Policy and Section after Section 4.2.1.13 as follows:*

#### **"Section 4.2.2.14 Policy OSR15: Sandycove Harbour and Bullock Harbour Masterplans**

**It is Council policy to formulate Masterplans for Bullock Harbour and Sandycove Harbour.**



The Council will formulate – in conjunction with all relevant stakeholders – a Masterplan for both Bullock and Sandycove Harbours in order to provide for the effective management of the entirety of the County’s 17km long coastline.”



## **Section 5:** Physical Infrastructure Strategy



## Section 5.1 Environmental Infrastructure and Management

---

### **Section 5.1.1 Water Supply and Wastewater**

#### **Section 5.1.1.4 Policy EI4: Groundwater Protection and Appropriate Assessment (page 125)**

*Amend text to Policy EI4 as follows:*

"It is Council policy to ensure the protection of the groundwater resources in and around the County and associated habitats and species, in accordance with the Groundwater Directive 2006/118/EC and the European Communities Environmental Objectives (Groundwater) Regulations 2010. **In this regard, the Council will support the implementation of Irish Water's Water Safety Plans to protect sources of public water supply and their contributing catchment.**"

#### **Section 5.1.1.5 Policy EI5: Water Supply and Wastewater (page 126)**

*Amend text to Policy EI5 as follows:*

"In addition, it is Council Policy to promote the advancement of greywater **re-use systems and rain water** harvesting systems and other water conservation measures in the County, **in accordance with best practice and subject to compliance with Ministerial Guidelines/Regulations.**"

#### **Section 5.1.1.5 Policy EI5: Water Supply and Wastewater (page 126)**

*Insert a standalone text box between Policies EI5 and EI6 which incorporates the policies as detailed below:*

##### **Timely Delivery of Water Services**

**It is the policy of the Council to support Irish Water in the facilitation of the timely delivery of the water services required to realise the development objectives of this Plan.**

##### **Water and Wastewater Network Design and Construction**

**It is the policy of the Council to support the provision of integrated and sustainable water services through effective consultation with Irish Water on the layout and design of water services in relation to the selection and planning of development areas and the preparation of Masterplans/LAPs/ SDZ Planning Schemes.**

##### **Ensuring Availability of Water Services for Planned Development**

**It is the policy of the Council to advise applicants to consult with Irish Water regarding capacity issues prior to applying for planning permission – where practicable.**

##### **Protecting Water Services Infrastructure**

**It is the policy of the Council to advise applicants to consult with Irish Water and be aware of Irish Water's requirements regarding way leaves and buffer zones around public water utilities.**

##### **Promote Water Conservation**

**It is the policy of the Council to promote and support water conservation and demand management measures among all water users.**

### Separate Water Drainage Systems

It is the policy of the Council to require new development to provide a separate foul and surface water drainage system – where practicable.

### Domestic Waste Water Treatment Systems

It is the policy of the Council to refuse planning permission for any residential development that requires the provision of domestic waste water treatment systems, other than for single house systems.

It is the policy of the Council to strongly discourage the provision of individual septic tanks and domestic waste water treatment systems and, where applicable, to connect the development to the public sewer mains network, in order to minimise the risk of groundwater pollution. Where such facilities are permitted, full compliance with the prevailing regulations and standards including the EPA's Code of Practice Wastewater Treatment and Disposal Systems Serving Single Houses (PE. 10) (EPA 2009), as may be amended, will be required."

### **Section 5.1.1.8 Policy EI8: Sustainable Drainage Systems (page 127)**

*Amend text of Policy EI8 as follows:*

"It is Council policy to ensure that all development proposals incorporate Sustainable Drainage Systems (SuDS). Development will only be permitted where the Council is satisfied that suitable measures have been considered that balance the impact of drainage through the achievement of control of run-off quantity and quality, and enhance amenity and habitat (for further details refer to Sections 8.2.8.3, 8.2.9.7, 8.2.9.11, 8.2.10.4 and Appendix 14 Green Infrastructure Strategy)."

## **Section 5.1.3 Pollution**

### **Section 5.1.3.4 Policy EI23: Rathmichael Ground and Surface Water Protection (page 133)**

*Delete Policy EI23 as follows:*

#### ~~**"Policy EI23: Rathmichael Ground and Surface Water Protection**~~

~~**It is Council policy to refuse planning permission for any new developments which include an on-site wastewater treatment facility within the Rathmichael area until the groundwater issues in the area are resolved or ameliorated (See SLO 126 Maps 10, 13 and 14).**~~

~~This policy will be implemented through the Development Management process through the refusal of planning permission for any new developments which include an on-site wastewater treatment facility within the Rathmichael area (See SLO 126 Maps 10, 13 and 14 for the boundary of this area). This policy is necessitated due to the potential impact of un-sewered developments on groundwater and surface water quality and also on the ability of the Council to meet its obligations under the Water Framework Directive.~~

~~Proposals for change of use, or alteration to, or extension of, existing approved developments within these areas involving on-site wastewater treatment facilities will be assessed in the context of there being no potential deterioration of ground or surface waters."~~

**Section 5.1.3.5 Policy EI24: Litter Control (page 133)**

*Amend text to Policy EI24 as follows:*

5.1.3.54 Policy ~~EI24~~ EI23: Litter Control

**Section 5.1.3.6 Policy EI25: Major Accidents (page 133)**

*Amend text to Policy EI25 as follows:*

5.1.3.65 Policy ~~EI25~~ EI24: Major Accidents





## Section 5.2 Climate Change, Energy Efficiency and Flooding

---

### **Section 5.2.1 Climate Change Adaptation and Mitigation (page 135).**

*Reposition the terms 'mitigation' and 'adaptation' in section title as follows:*

**"5.2.1 Climate Change ~~Adaptation~~ Mitigation and ~~Mitigation~~ Adaptation."**

*Reposition the terms 'adaptation' and 'mitigation' on the last line in second paragraph as follows:*

"It is accepted that action is required to manage and deal with Climate Change impacts. Measures to deal with Climate Change can be defined as either ~~adaptation~~ mitigation measures or ~~mitigation~~ adaptation measures."

*Reorder paragraphs 3 and 4 to ensure reference to 'mitigation' appears first as follows:*

~~"Climate Change Adaptation refers to 'the adjustment or preparation of natural or human systems to a new or changing environment, with the aim of moderating harm or exploiting beneficial opportunities' (DoECLG). Examples of adaptation measures include but are not limited to flood Risk Assessment and Management.~~

~~Mitigation is defined as action to reduce emissions of greenhouse gases (DoECLG, 2012). Mitigation measures include green building measures and the delivery of more compact, less carbon intensive forms of development.~~

Mitigation is defined as action to reduce emissions of greenhouse gases (DoECLG, 2012). Mitigation measures include green building measures and the delivery of more compact, less carbon intensive forms of development.

Climate Change Adaptation refers to 'the adjustment or preparation of natural or human systems to a new or changing environment, with the aim of moderating harm or exploiting beneficial opportunities' (DoECLG). Examples of adaptation measures include but are not limited to flood Risk Assessment and Management."

---

### **Section 5.2.3 Energy Efficient Design**

#### **Section 5.2.3.1, Policy CC6: Energy Performance in Existing Buildings\* (page 138)**

*Delete paragraph 5 in Policy CC6 as follows:*

~~"The Council will, in addition, promote the integrated energy concept of Passive House that will result in high quality constructed, economic, comfortable and healthy future proofed buildings. The EnerPHit standard is the designated standard for Passive House refurbishment projects and accepts slightly lower performance thresholds."~~

Delete text in paragraph 6 of Policy CC6 as follows;

"...principles of nZEB design /-~~Passive House.~~"

Delete last sentence of paragraph 7 in Policy CC6 as follows:

~~"The PHPP software should be used to design and certify works to Passive House (EnerPHit) standard."~~

### **Section 5.2.3.2, Policy CC7 Energy Performance in New Buildings (page 138)**

Amend Policy CC7 as follows:

~~"It is Council policy to promote and support new development that is low carbon development, is well adapted to the impacts of climate change and that energy conservation is considered and designed at the earliest stages through the use of energy efficiency management systems. It is Council policy that all new development in new buildings should be built to Passive House Standard. Buildings constructed to nZEB standard or other low energy standard may be considered as an appropriate alternative. All new buildings will be required to meet the passive house standard or equivalent, where reasonably practicable."~~

By equivalent we mean approaches supported by robust evidence (such as monitoring studies) to demonstrate their efficacy, with particular regard to indoor air quality, energy performance, comfort, and the prevention of surface/interstitial condensation. Buildings specifically exempted from BER ratings as set out in S.I No 666 of 2006 are also exempted from the requirements of CC7.

These requirements are in addition to the statutory requirement to comply fully with Parts A-M of Building Regulations."

---

## **Section 5.2.4 Renewable Energy**

### **Section 5.2.4.1 Policy CC11: Renewable Energy (page 140)**

Amend title of Policy CC11 as follows:

"Policy CC11: Renewable Energy<sup>\*</sup> and Energy Networks<sup>\*</sup>".

---

## **Section 5.2.5 Flood Risk**

### **Section 5.2.5.1, Policy CC14: Catchment Flood Risk and Management (CFRAM)\* (page 141)**

Amend title of Policy CC14 as follows:

**Policy CC14: Catchment Flood Risk Assessment and Management (CFRAM)\***

Amend sixth line, second paragraph of Policy CC14 as follows:

"...(ii) CFRAM Studies ~~2010—2015~~ on-going and..."

### **Section 5.2.5.2 Policy CC15: Flood Risk Management\* (page 141-142)**

*Amend Policy CC15 as follows:*

**"It is Council policy to support, in cooperation with the OPW, the implementation of the EU Flood Risk Directive (2007/60/EC) on the assessment and management of flood risks, the Flood Risk Regulations (SI No 122 of 2010) and the Department of the Environment, Heritage and Local Government and the Office of Public Works Guidelines on 'The Planning System and Flood Risk Management, (2009)' and relevant outputs of the Eastern District Catchment and Flood Risk Assessment and Management Study (CFRAMS ECFRAM Study).**

The Council will ensure the implementation of the DEHLG/OPW Guidelines 'The Planning System and Flood Risk Management', (2009) and DoECLG Circular PI2/2014 (or any updated/superseded document) in relation to flood risk management within the County. A Strategic Flood Risk Assessment of the County has been carried out as part of this County Development Plan process (Refer to Appendix 13).

Implementation of the Guidelines will include the following:

- Avoid, reduce and/or mitigate, as appropriate, in accordance with the Flood Risk Management Guidelines, the risk of flooding within the flood risk areas indicated in the ECFRAM study and the Strategic Flood Risk Assessment of the County and any other flood risk areas that may be identified during the period of the Plan or in relation to a planning application (Refer Section 6 of Appendix 13)
- Development proposals in areas where there is an identified or potential risk of flooding or that could give rise to a risk of flooding elsewhere ~~may be required to carry out~~ must be accompanied by a Site-specific Flood Risk Assessment, and Justification Test where appropriate, (Refer to Development Management section 8.2.10.4 and Appendix 13 SFRA for further detail).
- Development that would be subject to an inappropriate risk of flooding or that would cause or exacerbate such a risk at other locations shall not normally be permitted.
- Where certain measures proposed to mitigate or manage the risk of flooding associated with new developments are likely to result in significant effects to the environment or European sites downstream, such measures will undergo environmental assessment and Habitats Directive Assessment, as appropriate.
- Flood risk management and Strategic Flood Risk Assessment (SFRA) shall be incorporated into the preparation of all Local Area Plans and any other lower tier plans.
- Regard shall be had to any future flood hazard maps, flood risk maps and flood risk management plans prepared as part of the Eastern District Catchment Flood Risk Assessment and Management Study and future iterations of other similar studies including studies of impacts of climate change.
- Where flood protection or alleviation works take place the Council will ensure that the natural and cultural heritage and rivers, streams and watercourses are protected and enhanced.
- Existing wetland Habitats within the County which serve as flood protection/management measures shall be managed and enhanced.
- The Council will also require that all proposed flood protection or alleviation works will be subject to Appropriate Assessment (AA) to ensure there are no likely significant effects on the integrity, defined by the structure and function, of any

Natura 2000 sites and that the requirements of Article 6 of the EU Habitats Directive are met.

• ~~Coastal Defence policies.~~"

*Introduce an additional Section and Policy after Policy CC15 as follows:*

**"Section 5.2.5.3 Policy CC16: Cross-Boundary Flood Management.**

**It is Council Policy to work with neighbouring Local Authorities when developing cross boundary flood management work programmes and when considering cross boundary development."**

**Section 5.2.5.3 Policy CC16: Coastal Defence\* (page 142)**

Amend Section 5.2.5.3 and Policy CC16 as follows:

**"Section 5.2.5.34 Policy ~~CC16~~CC17: Coastal Defence\*"**

*Insert the following sentence at the end of Policy CC17:*

**"The Council will also require that all coastal defence works will be subject to Appropriate Assessment (AA) to ensure there are no likely significant effects on the integrity of any Natura 2000 sites and that the requirements of Article 6 of the EU Habitats Directive are met."**

## **Section 6:** Built Heritage Strategy



## 6.1 Archaeological and Architectural Heritage

---

### **Section 6.1.2 Archaeological Heritage**

#### **Section 6.1.2(ii) The Record of Monuments and Places (RMP) (page 146)**

*Add a new sentence to the end of Section 6.1.2(ii) as follows:*

"Applicants with development proposals proximate to sites listed within the RMP are encouraged to consult with The National Monuments Service at an early stage in order to ascertain any specific requirements that may be required to protect the site in question."

#### **Section 6.1.2.1 Policy AH1: Protection of Archaeological Heritage (page 146)**

*Amend text in the first sentence of Policy AH1 as follows:*

"It is Council policy to protect archaeological sites, National Monuments (and their settings), which have been identified in the Record of Monuments and Places (RMP) and, where feasible, **and** appropriate **and applicable** to promote access to and signposting of such sites and monuments."

#### **Section 6.1.2.3 Policy AH3: Protection of Historic Towns (page 146)**

*Insert text to Policy AH3 as follows:*

"It is Council policy to **promote and** protect the Historic Town of Dalkey as identified by the Department of Arts, Heritage and the Gaeltacht (DoAHG)."

#### **Section 6.1.2.3 Policy AH4: Carrickmines Castle (page 146)**

*Amend text in the first sentence of Policy AH4 as follows:*

"It is Council Policy to **produce support the implementation of the** (Archaeological) Conservation Plan for the Carrickmines Castle Site".

---

### **Section 6.1.3 Architectural Heritage**

#### **Section 6.1.3.5 Policy AR5: Buildings of Heritage Interest (page 148)**

*Insert a footnote and associated text to Policy AR5 as follows:*

"The retention and reuse of these buildings adds to the streetscape and sense of place and has a role in the sustainable development of the County.\*.

\* In the interest of clarity, the former Stepside Garda Station will be afforded protection under this policy."

#### **Section 6.1.3.10 Policy AR10: Protection of Coastline Heritage (page 150)**

*Insert text to part 'i' of Policy AR10 as follows:*

**"i. Encourage and promote the retention of features of the County's coastal heritage where these contribute to the character of the area."**



## **Section 7:** Community Strategy



## 7.1 Social Infrastructure and Community Development

---

### **Section 7.1.2 Community Support and Social Inclusion**

#### **Section 7.1.2.1 Policy SCC1: The Local Economic and Community Plan (page 156)**

*Amend policy prefix text as follows:*

**"Policy ~~SCC1~~ SIC1"**

#### **Section 7.1.2.2 Policy SSC2: Social Inclusion and Participation (page 156)**

*Amend policy prefix text as follows:*

**"Policy ~~SSC2~~ SIC2"**

#### **Section 7.1.2.3 Policy SCC3: Universal Access (page 156)**

*Amend policy prefix text as follows:*

**"Policy ~~SCC3~~ SIC3"**

#### **Section 7.1.2.4 Policy SSC4: Safer Living Environment (page 156)**

*Amend policy prefix text as follows:*

**"Policy ~~SSC4~~ SIC4"**

#### **Section 7.1.2.5 Policy SSC5: Estate Management (page 157)**

*Amend policy prefix text as follows:*

**"Policy ~~SSC5~~ SIC5"**

---

### **Section 7.1.3 Community Facilities**

#### **Section 7.1.3.1 Policy SCC6: Community Facilities (page 157)**

*Amend policy prefix text as follows:*

**"Policy ~~SCC6~~ SIC6"**

*Insert text in first sentence as follows:*

"It is Council policy to support the development, **improvement** and provision of a wide range of community facilities distributed in an equitable manner throughout the County".

*Insert text after fourth paragraph as follows:*

"The Council will also support improvements to and/or redevelopment of existing community facilities throughout the County as appropriate. All such proposals should have regard to the provisions set out above and the guidance provided within Section 8.2.12.3: Community Facilities".

#### **Section 7.1.3.2 Policy SSC7: New Development Areas (page 158)**

*Amend policy prefix text as follows:*

**"Policy ~~SSC7~~ SIC7"**

#### **Section 7.1.3.3 Policy SSC8: Schools (page 159)**

*Amend policy prefix text as follows:*

**"Policy ~~SSC8~~ SIC8"**

#### **Section 7.1.3.4 Policy SSC9: Further and Higher Education Facilities (page 159)**

*Amend policy prefix text as follows:*

**"Policy ~~SSC9~~ SIC9"**

#### **Section 7.1.3.4 (i) University College Dublin (UCD) (page 160)**

*Amend text in second paragraph as follows:*

"UCD is Ireland's largest and most diverse university. The current population of UCD for the 2013/2014 academic year is circa ~~26,700~~ **26,750 students** ~~in total comprising 16,300 undergraduate students, 5,400 post graduate students and 4,000 direct employees~~ **5,500 staff and researchers**. There are approximately ~~5,500~~ **6,580** international students drawn from approximately ~~120~~ **127** countries."

#### **Section 7.1.3.5 Policy SSC10: Health Care Facilities (page 161)**

*Amend policy prefix text as follows:*

**"Policy ~~SSC10~~ SIC10"**

#### **Section 7.1.3.6 Policy SSC11: Childcare Facilities (page 161)**

*Amend policy prefix text as follows:*

**"Policy ~~SSC11~~ SIC11"**

#### **Section 7.1.3.7 Policy SSC12: Arts and Culture (page 162)**

*Amend policy prefix text as follows:*

**"Policy ~~SSC12~~ SIC12"**

**Section 7.1.3.8, Policy SSC13: Libraries (page 162)**

*Amend policy prefix text as follows:*

**"Policy ~~SSC13~~ SIC13"**



## **Section 8: Principles of Development**





## **Section 8.1 Urban Design**

---

There are no amendments to Section 8.1 of the Draft Plan.



## Section 8.2 Development Management

---

### Section 8.2.3 Residential Development

#### Section 8.2.3.1 Quality Residential Design (page 172)

*Insert additional bullet point to section 8.2.3.1 as follows:*

- “Context – having regard to the setting of a site and the surrounding character and streetscape”.

#### Section 8.2.3.3 Apartment Development (page 173)

*Insert text at end of subsection (i) Design Standards as follows:*

“The feasibility of installing solar panels to apartment buildings shall be considered at design stage in accordance with the above Guidelines.”

*Amend text and insert a footnote at the end of subsection (ii) Dual Aspect as follows:*

“Apartment developments are expected to provide a minimum of 70% of units as dual aspect apartments. ~~North facing single aspect units will only be considered under exceptional circumstances north facing single aspect units should be avoided.~~ A relaxation\* of the 70% dual aspect requirement may be considered on a case-by-case basis where an applicant can demonstrate, to the satisfaction of the Planning Authority, that habitable rooms of single aspect units will be adequately served by natural light and/or innovative design responses are used to maximise natural light.

\* Where an applicant is seeking a relaxation, all details/requirements will require to be discussed with the Planning Authority at pre-application stage”.

#### Section 8.2.3.4 Additional Accommodation in Existing Built-up Areas (page 175)

*Amend last four paragraphs of subsection (i) Extensions to Dwellings as follows:*

“Dormer extensions to roofs will be considered with regard to impacts on existing character and form, and the privacy of adjacent properties. The design, dimensions and bulk of any roof proposal relative to the overall size of the dwelling and gardens will be the overriding considerations. Dormer extensions ~~(whether for functional roof space or light access) shall generally not form a dominant part of a roof. The extension shall be set back from the eaves, gables and/or party boundaries. Consideration may be given to dormer extensions proposed up to the ridge level of a house, but in all cases no dormer extension shall be higher than the existing ridge height of the house.~~

The proposed quality of materials/finishes for dormers will be considered carefully as this can greatly improve their appearance. The level and type of glazing within a dormer structure should have regard to existing window treatments and fenestration of the dwelling. Particular care will be taken in evaluating large, **visually dominant** dormer window structures, **with a balance sought between quality residential amenity and the privacy of adjacent properties.** Excessive overlooking of adjacent properties should be avoided unless support by the neighbours affected can be demonstrated. ~~—due to~~

~~potential excessive overlooking of adjacent properties and the possibility of visual dominance when viewed from the surroundings.~~

~~Roof light windows and roof level windows (including dormers) that convert into or create a balcony/ balconette are not encouraged.~~

More innovative design responses will be encouraged, particularly within sites where there may be difficulty adhering to the above guidance **and where objectives of habitability and energy conservation are at stake."**

*Amend the first bullet of subsection **(xii) Student Accommodation** (page 179) as follows:*

- "The location of student accommodation within the following hierarchy of priority:
  - On Campus
  - Within 1km distance from the boundary of a Third Level Institute
  - Within close proximity to high quality public transport corridors (DART, N11 and Luas), cycle and pedestrian routes and green routes.

**In all cases such facilities will be resisted in remote locations at a remove from urban areas."** ~~and accessibility to Educational Facilities and the proximity to existing or planned public transport corridors, cycle and pedestrian routes and green routes (1km distance from the boundary of a Third Level Institution).~~

## **Section 8.2.4 Sustainable Travel and Transport**

### **Section 8.2.4.5 Car Parking Standards (pages 187-190)**

*Amend Table 8.2.4: Non Residential Land Use – Maximum Car Parking Standards as follows:*

<b>Table 8.2.4: Non Residential Land Use – Maximum Car Parking Standards</b>		
<b>Land Use</b>	<b>General</b>	<b>Designated areas along public transport corridors</b>
...	...	...
Office – Business, Professional	1 space per 50 sq.m. gross floor area to include parking for visitors.	1 space per <del>75</del> <b>100</b> sq.m. gross floor area to include parking for visitors.
...	...	...
Sports Grounds	15 spaces per pitch plus overflow car parking, <del>set down parking and coach parking</del> to be decided on a case-by-case basis for each sports ground.	15 spaces per pitch plus overflow car parking, <del>set down parking and coach parking</del> to be decided on a case-by-case basis for each sports ground.
...	...	...

### **Section 8.2.4.12 Electrically Operated Vehicles (page 194)**

*Amend text in section 8.2.4.15 as follows:*

"To encourage the use of **Electric Vehicles** ~~electrically operated cars and bicycles~~, in line with Council and National Policy, ~~non-residential~~ developments shall provide **Electric Vehicle Charging spaces** as follows:

- Residential Developments (with private car spaces including visitor car parking spaces)
- Minimum of one car parking space per ten residential units should be equipped with one fully functional Electric Vehicle Charging Point.
- Non-Residential Developments (with private car parking spaces including visitor car parking spaces e.g. office developments)
- Minimum of one car parking space per ten car parking spaces should be equipped with one fully functional Electric Vehicle Charging Point
- Developments with Publicly Accessible Spaces (e.g. supermarket car park, cinema etc.)
- Minimum of one car parking space per ten car parking spaces should be equipped with one fully functional Electric Vehicle Charging Point

The Charge Point Parking space(s) should be clearly marked as being designated for Electric Vehicle charging. Appropriate signage indicating the presence of a Charge Point or Points should also be erected. All Charge Points fitted in publically accessible areas should be capable of communicating usage data with the National Charge Point Management System and use the latest version of the Open Charge Point Protocol (OCPP). They should also support a user identification system such as Radio Frequency Identification (RFID). ~~The remainder of the car parking spaces, for all land uses, shall be constructed to be capable of accommodating future charging points, including ducting and wiring, as required. Electrically Powered Vehicle Recharging Parking Bays at a rate of 10% of the total car parking spaces (metered fast charging 220-240V, 32A three phase). The remainder of the parking spaces, as for all residential parking spaces including parking spaces for the disabled, shall be constructed to be capable of accommodating future charging points, including wiring, as required – residential space facilities to be coded/metered, slow charging 220-240V, 13A single phase.~~ As sales of battery operated cars increase to meet the Government objectives of 10% car ownership by 2020 it would be expected that such spaces would be specifically allocated to that use similar to parking spaces suitable for the disabled and 'Parent and Child'".

## **Section 8.2.7 Landscape, Heritage and Biodiversity**

### **Section 8.2.7.3 High Amenity Landscapes, Views and Prospects (page 204)**

*Insert text to section 8.2.7.3 as follows:*

"Planning applications that have the potential to adversely impact upon landscapes attributed with a High Amenity Zoning Objective - or upon Protected Views or Prospects - shall be accompanied by an assessment of the potential landscape and visual impacts of the proposed development, **including photomontages** – demonstrating that landscape impacts have been anticipated and avoided to a level consistent with the sensitivity of the landscape."

## Section 8.2.8 Open Space and Recreation

### Section 8.2.8.2 Public/Communal Open Space – Quantity (page 205)

*Insert text to subsection (i) Residential / Housing Developments as follows:*

“Open Space: For all developments with a residential component – 5+ units - the requirement of **15 sq.m. - 20 sq.m.** of Open Space per person shall apply based on the number of residential/housing units. For calculation purposes, open space requirements shall be based on a presumed occupancy rate of 3.5 persons in the case of dwellings with three or more bedrooms and 1.5 persons in the case of dwellings with two or fewer bedrooms. **A lower quantity of open space (below 20sq.m. per person) will only be considered acceptable in instances where exceptionally high quality open space is provided on site and such schemes may be subject to financial contributions as set out under Section 8.2.2.2(iii) below.**

### Section 8.2.8.4 Private Open Space – Quantity (page 207 – 208)

*Insert text to subsection (iv) Private Open Space for Apartment Developments as follows:*

“Every apartment shall have direct access to its own area of private open space in the form of a balcony, **winter garden** or patio area (Table 8.2.5 sets out minimum requirements).”

*Insert text to title of Table 8.2.5 as follows:*

“Table 8.2.5: Balconies / **Winter Gardens**: Minimum Private Open Space Standards”

## **Section 8.2.9 Environmental Management**

### Section 8.2.9.7 New Developments – Environmental Impacts (page 212)

*Insert text to section 8.2.9.7 as follows:*

“The Planning Authority will:

- Not permit culverting of streams unless considered absolutely necessary by the Council’s Water Services Section.
- **Encourage the opening up of existing culverts where practicable (in accordance with the recommendations of the GDSDS)”.**

### Section 8.2.9.9 Telecommunications Antennae and Structures (page 213)

*Insert text to section 8.2.9.9 as follows:*

- “To what degree the proposal will impact on the amenities of occupiers of nearby properties, or the amenities of the area - e.g. visual impacts of masts and associated equipment cabinets, security fencing treatment etc. – and the potential for mitigating visual impacts including low and mid-level landscape screening, tree-type masts being provided where appropriate, colouring or painting of masts and antennae, and considered access arrangements.

- That the beam of greatest intensity from a base station does not fall on any part of school grounds or buildings without agreement from the school and parents. Where an operator submits an application, alteration or replacement of a mobile phone base station, whether at or near a school or college, the operator must provide evidence that they have consulted with the relevant body of the school or college."

## **Section 8.2.10 Climate Change Adaptation and Energy**

### **8.2.10.3 Energy Efficiency and Climate Change Adaptation (page 215)**

*Insert the following text to the end of Section 8.2.10.3 as follows:*

"Where possible, building materials with low embodied carbon should be used."

*Delete text at the end of Section 8.2.10.3 as follows:*

~~"Passive House Building Standard~~

~~In order for a low energy building to be in compliance with Passive House standard it must have a maximum m space heating demand of 15kWh/m<sup>2</sup>/year, an airtightness level of 0.6 air changes per hour measured at 50 Pascal and a maximum primary energy use of 120kWh.m<sup>2</sup>/year. Buildings aiming to meet Passive House Standard should be designed using Passive House Planning Package (PHPP) software.~~

~~Design stage PHPP verification page should be submitted with any planning application.~~

~~Prior to occupation, final PHPP verification sheet should also be submitted (refer also to Section 5.2.3.2, Policy CC&)."~~

### **Section 8.2.10.4 Flood Risk Management (page 215)**

*Amend text in section 8.2.10.4 as follows:*

~~"The Eastern Catchment Flood Risk Assessment and Management (CFRAM) maps should be consulted at pre-planning stage and when planning applications are lodged. The Flood zone maps accompanying this Plan should be consulted at pre-planning stage and/or prior to lodgement of planning applications.~~

~~Table 12 in Section 5.1 of the Dún Laoghaire-Rathdown Strategic Flood Risk Assessment (FRA), which is contained in Appendix 13, outlines the five stage Development Management process advocated by the Guidelines."~~

*Amend text in subsection (i) **Applications for Minor Development in Areas at Risk of Flooding** as follows:*

"Checklist of what is required for Minor Developments in Areas at Risk of Flooding:

- Consideration of minor works classification (see section 4.6 of Appendix 13 SFRA)
- Assessment of flood risk carried out by an appropriately qualified Engineer with relevant FRA experience (as deemed acceptable by the Planning Authority).
- Flood resilient design.

- Access, egress and emergency plans must be in places which are appropriate to the vulnerability of the development and its occupiers, the intensity of use and the level of flood risk”.

*Amend text in subsection (ii) **Applications for Larger Developments in Areas at Risk of Flooding** as follows:*

“Applications for larger developments on lands at risk of flooding in the built-up area will require a FRA to be carried out by an appropriately qualified Chartered Engineer as outlined in ~~Table 12, Section 5.1 in Appendix 13 and~~ in the Guidelines. The FRA should be suitably detailed to quantify the risks and the effects of any residual mitigation/adaptation together with the measures needed to manage residual risks”. ...

... “All parties involved in the making of a planning application should consult the CFRAM maps ~~and the Flood Zone maps accompanying this Plan~~ at pre-planning stage to ascertain whether FRA is required”. ...

... “Checklist ~~for Applications~~ for Larger Developments in Areas at Risk of Flooding:

- Development Management ‘Justification Test’ has been passed.
- FRA in accordance with ~~Table 12 in Section 5.1 of~~ the Dún Laoghaire-Rathdown Strategic Flood Risk Assessment (SFRA) (Appendix 13) ~~and the Planning System and Flood Risk Management Guidelines, to be or Section 5.9 of the Flooding Guidelines~~ carried out by an appropriately qualified Engineer with relevant FRA experience (as deemed acceptable by the Planning Authority).
- ~~Development Management Justification Test.~~
- Flood resilient design and statement to be submitted.
- Compliance with GSDS ~~and inclusion of SuDS.~~
- ~~SuDS.~~
- Assessment of the potential impacts of Climate Change and the adaptive capacity of the development
- Access, egress and emergency plans must be in place which are appropriate to the vulnerability of the development and its occupiers, the intensity of use and the level of flood risk.”

## **Section 8.2.11 Archaeological and Architectural Heritage**

### **Section 8.2.11.1 Archaeological Heritage (page 217)**

*Amend text in Section 8.2.11.1 as follows:*

“Pre-development archaeological testing, surveying, monitoring and recording ~~shall be carried out~~ where appropriate shall be carried out and submitted by a qualified archaeologist. In addition to the Government’s ‘Frameworks and Principles for the Protection of the Archaeological Heritage’, regard should be had to the Heritage Council’s guidance document ‘Archaeology & Development: Guidelines for Good Practice for Developers’ (2000)....

...All planning applications and other development proposals which are in, or might affect, sites and features of historical and archaeological interest, shall be referred to the Minister through the Department of ~~Environment, Community and Local Government~~ Arts, Heritage and the Gaeltacht and to the Heritage Council. In considering such planning applications, the Planning Authority will have regard to the views and



recommendations of the National Monuments Service, Department of Arts, Heritage and the Gaeltacht and other interested bodies.”



## Section 8.3 Land Use Zoning Objectives

**Table 8.3.2 Zoning Objective 'A' (page 226)**

*Amend text in Table 8.3.2 as follows:*

<b>Table 8.3.2</b>
<b>ZONING OBJECTIVE 'A'</b>
'To protect and/or improve residential amenity'.
<b>Permitted in Principle</b>
Assisted Living Accommodation, Open Space, Public Services, Residential, Residential Institution, Travellers Accommodation.
<b>Open For Consideration</b>
Allotments, Bring Banks/Bring Centres, Carpark, Caravan Park-Holiday, Caravan Park-Residential, Cemetery, Community Facility, Childcare Service, Cultural Use, Doctor/Dentist etc., Education, Embassy, Enterprise Centre, Funeral Home, Garden Centre/Plant Nursery, Guest House, Health Centre / <b>Healthcare Facility</b> , Home Based Economic Activities, Hotel/Motel, Household Fuel Depot, Industry-Light, Part Off- License, Office Based Industry <sup>a</sup> , Offices less than 200sq.m. <sup>b</sup> , Petrol Station, Place of Public Worship, Public House, Restaurant, Service Garage, Shop Neighbourhood, Sports Facility, Tea Room/Café, Veterinary Surgery.
a: less than 200sq.m.
b: Where the use will not have adverse effects on the 'A' zoning objective, 'to protect and/or improve residential amenity'.

**Table 8.3.3 Zoning Objective 'A1' (page 226)**

*Amend text in Table 8.3.3 as follows:*

<b>Table 8.3.3</b>
<b>ZONING OBJECTIVE 'A1'</b>
'To provide for new residential communities in accordance with approved local area plans'.
<b>Permitted in Principle</b>
Assisted Living Accommodation, Carpark, Caravan Park-Residential, Community Facility, Craft Centre/ Craft Shop, Childcare Service, Cultural Use, Doctor/ Dentist etc., Education, Embassy, Enterprise Centre, Funeral Home, Garden Centre/Plant Nursery, Guest House, Health Centre / <b>Healthcare Facility</b> , Industry-Light, Off-License, Offices less than 600sq.m, Open Space, Petrol Station, Place of Public Worship, Public House, Public Services, Residential, Residential Institution, Restaurant, Service Garage, Shop-Specialist, Shop- Neighbourhood, Shop District, Sports Facility, Tea Room/Café, Travellers Accommodation, Veterinary Surgery.
<b>Open For Consideration</b>
Allotments, Advertisement and Advertising Structures, Agricultural Buildings, Betting Office, Caravan Park-Holiday, Cash and Carry/Wholesale Outlet, Cemetery, <b>Nightclub</b> , Heavy Vehicle Park, Home Based Economic Activities, Hospital, Hotel / Motel, Household Fuel Depot, Industry-General, Motor Sales Outlet, <b>Nightclub</b> Office Based Industry, Offices, Refuse Transfer Station, Rural Industry-Cottage, Rural Industry-Food, Science and Technology Based Industry, Shop-Major Convenience.

**Table 8.3.5 Zoning Objective 'B' (page 227)**

*Amend text in Table 8.3.5 as follows:*

<b>Table 8.3.5</b>
<b>ZONING OBJECTIVE 'B'</b>
'To protect and improve rural amenity and to provide for the development of agriculture'
<b>Permitted In Principle</b>
Allotments, Agricultural Buildings, Boarding Kennels, Caravan Park-Holiday, Cemetery, Community Facility, <b>Crematorium*</b> Concrete/Asphalt (etc.) Plant in or adjacent to a Quarry, Home Based Economic Activities, Industry-Extractive, Open Space, Place of Public Worship, Public Services, Rural Industry-Cottage, Rural Industry-Food, Travellers Accommodation.
<b>Open For Consideration</b>
Abattoir, Carpark, Craft Centre/Craft Shop, Childcare Service, Cultural Use, Doctor/Dentist etc., Education, Enterprise Centre, Garden Centre/Plant Nursery, Guest Housed, Heavy Vehicle Park, Hospital, Hotel/ Motel, Refuse Landfill/Tip, Refuse Transfer Station, Residential <sup>c</sup> , Restaurant <sup>d</sup> , Science and Technology Based Industry, Shop-Neighbourhood, Sports Facility, Tea Room/Café, Transport Depot, Veterinary Surgery.
c: In accordance with Council policy for residential development in rural areas.
d: In existing premises
<b>*: Crematorium use is only permitted in principle on lands zoned for agricultural purposes and subject to SLO 162 at Ballycorus Road</b>

**Table 8.3.6 Zoning Objective 'NC' (page 228)**

*Amend text in Table 8.3.6 as follows:*

<b>Table 8.3.6</b>
<b>ZONING OBJECTIVE 'NC'</b>
'To protect, provide for and/or improve mixed-use neighbourhood centre facilities'.
<b>Permitted In Principle</b>
Advertisements and Advertising Structures, Assisted Living Accommodation, Betting Office, Carpark, Community Facility, Craft Centre/Craft Shop, Childcare Service, Cultural Use, Doctor/Dentist etc., Education, Embassy, Enterprise Centre, Funeral Home, Garden Centre/Plant Nursery, Guest House, Health Centre / <b>Healthcare Facility</b> , Offices less than 300 sq.m, Open Space, Petrol Station, Public House, Public Services, Residential, Residential Institution, Restaurant, Service Garage, Shop-Neighbourhood, Sports Facility, Tea Room/Café, Veterinary Surgery.
<b>Open For Consideration</b>
Cash and Carry/Wholesale Outlet, Nightclub, Home Based Economic Activities, Hotel/Motel, Household Fuel Depot, Motor Sales Outlet, Off-License, Office Based Industry, Offices less than 600sq.m., Place of Public Worship, Shop-Specialist, Shop District, Travellers Accommodation

**Table 8.3.7 Zoning Objective 'DC' (page 228)**

*Amend text in Table 8.3.7 as follows:*

<b>Table 8.3.7</b>
<b>ZONING OBJECTIVE 'DC'</b>
'To protect, provide for and/or improve mixed-use district centre facilities'.
<b>Permitted In Principle</b>
Advertisements and Advertising Structures, Assisted Living Accommodation, Betting Office, Carpark, Community Facility, Craft Centre/Craft Shop, Childcare Service, Cultural Use, <a href="#">Nightclub</a> , Doctor/Dentist etc., Education, Enterprise Centre, Funeral Home, Garden Centre/Plant Nursery, Guest House, Health Centre / <a href="#">Healthcare Facility</a> , Home Based Economic Activities, Hospital, Hotel/Motel, Household Fuel Depot, Industry-Light, Leisure Facility, Motor Sales Outlet, <a href="#">Nightclub</a> Off-License, Office Based Industry, Offices less than 1000sq.m., Open Space, Petrol Station, Public House, Place of Public Worship, Public Services, Residential, Residential Institution, Restaurant, Service Garage, Shop-Major Convenience, Shop-Specialist, Shop- Neighbourhood, Shop-District, Sports Facility, Tea Room/Café, Veterinary Surgery.
<b>Open For Consideration</b>
Cash and Carry/Wholesale Outlet, Industry-General, Offices over 1,000 sq.m., Refuse Transfer Station, Shop-Major Comparison, Science and Technology Based Industry, Transport Depot, Travellers Accommodation, Warehousing.

**Table 8.3.8 Zoning Objective 'MTC' (page 229)**

*Amend text in Table 8.3.8 as follows:*

<b>Table 8.3.8</b>
<b>ZONING OBJECTIVE 'MTC'</b>
'To protect, provide for and/or improve major town centre facilities'.
<b>Permitted In Principle</b>
Advertisements and Advertising Structures, Assisted Living Accommodation, Betting Office, Carpark, Cash and Carry/Wholesale Outlet, Craft Centre/Craft Shop, Community Facility, Childcare Service, Cultural Use, <a href="#">Nightclub</a> , Doctor/Dentist etc., Education, Embassy, Enterprise Centre, Funeral Home, Garden Centre/Plant Nursery, Guest House, Health Centre / <a href="#">Healthcare Facility</a> , Home Based Economic Activities, Hospital, Hotel/Motel, Industry-Light, Leisure Facility, <a href="#">Nightclub</a> Off-License, Office Based Industry, Offices, Open Space, Petrol Station, Place of Public Worship, Public House, Public Services, Residential, Residential Institution, Restaurant, Service Garage, Shop-Specialist, Shop-Neighbourhood, Shop- District, Shop-Major Convenience, Shop-Major Comparison, Sports Facility, Tea Room/Café, Veterinary Surgery.
<b>Open For Consideration</b>
Heavy Vehicle Park, Household Fuel Depot, Industry- General, Motor Sales Outlet, Refuse Transfer Station, Retail Warehouse, Science and Technology Based Industry, Transport Depot, Travellers Accommodation, Warehousing.

**Table 8.3.9 Zoning Objective 'E' (page 229)**

*Amend Text in table 8.3.9 as follows:*

<b>Table 8.3.9</b>
<b>ZONING OBJECTIVE 'E'</b>
'To provide for economic development and employment'.
<b>Permitted In Principle</b>
Advertisements and Advertising Structures, Carpark, Cash and Carry/Wholesale Outlet, Craft Centre/Craft Shop, Childcare Service, Enterprise Centre, Heavy Vehicle Park, Hospital, Household Fuel Depot, Industry-General, Industry-Light, Industry-Special, Motor Sales Outlet, Office Based Industry, Offices, Open Space, Petrol Station, Public Services, Refuse Transfer Station, Rural Industry- Food, Science and Technology Based Industry, Scrap Yard, Service Garage, Tea Room/Café, Transport Depot, Travellers Accommodation, Warehousing.
<b>Open For Consideration</b>
Abattoir, Assisted Living Accommodation, Boarding Kennels, Community Facility, Cultural Use, Nightclub, Doctor/Dentist etc., Education, Funeral Home, Garden Centre/Plant Nursery, Health Centre / <b>Healthcare Facility</b> , Home Based Economic Activities, Hotel/Motel, Industry-Extractive, Leisure Facility <sup>e</sup> , Off-License, Place of Public Worship, Public House, Refuse Landfill/Tip, Residential, Retail Warehouse, Restaurant, Rural Industry-Cottage, Shop Specialist, Shop-Neighbourhood, Shop-District, Sports Facility, Veterinary Surgery.
e: Only applies to 'E' zoned lands subject to a Specific Local Objective for a 'Neighbourhood Centre'.

**Table 8.3.13 Zoning Objective 'TLI' (page 231)**

*Amend text in Table 8.3.13 as follows:*

<b>Table 8.3.13</b>
<b>ZONING OBJECTIVE 'TLI'</b>
'To facilitate, support and enhance the development of third level education institutions'.
<b>Permitted In Principle</b>
Carpark, Community Facility, Childcare Service, Cultural Use, Doctor/Dentist etc., Education, Enterprise Centre, Health Centre / <b>Healthcare Facility</b> , Office less than 1000 sq.m. <sup>l</sup> , Open Space, Public House, Public Services, Residential ( <del>student</del> ) <sup>m</sup> , Restaurant, Science and Technology Based Industry, Shop Neighbourhood, Sports Facility.
<b>Open For Consideration</b>
Conference Facilities, Hotel/Motel Refuse Transfer Station, Transport Depot, Travellers Accommodation, Offices, Shop District.
l: Except at the UCD 'Gateway' Area at the N11 entrance to the campus, where office proposals in excess of 1000 sq.m. may be considered - subject to normal planning considerations. m: <del>Student rental accommodation only</del> . In accordance with Department of Education and Science Guidelines on Residential Development for Third Level Students (1999) and subsequent supplementary document (2005)

**Table 8.3.15 Zoning Objective 'MH' (page 232)**

*Amend text in Table 8.3.15 as follows:*

<b>Table 8.3.15</b>
<b>Zoning Objective 'MH'</b>
'To improve, encourage and facilitate the provision and expansion of medical/hospital uses and services'.
<b>Permitted In Principle</b>
Advertisements and Advertising Structures, Community Facility, Childcare Service, Doctor/ Dentist etc., Education, Funeral Home, Health Centre / <b>Healthcare Facility</b> , Hospital, Open Space, Place of Public Worship, Public Services, <del>Residential Institution</del> , Small Scale Convenience Shop (300 m2), Tea Room/ Café, <b>Transitional/step-down non-acute medical facilities and rehabilitation services (including associated on-site, short- stay accommodation)</b> , Veterinary Surgery.
<b>Open For Consideration</b>
Assisted Living Accommodation, Car Park, Cultural Use, Hotel/Motel, Leisure Facility, Offices, Residential, <b>Residential Institution</b> , Restaurant, Sports Facility.

**Table 8.3.16 Zoning Objective 'MIC' (page 233)**

*Amend text in Table 8.3.16 as follows:*

<b>Table 8.3.16</b>
<b>Zoning Objective 'MIC' (applies to Sandyford Urban Framework Plan area only)</b>
'To consolidate and complete the development of the mixed use Inner Core to enhance and reinforce sustainable development'.
<b>Permitted In Principle</b>
Advertisements and Advertising Structures, Betting Office, Craft Centre/Craft Shop, Community Facility, Childcare Service, Cultural Use, Nightclub, Doctor/ Dentist etc., Education, Embassy, Enterprise Centre, Funeral Home, Guest House, Health Centre / <b>Healthcare Facility</b> , Home Based Economic Activities, Hotel/Motel, Leisure Facility, Off-License, Offices <sup>*1</sup> , Open Space, Place of Public Worship, Public House, Public Services, Residential <sup>*2</sup> , Restaurant, Shop-Specialist, Tea Room/Café, Veterinary Surgery, Convenience (including supermarkets) and Comparison Shops <sup>*3</sup> .
*1 Any office development shall accord with the policy for office based employment in Mixed Use Core Areas as outlined in the Sandyford Urban Framework Plan.
*2 Any residential development shall accord with the Residential policy for residential within the Mixed Use Core Areas as outlined in the Sandyford Urban Framework Plan.
*3 Any retail development shall accord with the policy for retail within Mixed Use Core Areas as outlined in the Sandyford Urban Framework Plan.
<b>Open For Consideration</b>
Industry-Light, Office Based Industry, Retail Warehouse, Carpark.

**Table 8.3.17 Zoning Objective 'MOC' (page 233)**

*Amend text in Table 8.3.17 as follows:*

<b>Table 8.3.17</b>
<b>Zoning Objective 'MOC' (applies to Sandyford Urban Framework Plan area only)</b>
'To provide for a mix of uses which complements the Mixed Use Inner Core, but with less retail and residential and more emphasis on employment and services.'
<b>Permitted in Principle</b>
Advertisements and Advertising Structures, Betting Office, Community Facility, Childcare Service, Cultural Use, Nightclub, Doctor/Dentist etc., Education, Embassy, Enterprise Centre, Guest House, Health Centre / Healthcare Facility, Hotel/Motel, Leisure Facility, Off License, Offices <sup>*1</sup> , Open Space, Place of Public Worship, Public House, Public Services, Restaurant, Shop-Specialist, Local Shop <sup>*2</sup> , Sports Facility, Tea Room/Café.
*1 Any office development shall accord with the policy for office based employment in Mixed Use Core Areas as outlined in the Sandyford Urban Framework Plan.
*2 Local shop and services primarily serving the local/walk in community with basic day to day needs, typically these comprise convenience stores and services such as newsagents, butchers, vegetable shop, hairdresser, beauty salon and other similar basic retail services.
<b>Open For Consideration</b>
Craft Centre/Craft Shop, Garden Centre/Plant Nursery, Home Based Economic Activities, Motor Sales Outlet, Office Based Industry, Residential*, Residential Institution, Carpark.
* Residential development shall accord with the Policy for residential within the Mixed Use Core Areas as outlined in the Sandyford Urban Framework Plan.

**Table 8.3.19 Zoning Objective 'W' (page 234)**

*Amend text in Table 8.3.19 as follows:*

<b>Table 8.3.19</b>
<b>ZONING OBJECTIVE 'W'</b>
'To provide for waterfront development and harbour related uses'.
<b>Permitted In Principle</b>
Carpark, Community Facility, Cultural Use, Industry- Light, Offices less than 200 sq.m., Marine Leisure Facility, Open Space, Public Services, Restaurant, Transport Depot.
<b>Open For Consideration</b>
Advertisements and Advertising Structures, Assisted Living Accommodation, Craft Centre/ Craft Shop, Childcare Service, Doctor/Dentist, Education, Enterprise Centre, Hotel/Motel, Office Based Industry, Offices, Off-License <sup>k</sup> , Place of Public Worship, Public House <sup>k</sup> , Sports Facility, Residential, Residential Institution, Science and Technology Based Industry, Shop-Specialist, Shop Neighbourhood, Tea Room/Café, Travellers Accommodation.
K: Uses Open for Consideration in Dún Laoghaire Harbour area only.
<b>Note 1:</b>
An objective of this Plan is to protect the harbour/ marine entity of Dún Laoghaire Harbour by facilitating harbour-related uses, but not to confine permitted uses in the harbour to a degree that exclusively attracts those with an interest in active maritime recreation. Any development proposal



should seek to ensure public accessibility to the harbour and shorefront.

**Note 2:**

Any development in the coastal area should have regard to the findings of the Dún Laoghaire-Rathdown County Council Coastal Defence Strategy Study, (2010).

**Note 3:**

Any redevelopment of the former Killiney Beach Tea Rooms shall be within the size and scale of the permitted development, and generally confined to the uses permitted under Reg. Ref. D09A/0034/E. In particular no more than two residential units to be provided on the site

### **Section 8.3.12 Definition of Use Classes (pages 235 - 239)**

*Amend text of 'Health Centre' definition as follows:*

**Health Centre / Healthcare Facility**

"A building or part thereof or land used for the provision of local medical, dental, prophylactic or social assistance services for the local community and including group practices and clinics, ~~and~~ primary care centres, **mental health and wellbeing facilities and other complimentary medical services.**(The above relates to outpatient services only - see 'Hospital' for inpatient services)."

*Insert a new definition after 'Hospital' as follows:*

**"Transitional/'Step-Down' Medical/Rehabilitation Services**

A building or part thereof or land used for post-acute hospital care or 'step down'/transitional medical and rehabilitation services usually with associated on-site, short-stay accommodation."

*Amend text of 'Public Services' definition as follows:*

**"Public Services**

A building or part thereof or land used for the provision of 'Public Services'. 'Public Services' include all service installations necessarily required by electricity, gas, telephone, radio, television, **water**, drainage and other statutory undertakers. ~~It~~ **It** includes public lavatories, public telephone boxes, bus shelters, bring centres, green waste composting facilities, etc."

*Delete 'Residential (Student)' definition as follows:*

~~**"Residential (Student)**~~

~~The use of a building or part thereof including houses, flats, bed sitters, residential caravans, etc., designed for human habitation, and specifically designed for short-term rental accommodation for students and operated in accordance with the Department of Education and Science Guidelines on Residential Development for Third Level Students."~~







## Section 9 Specific Local Objectives

---

### **Map 1 Clonskeagh/Dundrum (page 243)**

*Delete SLO No. 146 as follows:*

~~"To prepare a Local Area Plan for Clonskeagh/UCD".~~

*Insert additional SLO No.148 as follows:*

"To prepare - in conjunction with the National Transport Authority - a Traffic Management Study for UCD and its surrounding environs to address the existing localised car parking issues within the area".

*Amend text in SLO No.6 as follows:*

"To promote potential additional future uses of the Dublin Eastern Bypass reservation corridor, including a greenway/cycleway, a pedestrian walkway, biodiversity projects, recreational opportunities - inclusive of playing pitches - and public transport provision such as Bus Rapid Transit services, pending a decision from the National Roads Authority/Central Government in relation to the future status of the Bypass. Any potential additional future short-term uses of the reservation corridor will be subject to a joint feasibility study to be undertaken by the NRA and NTA."

*Insert additional SLO No.149 as follows:*

"That any future redevelopment of Dundrum Village Centre (Phase 2) shall provide for and retain a range of complementary non-retail uses including - but not limited to - employment, restaurant, leisure, entertainment, cultural, community, and civic uses – to supplement that already provided for within the wider Dundrum Town Centre."

*Insert additional SLO No.150 as follows:*

"To ensure that Phase 2 of the Dundrum Town Centre takes cognizance of the character and streetscape of the old Main Street".

---

### **Map 2 Booterstown/Blackrock/Stillorgan (page 244)**

*Delete SLO No.5 as follows:*

~~"The Council will support and facilitate the development of a "Gateway" scheme at the N11 entrance to the UCD campus which will provide for a range of uses normally associated with a major international university. These facilities should encourage a greater interaction with the neighbouring community and the wider public and should include, inter alia, cultural, community and neighbourhood scale retail facilities, swimming pool, theatre, a significant commercial office component, incubator units, hotel and student accommodation and transport facilities. The "Gateway" shall be of a high architectural standard and embody the principles of sustainability and energy~~

~~efficiency. The open spaces and sylvan setting of the University campus shall be protected from development in accordance with the University College Dublin Campus Development Plan.~~

*Amend SLO No.6 as follows:*

"To promote potential additional future uses of the Dublin Eastern Bypass reservation corridor, including a greenway/cycleway, a pedestrian walkway, biodiversity projects, recreational opportunities - inclusive of playing pitches - and public transport provision such as Bus Rapid Transit services, pending a decision from the National Roads Authority/Central Government in relation to the future status of the Bypass. Any potential additional future short-term uses of the reservation corridor will be subject to a joint feasibility study to be undertaken by the NRA and NTA."

*Amend SLO No.10 as follows:*

"To implement and develop the lands in Blackrock in accordance with the forthcoming adopted Blackrock LAP."

*Delete SLO No.72 as follows:*

~~"The line of the Eastern Bypass between the N11 and Dublin Bay is not fixed. The route will be determined following environmental assessment including appropriate assessment and a process of public consultation."~~

*Delete SLO No.142 as follows:*

~~"To preserve the distinctive original appearance of the Kenny built residences in Mount Merrion."~~

*Delete SLO No.146 as follows:*

~~"To prepare a Local Area Plan for Clonskeagh/UCD"~~

*Insert additional SLO No.148 as follows:*

"To prepare - in conjunction with the National Transport Authority - a Traffic Management Study for UCD and its surrounding environs to address the existing localised car parking issues within the area".

*Insert additional SLO No.151 as follows:*

"To support and facilitate the provision of a swimming pool and leisure facility within the Stillorgan area."

---

**Map 3 Monkstown/Dún Laoghaire (page 245)**

*Amend SLO No.13 as follows:*

"To facilitate the continued development of the Harbour, **ensuring at all times that the historic significance and natural beauty of this public amenity is protected**, in advance of the preparation of the Dún Laoghaire and Environs Local Area Plan (LAP). Following the adoption of the Dún Laoghaire and Environs LAP, the future development of the Harbour will thereafter be guided by the principles and objectives of the Plan and that of Policy E14".

