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| Prepared For | O'Briain Beary Architects |



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1. INTRODUCTION

This Site Specific Flood Risk Assessment (SSFRA) Report has been prepared by Downes Associates as part of documentation to be submitted in support of a Section 179A planning application by Fingal County Council for a proposed residential development at Mayeston, Poppintree, Dublin 11. This report sets out in detail the assessment of the subject site for flood risk purposes only. This report should be read in conjunction with other separate reports prepared by Downes Associates and others.

As part of its Housing Programme, Fingal County Council (Housing Department) proposes to construct a number of new dwelling units and a crèche at a site located within the Mayeston estate at Poppintree, Dublin 11. The site, which measures approximately 1.35Ha in area, is located between St Margaret's Rd to the south, the M50 to the north, existing residential development to the east, and a public park to the west (refer to Figure 1a below). The land is zoned RS-Residential: '*Provide for residential development and protect and improve residential amenity*'. The site forms part of the Mayeston estate which has been developed in recent years. The southern part of the current application site forms part of a larger 1.43Ha site for which planning permission was previously granted (planning register ref. F06A/1348) – refer to orange shaded area in Figure 1b. The northern wedge-shaped part of the current application as shaded green in Figure 1b and which measures approximately 0.59Ha did not form part of the previous planning application permitted under F06A/1348. Only the eastern part of the granted development F06A/1348 was constructed – refer to Figure 1c. The remaining site was only partially developed – concrete slabs and foundations are in place for unfinished units as can be seen in Figure 1a.

The proposed development will include for the provision of 119 No. apartment units consisting of 39 No. one-bedroom apartments, 68 No. two-bedroom apartments and 12 No. 3-bedroom apartments ranging from 3-6 No. storeys and will also include for car parking, cycle parking, pedestrian and cycle links, storage, services and plant areas. Landscaping will include for high quality private open space, communal amenity areas and public open space provision.

| House Type | Total Number |
|-----------------------------------|--------------|
| 1-bed apartment units | 39 |
| 2-bed 3-person apartment units | 13 |
| 2-bed 3-person UD apartment units | 20 |
| 2-bed 4-person apartment units | 35 |
| 3-bed 5-person apartment units | 6 |
| 3-bed 5-person duplex unit | 6 |
| Total | 119 |

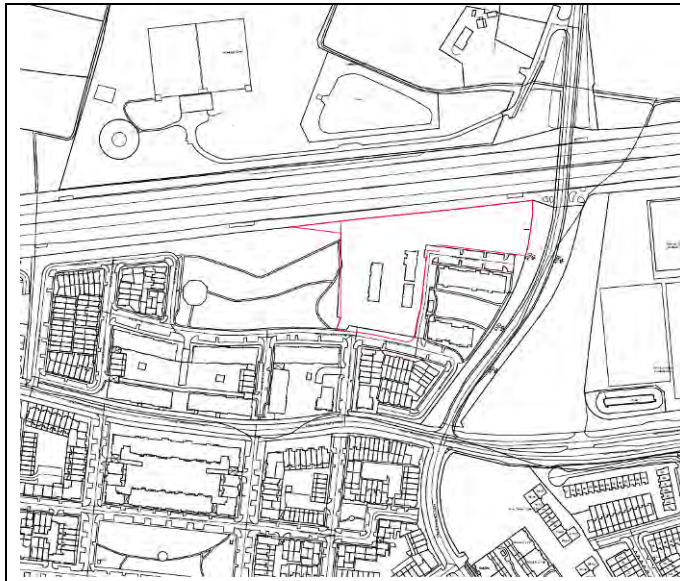


Figure 1a – Proposed site location map with site outlined in red.



Figure 1b -Site Map showing approximate extent of previous planning application F06A/1348 (shaded orange) and additional lands (shaded green) included in the current application.

