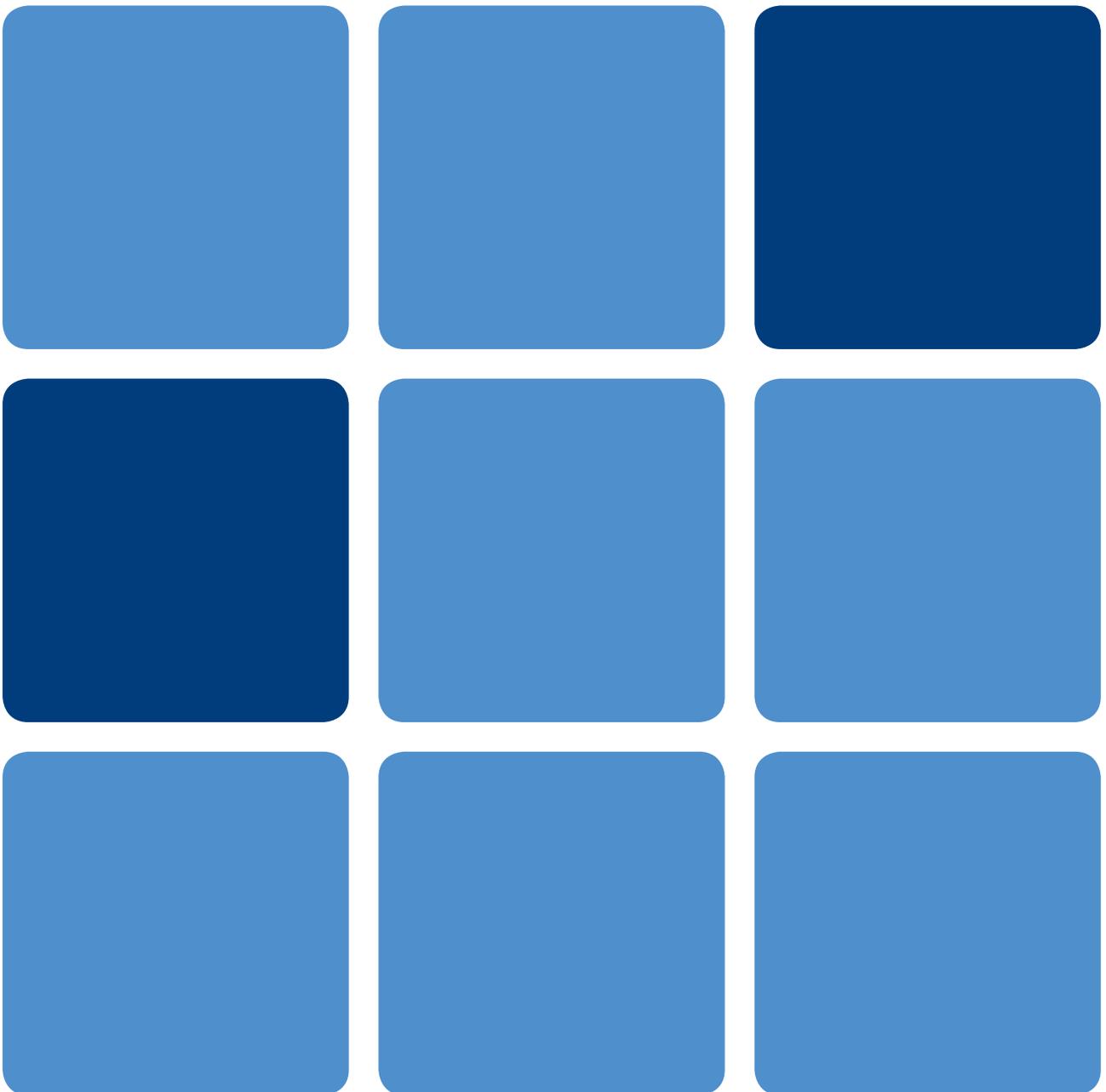


RPS

# Strategic Flood Risk Assessment for SDCC Development Plan

## Detailed Report on Flood Risk in the Baldonnell Area

8<sup>th</sup> May 2015





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# 1 INTRODUCTION

## 1.1 PURPOSE OF THE REPORT

This report examines the Flood Zones A, B and C identified from the Strategic Flood Risk Assessment (SFRA) Stage 1 – Flood Risk Identification Report with respect to the management of flood risk for development in the townland of Moneenalion Commons, Baldonnell, Co. Dublin and also provides an overview of drainage and storm water management for the area.