*Insert additional SLO No.152 as follows:*

**"To enhance the character, ambiance and quality of the environment, historic streetscapes and public realm of the residential streets in the areas adjoining Lower George's Street, Dún Laoghaire and in particular, the areas of early twentieth century social housing, to ensure that the public realm in this older residential area, in close proximity to the core business district of the Town, is enhanced, improved and maintained to the standard provided for other residential and business districts adjoining Upper and Lower George's Street".**

*Insert SLO No.153 as follows:*

**"That Dun Leary House (Yellow Brick House) and associated boundary be retained in situ and renovated."**

*Insert additional SLO No.154 as follows:*

**"To encourage and support the redevelopment and refurbishment of the Dún Laoghaire Shopping Centre Site - in accordance with the provisions of the Dún Laoghaire Urban Framework Plan - in advance of the adoption of the Dún Laoghaire and Environs Local Area Plan (LAP)."**

*Insert additional SLO No.156 as follows:*

**"In accordance with the National Ports Policy the Council shall, within the relevant planning frameworks, formulate and implement, where appropriate and applicable, a plan for the future development of Dún Laoghaire Harbour and its curtilage as determined by Part 1, subsection 6 of the Third Schedule of the Harbours Act, 1996."**

*Insert additional SLO No.157 as follows:*

**"To support and encourage the development of a National Watersports Centre to facilitate training and participation in a varied range of water sports and activities to provide a focus for national and international watersport events. Site appraisal and analysis of the harbour environs to identify the optimum location(s) for such a centre to be expedited as an integral component of the forthcoming Dún Laoghaire and environs LAP."**

**Map 4 Sandycove/Dalkey (page 246)**

*Amend wording of SLO No.78 on map 4 as follows:*

"To prepare a Management Plan for Killiney Hill Park to include the area comprising the entire pNHA of Killiney Hill and Roches/Mullins Hill in consultation and liaison with the National Parks and Wildlife Service."

---

**Map 5 Dundrum/Ballinteer (page 247)**

*Amend SLO No.6 as follows:*

"To promote potential additional future uses of the Dublin Eastern Bypass reservation corridor, including a greenway/cycleway, a pedestrian walkway, biodiversity projects, recreational opportunities - inclusive of playing pitches - and public transport provision such as Bus Rapid Transit services, pending a decision from the National Roads Authority/Central Government in relation to the future status of the Bypass. Any potential additional future short-term uses of the reservation corridor will be subject to a joint feasibility study to be undertaken by the NRA and NTA."

*Insert additional SLO No.158 as follows:*

"To support and promote the sporting and amenity use on the lands known as St. Thomas Estate, Tibbradden Road, Whitechurch - towards the development of facilities and activities which would integrate with the wider community and established regional parklands and promote the development of athletics by Dundrum South Dublin Athletic Club in Dún Laoghaire-Rathdown."

*Insert additional SLO No.159 as follows:*

"To facilitate suitable proposals for the use/reuse and extension of the existing sports science complex and health and fitness club facility at Blackglen Road/Ticknock Drive and to provide for suitable uses - to include uses relating to health and fitness, rehabilitation services and transitional/'step-down' care services and associated medical support services - including the provision of an appropriate level of associated short-stay accommodation on the site."

---

**Map 6 Sandyford/Foxrock (page 248)**

*Amend SLO No.6 as follows:*

"To promote potential additional future uses of the Dublin Eastern Bypass reservation corridor, including a greenway/cycleway, a pedestrian walkway, biodiversity projects, recreational opportunities - inclusive of playing pitches - and public transport provision such as Bus Rapid Transit services, pending a decision from the National Roads Authority/Central Government in relation to the future status of the Bypass. Any potential additional future short-term uses of the reservation corridor will be subject to a joint feasibility study to be undertaken by the NRA and NTA."



*Insert additional SLO No.164 as follows:*

**"To protect and support the continuation of playing pitches at Páirc Ui Bhriain."**

---

### **Map 7 Cabinteely/Killiney (page 249)**

*Amend title of Map 7 as follows:*

**"Cabinteely/Killiney/Sallynoggin"**

*Amend wording of SLO No.78 as follows:*

**"To prepare a Management Plan for Killiney Hill Park to include the area comprising the entire pNHA of Killiney Hill and Roches/Mullins Hill in consultation and liaison with the National Parks and Wildlife Service."**

*Amend SLO No.132 as follows:*

**"To encourage the redevelopment and refurbishment of the former Killiney Beach Tea Rooms within the size and scale of the permitted development, and generally confined to the uses permitted under Reg. Ref. D09A/0034/E. In particular no more than two residential units to be provided on the site."**

*Insert additional SLO No.160 as follows:*

**"To facilitate, support and enhance the development of the area, both roundabouts at Killiney Shopping Centre (Graduate roundabout) and at Glenageary, be retained to ensure proper traffic management of the area."**

---

### **Map 8 Kilmashogue/Ticknock (page 250)**

*Amend SLO No.36 as follows:*

**"To prepare and adopt a Masterplan to develop Fernhill Gardens into a 'Gateway' Park/Regional Park with all the recreational amenities associated with a major park, such as pitches, playground, ponds, paths and a car park. The Masterplan should also ensure the continued conservation of Fernhill House and the preservation of trees, woodlands and amenity gardens at Fernhill"**

---

### **Map 9 Stepside (page 250)**

*Amend SLO No.36 as follows:*

**"To prepare and adopt a Masterplan to develop Fernhill Gardens into a 'Gateway' Park/Regional Park with all the recreational amenities associated with a major park, such as pitches, playground, ponds, paths and a car park. The Masterplan should also ensure the continued conservation of Fernhill House and the preservation of trees, woodlands and amenity gardens at Fernhill"**

*Insert additional SLO NO. 161 as follows:*

"To conserve and protect Carrickmines Castle site and to proceed to implement the Carrickmines Castle Conservation Plan 2015-2015."

*Insert additional SLO No.162 as follows:*

"To provide for a crematorium on lands zoned for agricultural purposes at Ballycorus Road".

---

### **Map 10 Laughanstown/Shankill (page 251)**

*Amend SLO No.42 as follows:*

~~To prepare and implement a design for the grade separation of the Loughlinstown Roundabout as a Long Term Roads Objective. To liaise with the National Roads Authority (NRA) to investigate potential improvements to the Loughlinstown Roundabout with any such improvements to be informed by the outcomes of the NRA's on-going Corridor Studies."~~

*Delete SLO No.126 as follows:*

~~"To refuse planning permission for any new developments which include on-site wastewater treatment facilities within this catchment, until the groundwater issues in the area are resolved or ameliorated."~~

---

### **Map 13 Glencullen/Ballycorus (page 252)**

*Delete SLO No.126 as follows:*

~~"To refuse planning permission for any new developments which include on-site wastewater treatment facilities within this catchment, until the groundwater issues in the area are resolved or ameliorated."~~

---

### **Map 14 Rathmichael/Old Connaught (page 253)**

*Amend SLO No.56 as follows:*

~~"To upgrade the Wilford Interchange in order to provide connectivity to lands west of the M11 and Old Conna Village. To investigate the potential upgrading of the Wilford interchange to provide connectivity to lands west of the M11 and Old Conna Village with any such improvements to be informed by the outcome of the NRA's on-going Corridor Studies."~~

*Delete SLO No.126 as follows:*

~~"To refuse planning permission for any new developments which include on-site wastewater treatment facilities within this catchment, until the groundwater issues in the area are resolved or ameliorated."~~

*Insert additional SLO No.163 as follows:*

"To facilitate the provision of a pedestrian corridor connecting Cois Cairn to the Dublin Road, in conjunction with the development of the Council owned 'E' zoned lands and the upgrading of the Wilford Interchange."



**Section 10: Strategic  
Environmental Assessment  
and Appropriate  
Assessment**



## **10.1 Strategic Environmental Assessment**

---

There are no amendments to Section 10.1 of the Draft Plan.

---

## **10.2 Appropriate Assessment**

---

There are no amendments to Section 10.2 of the Draft Plan.





**Part 3:**

**Proposed amendments to Appendices of Draft  
County Development Plan**



## **Appendix 2:** Interim Housing Strategy



## Appendix 2: Interim Housing Strategy

---

*Amend title as follows:*

**"Appendix2: ~~Interim~~ Housing Strategy"**

*Amend text of Housing Strategy as follows:*

### **"Table of Contents**

#### **Section 1 Introduction**

- 1.1 Introduction
- 1.2 Strategy Format

#### **Section 2 Context**

- 2.1 Legislative Context
- 2.2 National and Regional Policy
  - 2.2.1 National Spatial Strategy
  - 2.2.2 Housing Policy Statement June 2011
  - 2.2.3 Social Housing Strategy 2020
  - 2.2.4 Other National/Housing Documents
  - 2.2.5 Regional Planning Guidelines for the Greater Dublin Area 2010 - 2022
- ~~2.3 Review of Part V of the Planning and Development Act, 2000.~~
- 2.43 Implications for the Dún Laoghaire-Rathdown County Development Plan

#### **Section 3 An Analysis of Housing Demand and Supply.**

- 3.1 Housing Demand
  - 3.1.1 Population
  - 3.1.2 Household Structure
- 3.2 Housing Supply
  - 3.2.1 House Completions
  - 3.2.2 Housing Land Availability (HLA) Study
- 3.3 House Prices
  - 3.3.1 Average House Prices in Dún Laoghaire–Rathdown
  - 3.3.2 Trends Identified
- 3.4 Private Rented Sector

#### **Section 4 An Analysis of the Social Housing Demand and Supply.**

- 4.1 Introduction
- 4.2 Social Housing List
- 4.3 Social Housing Provision
  - 4.3.1 Rental Accommodation Scheme (RAS)
  - 4.3.2 Rent Supplement
  - 4.3.3 Social Housing Leasing Initiative (SHLI)
- 4.4 Housing Needs Assessment

## **Section 5 Specific Housing Needs**

### 5.1 Introduction

#### 5.1.1 Homeless Persons

#### 5.1.2 Traveller Accommodation

#### 5.1.3 Disabled Persons

#### 5.1.4 Elderly Persons

#### 5.1.5 Household Composition

## **Section 6 Estimated Social and Affordable Housing**

### 6.1 Estimated Affordable Housing Need

### 6.2 Estimated Social Housing Need.

## **Section 7 Issues and Objectives to Secure Delivery of the Strategy.**

### 7.1 Introduction

### 7.2 Housing Mix

### 7.3 Housing Type

### 7.4 Provision for Special Needs

### 7.5 Implementation of the Housing Strategy

### 7.6 Circumstances where a Reduced Element may be Acceptable

### 7.7 Objectives

## Section 1: Introduction

### **1.1 Introduction**

Under Section 94 (1) (a) of the Planning and Development Act 2000 (as amended), *'each planning authority shall include in any development plan that it makes in accordance with section 12 a strategy for the purpose of ensuring that proper planning and sustainable development of the area of the development plan provides for the housing of the existing and future population of the area in the manner set out in the strategy'*.

The implosion of Ireland's property bubble in 2008 prompted the announcement, in June 2011, of significant changes to Government housing policy with a new Vision for the future of the housing sector. The Housing Policy Statement of 2011 also flagged a comprehensive review of Part V. In August 2013 The Housing Agency published a consultation document entitled "Review of Part V of the Planning and Development Act, 2000" (Refer also 2.3 below). (Refer also 2.3 below). ~~The consultation document put forward six different options regarding delivery of Part V but to date findings of that review process have not yet been published. Consequently, at this point in time, it is not possible to conclude a finalised Housing Strategy for the County.~~ The Urban Regeneration and Housing Act 2015 was enacted on September 1<sup>st</sup> 2015. Part V provision has been amended from 20% to 10%.

#### **Aim**

*The aim of this Strategy is to ensure access by each household in the County to affordable housing or accommodation of good quality, culturally acceptable, suitable to its needs and in the tenure of their choice, as far as possible.*

The targets set in this Housing Strategy may be considered to be ambitious, given the present economic climate. However given the population increase in the County over the last intercensal period (+7%) and recent Central Statistic Office (CSO) projections it is important to plan for growth. Whilst sufficient zoned lands are currently available to meet residential targets in the County, it is considered that realistically, the delivery of these 'targets' will be achieved over a significantly longer time horizon than this Development Plan.

~~This Housing Strategy is therefore considered as an 'Interim' Housing Strategy until such time as the revised Part V is enacted and the Council is in a position to plan for housing provision in a manner consistent with the policies which will frame the Development Plan 2016-2022.~~

### **1.2 Strategy Format**

The Strategy takes the format of a Written Statement as follows:

- Section 1 Introduction
- Section 2 An outline of the Legislative and National and Regional context.
- Section 3 An analysis of housing demand and supply.
- Section 4 An analysis of social housing demand and supply for the County.
- Section 5 An outline of the principle specific needs categories.
- Section 6 An estimate of the social housing needs for the County over the period of the Strategy
- Section 7 Issues and objectives to secure delivery of the Strategy.

## Section 2: Context

### **2.1 Legislative Context**

Part V of the Planning and Development Act 2000 (as amended), ~~hereafter referred to as the Act,~~ and the Urban Regeneration and Housing Act 2015 requires that all Planning Authorities prepare Housing Strategies and incorporate them into their Development Plans. Section 10(1A) of the Act requires that Development Plans include a Core Strategy which shows that the Plan is consistent with both the National Spatial Strategy and Regional Planning Guidelines. Planning Authorities are required to demonstrate that the Housing Strategy is aligned with the population projections contained in the Core Strategy and the Regional Planning Guidelines.

The Housing Strategy must include an analysis of demand and supply for the different sectors of the housing market, forecast future requirements and propose strategies to balance demand and supply in a sustainable manner.

The Planning and Development Act and the Urban Regeneration and Housing Act specifies, in particular, that in preparing the Housing Strategy the Planning Authority shall:

- a) have regard to the most recent summary of social housing assessments prepared under section 21(a) of the Housing (Miscellaneous Provisions) Act 2009 that relate to the area of the development plan,
- b) consult with anybody standing approved of for the purposes of section 6 of the Housing (Miscellaneous Provisions) Act 1992 in its functional area, and
- c) have regard to relevant policies or objectives for the time being of the Government or any Minister of the Government that relate to housing and, in particular, social integration in the provision of housing services."

The Act specifies that a Housing Strategy shall:

- Ensure that adequate zoned and serviced lands for residential purposes are available in appropriate locations to meet the requirements of the Housing Strategy and the existing and future housing demand ~~—including social and affordable housing (This requirement has been superseded by the Core Strategy).~~
- Ensure that housing is available to people of different income levels and determine the distribution of this housing.
- Ensure that a mixture of house types and sizes is developed to reasonably match the requirements of the different categories of households, including the special requirements of elderly persons and persons with disabilities.
- Counteract undue segregation in housing between people of different social backgrounds.
- Provide that a specific percentage (not exceeding ~~2~~10%) of the land zoned in the Development Plan for residential use or a mixture of residential and other uses, shall be reserved for those in need of social or affordable housing in the area.

The Housing (Miscellaneous Provisions) Act 2009 requires the preparation of Housing Services Plans and contains new provisions on the assessment of social housing needs. It also revises the Housing Authority's management and control powers and introduces antisocial behaviour strategies. It increases the choice available to those seeking social housing by providing a more developed legislative basis for the Rental Accommodation Scheme (RAS) and by expanding paths to home ownership through a new Incremental Purchase Scheme.



The Urban Regeneration and Housing Act 2015 aims to implement Construction 2020 – Strategy for a Renewed Construction Sector and is focused on incentivising the activation of existing and new planning permissions. The main changes to the Part V agreements are as follows;

- The halving to 10% (from 20%) the percentage of land that must be provided for social and affordable housing in new housing developments (section 31 (b));
- A requirement that Part V agreements should be reached between developers and local authorities prior to the lodgement of a commencement notice for the development.
- The elimination of the current options allowing developers to fulfil their Part V obligations by means of the transfer of sites or land elsewhere, or of making a cash payment in lieu of Part V obligations, thereby signalling that the focus is now firmly on the provision of an element of social housing as an integral part of new housing projects
- The possibility for the new Part V provisions to be retrospectively applied to, and be renegotiated in respect of, existing planning permission where works have not yet commenced subject to the agreement of the developer and the planning authority
- The introduction of the possibility for developers to agree with a planning authority to lease out units for social housing either on or off site
- The increase in the size of developments exempted from the Part V provisions from developments of 4 units or less to developments of 9 units or less – in effect, Part V will now only apply to developments of 10 units or more.

## **2.2 National and Regional Policy**

### **2.2.1 National Spatial Strategy (NSS)**

The National Spatial Strategy 2002 – 2022 update (2010) outlines the Government's commitment to implementing long-term planning frameworks - taking account of the experience since 2002 and the new environmental, budgetary and economic challenges. There is a continuing emphasis on encouraging more sustainable patterns of urban and rural development. It is noted that the Department of Environment Community and Local Government (DoECLG) have given some recent indications (Spring 2013) that a comprehensive review and update of the NSS has been considered in response to the Country's significantly changed economic landscape.

### **2.2.2 Housing Policy Statement June 2011**

In June 2011 the DoECLG issued a revised Housing Policy Statement. This document outlines a vision for the future of the housing sector in Ireland '*based on choice, fairness, equity across tenures and on delivering quality outcomes for the resources invested*'.

The overall strategic objective is to enable all households to have access to good quality housing appropriate to the household circumstances and in their particular community of choice.

It is considered that in general, housing policy decrees that those who can afford to do so should provide housing for themselves with the aid of the fiscal incentives available, and that those unable to do so from their own resources should have access to social housing or to income support to secure and to retain private housing.

The document also outlines the Government's view that there has been too great an emphasis placed on home ownership in the past and that this has had a detrimental effect on the economy. It is stated that future housing policy will require to focus on meeting the most acute needs. It is noted that it is not intended to terminate Part V fully as the statement confirms that there is a continued rationale for capturing planning gain for residential development which can be used to resource social housing supports.

A summary of the relevant measures outlined in the document are:

A summary of the **relevant** measures outlined in the document are:

- The standing down of all affordable housing schemes.
- A formal review of Part V
- Maximising the delivery of social housing supports within the resources available.
- Transfer of responsibility for long-term recipients of rent supplement to local authorities.
- More equitable treatment of housing tenure.
- Publication of the Housing Strategy for People with Disabilities.
- New mechanisms for delivering permanent social housing.
- Creating an enabling regulatory framework to support the increasingly prominent role of the voluntary and cooperative sector in housing delivery.

### 2.2.3 Social Housing Strategy 2020

In November 2014 the Government approved the 'Social Housing Strategy 2020' which supports a new vision *"that to the greatest extent possible, every household in Ireland will have access to secure, good quality housing suited to their needs at an affordable price and in a sustainable community"*.

The aim of the strategy is threefold:

- To provide 35,000 new social houses, over the six year period to 2020.
- To support up to 75,000 Households through an enhanced private rented sector.
- To reform social housing supports.

The strategy will be underpinned by the development of sustainable funding of social housing.

The delivery of new housing will be via Local Authorities and Approved Housing Bodies (AHBs), which will be supported by a Dublin Social Housing Delivery task Force (DSHDT).

### 2.2.4 Other National/Housing documents

The Government outlined its commitment to ensure that housing provision was sustainable and of high quality in its guidance documents 'Delivering Homes, Sustaining Communities (2007)', 'Quality Housing for Sustainable Communities' (2007).

The DoECLGs 'National Housing Strategy for People with a Disability' (2011) outlines the Government strategy to address the housing needs of people with disabilities over the period 2011 to 2016. The Government's Housing Policy Statement, also published in 2011, supports and further supplements the 'National Housing Strategy for People with a Disability' as part of a framework of initiatives to provide for the housing needs of vulnerable and disadvantaged households.

The DoECLGs Homeless Strategy National Implementation Plan (2008) states that the Strategy will be carried out primarily through the Local Homeless Action Plan process prepared under the Housing (Miscellaneous Provisions) Act 2009.

## **2.2.5 Regional Planning Guidelines for the Greater Dublin Area 2010 – 2022**

The Regional Planning Guidelines for the GDA 2010 - 2022 (RPGs) aim to direct and influence future growth of the Greater Dublin Area (GDA) over the medium-to -long term, and to give effect to the overarching strategic planning framework set out in the NSS.

With specific relevance to Dún Laoghaire-Rathdown the RPG's recommend that *'As a mostly Metropolitan County, housing delivery should focus on strengthening the urban form of the County through building up town and district centres at public transport nodes; continuing sensitive infill to counteract falling population and declining services and supporting new housing growth along the key new public transport services of the Luas extension from Sandyford to Bray/Fassaroe (in two phases) and upgrades to the DART route through the Count'.*

In relation to rural housing, it advises that local authority policies need to *'take account of the differing types of rural housing demands in varying rural contexts and be tailored accordingly'.*

### **~~2.3 — Review of Part V of the Planning and Development Act, 2000.~~**

~~The Housing Agency published a consultation document 'Review of Part V of the Planning and Development Act, 2000' in August 2013. The consultation document reviews the outputs to date from the Part V process including a financial analysis of the economic efficiency of the process. Evidence indicates that after an initial lag period, Part V began to yield considerable results around 2005 to 2008 with Part V accounting for 12% of all house completions nationally (excluding 'one-offs') in 2008. Since that date Part V has been less successful in delivering social and affordable housing due primarily to the collapse of the housing market.~~

~~Six options to recast Part V are put forward. These include:~~

- ~~• Abolition or suspension of Part V.~~
- ~~• Streamlining of the current process — which could include setting the requirement for affordable housing at 0%, increasing the role of the voluntary housing bodies in the provision of social housing and reviewing the appropriateness of 20%.~~
- ~~• Widening the scope of development — applying Part V to all residentially zoned land, all zoned land or all land.~~
- ~~• A development contribution basis.~~
- ~~• Negotiated solution — similar to the UK where social housing provision by developers is subject to individual negotiated agreements.~~
- ~~• Inclusionary zoning — provides incentives to developers to provide social housing.~~

~~In September 2013 Dún Laoghaire-Rathdown made a corporate response to the Part V Review process. That response made four key points:~~

- ~~• The complete abolition or suspension of Part V would be a retrograde step.~~
- ~~• Notwithstanding the closing of the 'affordability gap' it is important that Local Authorities remain in a position to obtain planning gain from developers even in the current economic climate.~~
- ~~• A recognition that the cyclical nature of the economy means there will be times when the yield from Part V will be higher/lower.~~
- ~~• Additional and alternative mean of provision of housing may need to be considered particularly relating to tenure and/or security of tenure.~~

## **2.4 2.3 Implications for the Dún Laoghaire-Rathdown County Development Plan**

~~The Part V review process has not yet advanced to the point of sufficiently providing any guidance or recommendations in terms of methodology for the preparation of 'Housing Strategies' particularly when set against the backdrop of the standing down of affordable housing.~~

Section 94 of the Planning and Development Act outlines the criteria that the Planning Authority should have regard to when estimating the amount of affordable housing required in the Plan area. The criteria include house prices, interest rates and the relationship between house prices, interest rates and income. In previous Housing Strategies Dún Laoghaire-Rathdown have been led by the 'Louth Model'.

However, because of low levels of Government funding for the provision of direct build social housing and the stepping down of the affordable housing provisions there would appear to be little or no benefit in preparing a Housing Strategy in accordance with the Louth Model. It is noted that other Planning Authorities have proceeded with their County Development Plan and Housing Strategy without recourse to the Louth Model (Wexford and Mayo Co Council for example). The inherent difficulty with Housing Strategies is that they always represent a 'snap-shot' in time of something that is constantly evolving and changing. This is particularly the case at this time when there is such volatility and uncertainty in the housing market in Dún Laoghaire Rathdown.

The following ~~Interim~~ Housing Strategy endeavours to address the obligations set out in Section 94 but all the time recognising and having regard to the rapidly changing and evolving housing landscape both nationally and locally. **In addition it is noted as set out above that the Urban Regeneration and Housing Bill 2015 states that a Planning Authority shall have regard to the**

***"relevant policies or objectives for the time being of the Government or any Minister of the Government that relate to housing and, in particular, social integration in the provision of housing services."***

~~The following Interim Housing Strategy endeavours to address the obligations set out in Section 94 but all the time recognising and having regard to the rapidly changing and evolving housing landscape both nationally and locally. The continuing delay in bringing forward recommendations from the Part V Review process continues to present major challenges. Given this particular set of circumstances it is recommended that a commitment be given to undertaking a comprehensive review of this Housing Strategy when clarity is respect of Part V is forthcoming or as a component part of the mandatory 'Two Year' Development Plan Review process whichever is the earlier. This review will also take into account the Government "Social Housing Strategy 2020" (November 2014).~~

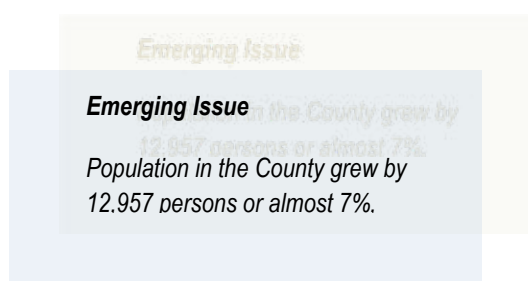
## Section 3: An Analysis of Housing Demand and Supply

### 3.1 Housing Demand

This section sets out the projected demand for housing units in Dún Laoghaire-Rathdown based both on the population targets contained in the 2010-2022 Regional Planning Guidelines (RPGs) and the Core Strategy contained in the County Development Plan 2016 - 2022 (Refer Section 1.2 of the Written Statement).

#### 3.1.1 Population

In previous Housing Strategies practice was to target the overall population of the County – and for the main settlements in the County – and predict the required number of housing units accordingly. The Planning and Development (Amendment) Act 2010, however, now requires Planning Authorities to take a more planned approach and to indicate the proposed 'distribution' of the population assigned to the County in the RPGs. The population allocations for the County are set by the RPGs.



Census 2011 revealed that the population in the County grew by c. 13,000 or almost 7%, between 2006 and 2011. The population of the County now stands at 207,000 persons. The Glencullen ED had the third highest rate of growth of any ED in the Country – an increase of almost 4,000 persons. This recent pattern of growth represents a significant change in the demographic

patterns of the last 25 years. It is testimony that policies pursued by the Council in recent years have succeeded in reversing a long-standing pattern of population decline. In the previous Census the County had the lowest rate of growth of any Council in the Country. The data collected in the Census 2011 indicates that a number of areas, including Dún Laoghaire, Sandyford and Dudrum environs, which were previously in decline are now displaying a pattern of growth. It is notable that these areas of population growth in the Census 2011 correspond with areas of employment concentration.

**Table 1: Population.**

Census	Population	% increase
1991	185,410	
1996	189,999	2.4%
2002	191,792	0.9%
2006	194,038	1.2%
2011	206,995	6.3%

(Source: CSO)

### 3.1.1.1 Projected Population Growth.

The 2010–2016 RPGs set the following population targets for Dún Laoghaire-Rathdown:

**Table 2: Targeted Growth**

	Population 2006	Population 2016	Population 2022
DLR	194,000	223,000	240,000

(Source: RPG 2010 – 2016)

Census 2011 indicated a population count of 207,000. The population growth for the six year period 2011 to 2016 is therefore 223,000 minus 207,000 which is c.16,000. Targeted population growth for the six-year period 2016 to 2022 is 240,000 minus 223,000 which is 17,000, or c.3000 per annum. For the overall period 2011 to 2022 targeted population growth is 240,000 minus 207,000 which is 33,000 or c.3000 per annum.

### 3.1.1.2 Age Profile

Table 3 below outlines the age profile of Dún Laoghaire-Rathdown compared to that of the State and other parts of Metropolitan Dublin. The County has a lower percentage of population in the 0 – 14 age bracket than the National percentage and a corresponding higher percentage in the over 65 age category – 14.5 % compared to 11.7 % Nationally.

**Table 3: Age profile.**

Age Group	State	Dún Laoghaire-Rathdown	DLR %	State%
0 – 14	979590	37535	18.2	21.3
15 – 30	941372	44742	21.7	20.5
30 – 45	1089018	45098	21.9	23.7
45 – 65	1,042,879	49,014	23.8	22.7
over 65	535,393	29,872	14.5	11.7
Total	4588252	206261	100.0	100.0

(Source: CSO)

Dún Laoghaire has a significantly higher percentage of population in the over 65-age bracket – 14.5% than South Dublin (8.7%) and Fingal (7.2%) respectively. This has implications for the type of housing units required to meet the specific needs of the County's population. With an older demographic in the County, relative to the rest of the GDA, a policy that can ensure mobility within the housing market is to be encouraged. There is also an evidence-based argument for a broader range of house types.

#### Emerging Issue

**Emerging Issue** Dún Laoghaire has a high percentage of population in the over 65 age bracket. 14.5% versus 11.7%

### 3.1.2 Household Structure

#### 3.1.2.1 Household Size

In order to estimate the number of housing units required in the County over the period of the Strategy, it is necessary to establish the average household size in Dún Laoghaire-Rathdown.

**Table 4: Number of Households**

	<b>1996</b>	<b>2002</b>	<b>2006</b>	<b>2011</b>
<b>Households</b>	61,465	64,132	68,412	75,953
<b>Increase</b>		+2667	+4280	+7541
<b>% increase</b>		+4.3%	+6.7%	+11%

(Source: CSO)

Targeted household allocations for Dún Laoghaire-Rathdown are set out in the 2016–2022 RPG's. These household allocations mean that the County is expected to target household growth of c. 20,000 during the period 2016 – 2022. This translates to 3,300 households per annum for this six year period of the Development Plan. This is very highly ambitious and, in current circumstances, unlikely to be realisable.

Census 2011 indicates average household size in the County is 2.7, which reflects the National household size but is markedly lower than the other two Metropolitan Counties of Fingal and South Dublin where average household size in 2011 was 2.9.

**Table 5: Average Number of Persons per Household.**

Dún Laoghaire-Rathdown	2.7
Dublin City	2.4
Fingal	2.9
South Dublin	2.9
State	2.7

(Source: CSO)

## 3.2 Housing Supply

This section examines information available on housing supply, specifically data on house completions from the DoECLG and statistics on household numbers, composition and accommodation from the CSO. This data gives an indication on whether the demand forecast under the previous Strategy has been met, the type of units that have been built and any other changes that have occurred in order to identify more nuanced changes in demand into the medium term. The Section also analyses at vacant housing, house prices in the County, the role of the private rental sector in supplying housing, the supply of Social and Affordable Housing and the availability of zoned land.

### 3.2.1 House Completions

House completions in the County peaked at an all time high in 2007 with 3,050 units built in that year alone. The Council's policies of encouraging densification in the existing built-up area and facilitating quality, higher density new development areas, such as Stepaside, contributed significantly to this increased rate of supply.



The Housing Strategy contained in the previous County Development Plan 2010-2016 identified a demand for nearly 15,000 units, over the lifetime of that Plan. The number of house completions, both within the County and Nationally, has however, fallen dramatically as a consequence of the recent economic climate. Table 6 below details the housing completions for Dún Laoghaire-Rathdown for the years 2010, 2011, 2012 and 2013.

**Table 6: House completions**

Year	House Completions
2010	384
2011	192
2012	175
2013	260

(Source: DoECLG)

These figures reflect the reality of the challenging economic conditions that the Country continues to experience, but the targeted figures for housing completions in Dún Laoghaire-Rathdown as set out in the RPG's were forecast in 2006 when the

Emerging Issue.

*Despite the economic recession that triggered in 2008 population continues to grow nationally with the urban population reaching an all time high in 2011. We need to plan*

economic climate was entirely different. However, there are positives that during the last intercensal period Dún Laoghaire-Rathdown managed to finally reverse the long standing trend of out migration and actually attracted persons into the County. In light of more positive economic indicators (from 1<sup>st</sup> quarter 2014 on) there remains a need to take account of, and be prepared for, a continuing recovery in the economy. Given the County's prime location in the Metropolitan Dublin area there is a need to ensure that, when economic

stability returns, the Development Plan has sufficient land zoned and targets in place to meet the needs of any nascent population growth in the County. In National terms it is of note that despite the economic recession that triggered in 2008 population in the State continues to grow due to a high birth rate and this growth is primarily focussed in urban areas (CSO, 2011)

### 3.2.2 Housing Land Availability (HLA) Study

The Council's 2013 HLA study indicated that there are 640 hectares of zoned undeveloped land in the County. Of this total c.400 hectares is serviced and ready for residential development. It is estimated that c. 18,000 no. units can be delivered on these serviced lands at an average density of 43 units per ha. (A total of 34,000 units could be accommodated on zoned serviced and non serviced lands).

As referred to in section 2.1 above (and the Core Strategy – Refer Section 1.2 of the Written Statement) the housing and population 'targets' of the County Development Plan - and by implementation this Housing Strategy – continue to be based on the most recently available, but now out-dated 2010 – 2022 RPG targets originally based on Census 2006. This situation will however evolve over the next two years with the updating/revision of both the NSS and the replacement RPGs, which will almost certainly be based on significantly different population projections and targets derived from the most recent Census 2011.



The CSO recently published (December 2013) 'Regional Population Targets' - based on Census 2011 - are now being used by a number of State and Semi-State organisations - including The Housing Agency - to plan and future-proof strategies and frameworks. There are significant differences between these projections and the Census 2006 based Regional Planning Guidelines targets. Starkly contrasting assumptions regarding migration trends account for the bulk of the difference with the CSO projecting a significantly lower rate of population and housing growth in the coming years than is forecast in the RPGs 'targets'.

The NSS and RPG reviews - as and when they are published - will necessitate a requirement for the Council to vary the County Development Plan, post adoption to take account of any revised population/housing targets. In the interim, however, the Council will seek to ensure a reasonable equilibrium of supply of zoned residential development land and population 'targets' derived as set out in the 2010 - 2022 RPGs - but underpinned, nevertheless, by a precautionary approach to repeat the prospect of a more constrained population/housing landscape being revealed in 2016/2017 post adoption of this County Development Plan process.

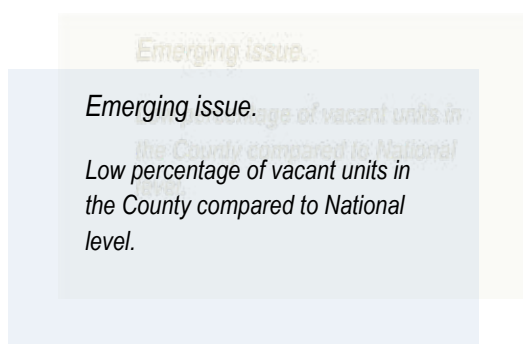
### 3.2.3 Housing Stock and Vacant Units.

Census 2011 indicated a housing stock of 85,896 units in Dún Laoghaire-Rathdown of which 7.7 % (c.6,600) were recorded as being vacant units (includes vacant houses, flats and holiday homes). Apartments accounted for 57% of the vacant units, houses 43%. The comparable National vacancy rate was 14.5%.

### 3.3 House Prices

The task of ascertaining average house prices in the County, and predicting future trends in this direction as a means of estimating affordability is fraught with difficulties particularly at this time when there is so much market volatility and uncertainty. There are a number of sources of data on house prices in the County.

- The DoECLG collects data at a Regional level, with information available for the overall Dublin area but not disaggregated by individual County/City.
- The CSO Residential Property Price Index (RPPI) also provides National data and datasets for the overall Dublin Region - but again not disaggregated to individual County/City Level. The RPPI is designed to measure the change in



the average level of prices paid for residential properties sold in Ireland. The Index is mix-adjusted to allow for the fact that different types of property are sold in different periods. The RPPI is compiled using data on drawdowns provided on a monthly basis by eight of the main Mortgage Lending Institutions under Section 13 of the Housing Act (2002). The growing rental market is not covered by the RPPI.

- The recently established Residential Property Price Register (RPPR) is of some use, although it does not break down purchased properties either by unit size or whether the unit is an apartment or a house.

- Estate agents and other agencies.

Unsurprisingly the comprehensive data review revealed that property values in the Dún Laoghaire–Rathdown Council area remain higher, on average, than any of the other three Dublin Authorities, and remain the highest of any County in the State. There is however a ‘time lag’ issue with any survey especially given that fact the market is constantly evolving.

### 3.3.1 Average House Prices in Dún Laoghaire–Rathdown

For the purpose of framing the Interim Housing Strategy, two detailed surveys to establish average property prices in the County were carried out in April 2013 (for the year 2012) and in April 2014 (for the year 2013).

Both quantitative and qualitative analytical methods were used. A telephone survey of various estate agents active in the County was conducted to determine average house prices and to discuss forecast changes and trends for the County in the future years covering the lifetime of the Plan.

Of interest in the year 2013 was the significant increase in the strength of cash sales. Information received from one estate agent surveyed identified ‘*a notable feature of the market is the strength of cash. 54% of all residential transactions were bought with cash in the first nine months of the year*’ (2013). This feature cannot however, be identified as a definite trend in that there will not be an indefinite source of cash buyers. The market now operating is ever changing and subject to so much volatility that it creates a challenge in terms of drafting any coherent and tenable Interim Housing Strategy.

The house price data received from estate agents was for actual sales in the County during the years 2012 and 2013. This data was entered into a spreadsheet, which enabled the results to be viewed in ascending order, to enable the calculation of the median value as opposed to the average value. The median house price for the County is more meaningful than the average house price, as the average house price would be a skewed value given the very significant range between the highest and lowest house prices. The average house price for the County for the year 2012 (based on the data received from the estate agents) was €401,000. The median house price was €313,000. The comparable average house price for the County for the year 2013 was €443,000 while the median house price was €350,000.

**Table 7: Average & Median House Prices:**

	<b>Average House Price</b>	<b>Median House Price</b>
<b>2012</b>	€401,000	€313,000
<b>2013</b>	€443,000 (+11.4% year-on-year)	€350,000 (+11.9% year-on-year)

It should be noted that the information supplied by estate agents directly was very limited and sometimes variable. The data supplied by local estate agents was supplemented by information available from the CSO Residential Property Price Index and the Residential Property Price Register. Again it must be stressed that the CSO Property price Index does not provide data at individual County level and is restricted to mortgage drawdowns.

Notwithstanding, a desktop survey of data available on the Residential Property Price Register was used to ascertain average house prices for the County in 2012 and 2013. This data is produced by the Property Services Regulatory Authority (PSRA) pursuant to Section 86 of the Property Services (Regulation) Act 2011. It includes date of sale, price and address of all residential properties purchased in Ireland since the 1<sup>st</sup> January 2010, as declared to the Revenue Commissioners for Stamp Duty purposes. As intimated above it does not distinguish unit size nor does it indicate whether the unit is an apartment or a house.

The desktop survey involved analysis of 1000 separate property prices – of apartments and houses, in all the major towns, suburbs and rural areas of the County during the year 2012 and 2013. The survey was conducted in April 2013 and April 2014.

The website contains data for residential sales within each town, suburban area and rural area in the County. Again the house price data was entered into a spread sheet, which enabled the results to be viewed in ascending order, and enabling a median value to be calculated as opposed to the simple average value.

Again a median house price for this particular County is preferable to an average house price, as the average house price would be a skewed value, since the lowest house price and highest house price recorded in 2013 ranged from €90,000 to €525,000.

The results of the desktop survey indicated that the average house price in the County in 2013 was €488,000 while the corresponding median house price €420,000.

There, therefore, is a marked divergence between the Residential Property Price Register median house price for 2013 (€420,000) and the survey of estate agents median house price derived from local estate agents in the same year (€350,000). Given the limited number of estate agents that responded to the survey, the median figure derived from the RPPR is considered to be more indicative of the actual figure. A comparison of the median house prices between 2012 and 2013 figures indicates a 23% increase.

**Table 8: Average House Prices in 2012**

<200000	200000	300000	400000	500000	600000	700000	800000	900000	1m
	-	-	-	-	-	-	-	-	+
	300000	400000	500000	600000	700000	800000	900000	1m	
13.9%	26 %	22.9%	16.7%	7.8%	4.3%	2%	2.7%	1.3%	2.4%

(Source: Dún Laoghaire-Rathdown survey)

**Table 9: Average House Prices in the County 2013**

<200000	200000	300000	400000	500000	600000	700000	800000	900000	1m
	-	-	-	-	-	-	-	-	+
	300000	400000	500000	600000	700000	800000	900000	1m	
8.3%	17.6 %	19.3%	20%	13.5%	7.1%	5.2%	2.4%	1.7%	4.9%

(Source: Dún Laoghaire-Rathdown survey)

**Table 10: Average vs Median House Prices (RPPR derived)**

	Average house price	Median house price
<b>2012</b>	€406,466	€340,000
<b>2013</b>	€487,373	€420,000 (+23% year-on-year)

### **3.3.2 Trends identified**

Prices have risen, and continue to rise, but it is difficult to predict ongoing future trends in such a recovering and changing market.

Information received from estate agents related primarily to the current situation in the market with regard to house sales. Significantly all agents reported that in terms of house sales there has been stability in the Dublin market and in the first quarter of 2013 the market saw the first period of positive, albeit moderate, price growth since 2006'. (Sherry Fitzgerald, April 2013)

It was commented upon, however, that much of this increase is down to supply constraints. There were only 1,266 new residential units built in metropolitan Dublin in 2012 - this is only 6% of the numbers built in Dublin at the peak of the building boom in 2006. (Lisney, Feb 2013).

Of interest, and commented on by all estate agents, is the ever decreasing quantity of property for sale at present. In Dublin *'just 0.6% of the Dublin private housing market is currently available for sale. This is incredibly low by either historical or comparable levels'* (propertypad.ie). In normal circumstances most markets would have 3% of their housing stock for sale at any one time. Tentative steps towards a recovery within the construction sector are now evident, however, Central Government is seeking support to this rebirth through a series of objectives and initiatives set out in 'Construction 2020', which has a particular focus on Metropolitan Dublin. The number of pre-planning enquiries, planning applications and finishing out of existing larger residential schemes in Dún Laoghaire-Rathdown in 2014 to date would seem to indicate that there will be units coming 'on-stream' at some point in the medium term but again the time lag in delivering and releasing units to the market may continue to drive houses prices in the short-term.

### **3.4 Private Rented Sector**

The private rented sector has grown in importance in the housing market in recent years, and the ongoing instability and volatility in the housing market and economy may mean that this trend towards private rented accommodation is likely to continue. Since 2009 rents have largely stabilised, while house prices have fallen, suggesting that the two property markets are moving independently from each other (source RICS). It would appear that the private rental sector in Ireland is healthy and is benefiting from the instability in the property market. It is noted that the Housing Policy Statement (June 2011) indicated that previous policy approach had put disproportionate value on owner occupation. Private rental accommodation can serve and is serving a critical function in the housing market at present and is likely to do so in greater numbers into the future.

## **Section 4: An Analysis of Social Housing Demand and Supply.**

### **4.1 Introduction**

This section examines both the supply of and demand for social housing in the County and identifies how the actual provision of social housing has changed considerably in recent times.

### **4.2 Social Housing List**

There are 4531 households on the Dún Laoghaire-Rathdown Social Housing List (January, 2015). This equates to approximately 5.6% of all households in the County (based on Census 2011 Household Figure). Nationally the figure is 89,872 households or 5.4% of the National figure of 1,654,000 (Census, 2011). The National figure is taken from the Housing Agency publication "Summary of Social Housing Assessment 2013" published in December 2013.

In order to calculate the amount of growth in demand for social housing it has been assumed that the number of persons requiring social housing will grow at the same rate as the general population for the period of the strategy (i.e. 7.3% in accordance with the Regional Planning Guidelines 'Allocation'). This would give a total of 4531 households in need of housing over the period of the Strategy (or c.12,230 persons based on an average household size of 2.7 persons).

Proposals for construction or purchase of social housing are currently very limited as a result of budgetary constraints. The delivery of social housing is extremely challenging in the current economic climate as all funding has been severely cut. In the future, and certainly within the lifetime of this Development Plan, the Rental Accommodation Scheme (RAS) and Social Housing Leasing Initiatives (SHLI) will provide a much larger component part of the overall social housing provision. Voluntary Housing Associations have made increasingly significant contributions to the provision of social housing to accommodate applicants from the local authority housing list. Of the 190 households housed from the Council waiting list in the last 11 months; 53 were by voluntary housing associations; 29 were long term rentals; 28 were by RAS, and 84 were placed in Council housing.

### **4.3 Social Housing Provision**

Social housing in the County is currently being provided through a number of schemes. The SHLI and RAS are identified as two of the key models for long term social housing supports which can achieve greater 'value for money', replacing the very large capital-funded construction programmes pursued by local authorities in the past. The statutory basis for the Social Housing Leasing Initiative (long-term leasing schemes) and the RAS is provided for within the Housing (Miscellaneous Provisions) Act, 2009.

### 4.3.1 Rental Accommodation Scheme (RAS)

RAS is designed to provide security of tenure in good quality accommodation for eligible tenants in the private rented sector. Under RAS, eligible tenants and their landlords become RAS clients. Eligible tenants are those in receipt of Rent Supplement for more than 18 months and in need of long-term housing. The rent negotiated between the Council and the landlord is paid monthly by the Council directly to the landlord for the duration of the RAS contract. The tenant contributes to the rent but pays it to the Local Authority, not the landlord. Under RAS the landlord and tenant retain all duties and responsibilities under Landlord and Tenant law. The Residential Tenancies Act 2004 governs the relationship between the landlord and the tenant. Under RAS Local Authorities make agreements with private landlords (or voluntary bodies) to provide accommodation on a medium-to-long-term basis, i.e. a 4-year agreement or a 10 year agreement. The total number of RAS Tenants accommodated in the County at present (March 2013) is 400.

#### *Emerging issue.*

*Emerging issue.*  
Increased role of the voluntary sector in the provision of social

### 4.3.2 Housing Assistant Payment (HAP)

The replacement for Rent Supplement - the Housing Assistant Payment (HAP) - will be administered by Dún Laoghaire-Rathdown. The Government acknowledged in the Housing Policy Statement (June 2011) that Rent Supplement, which was always intended as a short-term income support, had actually become a long-term social housing support. The Government expressed its intention to transfer the responsibility for those requiring long-term rent support to the Local Authorities.

### 4.3.3 Social Housing Leasing Initiative (SHLI)

In order to increase the availability of properties for social housing provision, the DoECLG, launched the SHLI in 2009. This involves Housing Authorities leasing properties from private property owners for the purposes of providing accommodation to households on social housing waiting lists. Leasing introduces greater flexibility in the composition of the housing stock and provides the opportunity for housing authorities to benefit from market conditions to increase output and meet housing need in a cost effective manner.

Access to housing stock is achieved through a number of ways:

- Local Authorities leasing properties from private property owners for periods of 10-20 years.
- Approved Housing Bodies leasing from property owners, purchasing on the market or constructing properties and making them available for social housing provision through direct agreements with the DoECLG.
- Local Authorities temporarily utilising unsold affordable housing stock.

## Section 5 Specific Housing Needs

### **5.1 Introduction**

A number of categories of housing applicants require special, and very often, quite specific response. These categories are outlined in this section.

#### **5.1.1 Homeless Persons**

Under the Council's Scheme of Letting Priorities homeless persons may be awarded overall priority in the allocation of social housing. There are two main sources of obtaining data on people who are homeless in Ireland, both of which are carried out every three years, the Housing Need Assessment and the 'Counted In' survey. For the first time the CSO counted the number of people who were homeless on Census night 2011. There are 92 homeless persons on the Council list at present (March 2013).

The Government's 'Homelessness Policy Statement' (February 2013) has set 2016 as the target year for ending long-term homelessness. By moving away from over-reliance on expensive emergency accommodation, the 'housing-led' strategy can also provide better value for the significant amount of public money invested in homeless services.

#### **5.1.2 Traveller Accommodation**

The Housing (Traveller Accommodation) Act 1998 requires Housing Authorities in consultation with travellers and with the general public to prepare and adopt a five year Traveller Accommodation Programme (by resolution of the elected members of the Council) to meet the existing and projected needs of travellers in the area. The 2009 – 2013 Traveller Accommodation Programme identified a requirement for 38 traveller-specific units and 21 houses. During the lifetime of the Programme 3 families have been accommodated in permanent traveller-specific units and 50 casual vacancies have been filled. There had also been significant ongoing refurbishment of existing schemes.

The 2014 – 2018 Traveller Accommodation Programme was adopted in January 2014 and as part of this Programme, a further detailed assessment of need was carried out. That assessment indicated that there are 114 traveller families resident in the County. 78 of these families are in permanent accommodation, which is an increase of 11% from the period of 2009 – 2013. Some 36 families remain without accommodation. In assessing overall future need the Council have taken into account these 36 families and also travellers who have reached the age of 18, who will reach the age of 18 over the lifetime of the Programme. This gives a total requirement of 62 families which does not take account of travellers who may migrate into the County.

**Table 10: Traveller Accommodation Need 2014 – 2018**

Standard Housing	15
Grouped Housing	30
Halting Sites	8
<b>Total</b>	<b>53</b>

(Source: Traveller Accommodation Programme 2014–2018)

The total of need of 62 units will be met by the 53 units shown above plus an additional 9 refurbished units.

**Table 11: Accommodation Programme**

<b>Location</b>	<b>Number of Units</b>
Halting site Programme	No of Bays
Cloragh	3
Kiltiernan, Glenamuck Road	4
West Pier	3
	10
Group Housing Programme	No. of Units
Enniskerry Road	4
Bird Avenue	3
Lehaunstown	5
Mount Anville Road	5
Pottery Road	5
Stillorgan Grove	6
Rathmichael Road	5
University College Dublin	5
	38

(Source: Traveller Accommodation Programme 2014 – 2018)

### **5.1.3 Disabled Persons**

It is an objective of the Council to provide for the specific housing needs of people with disabilities. The Council provides a small number of specially adapted units in new housing schemes for people with disabilities. In addition it also adapts existing houses to the needs of tenants with disabilities, subject to resources.

The 2013 Assessment of Need (The Housing Agency, December 2013) included 386 applicants in Dún Laoghaire-Rathdown with disabilities, representing 11% of the total assessment. Nationally the percentage of those households having specific accommodation requirements due to a disability is only 4%. Dún Laoghaire-Rathdown has a significantly higher demand in this area that is primarily a consequent of aging demographics of the County.

### **5.1.4 Elderly Persons**

It is estimated that the number of older persons will almost double in all regions of Ireland over the period 2006-2026 (CSO). As a County Dún Laoghaire-Rathdown has a higher than National average number of persons over 65. Many older persons own their own home and wish to remain at home in their own community for as long as they are able. It is appropriate and logical therefore, that more specific policies and objectives be set out in this Housing Strategy to cater for the needs of older people. The needs of older people can change over time - some may have specific housing needs relating to access, medical care, security and personal safety. Housing location in close proximity to convenience shops, public transport and community facilities are important. Building new homes suitable for older persons within established communities can free-up existing housing stock, which may be more suited to requirements of young families. Sheltered accommodation which enables older persons to live independently, but with on-site support and facilities can enable older people to remain in the local area. The Council currently has 574 no. units available for, and assigned to, elderly persons.



### **5.1.5 Household Composition**

Nationally those seeking social housing single-person households made up the largest household type (44%). The next highest category is single-person with children. In Dún Laoghaire-Rathdown the percentage of single households is currently 50%. This figure is of particular relevance given the current property sector-led campaign for the construction of family-type homes to the virtual exclusion of other unit types. Whilst social housing represents only a small part of the overall housing demand it is important that appropriately sized units are still provided for single person households. It will, however, be extremely difficult to meet a significant proportion of this need from the Council's construction programme and other housing support options will require to be explored including units generated through Part V, the voluntary housing sector and RAS.

## **Section 6      Estimated Social and Affordable Housing.**

### **6.1 Estimated Affordable Housing Need**

Section 94(4) of the Planning and Development Act (as amended) states that a Housing Strategy shall include an estimate of the amount of:

- (i) housing for the purposes of the provision of social housing support within the meaning of the Housing (Miscellaneous Provisions) Act 2009, and
- (ii) affordable housing (amendment under Housing (Miscellaneous Provisions) Act not commenced)\*

\*It should be noted that the Housing (Miscellaneous Provisions) 2009 contains an amendment to Section 94 4(a)(ii) of the Planning and Development Act but this amendment has not yet commenced yet and, at present, indications from the DoECLG that this amendment will not commence during the preparation of this Development Plan if at all.

Section 94(5)(a) details the items which Planning Authorities must have regard when making an assessment of affordable housing. The methodology for carrying out such an 'affordability assessment' is included in DoECLGs 'Housing Supply – A Model Housing Strategy and Step-by-Step Guide' (2000). This 'Louth Model' – in now some fifteen years old and its relevance in the current housing market is questionable.

The Government 'Housing Policy Statement' of June 2011 indicated that Affordable Housing Schemes should be stepped down and that there should be a move away from an over emphasis on the importance of owner-occupancy. Consequently it is considered that, at this point in time there is, therefore, no need to carry out a detailed and comprehensive affordable housing assessment in line with the 'Louth Model'. This would accord with the position adopted by other Housing Authorities – Mayo County Council and Wexford County Council for example – who have reviewed their respective Housing Strategies over the last year.

There is however awareness that house prices in Dún Laoghaire-Rathdown are the highest in the State and affordability is again becoming an issue. House price alone will not, however, ensure access to the property market - a number of other factors are relevant. Accessing finance can be a major hurdle. There is also less certainty with regard to people's future income due to the current economic situation with wage cuts/freezes and job uncertainty, and a large number of persons are in mortgage arrears and/or unsustainable mortgages.

Good planning practice promotes sustainable living patterns to ensure with people are able to live and work in close proximity. Any increase in affordability issues in any part of the County could potentially result in people who work in Dún Laoghaire-Rathdown being unable to afford to purchase property in the County.

Having regard to the changes in the overarching economic and policy context, and specifically the Housing Policy Statement of June 2011 announcing that Affordable Housing Schemes should be stepped down, it is considered unnecessary to carry out an 'affordability assessment' at this point in time.

The Two Year review of the County Development Plan should however, commit to including a re-examination of housing affordability in the County.

## **6.2 Estimated Social Housing Need.**

The Government 'Housing Policy Statement' (June 2011) outlined that there was a continued rationale for capturing planning gain through Part V. The calculation provides details of the requirement for social housing based purely on a percentage of all new households formed.

The 2010 – 2022 RPS indicated that 19,850 households are 'targeted' to be accommodated in Dún Laoghaire-Rathdown over the lifetime of the Development Plan.

Section 4.2 of this Strategy estimates that 4,531 households will require social housing over the same time frame. This equates to 23% of the total housing provision over the period of the Plan. It should be noted that the affordable element has not been addressed. Therefore, it is considered a tenable position at this point in time to continue to apply a requirement of 21% of all land or equivalent to be reserved for the purposes of Part V in accordance with the provisions of the Urban Regeneration and Housing Act 2015. .

### *Emerging Issue*

#### **Emerging Issue**

21% of land zoned for residential development to be reserved for social housing.

## Section 7: Issues and Objectives to Secure Delivery of the Strategy.

### **7.1 Introduction**

This section sets out the policies and objectives of the Housing Strategy.

*Issues emerging from the Housing Strategy*

**Issues emerging from the Housing Strategy**

- Despite economic turnabout the population of the County is growing with in-migration into the County recorded for the intercensal period 2006 – 2011.
- Significant decline in house completions since 2007.
- Population growth not being met by house completions.
- Projected population growth from 2016 – 2022 is 7%
- High % of population in the over 65 age bracket.
- Sufficient lands zoned to accommodate planned development
- Affordable housing schemes have become less important as house prices have fallen below what can be offered for housing under the Scheme.
- House prices have fallen in the County but are still highest in the Country.
- No need to conduct 'affordability assessment' due to standing down of scheme.
- Estimated that 4730 households will require social housing over the life time of the Strategy - which equates to 23% of households.