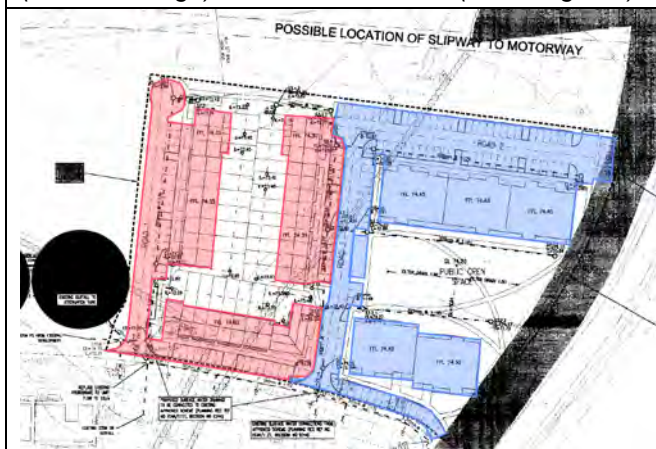


Figure 1c – Extract of planning drawing for Planning Ref. F06A/1348 showing extent of constructed development (blue) and unconstructed development (red).

Figure 1 – Site Location Maps

2. FLOOD RISK MANAGEMENT GUIDELINES

This SSFRA has been carried out in accordance with The OPW/Dept. of the Environment, Heritage and Local Government publication “The Planning System and Flood Risk Management – Guidelines for Planning Authorities”, November 2009 (FRM Guidelines).

The core objectives of the FRM Guidelines are to:

- Avoid inappropriate development in areas at risk of flooding;
- Avoid new developments increasing flood risk elsewhere, including that which may arise from surface water run-off;
- Ensure effective management of residual risks for development permitted in floodplains;
- Avoid unnecessary restriction of national, regional or local economic and social growth;
- Improve the understanding of flood risk among relevant stakeholders;
- 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.

In achieving the aims and objectives of the FRM Guidelines, the key principles that should be adopted by regional and local authorities, developers and their agents should be to:

- Avoid the risk, where possible,
- Substitute less vulnerable uses, where avoidance is not possible, and
- Mitigate and manage the risk, where avoidance and substitution are not possible.

The FRM Guidelines recommend a precautionary approach when considering flood risk management in the planning system. The core principle of the guidelines is to adopt a risk based sequential approach to managing flood risk and to avoid development in areas that are at risk. The sequential approach is based on the identification of flood zones for river and coastal flooding. A three staged approach to undertaking a FRA is recommended:

Flood Risk Identification (Stage 1) - Identification of any issues relating to the site that will require further investigation through a Flood Risk Assessment.

Initial Flood Risk Assessment (Stage 2) - Involves establishment of the sources of flooding, the extent of the flood risk, potential impacts of the development and possible mitigation measures.

Detailed Flood Risk Assessment (Stage 3) - Where Stages 1 and 2 indicate that a proposed development or area of possible zoning may be subject to a significant flood risk, a detailed flood risk assessment must be carried out. Assess flood risk issues in sufficient detail to provide quantitative appraisal of potential flood risk of the development, impacts of the flooding elsewhere and the effectiveness of any proposed mitigation measures.

3. FLOOD RISK ASSESSMENT METHODOLOGY

The assessment of flood risk requires an understanding of where the water comes from (i.e. the source), how and where it flows (i.e. the pathways) and the people and assets affected by it (i.e. the receptors). The components to be considered in the identification and assessment of flood risk are set out in Table A1 of the FRM Guidelines and are summarised below:

- Tidal – flooding from high sea levels
- Fluvial – flooding from watercourses
- Pluvial – flooding from rainfall/surface water
- Ground Water – flooding from springs / raised groundwater
- Human/mechanical error – flooding due to human or mechanical error

Each component shall be considered from a Source, Pathway and Receptor model perspective (refer to Figure 2). The overall risk of flooding to development is then determined by considering the **likelihood** of a flooding event occurring within the development and the **consequences** of such flooding. This is commonly assessed using a likelihood versus consequences risk matrix, as shown in Figure 3.