Flood risk management for development in the area is based on guidance provided in the [OPW Planning System and Flood Risk Assessment Guidelines for Planning Authorities](#) (2009) (referred to hereafter as ‘The Guidelines’), the [Greater Dublin Strategic Drainage Study](#) (GSDSD) (2005) and the [Greater Dublin Regional Code of Practice for Drainage Works](#) (2012) (referred to hereafter as ‘The Code of Practice’).

While this document provides an overview of flood risk management and drainage for development in Moneenalion Common, the Guidelines, GSDSD and Code of Practice remain the overriding policy documents.

The overriding purpose of this report is to assist SDCC in reviewing the zoning objective for these lands with regard to flood risk, to apply the Guidelines sequential approach, where necessary to appraise sites using the Guidelines Justification Test and identify how flood risk can be reduced as part of development.

## 1.2 STUDY AREA

Moneenalion Commons is located in Baldonnell, Co. Dublin, north of the N7 between Junction 4 and Junction 2 as highlighted by the pink outline show in **Figure 1.1** below.



**Figure 1.1 Study Area - Moneenalion Commons (Baldonnell)**

## 1.3 REPORT STRUCTURE

**Chapter 2** identifies the Flood Zones for Moneenalion Commons and reviews the land use zonings as per the 2010-2016 County Development Plan in the context of those flood zones for the area.

**Chapter 3** provides an overview of drainage and storm water management requirements for development in the area, in accordance with current drainage policy and best practice.

**Chapter 4** provides a summary of flood risk management considerations and surface water management policies applicable to Moneenalion Commons identified in the report.

## 2 FLOOD RISK & DEVELOPMENT

### 2.1 FLOOD ZONES

The Guidelines recommend identifying flood zones which show the extent of flooding for a range of flood event probabilities. Refer to the SFRA Stage 1 – Flood Risk Identification Report for further information on the criteria / methodology used to produce the flood zones.

**Figure 2.1** shows the Flood Zones produced for Moneenalion Commons. The Guidelines identify three levels of flood zones:

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

### 2.2 CURRENT LAND USE DEVELOPMENT APPROPRIATENESS

**Figure 2.2** shows the land use zonings for Moneenalion Commons under the 2010-2016 County Development Plan, overlaid with Flood Zones A, B and C.

Lands at Moneenalion Commons are subject to an EP2 zoning objective under the 2010-2016 County Development Plan as shown with purple shading in Figure 2.2. EP2 allows for manufacturing, research and development, light industry and enterprise and employment uses.

By definition from the Guidelines, this type of development (as shown in Table 2.1. ) is classified as “less vulnerable”, therefore zoning is appropriate in Flood Zone C and Flood Zone B, but shall only be considered within Flood Zone A *providing the sequential approach has been applied and the requirements of the Development Plan Justification Test can be demonstrated.*

Annual Exceedance Probability (%)	Flood Zone A	Flood Zone B	Flood Zone C
Highly vulnerable development	Justification Test required	Justification Test required	Appropriate
Less vulnerable development	Justification Test required	Appropriate	Appropriate
Water compatible development	Appropriate	Appropriate	Appropriate