### **7.2 Housing Mix**

There are different requirements for housing mix for both social housing and private housing. The previous Housing Strategy 2010-2016 indicated a notional breakdown of social housing units as 25% one bed, 25% two bed and 50% three and four bed.

Over the intervening period the demand for one-bed social housing units has grown significantly – as evidenced by the current waiting list. The composition of the housing waiting list in March 2013 is follows:

**Table 11: Social Housing Accommodation Requirements.**

One bedroom need	53%
Two bedroom need	23%
Three & four bedroom need	24%

(Source: Dún Laoghaire-Rathdown County Council).

There is, however, a new focus on the delivery of social housing. In the future, and certainly within the lifetime of this Strategy, the Rental Accommodation Scheme (RAS) and Social Housing Leasing Initiatives (SHLI) will provide a much greater component part of the social housing provision. Voluntary Housing Associations have also made an increasingly significant contribution to the provision of social housing to accommodate applicants from the Local Authority housing list. The ongoing requirements with regard to social housing mix may have to change over the period to 2022, and the Council will require to respond by amending policy to reflect any such changes in social housing needs.

### **7.3 Housing Type**

While the Council continues to require that developments provide for a housing mix, it is also essential that a range of house-types are provided within residential schemes. The inclusion of combinations of detached, semi detached, terraced, single storey, and apartment units is essential.

### **7.4 Provision for Special Needs**

The Council will encourage proposals from developers to satisfy Part V obligations which are directed towards special need categories namely, elderly accommodation, traveller accommodation, specialised accommodation for the homeless and specially adapted accommodation for persons with disabilities – where the proposal is related to a local need and is consistent with other policies of the Development Plan.

### **7.5 Implementation of the Housing Strategy**

A ~~twenty~~ ten percent social housing requirement will be applied in relation to all sites that are residentially zoned or proposals where a mixed-use development, including residential is proposed on any zoning in the County, unless otherwise stated in the Strategy, or exempt from the provisions of Part V.

In determining the type of agreement to be entered into, the Planning Authority shall consider the following in accordance with Part II, Section 3(c) of the Planning and Development (Amendment) Act 2002:

- Whether such an agreement will contribute effectively and efficiently to the achievements of the objectives of the Housing Strategy.
- Whether such an agreement will constitute the best use of resources available to the Planning Authority to ensure an adequate supply of social housing and any financial implications of the agreement for its functions as a Housing Authority.
- The need to counteract undue segregation in housing between persons of different social background in the area of the Authority.
- Whether such an agreement is in accordance with the provisions of the Development Plan.
- The time within which housing referred to in section 94(4)(a) is likely to be provided as a consequence of the agreement.

Consideration will also be given to housing market conditions prevailing at the time of entering into any such agreement.

### **7.6 Circumstances where a 'reduced element' may be Acceptable**

#### **Housing For Older People**

In instances where it is proposed that the site or portion of a site be developed for elderly persons/assisted living accommodation, the portion of the site to be used for elderly/assisted living accommodation will generate a reduced percentage requirement in respect of social housing. This is to encourage the development of these types of units. It may also result in elderly persons vacating larger units for units more appropriate to their current needs and in turn returning family sized accommodation to the market.

## **Student Accommodation**

It is recognised that there is a need to provide student accommodation for students studying both within and outside the County. The Council will support the provision of on-campus student accommodation and may also permit student accommodation off-campus where the proposed development:

- Is located within one pedestrian kilometre from the boundary of a Third Level Institution or proximate to existing or planned public transport corridors, cycle and pedestrian routes and green routes.
- Complies with the Department of Education and Science Guidelines on 'Residential Development for Third Level Students'. (Refer also Section 8.2.3.4 (xi) of the Written Statement).

No social housing will be required in instances where it is proposed that student accommodation is to be provided on the campus of a Third Level Institution. In all other instances of student accommodation the standard 20% social housing requirement will apply.

### **Semi-independent or supported living accommodation for people with intellectual and/or physical disabilities.**

The Council recognises the particular difficulties parents of people with intellectual disabilities who must make provision for respite care, or permanent housing when parents can no longer care for their adult children. Current best practice is for the provision of semi-independent or supported living dispersed throughout the community. In instances where it is proposed to provide such units, a reduction in the required percentage of social and affordable housing may be accepted.

It should be noted that in accordance with Section 94 (13) of the Planning and Development Act as amended the Part V provision does not apply to the provision of housing by an approved housing body for households as qualified for social housing support so in the event of an approved housing body providing a scheme for the those with intellectual or physical disabilities who qualify for social housing support Part V would not apply.

## **7.7 Objectives**

### **Objective HS1**

It is an objective of the Council to secure implementation of the Interim Dún Laoghaire-Rathdown housing Strategy 2016 – 2022 by:

1. Ensuring that adequate and appropriate lands are zoned to meet future housing need identified in the Housing Strategy and the Core Strategy.
2. Requiring that 10% of all lands zoned for residential use, or for a mixture of residential or other uses, shall be reserved for the purposes of Section 94(4)(a)(i) of the Planning and Development Act 2000 – 2012 with the exception of the exemptions provided for in this Strategy.
3. Requiring a mix of house types in all new residential development to meet the categories of social housing need identified for the particular area.

### **Objective HS2**

It is an objective of the Council to seek to facilitate all households access to good quality housing appropriate to their circumstances, and in a community of choice. The Council's

priority will be on meeting the most acute needs – those unable to provide accommodation from their own resources.

**Objective HS3**

It is an objective of the Council to ensure that those with specific housing needs, such as the elderly, persons with disabilities, homeless persons and travellers, are accommodated in a manner appropriate to their specific needs.

**Objective HS4**

It is an objective of the Council to promote the development of sustainable housing developments which are energy efficient and efficient in their use of natural resources and are in accordance with 'Sustainable Residential Development in Urban Areas: Guidelines for Planning Authorities' and the accompanying 'Urban Design Manual '(2008).

**Objective HS5**

It is an objective of the Council to implement the Traveller Accommodation Programme 2014 – 2018, and any subsequently adopted strategy, during the lifetime of the Plan.

**Objective HS6**

It is an objective of the Council to engage in a range of options for housing provision, including direct new stock acquisition or build, leasing and RAS.

**Objective HS7**

It is an objective of the Council to support and assist the Voluntary Housing Sector in their role as providers of housing to those in need of accommodation.

**Objective HS8**

It is an objective of the Council to support and assist the Voluntary Housing Sector in their role as providers of housing to those in need of accommodation.





**Appendix 4:** Record of  
Protected Structures/  
Record of Monuments and  
Places/Architectural  
Conservation Areas



## Appendix 4: Record of Protected Structures/Record of Monuments and Places/Architectural Conservation Areas

### Section 1: Record of Protected Structures (RPS)

Amend Table on Page 2 of RPS as follows:

STRUCTURE NAME	No.	LOCATION	DESCRIPTION	MAP No.	RPS No.
...	...	...	...	...	...
Ard Na Greine		Eaton Brae, Churchtown, Dublin 14.	House	1	113
Taney Hall (former Church of Ireland Hall)		Eglinton Terrace, Dundrum	Commercial premises (former Church of Ireland Hall, School and Masters House)	1	1964
Former Church of Ireland School and Masters House		Eglinton Terrace, Dundrum	Commercial premises (former Church of Ireland Hall, School and Masters House)	1	1965
Ivy Grove	1	Eglinton Terrace, Dundrum	House	1	1966
Eglinton House	2	Eglinton Terrace, Dundrum	House	1	1967
Eglinton Lodge		Eglinton Terrace, Dundrum	House	1	1968
...	...	...	...	...	...
Dundrum Courthouse		Kilmacud Road Upper, Dublin 14.	Courthouse and Boundaries	1	1110
Herberton		Kilmacud Road Upper, Dundrum	House	1	1971
Overton		Kilmacud Road Upper, Dundrum	House	1	1972
Landore hall	7	Landore, Churchtown, Dublin 14.	House	1	93
Holy Cross Church		Main Street, Dundrum, Dublin 14.	Church (Note: Railings and Gates also a Protected Structure)	1	1129
Holy Cross Church		Main Street, Dundrum, Dublin 14.	Railings and Gates (Note: Church also a Protected Structure)	1	1129
Holy Cross Church Parochial House		Main Street, Dundrum, Dublin 14.	Parochial House	1	1960
...	...	...	...	...	...
Mill House		Sandyford Road, Dublin 16	House	1	1234
	1	Sydenham Place, Kilmacud Road Upper, Dublin 14	House	1	1969
	2	Sydenham Place, Kilmacud Road Upper, Dublin 14	House	1	1970
...	...	...	...	...	...

*Amend Table on Page 17 of RPS as follows:*

STRUCTURE NAME	No.	LOCATION	DESCRIPTION	MAP No.	RPS No.
National Yacht Club		Dún Laoghaire Harbour, Dún Laoghaire, Co. Dublin.	Yacht Club	3	726
Royal Saint George Yacht Club		Dún Laoghaire Harbour, Dún Laoghaire, Co. Dublin.	Yacht Club	3	599
East Pier		Dún Laoghaire, Co. Dublin.	East Pier	3	307
Old Pier/Coal Quay		Dún Laoghaire, Co. Dublin.	Old Pier/Coal Quay	3	401
Traders Wharf		Dún Laoghaire, Co. Dublin.	Pier and Quay	3	284
West Pier		Dún Laoghaire, Co. Dublin.	West Pier	3	127
<del>Dunleary House</del>		<del>Dunleary Road, Dún Laoghaire, Co. Dublin</del>	<del>House</del>	<del>3</del>	<del>1957</del>
Lisowen	1	Durham Place, Tivoli Road, Dún Laoghaire, Glenageary, Co. Dublin.	House Terrace	3	1147
...	...	...	...	...	...

*Amend Table on Page 26 of RPS as follows:*

STRUCTURE NAME	No.	LOCATION	DESCRIPTION	MAP No.	RPS No.
...	...	...	...	...	...
Martello Tower		Dalkey Island, Dalkey, Co. Dublin.	Martello Tower	4	1591
	<del>1</del>	<del>Eastmount, Mount Salus Road, Dalkey</del>		<del>4</del>	<del>1937</del>
	<del>2</del>	<del>Eastmount, Mount Salus Road, Dalkey</del>	<del>House Terrace</del>	<del>4</del>	<del>1936</del>
Gorse Hill		Gorse Hill, Knocknacree Road, Dalkey, Co. Dublin		4	1910
	1	Grosvenor Terrace, Dalkey, Glenageary, Co. Dublin.	House	4	1527
	2	Grosvenor Terrace, Dalkey, Glenageary, Co. Dublin.	House	4	1528
Bronte Cottage		Grosvenor Terrace, Dalkey, Glenageary, Co. Dublin.	House	4	1526
Martello Tower		Harbour Road, Dalkey, Co. Dublin.	Martello Tower (Note: Battery Wall also a Protected Structure)	4	1402

*Amend Table on Page 27 of RPS as follows:*

STRUCTURE NAME	No.	LOCATION	DESCRIPTION	MAP No.	RPS No.
...	...	...	...	...	...
	4	Killiney Terrace, Breffni Road, Sandycove, Glenageary, Co. Dublin	House Terrace	4	1297
Arcadia		Knock na cree Road, Dalkey, Co. Dublin	House	4	1956
Lios Mor		Knock na Cree Grove, Dalkey, Glenageary, Co. Dublin.	House	4	1549
Prince Patrick House		Knock na cree Road, Dalkey, Co. Dublin	House	4	1911
The White House		Knock na Cree Road, Dalkey, Glenageary, Co. Dublin.	House	4	1560
Loreto Abbey		Loreto Avenue, Dalkey, Glenageary, Co. Dublin.	Convent and School Building	4	1445
...	...	...	...	...	...
	2	Otranto Place, Glenageary, Co. Dublin.	House	4	1180
Prince Patrick		Prince Patrick, Knocknacree Road, Dalkey, Co. Dublin		4	1911
Dalkey Dart Station		Railway Road/Sorrento Drive, Dalkey, Glenageary, Co. Dublin.	Railway Station	4	1517
...	...	...	...	...	...

*Amend Table on Page 28 of RPS as follows:*

STRUCTURE NAME	No.	LOCATION	DESCRIPTION	MAP No.	RPS No.
...	...	...	...	...	...
Geragh Haus		Sandycove Point, Dún Laoghaire, Glenageary, Co. Dublin.	House	4	1015
Martello Tower (Joyce's Tower)		Sandycove Point, Dún Laoghaire, Glenageary, Co. Dublin.	Martello Tower	4	1027
Battery Wall		Sandycove Point, Sandycove Avenue North, Co. Dublin.	Battery Wall	4	980
The Battery		Sandycove Point, Co. Dublin.	House	4	1961
Cambridge House	31	Sandycove Road, Dún Laoghaire, Glenageary, Co. Dublin.	House Terrace	4	1285
...	...	...	...	...	...

*Amend Table on Page 31 of RPS as follows:*

STRUCTURE NAME	No.	LOCATION	DESCRIPTION	MAP No.	RPS No.
...	...	...	...	...	...
Cabinteely Library		Bray Road, Cabinteely, Dublin 18.	Carnegie Library	7	1682
Barrington Tower		Brennanstown Road, Cabinteely, Dublin 18.	House Former Folly only	7	1729
Brennanstown House		Brennanstown Road, Cabinteely, Dublin 18.	House and Out Offices	7	1715
Glendruoid		Brennanstown Road, Cabinteely, Dublin 18.	Entrance Gates (Note: House also Protected Structure)	7	1730
Glendruoid		Brennanstown Road, Cabinteely, Dublin 18.	House (Note: Entrance gates also Protected Structure)	7	1730
Saint Alphonsus & Saint Columba's Church		Church Avenue, Killiney, Co. Dublin.	Church, Presbytery and Ballybrack Old National School	7	1719
Harrow House		Church Road, Killiney, Co. Dublin	House	7	1962
St. Mathias's Church		Church Road, Killiney, Co. Dublin	Church	7	1686
Woodfield House		Church Road, Killiney, Co. Dublin	House	7	1887
...	...	...	...	...	...

*Amend Table on Page 32 of RPS as follows:*

STRUCTURE NAME	No.	LOCATION	DESCRIPTION	MAP No.	RPS No.
...	...	...	...	...	...
Waterfall Cottage		Cherrywood Road, Shankill, Dublin 18.	Thatched Dwelling	10	1770
Ramblers Rest	24	Church Road, Killiney, Co. Dublin	Public House	10	1963
Shanganagh Bridge (Over River)		Commons Road, Loughlinstown, Dublin 18.	Bridge over Loughlinstown River	10	1772
Plaque (Opposite Shankill Post Office)		Dublin Road, Shankill, Dublin 18.	Plaque	10	1838
...	...	...	...	...	...

*Amend Table on Page 35 of RPS as follows:*

STRUCTURE NAME	No.	LOCATION	DESCRIPTION	MAP No.	RPS No.
Knocklinn		Ballyman Road, Bray, Co. Dublin.	House and Outbuildings (Note: Entrance Walls also Protected Structures)	14	1883
Knocklinn		Ballyman Road, Bray, Co. Dublin.	Entrance Walls (Note: House and Outbuildings also Protected Structures)	14	1883
<del>Crinken House</del>		<del>Crinken Lane, Shankill, Co. Dublin</del>		<del>14</del>	<del>1939</del>
Ellerslie		Crinken Lane, Shankill, Dublin 18.	House	14	1847
...	...	...	...	...	...

---

## Section 4: Candidate Architectural Conservation Areas (cACA)

*Insert text at end of Section 4 as follows:*

### **"MAP NO. 10**

Where there is an overlap between Maps 10 & 14, areas are listed in the Map 10 list only.  
Ballybride Road/Ferndale Road, Rathmichael"





## **Appendix 12:** Dún Laoghaire Urban Framework Plan



## Appendix 12: Dún Laoghaire Urban Framework Plan

---

### Section 2.7 George's Place (page 9)

*Amend the wording of Section 2.7 as follows:*

"The redevelopment of the former Council Depot at George's Place offers an opportunity to provide a new pedestrian/cycle link between George's Place and Crofton Road **without reduction of parking**. This would further strengthen the connectivity between George's Place and the Waterfront. A mixed-use re-development at George's Place could also provide opportunities to further expand the residential population of the Town, build on the existing enterprise activities, while adapting and reusing some of the existing buildings on the site where considered appropriate. **Any redevelopment of George's Place would require to take cognizance of the Coastal Fringe Zone provisions of Appendix 9: Building Height Strategy.**"

---

### Section 3 Creating Vitality (page 10)

*Amend Paragraph 4 as follows:*

"The key projects identified in the Framework Plan to achieve the objective of creating vitality are described below. These focus on supporting the commercial activities of the Town, particularly along George's Street, **the creation of an 18hr economy and, increasing the residential population, including student accommodation,** to create demand for local services, **while** developing the Waterfront as a marine, leisure and tourism destination and creating a high quality public realm that will support improved social and leisure activities. At the same time it is an objective to protect, preserve and enhance the unique historic character, ambiance and identity of the adjoining residential streets and communities."

---

### Section 3.2 The Waterfront (page 15)

*Amend the last sentence of the fourth paragraph of this section as follows:*

"Analysis of the overall Harbour area indicates that it comprises of several areas which are of distinct character. This character, in turn, points to certain appropriate uses. It is considered that Cultural and Leisure uses will generally cluster to the east of St Michael's Wharf - on the Carlisle Pier and along the East Pier - creating symbiotic linkages with the recently completed dlr LexIcon and the National Maritime Museum. Marine Activities and Enterprise are more likely to cluster around the Irish Lights Headquarters, Coastguard Station and Cottages and the Coal Harbour while traditional sail, fishing and boating activities ~~will be concentrated at the West Pier and The Gut~~ **will occur across the entire Harbour area.**"

---

### Section 3.2.1 Central Harbour Area (page 15)

*Add a new first sentence to the first paragraph of this section as follows:*

"It will be an objective of this Plan to preserve the integrity, natural beauty and historical significance of the Harbour by protecting this central area from any cruise berth that would allow cruise ships longer than 250m to come directly into the harbour. This Plan will support and encourage the niche market of smaller cruise ships."

*Amend the last sentence of the first paragraph of this section as follows:*

"Any development within the Harbour ~~should exhibit the highest level of design ambition leading to a Waterfront that will be an international exemplar~~ should be low rise, no higher than existing permanent structures, should exhibit the highest level of design ambition leading to a waterfront that will be an international exemplar."

---

### Section 6 Specific Local Objectives (page 20)

*Amend SLO No.13 in Section 6 as follows:*

"To facilitate the continued development of the Harbour, ~~ensuring at all times that the historic significance and natural beauty of this public amenity is protected~~, in advance of the preparation of the Dún Laoghaire and Environs Local Area Plan (LAP). Following the adoption of the Dún Laoghaire and Environs LAP, the future development of the Harbour will thereafter be guided by the principles and objectives of the Plan and that of Policy E14".

*Add new SLO's to Section 6 of the Urban Framework Plan and Map 3 as follows:*

"SLO No.154

To encourage and support the redevelopment and refurbishment of the Dún Laoghaire Shopping Centre Site - in accordance with the provisions of the Dún Laoghaire Urban Framework Plan - in advance of the adoption of the Dún Laoghaire and Environs Local Area Plan (LAP)."

"SLO No.156

In accordance with the National Ports Policy, the Council shall, within the relevant planning frameworks, formulate and implement, where appropriate and applicable, a plan for the future development of Dún Laoghaire Harbour and its curtilage as determined by Part 1, subsection 6 of the Third Schedule of the Harbours Act, 1996."

"SLO No.157

To support and encourage the development of a National Watersports Centre to facilitate training and participation in a varied range of water sports and activities to provide a focus for national and international watersport events. Site appraisal and analysis of the Harbour environs to identify the optimum location(s) for such a centre to be expedited as an integral component of the forthcoming Dún Laoghaire and Environs LAP."

## **Appendix 13:** Strategic Flood Risk Assessment





# Contents

<b>1</b>	<b>Background .....</b>
1.1	Introduction .....
1.2	SFRA Structure.....
<b>2</b>	<b>The Planning System and Flood Risk Management .....</b>
2.1	Introduction .....
2.2	Definition of Flood Risk.....
2.3	Definition of Flood Zones .....
2.4	Objectives and Principles of the Planning Guidelines.....
2.5	The Sequential Approach and Justification Test .....
2.6	Scales and Stages of Flood Risk Assessment.....
<b>3</b>	<b>Strategic Flood Risk Assessment of Dún Laoghaire Rathdown .....</b>
3.1	Description of Study Area .....
3.2	Identification of Flood Risk (Stage 1).....
3.3	Summary of flood sources .....
<b>4</b>	<b>Policy Response .....</b>
4.1	The Strategic Approach .....
4.2	Development Management and Flood Risk.....
4.3	Requirements for a Flood Risk Assessment.....
4.4	Drainage impact assessment .....
4.5	Development proposals in Flood Zone C.....
4.6	Applications for Minor Developments in Areas at Risk of Flooding .....
4.7	Applications for Larger Development in Areas at Risk of Flooding.....
4.8	Key points for FRAs for all types of development.....
4.9	Incorporating Climate Change into Development Design.....
4.10	Flood Mitigation Measures at Site Design .....
4.11	'Green Corridor' .....
<b>5</b>	<b>Application of the Justification Test .....</b>
5.1	Undeveloped land .....
5.2	Existing, developed, zoned areas at risk of flooding.....
5.3	Justification Test: Part 3.....
<b>6</b>	<b>SFRA review and monitoring .....</b>
<b>7</b>	<b>Glossary .....</b>
<b>Annexes .....</b>	
<b>A</b>	<b>Dundrum Shopping Centre.....</b>



## List of Figures

Figure 2-1 Sequential Approach Principles in Flood Risk Management.....	
Figure 5-1: Crinken Stream .....	
Figure 5-2: Old Conna LAP .....	
Figure 5-3: Shanganagh and Deansgrange Rivers .....	
Figure 5-4: Loughlinstown River .....	
Figure 5-5: Seafield and Bayview.....	
Figure 5-6: Carrickmines River .....	
Figure 5-7: Carysfort Maretimo Rivers .....	
Figure 5-8: Merrion Strand to Blackrock .....	
Figure 5-9: Dundrum Slang .....	
Figure 5-10: River Dodder.....	
Figure 5-11: Little Dargle.....	

## List of Tables

Table 2-1 Probability of Flooding.....	
Table 2-2 Definition of Flood Zones.....	
Table 2-3 Matrix of Vulnerability versus Flood Zone .....	
Table 3-1: Flood Risk Datasets.....	
Table 3-2: Allowances for Future Scenarios (100 Year Time Horizon) .....	
Table 5-1: Justification Test (Part 1 and 2) only for zoning objective A, A1, A2, NC, DC, MTC, E, TLI, MH, MIC, MOC, OE, W areas in the County that are already developed and include existing vulnerable uses and are in flood zone A and B. ....	
Table 5-2: Justification test for Old Conna .....	
Table 6-1: SFRA Review Triggers.....	





## **IMPORTANT DISCLAIMER**

Dún Laoghaire-Rathdown Strategic Flood Risk Assessment

**Please read below the disclaimer, and limitations associated with this assessment to avoid incorrect interpretation of the information and data provided.**

### **DISCLAIMER**

Dún Laoghaire-Rathdown County Council makes no representations, warranties or undertakings about any of the information provided in this assessment including, without limitation, on its accuracy, completeness, quality or fitness for any particular purpose. To the fullest extent permitted by applicable law, Dún Laoghaire-Rathdown 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 in this assessment 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 Dún Laoghaire-Rathdown has been advised of the possibility of such loss or damages, or such loss or damages were reasonably foreseeable. Dún Laoghaire-Rathdown reserves the right to change the content and / or presentation of any of the information provided in this report at their 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.

### **UNCERTAINTY**

Although great care and modern, widely-accepted methods have been used in the preparation of this assessment there is inevitably a range of inherent uncertainties and assumptions made during the estimation of design flows and the construction of flood models.

### **BEST AVAILABLE INFORMATION**

There has been a wide range of datasets utilised in the production of this plan which are constantly changing and subsequently the analysis of these datasets is only correct at the time of assessment. The assessment is based on the maps available in June 2015 (which includes Draft Eastern CFRAM maps). It is acknowledged that new methodologies and/or recently recorded data could have a minor impact on the analysis undertaken herein.

The SFRA is not a statutory planning document. It is a consultation document that should be used to inform a development plan or local area plan, enabling the implementation of the 'Sequential Approach' and the testing of development zoning against flood risk criteria. It can also be used to assist other planning decisions, such as Development Management, and emergency planning. In any instance, a site-specific flood risk assessment may be required when deciding on the grant of planning permission. (Department of Environment, Heritage and Local Government and OPW, The Planning System and Flood Risk Management; (2009).

This SFRA covers the entire County excluding Cherrywood Planning Scheme



# 1 Background

## 1.1 Introduction

Flood Risk is defined as:

*“Flood risk is the damage that may be expected to occur at a given location arising from flooding. It is a combination of the likelihood, or probability, of flood occurrence, the degree of flooding and the impacts or damage that the flooding would cause” (OPW, 2014).*

One of the key messages of the then Department of Environment, Heritage and Local Government Guidelines “The Planning System and Flood Risk Management, Guidelines for Planning Authorities”, published in 2009, was that *“Flood risk management should be integrated into spatial planning at all levels to enhance certainty and clarity in the overall planning process”*. The purpose of this Strategic Flood Risk Assessment (SFRA) is to provide sufficient information to allow proper planning decisions to be made on sites at risk of flooding over the lifetime of the next County Development Plan 2016 – 2022 and also to ensure that Elected Members have the necessary information with regard to flooding, the ‘Sequential Approach’ and the ‘Justification Test’ (see below and Glossary for definitions) in coming to decisions on the Draft Plan.

## 1.2 SFRA Structure

A two stage assessment of flood risk was undertaken, as recommended in ‘The Planning System and Flood Risk Management’ guidelines, for the area that lies within the County Development Plan area. The first stage was to identify flood risk and develop Flood Zone maps which confirmed that a proportion of zoned lands are at flood risk. The second stage and the main purpose of this SFRA report is to highlight development areas that require more detailed assessment on a site specific level. The SFRA also provides guidelines for development within areas at potential risk of flooding, and specifically looks at flood risk and the potential for development across the County.

Section 1 of this SFRA gives an overview of the Planning System and Flood Risk Management. Section 2 provides a background to flood risk in Dún Laoghaire-Rathdown, including a review of available flood risk information and a summary of sources of flooding. In Section 4 an overview of flood management policy has been provided. This includes details of development which may be considered appropriate in certain areas and the expected content of site specific FRAs. Having established the planning and development controls, the Justification Test has been applied across Dún Laoghaire-Rathdown and the outcome of this assessment is provided in Section 2. This section also provides specific requirements for FRA at key sites. Finally, in Section 2 a summary of the triggers for monitoring and review of the SFRA is provided.



## 2 The Planning System and Flood Risk Management

### 2.1 Introduction

Prior to discussing the management of flood risk, it is helpful to understand what is meant by the term. It is also important to define the components of flood risk in order to apply the principles of the Planning System and Flood Risk Management in a consistent manner.

*The Planning System and Flood Risk Management: Guidelines for Planning Authorities*, published in November 2009, describe flooding as a process that can occur at any time and in a wide variety of locations. Flooding can often be beneficial, and many habitats rely on periodic inundation. However, when flooding interacts with human development, it can threaten people, their property and the environment.

The following paragraphs will outline the definitions of flood risk and the Flood Zones used as a planning tool; a discussion of the principles of the Planning Guidelines and the management of flood risk in the planning system follows.

### 2.2 Definition of Flood Risk

Flood risk is generally accepted to be a combination of the likelihood (or probability) of flooding and the potential consequences arising. Flood risk can be expressed in terms of the following relationship:

$$\text{Flood Risk} = \text{Probability of Flooding} \times \text{Consequences of Flooding}$$

The assessment of flood risk requires an understanding of the sources, the flow path of floodwater and the people and property that can be affected.

Principal sources of flooding are rainfall or higher than normal sea levels while the most common pathways are rivers, drains, sewers, overland flow and river and coastal floodplains and their defence assets. Receptors can include people, their property and the environment. All three elements must be present for flood risk to arise. Mitigation measures, such as defences or flood resilient construction, have little or no effect on sources of flooding but they can block or impede pathways or remove receptors.

The planning process is primarily concerned with the location of receptors, taking appropriate account of potential sources and pathways that might put those receptors at risk.

#### 2.2.1 Likelihood of Flooding

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

Return period is often misunderstood to be the period between large flood events rather than an average recurrence interval. Annual exceedance probability is the inverse of return period as shown in Table 2-1.

Table 2-1 Probability of Flooding

Return Period (Years)	Annual Exceedance Probability (%)
2	50
100	1
200	0.5
1000	0.1



Considered over the lifetime of development, an apparently low-frequency or rare flood has a significant probability of occurring. For example, a flood with a 1% AEP (1 in 100 year) has a 22% (1 in 5) chance of occurring at least once in a 25-year period, which is the period of a typical residential mortgage, and a 53% (1 in 2) chance of occurring in a 75-year period, which is a typical human lifetime.

### 2.2.2 Consequences of Flooding

Consequences of flooding depend on the hazards caused by flooding (depth of water, speed of flow, rate of onset, duration, wave-action effects, water quality) and the vulnerability of receptors (type of development, nature, e.g. age-structure, of the population, presence and reliability of mitigation measures etc).

The 'Planning System and Flood Risk Management' provides three vulnerability categories, based on the type of development, which are detailed in Table 3.1 of the Guidelines, and are summarised as:

- **Highly vulnerable**, including residential properties, essential infrastructure and emergency service facilities;
- **Less vulnerable**, such as retail and commercial and local transport infrastructure;
- **Water compatible**, including open space, outdoor recreation and associated essential infrastructure, such as changing rooms.

## 2.3 Definition of Flood Zones

In the 'Planning System and Flood Risk Management', Flood Zones are used to indicate the likelihood of a flood occurring. These Zones indicate a high, moderate or low risk of flooding from fluvial or tidal sources and are defined below in Table 2-2.

It is important to note that the definition of the Flood Zones is based on an **undefended scenario** and does not take into account the presence of flood protection structures such as flood walls or embankments. This is to allow for the fact that there is a residual risk of flooding behind the defences due to overtopping or breach and that there may be no guarantee that the defences will be maintained in perpetuity.

It is also important to note that the Flood Zones indicate flooding from fluvial and tidal sources and do not take other sources, such as groundwater or pluvial, into account, so an assessment of risk arising from such sources should also be made.

Table 2-2 Definition of Flood Zones

Zone	Description
<b>Zone A</b> High probability of flooding.	This zone defines areas with the highest risk of flooding from rivers (i.e. more than 1% probability or more than 1 in 100) and the coast (i.e. more than 0.5% probability or more than 1 in 200).
<b>Zone B</b> Moderate probability of flooding.	This zone defines areas with a moderate risk of flooding from rivers (i.e. 0.1% to 1% probability or between 1 in 100 and 1 in 1000) and the coast (i.e. 0.1% to 0.5% probability or between 1 in 200 and 1 in 1000).
<b>Zone C</b> Low probability of flooding.	This zone defines areas with a low risk of flooding from rivers and the coast (i.e. less than 0.1% probability or less than 1 in 1000).

## 2.4 Objectives and Principles of the Planning Guidelines

The 'Planning System and Flood Risk Management' describes good flood risk practice in planning and development management. Planning authorities are directed to have regard to the guidelines in the preparation of Development Plans and Local Area Plans, and for development control purposes.

The objective of the 'Planning System and Flood Risk Management' is to integrate flood risk management into the planning process, thereby assisting in the delivery of sustainable development. For this to be achieved, flood risk must be assessed as early as possible in the planning process. Paragraph 1.6 of the Guidelines states that the core objectives 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 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 aim to facilitate 'the transparent consideration of flood risk at all levels of the planning process, ensuring a consistency of approach throughout the country.' SFRAs therefore become a key evidence base in meeting these objectives.

The 'Planning System and Flood Risk Management' works on a number of key principles, including:

- Adopting a staged and hierarchical approach to the assessment of flood risk;
- Adopting a sequential approach to the management of flood risk, based on the frequency of flooding (identified through Flood Zones) and the vulnerability of the proposed land use.

## 2.5 The Sequential Approach and Justification Test

Each stage of the FRA process aims to adopt a sequential approach to management of flood risk in the planning process.

Where possible, development in areas identified as being at flood risk should be avoided; this may necessitate de-zoning lands within the plan boundary. If de-zoning is not considered appropriate, then it must be ensured that permitted uses are water compatible or less vulnerable, such as open space, and that vulnerable uses such as residential are not permitted in the flood risk area.

Figure 2-1 Sequential Approach Principles in Flood Risk Management



Source: The Planning System and Flood Risk Management (Figure 3.1)



Where rezoning is not considered appropriate, exceptions to the development restrictions are provided for through the Justification Test. Many towns and cities have central areas that are affected by flood risk and have been targeted for growth. To allow the sustainable and compact development of these urban centres, development in areas of flood risk may be considered necessary. For development in such areas to be allowed, the Justification Test must be passed.

The Justification Test has been designed to rigorously assess the appropriateness, or otherwise, of such developments. The test is comprised of two processes; the Plan-making Justification Test, which is undertaken in Section 5 of this SFRA, and the Development Management Justification Test. The latter is used at the planning application stage where it is intended to develop land that is at moderate or high risk of flooding for uses or development vulnerable to flooding that would generally be considered inappropriate for that land.

Table 2-3 shows which types of development, based on vulnerability to flood risk, are appropriate land uses for each of the Flood Zones. The aim of the SFRA is to guide development zonings to those which are 'appropriate' and thereby avoid the need to apply the Justification Test.

A planning circular (PL2/2014<sup>1</sup>) has also been issued which provides greater clarity on the need to apply the Justification Test to existing development and areas which are proposed for redevelopment, included as Section 4.27a. Further, this amendment requires the SFRA to specify the nature and design of structural or non-structural flood risk management measures required prior to development in such areas. As part of the Application of the Justification Test, detailed in Section 5, consideration has been given to both developed and currently undeveloped land.

Table 2-3 Matrix of Vulnerability versus Flood Zone

	Flood Zone A	Flood Zone B	Flood Zone C
Highly vulnerable development (Including essential infrastructure)	Justification Test	Justification Test	Appropriate
Less vulnerable development	Justification Test	Appropriate	Appropriate
Water-compatible development	Appropriate	Appropriate	Appropriate

Source: Table 3.2 of The Planning System and Flood Risk Management

## 2.6 Scales and Stages of Flood Risk Assessment

Within the hierarchy of regional, strategic and site-specific flood-risk assessments, a tiered approach ensures that the level of information is appropriate to the scale and nature of the flood-risk issues and the location and type of development proposed, avoiding expensive flood modelling and development of mitigation measures where it is not necessary. The stages and scales of flood risk assessment comprise:

- **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. This should be based on readily derivable information and undertaken to inform the Regional Planning Guidelines.
- **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,

<sup>1</sup> Department of Environment, Community and Local Government, Planning Circular PL2/2014 (13/08/2015)



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 detailed stage 3 FRA will be required to ensure zoning objectives are compatible with flood risk at the site, and more importantly that mitigation measures which reduce flood risk to the site and neighbouring lands can be implemented. The SFRA will highlight where a site specific FRA is required as part of the planning application process.

In Dún Laoghaire-Rathdown, a range of flood data sources have been reviewed and used to compile a composite Flood Zone map. In most locations this map, coupled with engineering knowledge has been sufficient to provide recommendations for flood risk assessment and development management. However, in Dún Laoghaire-Rathdown a Stage 3 FRA has been carried out for the area within the Dundrum Major Town Centre lands. The aim of the FRA was to indicate it, in principle, development of the lands could be carried out without increasing risk to neighbouring sites. The details of the Detailed FRA are provided in Annex A.1a.i.A.

- **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 the site to an acceptable level. If the previous tiers of study have been undertaken to appropriate levels of detail, it is highly likely that the site specific FRA will require detailed channel and site survey, and hydraulic modelling. It should consider residual risks, such as culvert blockage or defence overtopping and access and evacuation plans are likely form important element of the assessment.





## 3 Strategic Flood Risk Assessment of Dún Laoghaire Rathdown

### 3.1 Description of Study Area

Dún Laoghaire-Rathdown covers an area of 125 km<sup>2</sup> to the south of Dublin City. Along the east of the County runs 17 kilometres of coastline which includes beaches cliffs and marshes. It is along the coast that the County town of Dún Laoghaire is located. In terms of settlement approximately two thirds of the County is made up of the built-up area which forms part of suburban Dublin. This suburban area is made up of a network of smaller towns and villages which have been subsumed into the urban form. To the south and west the built-up area gives way to agricultural lands and then rises into the upland scenic area of the Dublin Mountains.

### 3.2 Identification of Flood Risk (Stage 1)

One of the first tasks within the SFRA is to undertake a data collection exercise which will allow Flood Zone maps to be developed. The Flood Zones relate to risk arising from fluvial (river) and coastal flooding. Other sources of flooding should also be taken into account through the SFRA process, but are not part of the initial assessment process.

It is important to note that the Flood Zones do not take into account the benefits of flood defences. The sequential approach and Justification Test should be applied using the undefended outlines, but the benefits of the defences can be used to inform the requirements for detailed flood risk assessment and development design, if the Justification Test has been passed.

Due to the number of flood investigation and management studies that have focused on Dún Laoghaire-Rathdown, there are a number of datasets which record either historical or predicated flood extents. The aim of this phase of work is to identify flood risk based on the data available, including historical records, considering all sources of flooding, and to appraise the quality and usefulness of the data. Table 3-4 below summarises the data available and its quality, includes an assessment of confidence in its accuracy (when attempting to incorporate it into the flood zone map) and gives an indication of how it was used in the SFRA study.

The Office of Public Works (OPW) are the lead Authority on flooding in the Country and in 2011 they commenced a National Catchment Flood Risk Assessment and Management (CFRAM) programme. CFRAM is currently being carried out for the Eastern Region - which includes Dún Laoghaire-Rathdown - and these studies have been used as the basis of this Strategic Flood Risk Assessment. The Eastern CFRAMs are still being finalised, but draft flood extent maps are available in the public domain. The Dodder River, which forms part of the Eastern Region CFRAM, was the subject of an earlier pilot project and the maps in relation to the Dodder CFRAM have been finalised and are consequently in the public domain. The plan area of Dún Laoghaire-Rathdown has also been subject to a number of other flood assessments at both the County and local scales. These have looked at risks arising from sources such as coastal inundation and wave overtopping, surface water and manhole surcharge, culvert blockage and direct fluvial flooding. There have also been a number of recorded flood events. This information has been compiled to form the Flood Zone maps that are the basis for this SFRA.

The Flood Zone maps have been developed using the most appropriate data available to Dún Laoghaire-Rathdown at the time of preparing the Development Plan. The Flood Zone maps have been created specifically to inform the application of the Justification Test and to guide development policy within the County and have been through several iterations of review, and are now considered to be fit for purpose. However, it should be borne in mind that the input data was developed at a point in time and there may be changes within the catchment that mean a future study, or more localised assessment of risk may result in a change in either





flood extent or depth. This means a site specific flood risk assessment may result in locally appropriate information which could show a greater or less level of risk than is included in the Flood Zone maps. This is to be expected and it will require discussion between the developer and the Dún Laoghaire-Rathdown Planning and Engineering teams to ensure the assessment is appropriate and relevant to the site in question.

The Flood Zone maps show Flood Zones A, B and C and also show historical and predicted flooding hotspots in the County. Flood Zone A refers to areas where the probability of flooding from rivers is greater than 1% or 1 in 100 year for river flooding, or 0.5% or 1 in 200 for coastal flooding. Flood Zone B refers to areas where the probability of flooding from rivers and seas is up to 0.1% or 1 in 1000. The rest of the map shows Flood Zone C, where there is less than a 0.1% or 1 in 1000 chance of flooding. Historical surface water hotspots are those where Dún Laoghaire-Rathdown County Council has a record of a flood occurring, although in some cases work has been carried out to remediate the issue. The predicted hotspots are based on modelling and indicate where surface water has the potential to pond to depths of greater than 0.3m. Guidance on applying this information is provided in Section 4.4.

Table 3-4: Flood Risk Datasets

<b>Data</b>	<b>Description / Coverage</b>	<b>Quality</b>	<b>Data used in developing Flood Zones</b>
Dodder CFRAM Flood Extents	Flood extents covering the Dodder River and its tributaries, the Dundrum Slang and the Little Dargle	Moderate to high, but gives extents (defended) not flood zones (undefended)	Where no defences are present, extents have been used directly. Where there are defences, the benefit of those defences has been estimated and the extents reconfigured to give Flood Zones
Draft Eastern CFRAM extents and defence layers	Flood extents covering the Crinken Stream, Shanhanagh River, Loughlinstown River, Deansgrange Stream, Carrickmines River and Carysfort Maritimo, as well as the coastline of the County.	High in most locations. Maps are draft, but have been subject to several iterations of review through the CFRAM development process	Flood extents, defence lines and defended area polygons have been used to develop Flood Zones
Irish Coastal Protection Strategy Study JFLOW® (JBA's multi-scale two dimensional hydraulic fluvial flood modelling software)	Tidal extents for 200 year and 1000 year events Covers full study area, including all watercourses with catchment greater than 3km <sup>2</sup> .	High  Moderate	Used to define the tidal risk within Flood Zone A and B.  Some minor watercourses, and the upstream reach of some CFRAM watercourses.
OPW Preliminary Flood Risk Assessment (PFRA) flood	The PFRA was a national screening exercise that was undertaken by OPW to identify	Moderate	Some minor watercourses, and the upstream reach of some CFRAM watercourses.



Data	Description / Coverage	Quality	Data used in developing Flood Zones
maps	areas at potential risk of flooding.		
LiDAR	Digital terrain model covering the whole County	High, but not direct representation of flood zones.	Not used directly, but has helped define the undefended floodplain.
Dundrum flood extents	Flood maps produced as part of this SFRA, providing detailed FRA for Dundrum town centre	High	Replaces part of the Dodder flood extent through Dundrum.
Historical event outlines and point observations and reports	Various: 2011 event outlines received. OPW flood maps.ie also to be consulted. Surface water risk locations mapped	Various – based on anecdotal evidence and post flood survey	Indirectly used to validate flood zones and identify non-fluvial and tidal flooding
Deansgrange and Kilbogget Park flood extents	Localised studies as part of flood relief scheme appraisal	High	Indicates defended areas and guides requirements for site specific FRAs.
Wave overtopping from DART Drainage Impact Study	Merrion Gate to Monkstown. Indicates risks associated with wave overtopping	Moderate to high	Not used to create Flood Zones, but mapped to indicate 'other' risk areas.
Culvert blockage	The impact of blockage was tested at 21 culverts across the County	Moderate to high (but based on an assumption of 100% blockage)	Not used to create Flood Zones, but reviewed to indicate residual risk areas.
Direct rainfall modelling	Shows surface water routes, but does not take into account contributions from surcharging sewer networks. Whole County covered.	Moderate	Used to highlight areas at high risk of surface water flooding. Also indicates potential Flood Zones at the upstream end of some small watercourses.

### 3.3 Summary of flood sources

Using the information detailed above, along with the knowledge of engineering staff, the following potential sources of flooding have been identified with the development plan area.

#### 3.3.1 Fluvial Flooding

Flooding of watercourses is associated with the exceedance of channel capacity during higher flows. The process of flooding on watercourses depends on a number of characteristics associated with the catchment including; geographical location and variation in rainfall, steepness of the channel and surrounding floodplain and infiltration and rate of runoff associated with urban and rural catchments. Generally there are two main types of



catchments; large and relatively flat or small and steep, both giving two very different responses during large rainfall events.

In a large, relatively flat catchment, flood levels will rise relatively slowly and natural floodplains may remain flooded for several days, acting as the natural regulator of the flow. This is typical of the River Dodder. In small, steep catchments, such as some of the tributaries, local intense rainfall can result in the rapid onset of deep and fast-flowing flooding with little warning. Such “flash” flooding, which may only last a few hours, can cause considerable damage and possible threat to life.

The form of the floodplain, either natural or urbanised, can influence flooding along watercourses. The location of buildings and roads can significantly influence flood depths and velocities by altering flow directions and reducing the volume of storage within the floodplain. Critical structures such as bridge and culverts can also significantly reduce capacity creating pinch points within the floodplain. These structures are also vulnerable to blockage by natural debris within the channel or by fly tipping and waste.

In Dún Laoghaire-Rathdown, flood risk arises from a number of different watercourses, each of which has its own specific characteristics. These have been taken into account when flood risk to specific potential development sites was reviewed. Where zoning for development is proposed within Flood Zones A or B, the Justification Test must be applied, and passed.

### 3.3.2 Tidal Flooding

Dún Laoghaire-Rathdown is located on the east coast of Ireland, and much of the County boundary is subject to flood risk from the Irish Sea. As well as direct inundation associated with high tides and storm surge, wave overtopping has also been investigated as part of the Dart Drainage Impact study, for the length of coast from Merrion Gate to Monkstown. The extents of the overtopping outline are the very similar to the Flood Zones, so this does not need specific consideration in the SFRA, but should be a factor in site specific flood risk assessments near the coastal zone.

The tide can also impact on flood risk from rivers, particularly at the downstream end of those which discharge directly into the sea. On such watercourses, if high river flows coincide with high tides, the rivers can't discharge and may cause flooding locally.

Peak tide levels were calculated as part of ICPSS and the Eastern CFRAM study and should be referred to in any site specific FRA.

### 3.3.3 Residual Risks arising from Flood Defence Overtopping or Breach

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

The concept of residual risk is explained in the Planning System and Flood Risk Management guidelines as follows:

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

Owing to an extensive and frequent history of flooding in some parts of the County, there are a number of flood relief schemes in Dún Laoghaire-Rathdown. These include large scale OPW managed schemes on the River Dodder, and some smaller works which have been constructed, or are due for construction on smaller watercourses. It should be noted that whilst existing development clearly benefits from the construction of defences, it is against



sustainability objectives, and the general approach of the OPW, to construct defences with the intention of releasing land for development. It is also not appropriate to consider the benefits of schemes which have not been constructed, and which may only be at pre-feasibility or design stage. Overtopping of flood defences will occur during flood events greater than the design level of the defences. Overtopping is likely to cause more limited inundation of the floodplain than if defences had not been built, but the impact will depend on the duration, severity and volume of floodwater. However, and more critically, overtopping can destabilise a flood defence, cause erosion and make it more susceptible to breach or fail.

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

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

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

Defence locations in Dún Laoghaire-Rathdown have been identified through the Eastern CFRAM, which has included an assessment of the defences' ability to provide an effective function, and to what standard of protection. Individual defence locations have been highlighted in the consideration of specific risks. Where walls and embankments are not discussed it is highly likely that they are informal or ineffective structures which should not be relied upon in a flood event. For the purposes of a site specific flood risk assessment it should be assumed that the site is undefended.

#### **3.3.4 Pluvial Flooding**

Flooding of land from surface water runoff is usually caused by intense rainfall that may only last a few hours. The resulting water follows natural valley lines, creating flow paths along roads and through and around developments and ponding in low spots, which often coincide with fluvial floodplains. Any areas at risk from fluvial flooding will almost certainly be at risk from surface water flooding.

Although having potentially severe consequences, pluvial flooding can generally be managed through site design, layout and drainage. However, SFRA's require a strategic assessment of the likelihood of surface water flooding, which includes consideration of the following:

- Are there zoned lands which may need to accommodate and retain surface water flow routes?
- Are there zoned lands which might discharge upstream of an area vulnerable to surface water flooding?

A preliminary screening of surface water hot-spots has been carried out for this SFRA, drawing on historical flood records and the OPW's PFRA mapping amongst other sources. For development within or near these areas, particular attention to surface water risk is required. Drainage Impact Assessments are required for all development proposals, and are further detailed in Section 4.4.

#### **3.3.5 Flooding from Drainage Systems**

Flooding from artificial drainage systems occurs when flow entering a system, such as an urban storm water drainage system, exceeds its discharge capacity, it becomes blocked or it cannot discharge due to a high water level in the receiving watercourse.

Flooding in urban areas can also be attributed to sewers. Sewers have a finite capacity which, during certain load conditions, will be exceeded. In addition, design standards vary and changes within the catchment areas draining to the system, in particular planned growth



and urban creep, will reduce the level of service provided by the asset. Sewer flooding problems will often be associated with regularly occurring storm events during which sewers and associated infrastructure can become blocked or fail. This problem is exacerbated in areas with under-capacity systems. In the larger events that are less frequent but have a higher consequence, surface water will exceed the sewer system and flow across the surface of the land, often following the same flow paths and ponding in the same areas as overland flow.

Foul sewers and surface water drainage systems are spread extensively across the urban areas with various interconnected systems discharging to treatment works and into local watercourses.

### 3.3.6 Groundwater Flooding

Groundwater flooding is caused by the emergence of water originating from underground, and is particularly common in karst landscapes. This can emerge from either point or diffuse locations. The occurrence of groundwater flooding is usually very local and unlike flooding from rivers and the sea, does not generally pose a significant risk to life due to the slow rate at which the water level rises. However, groundwater flooding can cause significant damage to property, especially in urban areas and pose further risks to the environment and ground stability. There are many underground streams within Dún Laoghaire-Rathdown, particularly in the Dalkey, Killiney, Dun Laoghaire, Glenageary and Glasthule areas. Some of these streams continue to give issues in private properties, and care should be taken to ensure high-water tables do not impact on basements, foundations, percolation areas or other sub-ground construction works. This should be assessed on a site by site basis through percolation testing and bore holes.

### 3.3.7 Climate Change

Climate change should be considered when assessing flood risk and in particular residual flood risk. Areas of residual risk are highly sensitive to climate change impacts as an increase in flood levels will increase the likelihood of defence failure.

The 'Planning System and Flood Risk Management' recommends that a precautionary approach to climate change is adopted due to the level of uncertainty involved in the potential effects. Specific advice on the expected impacts of climate change and the allowances to be provided for future flood risk management in Ireland is given in the OPW draft guidance<sup>2</sup>. Two climate change scenarios are considered. These are the Mid-Range Future Scenario (MRFS) and the High-End Future Scenario (HEFS). The MRFS is intended to represent a "likely" future scenario based on the wide range of future predictions available. The HEFS represents a more "extreme" future scenario at the upper boundaries of future projections. Based on these two scenarios the OPW recommended allowances for climate change are given in Table 3-2.**Error! Reference source not found..** These climate change allowances are particularly important at the development management stage of planning, and will ensure that proposed development is designed and constructed to take into account current Government advice. Guidance on when the MRFS or HEFS should be used is provided in Section 4.9. Further work on the impacts of climate change on flood levels is being undertaken as part of the Eastern CFRAM for a number of watercourses in Dún Laoghaire-Rathdown. When complete, this study will include both current and potential future water levels across the river system, and these levels can be used to inform design criteria for developments within the CFRAM study area.

---

<sup>2</sup> OPW Assessment of Potential Future Scenarios, Flood Risk Management Draft Guidance, 2009



Table 3-5: Allowances for Future Scenarios (100 Year Time Horizon)

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

## Notes:

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

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

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

It is acknowledged that climate change research is advancing rapidly, and the allowances provided in the OPW guidance may be an underestimate of future impacts. At this, the development planning stage, a detailed knowledge of the impact of climate change on flood levels is not required to inform the strategic allocation of land. Instead, and in the absence of detailed projections of climate change impacts, fluvial 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', as suggested in the 'Planning System and Flood Risk Management'. For tidal flood risk, an increase of 0.5m or 1m should be assessed using LiDAR or other available ground level data.



## 4 Policy Response

### 4.1 The Strategic Approach

A strategic approach to the management of flood risk is particularly important in Dún Laoghaire-Rathdown due to the density of existing development and the strategic importance of the County in relation to future growth and expansion. This makes it impractical to consider flood management on a site by site basis. This is particularly true where higher levels of flood risk have been identified and a more detailed flood risk assessment and options appraisal study, such as is being carried out through the CFRAM, may be required prior to permitting further development. In some cases, such a study may demonstrate a manageable level of risk and in others, a whole, or partial-catchment scheme may be recommended and should be constructed prior to further development taking place.

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

It is important to note that whilst it may be technically feasible to mitigate or manage flood risk at site level, strategically it may not be a sustainable approach.

A summary of flood risks associated with each of the zoning objectives has been provided in Table 4-6, 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 in Section 5. However, when applications are being considered it is important to remember that not all uses will be appropriate on flood risk grounds, hence the need to work through the Justification Test for Development Management on a site by site basis and with reference to Section 5. For example, zoning objective MTC (mixed use town centre) could include a highly vulnerable crèche, less vulnerable shops and water compatible car parking but they would not be equally permissible on the ground floor within Flood Zone A or B.

Table 4-6: Zoning objective vulnerability

Zoning Objective		Indicative Primary Vulnerability	Flood Risk Commentary
A	To protect and-or improve residential amenity.	Highly vulnerable	Generally not appropriate in areas at risk of flooding.
A1	To provide for new residential communities in accordance with approved local area plans.	Highly vulnerable	Generally not appropriate in areas at risk of flooding.
A2	To provide for the creation of sustainable residential neighbourhoods and preserve and protect residential amenity.	Highly vulnerable	Generally not appropriate in areas at risk of flooding.
B	To protect and improve rural amenity and to provide for the development of agriculture.	Water compatible	In general rural amenity will include water compatible uses, but individual and groups of residential and other developments may arise. Applying the Justification Test would require such developments to avoid areas with Flood Zone A / B.
DC	To protect, provide for	Less / highly	A mix of uses within this zoning





Zoning Objective		Indicative Primary Vulnerability	Flood Risk Commentary
	and-or improve mixed-use district centre facilities.	vulnerable	objective is possible. Flood risk should be assessed and managed in accordance with this SFRA, and applying the sequential approach.
E	To provide for economic development and employment.	Less vulnerable	Generally appropriate in Flood Zone B and extensions of existing development in Flood Zone A are justified, subject to site specific FRA.
F	To preserve and provide for open space with ancillary active recreational amenities.	Water compatible	Appropriate for all Flood Zones. Ancillary developments to be assessed in accordance with the sequential approach.
G	To protect and improve high amenity areas.	Water compatible	Appropriate for all Flood Zones. Objective is to avoid new development in these areas, and what development is allowed should be located within Flood Zone C.
GB	To protect and enhance the open nature of lands between urban areas.	Water compatible	Appropriate for all Flood Zones. Any ancillary developments to be assessed in accordance with the sequential approach.
LIW	To improve and provide for low density warehousing/light industrial warehousing uses	Less vulnerable	Generally appropriate in Flood Zone B and extensions of existing development in Flood Zone A are justified, subject to site specific FRA.
MH	To improve, encourage and facilitate the provision and expansion of medical/hospital uses and services.	Highly vulnerable	Appropriate in Flood Zone C. Sequential approach may be applied within a site to locate water compatible elements (car parks) within Flood Zone A/B, provided emergency plan is in place.
MIC	To consolidate and complete the development of the mixed use inner core to enhance and reinforce sustainable development.	Less / highly vulnerable	A mix of uses within this zoning objective is possible. Flood risk should be assessed and managed in accordance with this SFRA, and applying the sequential approach.
MOC	To provide for a mix of uses which complements the inner core, but with less retail and residential and more emphasis on employment and services.	Less / highly vulnerable	A mix of uses within this zoning objective is possible. Flood risk should be assessed and managed in accordance with this SFRA, and applying the sequential approach.
MTC	To protect, provide for and-or improve major town centre facilities.	Highly / less vulnerable	A mix of uses within this zoning objective is possible. Flood risk should be assessed and managed in accordance with this SFRA, and applying the sequential approach.
NC	To protect, provide for and-or improve mixed-use neighbourhood centre facilities.	Highly / less vulnerable	A mix of uses within this zoning objective is possible. Flood risk should be assessed and managed in accordance with this SFRA, and applying the sequential approach.