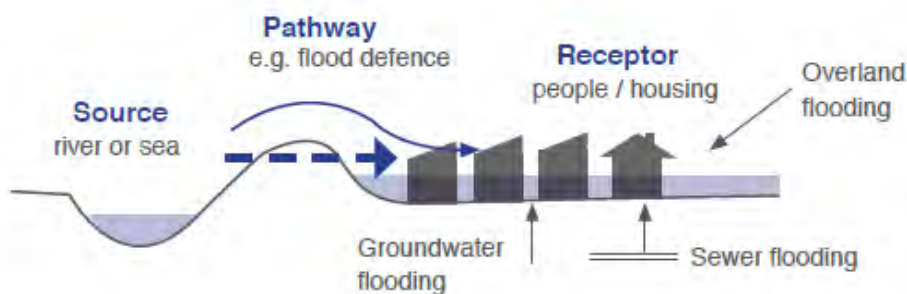


Figure 2 – Source-Pathway-Receptor Model

| | | CONSEQUENCES | | |
|------------|----------|--------------------|---------------|---------------------|
| | | LOW | MODERATE | HIGH |
| LIKELIHOOD | LOW | Extremely Low Risk | Low Risk | Moderate Risk |
| | MODERATE | Low Risk | Moderate Risk | High Risk |
| | HIGH | Moderate Risk | High Risk | Extremely High Risk |

Figure 3 – Flood Risk Assessment Matrix

2.1 Likelihood of Flooding

The **likelihood** of flooding falls into the categories of low, moderate, and high, which are described in the FRM Guidelines. The guidelines include definitions of Flood Zones A, B and C as set out below. It should be noted that these do not take into account the presence of flood defences, as there remain risks of overtopping and breach of the defences.

Zone A (high probability of flooding) refers to lands where the probability of flooding is greatest (greater than 1% or the 1 in 100 for river flooding and 0.5% or 1 in 200 for coastal flooding).

Zone B (moderate probability of flooding) refers to lands where the probability of flooding 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 and 0.5% or 1 in 200 for coastal flooding).

Zone C (low probability of flooding) refers to lands where the probability of flooding is low (less than 0.1% or 1 in 1000 for both river and coastal flooding).

Once a flood zone has been identified, the guidelines set out the different types of development appropriate to each zone. Exceptions to the restriction of development due to potential flood risks are provided for through the use of the Justification Test, where the planning need and the sustainable management of flood risk to an acceptable level must be demonstrated. This recognises that there will be a need for future development in existing towns and urban centres that lie within flood risk zones, and that the avoidance of all future development in these areas would be unsustainable.

2.2 Consequences of Flooding

The **consequences** of flooding are determined by the hazards associated with the flooding (depth of water, speed, flow, rate of onset, duration, wave action, water quality) and the vulnerability of people, property, and environment assets potentially affected by a flood (age profile of the population, type of development, presence, and reliability of mitigation measures). There is no defined method used to quantify the consequences of a flooding event. Therefore, in order to determine a value for the consequences of a flooding event, the elements likely to be adversely affected by such flooding will be assessed, with the likely damage being stated, and professional judgment is then used in order to determine a value for consequences. Consequences will also be categorized as low, moderate and high.

2.3 Sequential Approach & Justification Test

The FRM Guidelines recommend a sequential approach to planning to ensure the core objectives outlined in Section 2 above are implemented. It is of particular importance at the plan making stage but is also applicable in the layout and design of development at the development management stage. The broad philosophy of the sequential approach in flood risk management from the OPW Guidelines is shown in Figures 4 and 5. In general, most types of development would be considered inappropriate in Flood Zone A. In Flood Zone B, highly vulnerable development (e.g., hospitals, dwelling houses and primary infrastructure) would be considered inappropriate but less vulnerable development (e.g., retail, commercial and industrial uses) might be considered appropriate. Development within Flood Zone C is appropriate from a flood risk perspective. However, this preferred Sequential Approach is not always possible as

many urban centres are affected by Flood Zones and are targeted for key social and economic development. To reflect this, the OPW Guidelines outline the Justification Test to facilitate assessment of the balance between consideration of flood risk issues and the need for continued development in towns and cities.