**Table 2.1 Development Appropriateness for Flood Zones**

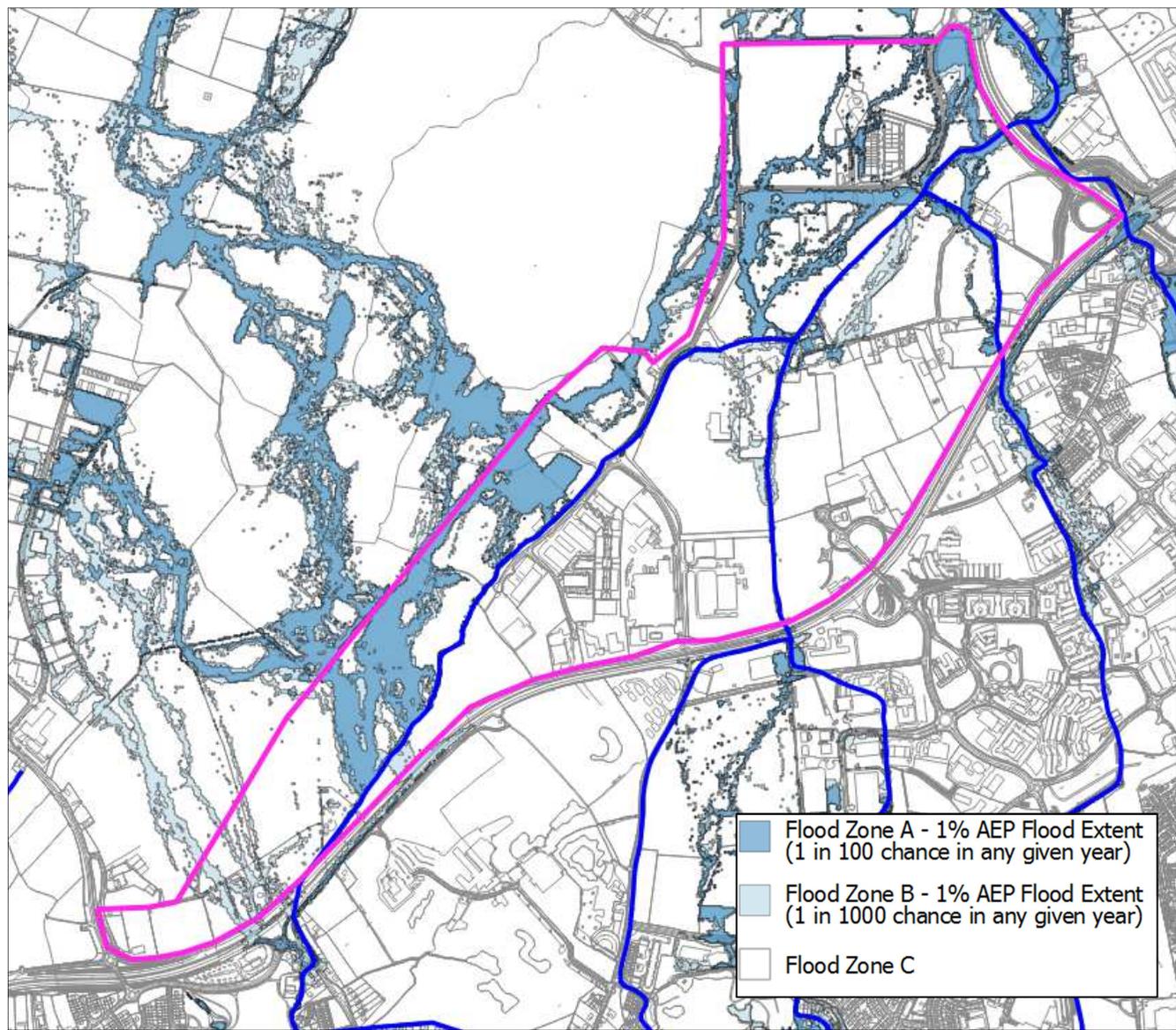


Figure 2.1 Flood Zones in Moneenalion Commons, Baldonnel, Co Dublin

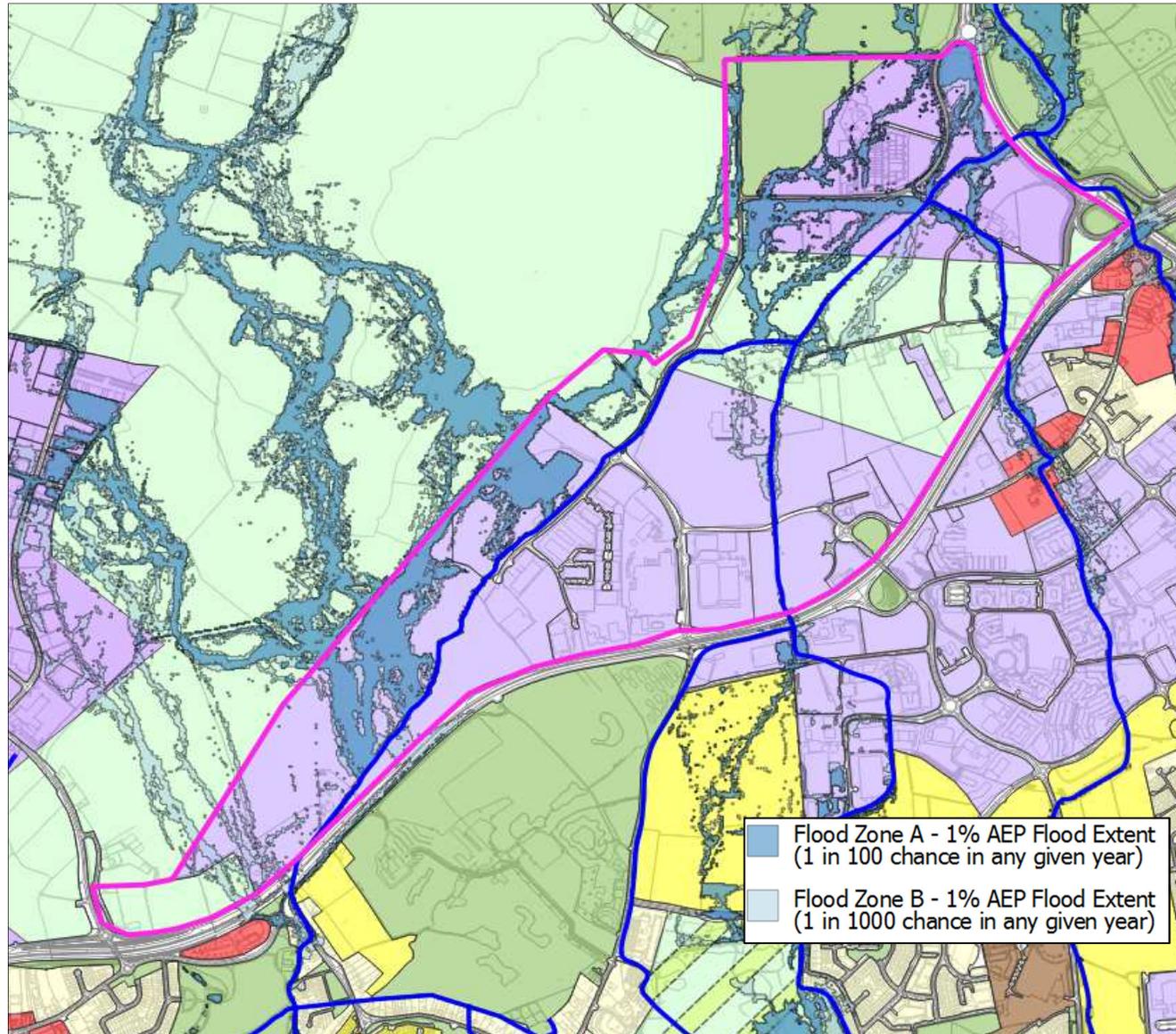


Figure 2.2 2010-2016 Land Zonings in Moneenalion Commons, Baldonnel, Co Dublin

## 2.3 EXISTING UNDEVELOPED, ZONED AREAS AT RISK OF FLOODING

The application of the **Sequential Approach** requires initially considering the overriding need for current zoning within the Development Plan area and if possible substituting the current use to a lower flood risk area. If the lands at Moneenalion Commons in Flood Zones A are the only possible location for development of this type, it must then satisfy all of the criteria of the Plan-making Justification Test, as detailed in **Table 2.2**.