Zoning Objective		Indicative Primary Vulnerability	Flood Risk Commentary
OE	To provide for office and enterprise development.	Less vulnerable	Generally appropriate in Flood Zone B and extensions of existing development in Flood Zone A are justified, subject to site specific FRA.
TLI	To facilitate, support and enhance the development of third level education institutions.	Highly vulnerable	Appropriate in Flood Zone C. Sequential approach may be applied within a site to locate water compatible elements (car parks and playing fields) within Flood Zone A/B, provided emergency plan is in place.
W	To provide for waterfront development and harbour related uses.	Water compatible	Appropriate for all Flood Zones. Ancillary developments to be assessed in accordance with the sequential approach.

## 4.2 Development Management and Flood Risk

In order to guide both applicants and planning officials through the process of planning for, and mitigating flood risk, the key features of a range of development scenarios have been identified (relating the flood zone, development vulnerability and presence or absence of defences). For each scenario, a number of considerations relating to the suitability of the development are summarised below.

It should be noted that this section of the SFRA begins from the point that all land zoned for development has passed the Justification Test for Development Plans, and therefore Part 1 of the Justification Test for Development Management. In addition to the general recommendations in the following sections, Section 5 should be reviewed for specific recommendations for the watercourses within Dún Laoghaire-Rathdown, including details of the application of the Justification Test.

In order to determine the appropriate design standards for a development it may be necessary to undertake a site specific flood risk assessment. This may be a qualitative appraisal of risks, including drainage design. Alternatively, the findings of the CFRAM, or other detailed study, may be drawn upon to inform finished floor levels. In other circumstances a detailed modelling study and flood risk assessment may need to be undertaken. Further details of each of these scenarios, including considerations for the flood risk assessment are provided in the following sections.

## 4.3 Requirements for a Flood Risk Assessment

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. As a minimum, all proposed development, including that in Flood Zone C, must consider the impact of surface water flood risks on drainage design. In addition, flood risk from sources other than fluvial and tidal should be reviewed.

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

Within the FRA the impacts of climate change and residual risk (including culvert/structure blockage) should be considered and remodelled where necessary, using an appropriate level of detail, in the design of FFL. Further information on the required content of the FRA is provided in the Planning System and Flood Risk Management Guidelines.

Any proposal that is considered acceptable in principle shall demonstrate the use of the sequential approach in terms of the site layout and design and, in satisfying the Justification



Test (where required), the proposal will demonstrate that appropriate mitigation and management measures are put in place.

#### **4.4 Drainage impact assessment**

All proposed development, including that in Flood Zone C, must consider the impact of surface water flood risks on drainage design. In this regard, all the other development scenarios must pass through this stage before completing the planning and development process, and should be accompanied by an appropriately detailed flood risk assessment, or drainage impact assessment.

There are extensive networks of surface water runoff routes across the County, with areas vulnerable to ponding indicated on the Flood Zone Map. Particular attention should be given to development in low-lying areas which may act as natural ponds for collection of runoff.

The drainage design should ensure no increase in flood risk to the site, or the downstream catchment. Considerable detail on the process and design of SUDS is provided in the Greater Dublin Strategic Drainage Study, and more details and guidance are available on the 'Irish SuDS: Guidance and Tools' website<sup>3</sup>.

Master planning of development sites should ensure that existing flow routes are maintained, through the use of green infrastructure. Where possible, and particularly in areas of new development, floor levels should at a minimum be 300mm above adjacent roads and hard standing areas to reduce the consequences of any localised flooding. Where this is not possible, an alternative design appropriate to the location may be prepared. The surface water flood locations are indicated as both historical and predicated 'surface water hotspots' on the Flood Zone map. A more rigorous design approach will be required in locations indicated to be at, or near (approximately 50m radius) these locations. Further discussion with the Water Services Section of Dún Laoghaire-Rathdown County Council is recommended in this situation.

#### **4.5 Development proposals in Flood Zone C**

Where a site is within Flood Zone C, but adjoining or in close proximity to Flood Zone A or B there could be a risk of flooding associated with factors such as future scenarios (climate change) or in the event of failure of a defence, blocking of a bridge or culvert. Risk from sources other than fluvial and coastal must also be addressed for all development in Flood Zone C. As a minimum in such a scenario, a flood risk assessment should be undertaken which will screen out possible indirect sources of flood risk and where they cannot be screened out it should present mitigation measures. The most likely mitigation measure will involve setting finished floor levels to a height that is above the 1 in 100 year fluvial or 1 in 200 year tidal flood level, with an allowance for climate change and freeboard, or to ensure a step up from road level to prevent surface water ingress. Design elements such as channel maintenance or trash screens may also be required. Evacuation routes in the event of inundation of surrounding land should also be detailed.

The impacts of climate change should be considered for all proposed developments. This is particularly important for development near areas at risk of tidal flooding. A development which is currently in Flood Zone C may be shown to be at risk when 0.5m is added to the extreme (1 in 200 year) tide. Details of the approach to incorporating climate change impacts into the assessment and design are provided in Section 4.8.

#### **4.6 Applications for Minor Developments in Areas at Risk of Flooding**

In an extension to Section 5.28 of the Planning Guidelines on Flood Risk Management, two classes of 'Minor developments' have been defined through this SFRA. These are:



- Class 1 - Works directly associated with existing developments, such as extensions, renovations and rebuilding within the footprint of the existing development, and changes of use.
- Class 2 - Works in relation to infill development, which may include development of previously unused (greenfield) land, or building with the curtilage of an existing development, but outside the footprint of the building.

In the case of class 1, the 'Sequential Approach' and 'Justification Test' will not apply as they relate to existing buildings. However, an assessment of the risks of flooding should accompany such applications to demonstrate that they would not have adverse impacts or impede access to a watercourse, floodplain or flood protection and management facilities. Where possible, the design of built elements in these applications should demonstrate principles of flood resilient design (See Section 4 - Designing for Residual Flood Risk of the Technical Appendices to the DoECLG Flooding Guidelines). Emergency access must be considered as in many cases flood resilience will not be easily achieved in the existing built environment.

For Class 2 development, construction of new buildings on what would otherwise be greenfield, or undeveloped land, has generally been found to generate an un-justifiable level of risk, either through introducing additional people into the floodplain, blocking surface water and overland flow paths or requiring works which are likely to have a negative impact on flood risk elsewhere. For this reason, new, standalone development is not permitted within Flood Zone A or B for highly vulnerable uses or in Flood Zone A for less vulnerable uses.

#### **Checklist of what is required for Minor Applications in Areas at Risk of Flooding.**

- Consideration of minor works classification.
- Assessment of flood risk carried out by an appropriately qualified Engineer with relevant FRA experience (as deemed acceptable by the Planning Authority).
- Flood resilient design
- Access, egress and emergency plans must be in place which are appropriate to the vulnerability of the development and its occupiers, the intensity of use and the level of flood risk.

## **4.7 Applications for Larger Development in Areas at Risk of Flooding**

### **4.7.1 Highly vulnerable development in Flood Zone A or B**

Development which is highly vulnerable to flooding, as defined in The Planning System and Flood Risk Management, includes (but is not limited to) dwelling houses, hospitals, emergency services and caravan parks.

#### **4.7.1.1 New development**

It is not appropriate for new, highly vulnerable development to be located on greenfield land in Flood Zones A or B, particularly outside the core of a settlement and where there are no flood defences. Such proposals do not pass the Justification Test. Instead, a less vulnerable use should be considered.

#### **4.7.1.2 Existing developed areas**

The Planning Circular (PL02/2014) states that *"notwithstanding the need for future development to avoid areas at risk of flooding, it is recognised that the existing urban structure of the country contains many well established cities and urban centres which will continue to be at risk of flooding. In addition, development plans have identified various strategically important urban centres ... whose continued consolidation, growth, development or generation, including for residential use, is being encouraged to bring about compact and sustainable growth."*

Within this SFRA, small scale infill housing, extensions or changes of use have been considered and, subject to site specific flood risk assessment, can generally be considered



appropriate provided they constitute a continuation of the existing level of development. There are a number of areas within Dún Laoghaire-Rathdown that prove to be exceptions to this approach, such as Seafield, Bayview and downstream of Dundrum town centre, so the detail contained in Section 2 should be consulted for more site specific information.

In cases where development has been justified, the outline requirements for a flood risk assessment and flood management measures have been detailed in this SFRA in both the following sections and the site specific assessments in Section 5, which also details where such development has been justified. Of prime importance are the requirement to manage risk to the development site and not to increase flood risk elsewhere. This should give due consideration to safe evacuation routes and access for emergency services during a flood event.

#### **4.7.2 Less vulnerable development in Flood Zone A or B**

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

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

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

Major developments may also be located in areas with a higher likelihood of flooding, provided the risks are understood, and accepted, and operability and emergency response is clearly defined; this may allow construction to a finished floor level which is lower than the 'ideal' starting point.

#### **4.8 Key points for FRAs for all types of development**

- Finished floor levels to be set above the 1% AEP fluvial (0.5% AEP tide) level, with an allowance for climate change plus a freeboard of at least 300mm. The freeboard allowance should be assessed and the choice justified.
- Flow paths through the site and areas of surface water storage should be managed to maintain their function and without causing increased flood risk elsewhere
- Compensatory storage is to be provided to balance floodplain loss as a result of raising ground levels within Flood Zone A. The storage should be provided within the flood cell and on a level for level basis up to the 1% level.
- Within currently developed areas, the impact of loss of storage should also be investigated for the 0.1% AEP event, and further compensatory storage provided if the development is shown to have a negative impact on flood risk elsewhere<sup>4</sup>.
- In a defended site, compensatory storage is not required, but the impact of removing the net reduction in floodplain storage should be assessed, and any impacts to existing development mitigated for the 0.1% event or a breach of these defences.
- A site is considered to be defended if the standard of protection is 1% AEP, within which a freeboard of at least 300mm is included. The FFL of the proposed development needs to take into include for the impacts of climate change and other residual risks, including the 0.1% event, unless this has also been incorporated into the defence design. This

<sup>4</sup> A negative impact would result in additional numbers of properties being at flood risk, or an increase in flood depth to properties currently at flood risk.



may be assessed through breach analysis, overtopping analysis or projection of levels from the channel inland.

- For less vulnerable development, it may be that a finished floor level as low as the 1% AEP level could be adopted, provided the risks of climate change are included in the development through adaptable designs or resilience measures. This approach should reflect emergency planning and business continuity to be provided within the development. It may reflect the design life of the development, the proposed use, the vulnerability of items to be kept in the premises, the occupants and users, emergency plan and inclusion of flood resilience and recovery measures.

#### **Checklist for Applications for Larger Development in Areas at Risk of Flooding.**

- Development Management 'Justification Test' has been passed.
- FRA in accordance the Dún Laoghaire-Rathdown SFRA and the Planning System and Flood Risk Management Guidelines, to be carried out by an appropriately qualified Engineer with relevant FRA experience (as deemed acceptable by the Planning Authority).
- Flood resilience statement to be submitted.
- Compliance with GDSDS and inclusion of SuDS.
- Assessment of the potential impacts of Climate Change and the adaptive capacity of the development
- Access, egress and emergency plans must be in place which are appropriate to the vulnerability of the development and its occupiers, the intensity of use and the level of flood risk.

## **4.9 Incorporating Climate Change into Development Design**

As detailed throughout this SFRA, consideration and incorporation of the potential impacts of climate change into development layout and design is essential. The following summary provides an indication of allowances that should be considered when assessing the impacts of climate change. It should be noted that this information is intended as a guide only and there may be instances where it is appropriate for a greater or lesser allowance to be provided, particularly as climate change projections are further refined. The guidance does not necessarily relate directly to the vulnerability of the development used within the Planning Guidelines, but should be assessed on a case by case basis. For watercourses that fall within the Eastern CFRAM study area, water levels for future scenarios are being developed. For other watercourses a conservative approach would be to take the 0.1% AEP event levels as representing the 1% AEP event plus climate change. Where access to the hydraulic river model is readily available a run with climate change could be carried out, or hand calculations undertaken to determine the likely impact of additional flows on river levels.

For most development, including residential, nursing homes, shops and offices, the medium-range future scenario (20% increase in flows and / or 0.5m increase in sea level) is an appropriate consideration.

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

Conversely, there may be development which requires a higher level response to climate change. This could include major facilities which are extremely difficult to relocate, such as hospitals, Seveso sites or power stations, and those which represent a high-economic and long term investment within the scale of development across the city. In such situations it would be reasonable to expect the high-end future scenario (30% increase in flow or 1m in sea level) to be used as the design standard. In the case of coastal locations, and as climate projections are further developed, it may be prudent to demonstrate adaptability to even higher sea levels.



## 4.10 Flood Mitigation Measures at Site Design

For any development proposal in an area at moderate or high risk of flooding that is considered acceptable in principle, it must be demonstrated that appropriate mitigation measures can be put in place and that residual risks can be managed to acceptable levels. Guidance on what might be considered 'acceptable' has been given in a number of sections in this document.

To ensure that adequate measures are put in place to deal with residual risks, proposals should demonstrate the use of flood-resistant construction measures that are aimed at preventing water from entering a building and that mitigate the damage floodwater causes to buildings. Alternatively, designs for flood resilient construction may be adopted where it can be demonstrated that entry of floodwater into buildings is preferable to limit damage caused by floodwater and allow relatively quick recovery.

Various mitigation measures are outlined below and further detail on flood resilience and flood resistance are included in the Technical Appendices of the Planning Guidelines, The Planning System and Flood Risk Management<sup>5</sup>.

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

### 4.10.1.1 Site Layout and Design

To address flood risk in the design of new development, a risk based approach should be adopted to locate more vulnerable land use to higher ground while water compatible development i.e. car parking, recreational space can be located in higher flood risk areas. Highly vulnerable land uses (i.e. residential housing) should be substituted with less vulnerable development (i.e. retail unit).

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

### 4.10.1.2 Ground levels, floor levels and building use

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

- Development at the site must have been justified through this SFRA based on the existing (unmodified) ground levels.
- The FRA should establish the function provided by the floodplain. Where conveyance is a prime function then a hydraulic model will be required to show the impact of its alteration.
- Compensatory storage should be provided on a level for level basis to balance the total area that will be lost through infilling where the floodplain provides static storage.
- The provision of the compensatory storage should be in close proximity to the area that storage is being lost from (i.e. within the same flood cell).
- The land proposed to provide the compensatory storage area must be within the ownership / control of the developer.

---

<sup>5</sup> The Planning System and Flood Risk Management Guidelines for Planning Authorities, Technical Appendices, November 2009





- The land being given over to storage must be land which does not flood in the 1% AEP event (i.e. Flood Zone B or C).
- The compensatory storage area should be constructed before land is raised to facilitate development.

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

Raising finished floor levels within a development is an effective way of avoiding damage to the interior of buildings (i.e. furniture and fittings) in times of flood.

Alternatively, assigning a water compatible use (i.e. garage / car parking) or less vulnerable use to the ground floor level, along with suitable flood resilient construction, is an effective way of raising vulnerable living space above design flood levels. It can however have an impact on the streetscape. Safe access and egress is a critical consideration in allocating ground floor uses.

Depending on the scale of residual risk, resilient and resistance measures may be an appropriate response but this will mostly apply to less vulnerable development.

#### **4.10.1.3 Raised Defences**

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

#### **4.11 'Green Corridor'**

It is recommended that, where possible, and particularly where there is greenfield land adjacent to the river, a 'green corridor', is retained on all rivers and streams. This will have a number of benefits, including:

- Retention of all, or some, of the natural floodplain;
- Potential opportunities for amenity, including riverside walks and public open spaces;
- Maintenance of the connectivity between the river and its floodplain, encouraging the development of a full range of habitats;
- Natural attenuation of flows will help ensure no increase in flood risk downstream;
- Allows access to the river for maintenance works;
- Retention of clearly demarcated areas where development is not appropriate on flood risk grounds, and in accordance with the Planning System and Flood Risk Management.

The width of this corridor should be determined by the available land, and topographically constraints, such as raised land and flood defences, but would ideally span the fully width of the floodplain (i.e. all of Flood Zone A). The DLR Green Infrastructure Strategy has identified core green corridors which have been mostly formed along watercourses.



## 5 Application of the Justification Test

Having reviewed the level of flood risk within the County, and determined appropriate measures for assessing and managing risks to high and low vulnerability development in Flood Zones A, B and C, a more detailed assessment of sites and areas was carried out. The aim of this assessment was to apply the Plan Making Justification Test, taking into account circular PL02/2014 in relation to existing development.

### 5.1 Undeveloped land

With the exception of zoned Major Town Centres and District Centres, new development within Flood Zones A or B does not pass the Justification Test and will not be permitted. This applies to undeveloped areas which are zoned for development but are currently undeveloped and to areas of existing low intensity development. Whilst lands may have retained a zoning objective which would include development, applying the guidance in Section 4 means such development is restricted to Flood Zone C, with water compatible uses located within Zone A and B.

### 5.2 Existing, developed, zoned areas at risk of flooding

#### 5.2.1 Highly vulnerable uses

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 area 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 Seafield and Bayview, Shankill, Carysfort, Ludford and in and around Dundrum Town Centre. It is considered that it would be unrealistic to down zone these lands as they are fully developed. Parts 1 and 2 of the Justification Test in relation to these areas of existing housing in the County is outlined below in Table 5.1.

In applying the Justification Test Part 3, consideration has been given to structural and non-structural measures which may be required prior to further development taking place. 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 areas flood risk can be addressed through non-structural responses, such as requiring a site specific flood risk assessment which will identify appropriate mitigation measures such as retaining flow paths, flood resilient construction and emergency planning.

There are a number of locations where flood risk is greater and non-structural responses are not appropriate to the scale of risks. In these locations, structural measures, generally in the form of flood defences, will be required prior to future development occurring. Further detail on the specifics of the flood management measures in these locations will be available in the ECFRAM.

Section 5.3 provides more detail on the various flood risk areas within the County, and gives a details of the outcome of Part 3 of the Justification Test.





Table 5-7: Justification Test (Part 1 and 2) only for zoning objective A, A1, A2, NC, DC, MTC, E, TLI, MH, MIC, MOC, OE, W areas in the County that are already developed (excluding area with very low intensity development) and include existing vulnerable uses and are in flood 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.	<p>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.</p> <p>The Regional Planning Guidelines for the Greater Dublin Area 2010 – 2016 show the entire built up area of the County of Dun Laoghaire Rathdown as falling within the Metropolitan Area as illustrated in Figure 12 (p89 of Development Plan).</p>
2	The zoning or designation of the lands for the particular use or development type is required to achieve the proper planning and sustainable development of the urban settlement and, in particular:	
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:	All the lands in question contain existing development and are therefore previously developed lands.
2(iii)	Is within or adjoining the core of an established or designated urban settlement:	The lands in question fall within the Metropolitan Area of the GDA.
2(iv)	Will be essential in achieving compact and sustainable urban growth; and,	As the lands in question contain existing development in the County they are already 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 suitable alternative lands identified within the County.

### 5.3 Justification Test: Part 3

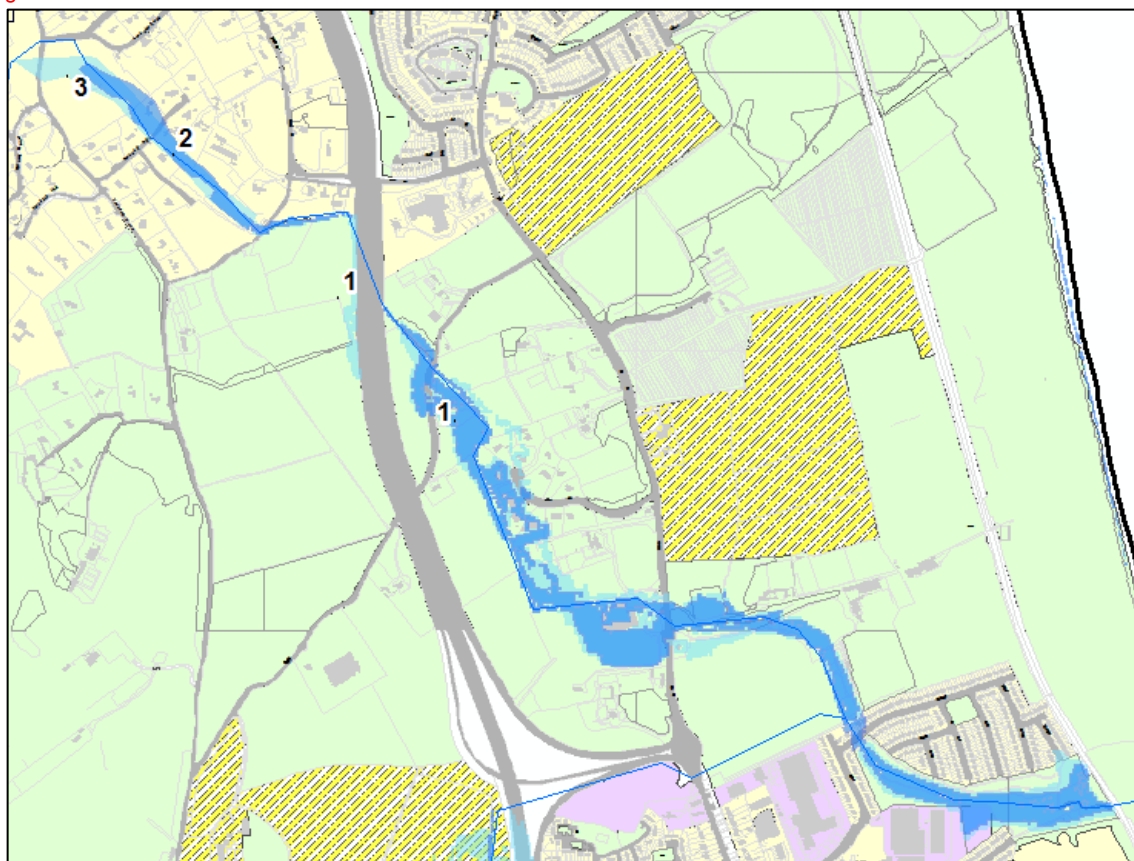
In the following sections a simplified version of the land zoning objectives have been mapped alongside the Flood Zones. Essentially, yellow (and yellow hatching) indicates residential, brown/orange is rural amenity, pink/purple is commercial or mixed use (generally less vulnerable), light blue is high amenity and green is open space.

#### 5.3.1 Crinken Stream

Flooding shown to west of M50 south of Crinken Lane and east of M50 either side of Allies River Road, see Figure 5-2 (1). Flood risk arising from the Crinken Stream in this area primarily within land zoned as greenbelt (GB and F), which is water compatible and therefore appropriate within Flood Zone A and B and should be retained. Flooding is also shown at St Brendans School, Wilford and lands to north at Woodbrook Downs and Woodbrook Golf course and open space area associated with Woodbrook Glen residential development. This land is also zoned as greenbelt.

There is also limited flood risk shown within the existing development at the upstream end of the northern reach of the Stream (2). It is likely that opportunities for further development will be limited to small scale infill / extensions. At the upstream end of the Crinken Stream there is a plot which is currently undeveloped (3) and shown through the PFRA mapping to be at flood risk. Ground conditions also indicate high water table / poor infiltration of surface water at this site. Risks to these lands can be further defined through site specific risk assessment, following the guidance within this SFRA, with development in Flood Zone A and B to be avoided.

Figure 5-2: Crinken Stream



### 5.3.2 Old Conna LAP

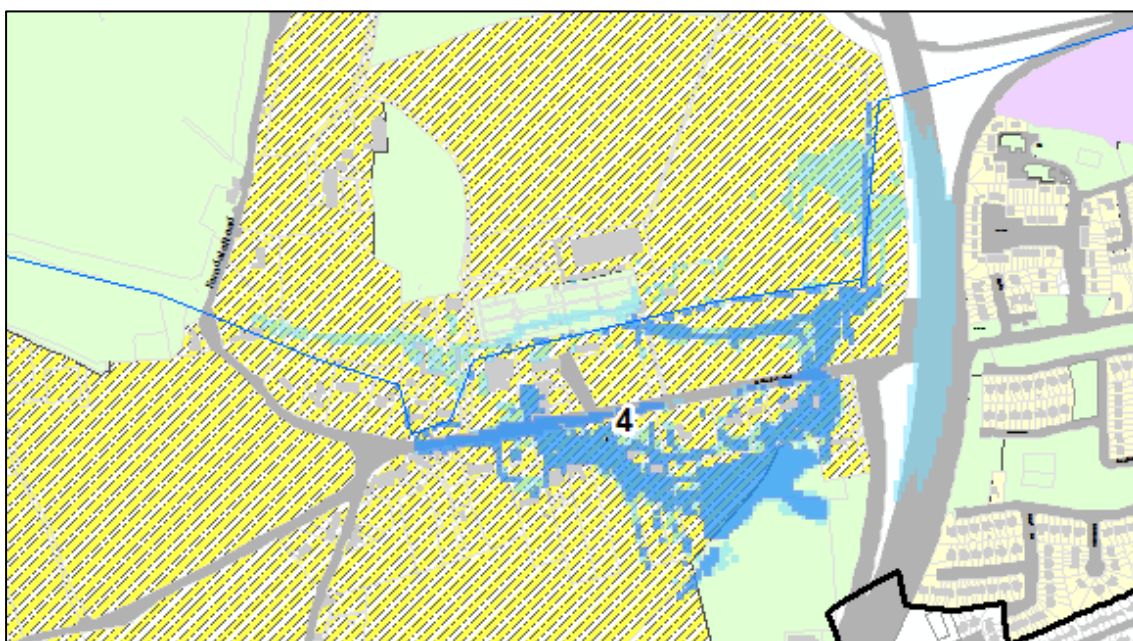
Lands zoned zoning Objective A1 - 'to provide for new residential communities in accordance with approved local area plans' - have been shown to be at risk of flooding, Figure 5-3 (4). The lands fall into both Flood Zone A and B. To determine the appropriateness of such development in Old Conna, the sequential approach has been applied, which has culminated in application of the Justification Test.

As outlined in the Core Strategy and in accordance with housing targets set by the Regional Planning Guidelines Dún Laoghaire-Rathdown are obliged to provide a certain number of residential units over the life time of the next County Development Plan. To achieve these targets various areas in the County are zoned for future development in accordance with approved Local Area Plans. Old Conna is one such area.

In a County such as Dún Laoghaire-Rathdown which consists of a significant built-up area and an upland area which is of high landscape value land suitable for future residential communities is scarce. As such it is not considered that there is an alternative site available for significant development such as that envisaged at Old Conna; Dún Laoghaire-Rathdown is by far the smallest County in the State. In addition, as the specific need is for residential accommodation, substitution for a less vulnerable land use will not be possible.

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'.

Figure 5-3: Old Conna LAP



Section 4.23 of the Flooding Guidelines relate to the 'Justification Test' and outline the three criteria that must be satisfied. The criteria and the local authority's response detailed in Table 5-8.

Table 5-8: Justification test for Old Conna

	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.	<p>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.</p> <p>The Regional Planning Guidelines for the Greater Dublin Area 2010 – 2016 show the Old Conna area as falling within the Metropolitan Area as illustrated in Figure 12 (p89). The focus of the RPGs is on new housing within the built-up footprint of Dublin City and suburbs within the Metropolitan Area. Under the existing plan the Old Conna area was to be serviced by an extension to the Luas line. The NTA Draft Transport Strategy 2011 – 2030 states that a southward extension of the Luas to Bray is still proposed but will be subject to the timing of new development.</p> <p>Bray and Environs - including the surrounding areas of Old Conna and Fassaroe - is identified as a Metropolitan Consolidation Town in the GDA Regional Planning Guidelines 2010 – 2022 (RPGs p91). Metropolitan Consolidation Towns</p>

Criteria		Response
		are defined as towns close to Dublin which will function as part of the Gateway. The Regional Planning Guidelines state that these towns should continue to be developed at a large scale, with key public transport corridors connecting these towns to the City (RPGs, p93).
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 Old Conna are essential to allow for growth and expansion of Dún Laoghaire-Rathdown (and Bray Town) 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 under-utilised zoned land suitable for a higher density mixed-use type development, proximate to the N11 which will have quality bus corridor.
2(iii)	Is within or adjoining the core of an established or designated urban settlement:	The lands at Old Conna 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 an approved LAP prepared in accordance with up-to-date guidance on sustainable settlement and compact 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 suitable alternative lands identified within the County and in order to meet the requirements of the RPGs and the Core Strategy this land is required to be zoned for future development.
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.	Flood Zone A and B cover some land within the LAP boundary, and some to the south of the LAP. The lands within Flood Zone A have largely been developed, particularly along Old Conna Avenue, but the surrounding area is also zoned for new residential development. It is noted that a surface water pipe has been installed to mitigate flood risk in the village environs. Whilst providing benefits to existing development, it is important that residual risks, such as through culvert blockage, should be addressed through LAP / site specific flood risk assessment. Although residential uses have been identified for the area, the LAP should take care to allocate land uses sequentially within the plan boundary, focusing the residential housing in Flood Zone C and retaining open space, roads and gardens in Flood Zones A and B.

### 5.3.3 Shanganagh River

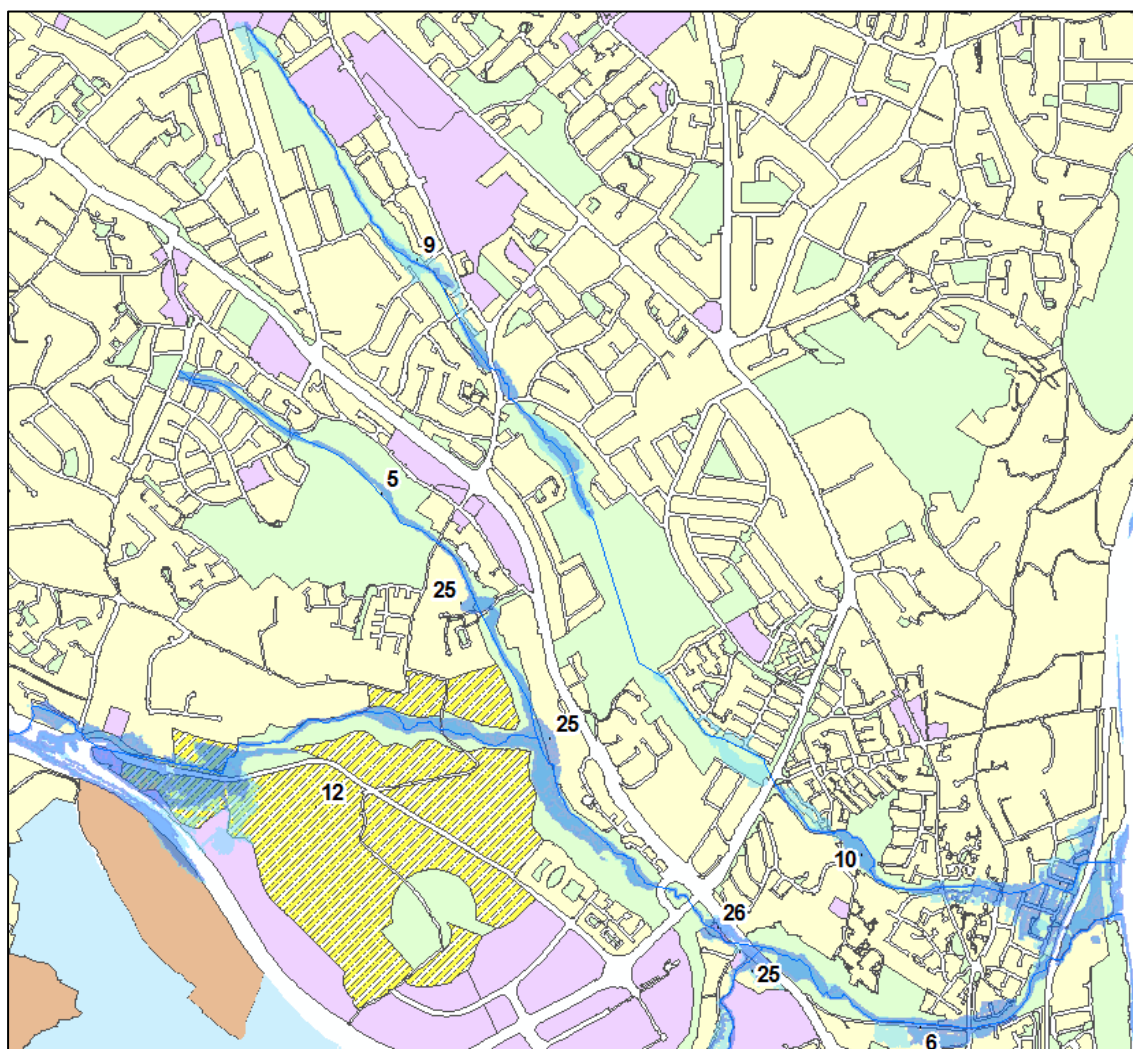
Upstream of the crossing point between the Shanganagh River and the N11, and at the confluence of the Shanganagh and Loughlinstown Rivers, lands within Flood Zone A and B are mainly zoned for water compatible uses, which should be retained (5), see Figure 5-4. There are some areas of existing residential development (25), including parts of, Beech Park, Sunnyhill Park and Cherrywood Park and an area zoned neighbourhood centre at the junction of Cherrywood Road and the M11 (26), that are located in Flood Zone A and B. In areas of existing development, flood risks are generally moderate and risks to minor



development, such as extensions and changes of use, can be managed through site specific risk assessments in accordance with the specification guidance in this SFRA. New development within Flood Zone A and B cannot be justified and floodplain land should be retained as open space.

Downstream of M11 and upstream of the DART line Flood Zone A extends into areas of existing residential development (6) along the Commons Road, with some additional flood risk indicated by Flood Zone B. The area along Mill Lane has flooded in the past, both before and after construction of the defences. The defences consist of a combination of reinforced concrete walls and embankment. The walls were designed to provide a 1 in 50 year standard of protection, which is below the required standard of protection for Flood Zone A so it must be assumed that the lands are undefended and development should only proceed in accordance with the general FRA recommendations. Development should be limited to infill and other minor development until such as time as the defences are brought up to the 1 in 100 year standard.

Figure 5-4: Shanganagh and Deansgrange Rivers



#### 5.3.4 Loughlinstown River

The Loughlinstown River, shown in Figure 5-5, passes through areas zoned for various vulnerabilities, including high amenity, rural amenity and agricultural development and existing residential development.

Within currently undeveloped areas (7) there is no justification for development within Flood Zones A and B.

In areas of existing residential development (8), flood risks are generally moderate and minor development, such as extensions and changes of use, can be managed through site specific risk assessments in accordance with the specification guidance in this SFRA.

Infill development should be restricted to Flood Zone C and new largescale development within Flood Zone A or B does not pass the justification test. This would include on-off housing in existing plots, or large scale new development.

Figure 5-5: Loughlinstown River



### 5.3.5 Deansgrange Stream

The majority of the Flood Zones associated with the Deansgrange River (Figure 5-4) cover land zoned for water compatible open space uses (9). Areas at risk include residential areas of Little Meadow and Cabinteely Court, the rear of properties along Pottery Road near its junction with Johnstown Road, the rear of houses in Coolevin estate, the Glenavon Park residential estate, Clonkeen Park, particularly to rear of Kill of Grange School and Kilbogget Park.

It is noted that no flooding is shown in Deansgrange Village despite recent significant flooding events. These events have been attributed to pluvial flooding and not fluvial and are therefore not included in the Flood Zones, but has been identified as a surface water hotspot.

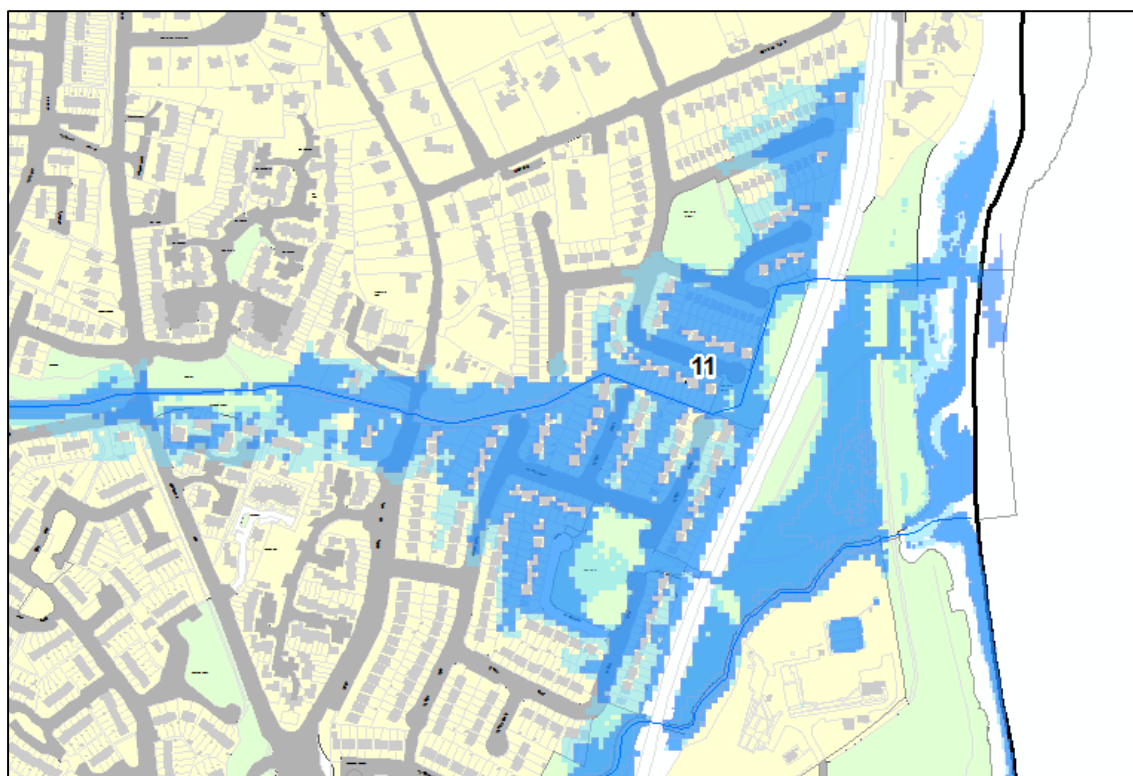
A feasibility study has been carried out and reviewed the potential for increasing flood storage on Kilbogget Park with a view to limiting downstream flows and manage flooding to residential development between the park and the areas downstream (10). However, the study has not progressed to detailed design. Until such time as this study has been completed and the scheme put in place, extensive development within this area would be considered premature. Minor extensions (such as garages and conservatories) are unlikely to increase flood risk and may be considered, but uses which introduce additional people into the floodplain (such as an extension to a nursing home or change of use from less to highly vulnerable) should be avoided.

At the downstream end of the Deansgrange Stream there is a high level of flood risk arising from a combination of low capacity watercourses and culverts below the DART line (Figure 5-6).

The result is extensive flood risk to the Seafield, Bayview and neighbouring residential areas (11). This risk could be exacerbated during periods of high tide which could further restrict outflows into the sea. This area is within the Eastern CFRAM and should be subject to detailed flood management options assessment through the FRMP.

Whilst Parts 1 and 2 of the Justification Test have been passed, the draft CFRAM outputs indicate possible flood depths of up to 1m. Development in Flood Zones A and B, whether infill or extensions that increase the footprint of a building, should be considered premature without consideration of the CFRAM findings and its recommendations for flood management measures (Class 1 domestic extensions which do not increase the footprint of a building, including garage and attic conversions and/or building over an existing ground floor will be considered). If the CFRAM proposes a flood relief scheme, this should be implemented prior to larger development taking place and care should be taken to ensure minor developments will not have a negative impact on the CFRAM's recommended scheme and will not bring additional people into the floodplain (such as an extension to a nursing home or change of use from less to highly vulnerable).

Figure 5-6: Seafield and Bayview



### 5.3.6 Carrickmines River

(Note: The 'Carrickmines/Shanganagh' river catchment comprises several tributaries including the Carrickmines River, Loughlinstown River, Shanganagh River, Glenamuck Stream, Brides Glen River, Foxrock Stream and Cabinteely Stream. The boundaries of these sub-catchments are not definitive and may indeed overlap and thus are to be considered indicative only.)

The Carrickmines River is shown in **Error! Reference source not found.** Figure 5-6. As part of the Cherrywood SDZ (12) process a stage 3 FRA was carried out, and included

assessment of risks at the M50 and Carrickmines Luas Station (Priorsland)<sup>6</sup>. As a result, the SDZ has not been re-reviewed under this SFRA.

Much of the river margins upstream of the Cherrywood SDZ, and therefore Flood Zone A and B, are within land zoned for open spaces uses, and this should be retained as water compatible uses (13). New development within Flood Zone A and B cannot be justified

Figure 5-7: Carrickmines River



Towards the upstream end of the Carrickmines River is an area of existing, low density residential housing (14). Flood risk in this area is indicated to be high, with many properties in Flood Zone A. Future development in this area should be limited to extensions to existing dwellings and should not include infill or larger scale new development. Minor extensions (such as garages and conservatories) are unlikely to increase flood risk and may be considered but uses which introduce additional people into the floodplain (such as an extension to a nursing home or change of use from less to highly vulnerable) should be avoided. The CFRAM extends along the Carrickmines River and may include flood management measures which, when implemented, will allow development to occur.

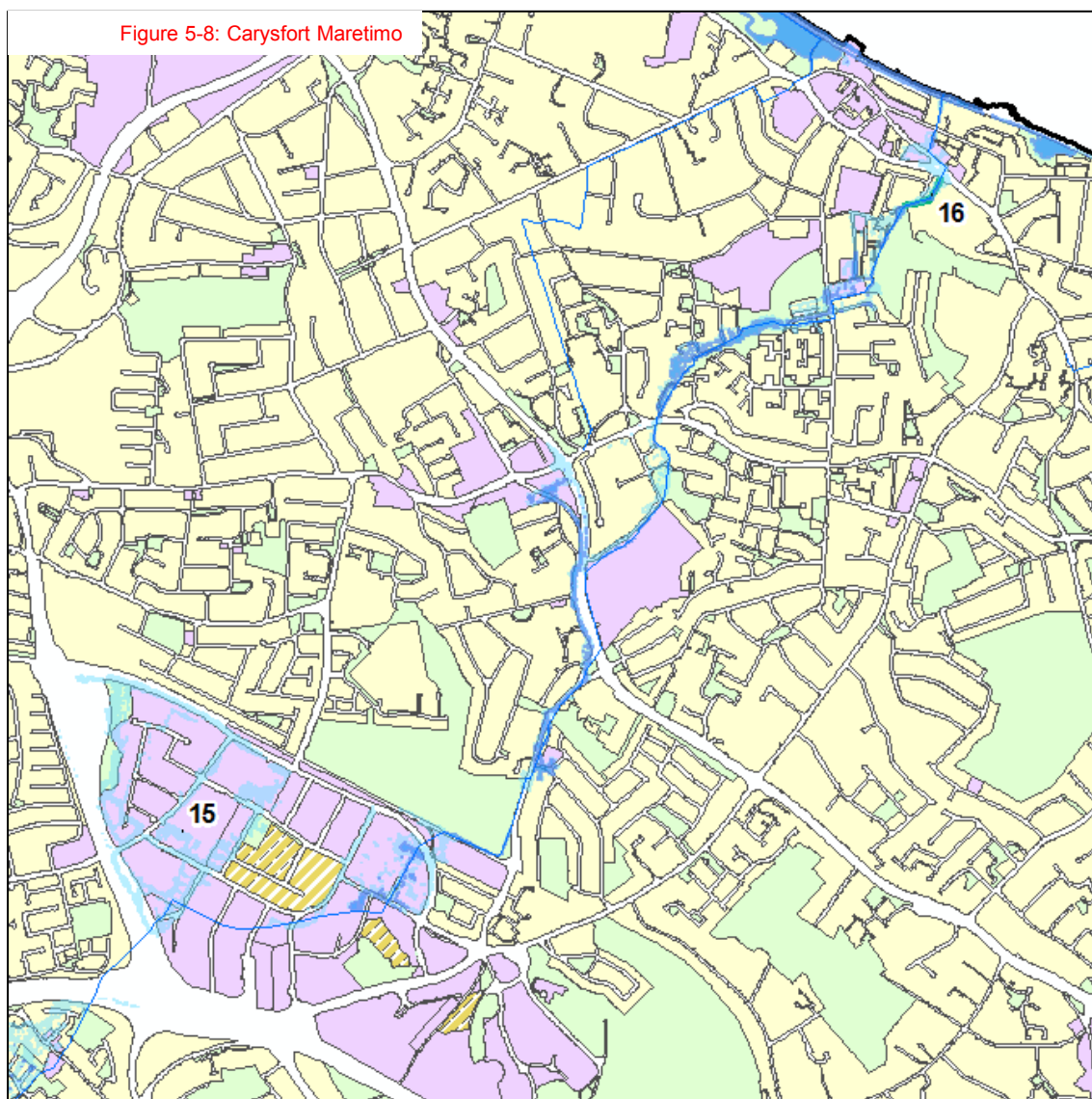
### 5.3.7 Carysfort Maretime

The CFRAM shows flood risk along the majority of the Carysfort Maretime River, being a combination of Flood Zone A and B and covering a range of land existing land uses, including open space, residential and office and enterprise (Figure 5-7Error! Reference source not found.).

In particular, flooding is indicated at Blackrock Bypass, Brookfield, Carysfort Avenue, Avondale Lawn, Carysfort Hall, Avoca Park, Grove Paddock, Stillorgan Grove, Stillorgan Road and Brewery Road, Blackthorn Avenue and Blackthorn Road, Corrig Road, Blackthorn Drive, Lakelands, Moreen Estate, along M50 at Sandyford Interchange, Sandyford Park, Coolkill, Sandyford Downs and Sandyford Village (15).

<sup>6</sup> "Flood Risk Assessment and management Study at Priorsland, Carrickmines".





Where there is existing residential housing, and supporting infrastructure, Part 1 and 2 of the Justification Test have been applied and passed and flood risk can be managed through non-structural responses. Future development within Flood Zone A and B should be limited to extensions, changes of use and small scale infill and flood risks can be managed through a site specific FRA, which should include consideration of culvert blockage (where appropriate) and the impact this could have on flood risk at lower return periods.

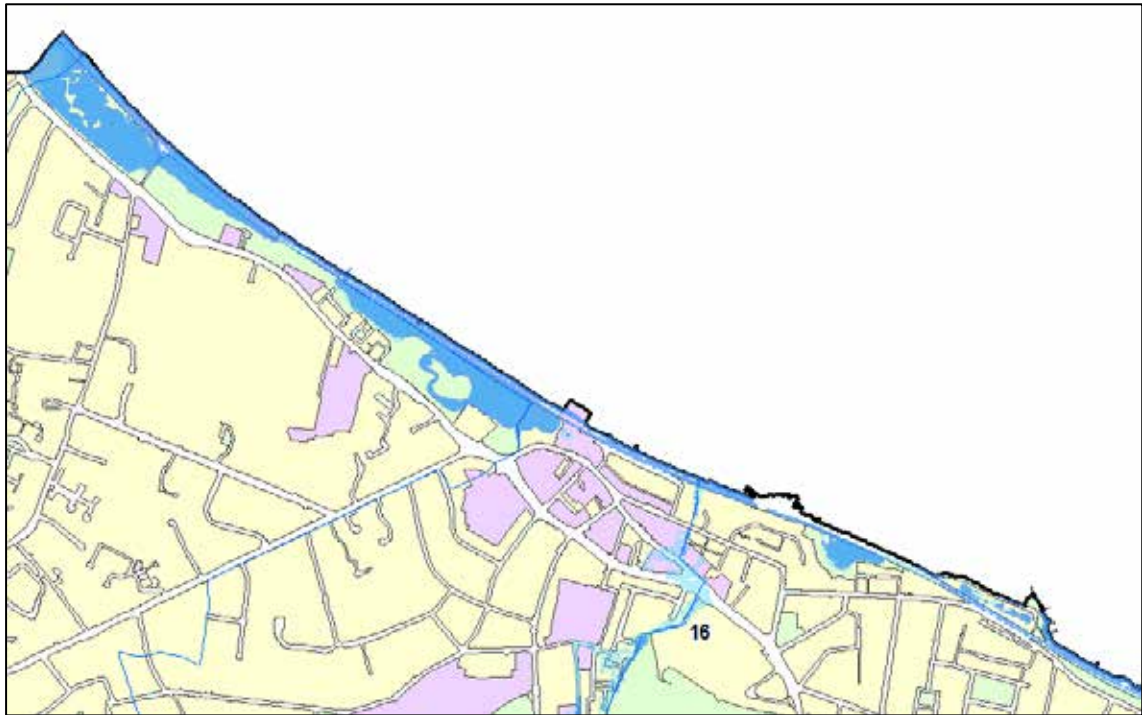
There is a length of defence along this watercourse which runs parallel to Rockfield Park (16). These defences are of robust construction, although consideration of the impacts of overtopping, either through higher return period events or with the impact of climate change on river flows, should be taken into account in any site specific flood risk assessment. Breach assessment is unlikely to be required.

### 5.3.8 Coastal flooding

Coastal inundation between West Pier and the County boundary to the north results in some existing shoreline development being with Flood Zone A (Figure 5-9). Area shown at flood risk includes backlands and the train line. There are also some harbour buildings that are within Flood Zone A. Climate change projected to result in sea levels to increase, with latest OPW recommendations indicating rises of between 0.5 and 1m should be planned for.

Development opportunities along the seafront are limited, but any flood risk assessment for infill or small new development should take into account the potential impact of climate change on sea levels. Depending on the nature and design life of the development, this may include additional allowances in finished floor levels, emergency planning and business continuity and recovery. The CFRAM study may propose flood management measures for this length of shoreline.

Figure 5-9: Merrion Strand to Blackrock



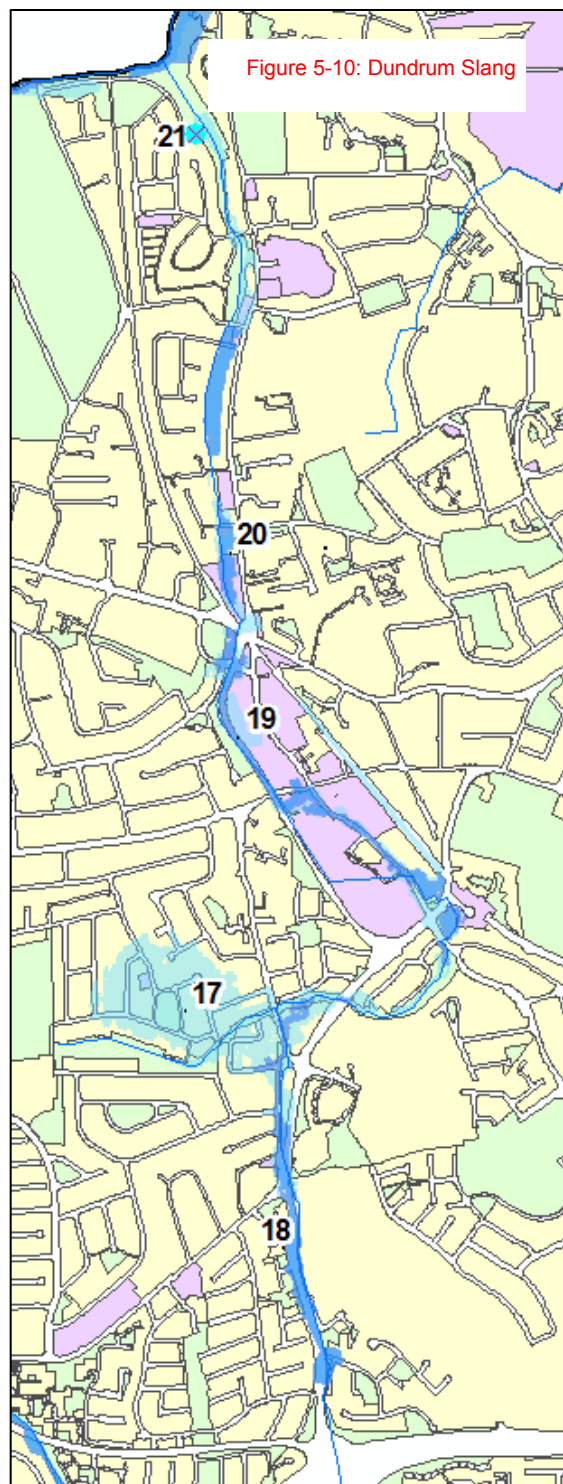
### The Dundrum Slang

This area was included in the Dodder CFRAM, which identified a number of flood management measures, and some follow on works have taken place. The watercourse can be seen in Figure 5-10.

Upstream of Dundrum Town Centre the Slang and its tributaries pass through areas of residential housing, including Hillview Estate, Ashlawn and Willow Gate (17). These areas are shown to be within Flood Zone B, and rainfall modelling indicates these housing estates also act as a collection pond for surface water. The extents of Flood Zone B indicate that the area may be particularly vulnerable to channel blockage, and sensitive to reductions in channel capacity. In addition, climate change impacts are likely to be significant here. Part 1 and 2 of the Justification Test have been passed and will allow continued residential zoning in this area. Extensions to existing development within Flood Zone B are unlikely to present a significant flood risk, provided overland flow routes are maintained between and around buildings. Flood risks to development on vacant plots, or reconstruction of buildings and infill development within Flood Zone B can be managed, with the Flood Risk Assessment considering appropriate finished floor levels. Where minor development is proposed within Flood Zone A extreme caution should be exercised both to ensure no increase in risk to the development and its occupants and to protect flow paths and storage areas that may impact surrounding development.

Should there be proposals to develop / redevelop larger areas of the housing estates a more detailed assessment of the risks will be needed. The Dodder CFRAM demonstrated that site-scale management measures would not be sufficient so future development in this area will be considered premature until such a time as further assessment is undertaken and follow on works, if found to be sustainable, are implemented. Further details are provided in Annex A.

Further to the north, flooding is indicated in the rear gardens of properties along Dundrum Road and to a neighbourhood centre between Highfield Park and St Columbanus Road. Development in this area should be limited to Flood Zone C.





Flooding is shown at Dundrum Shopping Centre Phase Two lands (site of old shopping centre) in Dundrum Village. Flood risk arising from culvert blockage and channel constrictions has been identified at Dundrum Shopping Centre and at the library.