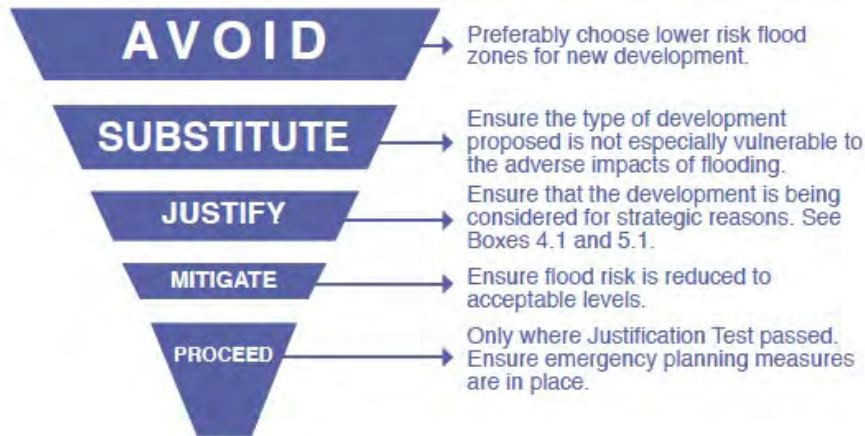


Figure 4 – Flood Risk Management Sequential Approach Principles

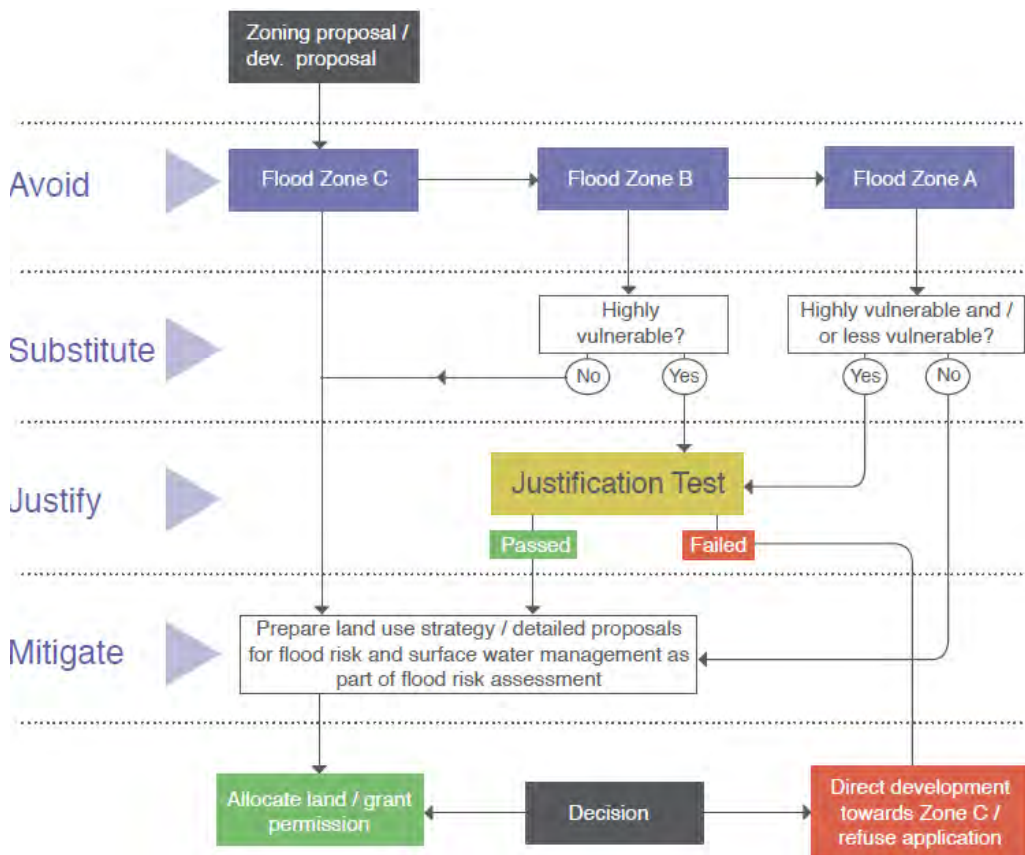


Figure 5 – Sequential Approach Mechanism for Planning

This SSFRA shall assess compliance with the above sequential approach in terms of proper planning and development.

2.4 Climate Change Adaptation Plan

The Flood Risk Management Climate Change Sectoral Adaptation Plan was published in 2019 under the National Adaptation Framework and Climate Action Plan. This plan outlines the OPW's approach to climate change adaptation in terms of flood risk management. This approach is based on a current understanding of the potential impacts of climate change on flooding and flood risk. Research has shown that climate change is likely to worsen flooding through more extreme rainfall patterns, more severe river flows, and rising mean sea levels. To account for these changes, the Adaptation Plan presents two future flood risk scenarios to consider when assessing flood risk:

- Mid-Range Future Scenario (MRFS)
- High-End Future Scenario (HEFS)

Table 2-2 indicates the allowances that should be added to estimates of extreme rainfall depths, peak flood flows, and mean sea levels for the future scenarios.

| Parameter | Mid-Range Future Scenario (MRFS) | High-End Future Scenario (HEFS) |
|-------------------------|---|--|
| Extreme Rainfall Depths | +20% | +30% |
| Peak River Flood Flows | +20% | +30% |
| Mean Sea Level Rise | +0.5m | +1.0m |

Table 1 - Climate Change Adaptation Allowances for Future Flood Risk Scenarios

This SSFRA shall consider the above recommendations in determining the flood risk associated with future climate change.

2.5 Residual Risk & Flood Risk Management