<b>Justification Test for Development Plans</b>	
1.	The urban settlement is targeted for growth under the National Spatial Strategy, regional planning guidelines, statutory plans as defined above or under the Planning Guidelines or Planning Directives provisions of the Planning and Development Act, 2000, as amended.
2.	The zoning or designation of the lands for the particular use or development type is required to achieve the proper planning and sustainable development of the urban settlement and, in particular: <ol style="list-style-type: none"> <li>i. Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement;</li> <li>ii. Comprises significant previously developed and/or under-utilised lands;</li> <li>iii. Is within or adjoining the core of an established or designated urban settlement;</li> <li>iv. Will be essential in achieving compact and sustainable urban growth; and</li> <li>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.</li> </ol>
3.	A flood risk assessment to an appropriate level of detail has been carried out as part of the Strategic Environmental Assessment as part of the development plan preparation process, which demonstrates that flood risk to the development can be adequately managed and the use or development of the lands will not cause unacceptable adverse impacts elsewhere. N.B. The acceptability or otherwise of levels of any residual risk should be made with consideration for the proposed development and the local context and should be described in the relevant flood risk assessment

**Table 2.2 Justification Test for Development Plans**

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

- Remove the existing zoning for all types of development on the basis of the unacceptable high level of flood risk;
- Reduce the zoned area and change or add zoning categories to reflect the flood risk; and/or
- Replace the existing zoning with a zoning or a specific objective for less vulnerable uses;
- Prepare a local area plan informed by a detailed flood risk assessment to address zoning and development issues in more detail and prior to any development; and/or
- If the criteria of the Justification Test have been met, design of structural or non-structural flood risk management measures as prerequisites to development in specific areas, ensuring that flood hazard and risk to other locations will not be increased or, if practicable, will be reduced. The mitigation measures are required prior to development taking place.

## 2.4 PROPOSED DEVELOPMENT IN MONEENALION COMMONS

### 2.4.1 Detailed Flood Risk Assessments

Following application of the sequential approach, Development Plan Justification Test and subsequent potential re-zoning of land, it is recommended that any planning applications in Moneenalion Commons are accompanied by a supporting Stage 3 – Detailed Flood Risk Assessment as recommended by the Guidelines. This is to ensure a conservative approach and that consideration is given to new development within Flood Zone B where mitigation measures may still be required to ensure an appropriate level of flood protection and/or resilience.

Detailed FRAs should be carried out in accordance with the Guidelines and should present in sufficient detail the potential flood risk to a proposed development, the potential increase in flood risk elsewhere, any proposed mitigation measures and proposals for sustainable surface water management. The surface water drainage must be compliant with the GSDS and the Code of Practice, further discussed in Chapter 0.

### 2.4.2 Development Proposals in Flood Zones

For any development areas at Moneenalion Commons that meet the Development Plan Justification Test, a Development Management Justification Test must then be applied. Development must satisfy all of the criteria of the Development Management Justification Test as per **Table 2.3** below.

<b>Justification Test for Development Management</b>	
1.	The subject lands have been zoned or otherwise designated for the particular use or form of development in an operative development plan, which has been adopted or varied taking account of these Guidelines.
2.	The proposal has been subject to an appropriate flood risk assessment that demonstrates: <ol style="list-style-type: none"> <li>i. The development proposed will not increase flood risk elsewhere and, if practicable, will reduce overall flood risk;</li> <li>ii. The development proposal includes measures to minimise flood risk to people, property, the economy and the environment as far as reasonably possible;</li> <li>iii. The development proposed includes measures to ensure that residual risks to the area and/or development can be managed to an acceptable level as regards the adequacy of existing flood protection measures or the design, implementation and funding of any future flood risk management measures and provisions for emergency services access; and</li> <li>iv. The development proposed addresses the above in a manner that is also compatible with the achievement of wider planning objectives in relation to development of good urban design and vibrant and active streetscapes.</li> </ol>

The acceptability or otherwise of levels of residual risk should be made with consideration of the type and foreseen use of the development and the local development context.