The Dundrum Shopping Centre and adjoining library and gym sites (zoned MTC) have been subject to Detailed FRA under this SFRA, and the findings are detailed in an Annex A.1a.i.A of this report, along with detailed responses to the Justification Test. Modelling carried out as part of this SFRA shows the flow path crosses the shopping centre site and ponds near the river prior to discharging back into the Slang. The modelling also showed that the modelled water levels are very sensitive to model parameters and any ingress to Flood Zone B could increase flood risk to neighbouring properties. It is therefore important that the flow path and the capacity for storage on site is respected in any development proposal.

The detailed modelling assessment also highlighted the vulnerability of the library site (also zoned MTC) to flood risk and its importance in providing a flow path back into the river.

It is clear from the consideration of the suite of risks that the potential impact of development within the MTC lands poses significant impact to others. Structural flood management methods would involve catchment scale measures including storage and attenuation to reduce flow volumes.

There is currently no formal specification of the nature and design of catchment management measures and the MTC lands remain at potential risk of flooding. In this case a policy of avoidance of highly or less vulnerable land uses within Flood Zone A & B has been adopted. Further, where water compatible uses are proposed, such as surface level car parking, all existing conveyance routes and floodplain storage volumes must be retained. This policy will also safeguard areas for mitigation.

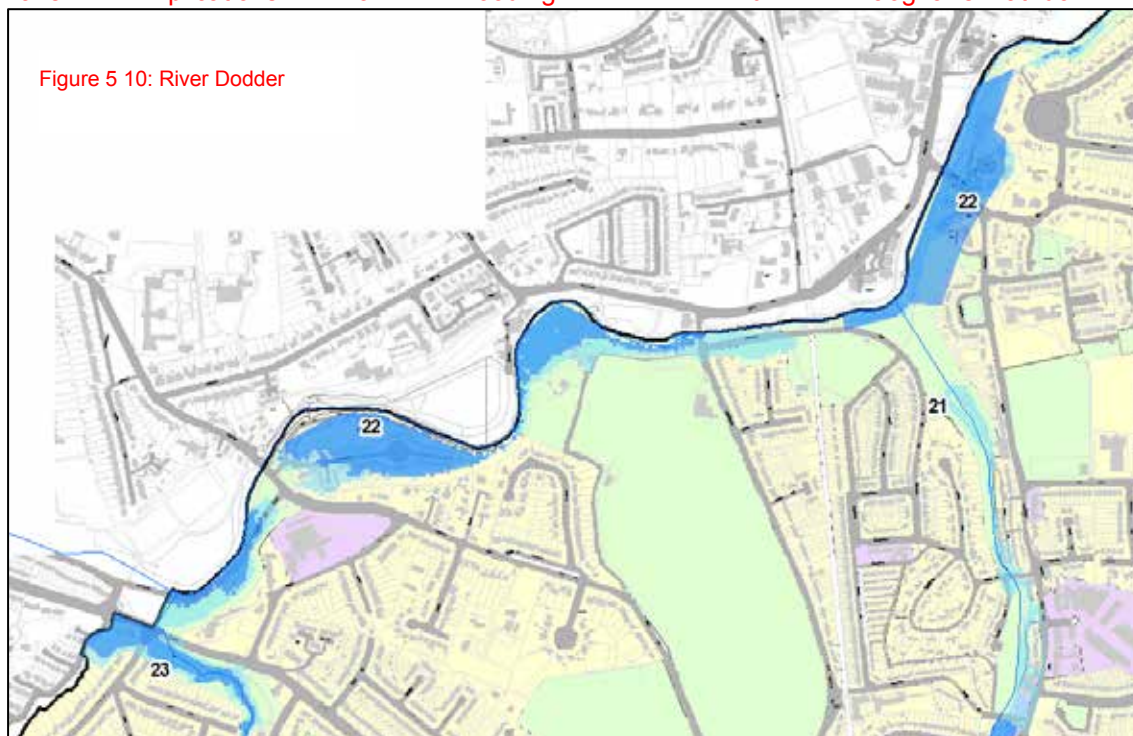
Downstream of Dundrum town centre there are areas of MTC and residential zoned land to the north of Churchtown Road Upper, and around the junction of Churchtown Road Upper, Taney Road, Dundrum Road, Main Street which are within Flood Zone A and B. These lands are currently developed. It is recommended that until such time as the flood risk issues for the Dundrum town centre are resolved, development in this area is limited to changes of use and redevelopment within the original development footprint. As overland flow is known to be a problem, even small extensions could have a negative impact on flood risk elsewhere.

Further downstream (north of St. Columbanus Road) Flood Zone A and B are generally within areas of open space, which should be retained.



### 5.3.9 River Dodder

The Dodder forms a County boundary between Dún Laoghaire-Rathdown and the jurisdictions of Dublin City and South Dublin (Figure 5-10 **Error! Reference source not found.**). Development which occurs in Dublin City or South Dublin County Council could have implications on flooding in Dún Laoghaire-Rathdown.



Flood risk arising from the River Dodder has long since been identified as a problem in Dún Laoghaire-Rathdown and Dublin City. Specific locations shown to be at flood risk include Orwell Park and Orwell Gardens, Milltown Golf Course, some of Patrick Doyle Road and apartments at Milltown Grove and Dodderbank.

The Dodder Catchment Flood Risk Management Plan identifies a number of flood risk management measures including flood embankments and walls starting at the Dundrum Slang confluence and finishing at the Clonskeagh Road. The Plan also includes for the maintenance of existing defences and design and construction of new defences at Orwell Gardens (22) and along the Little Dargle (23).

The Dodder CFRAM Plan does not provide solutions to all the flooding problems that exist in the catchment as this would simply not be economically viable. It does however, identify viable structural and non-structural options for managing flood risk.

Flood defence works largely completed include raising flood defence walls along the tidal stretches of the Dodder to Ballsbridge. Works have commenced in the fluvial section upstream of Ballsbridge and are programmed to be completed by the end of 2015. Further works are under construction in Herbert Park. It is programmed to have all works completed to the Smurfit weirs by the end of 2016 bring the existing standard of protection up to the estimated 100 year fluvial flood level. The defences are generally providing protection (or will defend) existing residential areas. There are also parks and other areas of open space along the river which should be retained.

Opportunities for development in areas that are defended will generally be limited to infill and other minor works. Given the standard of protection provided by the defences, a relatively

simple flood risk assessment should be completed, which should acknowledge risks associated with overtopping and climate change, but will not need to consider breach analysis. Infill development should be in-keeping with the surrounding residences, although opportunities to further reduce flood risk, particularly associated with surface water should be sought. This will primarily be in the form of finished floor levels and consideration of flood resilience and emergency access. New development, or regeneration of brownfield sites can be carried out behind defences and opportunities to further reduce flood risks should be sought and incorporated into the development.

Outside these defended areas, new development would be considered premature until the flood relief scheme has been completed

#### 5.3.10 Little Dargle

The Little Dargle is a tributary of the Dodder, and included in the Dodder CFRAM. As detailed above, flood defence works for some length of the Little Dargle is proposed. Flood risk is shown to rear of Crannagh Hall, Landscape Road, and in open space area to the north of Riverside Drive. Risk is also indicated to Dodder Park open space area. There is an ESB substation in this open space. As most risks arising from the Little Dargle are generally moderate and occurs in open space, the Justification Test is not required.

There is an area of Flood Zone B near the upstream end of the Little Dargle (Figure 5-) shown to extend across Llewellyn Park and Llewellyn Court (24). This appears to arise as a result of a localised overflow point from the Little Dargle. It could be indicative of an area which is also vulnerable to surface water ponding. Opportunities for development in this area is likely to be limited to extensions and infill, in which case consideration of finished floor levels and maintenance of overland flow paths is important.



Figure 5-11: Little Dargle



## 6 SFRA review and monitoring

An update to the SFRA will be triggered by the six year review cycle that applies to Local Authority development plans. In addition, there are a number of other potential triggers for an SFRA review and these are listed in the table below.

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

Much of Dún Laoghaire-Rathdown is currently subject to a detailed flood risk mapping and management study under the Eastern CFRAM. It will be necessary to review the results and recommendations of the CFRAM with respect to Dún Laoghaire-Rathdown when the results become available. This will include taking into account the findings of the flood risk management plan, and recommendations for flood protection works. As recommended works are completed areas of the County can be released for more extensive development.

Table 6-9: SFRA Review Triggers

Trigger	Source	Possible Timescale
Catchment Flood Risk Assessment and Management (CFRAM) Flood Hazard Mapping	OPW under the Floods Directive	2015
Eastern River Basin Flood Risk Assessment and Management (EFRAM) Plan	OPW	2016, and 6 yearly reviews
Flood maps of other sources, such as drainage networks	Various	Unknown
Significant flood events	Various	Unknown
Changes to Planning and / or Flood Management Policy	DoEHLG / OPW	Unknown
Construction / completion of flood relief schemes	OPW / DLRCC	Unknown



## 7 Glossary

**Annual Exceedence Probability (AEP)** - Likelihood or probability of flooding or a particular flood event is classified by its annual exceedence probability (AEP) or return period (in years). A 1% AEP flood indicates the flood event that will occur or be exceeded on average once every 100 years and has a 1 in 100 chance of occurring in any given year.

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

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

**Flood Risk** - An expression of the combination of the flood probability or likelihood and the magnitude of the potential consequences of the flood event. Flood Risk Assessment (FRA) can be undertaken at any scale from the National down to the individual site and comprises three stages: flood risk identification, initial flood risk assessment and detailed flood risk assessment.

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

**Flood Zones** - A geographic area for which the probability of flooding from rivers, estuaries or the sea is within a particular range as defined within these Guidelines.

**Fluvial Flooding** - Flooding from a river or other watercourse.

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

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

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

**Mitigation Measures** - Elements of a development design which may be used to manage flood risk to a development, either by reducing the incidence of flooding both to the development and as a result of it and/or by making the development more resistant and/or resilient to the effects of flooding.

**Precautionary Approach** - The approach to be used in the assessment of flood risk which requires that lack of full scientific certainty, shall not be used to assume flood hazard or risk does not exist, or as a reason for postponing cost-effective measures to avoid or manage flood risk. River Basin Management Plan (RBMP) are required by the EU Water Framework Directive (2000/60/EC). These plans will establish a strategic plan for the long-term management of the River Basin District, set out objectives for water bodies and in broad





terms, identify what measures are planned to meet these objectives, and act as the main reporting mechanism to the European Commission.

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

**Return Period** - The return period is means of expressing the likelihood or probability of flooding or a particular flood event occurring and is comparable to the AEP of the event. A 1% AEP flood indicates the flood event that will occur or be exceeded on average once every 100 years and has a 1 in 100 chance of occurring in any given year.

**‘Sequential Approach’** - The ‘Sequential Approach’ is a risk-based method to guide development away from areas that have been identified through a flood risk assessment as being at risk from flooding.

**Strategic Flood Risk Assessment (SFRA)** - The assessment of flood risk on a wide geographical area against which to assess development proposed in an area (Region, County, Town).

**Sustainable Drainage Systems (SuDS)** - A form of drainage that aims to control run-off as close to its source as possible using a sequence of management practices and control structures designed to drain surface water in a more sustainable fashion than some conventional techniques.

## Annexes

### A. Dundrum Shopping Centre

#### A.1 Justification Test Part 1 and 2

Criteria		Response
1	The urban settlement is targeted for growth under the National Spatial Strategy, Regional Planning Guidelines, and statutory plans or under the Planning Guidelines or Planning Directives provisions of the Planning and Development Act 2000, as amended.	<p>The National Spatial Strategy 2002-2022 is a twenty-year plan for the Country. Consolidating the Greater Dublin Area, which is identified in the Strategy as a 'Gateway', is a primary policy of the Strategy. Enhancing the competitiveness of the Greater Dublin Area (GDA) through physically consolidating growth of the Metropolitan Area is also identified as being of importance. The Metropolitan area is identified as Dublin City and suburbs, which would include Dundrum.</p> <p>The Regional Planning Guidelines for the Greater Dublin Area 2010 – 2022 identify Dundrum as a Metropolitan Consolidation Town within the settlement hierarchy outlined. Such Towns are defined as strong active urban places within the Metropolitan area with strong transport links. The RPGs state that;</p> <p>"As key destination (and interchange) points on public transport corridors and important locations for services, retail and economic activity, these towns are important foci within the metropolitan area. They present opportunities for intensive development and activity....." (p93)</p> <p>The RPGs recommendation for the DLR Development Plan and Core Strategy is "As mostly a Metropolitan County, housing delivery should focus on strengthening the urban form of the County through building up town and district centres at public transport nodes..."</p> <p>The focus in the RPGs is very much on consolidation within the existing footprint of Dublin City and suburbs. Dundrum falls into this area and is further enhanced as a growth area by the fact that it has excellent public transport links with the city centre via the Luas line B.</p> <p>The Retail Planning Strategy for the Greater Dublin Area 2008 – 2016 identifies Dundrum as a Major Town Centre Level 2 – one of only two in Dún Laoghaire-Rathdown. There is only one level one destination, Dublin city.</p> <p>In accordance with the principles of sustainable urban development future town centre growth is very much based on mixed-use development with retail and residential in close proximity allowing a vibrant living and active townscape develop.</p>
2. The zoning or designation of the lands for the particular use or development type is required to achieve the proper planning and sustainable development of the urban settlement and, in particular:		
2 (i)	Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement:	It is considered that the lands at Dundrum that are the subject of the Flood Zone A & B status are an essential element of the planned expansion of the Dundrum Major Town Centre area.
2(ii)	Comprises significant previously developed and/or under-utilised lands:	The subject lands consist of significant under-utilised zoned land suitable for a higher density mixed-use type development, proximate to the LUAS line and a LUAS stop.



	Criteria	Response
2(iii)	Is within or adjoining the core of an established or designated urban settlement:	The lands at Dundrum are zoned Major Town Centre and are located in a Metropolitan Consolidation Town as identified in the RPGs.
2(iv)	Will be essential in achieving compact and sustainable urban growth; and,	The future development of these lands will allow Dundrum further develop as a vibrant active Major Town Centre for the County.
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. (Criteria can be set aside where section 4.27b of Circular PL2.2014 applies. This section would appear to relate to regeneration areas although the circular does not clearly identify Section 4.27b)	There are no suitable alternative lands identified in the Major Town Centre zoning.
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.	See attached flood risk assessment.

# **Dundrum MTC Stage 3 Flood Risk Assessment**

**Report**

**July 2015**



## JBA Project Manager

Ross Bryant BSc MSc CEnv MCIWEM C.WEM  
24 Grove Island  
Corbally  
Limerick  
Ireland

## Revision History

Revision Ref / Date Issued	Amendments	Issued to
V1.0 23 March 2015	First Issue	DLR
V2.0 17 July 2015	Alterations to Sections 5 & 6 following development of SFRA	DLR

## Contract

This report describes work commissioned by Dún Laoghaire Rathdown County Council (DLR) under Purchase Order 400292394 dated 27/11/2014. Jonathan Cooper, Ross Bryant, Mark Bentley, Joanne Cullinane and David Forde of JBA Consulting carried out this work.

Prepared by .....Ross Bryant BSc MSc CEnv MCIWEM C.WEM  
*Chartered Senior Analyst & Team Leader*

.....David Forde BEng MEng MIEI  
*Assistant Engineer*

Reviewed by .....Jonathan Cooper BEng MSc DipCD CEng MICE  
MCIWEM C.WEM MloD  
*Managing Director*

## Purpose

This document has been prepared as an FRA for DLR. JBA Consulting accepts no responsibility or liability for any use that is made of this document other than by the Client for the purposes for which it was originally commissioned and prepared.

JBA Consulting has no liability regarding the use of this report except to DLR.

## Copyright

© JBA Consulting Engineers and Scientists Ltd 2015

## Carbon Footprint

A printed copy of the main text in this document will result in a carbon footprint of 95g if 100% post-consumer recycled paper is used and 122g if primary-source paper is used. These figures assume the report is printed in black and white on A4 paper and in duplex.

JBA is aiming to reduce its per capita carbon emissions.

<b>1</b>	<b>Introduction .....</b>
1.1	Terms of Reference.....
1.2	Background .....
1.3	Study Area .....
1.4	Flood Risk Assessment: Aims and Objectives.....
1.5	Report Structure .....
1.6	Terminology .....
<b>2</b>	<b>Initial FRA .....</b>
2.1	Historic Information .....
2.2	The Dodder Catchment Flood Risk Assessment & Management Study .....
2.3	Summary .....
2.4	Appropriateness of Flood Zone Information .....
<b>3</b>	<b>Detailed FRA - Background .....</b>
3.1	Hydrology.....
3.2	Hydraulics .....
<b>4</b>	<b>Detailed FRA - Results and Analysis .....</b>
4.1	Existing Condition Scenario & Flood Zone Mapping.....
4.2	Baseline Comparison of Development Options .....
4.3	Residual Risk .....
4.4	Flood Hazard.....
4.5	Summary .....
<b>5</b>	<b>Planning Guidelines &amp; Strategy.....</b>
5.1	Application of the Planning Guidelines .....
5.2	Comment on Risk and Potential Non-Structural/Structural Responses.....
<b>6</b>	<b>Site Specific Flood Risk Management.....</b>
6.1	Design Considerations.....
6.2	Suggested Site Specific Approach .....
<b>7</b>	<b>JBA Flood Mapping.....</b>
7.1	Flood Zone Map - Overview .....
7.2	Flood Zone Map - Site Specific.....
7.3	Depth Difference - 1% AEP - Option A .....
7.4	Depth Difference - 0.1% AEP - Option A.....
7.5	Depth Difference - 1% AEP - Option B .....
7.6	Depth Difference - 0.1% AEP - Option B.....
7.7	Depth Difference - 1% AEP - Option C .....
7.8	Depth Difference - 0.1% AEP - Option C .....
7.9	Depth - 1% AEP - Existing .....
7.10	Depth - 0.1% AEP - Existing.....
7.11	Depth - 1% AEP + Climate Change - Existing .....
7.12	Depth - 1% AEP - Blockage .....
7.13	Depth - 1% AEP - Option A .....
7.14	Depth - 0.1% AEP - Option A .....
7.15	Depth - 1% AEP - Option B .....
7.16	Depth - 0.1% AEP - Option B .....
7.17	Depth - 1% AEP - Option C.....
7.18	Depth - 0.1% AEP - Option C .....
7.19	Hazard - 1% AEP - Existing .....
7.20	Hazard - 0.1% AEP - Existing.....
7.21	Hazard - 1% AEP + Climate Change- Existing .....



<b>Appendices .....</b>	
<b>A Hydrology .....</b>	

## List of Figures

Figure 1-1 Study Area.....	
Figure 2-1 Historic Flooding Incidents .....	
Figure 2-2 Photo from thejournal.ie October 2011 road flooding adjacent to Taney's Cross and the Library .....	
Figure 2-3 Dodder CFRAMS Flood Extent Mapping.....	
Figure 3-1 Overview of study catchment (OPW FSU Web Portal).....	
Figure 3-2 Summary of hydrological input into the ISIS-TUFLOW hydraulic model.....	
Figure 3-3 Location of walls and conveyance structures included in the hydraulic model .....	
Figure 4-1 Flood Zone Map - Existing Conditions .....	

## List of Tables

Table 1-1 Conversion between return periods and annual exceedance probabilities .....	
Table 2-1 Historic Flooding Summary.....	
Table 2-2 Summary of Dodder CFRAM Management Measures .....	
Table 2-3 Flow rate (m <sup>3</sup> /s) comparison of EVA and EVA of Simulated Discharge for Frankfort Gauge Catchment, FSR estimate at Frankfort taken from the Dodder Hydrology Report .....	
Table 2-4 Peak Modelled Flow output at three Nodes local to the MTC sites - Appendix D, Dodder Hydraulics Report .....	
Table 3-1 Flow Estimation Results, FSR Rainfall Runoff - Study Catchment .....	
Table 3-2 Summary of development options tested in TUFLOW hydraulic model.....	
<b>Table 4-1 JBA Flood Zone Maps - Existing Condition Scenario.....</b>	
<b>Table 4-2 JBA Flood Maps - DEPTH DIFFERENCE (with Existing Scenario) .....</b>	
<b>Table 4-3 JBA Flood Maps - DEPTH .....</b>	
<b>Table 4-4 JBA Flood Maps - HAZARD .....</b>	
Table 4-5 Percentage and Area of each site within Flood Zone A and B .....	
Table 4-6 Existing Property Flooding in the area surrounding the MTC Sites.....	
Table 4-7 Impacts of Options Development of MTC Sites.....	
Table 4-8 Hazard to People as a Function of Velocity and Depth .....	
Table 5-1 Summary of changes to flood risk as a result of various development options .....	
Table 5-2 Summary of Dodder CFRAM Management Measures and JBA Measures/Comment ....	
Table 5-3 Recommended Risk Management Approach.....	
Table 6-1 Management Considerations and Guidance .....	
Table 6-2 Site Specific Design Requirements.....	

## Abbreviations

1D	One Dimensional (modelling)
2D	Two Dimensional (modelling)
AEP	Annual Exceedance Probability
CCTV	Closed Circuit Television
CFRAM	Catchment Flood Risk Assessment and Management
CFRAMS	Catchment-Based Flood Risk Assessment and Management Study
DECLG	Department of Environment, Community and Local Government
DoEHLG	Department of the Environment, Heritage and Local Government
EPA	Environmental Protection Agency
FRA	Flood Risk Assessment
FSR	Flood Studies Report
FSU	Flood Studies Update
GDSDS	Greater Dublin Strategic Drainage Strategy
HR	Hydraulic Research, Wallingford
HSE	Health & Safety Executive
ID	Identifier
IH	Institute of Hydrology
ISIS	Hydrology and hydraulic modelling software
NAM	Rainfall Runoff Direct Simulation Model
OPW	Office of Public Works
PFRA	Preliminary Flood Risk Assessment
SFRA	Strategic Flood Risk Assessment
TUFLOW	Two-dimensional Unsteady FLOW (a hydraulic model)





# 1 Introduction

## 1.1 Terms of Reference

Under *The Planning System and Flood Risk Management: Guidelines for Planning Authorities* DoEHLG & OPW, 2009 (the Planning Guidelines), proposed development must undergo a Flood Risk Assessment to ensure sustainable development and effective management of flood risk. The study is in relation to Chapter 4 of the Planning Guidelines, which specifically considers *Flooding and Spatial Impacts*.

JBA Consulting was appointed by Dún Laoghaire Rathdown County Council (DLR) to prepare a Stage 3 Flood Risk Assessment (FRA) in support of Appendix 13 of the Dún Laoghaire-Rathdown County Development Plan 2016-2022; Strategic Flood Risk Assessment (SFRA). More specifically the report will focus on the proposed Major Town Centre (MTC) draft land use zoning objective for;

- **Site 1;** the Phase Two lands at Dundrum Shopping Centre,
- **Site 2;** the Dundrum Library site and
- **Site 3;** the site opposite the Library (referred as the 'Gym' site).

The proposals form part of the draft Dun Laoghaire Rathdown County Development Plan 2016 – 2022.

The report is intended to be read as a companion document to Appendix 13 (SFRA) of the draft Dun Laoghaire Rathdown County Development Plan 2016 – 2022.

## 1.2 Background

This report specifically addresses the requirement for Part 3 of the Justification Test for Development Plans, as applied to the specific MTC zoned land. Details of Parts 1 and 2 of the Justification Test can be found in Section 5 of the SFRA (Appendix 13 of the draft Dun Laoghaire Rathdown County Development Plan 2016 – 2022). To assess Part 3 of the Justification Test a detailed (Stage 3) Detailed FRA is required to support the wider SFRA.

The draft Development Plan has identified three specific areas of proposed MTC zoning that are subject to existing built development but are highlighted as a potential area for regeneration.

The draft MTC land use zoning objective is a mixed use zone that combines residential and commercial uses. Under the Planning Guidelines, these uses are considered to be highly vulnerable and less vulnerable to the impacts of flooding respectively.

The proposed MTC zoning is also identified as an area potentially at risk of flooding (partly within Flood Zone A and B) according to the OPW Dodder CFRAM mapping. As a result the draft Development Plan has applied the Justification Test for Development Plans, outlined within Section 5 of the SFRA. Parts 1 and 2 of the Justification Test are demonstrated to have been met for the three areas.

### 1.2.1 DECLG Circular PL 2/2014

In August 2014 the Department of Environment, Community and Local Government issued Circular PL2/2014. The document concerns two areas for clarification;

- I. Use of OPW Flood Mapping in assessing planning applications, and
- II. Clarifications of advice contained in the 2009 DECLG Guidelines for planning authorities – “The Planning System and Flood Risk Management”.

Of particular pertinence to the MTC lands subject to the Justification Test is point II which clarifies the approach within urban centres subject to potential regeneration:



### ***Regeneration areas***

*As indicated in section 3.7, development plans have identified various strategically located urban centres and particularly city and town centre areas whose continued consolidation, growth, and development or regeneration is being encouraged.*

*Where an existing residential area is proposed for residential regeneration, and is located in a flood zone A/B, the planning authority should in the first instance consider the relocation of the residential use and where in the opinion of the planning authority this is not feasible, the development plan (or any variation) must specify the matters above, i.e. the nature and design of structural or non-structural flood risk management measures required prior to future development in such areas to ensure that flood hazard and risk to the area and other locations will not be increased or, if practicable, will be reduced, with a particular emphasis on the overall design of the area following the core principles set out in section 2.1 of Appendix B on planning and design for flood risk.*

*Where more extensive regeneration is to take place, including site clearances, and where new mixed development is proposed i.e. a docklands site, again the planning authority must specify the nature and design of structural or non-structural flood risk management measures required prior to future development in such areas to ensure that flood hazard and risk to the area and other locations will not be increased or, if practicable, will be reduced, with a particular emphasis on the overall design of the area to integrate flood risk management as a central core of the design, ensuring that as far as possible vulnerable uses are not located in flood zone A/B areas.*

## **1.3 Study Area**

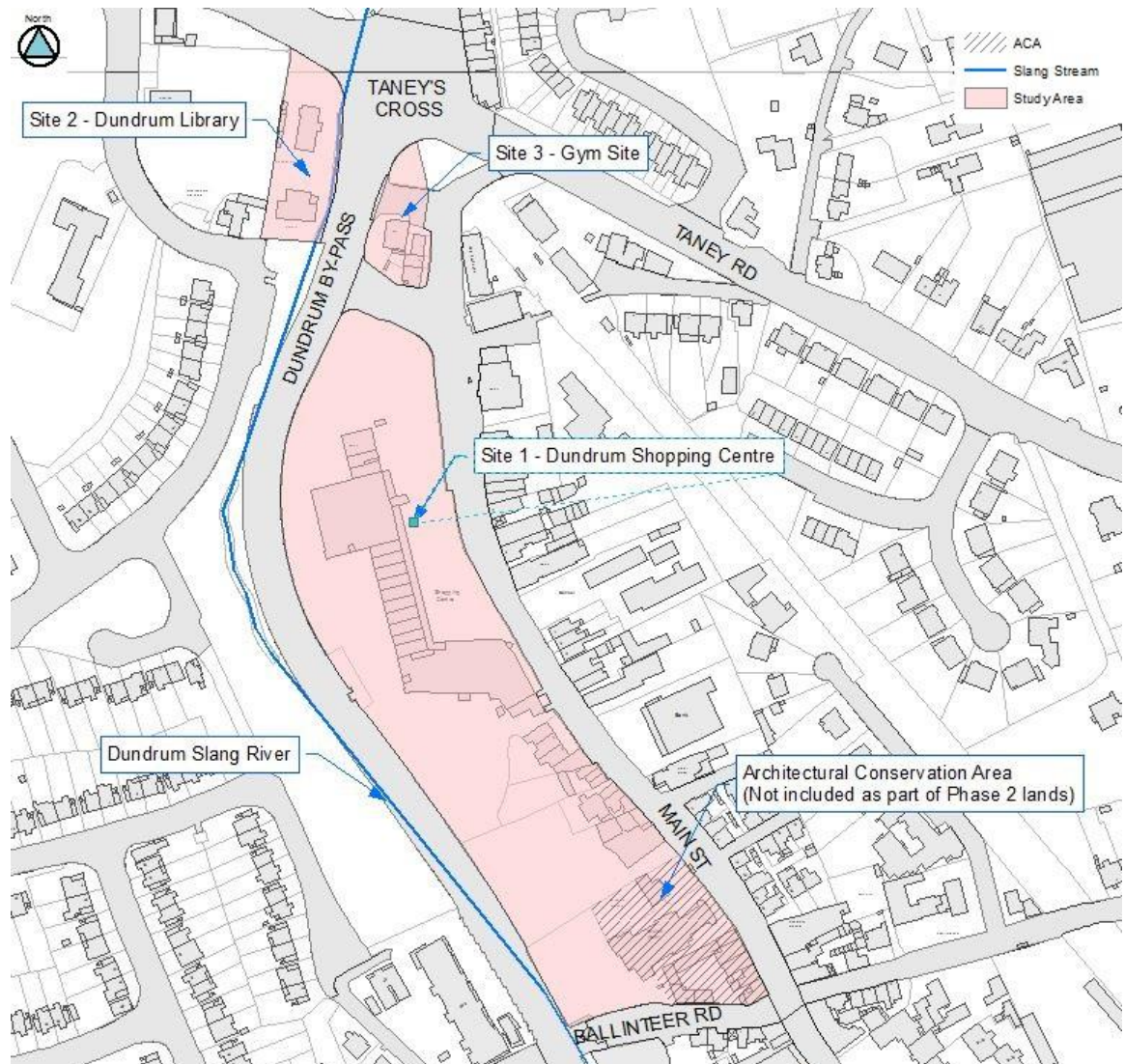
The focus of the study is on three MTC zoning objective sites listed below and presented in Figure Error! No text of specified style in document.-11;

- Site 1 - Dundrum Shopping Centre Phase 2 lands;
- Site 2 - Dundrum Library;
- Site 3 - Opposite Library (Gym).

It is noted that the MTC zoning for the Dundrum Shopping Centre Phase 2 lands includes the entire block of development, some of which includes the Post Office and Holy Cross Church. Whilst the study highlights the entire MTC zoning the findings and tests are in relation to just the Phase 2 lands identified for redevelopment.

The Slang River flows in a northerly direction and is noted as being intermittently in open channel and closed culvert sections to the west of the subject lands. The Slang has flooded the MTC lands previously and existing predictive flood studies confirm the potential risk of flooding from the watercourse. Figure Error! No text of specified style in document.-11 (over page) provides an overview of the area.

Figure Error! No text of specified style in document.-11 Study Area








©Ordnance Survey Ireland. All rights reserved. Licence number 2015/15CCMA Dun Laoghaire-Rathdown County Council



## 1.4 Flood Risk Assessment: Aims and Objectives

This study is being completed as a Stage 3 Detailed Flood Risk Assessment (FRA) to support the SFRA and the Justification Test for the MTC zoned lands. It aims to identify, quantify and communicate the risk of flooding to land, property and people. The purpose is to provide sufficiently detailed information to determine whether the proposed draft land use zoning objective is appropriate through the application of both proper planning and flood risk management principles.

The objectives are to:

-  Identify potential sources of flood risk;
-  Identify and verify Flood Zones (flood probability mapping);
-  Investigate flood risk to the site;
-  Inform the draft zoning objective decision;
-  Specify the nature and potential design of appropriate flood risk mitigation and management measures (structural and non-structural)



## 1.5 Report Structure

The initial FRA is presented in Section 1, it includes background information on the sites, catchment and appropriateness of previous studies. Section 3 introduces the detailed site specific FRA with results and analysis in Section 1. Discussion of the Justification Test and Flood Risk Management strategy is provided in Section 1. Section 1 contains a discussion on site specific measures and FRA. Section 7 contains the flood mapping.

## 1.6 Terminology

The first step in understanding the flood risk is to investigate the likely frequency and magnitude of a range of floods which are to be investigated at the sites.

The probability of a flood event (whether tidal or fluvial) is classified by its Annual Exceedance Probability (AEP) or return period (in years). A 0.5% AEP flood will occur on average once every 200 years and has a 1 in 200 chance of occurring in any given year.

In this report, flood frequency will primarily be expressed in terms of return period, which is the inverse of the AEP, as shown in Table 1-1 and explained above. This can be helpful when presenting results to members of the public who may associate the concept of return period with a regular occurrence rather than an average recurrence interval, and is the terminology which will be used throughout this report.

Table 1-1 Conversion between return periods and annual exceedance probabilities

Return Period (years)	Annual exceedance probability
2	50
10	10
50	2
100	1
200	0.5
1000	0.1



## 2 Initial FRA

The initial FRA for the subject lands is effectively presented within Section 4 of the SFRA document and summarises the flood risk areas impacting the MTC zoning. This section provides an expanded summary of both the historic and predictive flooding information. It is also reviews the appropriateness of the hydrology and production of the flood mapping.

### 2.1 Historic Information

Output from the floodmaps.ie website is included below in

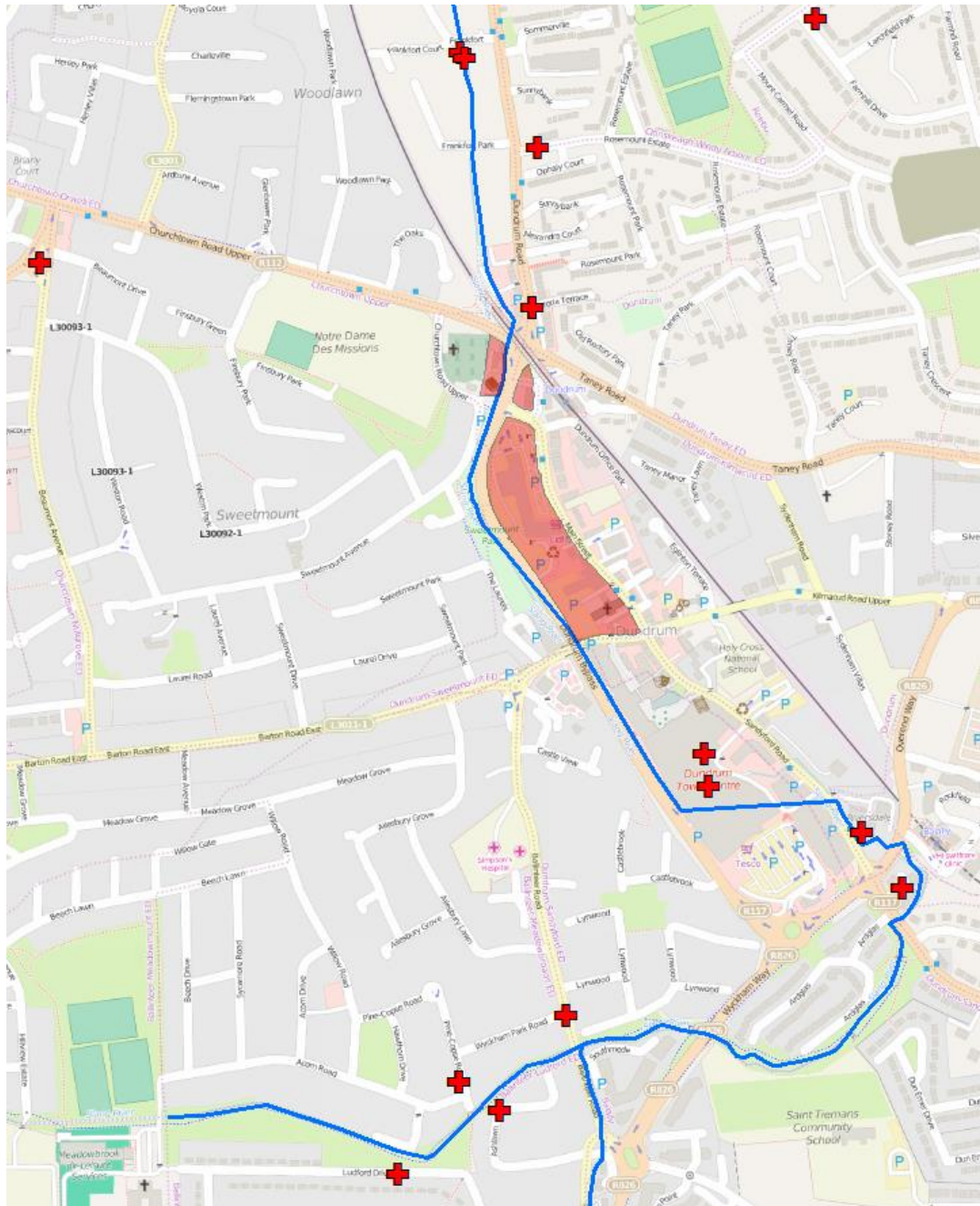


Figure 2- and confirms historic flooding from the Dundrum Slang River in the immediate vicinity of the study site. There are 16 records of flooding from the watercourse and two additional records that are not directly related to the Slang.

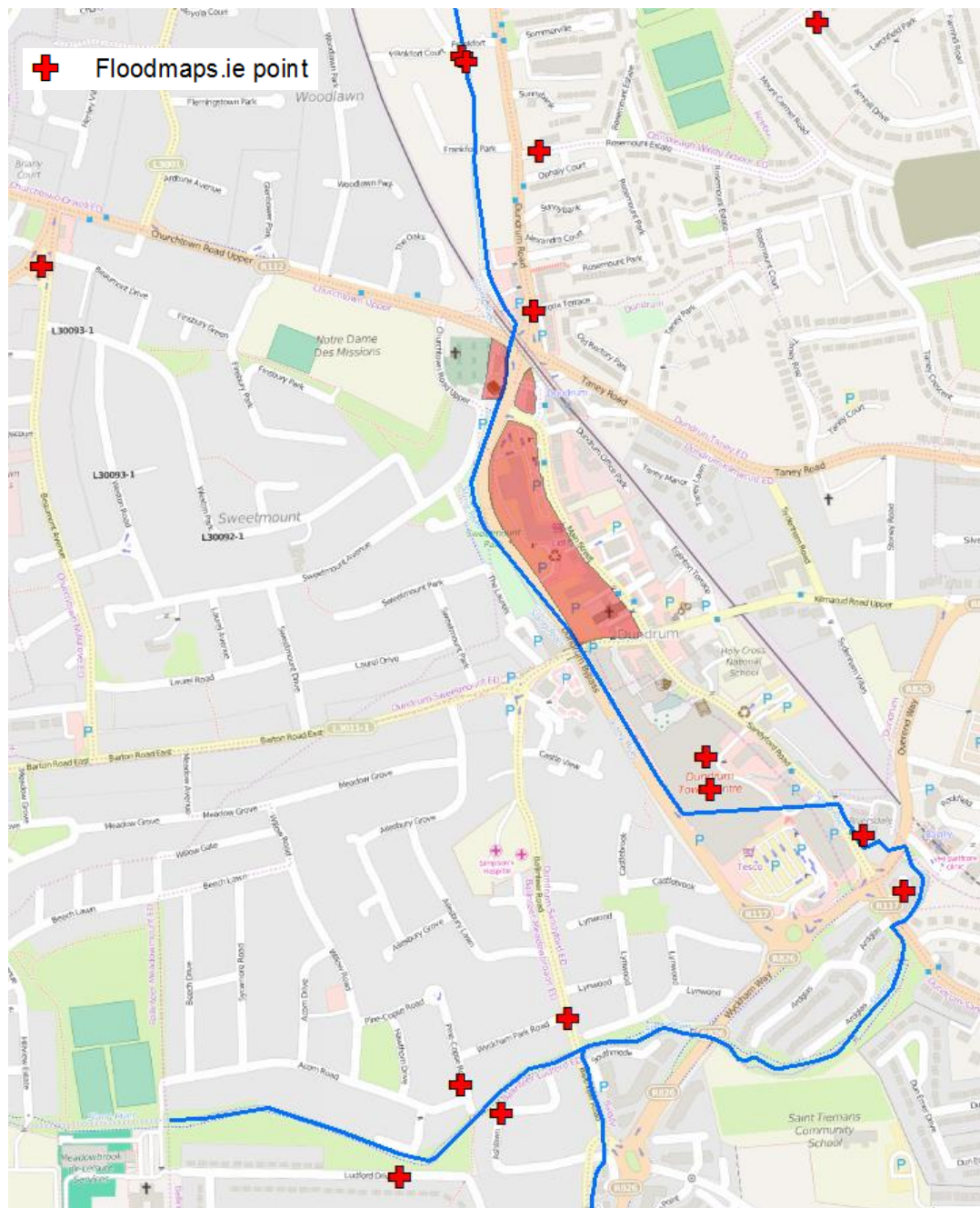


Figure 2-1 Historic Flooding Incidents

The records of flooding have been collated into a table of flood events that is provided below.

Table 2-10 Historic Flooding Summary

Date	Source	Areas impacted
24 Sept 1957	Fluvial	Dundrum River
11 June 1963	Fluvial/Surface Water	Dundrum
7 Nov 1982	Unknown	Pine Copse Road, Ballinteer
27 Aug 1986	Fluvial	Slang Frankfort (Hurricane Charlie)



11 June 1993	Unknown	Ashlawn Ballinteer Road
24 Oct 2011	Fluvial/Surface Water	Frankfort, Dundrum Shopping Centre, Taney's Cross, Willow Bank Apartments (Sandyford Road), Riverdale (Linden & Blackthorn Apartments).
Recurring	Unknown	Old Ballinteer Road - 'floods frequently, not impassable'
Recurring	Unknown	Pine Copse, Willow Road. Road & gardens flood.
Recurring	Fluvial	Slang Pyelands
Recurring	Unknown	Ludford Area Ballinteer
Recurring	Unknown	Old railway line, Dundrum (1950's?)
Recurring	Surface Water	Rosemount, Dundrum - now mitigated

The source of flooding is not always able to be ascertained from the available information, however it is most likely that the unknown sources will be related to fluvial and surface water flood sources. The most information is available for the 24 October 2011 flood event, which caused extensive damage to local residential property and Dundrum Shopping Centre itself. It is the most extreme of the recent events and is estimated to have resulted from rainfall return periods as high as 1% AEP which generated fluvial flows of approximately 2% AEP<sup>7</sup>.

Flooding in Dundrum was caused by ponding of surface water and the exceedance of channel and culvert capacity which resulted on overland flows. Blockage of trash screens is also understood to have contributed to the event severity. From a review of available information it is clear that there was surcharging of a number of culverts/channels upstream of and including the Dundrum Shopping Centre culvert, the Sandyford Road culvert (which resulted in the flooding of the Riverdale - Linden & Blackthorne Apartments and flow escaped along Sandyford Road) and Overend Way (which resulted in the flooding of the Willow Bank Apartments). The Dundrum Shopping Centre itself was flooded when the Slang overtopped the culvert inlet and entered through Butlers Coffee shop, flooding the ground floor of the centre. The Pembroke District was also impacted as well as the Red Car Park where the lowest level (-3) was flooded to 'ankle depth'. The waters continued their overland flow route along Sandyford Road and ponded at Taney's Cross, near to the Library, where there is a local low spot, see Figure 2- below.

Figure 2-2 Photo from thejournal.ie October 2011 road flooding adjacent to Taney's Cross and the Library



## 2.2 The Dodder Catchment Flood Risk Assessment & Management Study

In 2006, the Office of Public Works (OPW), Dublin City Council, Dún Laoghaire-Rathdown County Council and South Dublin County Council commenced work on a Catchment-based Flood Risk Assessment and Management Study (CFRAM) for the Dodder Catchment.

<sup>7</sup> OPW Eastern CFRAM Study, Overarching Report on The October 2011 Flood Event, IBE0600Rp0014





The CFRAM adopts a catchment-based, pro-active approach for identifying and managing existing, and potential future, flood risk to the catchment which encompasses the River Dodder and its five main tributaries; the Dundrum Slang, the Little Dargle, the Owendoher, the Whitechurch and the Tallaght Stream. Draft deliverables were published in February 2012 and pertinent information for this study includes the flood hazard mapping as well as the flood risk management plan.

Deliverables for the CFRAM are more detailed than the OPW PFRA mapping and take precedence for the purposes of this FRA.

The Dundrum / Slang model stretches from Wesley College in Ballinteer to the confluence with the River Dodder in Milltown. The total length of the modelled river is 4.6km and includes 70 topographical survey cross-sections. There are 3 weir structures and 7 culvert / bridge structures along this length that affect the hydrodynamic characteristics of the river and have been included in the model.

The hydraulic model has been provided to JBA for the purposes of hydraulic analysis and verification of the flood mapping.

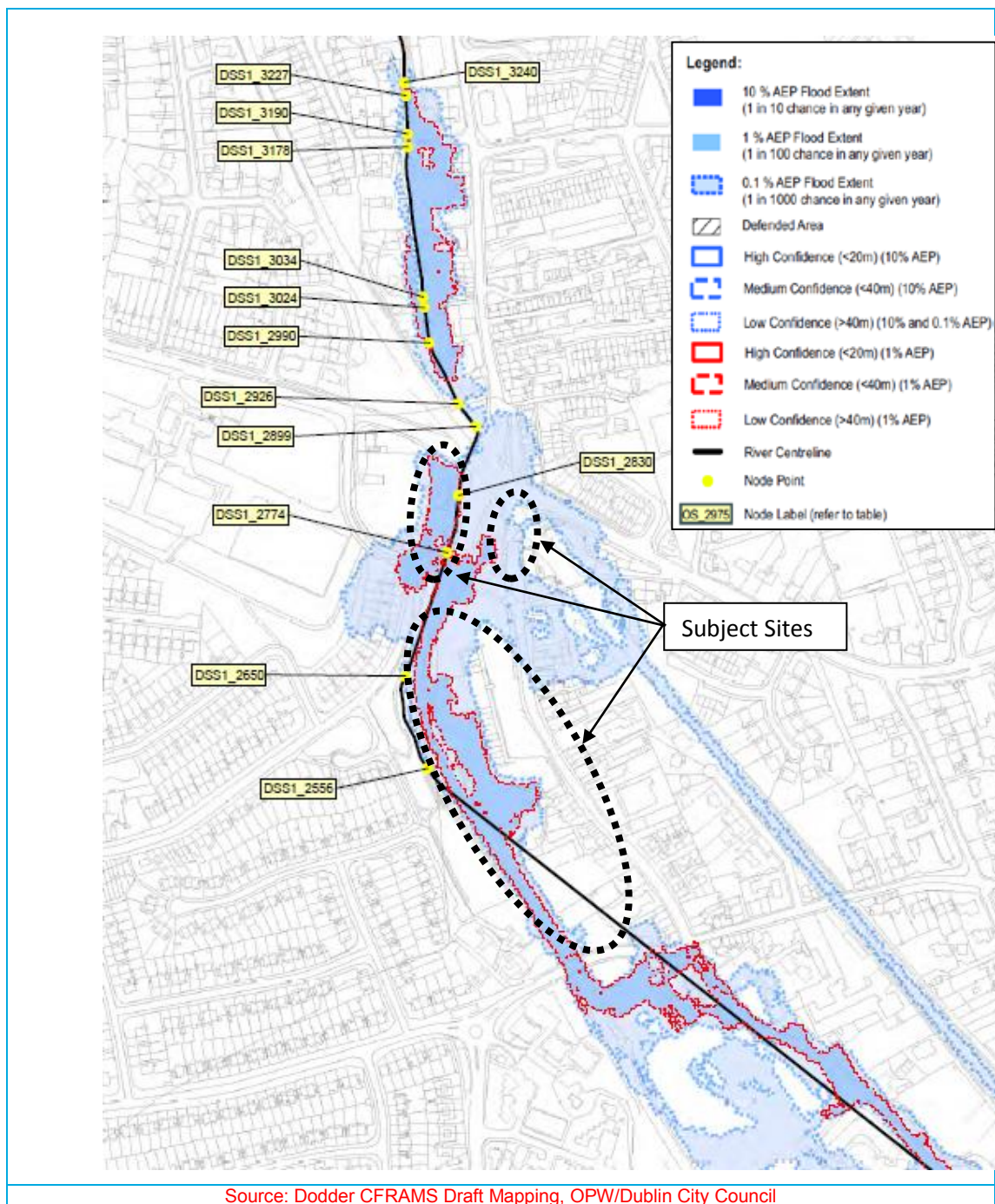
### **2.2.1 Predicted Flood Extent**

One of the key deliverables of the CFRAM is flood extent, depth and hazard mapping, which is detailed in nature and can be used for the purposes of site based flood risk assessment in line with a review of the appropriateness.

Output from the 1 in 1000 year and 1 in 100 year flood events will be used for the purposes of this FRA to provide an initial assessment of the flood extent and level in relation to Flood Zones A and B as defined by the Planning Guidelines. Further information on the Guidelines and the definition of Flood Zones is presented within the main DLR SFRA document referred to in Section 1.1. The appropriateness of the hydrology and hydraulic analysis (for use in this site specific FRA) conducted within the Dodder CFRAM is discussed in Section 2.4.

Flood extent (Flood Zone) mapping is provided over the page (Figure 2-).

Figure 2-3 Dodder CFRAMS Flood Extent Mapping





## 2.2.2 Management Measures (Dodder CFRAM)

The resulting flood risk in Dundrum has prompted the following flood risk management measures to be carried forward for further consideration<sup>8</sup>. The report identifies that 20 properties are at risk of flooding throughout the entire model reach. It is important that this study recognises and considers the potential management measures included within the Dodder CFRAM when considering the nature of any potential management and mitigation measures, this is more fully discussed later in the report.

Table 2-11 Summary of Dodder CFRAM Management Measures

Measure Carried Forward	Comment
Improvement of channel conveyance	Watercourse is heavily culverted limited scope to improve conveyance without large capital spend. BCR <1
Hard defences	Hard defences over relatively short section will alleviate the majority of flooding. BCR>1
Proactive maintenance regime	Will reduce the likelihood of localised flood events. BCR>1
Reactive maintenance regime	Will reduce the likelihood of localised flood events. BCR>1
Public awareness campaign	Technically straightforward, requires only a few properties to benefit to have positive BCR. May cause concern to public to know property is at risk.
Rehabilitation of existing defences	Technically straightforward to repair defects in existing flood wall to ensure current level of flood protection is maintained
Individual property protection or flood proofing	Only 20 properties to protect and would provide full protection.

## 2.3 Summary

The initial stage of an FRA requires the identification and consideration of probable sources of flooding.

### 2.3.1 Fluvial

The Slang River is urbanised, steeply sloping and heavily culverted through Dundrum. The Dodder CFRAM mapping suggests that many of the culverts are under capacity and the 1% AEP and 0.1% AEP model results indicate that there are significant overland flow routes along Sandyford Road, Dundrum By-pass and the LUAS line. All of these overland flow routes lead towards the lowest levels in the area which are on the road adjacent to the entrance to the existing Library building at Taney's Cross.

The result of the flood mechanism described above is that that the subject sites are located within the 1% AEP and the 0.1% AEP flood extents and as such is partly within Flood Zone A, B and C. Areas of the site are therefore at high and moderate probability of flooding from the Dundrum Slang Stream. Flooding to the site is typically characterised by overland flow resulting from surcharging of upstream channel and multiple upstream culverts. This mechanism is confirmed by the events witnessed in October 2011 when many of the overland flow routes predicted by the Dodder CFRAM mapping actually occurred, however it is noted that culvert blockage may have amplified the impacts of flooding beyond which would

<sup>8</sup> River Dodder Catchment Flood risk Management Plan, Option Development Process Preliminary Screening of Measures, January 2009, OPW.



normally be associated with a 2% AEP flood event. The appropriateness of the CFRAM mapping for the subject site is reviewed in Section 2.4.



### **2.3.2 Pluvial**

Pluvial flooding is the result of rainfall-generated overland flows which arise before run-off can enter any watercourse or sewer. It is usually associated with high intensity rainfall. Flood risk from pluvial sources exists in all areas and is closely linked to the operation of the surface water drainage system and local topography.

A review the OPW PFRA pluvial mapping did not suggest that there were any areas of high probability of pluvial flooding close to the sites, however it is clear from site observations that the low spot on the Dundrum Bypass in between the Library (Site 2) and the Gym (Site 3) is a topographic low spot that collects surface water that is unable to overtop the kerb and low wall that separates the Slang River from the Bypass.

The impacts of pluvial flooding are likely to be masked by those of fluvial flooding and overland flows from culvert exceedance. This is due to the catchment being sensitive to short duration rainfall events that simultaneously generate a rapid increase in peak flow and also surcharge the surface water and combined sewer network. Whilst pluvial flooding is an important consideration it can largely be tackled by site specific drainage measures and management measures that are aimed at mitigating the fluvial impacts.

For the above reason it is important that any new development does not increase the potential for runoff and as such; storm water drainage systems in line with the GDSDS will generally minimise the risk from pluvial flooding sources. These measures are appropriately catered for under the stormwater design requirements and auditing process specified by DLR under the planning application process.

## **2.4 Appropriateness of Flood Zone Information**

This section will examine the hydrological and hydraulic processes undertaken in the Dodder CFRAM to derive the current Flood Zone information for the site.

### **2.4.1 Hydrology**

A review of available hydrological analyses has been carried out on the following reports;

1. River Dodder Catchment Flood Risk Management - Hydrological Analysis Report (RPS, 2009)
2. River Dodder Catchment Flood Risk Management - Hydraulic Analysis Report (RPS, 2010)

The purpose of the review was to determine if the hydrology used to create the available flood maps for the site location was an appropriate estimation of the flow rates in the Slang River. A summary of the overarching process is presented below:



- A hydrological model was created for the catchment draining to the Frankfort gauging station. This hydrological model was produced using the rainfall-runoff module of the MIKE11 software package (NAM).
- This model was then calibrated against recorded discharge data from the gauging station.
- As Section 4.2.1 (page 34) in the Dodder CFRAMS Hydrological Analysis Report states: *"(When the NAM model alone was applied)....the Summer and some of the large Winter events were not predicting accurately. A response such as this is indicative of runoff from an urbanised catchment with a large amount of impervious surface area and cannot be reproduced using a NAM hydrological model. For this reason urban models were produced and joined with the NAM models to produce combined hydrological models. (The urban runoff models were constructed).... for each of the gauge catchments to reflect the rainfall runoff characteristics of the contributing urban area under current catchment conditions."* The urban models were constructed using the 'Urban' component of the RR module in MIKE11.
- According to the Dodder hydrology report, individual flood events [at Frankfort] calibrated well with discharge records using the combined model and a calibration factor ( $R^2$ ) of 0.767 was achieved, which indicates a good correlation.

The Dodder CFRAM presents a number of flow estimation and calibration exercises, many of which vary in the magnitude of the return period event. Table 2-12 below indicates the flow rate from the single site (EVA) analysis and simulated analysis for the Frankfort Gauge (downstream of the MTC sites), taken from Section 5.4.3 and 5.7.6.3 of the Dodder Hydrological Analysis Report, it also includes the FSR design flood estimation at Frankfort (Section 5.6.3 of the Dodder Hydrological Analysis Report).

Table 2-12 Flow rate ( $m^3/s$ ) comparison of EVA and EVA of Simulated Discharge for Frankfort Gauge Catchment, FSR estimate at Frankfort taken from the Dodder Hydrology Report

Return Period	EVA Frankfort	EVA simulated	FSR
50% AEP (2yr)	3.88	3.88	3.99
20% AEP (5yr)	5.57	5.57	4.94
10% AEP (10yr)	6.82	6.82	5.30
2% AEP (50yr)	10.25	10.25	6.10
1% AEP (100yr)	12.07	12.07	6.55
0.1% AEP (1000yr)	20.20	20.26	6.88

Included below in Table 2-13 are reported peak modelled flows taken from the hydraulic model as presented in Appendix D of the Dodder Hydraulics Report.