Residual flood risks are those that remain after a risk assessment has been made and all mitigation measures have been implemented. Examples of residual risk include failure of flood management measures, blockages of surface water management pipework and equipment, and a flood event that exceeds the flood design standard (exceedance). Flood risk management aims to minimize the potential risks to people, properties and the environment arising from potential flooding.

This SSFRA shall identify the residual risks associated with the proposed development along with any on- and off-site impacts arising from potential exceedance events.

4. SOURCES OF INFORMATION

As part of the preparation of the SSFRA, information has been collated from the following sources:

- Available water services record maps from Fingal County Council and Uisce Éireann.
- Strategic Flood Risk Assessment prepared by McCloy Consulting as part of the Fingal Development Plan 2023-2029, November 2022.
- OPW Preliminary Flood Risk Assessment indicative flood maps.
- [Floodinfo.ie](https://www.floodinfo.ie) - The national flood hazard website operated by the OPW, where information about past flood events are recorded and made, along with interactive maps of flood hazard that provide a detailed picture of flood risk for a range of flood event scenarios including climate change.
- [Gis.epa.ie](https://gis.epa.ie) – Environment & wellbeing mapping portal operated by Environmental Protection Agency (EPA).
- [Gsi.ie](https://www.gsi.ie) – Geological Survey Ireland is the national earth science knowledge centre operated by the Department of Communications, Climate Action and Environment.
- Internet-based search into local flooding.
- Site-specific Geotechnical Site Investigation Report 5909, Site Investigations Ltd, January 2022.
- Downes Associates Infrastructure Design Report Ref 21208-DOW-00-XX-RP-CE-0003 and Accompanying Drawings.