**Table 2.3 Justification Test for Development Management**

### **2.4.3 Assessment of Existing Major Development Proposals in Areas of Flood Risk**

If there are any existing major development proposals in Moneenalion Commons which predate the implementation of the Guidelines, proposals should be considered as though the land was not zoned for development. The applicant should prepare an appropriate SFRA which meets the criteria for the Plan-making Justification Test.

The planning authority must then assess the proposal against the Development Management Justification Test. Where the information is not sufficient to fully assess the issues involved, the development should not be approved on the basis of flood risk and / or on the grounds of prematurity prior to addressing flood risk as part of the normal review of the development plan for the area.

### **2.4.4 Assessment of Minor Proposals to Existing Buildings in Areas of Flood Risk**

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

## 3 SUSTAINABLE DRAINAGE

### 3.1 INTRODUCTION

All new development in Moneenalion Commons must be compliant with the GSDSDS and the Code of Practice to ensure that drainage from the site is managed sustainably. While this chapter provides an overview of drainage and storm water management for development in Moneenalion Commons to minimise the risk of flooding, the GSDSDS and Code of Practice remain the overriding policy documents.

### 3.2 SURFACE WATER RISK AREAS

#### 3.2.1 OPW Pluvial Flooding Risk Assessment Study

The Stage 1 – Flood Risk Identification Report identified clusters of indicative pluvial risk areas from the OPW Pluvial Flooding Risk Assessment (PFRA) study as shown in **Figure 3.1**. Any detailed flood risk assessment for development proposals within or adjacent to these areas in Moneenalion Commons may include a more detailed assessment of pluvial risk for the site. Drainage proposals should be cognisant of pluvial risk in these areas. Appropriate drainage proposals should be implemented in these areas to reduce the risk of pluvial flooding.