Table 2-13 Peak Modelled Flow output at three Nodes local to the MTC sites - Appendix D, Dodder Hydraulics Report

Return Period	Node 1565.95	Node 1688.14	Node 2555.68
50% AEP (2yr)	5.39	5.77	5.80
20% AEP (5yr)	7.43	7.96	8.01
10% AEP (10yr)	9.45	10.15	10.22
2% AEP (50yr)	15.62	16.85	16.97
1% AEP (100yr)	18.77	20.28	20.43
0.1% AEP (1000yr)	26.55	72.52	70.56

Flows presented in the three model nodes (1565.95, 1688.14 and 2555.68) appear to vary significantly at the 0.1% AEP and are inconsistent with the estimates presented for Frankfort gauge within the Dodder hydrology report (above). The flow estimates of the 1% AEP are close to double that presented by the EVA estimate and more than double of that presented



by the FSR. Comparing 1% to 0.1% AEP the increase in magnitude is more than a factor of three, which is extremely unusual compared to other gauging stations in Ireland.

The difference between Table 2-12 and Table 2-13 occurs because the calibrated RR model for Frankfort was not used as an input in the Slang CFRAMS model. Instead, the Slang (Dundrum) catchment was sub-divided into three distinct hydrological areas; each with a different RR model. The parameters in these models were based on the calibrated RR models for the three gauged catchments, with alterations to the catchment length and time of concentrations as required. Historic rainfall data from the rainfall gauging stations within the RR boundary was entered into each model and weighted according to their contribution relative to the catchment area. Therefore, there is a disconnect between the flow estimation at Frankfort and the model discharge files.

The use of the Frankfort gauging station, even with improvements to the rating curve may not be providing valid results;

- The EPA (who operate the Frankfort gauge) has a rating curve based on observed gaugings with a maximum flow of just  $2\text{m}^3/\text{s}$ .
- This flow rate is less than the median annual flood ( $Q_{\text{med}}$ ) derived by the CFRAM methodology.
- Beyond the gauged flow of  $2\text{m}^3/\text{s}$ , the rating curve was extrapolated using a 1D hydrodynamic model of the local reach.
- The new, extrapolated rating curve was used to provide the flow rates for the model calibration.

In summary, flow estimates vary between those detailed at the Frankfort gauging station and those used in the hydraulic model simulations, as reported in the Hydraulics Report, Appendix D. Where the flows are stated they are inconsistent and are much higher than expected, the 0.1% flow in particular, with a factor of three increase from the 1% AEP flow is extremely unusual. As such our confidence in the design flows used to create the Dodder CFRAM flood maps is limited and further analysis of the hydrology is required prior to establishing revised flood mapping for the MTC sites.





### 2.4.2 Hydraulics

A review of the CFRAM hydraulic model was completed to provide additional opinion on the appropriateness of the derived flood outlines. The following observations were made:

- The open channel cross-sections were compared with the raw CFRAM survey data; no discrepancies were found.
- The culverts were similarly compared with the following comments;
- The model combines the Dundrum Shopping Centre Culvert, the downstream section of open rectangular channel, access bridges adjacent to the Dundrum Bypass and the culvert under the Dundrum Bypass in a single 865m culvert with an outlet at Sweetmount Park.
- The modelled inlet dimensions to the Dundrum Shopping Centre Culvert represent a smaller area than suggested by the design drawings for the culvert. As such, the conveyance capacity of the structure is likely to have been under estimated.
- The culvert under the Sandyford Road has been overestimated in size compared to survey comparison; therefore the conveyance capacity through the culvert is likely to be over represented in the model.
- Only four of the nine culverts in the CFRAM model have allowed water to spill over the top of the structures. A check of the model results from the hydraulic modelling report indicates that all of the culverts without an overtopping spill are surcharged in the higher return periods. This will force all flow through the culvert and create unachievably high water levels at the culvert inlets.
- Finally, Table 2-13 suggests that the flows in the model are excessively high and inconsistent, which will impact on the appropriateness of the modelled water levels for given return periods.

As a result of the above findings the model representation of the culverts and general river system are limited in detail. Our confidence in the representation of surcharging and water levels is therefore limited. It is the overland flow routes (created by culvert exceedance) that drive most of the flood impacts generated from upstream of Dundrum Shopping Centre right down to Taney's Cross. It is therefore essential that the flood mechanism is appropriately presented in any further analysis. Therefore, additional topographic channel and culvert survey is required to accurately represent the Dundrum Slang River.

### 2.4.3 Summary

A review of the hydrology and hydraulics confirms that the Dodder CFRAM model presents a conservative estimation of flood extent and depth. This is due to significantly higher than expected flow volumes leading to greater exceedance volumes at many of the culverts.

The representation of the system is also simplified by the combination of a number of key structures upstream of Sweetmount Park and Dundrum Shopping Centre. The result being that the confidence in the model representation is reduced.

Overall, the low confidence in the flow estimates and model geometry/representation requires that this study must conduct additional hydrological analysis and modelling in order to present an appropriately detailed analysis of flow and modelled water levels for the MTC sites.



### 3 Detailed FRA - Background

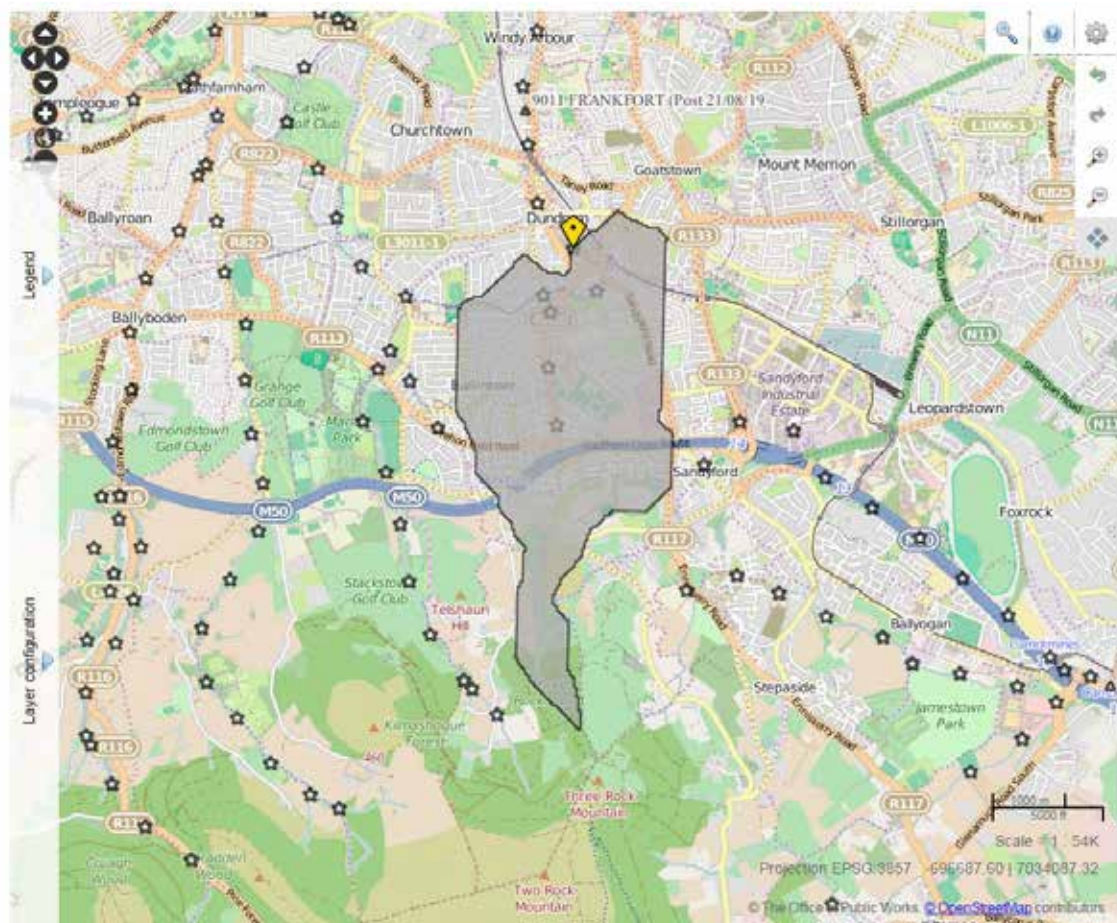
This section of the report will provide a full appraisal of flood risk to the site, outlining the hydrological and hydraulic operations undertaken to derive a revised suite of flood maps for the MTC sites.

#### 3.1 Hydrology

##### 3.1.1 Catchment overview

The Slang River is a major tributary of the Dodder River in south Co. Dublin. The Slang rises at Three Rock Mountain at an approximate elevation of 430mOD. The stream is approximately 8km in length and falls at an average gradient of 1 in 20. At Dundrum Town Centre, it drains a catchment area of approximately 4.41km<sup>2</sup>. The catchment is highly urbanised and is particularly vulnerable to short, high-intensity rainfall-generated flood events. An overview of the study catchment is presented in Figure 3-.

Figure 3-1 Overview of study catchment (OPW FSU Web Portal)



##### 3.1.2 Calculation Methodology

A flow estimation was completed using the FSR Rainfall Runoff Method, taking into account FSSR 16. A full breakdown of the FSR flood estimation methodology is presented in



Appendix A. The calculated flows for a range of return periods are displayed in Table 3- over the page.

Estimation methods using the gauged record at Frankfort, such as employed by the Dodder CFRAM have been rejected based on our appraisal of the rating curve, which is limited to flow recordings of 2m<sup>3</sup>/s or less. Results from the FSR Rainfall Runoff model are still comparable with the EVA and simulated EVA analysis presented in the Dodder CFRAM for the Frankfort gauge but peak flows are higher using the FSR Rainfall Runoff method.

Other estimation methods such as the FSR statistical and FSU approaches are unsuitable for a catchment less than 5km<sup>2</sup>. These estimates are also significantly lower than the FSR Rainfall Runoff results. The IH 124 method, whilst suitable for small catchments, also returns a lower estimates of peak flow and has also been rejected.

Table 3-1 Flow Estimation Results, FSR Rainfall Runoff - Study Catchment

Return Period	Flow Rate (m <sup>3</sup> /s)
50% AEP (2yr)	4.93
20% AEP (5yr)	6.48
10% AEP (10yr)	7.65
5% AEP (20yr)	8.90
1% AEP (100yr)	12.59
0.1% AEP (1000yr)	21.82

The flow estimates, whilst in line with some of the flow estimation work completed in the Dodder CFRAM, are still subject to uncertainty and further work on the Frankfort Gauging Station rating curve and monitoring would be required to improve confidence in the hydrology.

## 3.2 Hydraulics

A revised hydraulic model has been constructed using additional in-fill survey collected in March 2015. The in-fill survey has replaced and updated the previous (and incomplete) survey data collected under the Dodder CFRAM, which dates from 2007, as discussed in Section 2.2.

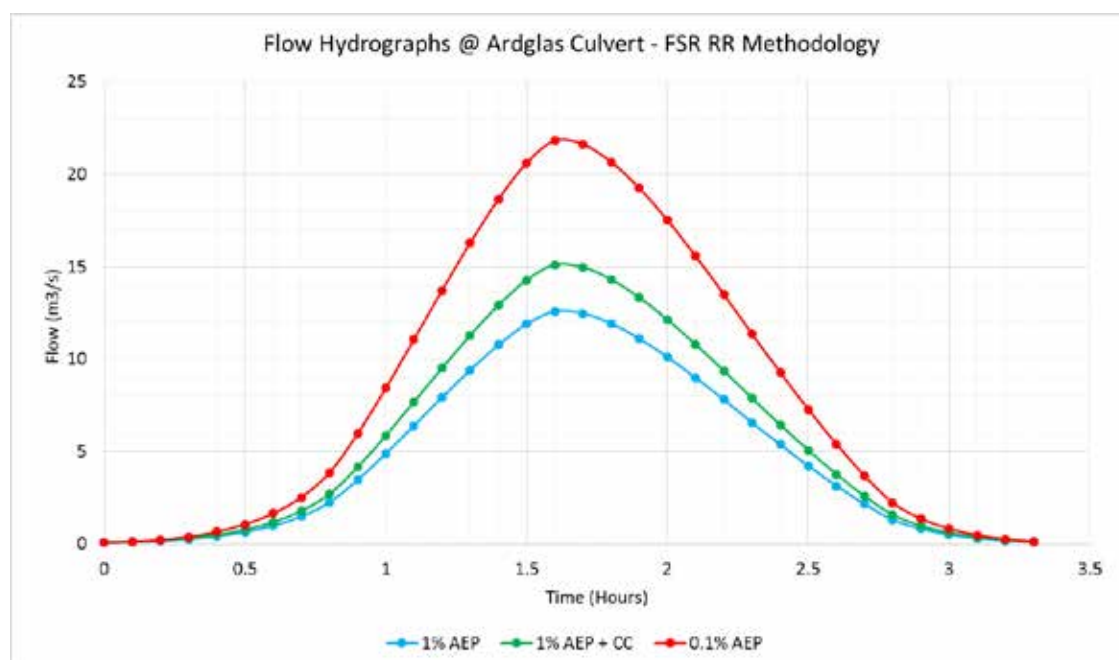
### 3.2.1 Modelling approach

The 1D-2D (ISIS-TUFLOW) hydraulic model incorporates LIDAR data provided by DLR and channel survey data provided by APEX Surveys Ltd.

A 1D-2D linked hydrodynamic hydraulic model is required so that both channel and culvert capacity can adequately represented and used to generate appropriate 2D overland flow routes (that are far removed from the culverted route of the watercourse). It is only through this linked modelling approach that the system can be appropriately represented.

The model specifically investigates flooding generated by the Slang River through the centre of Dundrum village. The model uses the hydrology described in Section 3.1 and a selection of hydrographs is shown below in Figure 3-.

Figure 3-2 Summary of hydrological input into the ISIS-TUFLOW hydraulic model



The model has been run for three return periods:

- 1% AEP event (Flood Zone A);
- 0.1% AEP event (Flood Zone B);
- 1% AEP Climate Change event (1% AEP + 20%).

Manning's roughness values have been assigned to the floodplain using OSi NTF data. This data represents elements such as buildings, roads, inland water and vegetation. Building footprints have not been physically raised, but flow paths have been verified on site by JBA staff.

### 3.2.2 Schematisation

An overview of the model representation is provided below in Figure 3-. The 1D-2D model begins in Ardglass Park and continues under Sandyford Road, past Willowbank Apartments, under Overend Way, the Riverbank Apartments under Sandyford Road (again) and then under Dundrum Shopping Centre. The model continues in open channel alongside the Shopping Centre before entering the Dundrum Bypass culvert. The culvert extends to Sweetmount Park before flowing through the second Sweetmount Park culvert and into open channel by the Library, before passing under Taney's Cross and towards Frankfort Gauge. The 1D model terminates downstream of Taney's Cross, whilst the 2D domain continues further downstream.

The model schematisation includes a significant portion of the channel upstream of the MTC sites because the CFRAM mapping clearly identifies culverts upstream of the Dundrum Shopping Centre as potentially generating a significant overland flow pathway down the Bypass, with flow collecting on the Dundrum Bypass prior to Taney's Cross - potentially impacting all three sites.



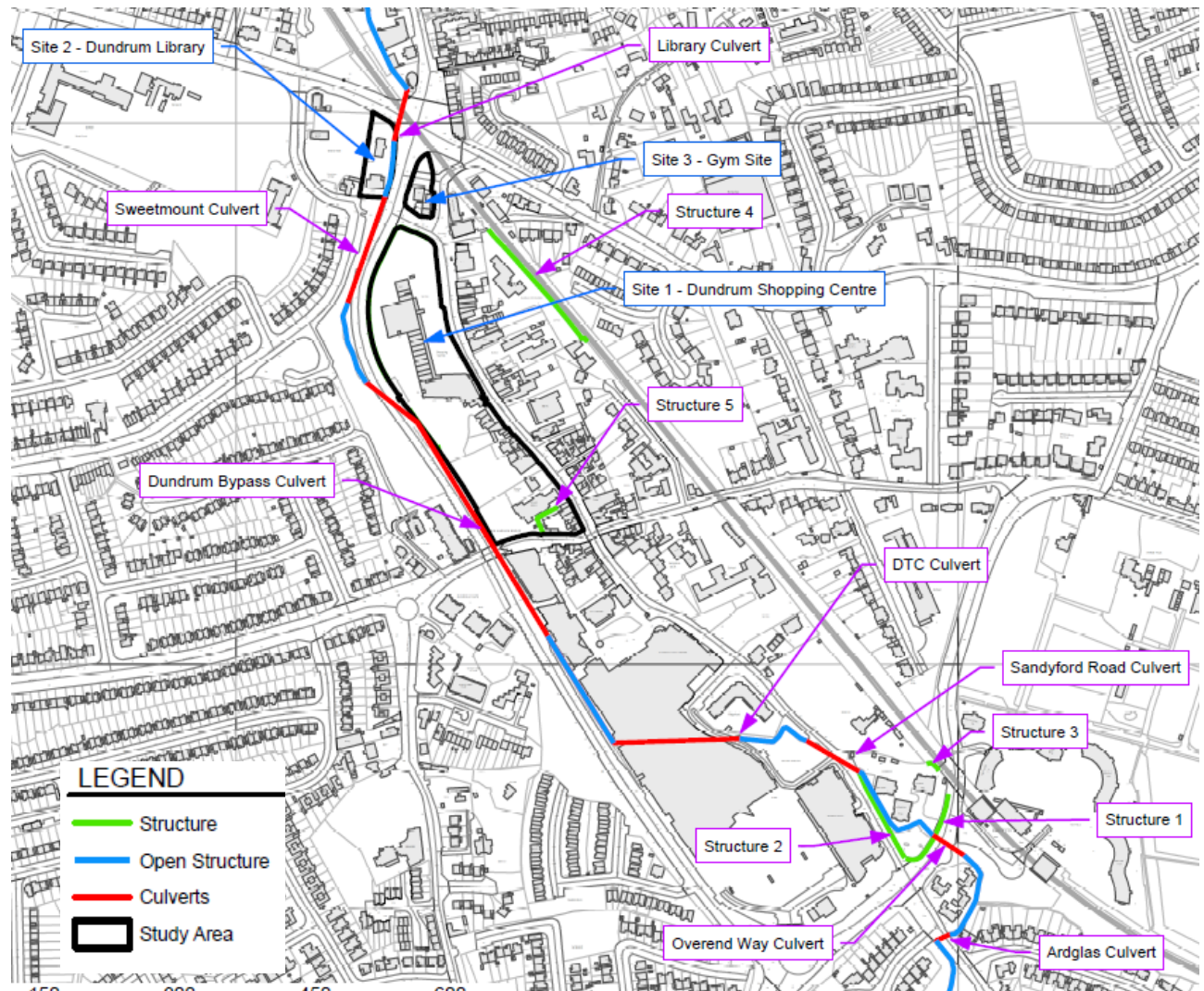


Figure 3-3 Location of walls and conveyance structures included in the hydraulic model



### 3.2.3 Model Scenarios

Five model scenarios have been presented by the hydraulic model;

- Existing Conditions (Baseline - March 2015);
- Existing Conditions - 50% Culvert Blockage(s) (residual risk);
- Option A (see Table 3-);
- Option B (see Table 3-);
- Option C (see Table 3-).

These five scenarios have been run with a combination of return period events:

- 1% AEP
- 0.1% AEP
- 1% AEP + Climate Change (20% flow increase - residual risk)

**The aim of the modelling is to determine the revised existing/baseline conditions (Flood Zone A & B) and assess the potential negative impacts on surrounding development. This will allow an appraisal of the sites in relation to the Justification Test. Two residual risk factors (climate change & culvert blockage) are also investigated.**

Option A, B and C represent three different future development scenarios across the three MTC potential re-development sites that were introduced in Section 1.3.

The Options represent development by excluding flooding from each site by raising of ground levels above maximum flood levels. This represents (in broad terms) a potential development scenario - and tests the potential impact of development on risk elsewhere and will indicate where risk is acceptable and how mitigation may be achieved, if required.

Table 3- below confirms how development within Sites 1-3 is represented within each Option.

Table 3-2 Summary of development options tested in TUFLOW hydraulic model

Development Site	Option A	Option B	Option C
1. Dundrum Shopping Centre Phase 2 Lands	●		●
2. Dundrum Library		●	●
3. Site opposite Library (Gym)	●	●	●

The potential impact on water level for each scenario can then be easily assessed by comparing Options model results with the Existing (baseline) Conditions using extents or depth difference maps. Residual risks of climate change (+20% flow) and 50% culvert blockage are also investigated.



## 4 Detailed FRA - Results and Analysis

Model results are discussed below and presented as a series of maps within Section 7. Tables of the mapping contained in Section 7 are provided below in Table 4- to Table 4-. There are 21 maps included.

Discussion in relation to the revised Existing Condition model and the new Flood Zone maps for the site is addressed first in Section 4.1.

Analysis is then based around the comparison of the Existing Condition (baseline) with Options A, B and C in Section 4.2.

Section 4.3 discusses the residual risk modelling for climate change and culvert blockage.

**Table 4-1 JBA Flood Zone Maps - Existing Condition Scenario**

Scale	Description	Link to Map
Overview of Model Area	Flood Zone A & B	Section 7.1
Study Area (Sites 1-3)	Flood Zone A & B	Section 7.1

**Table 4-2 JBA Flood Maps - DEPTH DIFFERENCE (with Existing Scenario)**

Scenario	1% AEP	0.1% AEP
Option A	Section 7.3	Section 7.4
Option B	Section 7.5	Section 7.6
Option C	Section 7.7	Section 1.1

**Table 4-3 JBA Flood Maps - DEPTH**

Scenario	1% AEP	0.1% AEP	1% AEP + CC
Existing	Section 7.9	Section 7.9	Section 7.11
Blockage	Section 7.12	n/a	n/a
Option A	Section 7.13	Section 7.14	n/a
Option B	Section 7.15	Section 7.16	n/a
Option C	Section 7.17	Section 7.18	n/a

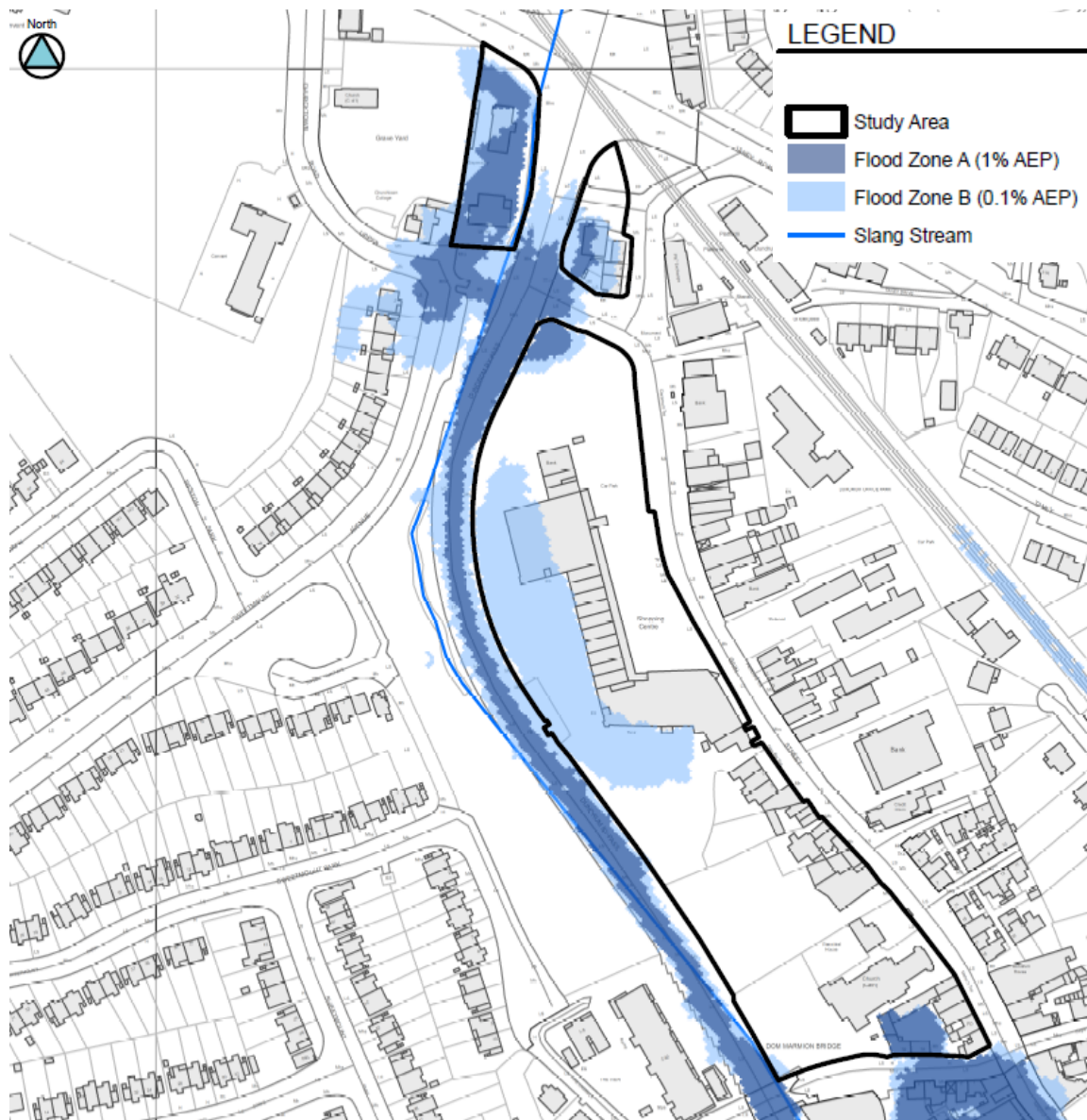
**Table 4-4 JBA Flood Maps - HAZARD**

Scenario	1% AEP	0.1% AEP	1% AEP + CC
Existing	Section 7.19	Section 7.20	Section 7.21

### 4.1 Existing Condition Scenario & Flood Zone Mapping

The existing conditions are presented as Flood Zone A and B, this refers to the flood extent for the 1% AEP and 0.1% AEP events. The mapping is presented in Section 7, with links to the mapping in Table 4-. An excerpt of the map is provided below in Figure 4-.

Figure 4-1 Flood Zone Map - Existing Conditions



#### 4.1.1 Overview of Results

Compared to the original Dodder CFRAM flood mapping (see Figure 2-), the extent of flooding is smaller and the impacts are therefore less severe, but are still significant. Reducing flood volumes is the main reason for the reduction in extent but there are also large differences in the representation of culverts and flow exceedance.

The table below confirms the percentage of each site area within Flood Zone A and B. The greater the area of the site within Flood Zone A and B the more the likelihood is that there will be negative impacts to surrounding lands from any re-development because of the accumulated loss in floodplain storage. Assuming re-development involves a policy of land raising to mitigate the risk for less vulnerable or highly vulnerable land uses.

Site 1 has the least percentage area within Flood Zone A and overall. Sites 2 and 3 both have significant percentages of the site within Flood Zone A & B, however the area of Site 3 is small compared to the other sites and does not interrupt any flow paths, or store significant volumes of flood water.



Site 2 is located adjacent to the open section of channel prior to Taney's Cross. Development of the site can potentially reduce flood storage and influence flow conveyance. The conveyance of flow back into the channel from the overland ponding witnessed on the Dundrum Bypass adjacent to the Library and Sweetmount Avenue is an important factor that controls flood levels in the area.

Table 4-5 Percentage and Area of each site within Flood Zone A and B

Site	Total Site Area (m <sup>2</sup> )	% site in Zone A	Area (m <sup>2</sup> ) site in Zone A	% site in Zone B	Area (m <sup>2</sup> ) site in Zone B	TOTAL A+B % (area m <sup>2</sup> )
1. Shopping Centre Phase 2 lands	30,107	3	903	19	5,720	22 (6,623)
2. Dundrum Library	2,636	52	1,371	25	659	77 (2,030)
3. Opposite Library (Gym)	1,551	13	202	35	543	48 (745)
TOTALS	34,294	68	2,476	79	6,922	n/a (9,398)





#### 4.1.2 Summary of Flood Mechanism and Property Impacts - Existing Scenario

- The heavily culverted nature of the Dundrum Slang River and the capacity of the culverts located upstream of the Dundrum Shopping Centre are responsible for generating an overland flow route that causes flood water to flow down the Dundrum Bypass.
- Flow enters the Dundrum Bypass by exceeding culvert capacity at the Sandyford Road culvert and the Ardglass culvert and flowing down Sandyford Road until the junction with Ballinteer Road. At this low point flow then passes along Ballinteer Road, inundates the courtyard (Maher's Terrace) and continues through the open pedestrian access in the Dundrum Shopping Centre onto the Dundrum Bypass, towards Taney's Cross.
- Flow pathways represented in the model have been verified by a number of site visits carried out by JBA staff.
- Flow into Site 1 is limited by the low wall extending along the boundary with the bypass, but a gap in the wall is exploited above the 1% AEP event and flow then begins to significantly pond on the site.
- Overland flows collect/pond in the vicinity of the Dundrum Library and can re-enter the open channel at this point.
- This area around the Library is a topographic low spot. Ground levels subsequently increase underneath Taney's Cross and the LUAS Bridge. The Slang flows under Taney's Cross in a section of culvert.
- The ponding of water extends in front of the Library and also impacts Sweetmount Avenue and Churchtown Road Lower.
- For the floodwaters to be removed from this low spot, the flow must re-enter the open section of channel adjacent to the Library building. This is an important control on local water levels.
- The Dundrum Bypass kerb and railing plinth have a combined height of around 0.3m greater than the road level; **which water must overtop before it can re-enter the River Slang at this point.**
- As a consequence, flow quickly rises to the overtopping point where it can re-join the Slang River channel. This involves a flood route that flows into the area in front of the Library at the junction of Sweetmount Avenue and Churchtown Road Upper. Water then extends around the library and back into channel.

The impacts of flooding within Flood Zone A & B extend to the properties listed over the page in

Table 4- over page.

Table 4-6 Existing Property Flooding in the area surrounding the MTC Sites

Area	Properties in FZ A	Properties in FZ B	TOTAL
1. Shopping Centre Phase 2 lands	0	1	1
2. Dundrum Library* (includes vacant HSE building)	1	1	2
3. Opposite Library (Gym)	1	3	4
Sweetmount Avenue	0	3	3
Church Road Upper	0	1	1
<b>TOTAL</b>	<b>2</b>	<b>9</b>	<b>11</b>
* note the Dundrum Library has an FFL of 44.67mOD which is greater than the potential Flood Zone A depths, but less than Flood Zone B. The building footprint has not been raised within the model and therefore the Flood Zone A mapping extends over the building footprint.			



#### 4.1.3 Confirmation of Flood Sources

From the analysis of the existing scenario information and flood mechanisms it is clear that the three MTC sites can be impacted from the following;

1. **FLUVIAL & SURFACE WATER OVERLAND FLOW;** All three sites are potentially at risk from the overland flow routes generated by fluvial flows exceeding culvert capacity above Dundrum Shopping Centre.
2. **CULVERT BLOCKAGE;** The existing scenario assumes culverts are operating without blockage, however the system is very sensitive to culvert capacity and further decreases in culvert capacity will generate increases in overland flow and flood depths to all three MTC sites. This applies to culverts upstream and downstream of the MTC sites.
3. **PLUVIAL;** Direct runoff from extreme rainfall events. Pluvial flooding from direct rainfall not entering the surface water drainage network could also threaten the three MTC sites in a similar manner to overland ponding noted in the first two sources. However, impacts would be more severe for sites two and three in this case. Pluvial flooding is potentially an issue but it can be effectively tackled by site specific drainage design and fluvial mitigation measures. The report will therefore focus on fluvial, surface water overland flows and residual risk management.

#### 4.2 Baseline Comparison of Development Options

To compare the potential impact of additional development/re-development for Options A, B and C depth difference maps have been produced. The maps are found in Section 7 and a link to the maps is contained in Table 4-.

- A significant increase in flood depth (as a result of development work to one of the Options sites is defined as an increase in flood depth >0.01m).
- Increase in flood depth is measured at an existing receptor (property) and is not in relation to new areas of flooding.
- The 1% AEP is the main reference point for significant impacts of flooding to aid the Justification Test.
- The 0.1% AEP is a reference point for exceedance flows (residual risk) for testing the impacts of development beyond the normal standard of flood protection methods. It is intended to be used to guide residual risk management rather than be used to appraise the Justification Test directly.

Results are summarised in Table 4-14 over page and show that development within the various Options combinations of Sites 1, 2 and 3.

Table 4-14 Impacts of Options Development of MTC Sites

Scenario	1% AEP Max WL Increase (m)	1% AEP Additional Properties Flooded?	0.1% AEP Max WL Increase (m)	0.1% AEP Additional Properties Flooded?
Option A (Site 1 + 3)	<0.01	No	0.1-0.25 **	Yes (2)
Option B (Site 2 + 3)	0.01-0.05 *	No	0.25-0.5 **	Yes (3)
Option C (Sites 1, 2 & 3)	0.01-0.05 *	No	0.25-0.5 **	Yes (3)

\* Typical increase in front of Library is 0.01-0.05m, 0.25-0.5m increase in depth is limited to the rear of the Library.

\*\* A >0.5m increase in depth is limited to an area west of properties on Sweetmount Avenue, however this is a new area of flooding where water overtops into a low spot that contains no properties.



#### 4.2.1 Summary of Impacts

- At the 1% AEP no new properties are impacted and the two properties noted as being within the flood extent (see
- Table 4-) will not be subject to an increase in flood depth.
- The depth increase at this AEP is limited to roads or open space.
- The HSE building is not impacted, it is also noted that the building also happens to be vacant. The 'Gym' building is removed from the floodplain in all three options, but would be unlikely to suffer significant increase in water levels at the 1% AEP for development of other options.
- Typical depths of flooding at the front of the Library on the Bypass and Sweetmount Road/Churchtown Road Lower would increase in depth by 0.01 to 0.05m at the 1% AEP for Options that include development of the Library (Options B & C).
- At the 0.1% AEP (an increase in flow from approximately 13m<sup>3</sup>/s to approximately 22m<sup>3</sup>/s), the impacts from additional development (Option A, B and C) increases significantly.
- At the 0.1% AEP additional properties are flooded along Sweetmount Avenue (1 or 2no.) and Churchtown Road Upper (1no.) and flood depths increase.

### 4.3 Residual Risk

Consideration of residual risk has been extended towards the impacts of climate change and an increase in culvert blockage to 50% (at all structures). The impact of the 0.1% AEP flow (also a residual risk from exceedance) is included within Section 4.2.

Climate change and blockage modelling has only been run with the Existing Scenario and all comments are in relation to a comparison between the impacts on this scenario.

Flood maps are included in Section 7 and mapping output for climate change extends to both DEPTH and HAZARD, blockage extends only to DEPTH. There are links to the maps in [Table 4-](#) and [Table 4-4](#). Hazard is discussed separately in Section 0, this section focusses on the residual impacts on flood depth.

#### 4.3.1 Climate Change Impacts

Flooding as a result of potential future climate change is represented by an increase in peak flow at the 1% AEP of approximately 2.5m<sup>3</sup>/s (20%), as can be seen in [Figure 3-](#). It is noted that this increase is significantly less than the flow increase of over 9m<sup>3</sup>/s between the 1% and 0.1% AEP.

The increase in flood depth and extent across the MTC lands is generally less than 0.1m, but with isolated areas (within Site 3) displaying an increase of 0.5m. Specific details include;

- An increase in extent and depth across Site 1 (0.1m maximum) is caused as a result of flows encroaching through the gap in the low wall adjacent to the bypass.
- An increase in the depth of flooding at the topographic low spot in front of the Library of 0.1m maximum.
- Within Site 2 (Library) flood depth increases by up to 0.5m.
- Within Site 3 the increase is >0.5m.
- No new property flooded

Climate change levels will generally guide the design of appropriate FFLs for any proposed re-development of the three MTC sites. This is discussed further in Section 1.

#### 4.3.2 50% Culvert Blockage Impacts

Increasing the culvert blockage to 50% for all structures forces more flow along the main overland route along the Dundrum bypass, into Site 1 through the gap in the low wall and into Sites 2 and 3 from an increase in ponding in the topographic low spot near to the Library.



Increases in flood depth and extent are significant;

- 0.1m to 0.25m increase consistently along the Dundrum Bypass and in the topographic low spot;
- Up to 0.5m increase in flood depth within Site 1;
- Up to 0.25m increase in flood depth in Site 2;
- Greater than 0.5m increase in Site 3.

It is noted that the increase in flood depth and extent is still less than that represented by the 0.1% AEP event.

#### 4.3.3 Conclusion on Residual Risk (including 0.1% AEP)

It is clear from the consideration of the suite of residual risks (climate change, blockage and flow exceedance - 0.1% AEP) that the potential impact of development within the combination of Sites 1-3 poses significant impact to others, which cannot be ignored. With the aim of ensuring that the residual impacts are minimised then it is necessary to compensate fully for the loss of floodplain storage (to the 0.1% AEP standard) on each site or alternatively, avoid developing within Flood Zone A or B. Both options limit the amount of space within the MTC lands available for highly and less vulnerable land use.

The Planning Guidelines recommend a precautionary approach and a simple application of this principle would result in a zoning objective that ensures lands within Flood Zone A and B are retained as open space/water compatible use with no change in ground levels.

However, if wider consideration is given to the potential mitigation options, that extends beyond the boundary of the three MTC sites (to a catchment based solution) then it is possible, in theory, to offer a solution that allows mitigation of the negative impacts to others and increases the amount of space within the MTC lands available for highly and less vulnerable land use.

The decision as to the adoption of this approach can be informed by the guidance contained within Section 1 and 1.

It is worth noting that the current fluvial design standard is normally the 1% AEP plus climate change. In this situation, due to the significance of the residual risks and uncertainty in the hydrology, mitigation is recommended to the 0.1% AEP standard. This brings with it significant challenges as will be discussed in subsequent sections of this report. **Flood Hazard**

Flood hazard provides an important indicator of the danger caused to human life by the combined impacts of flood velocity and depth. It is used to highlight in a single map where a combination of fast and deep flow will pose a risk to human life. It is useful for identifying the requirement for adequate mitigation measures and emergency planning. Table 4- provides further information.

Hazard is calculated using the Defra FD2321<sup>[1]</sup> formula as used in the OPW CFRAM studies. The Flood Hazard rating is a function of depth and velocity of flooding with a debris factor added. It is calculated using the following equation:

$$HR = d \times (v + 0.5) + DF$$

<sup>[1]</sup> Defra / Environment Agency Flood and Coastal Defence R&D Programme, R&D OUTPUTS: FLOOD RISKS TO PEOPLE Phase 2, FD2321/TR2, Guidance Document, March 2006



- where, HR = (flood) hazard rating;
- d = depth of flooding (m);
- v = velocity of floodwaters (m/sec); and
- DF = calculated debris factor

Table 4-8 Hazard to People as a Function of Velocity and Depth

$d * (v + 0.5)$	Degree of Flood Hazard	Description
<0.75	Low	Caution "Flood Zone with shallow flowing water or deep standing water"
0.75 – 1.25	Moderate	Dangerous for some (i.e. children) "Danger: flood zone with deep or fast flowing water"
1.25 – 2.5	High	Dangerous for most people "Danger: flood zone with deep fast flowing water"
>2.5	Significant	Dangerous for all "Extreme danger: flood zone with deep fast flowing water"

Flood maps are included in Section 7. Links to HAZARD maps are provided in Table 4- and these are limited to results from the Existing Scenario.

#### 4.3.4 Comment on Hazard

Hazard is most significant in the topographic low spot adjacent to and also behind the Library. Here we see large depths of flooding even at the 1% AEP which result in 'high' or in some smaller areas 'significant' hazard. Flows passing down the Dundrum Bypass exerts a moderate hazard at the 1% AEP.

At the 0.1% AEP flood hazard increases to 'significant' for much of the Dundrum Bypass and topographic low spot as both velocity and depth increase. As well as the risk to human life, vehicular access (including emergency services vehicles) along the Dundrum Bypass will not be possible under the 1% or 0.1% AEP.

In summary the risk to human life as a result of flooding from the 1% and 0.1% AEP are a serious consideration for future risk management and mitigation in Dundrum. The impacts from October 2011 clearly illustrate the potential for significant flood depth and velocity.

The hazard maps confirm that access and egress from the three MTC sites must be an important consideration for existing risk and future development. Emergency planning will form a crucial aspect of this consideration.

#### 4.4 Summary

The new Flood Zone mapping presents an estimate of the baseline probability of flooding. Flood extent and depth are both less than previously suggested by the Dodder CFRAM. The differences mainly stem from a decrease in estimated flow.

The primary source of flooding to the three MTC sites is from fluvial flow exceedance at upstream culverts generating overland flow that extends down the Dundrum Bypass and collects in a topographic low spot near the Library. The flow down/along the Dundrum Bypass and subsequent ponding causes flooding to the MTC sites. Flood depths are largely controlled by the ability of the flood water to re-enter the channel at the Library.

Impacts from potential future development at the 1% AEP are limited to a maximum of 0.05m increase in flood depth to open space and roads with no increase in flood depth to existing flooded property (assuming site 3 is raised in all three options). Flood hazard is still high or significant and will require consideration for existing and future development risk/emergency management.



Residual risk impacts at the 0.1% AEP exceedance flows are most significant. However, all residual risks are important considerations for future risk management and mitigation. The way in which the risk is managed, either through avoidance or wider catchment based mitigation is discussed in the next Section.



## 5 Planning Guidelines & Strategy

Building on the identification of existing and potential flood risk associated with development in the MTC zoned lands, this section will comment on vulnerability and appropriate uses, highlight potential management, emergency planning and mitigation measures and comment on the application of the Justification Test.

### 5.1 Application of the Planning Guidelines

#### 5.1.1 Risk Review

Proposed Options for the development of Sites 1, 2 and 3 have been assessed in relation to potential development scenarios discussed within Section 1. The results of the impacts are summarised in Table 5-1 below.

Significant negative impacts are only generated to existing or new flood receptors (properties) at the 0.1% AEP which is beyond the current design standard of flood mitigation design, but is an important consideration. As such it is a residual risk consideration that is used to assist both our recommendations for risk management and application of the Sequential Approach to zoning.

Residual risk of climate change and 50% culvert blockage are less severe than the 0.1% exceedance model tests.

Table 5-1 Summary of changes to flood risk as a result of various development options

Scenario	1% AEP Significant Impact?	Significant Residual Risk Impact?
Option A (Site 1 + 3)	No	Yes
Option B (Site 2 + 3)	No	Yes
Option C (Sites 1, 2 & 3)	No	Yes

**The increase in residual risk at the 0.1% AEP and under blockage scenarios will require significant flood risk management measures for the wider Dundrum Slang River catchment, rather than piecemeal measures within the specific sites. If wider measures are not implemented then residual risk to others will be significantly increased. Consideration of any potential wider measures should include floodplain storage to reduce peak flow volumes rather than increase conveyance, otherwise risk downstream will be increased.**

#### 5.1.2 Planning Strategy

The Planning Guidelines stipulate that the Sequential Approach should be applied within a given site boundary to aid the management of flood risk and development, the application of this approach is discussed within Appendix B, Section 3 of the Planning Guidelines Technical Appendices.

The DECLG Circular PL2/2014 also provides clarification under Section 4.27a that where regeneration is to occur within Flood Zone A/B the Planning Authority must specify the nature and design of structural or non-structural flood management measures prior to development.

It is clear from the consideration of the suite of risks (climate change, blockage and flow exceedance - 0.1% AEP) that the potential impact of development within the combination of Sites 1-3 poses significant impact to others, and that any mitigation must cater for the 0.1% AEP flood event. Structural flood management methods would involve catchment scale measures including storage and attenuation to reduce flow volumes.

There is currently no formal specification of the nature and design of catchment management measures and the MTC lands remain at potential risk of flooding. **In this case a policy of**



**avoidance of highly or less vulnerable land uses within Flood Zone A & B has been adopted.** Further, where water compatible uses are proposed, such as surface level car parking, all existing conveyance routes and floodplain storage volumes must be retained. This policy will also safeguard areas for mitigation.

Considering the principles discussed above, the three subject sites (which all include varying percentages of land within Flood Zone A & B) must follow the stated approach for any future re-development proposals:

1. Substitute water compatible uses for lands within Zones A/B. These must avoid any net loss of floodplain volume and should have no impact on flood risk;
2. Within areas of Flood Zone C, ensure that surface water management measures are in line with DLR policy and that an emergency plan is formulated to ensure access and egress to Flood Zone C can be maintained from any development within MTC sites.

Specific guidance for each site is provided in Section 1.

## 5.2 Comment on Risk and Potential Non-Structural/Structural Responses

Whilst the detailed nature and design of any potential risk management measures are not formally specified for the MTC lands, it is important to consider the current position of the Dodder CFRAM and the potential requirements for mitigation.

The source of risk to the MTC sites and the wider area is related to the exceedance of culvert capacity further upstream on the Slang River which causes overland flows and ponding at the topographic low spot near the Library. The risk of flooding is therefore transferred downstream towards Taney's Cross (and potentially further downstream) by surcharging culverts and will be most effectively mitigated in Dundrum by adopting a catchment based approach.

Non-structural responses focus on reducing the impact to people by warning, planning and preparedness, and through development management and planning. Structural responses focus on physical works to constrain or attenuate flows. Structural and non-structural responses were considered under the Dodder CFRAM, however this does not satisfy the requirements of the DoECLG Circular PL2/2014. Based on the findings of this report the CFRAM management measures have been commented on in Table 5- below.

Table 5-2 Summary of Dodder CFRAM Management Measures and JBA Measures/Comment

Measure	Dodder CFRAM Comment	JBA Comment
CFRAM: Improvement of channel conveyance	Watercourse is heavily culverted limited scope to improve conveyance without large capital spend. BCR <1	Requires a review, channel conveyance would not work on its own without consideration of culvert capacity and downstream impacts, which suggests flood storage is a requirement.
CFRAM: Hard defences	Hard defences over relatively short section will alleviate the majority of flooding. BCR>1	As above; review and consider feasibility under a wider scheme or Minor Works applications (see below).
CFRAM: Proactive maintenance regime	Will reduce the likelihood of localised flood events. BCR>1	Management of blockage and debris is essential and has been implemented at Dundrum Shopping Centre Culvert with CCTV and level monitoring. Consider expanding to other culverts at risk of exceedance.
CFRAM: Reactive maintenance regime	Will reduce the likelihood of localised flood events. BCR>1	As above.
CFRAM: Public awareness campaign	Technically straightforward, requires only a few properties to benefit to have positive BCR. May cause concern to public to	Essential that risk is communicated to the public and options provided to inform and warn residents/businesses.





	know property is at risk.	
CFRAM: Rehabilitation of existing defences	Technically straightforward to repair defects in existing flood wall to ensure current level of flood protection is maintained	Review and consider feasibility. Possible Minor Works application.
CFRAM: Individual property protection or flood proofing	Only 20 properties to protect and would provide full protection.	This has been employed at Dundrum Shopping Centre and it is recommended that Property Level Protection is recommended to at risk residents/businesses as part of the Public Awareness Campaign

To satisfy the requirement of Circular PL2/2014 a more detailed investigation of structural/non-structural responses would need to be carried out. Present analysis suggests that the Dodder CFRAM mitigation measures may be difficult to achieve or very costly to implement due to the highly urbanised nature of the catchment and limited options for attenuation/storage. Table 5-3 below provides recommendations for wider management of risk in Dundrum.

Table 5-3 Recommended Risk Management Approach

Potential Approach	Comment
Strategic Review of Options	As part of a pre-feasibility/options study an informed decision should be made to either; adopt local measures to protect existing property or conduct a comprehensive review the Dodder CFRAM options, increase the options/scope and investigate a series of Minor Works / Strategic Catchment scale measures. The current level of information is not sufficient to allow the potential success of the measures to be made.
Local Measures	Possible development of formal overland flow route (incorporating the existing roadway) from upstream of Dundrum Shopping Centre to Taney's Cross. Improved conveyance back into channel in open sections. Aim is to reduce risk from current overland flow route and ensure ponding at Taney's Cross is minimised. Initial modelling suggests that directing more flow back into the channel at the Library culvert may not be effective at the 0.1% AEP due to the limited capacity of the Library culvert. Improved flood storage and/or other local measures may need to be combined in a more detailed investigation of this/these options.
Catchment wide schemes culvert/channel conveyance	Consider potential schemes relating to upstream storage and/or culvert capacity increases at Dundrum Library Culvert, Sandyford Road Culvert and Ardglass Culvert. This will seek to review, revise and expand on existing options suggested by Dodder CFRAM. Initial modelling suggests that without some kind of attenuation storage (to replace that lost at Taney's Cross) the increased conveyance will increase flood risk further downstream, negatively impacting property. SuDS retrofitting may also be considered. Any considerations must therefore extend to the confluence with the River Dodder. The aim should be to reduce channel and culvert peak flow and reduce culvert and channel exceedance over a wider area. The potential benefits are more wide ranging but this is likely to incur very high capital costs.
Flood Warning	Extend level warning sensors to culverts upstream of Dundrum Shopping Centre to provide additional proactive maintenance measures. Consider using level sensors to provide warning to residents/businesses at risk of downstream overland flow routes/flooding. A useful measure but the lack of warning time may not prove effective.



## 6 Site Specific Flood Risk Management

When approaching the management of flood risk on individual sites, a number of factors should be considered to ensure the response to the risks is appropriate and proportional to the scale of both the probability of flooding, and the consequences of the flood. These general design considerations are then strengthened by site specific recommendations for each MTC site and guidance on how site specific FRAs will be tendered.

### 6.1 Design Considerations

Considerations and guidance for site design/analysis are summarised in Table 6-15 below. The considerations are then given added context from specific recommendations for each site in Section 6.2.

Table 6-15 Management Considerations and Guidance

Consideration	Guidance
ulnerability of Use	Adopt the avoidance principle noted within 5.1.1 and follow the applicable considerations below.
Maintenance of Flow Paths and no Loss of Floodplain Volume	Flow conveyance pathways (such as at the Library Site and along the Dundrum Bypass) must be retained or improved when implementing water compatible land uses within Flood Zone A/B. There must be no loss of floodplain within these zones.
Reduction of Surface Water Runoff	All sites should seek to reduce surface water runoff by considering SuDS options (including retrofitting) and complying with the GSDS and general DLR policies on surface water design.
Modelling Detail	The approach of avoiding development in Flood Zone A and B will not require hydraulic modelling, but if improvements to flow paths or increases in floodplain storage are proposed as part of a development, the benefits must be demonstrated through detailed hydraulic modelling. In this case, the model must include the Ardglass Culvert (see Figure 3-) at the upstream model extent and continue downstream of Taney's Cross. The model should include appropriate consideration of hydrology and sensitivity to flow. Hydrology should include a balanced assessment of potential flow estimation methods and seek to justify the choice of flow.
Manage Residual Risk	Guide FFLs are provided in Section 6.2. With development focussed within Flood Zone C the potential impacts of culvert blockage, climate change and exceedance flows (0.1% AEP) are appropriately managed. Basement levels or levels beneath potential flood levels should only consider water compatible land uses and not be used for critical electrical or mechanical purposes. Access to basements should not be considered unless it is raised above potential flood levels - to prevent the ingress of floodwater to the basement.
Flood Risk Management and Design	Appendix B of the Technical Appendices to the Planning System and Flood Risk Management Guidelines should be consulted when considering design and layout.
Emergency Planning	All sites must consider emergency planning for potential flood events on neighbouring lands within Flood Zone A/B. Issues of access, egress and warning/preparedness should be tackled.
Impact on Others	The above considerations must be achieved in a manner that will not increase flood risk elsewhere, and, if practicable, will reduce overall flood risk. Applying the Sequential Approach should ensure this but water compatible uses within Flood Zone C must adhere to the guidance above in relation to flow paths and floodplain volume.



## 6.2 Suggested Site Specific Approach

1. All sites must follow the overarching strategy highlighted in Section 5.1.1.
2. Site design must be progressed according to the considerations listed in Table 6-15.
3. All development must submit an appropriately detailed site specific FRA and emergency plan that should be completed in accordance with Table 6-15 (above) and; Table 6- (below) as well as the Planning System and Flood Risk Management Guidelines. Further Guidance is provided in Appendix A of the Technical Appendices of the Planning Guidelines.
4. Prior to completing any detailed design or FRA it is recommended that a pre-planning consultation is undertaken to fully discuss the design requirements and considerations.

Specific comments on individual sites are included below in Table 6-.

Table 6-2 Site Specific Design Requirements

Site	Summary/Approach	Minimum FFLs (including freeboard)
1. Shopping Centre Phase 2 Lands	<p>Sequential Approach; water compatible land use only within Flood Zone A/B. All less vulnerable/vulnerable development to be kept within Flood Zone C.</p> <p>The size of the site presents the most significant potential for large scale mixed use development within the local area, but the nature and extent of possible development is limited by the Sequential Approach. Care must be taken when considering the road/access and ventilation requirements to preclude flow from entering any basement excavated below flood level.</p> <p>A full emergency plan with access and egress to Main Street is compulsory.</p> <p>Worst case residual flood level to north of site related to overtopping of the road at Taney's Cross. Other FFLs recommended to be higher than the Dundrum Bypass and potential flood levels. Existing flow paths along the Dundrum Bypass should be maintained.</p> <p>The guidance listed 1-6 in Section 6.2 must also be applied.</p>	<p>46mOD Malin at northern end of site.</p> <p>Rising to 47mOD.</p> <p>No levels to be lower than Dundrum Bypass.</p>
2. Dundrum Library	<p>Large percentage of the site is within Flood Zone A/B and the application of the Sequential Approach is not possible.</p> <p>Options are limited to managing existing development (minor alterations or renovations) on the site, future redevelopment is not possible under the current high flood risk conditions.</p> <p>The maximum flood level at the site is sensitive to culvert blockage and in the worst case; flood levels are controlled overtopping of the road at Taney's Cross. The position of the site is at an important conveyance point where overland flow can re-enter the open channel. Any changes to the site configuration could have a significant negative local impact and cannot be implemented without wider flood relief measures.</p> <p>A full emergency plan with access and egress to higher ground on Main Street should be implemented as a priority for the existing development, if possible.</p> <p>The guidance listed 1-6 in Section 6.2 must also be applied.</p>	<p>46mOD Malin - freeboard adjusted to raise levels above that of the maximum road level at Taney's Cross.</p>



Site	Summary/Approach	Minimum FFLs (including freeboard)
3. Opposite Library (Gym)	<p>The site is small in area but is situated within a low spot and has a high percentage area within Flood Zone A/B and the application of the Sequential Approach is not possible. The site does not impede conveyance routes.</p> <p>Options are limited to managing existing development (minor alterations or renovations) on the site, future redevelopment is not possible under the current high flood risk conditions.</p> <p>A full emergency plan with access and egress to higher ground within the adjacent site should be implemented as a priority for the existing development, if possible.</p> <p>The guidance listed 1-6 in Section 6.2 must also be applied.</p>	46mOD Malin - freeboard adjusted to raise levels above that of the maximum road level at Taney's Cross.