5. FLOOD RISK IDENTIFICATION

5.1 Surface Water Features

The proposed development site is located within an urban area and there are no existing surface watercourses on or immediately adjacent to the site. The nearest significant watercourses to the site are the Santry River approximately 1.5km to the northeast and the Ward River approximately 2.5km to the northwest - refer to Figure 6 below. Both of these rivers have a history of flooding, but they are remote from the proposed development site.

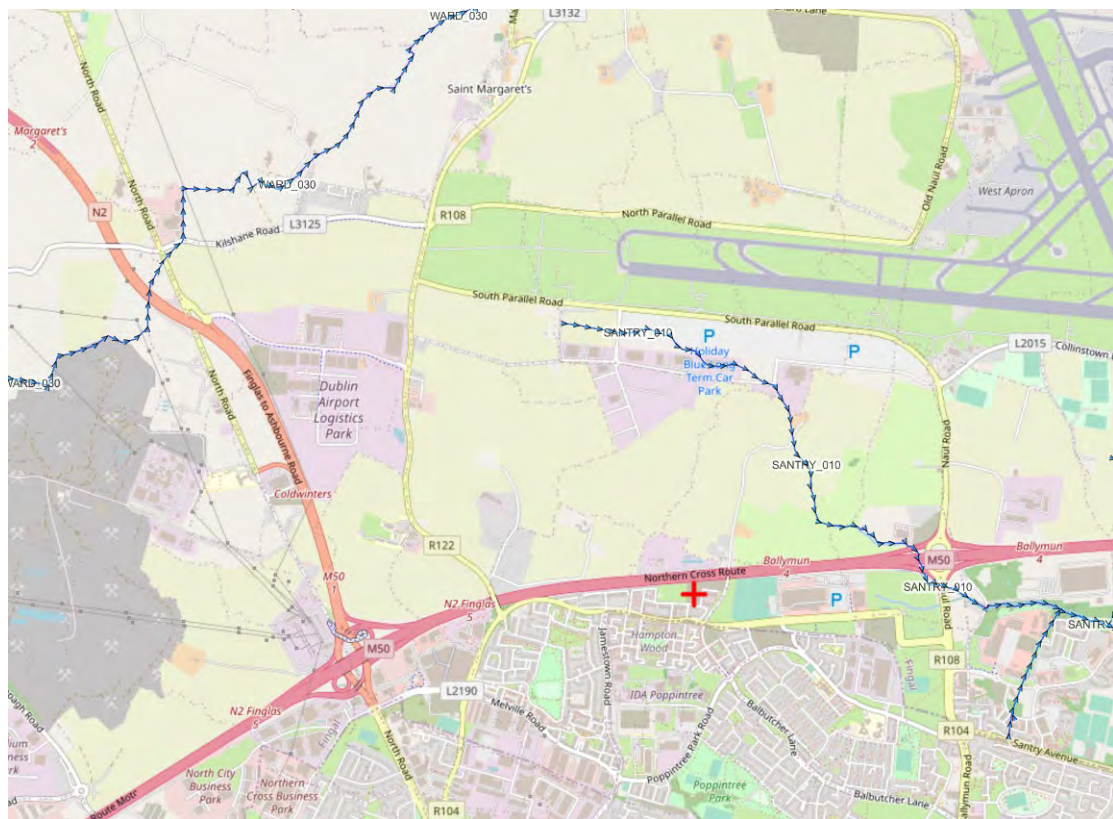


Figure 6 - Extract EPA GIS Map showing watercourses (site location marked with red cross)

The Irish Sea at Dublin Bay is approximately 6.7km southeast of the site – refer to Figure 7 below. The lowest ground level on the site is approximately 73.75m OD (Malin Head). The Dublin Coastal Protection Project indicated that the 2002 high tide event reached 2.95m OD (Malin Head).