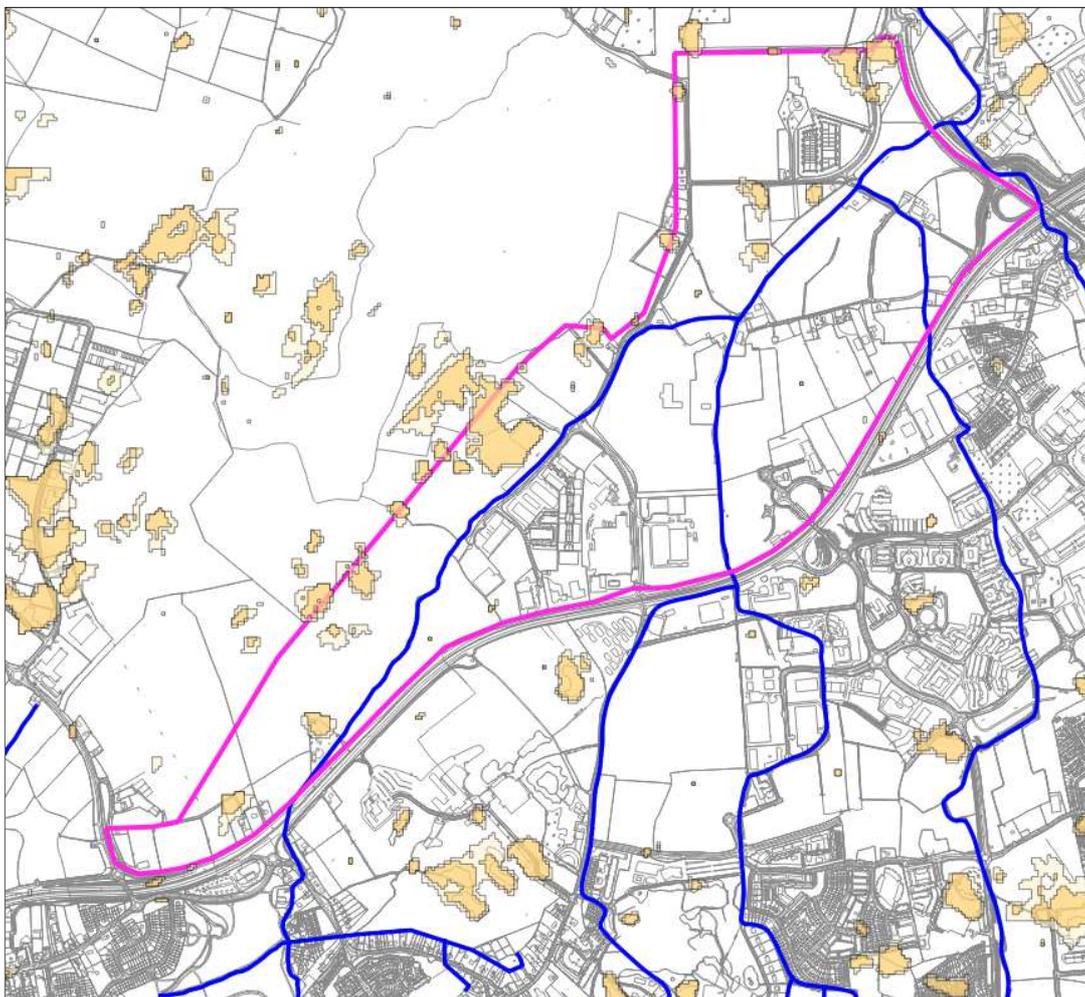


Figure 3.1 OPW Indicative Pluvial Flooding Risk Areas in Moneenalion Commons

### 3.2.2 GSDS Drainage Infrastructure

The GSDS undertook analysis of drainage infrastructure. Hydraulic models were run for a series of design events and current and future development scenarios up until 2031. Moneenalion Commons lies with the Camac River drainage catchment and the Lucan / Clondalkin and Newcastle / Rathcoole/ Saggart foul sewer drainage catchments.

The GSDS did not identify any drainage infrastructure at risk from flooding but appropriate drainage proposals should be implemented in these areas to reduce the risk of pluvial flooding and strain on the drainage infrastructure.

### 3.3 DRAINAGE REQUIREMENTS

The requirements below provide an overview of drainage requirements for development in Moneenalion Commons. It is noted that the GSDS and Code of Practice remain the overriding policy documents.

1. The proposed development shall be drained on a completely separate system. All new developments must incorporate Sustainable Drainage Systems (SuDS). In the unlikely event of this not being feasible the Developer must provide alternative means of dealing with pollutants. Rainwater should be infiltrated to the ground and/or discharged via a SuDS system to a surface water drain or watercourse. Other effluent, including wastewater, shall discharge to the foul drainage systems.
2. In general, watercourses are not to be culverted or piped. They should remain open in their natural valley, which should be incorporated into the public open space. Culverting should be confined to road crossings and should be sufficiently large to prevent blockage, allow runoff from a one in a hundred rain event and to allow for man entry for maintenance purposes. Permission must be obtained from the OPW (under a section 50 licence) to construct any culvert or bridge.
3. All proposed structures must be set back from the edge of any watercourse to allow access for channel cleaning/maintenance. A 15 meters wide riparian buffer strip each side of the watercourse is required. In dense urban areas the width of the riparian buffer strip is to be agreed with SDCC.
4. All new development must allow for climate change as set out in the [GSDS Technical Document, Volume 5, Climate Change](#).
  - i. River flows 20% increase in flows for all return periods up to 100 years
  - ii. Rainfall 10% increase in depth (factor all intensities by 1.1)
5. Surface water outfalls to streams, rivers, etc. should be unobtrusive and not cause erosion of the bed and banks. A suitable non-return device should be fitted on the outfall pipeline. SDCC must approve all design details.

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

### 3.4 STORM WATER MANAGEMENT REQUIREMENTS

The requirements below provide an overview of storm water management requirements for development in Moneenalion Common, but the GSDSDS and Code of Practice remain the overriding policy documents.