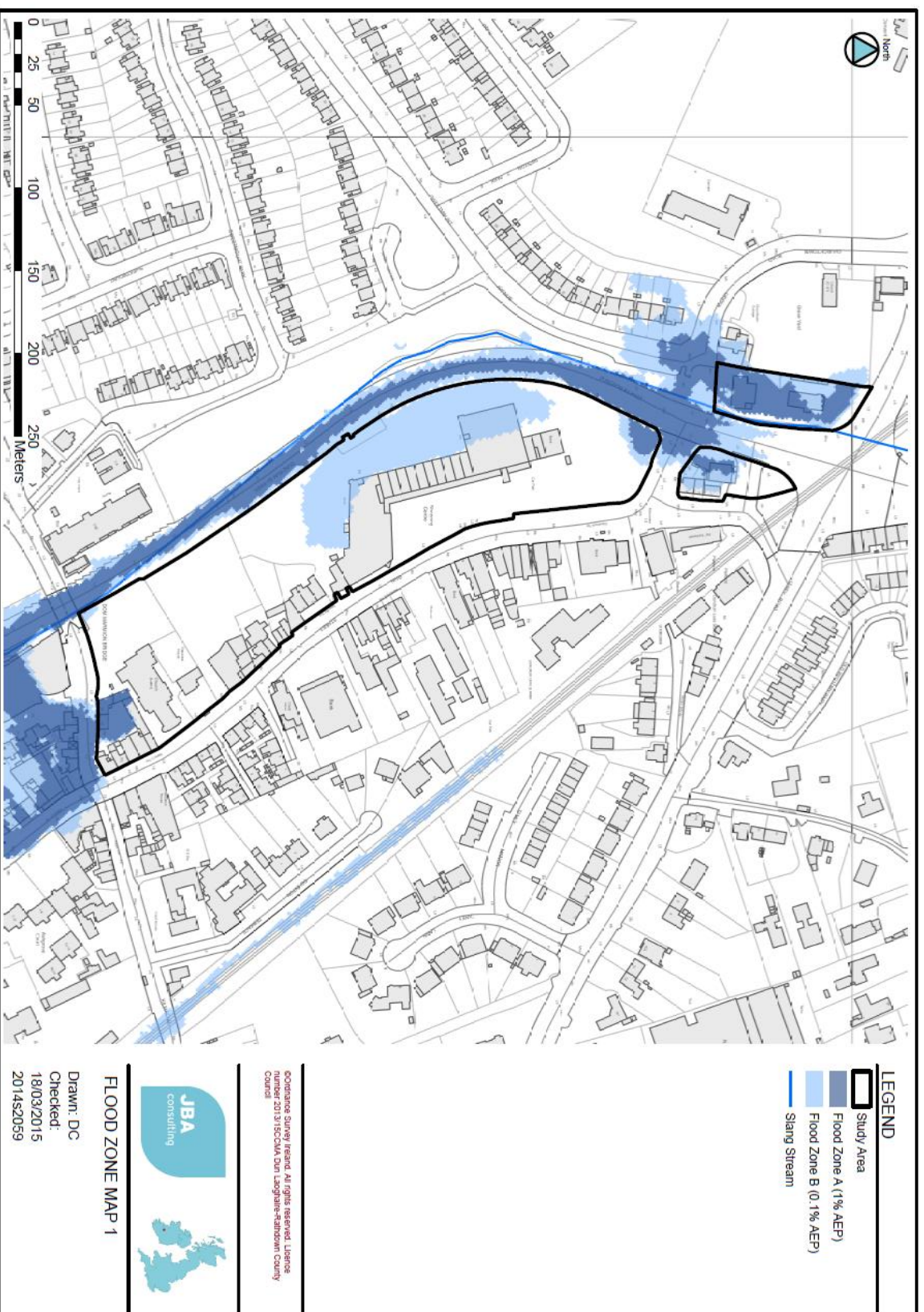
## 7 JBA Flood Mapping

The following pages present the suite of Flood Zone, Flood Depth, Depth Difference and Flood Hazard maps for the various scenarios and AEP events.

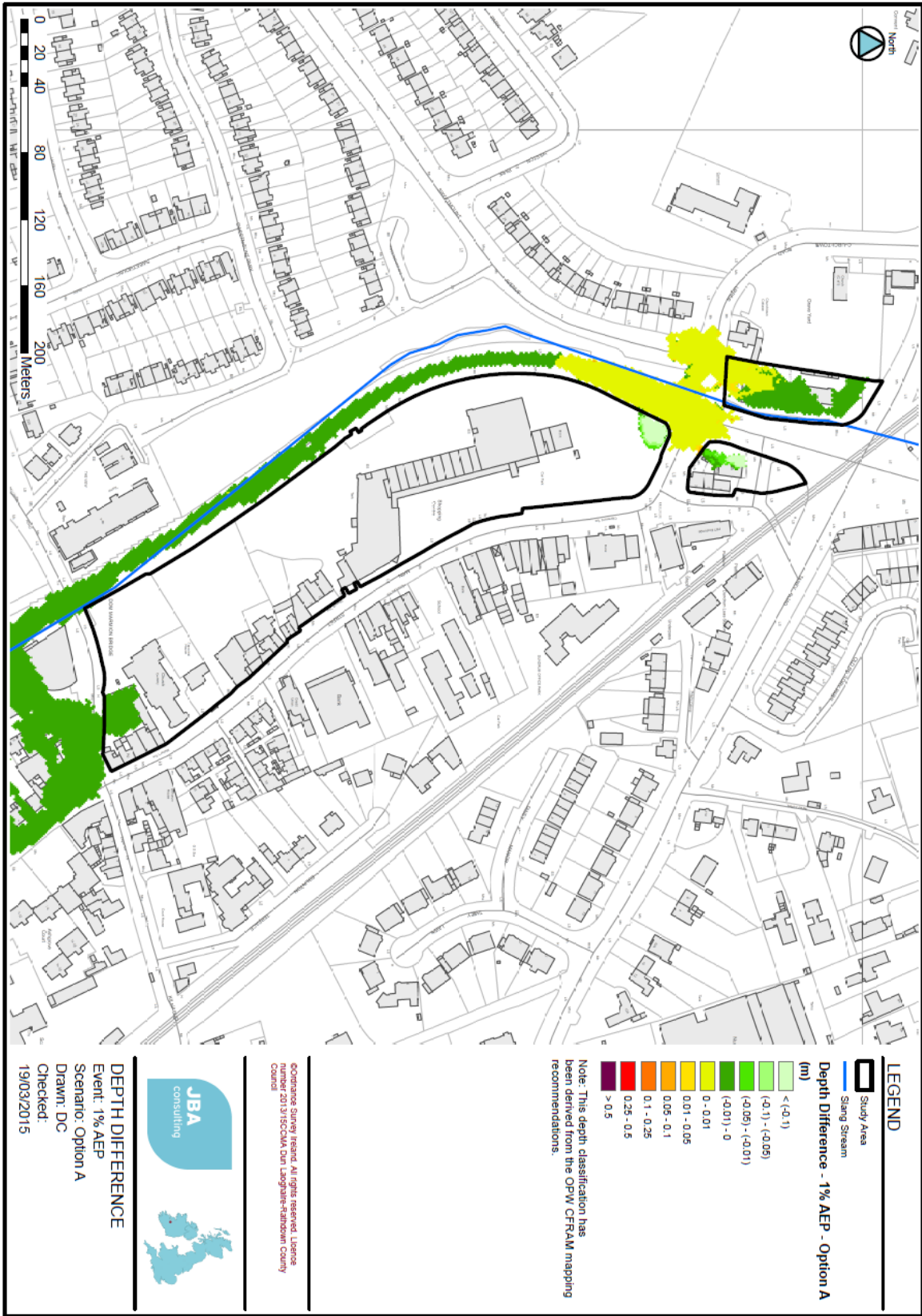




## 7.2 Flood Zone Map - Site Specific

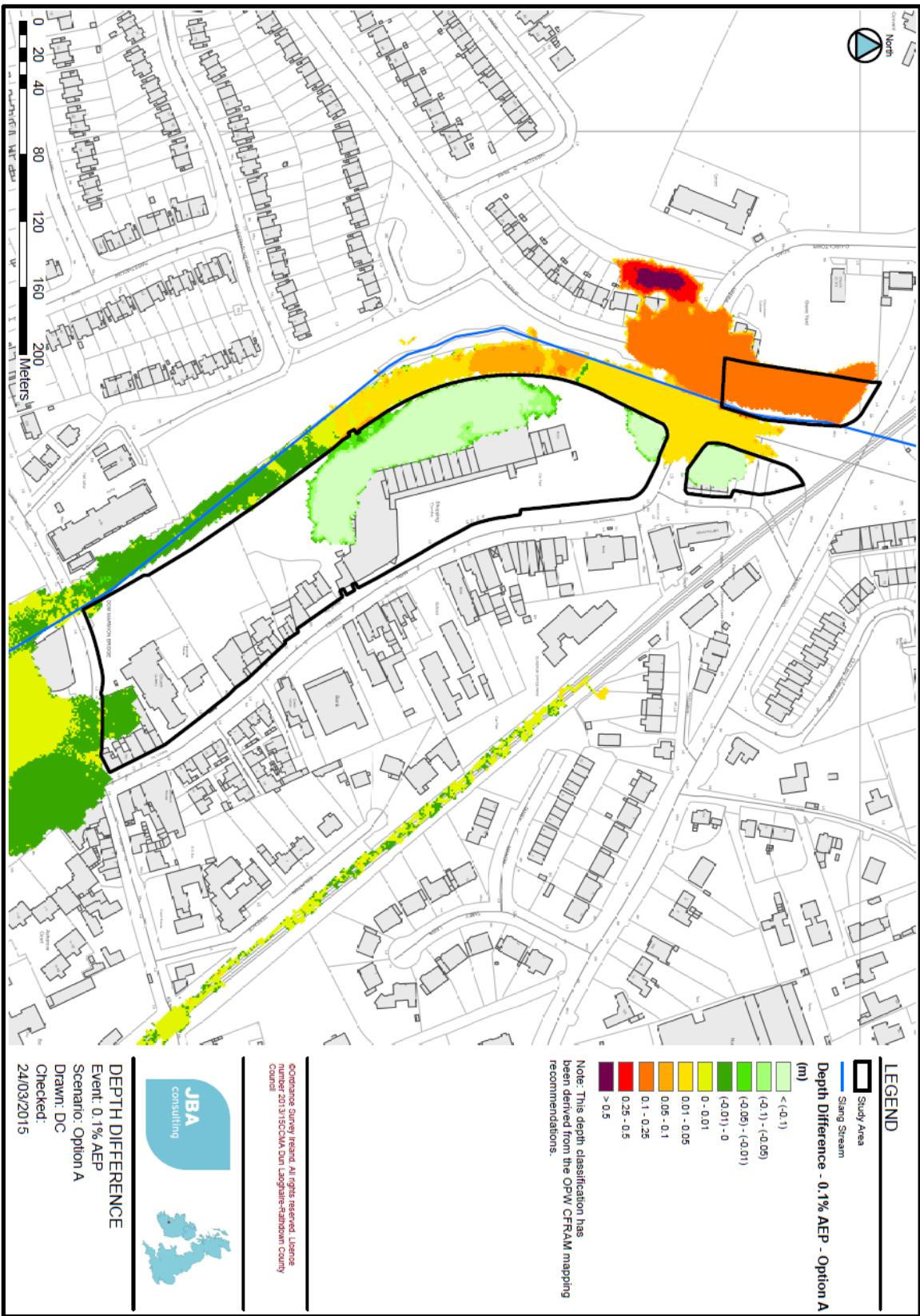


7.3 Depth Difference - 1% AEP - Option A





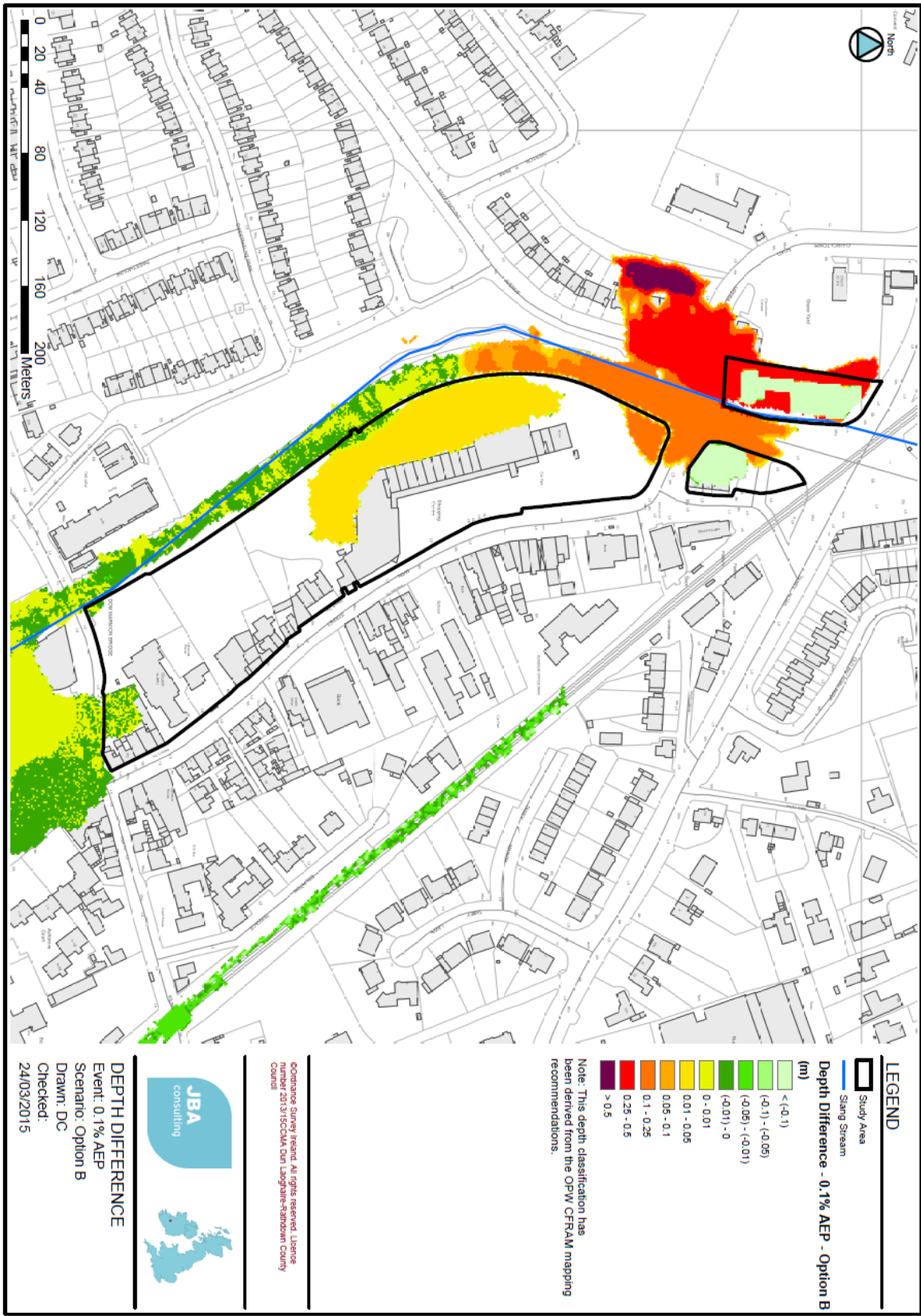
7.4 Depth Difference - 0.1% AEP - Option A