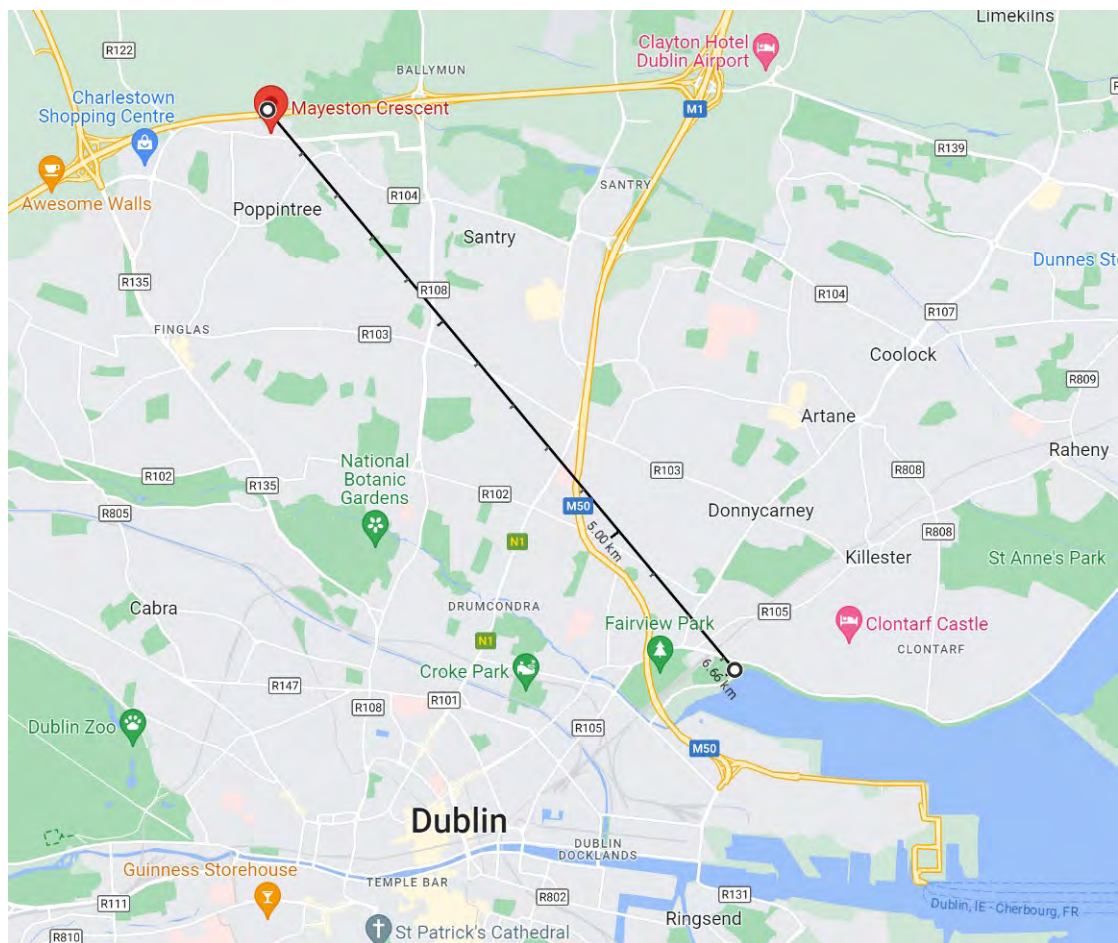


Figure 7 – Distance of Site from Sea

Currently the site is a partly developed brownfield site with a relatively level topography, with a number of concrete slabs and spoil heaps associated with previously granted development. There are known existing “separate” piped water services within and adjacent to the site which were constructed as part of the Mayeston estate, and these are connected to the existing wider drainage infrastructure. Based on available information, the existing surface water drainage system within the adjacent Mayeston Estate is designed in compliance with The Greater Dublin Strategic Drainage Study (GSDS) and includes attenuation storage within underground storage tanks located in the public open space area immediately to the west of the site. This attenuation storage system includes a design storage allowance for the current application site. Further details of the existing piped water services infrastructure can be found in Downes Associates Infrastructure Design Report included with this application.