1. Development shall comply with the [Greater Dublin Strategic Drainage Study, Volume 2, New Development Policy](#).
2. The maximum permitted surface water outflow from any new development is to be restricted to that of a Greenfield site before any development took place.
3. All new development must allow for climate change as set out in the [GSDSDS Technical Document, Volume 5, Climate Change](#).
4. In general, all new developments must incorporate Sustainable Drainage Systems (SuDS).
5. Sustainable Drainage Systems include devices such as: [Swales](#), [Permeable Pavements](#), [Filter Drains](#), [Storage Ponds](#), [Constructed Wetlands](#), [Soakaways](#), etc. SuDS devices such as permeable paving or swales/ ponds etc. may require the approval of SDCC.
6. In some exceptional cases it may not be feasible to use the above devices and at the discretion of the SDCC, approval may be given to install underground attenuation tanks or enlarged pipes in conjunction with other devices to achieve the required water quality. These should only be considered as a last resort where it can be shown that SuDS measures are not achievable
7. Attenuation tanks shall normally be located in green areas; any other location requires the approval from SDCC.
8. Where a tank is to be constructed in a trafficked area, a standard minimum depth of cover from road level to top of the roof of the tank should be 1.2m.
9. All enlarged pipes and associated manholes must comply with the GSDSDS and the Code of Practice.
10. In order to isolate and carry out maintenance of the flow control device a penstock valve (or similar approved) shall be installed within the outfall manhole, on the upstream end of the manhole.
11. For gravity systems a Hydrobrake (or similar approved flow control device) shall be installed in the last manhole.
12. The opening to be large enough to facilitate the extraction of the flow control device.
13. An overflow from the flow control manhole to the public drainage network is not allowed.

The key design criteria for development are shown in Error! Reference source not found. but readers are advised to consult the technical document, [Greater Dublin Strategic Drainage Study, Volume 2, New Development Policy](#).

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

**Table 3.1 Key Design Criteria for Storm Water Management for Development**

## 4 SUMMARY

This report examines the Flood Zones A, B and C identified from the Strategic Flood Risk Assessment (SFRA) Stage 1 – Flood Risk Identification Report with respect to the management of flood risk for development in the townland of Moneenalion Commons, Baldonnel, Co. Dublin and also provides an overview of drainage and storm water management for the area.

**Table 4.1** below summarises flood risk management considerations and key surface water management policies applicable to Moneenalion Commons identified in the report. These items are based on guidance provided in the OPW Planning System and Flood Risk Assessment Guidelines for Planning Authorities (2009) (referred to hereafter as ‘The Guidelines’), the Greater Dublin Strategic Drainage Study (GSDSDS) (2005) and the Greater Dublin Regional Code of Practice for Drainage Works (2012) (referred to hereafter as ‘The Code of Practice’).

<b>Moneenalion Commons Development – Flood Risk Management</b>
The land zoning for some areas should be reconsidered as it is inappropriate in accordance with the Guidelines.
If the existing land use zoning in Flood Zones A and B cannot be avoided or substituted, it must satisfy the criteria of the Justification Test for Development Plans. All of the criteria must be satisfied.
New development proposals should be subject to a detailed flood risk assessment. The detailed FRA should be carried out in accordance with the Guidelines.
New proposed development in flood risk areas must satisfy the criteria of the Development Management Justification Test. All of the criteria must be satisfied.
Minor development to existing buildings in areas of flood risk does not need to satisfy the Justification Test. But a flood risk assessment of appropriate detail must accompany any application.
Applications for existing major development proposals which predate the implementation of the Guidelines should prepare an appropriate SFRA which meets the criteria for the Plan-making Justification Test. The planning authority must then assess the application against the Development Management Justification Test.
Detailed flood risk assessments should be cognisant of an indicative pluvial flood risk in Moneenalion Commons. Appropriate drainage proposals should be implemented in these areas to reduce the risk of pluvial flooding.
Development drainage must be compliant with the Greater Dublin Strategic Drainage Study, Volume 2, New Development Policy and the Greater Dublin Regional Code of Practice for Drainage Works.
All new development must allow for climate change as set out in the GSDSDS Technical Document, Volume 5, Climate Change.
In general all new developments must incorporate Sustainable Drainage Systems (SuDS).

**Table 4.1 Overview of Flood Risk Management Considerations**

While this document provides an overview of flood risk management and drainage for development in Moneenalion Common, the Guidelines, GSDSDS and Code of Practice remain the overriding policy documents.