7.5 Depth Difference - 1% AEP - Option B

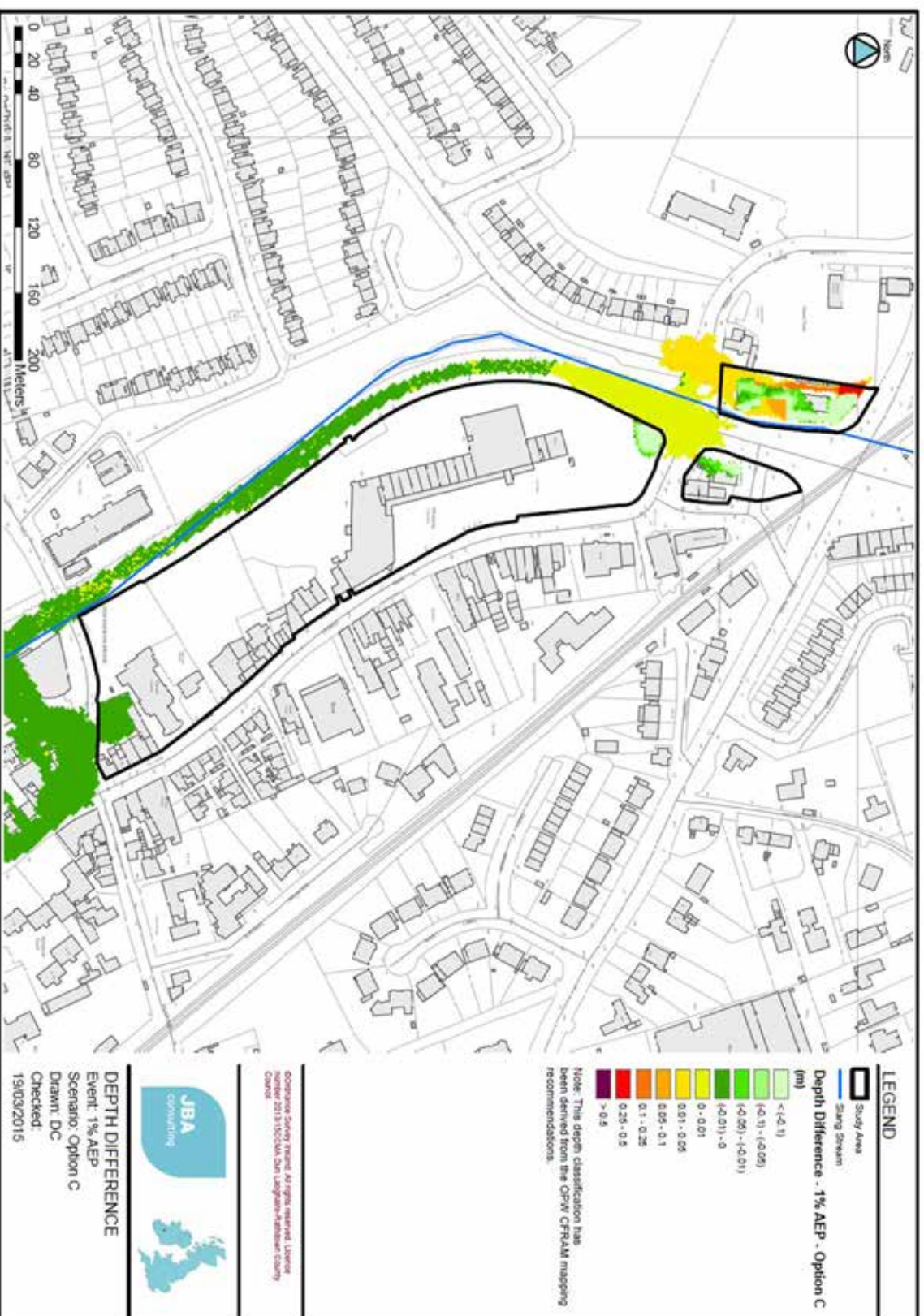


7.6 Depth Difference - 0.1% AEP - Option B

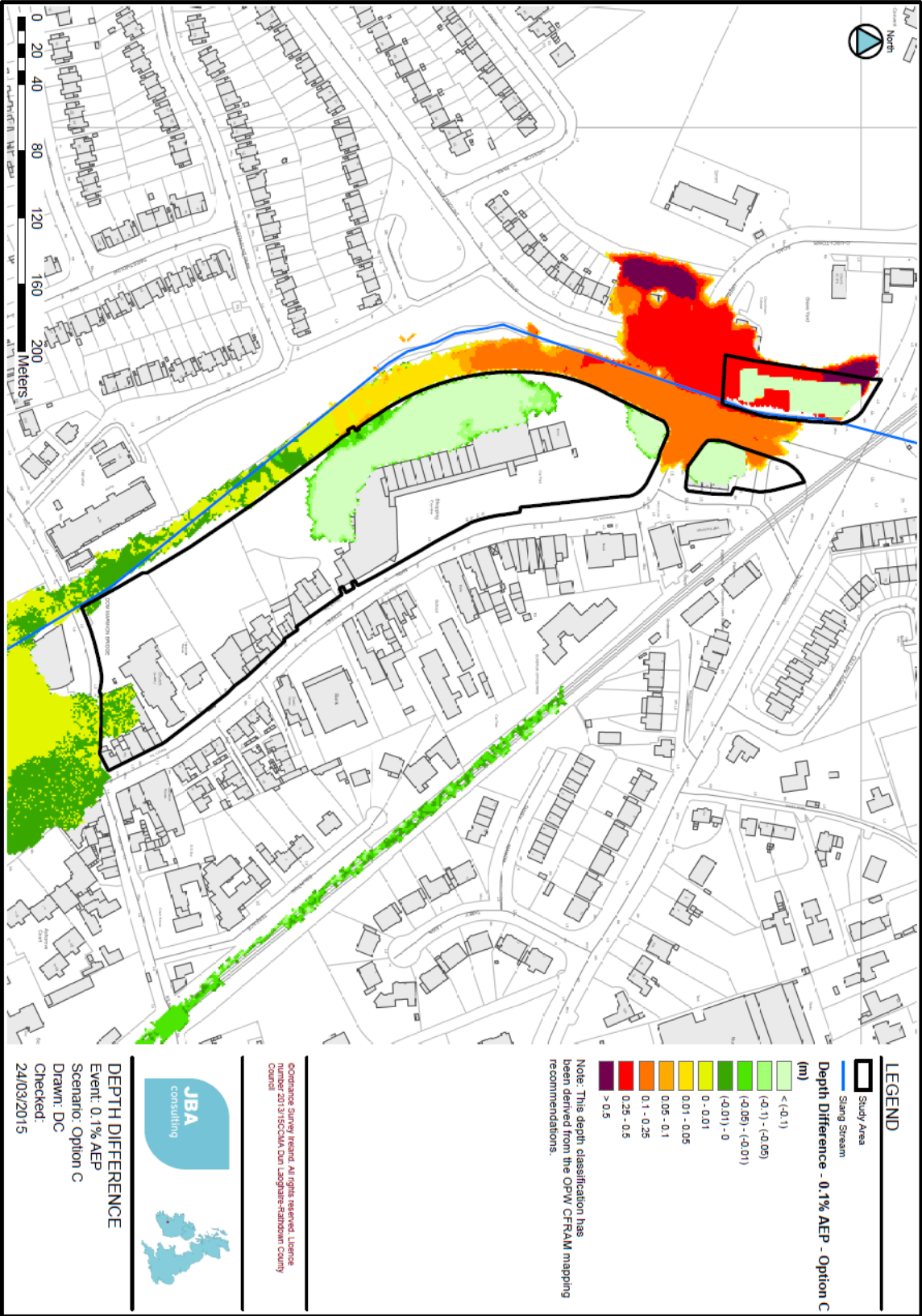




## 7.7 Depth Difference - 1% AEP - Option C

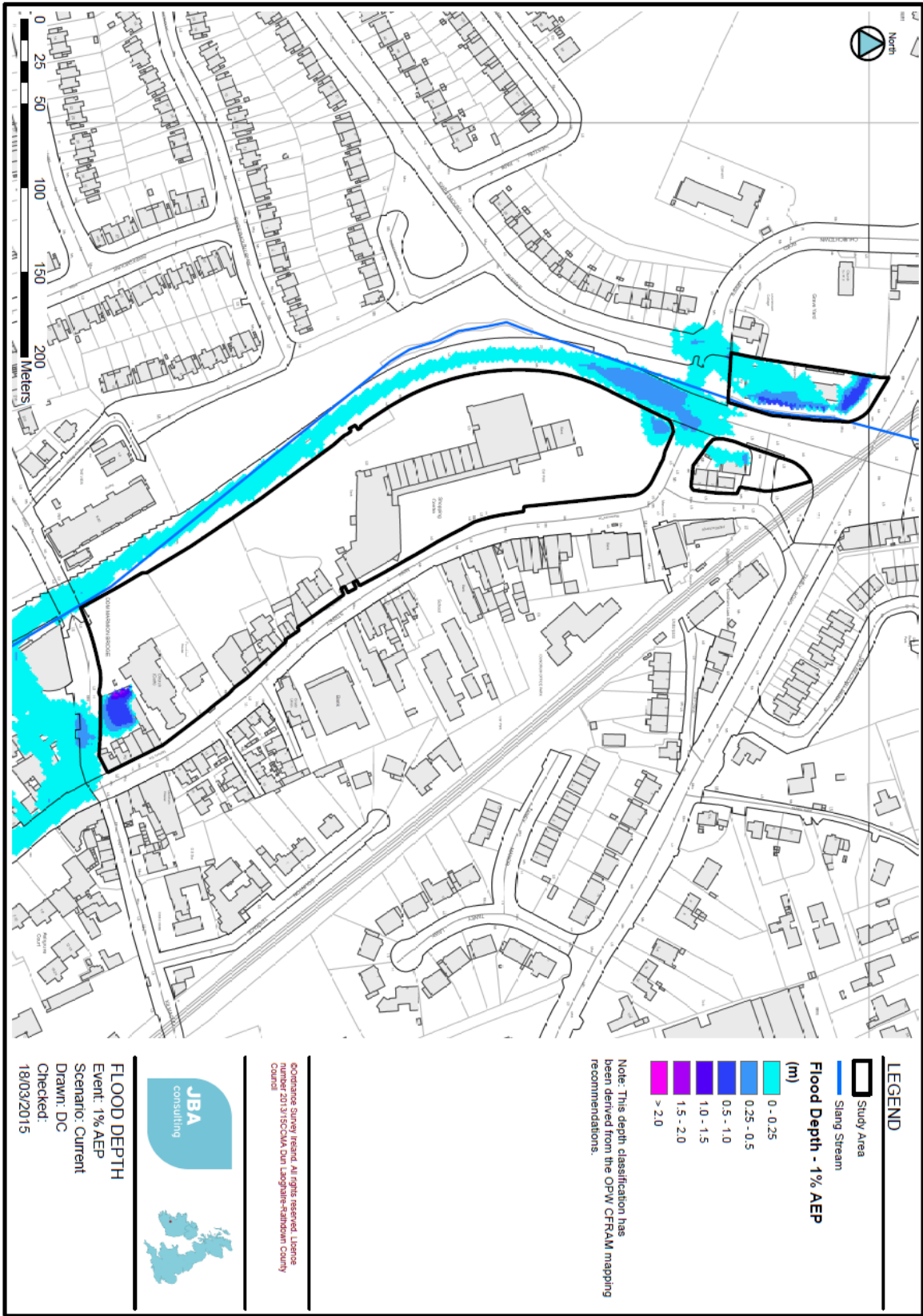


7.8 Depth Difference - 0.1% AEP - Option C

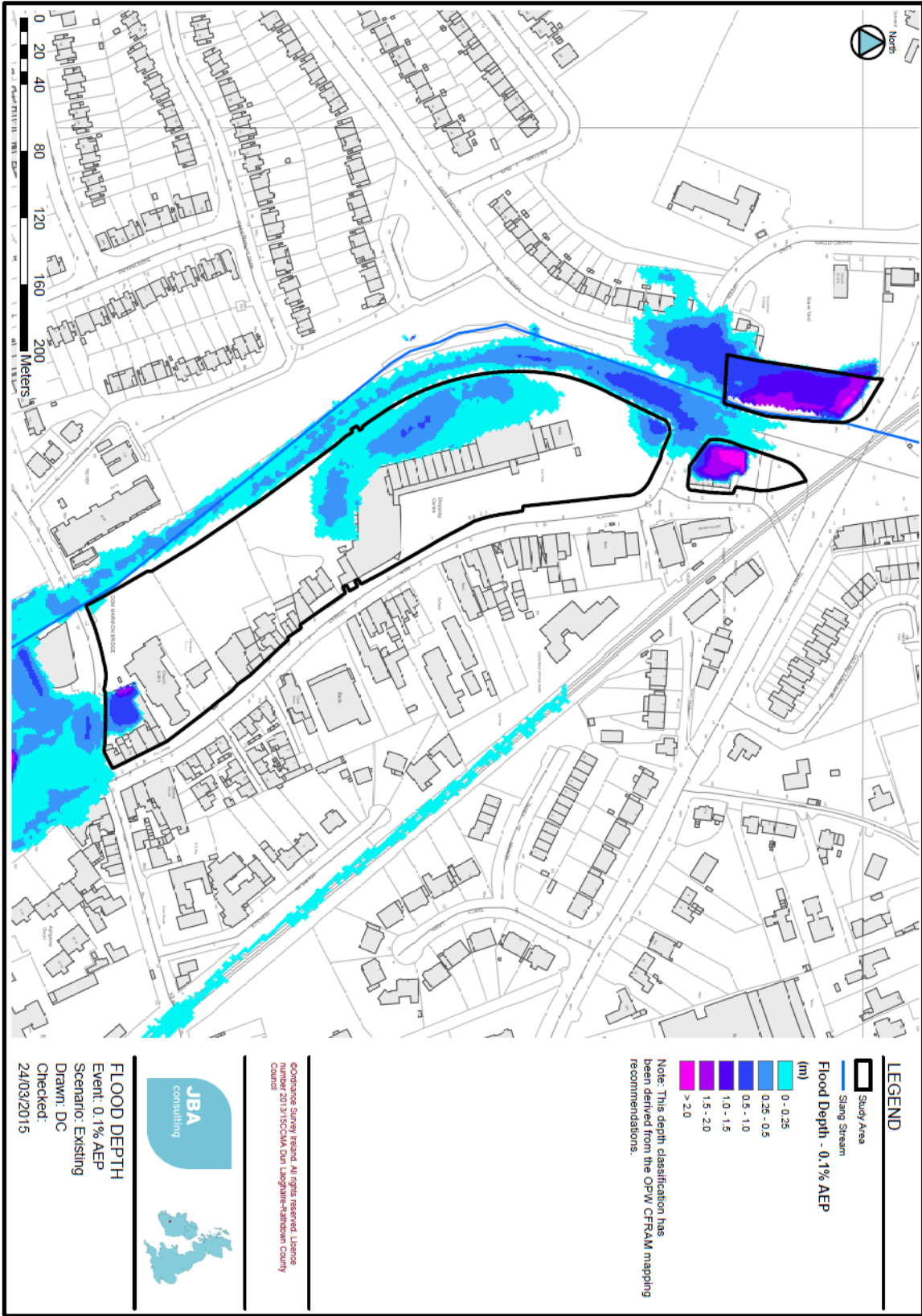




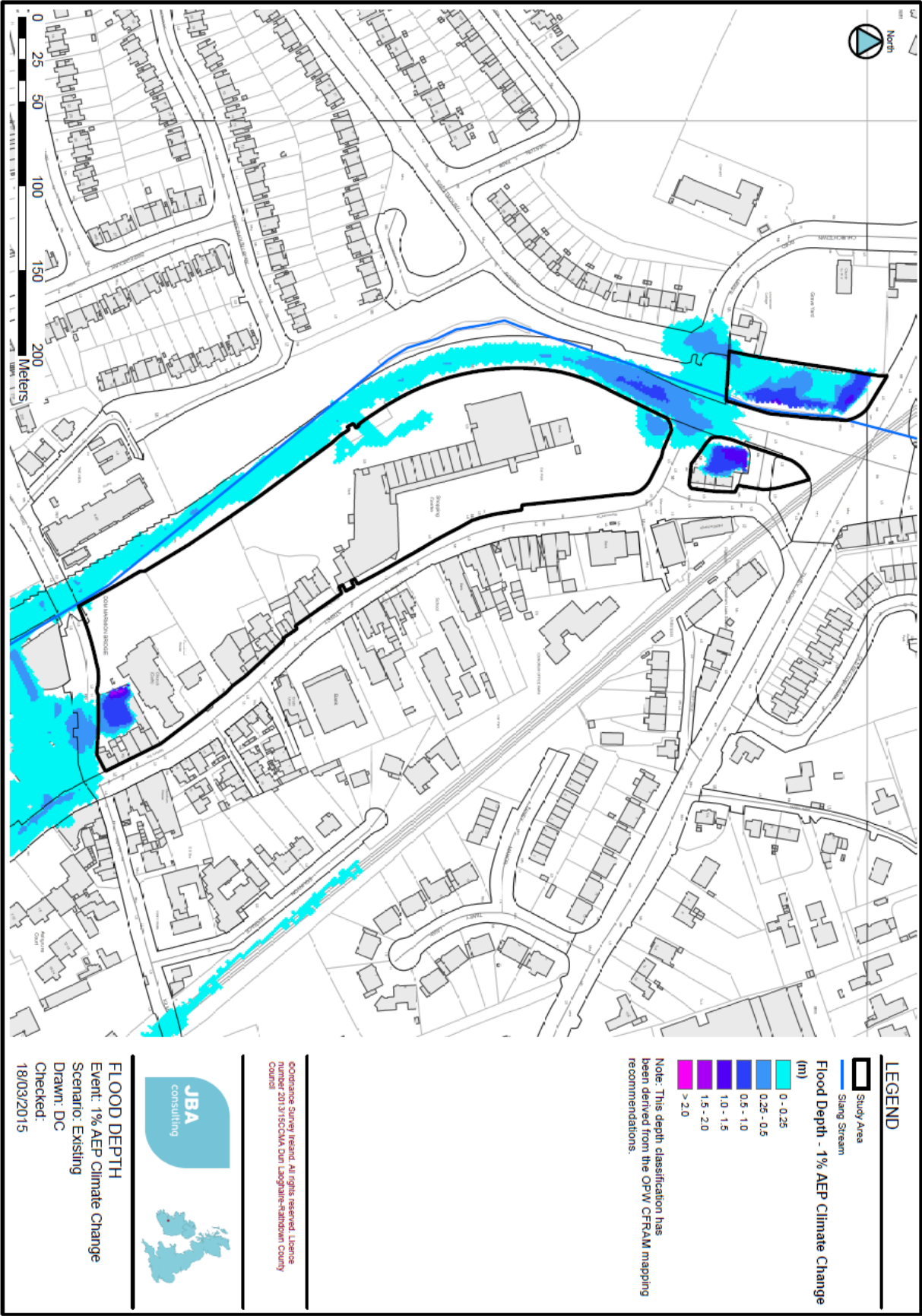
7.9 Depth – 1% AEP – Existing



7.10 Depth - 0.1% AEP - Existing

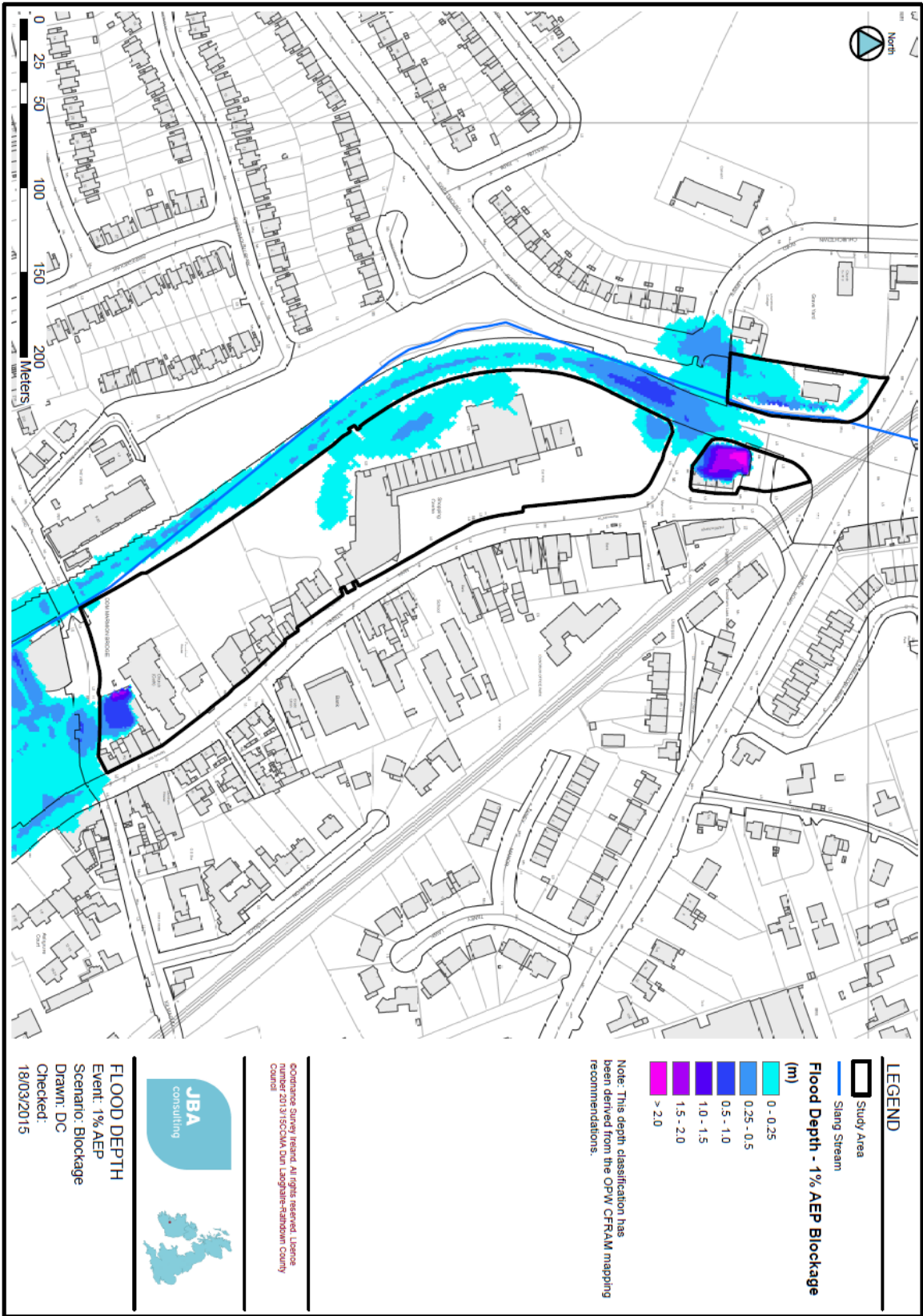


7.11 Depth - 1% AEP + Climate Change - Existing

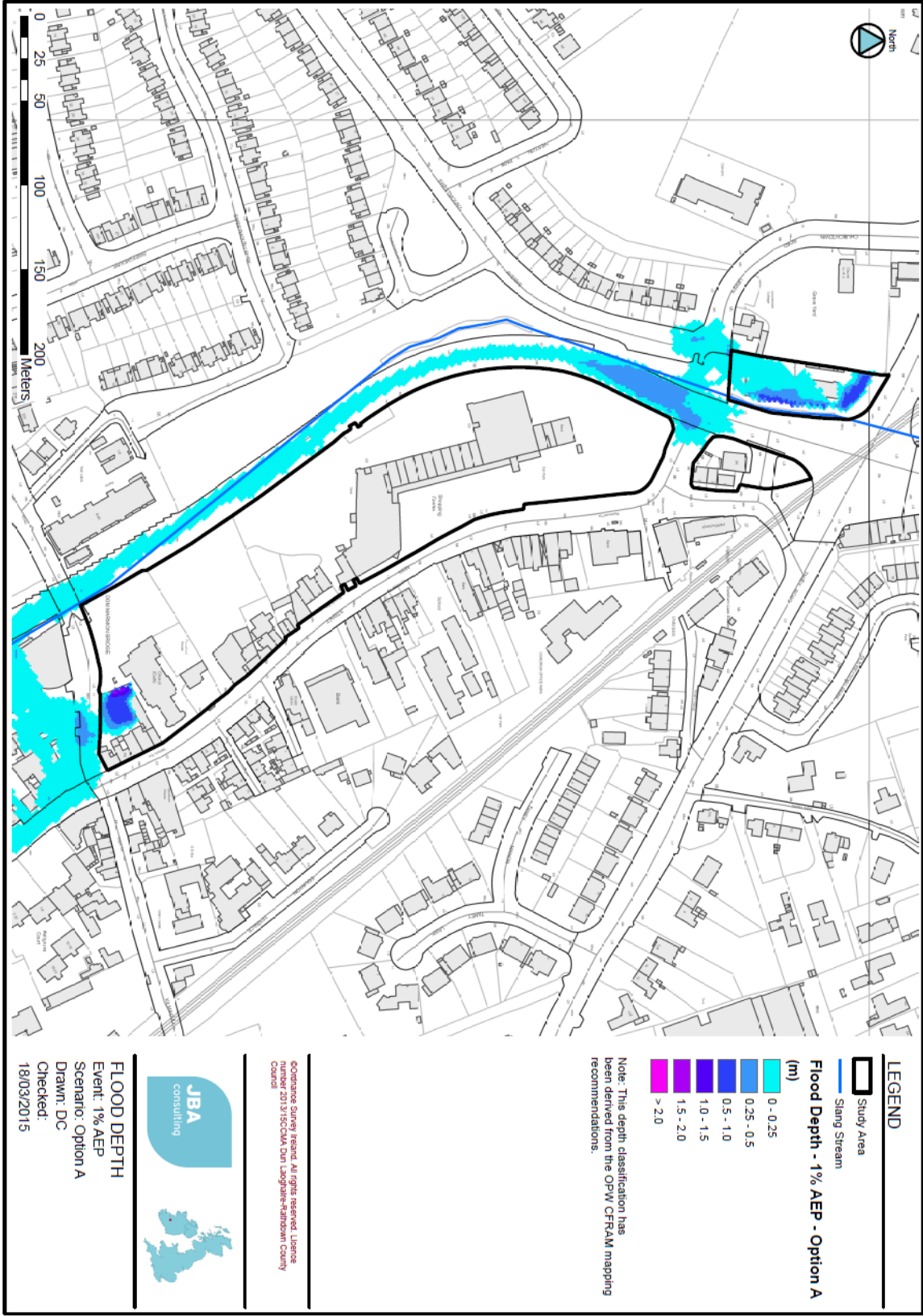




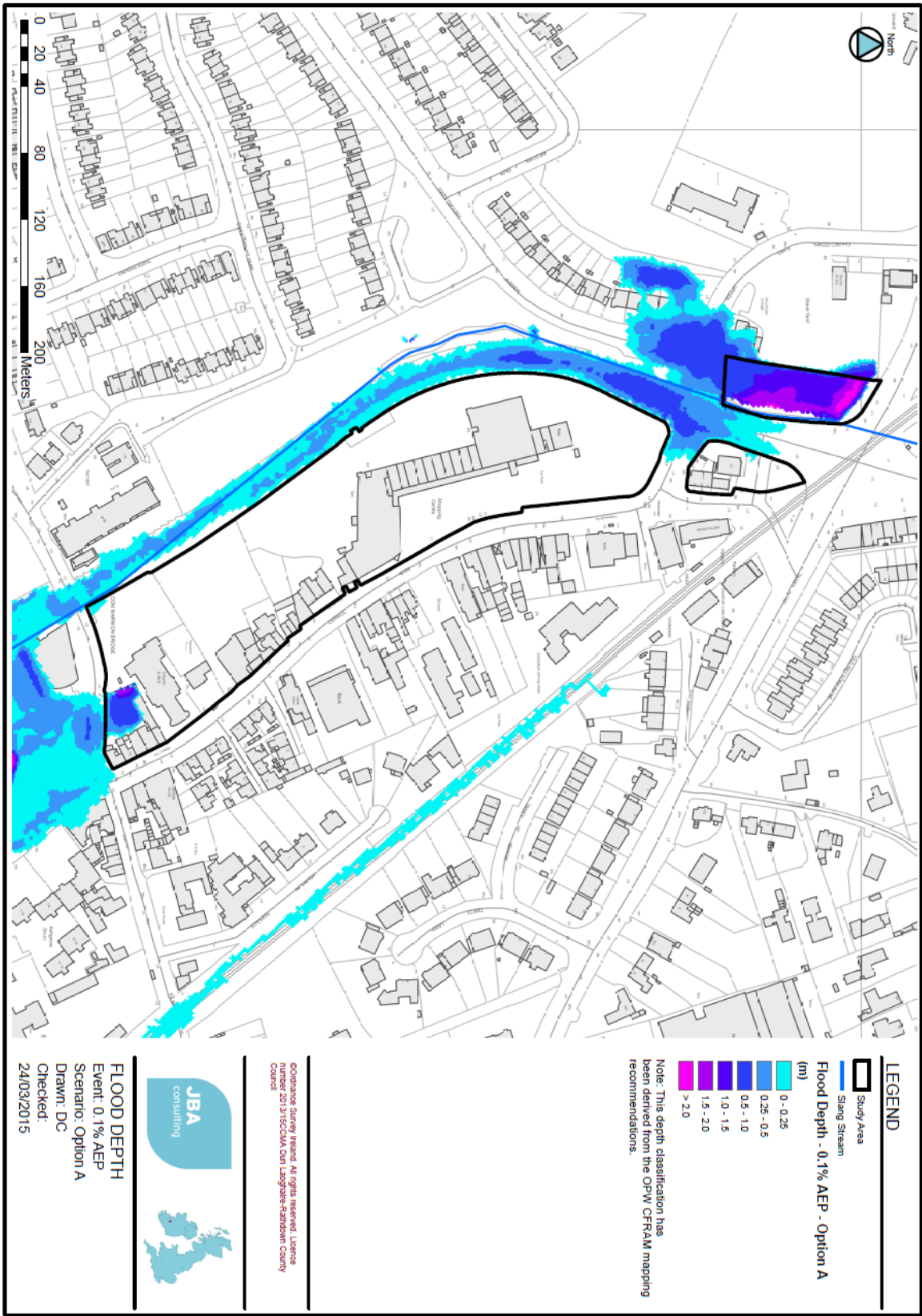
7.12 Depth - 1% AEP - Blockage



7.13 Depth - 1% AEP - Option A

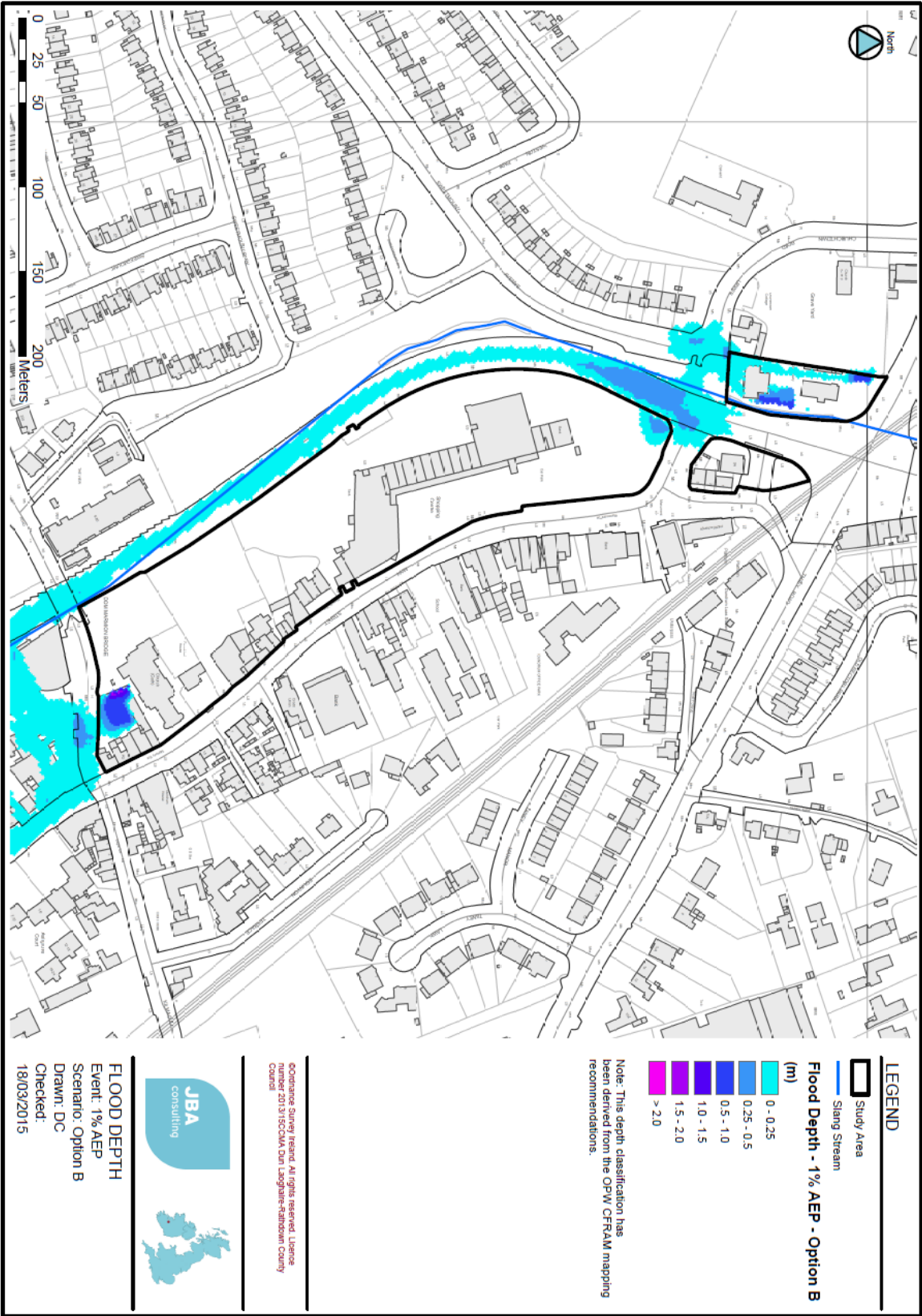


7.14 Depth - 0.1% AEP - Option A





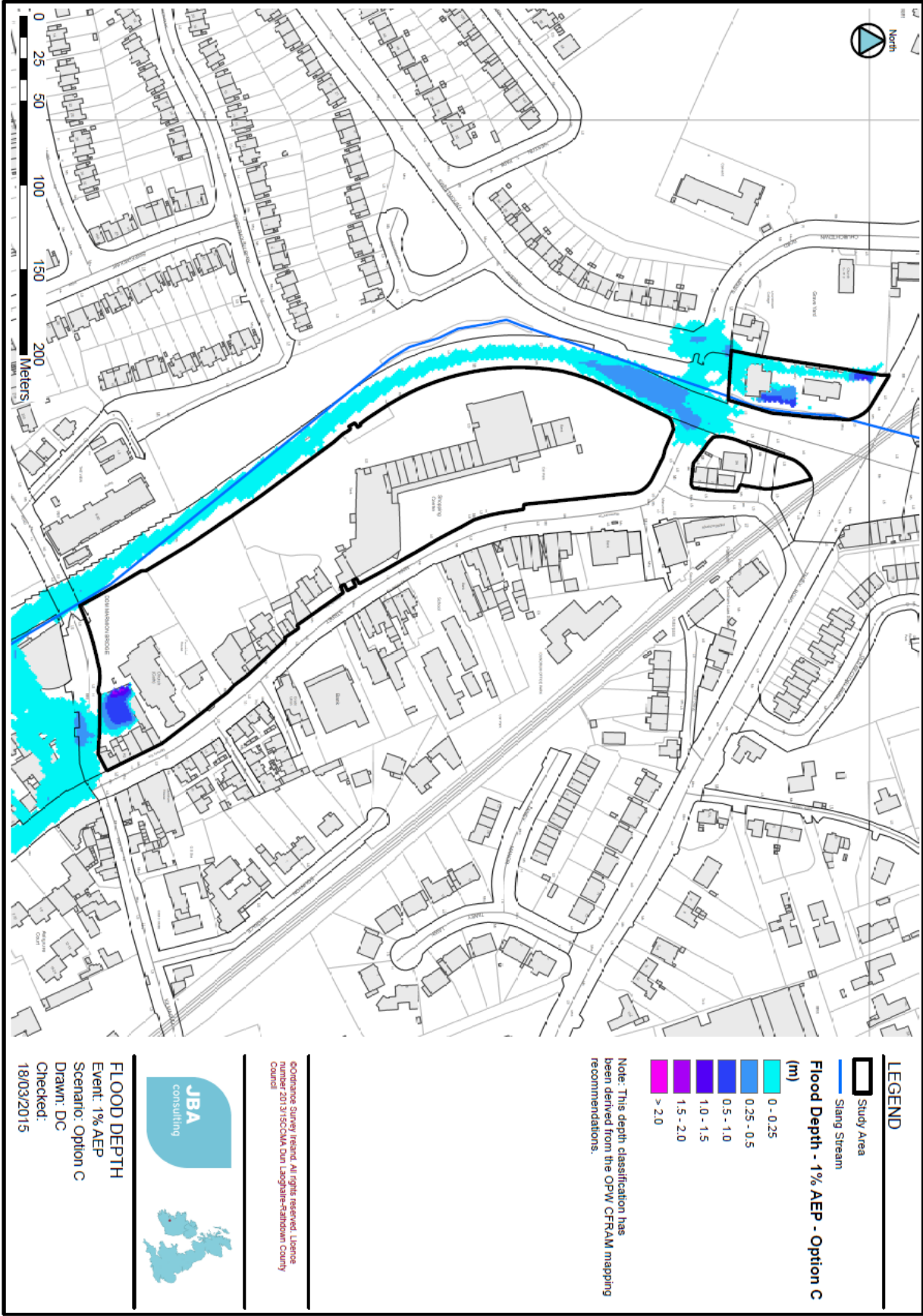
7.15 Depth - 1% AEP - Option B



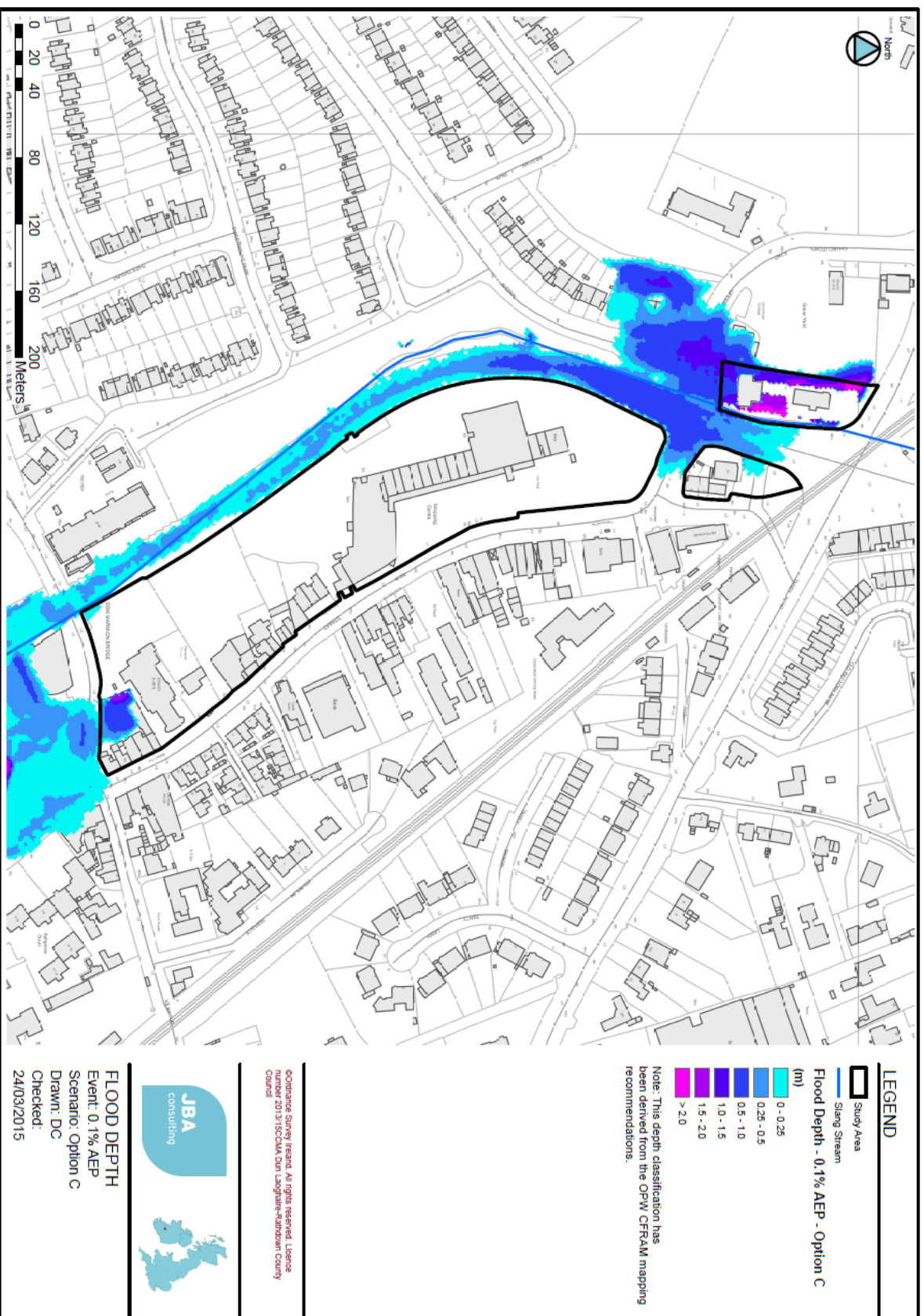
7.16 Depth - 0.1% AEP - Option B



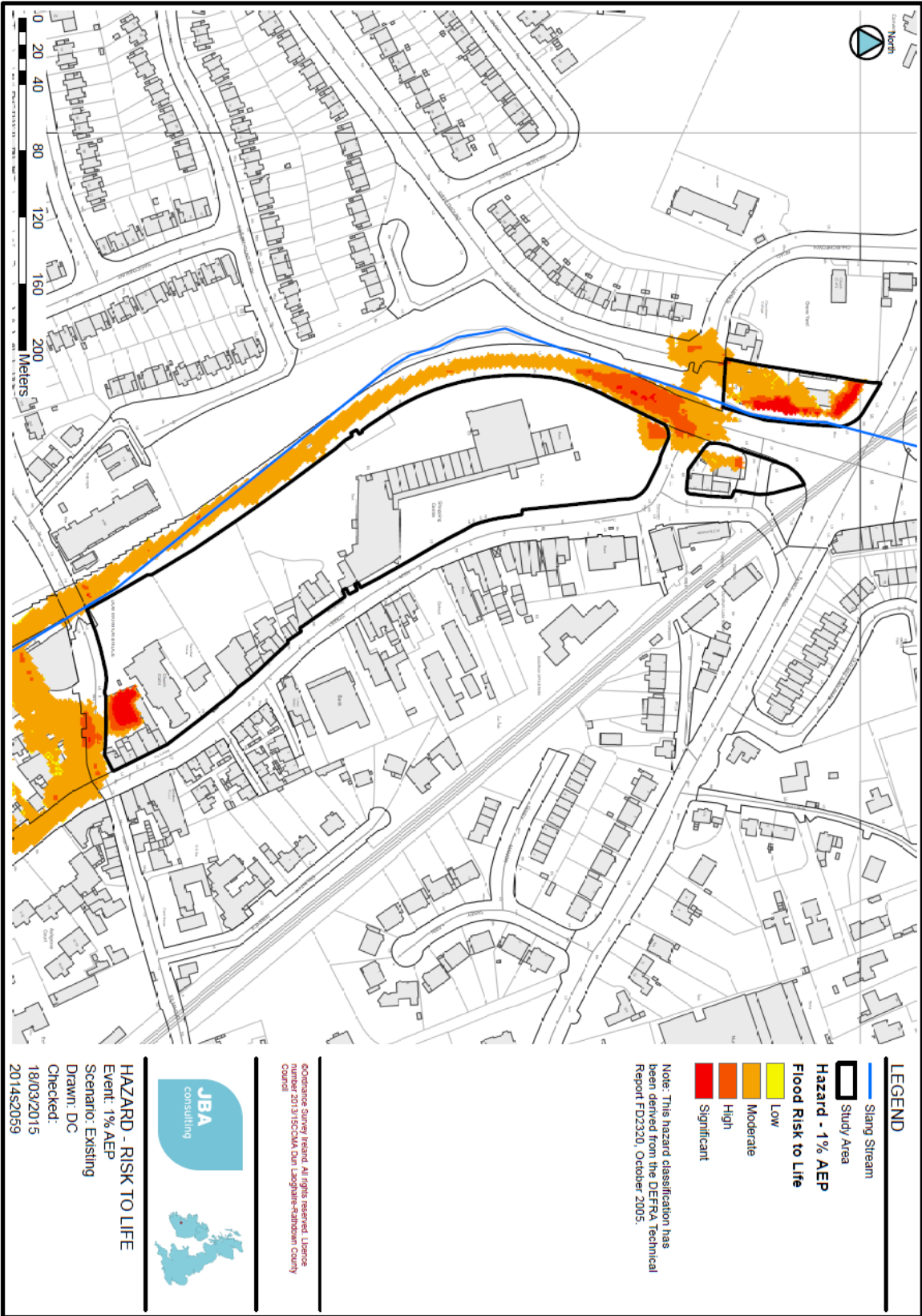
7.17 Depth - 1% AEP - Option C





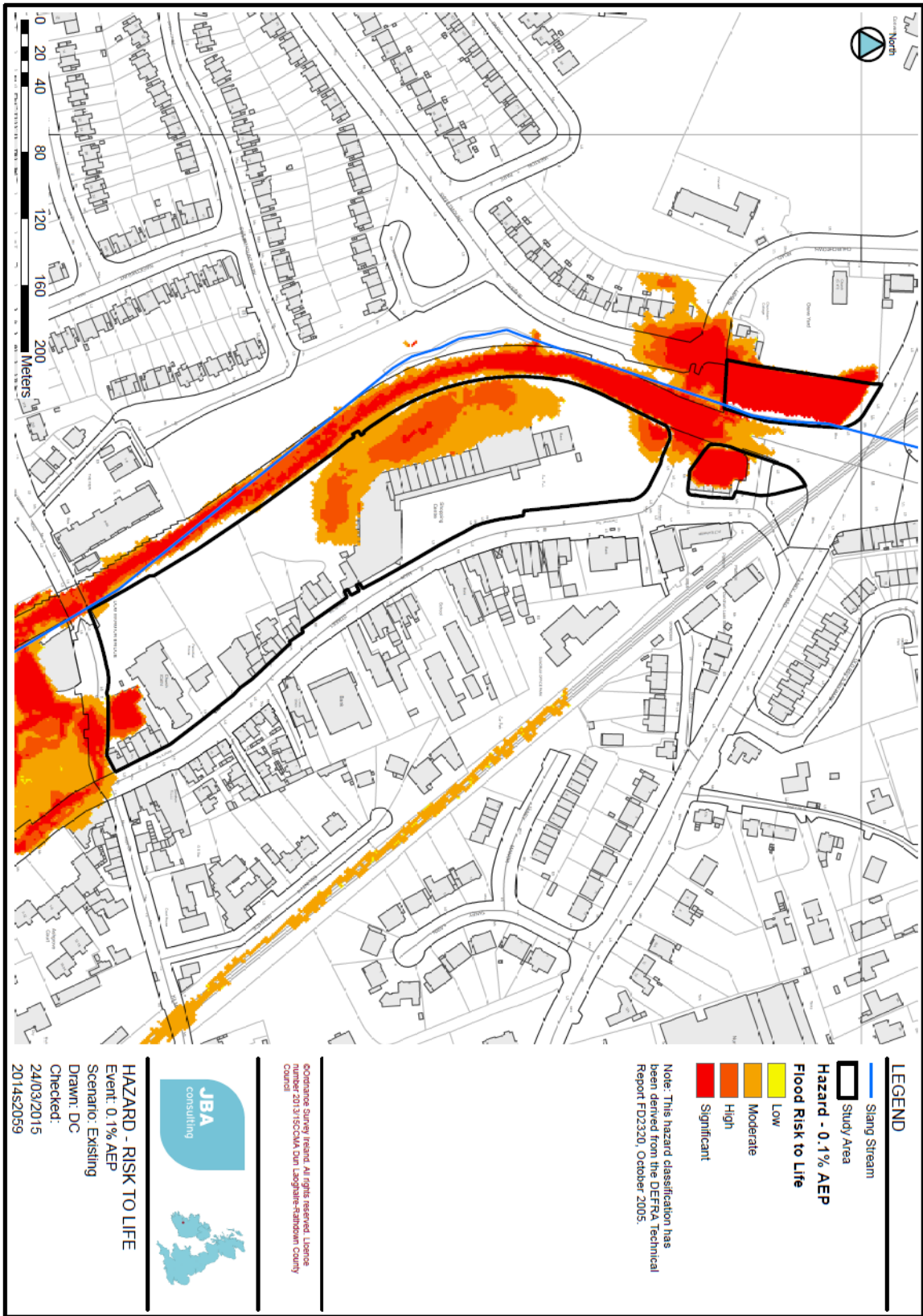


7.19 Hazard - 1% AEP - Existing

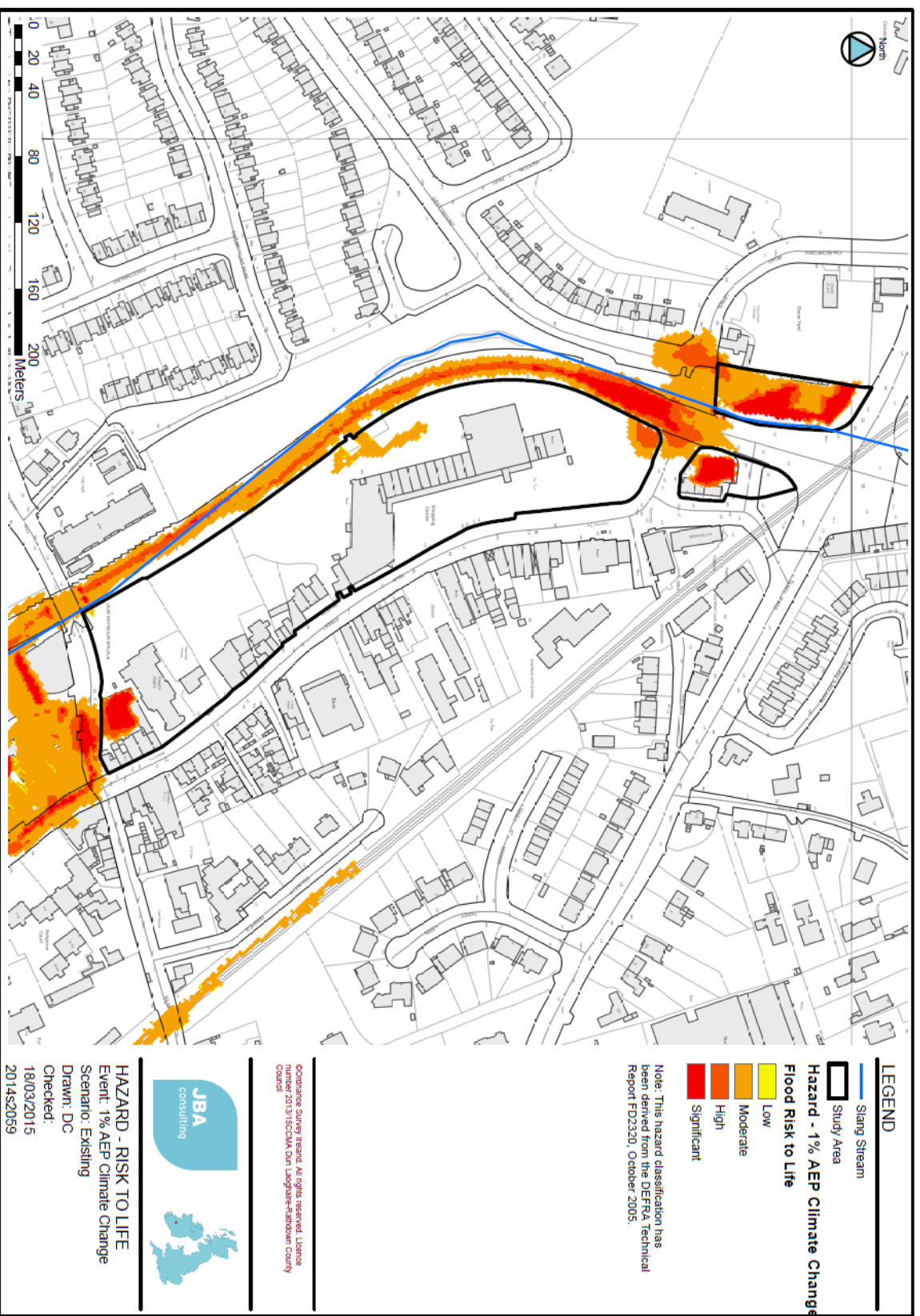




7.20 Hazard - 0.1% AEP - Existing



### 7.2.1 Hazard - 1% AEP + Climate Change-Existing





## Appendices

### A Hydrology

---

#### 1. PROJECT

##### 1.1 Project

---

Internal Reviewer	Ross Bryant
Office	Limerick
Project Manager	Ross Bryant
Analyst	D Forde
Project Title	Dundrum DP FRA
Client Name	DLR CoCo
Client Contact	DLR

#### 2 SITE

##### 2.1 Site Details

---

Site Code	LIMERICK_20/01/2015 15:29:47
Site Name	Dundrum Development
Site Location	Ireland
Site Description	This particular development is downstream of the Dundrum Town Centre and is susceptible to overland flooding from the Slang.
Watercourse Catchment	Dodder
Watercourse Name	Slang



## 2.2 Catchment

---

AREA (km2)	4.406
SAAR (mm)	776.68
FARL	1
S1085 (m/km)	37.0228
BFIsoil	0.5566
DRAIND (km/km2)	1.137
URBEXT	0.6135



## 3 FSR Rainfall-Runoff

---

### 3.1 Parameters

S1085 (m/km)	37.0228004455566
URBAN	0.961354498505592
MSL (km)	4.278
M5-2day (mm)	62
r	0.25
Catchment wetness index (mm)	112.7
WRAP Soil Class 1	0
WRAP Soil Class 2	1
WRAP Soil Class 3	0
WRAP Soil Class 4	0
WRAP Soil Class 5	0
Instantaneous unit hydrograph time-to-peak (hours)	0.750
Timestep (hours)	0.1
Standard Percentage Runoff (%)	30
Baseflow (m3/s)	0.085
Comments	
Storm Duration (hours)	1.5
Profile	Summer
Areal reduction factor (hours)	0.943



## 3.2 Results

---

Flow return period (years)	Rainfall return period (years)	Rainfall Depth (including ARF) (mm)	Peak Flow (m <sup>3</sup> /s)	Volume (000m <sup>3</sup> )	Specific Discharge (l/s/ha)	Growth Factor
2	2	12.817	4.93	23	11.19	1
5	5	16.911	6.48	30	14.71	1.31
10	10	20.007	7.65	36	17.36	1.55
20	20	23.297	8.9	41	20.2	1.81
75	75	26.943	10.28	47	23.33	2.09
100	100	33.066	12.59	58	28.57	2.55
1000	1000	54.198	21.82	100	49.52	4.43



### 3.3 Hydrographs

#### Return Period- 2 yr

Time (hr)	Total (mm)	Rainfall	Net Rainfall (mm)	Surface (m3 s-1)	Runoff	Total Flow (m3 s-1)
0.000	0.147		0.061	0.000		0.085
0.100	0.194		0.081	0.009		0.094
0.200	0.258		0.108	0.031		0.116
0.300	0.348		0.145	0.069		0.154
0.400	0.478		0.199	0.128		0.213
0.500	0.673		0.281	0.218		0.303
0.600	0.990		0.413	0.351		0.436
0.700	1.601		0.668	0.546		0.631
0.800	3.005		1.254	0.842		0.927
0.900	1.601		0.668	1.312		1.397
1.000	0.990		0.413	1.863		1.948
1.100	0.673		0.281	2.450		2.535
1.200	0.478		0.199	3.043		3.128
1.300	0.348		0.145	3.616		3.701
1.400	0.258		0.108	4.141		4.226
1.500	0.194		0.081	4.578		4.663
1.600				4.848		4.933
1.700				4.804		4.889
1.800				4.591		4.677
1.900				4.275		4.360
2.000				3.888		3.973
2.100				3.456		3.541
2.200				2.995		3.080
2.300				2.517		2.602
2.400				2.053		2.138
2.500				1.608		1.693
2.600				1.188		1.273



2.700			0.805	0.890
2.800			0.478	0.564
2.900			0.287	0.372
3.000			0.166	0.251
3.100			0.088	0.173
3.200			0.040	0.125
3.300			0.012	0.098





## Return Period- 5 yr

Time (hr)	Total Rainfall (mm)	Net Rainfall (mm)	Surface Runoff (m3 s-1)	Total Flow (m3 s-1)
0.000	0.194	0.081	0.000	0.085
0.100	0.256	0.107	0.012	0.097
0.200	0.340	0.142	0.041	0.126
0.300	0.459	0.191	0.091	0.176
0.400	0.630	0.263	0.169	0.254
0.500	0.888	0.371	0.288	0.373
0.600	1.306	0.545	0.463	0.548
0.700	2.112	0.881	0.720	0.805
0.800	3.965	1.654	1.111	1.196
0.900	2.112	0.881	1.731	1.816
1.000	1.306	0.545	2.459	2.544
1.100	0.888	0.371	3.233	3.318
1.200	0.630	0.263	4.015	4.100
1.300	0.459	0.191	4.771	4.856
1.400	0.340	0.142	5.463	5.548
1.500	0.256	0.107	6.040	6.125
1.600			6.396	6.482
1.700			6.338	6.423
1.800			6.058	6.143
1.900			5.641	5.726
2.000			5.129	5.214
2.100			4.559	4.644
2.200			3.952	4.037
2.300			3.321	3.406
2.400			2.709	2.794
2.500			2.121	2.206
2.600			1.567	1.652
2.700			1.062	1.147
2.800			0.631	0.716



2.900			0.378	0.463
3.000			0.219	0.304
3.100			0.117	0.202
3.200			0.053	0.138
3.300			0.016	0.101



## Return Period- 10 yr

Time (hr)	Total Rainfall (mm)	Net Rainfall (mm)	Surface Runoff (m3 s-1)	Total Flow (m3 s-1)
0.000	0.230	0.096	0.000	0.085
0.100	0.302	0.126	0.015	0.100
0.200	0.402	0.168	0.048	0.133
0.300	0.543	0.226	0.107	0.192
0.400	0.746	0.311	0.200	0.285
0.500	1.051	0.438	0.341	0.426
0.600	1.545	0.644	0.548	0.633
0.700	2.499	1.042	0.852	0.937
0.800	4.691	1.957	1.314	1.399
0.900	2.499	1.042	2.048	2.133
1.000	1.545	0.644	2.909	2.994
1.100	1.051	0.438	3.825	3.910
1.200	0.746	0.311	4.750	4.835
1.300	0.543	0.226	5.645	5.730
1.400	0.402	0.168	6.464	6.549
1.500	0.302	0.126	7.146	7.231
1.600			7.568	7.653
1.700			7.498	7.583
1.800			7.167	7.252
1.900			6.674	6.759
2.000			6.069	6.154
2.100			5.394	5.479
2.200			4.675	4.760
2.300			3.930	4.015
2.400			3.205	3.290
2.500			2.509	2.594
2.600			1.854	1.939
2.700			1.256	1.341
2.800			0.747	0.832



2.900			0.448	0.533
3.000			0.259	0.344
3.100			0.138	0.223
3.200			0.063	0.148
3.300			0.019	0.105



## Return Period- 20 yr

Time (hr)	Total Rainfall (mm)	Net Rainfall (mm)	Surface Runoff (m3 s-1)	Total Flow (m3 s-1)
0.000	0.267	0.112	0.000	0.085
0.100	0.352	0.147	0.017	0.102
0.200	0.469	0.196	0.056	0.141
0.300	0.632	0.264	0.125	0.210
0.400	0.868	0.362	0.233	0.318
0.500	1.224	0.510	0.397	0.482
0.600	1.799	0.750	0.638	0.723
0.700	2.910	1.214	0.992	1.077
0.800	5.463	2.279	1.530	1.615
0.900	2.910	1.214	2.385	2.470
1.000	1.799	0.750	3.387	3.472
1.100	1.224	0.510	4.454	4.539
1.200	0.868	0.362	5.531	5.616
1.300	0.632	0.264	6.573	6.658
1.400	0.469	0.196	7.527	7.612
1.500	0.352	0.147	8.322	8.407
1.600			8.812	8.897
1.700			8.731	8.816
1.800			8.346	8.431
1.900			7.771	7.856
2.000			7.066	7.151
2.100			6.281	6.366
2.200			5.444	5.529
2.300			4.576	4.661
2.400			3.732	3.817
2.500			2.922	3.007
2.600			2.159	2.244
2.700			1.463	1.548
2.800			0.870	0.955



2.900			0.521	0.606
3.000			0.302	0.387
3.100			0.161	0.246
3.200			0.073	0.158
3.300			0.023	0.108



### Return Period- 75 yr

Time (hr)	Total Rainfall (mm)	Net Rainfall (mm)	Surface Runoff (m3 s-1)	Total Flow (m3 s-1)
0.000	0.309	0.129	0.000	0.085
0.100	0.407	0.170	0.020	0.105
0.200	0.542	0.226	0.065	0.150
0.300	0.731	0.305	0.144	0.229
0.400	1.004	0.419	0.270	0.355
0.500	1.415	0.590	0.459	0.544
0.600	2.080	0.868	0.737	0.822
0.700	3.365	1.404	1.147	1.232
0.800	6.318	2.636	1.769	1.854
0.900	3.365	1.404	2.758	2.843
1.000	2.080	0.868	3.917	4.002
1.100	1.415	0.590	5.151	5.236
1.200	1.004	0.419	6.397	6.482
1.300	0.731	0.305	7.602	7.687
1.400	0.542	0.226	8.705	8.790
1.500	0.407	0.170	9.624	9.709
1.600			10.191	10.276
1.700			10.098	10.183
1.800			9.652	9.737
1.900			8.987	9.072
2.000			8.172	8.257
2.100			7.265	7.350
2.200			6.296	6.381
2.300			5.292	5.377
2.400			4.316	4.401
2.500			3.379	3.464
2.600			2.497	2.582
2.700			1.691	1.776
2.800			1.006	1.091



2.900			0.603	0.688
3.000			0.349	0.434
3.100			0.186	0.271
3.200			0.084	0.169
3.300			0.026	0.111





## Return Period- 100 yr

Time (hr)	Total Rainfall (mm)	Net Rainfall (mm)	Surface Runoff (m3 s-1)	Total Flow (m3 s-1)
0.000	0.380	0.158	0.000	0.085
0.100	0.500	0.208	0.024	0.109
0.200	0.665	0.277	0.079	0.165
0.300	0.897	0.374	0.177	0.262
0.400	1.232	0.514	0.331	0.416
0.500	1.737	0.724	0.563	0.648
0.600	2.553	1.065	0.905	0.990
0.700	4.130	1.723	1.408	1.493
0.800	7.754	3.235	2.171	2.257
0.900	4.130	1.723	3.385	3.470
1.000	2.553	1.065	4.807	4.892
1.100	1.737	0.724	6.321	6.406
1.200	1.232	0.514	7.851	7.936
1.300	0.897	0.374	9.329	9.414
1.400	0.665	0.277	10.683	10.768
1.500	0.500	0.208	11.811	11.896
1.600			12.507	12.592
1.700			12.393	12.478
1.800			11.845	11.930
1.900			11.030	11.115
2.000			10.030	10.115
2.100			8.915	9.000
2.200			7.727	7.812
2.300			6.494	6.579
2.400			5.297	5.382
2.500			4.147	4.232
2.600			3.064	3.149
2.700			2.076	2.161
2.800			1.234	1.319



2.900			0.740	0.825
3.000			0.428	0.513
3.100			0.228	0.313
3.200			0.103	0.188
3.300			0.032	0.117



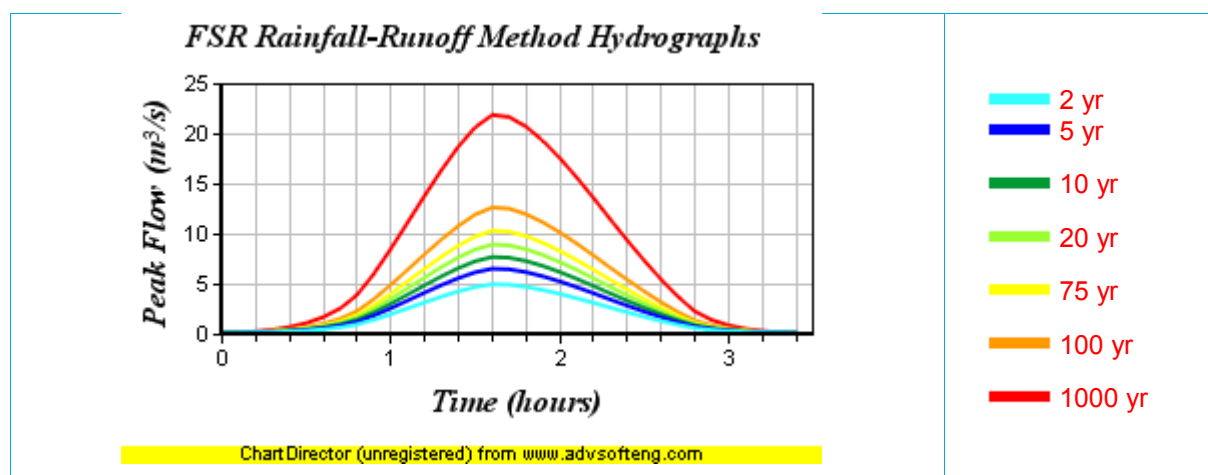
## Return Period- 1000 yr

Time (hr)	Total Rainfall (mm)	Net Rainfall (mm)	Surface Runoff (m3 s-1)	Total Flow (m3 s-1)
0.000	0.622	0.275	0.000	0.085
0.100	0.819	0.362	0.042	0.127
0.200	1.090	0.482	0.138	0.223
0.300	1.471	0.651	0.308	0.393
0.400	2.020	0.893	0.576	0.661
0.500	2.846	1.259	0.979	1.064
0.600	4.185	1.851	1.573	1.658
0.700	6.769	2.994	2.447	2.532
0.800	12.709	5.622	3.774	3.859
0.900	6.769	2.994	5.883	5.968
1.000	4.185	1.851	8.355	8.440
1.100	2.846	1.259	10.985	11.070
1.200	2.020	0.893	13.644	13.729
1.300	1.471	0.651	16.213	16.298
1.400	1.090	0.482	18.565	18.650
1.500	0.819	0.362	20.526	20.611
1.600			21.736	21.821
1.700			21.537	21.622
1.800			20.585	20.670
1.900			19.168	19.253
2.000			17.430	17.515
2.100			15.494	15.579
2.200			13.428	13.513
2.300			11.287	11.372
2.400			9.205	9.290
2.500			7.207	7.292
2.600			5.325	5.410
2.700			3.608	3.693
2.800			2.145	2.230



2.900			1.286	1.371
3.000			0.744	0.829
3.100			0.396	0.481
3.200			0.180	0.265
3.300			0.056	0.141

**Figure 3-1: FSR Rainfall-Runoff Results Chart**





Registered Office

**24 Grove Island  
Corbally  
Limerick  
Ireland**

t: +353 (0) 61 345463  
e: [info@jbaconsulting.ie](mailto:info@jbaconsulting.ie)

**JBA Consulting  
Engineers and Scientists  
Limited**

**Registration number  
444752**



**Visit our website  
[www.jbaconsulting.ie](http://www.jbaconsulting.ie)**



## **Appendix 15:** Sandyford Urban Framework Plan





## Appendix 15: Sandyford Urban Framework Plan

---

### Section 2.3.7 Objective F Open Space Zone 7 – Objective F2 (page 19)

*Attach an asterisk indicating the following caveat to Objective F2, as follows:*

**"The utilisation of the site as active open space is dependent on the upgrading of the reservoir, which forms an integral part of the Vartry Supply Scheme, being realised."**

---

### Appendix 1 Land Use Zoning Objectives (pages 50-52)

*Amend text in Zone 1: Mixed Use Inner Core (MIC) as follows:*

#### **"Zone 1: Mixed Use Inner Core (MIC)**

Objective 'MIC' To consolidate and complete the development of the Mixed Use Inner Core to enhance and reinforce sustainable development.

#### Permitted In Principle

Advertisements and Advertising Structures, Assisted Living Accommodation, Betting Office, Craft Centre/Craft Shop, Community Facility, Childcare Service, Cultural Use, Nightclub, Doctor/Dentist etc., Education, Embassy, Enterprise Centre, Guest House, Health Centre/**Healthcare Facility**, Home Based Economic Activities, Hotel/Motel, Leisure Facility, Off-License, Offices\*<sup>1</sup>, Open Space, Place of Public Worship, Public House, Public Services, Residential\*<sup>2</sup>, Restaurant, Shop-Specialist, Tea Room/Café, Veterinary Surgery, Convenience (inc. supermarkets) and Comparison shops\*<sup>3</sup>.

\*<sup>1</sup> Any office development shall accord with the policy for office based employment in Mixed Use Core Areas.

\*<sup>2</sup> Any residential development shall accord with the Policy for residential within the mixed use core areas.

\*<sup>3</sup> Any retail development shall accord with the Policy for retail within mixed use core areas

#### Open For Consideration

Industry-Light, Office Based Industry, Retail Warehouse, Carpark."

---

*Amend text in Zone 2: Mixed Outer Core (MOC) as follows:*

#### **"Zone 2: Mixed Outer Core (MOC)**

Objective 'MOC' To provide for a mix of uses which complements the Mixed Use Inner Core, but with less retail and residential and more emphasis on employment and services.

#### Permitted in Principle

Advertisements and Advertising Structures, Betting Office, Community Facility, Childcare Service, Cultural Use, Nightclub, Doctor/Dentist etc., Education, Embassy, Enterprise Centre, Guest House, Health Centre/**Healthcare Facility**, Hotel/Motel, Leisure Facility, Off License, Offices\*<sup>1</sup>, Open Space, Place of Public Worship, Public House, Public Services, Restaurant, Shop-Specialist, Local Shop\*<sup>2</sup>, Sports Facility, Tea Room/Café.

\*<sup>1</sup> Any office development shall accord with the policy for office based employment in Mixed Use Core Areas.

\*<sup>2</sup> Local shop and services primarily serving the local/walk in community with basic day to day needs. Typically these comprise convenience stores and services such as newsagents, butchers, vegetable shop, hairdresser, Beauty salon and other similar basic retail services.

**Open For Consideration**

Craft Centre/Craft Shop, Garden Centre/Plant Nursery, Home Based Economic Activities, Motor Sales Outlet, Office Based Industry, Residential\*, Residential Institution, Carpark.

\*Residential development shall accord with the policy for residential within the mixed use core areas."

*Amend text in Zone 3: Office Based Employment (OE) as follows:*

**"Zone 3: Office Based Employment (OE)**

Objective 'OE' 'To provide for office and enterprise development' in Zone 3 of the Sandyford Business District.

**Permitted In Principle**

Advertisements and Advertising Structures, Craft Centre/Craft Shop, Childcare Service, Education, Enterprise Centre, Office Based Industry, Offices, Office based industry, Open Space, Petrol Station, Public Services, Science and Technology Based Industry, Tea Room/Café, Transport Depot, Travellers Accommodation.

**Open For Consideration**

Carpark, Cash and Carry/Wholesale Outlet, Community Facility, Cultural Use, Doctor/Dentist etc., Funeral Home, Garden Centre/Plant Nursery, Health Centre/**Healthcare Facility**, Hotel/Motel, Household Fuel Depot, Motor Sales Outlet, Place of Public Worship, Public House, Restaurant, Retail Warehouse, Rural Industry-Cottage, Small scale convenience Shop (<300m<sup>2</sup>), Sports Facility, Veterinary Surgery."

*Amend text in Zone 6: Medical/Hospital as follows:*

**"Zone 6: Medical/Hospital**

Objective 'MH' 'To improve, encourage and facilitate the provision and expansion of medical/hospital uses and services in Zone 6 of Sandyford Business District.

**Permitted In Principle**

Advertisements and Advertising Structures, Community Facility, Childcare Service, Doctor/Dentist etc., Education, Funeral Home, Health Centre/ **Healthcare Facility**, Hospital, Open Space, Place of Public Worship, Public Services, **Residential Institution**, Small scale convenience Shop (<300m<sup>2</sup>), Tea Room/Café, **Transitional/step-down non-acute medical facilities and rehabilitation services (including associated on-site, short-stay accommodation)**, Veterinary Surgery.

**Open For Consideration**

Car Park, Cultural Use, Hotel/Motel, Leisure Facility, Offices, Residential, Restaurant, **Residential Institution**, Sports Facility.

**Appendix 2 Specific Local Objectives (page 53)**

*Insert a new SLO as follows:*

**"SLO No.164**

**To protect and support the continuation of playing pitches at Páirc Ui Bhriain."**

## **Appendix 17:** Green Roofs Document



## Appendix 17: Green Roof Guidance Document

---

*Insert the Green Roof Guidance Document (2015) as an entirely new Appendix 17 as follows:*

# ***"Green Roofs Guidance Document***

## ***Transportation and Water Services Department***



# Contents

## **1.1 Introduction**

- 1.1.1 The aim of this Guidance Document
- 1.1.2 What are Green Roofs?
- 1.1.3 Structure of a Green Roof
- 1.1.4 Types of Green Roofs
- 1.1.5 The Benefits of Installing a Green Roof

## **2.1 Relevant policies**

## **3.1 Requirements for Various Land Uses**

## **4.1 What type of Roof is best for my development?**

- 4.1.1 Reducing Storm Water Run-off
- 4.1.2 Designing for Amenity
- 4.1.3 Designing for Biodiversity

## **5.1 Costs and Maintenance**

- 5.1.1 Cost
- 5.1.2 Maintenance

## **6.1 Design**

- 6.1.1 When to build your Green Roof
- 6.1.2 Structural capacity of the Roof
- 6.1.3 Access to the Roof
- 6.1.4 Selection of Plants and Growing Materials

## **Appendix:**

- 1. Useful References**
- 2. Relevant Policies**

## 1.1 Introduction

---

### 1.1.1 The Aim of this Guidance Document

The aim of this document is to provide **brief** guidance on Green Roofs. It outlines the reasons why Dún Laoghaire-Rathdown County Council considers it appropriate to encourage the installation of Green Roofs and lists development types where Green Roofs would be appropriate.

### 1.1.2 What are Green Roofs?

Green Roofs are made up of layers that create an environment suitable for vegetation to grow. They are becoming increasingly important as a mechanism in attenuating stormwater run-off from sites.

### 1.1.3 Structure of a Green Roof

Usually, a Green Roof has a waterproof membrane at the bottom to protect the building from leaks. There is then an insulation layer and another protective layer, which will prevent damage from any penetrating roots, or other structural movement. Some designs may have the insulation layer as part of the protective layer. An insulation layer may also be placed above the protective layer instead of below.

A drainage layer is then put down over the insulation layer and the protective layer. The drainage layer can be made of lightweight gravel or light granulated clay. It helps to keep air in the Green Roof and soaks up any extra water. The drainage layer can also help store water for the plants to use at a later time. For maintenance purposes, it is important that the drainage points can be accessed from above. On top of the drainage layer, a filter mat may be installed to allow water to soak through. This will also prevent the fine soil from eroding.

The top layers of a Green Roof system include the soil layer (or substrate), plants and a wind blanket. The soil layer is made up of a lightweight material (for example, crushed clay bricks, clay granules etc) and will help with drainage as well as providing nutrients to the plants. The wind blanket protects the soil layer until the roots of the plants take hold.

### 1.1.4 Types of Green Roofs

There are two main types of Green Roof – Intensive and Extensive.

Intensive Green Roofs or Roof gardens provide similar benefits as a small urban park. They have a deep layer of soil, which can support a range of plants, trees and shrubs. Native species (plants which would grow naturally in the local area) can provide a rich habitat for wildlife. Intensive Green Roofs are designed to include access for people. These Roofs may require regular maintenance.

Extensive Green Roofs are more lightweight with a shallow soil layer and are not normally designed to provide access for people. They need little maintenance. There are three main types of Extensive Green Roof.

- Extensive Green Roofs, which are made up of sedum or vegetated mats – fabric mats that are prepared before the Green Roof is built. The mats are sprinkled



with sedum cuttings. These are then left in appropriate conditions to grow into the fabric mat. Once the mats are ready, they are rolled up and delivered to the construction site and laid down on to the Roof.

- Extensive Green Roofs where a soil layer is laid down and then planted directly with small plants. These plants (often sedum) will have been grown in small pots. They are often known as plug plants.
- Extensive Green Roofs where the soil layer is laid down and then planted with seeds (which are suitable for the local environment). This type of Roof is often known as a 'biodiverse' or 'brown' Roof.



**Examples of Extensive Green Roofs**

### **1.1.5 The Benefits of Installing Green Roofs**

Green Roofs can be designed to give a wide range of benefits. These include:

- Reducing the amount of surface water running off the Roof and so reducing the risk of flooding. Completed projects show a reduced annual run-off of at least 40% and more usually 60-70%. In some cases, for Intensive Green Roofs, the water retention can be up to 90%.
  - Providing habitat (homes), shelter and feeding opportunities for wildlife.
  - Contribute to sustainable drainage systems and water quality improvement.
  - Helping to meet the targets of our biodiversity action plan.
  - Improving the character and appearance of the building and the wider area.
  - Offering an opportunity to boost the environmental credentials of a business.
  - Providing extra heat and noise insulation.
  - Keeping the building cool in the summer.
  - Increasing the lifespan of the Roof membrane.



- Helping to reduce the amount of dust and pollutants in the air.
- Creating new open space for relaxation, providing potential for the creation of usable green spaces.

The driving force, however, for the installation of Green Roofs in our County is the need to maximise water retention capacity particularly as the Irish Climate Analysis and Research Unit (ICARUS) predicts that there will be a 12% increase in precipitation in winter by mid-century.

## 2.1 Relevant Policies

This Chapter lists the main policy documents that outline how the installation of Green Roofs will help to achieve some of the objectives underpinning current National and Local policies.

- National Climate Change Adaptation Framework, Building Resilience to Climate Change (Dec 2012)
- National Climate Change Strategy 2007 – 2012
- Greater Dublin Strategic Drainage Study 2005
- Water Framework Directive (2000/60/EC)
- National Biodiversity Plan 2002
- DLR's Biodiversity Action Plan 2009
- DLR's Green Infrastructure Strategy 2016 -2022

Further details of each of these Policy documents can be found in the Appendix.

## 3.1 Requirements for Various Land Uses

A Green Roof proposal is a requirement for all Roof areas greater than 300 square metres for the following development types unless exempted or partially exempted by DLRCC's Water Services Section following consideration of the suite of complimentary or alternative "soft" SUDS (Sustainable Drainage Systems)\* measures being proposed:

- **Apartment Developments**
- **Employment Developments**
- **Retail and Ancillary Shopping**
- **Leisure Developments**
- **Education Facilities**

Any habitable or employment related development type not covered under the above headings will be deemed to require the installation of a Green Roof unless exempted or partially exempted by DLRCC's Water Services Section following consideration of the suite of complimentary or alternative "soft" SUDS measures being proposed.

Terraced, semi-detached or detached housing or mews developments are not required to have Green Roofs. However, their installation is encouraged, wherever practicable. In addition, developments which are located in close proximity to the sea and can discharge directly to sea via a dedicated/exclusive surface water pipeline of sufficient capacity for all predicated rainfall events (including the 1:1000 year rainfall event) may, by agreement with the Water Services Department, omit the Green Roof.

A Green Roof, where required, shall in all cases cover a minimum of 60% of the Roof area. The minimum soil thickness shall be 2 to 4cm for a Moss/Sedum type of Extensive Green Roof and 10 to 15 cm for a grassed type of Extensive Green Roof.

\*Alternative 'soft' SUDS measure include ponds, bioretention areas, detention basins, infiltration basins, filter strips, wetlands, swales, rain gardens. (Note: while in most cases attenuation storage systems will be required to provide stormwater storage and a means of controlling the rate of outflow from a site, a reliance on these structures and/or permeable paving as an alternative to the provision of a Green Roof is not acceptable.)

---

## **4.1 What Type of Green Roof is best for a Development?**

The main benefit of the Green Roof will vary from one development type to the next. The following guide should help one ascertain the best type of Green Roof for each development proposal.

### **4.1.1 Reducing the Volume and Rate of Surface Water Runoff from a Roof**

All types of Green Roofs will reduce the amount of surface water running off a Roof. Green Roofs hold on to rainwater in the short term and when the water begins to be slowly released, a large proportion will be retained with the plants and soil layer. Some rainwater will also evaporate back into the atmosphere.

How much water the Roofs will hold will depend on the time of year (plants and the soil layer will keep more water during the summer months), the size and depth of the Green Roof and the type of plants used. Intensive Roofs are likely to retain more water because of their size and deeper layer of soil.

Green Roofs are particularly suitable in Dun Laoghaire-Rathdown County as a significant proportion of the piped drainage network is combined (the pipe carries both surface and foul water). With increasing urbanization and infill development these combined drainage pipes are sometimes unable to cope with the increase in surface water run-off, with resultant flooding.

### **4.1.2 Designing for Amenity**

Both Extensive and Intensive Green Roofs can add to the character and appearance of an area. However, Intensive Green Roofs are more suited as an area for people to relax in.

Intensive Green Roofs provide a pleasant area to look at, and people can also go onto the Roofs and enjoy an outdoor open space. These can be particularly valuable in built-up areas. However, Intensive Green Roofs cannot be used to justify reducing 'normal' open space requirements at street level.

### **4.1.3 Designing for Biodiversity**

Although all Green Roofs support biodiversity, some can be specifically designed to maximise these benefits. Green Roofs can benefit biodiversity by:

- Providing habitat for wildlife
- Providing undisturbed areas for wildlife

- Providing linkages or 'stepping stones' between green spaces
- Compensating for habitats that are lost through urban development.

A study of 11 Green Roofs in Switzerland recorded 25 species of bird, 172 species of beetle and 60 species of spider using these Roofs (English Nature 2003). In the UK, Green Roofs are recognised as having the potential to provide compensation for the loss of brownfield sites where they provide important habitats for rare species such as the Black Redstart. The benefits of Green Roofs to biodiversity will be influenced by their size and structure (including soil depth, growing medium, hydrology, topography, aspect etc.).

A Green Roof built for biodiversity purposes is usually 'Extensive'. This is because Extensive Roofs are not used by people and can provide undisturbed habitats for plants, birds and insects. An Extensive Green Roof will have a shallow depth of soil between 5 and 20cm, which is capable of supporting sedum/ moss communities or wildflower meadows. However, an Intensively designed Green Roof could also provide opportunities for biodiversity, if disturbance is kept to a minimum.

The larger the Green Roof area, the more habitats can be created and the greater its value will be to wildlife. Sedum communities do well in shallow soils of 0-5cm, while a depth of 5-15cm will be required to establish a wildflower area. The growing medium used on the Green Roof will greatly influence its biodiversity potential. A nutrient-poor growing medium will allow a greater diversity of wildflowers to thrive. Well-drained, nutrient poor soil with patches of bare ground may provide opportunities for many invertebrates; some of which are usually associated with heaths, dunes and brownfield sites (Natural England 2007). A Green Roof with a varied micro-topography and micro-hydrology may enhance the total species diversity through the creation of a range of microclimates. Providing areas with different growing mediums (e.g. sandy and rocky substrates); a range of soil depths; different aspects; and micro-hydrological fluctuations will contribute to a more diverse range of microclimates.

It is particularly important to choose plants which will benefit the existing local environment. Native plant species, which are characteristic of the general area, will usually be of greater benefit to local fauna than non-native plants. It is important to avoid non-native species that have the potential to become invasive and spread into existing local habitats or green spaces. Advice from an organization that understands both the local ecology and the ability of plant species to survive at roof level should be sought.

### **References**

Natural England (2003). Green Roofs: their existing status and potential for conserving biodiversity in urban areas. English Nature Research Report, No. 498. Peterborough, UK. English Nature.

Natural England (2007). Living Roofs Leaflet. Peterborough, UK. English Nature.

---

## **5.1 Costs and maintenance**

### **5.1.1 Costs**

The cost of a Green Roof per square metre (m<sup>2</sup>) varies depending on the type of Green Roof, what it will be used for and the quality. Extensive Roofs start from approximately €100 per m<sup>2</sup>, although a basic 'biodiverse' Extensive Roof can be installed for much less than this i.e. approximately €45. An Intensive Green Roof will be more expensive than an Extensive Green Roof and the cost will vary depending on the design and the features

to be included (for example, trees and ponds) – however the stormwater attenuation, amenity and biodiversity benefits are considerably greater.

Green Roofs can also save money as they provide insulation during both the winter and summer. This has been demonstrated in Canary Warf, one of the largest areas of Green Roofs in the UK. In 2003, it was discovered on one of the buildings that, since a Green Roof had been installed, the temperature stabilized on the level immediately below the Roof. Ventilation is no longer needed during the summer, and heating costs are reduced in winter. These savings can yield between €2.45 and €9.93 per m<sup>2</sup> annually dependent on the type of Green Roof<sup>9</sup>.

### 5.1.2 Maintenance

Intensive Green Roofs will require regular maintenance. Lawns will require mowing weekly or fortnightly, plant beds may require weeding on a weekly or fortnightly basis during the growing season, and wildflower meadows may require annual mowing with the cuttings removed. Extensive Green Roofs should normally only require bi-annual or annual visits to remove litter, check fire breaks and drains and, in some cases remove unwanted colonising plants. The highest maintenance regime is generally required in the first three years, and usually this should be made the responsibility of the Green Roof provider (Source: CIRIA C697)

Intensive Green Roofs need to be watered and weeded in the same way as you would a normal garden. Larger plants, shrubs and trees should be pruned to make sure they are safe during windy conditions. Drains and gutters should also be checked and cleared to avoid blockages.

---

## 6.1 Design

### 6.1.1 When to build a Green Roof

An ideal time to consider building a Green Roof is when the existing Roof needs to be replaced, or when a new building is to be developed. This way, features such as a waterproof layer and a protective root-resistant layer can be made part of the new Roof. It is possible to install a Green Roof onto an existing Roof, but this will mean taking into account the Roof's faults, such as any leaks and damage, and the Roof will not be able to resist roots.

### 6.1.2 Structural Capacity of the Roof

The structural capacity of the Roof is the weight which the Roof can hold without risking damage to the building. This will be an important factor in deciding what type of Roof can be installed. It should be included in the development proposal from the beginning. New buildings can be designed with suitable structural capacity for any type of Green Roof. Extensive Roofs weigh approximately 60 to 150kg/m<sup>2</sup> and Intensive Roofs weigh about 200 to 1000kg/m<sup>2</sup>. More specific guidance on the structural design of slabs which support Green Roofs are contained in the Institution of Structural Engineers publication *The Structural Engineer* dated 6<sup>th</sup> January 2009.

---

<sup>9</sup> As calculated by Klooster *et al.* (2008)

### **6.1.3 Access to the Roof**

It is important to consider how people will get onto the Roof, and how equipment and material will be taken onto the Roof. Green Roofs can be developed on most slopes. However, the flatter the Roof is, the easier it will be for people to get onto the Roof and maintain it. Safety when on the Roof should be part of the design process.

### **6.1.4 Selection of Plants and Growing Materials**

The types of plants suitable for growing on a Green Roof will partly depend on the level of maintenance that will be available during its lifetime. It will also depend on whether the Roof has an in-built irrigation and watering system, or has areas of protection such as shade and shelter.

However, choosing local seed varieties will mean that both Extensive and Intensive Green Roofs can help local biodiversity. The windy conditions that often exist on a rooftop will also mean that hardy plants, such as mosses and stonecrops, will establish themselves and thrive more easily.

One can consider using crushed demolition waste on an Extensive Green Roof. This has environmental benefits including recycling materials, and reducing the need for transporting and getting rid of the waste. Crushed bricks and concrete form drainage and a soil layer that can support a range of plants and insects. This in turn, benefits other types of wildlife.

The possibilities for an Intensive Green Roof are considerably greater. The Roof can contain trees, shrubs, meadows, flowerbeds and even features such as a small pond.

## Appendix

---

### 1. Useful References:

**Building Greener** - Guidance on the use of Green Roofs, green walls and complimentary features on buildings. Published by CIRIA London 2007.

**The SUDS Manual** (C697) published by CIRIA London 2007

**Green Roofs over Dublin** - A Green Roof Policy Guidance paper for Dublin City Council – Tepui 2008.

---

### 2. Relevant Policies

#### **National Climate Change Adaption Framework, Building Building Resilience to Climate Change.**

Under the “National Climate Change Adaptation Framework, Building Resilience to Climate Change” published by the Department of Environment, Community and Local Government, (Dec 2012) there is an onus on Local Authorities to “prepare, review and amend local development plans to mainstream climate change adaptation”.

The document emerges from the now held belief that climate change cannot necessarily be prevented and instead the focus is on the need to adapt to climate change. Adaptation is defined as “adjustment or preparation of natural or human systems to a new or changing environment, with the aim of moderating harm” (DECLG, Dec 2012). Mitigation refers to reducing activities that cause harm. It is further recognised in the strategy that adaptation needs to be planned, managed and monitored.

#### **The National Climate Change Strategy 2007- 2012**

Under the Kyoto Protocol, for the period 2007 – 2012, Ireland has to limit its average annual emissions to only 13% above the levels emitted in 1990. This equates to 8.137 million tonnes of CO<sub>2</sub>. Further to this, the EU has made a commitment post 2012, that they will continue to reduce their emissions by an additional 30% (relative to levels in 1990). This 30% reduction is provided that other developed countries commit to a comparable emission reduction. However, even if there is no international agreement, the EU still commits to reduce emissions by a further 20%, post 2012. This means that there will have to be radical changes made across the Irish economy, “particularly in relation to the way Ireland produces and uses energy, in the built environment and in transport”.

It has been mentioned already that Green Roofs can help reduce a building’s energy consumption and thereby its carbon emissions, when used in conjunction with regular insulation material. To date, there has been no research done in Ireland to quantify these reductions within the Irish context, but there are data from studies in other countries.

#### **Greater Dublin Strategic Drainage Study (Greater Dublin Strategic Drainage Study: Regional drainage policies Vol.3 March 2005)**

The Greater Dublin Strategic Drainage Study is a series of policy documents developed in 2005 by the Dublin area local authorities including DLRCC. One of its objectives is to

prepare plans and strategies to manage storm-water run-off in urban areas in addition to assessing the current run-off management practices.

This study states that at present, urban areas consume large volumes of drinkable water while discharging ever-increasing quantities of foul sewage and storm-water. In consequence, “traditional supply and disposal of water involves costly, energy-Intensive treatment and reticulation systems, with their associated environmental impacts”.

An alternative management system is therefore recommended. The name of this alternate system is SuDS, Sustainable Drainage Systems. SuDS are a completely different way of handling storm-water run-off. In the past, the main emphasis was on handling the volumes of water and clearing it from the surface but this system is an integrated approach that “addresses water quality, water quantity, amenity and habitat”. According to the drainage study, it is of the utmost importance to consider all of these aspects when implementing SuDS.

Green Roofs are an important aspect in the implementation of SuDS, as Green Roofs reduce the quantity of run-off, improve water quality and provide valuable new habitat in urban areas. It is also important to note that the drainage study recommends that a “SuDS system be mandatory in all new developments unless the developer can demonstrate to the Local Authority that its inclusion is impractical due to site circumstances or that its effect on the control of run-off would be minimal, such as rural sites”.

### **Water Framework Directive (2000/60/EC)**

The Water Framework Directive (WFD) evaluates all the objectives used to protect aquatic environments and it aims to ensure that the relevant steps are taken to achieve the objectives. In essence the framework promotes a sustainable approach to water management. One main requirement is to manage surface run-off such that its impact on the surrounding environment is mitigated. SuDS techniques are a very effective means of reducing the rate and volume of run-off and to remove pollution.

Under the same directive, Ireland has to achieve a ‘good water status’ in surface and groundwater by 2015 and according to the Environmental Protection Agency (EPA), this will be a challenging target to meet.

In regards to water management, Dun Laoghaire Rathdown County Council’s Green Roof policy creates another template by which we achieve some of the objectives outlined both in the Greater Dublin Strategic Drainage Study and the Water Framework Directive.

### **Dun Laoghaire Rathdown County Council Biodiversity Action Plan 2009 and National Diversity Plan 2002**

Biodiversity advantages of Green Roofs are as follows:

- Helping to remedy areas of deficiency by providing new habitat in areas which are currently lacking in wildlife habitat
- Creating new links in an intermittent network of habitats thereby facilitating movement and dispersal of wildlife
- Providing additional habitat for rare, protected or otherwise important species

Two of the major threats to biodiversity outlined in the Biodiversity Action Plan are loss of extent and habitat fragmentation. Loss of extent refers to the removal of an area of habitat. In urban areas replacement sites are not easily found. However, installing Green Roofs assists greatly in creating additional habitats in an urban environment.

The second threat, habitat fragmentation, refers to breaking up large areas of habitat into smaller areas thereby making it more difficult and dangerous for fauna to travel between them for food and shelter. Green Roofs provide both a valuable transport network and help link green corridors through the city. This is especially important when taken into the context of biodiversity and climate change. The impact of climate change on biodiversity will depend on a 'species or habitats capacity to change'. The most vulnerable are those who have a restricted range and have no means of moving from one area to another.

It is important to note that one of the actions of the National Biodiversity Plan is to "encourage and promote beneficial effects on biodiversity". This would be the outcome as Green Roofs are installed throughout the County. It would serve as an example for other councils around the country as an effective way of enhancing biodiversity as well as the other benefits previously mentioned.

### **Dún Laoghaire-Rathdown County Council Green Infrastructure Strategy -2016-2022**

DLR's Green Infrastructure Strategy includes a section of Water Management that identifies examples of Green Infrastructure that incorporate a water management function. Green Roofs are identified as a SUDS measure that can assist with improving water quality and also a role in preparing and mitigating the impacts of climate change."