5.2 Previous Flood Events & Extents

Examination of flood maps on the OPW website www.floodinfo.ie revealed records of past flooding in the vicinity of the site – refer to Figures 8 and 9 below. The summary report of records of past flooding within 2.5km of the site in Figure 9 indicates two records of past flood events, namely events ID-1701 and ID-1716. These two flood events relate to single rainfall events in 2002. Based on the reports provided about these flood events, we understand that

remedial measures were carried out to prevent recurrence. No reported recurrences at these two locations is evident from the records.

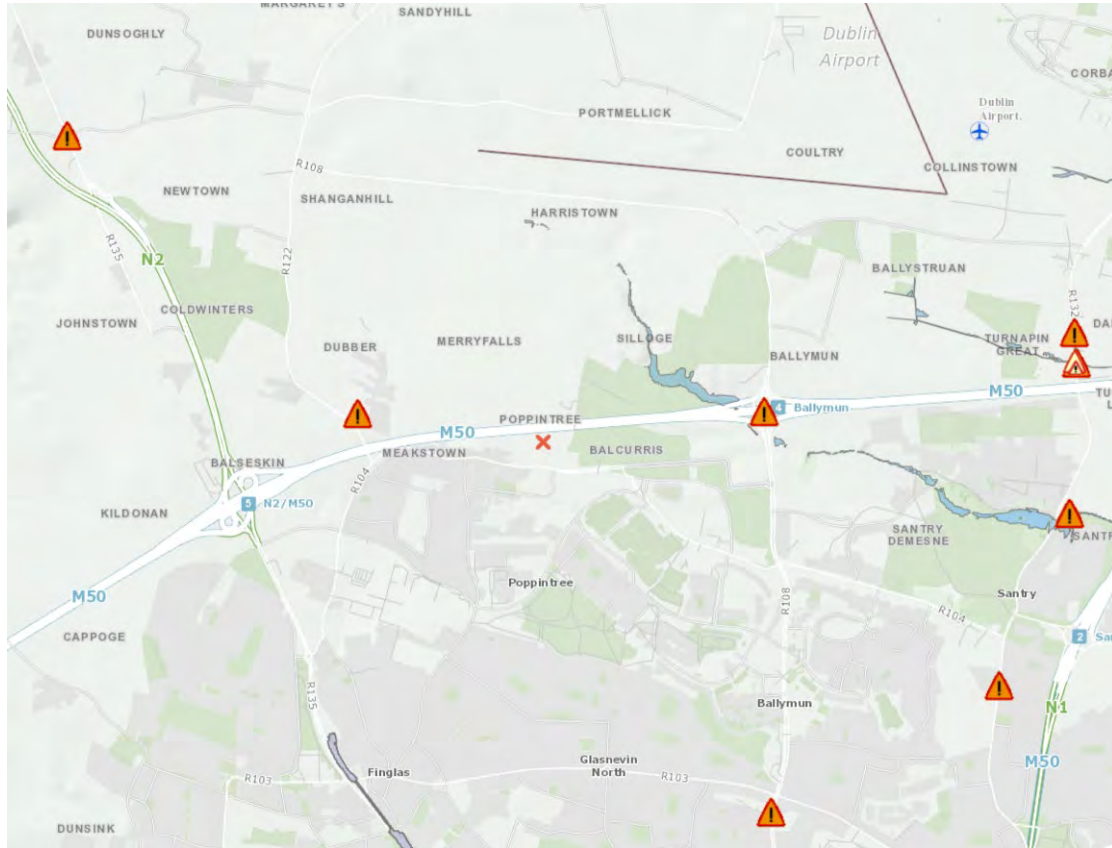


Figure 8 –Extent of records of Past Flooding Events and Extents from www.floodinfo.ie (site marked with red X)

Past Flood Event Local Area Summary Report

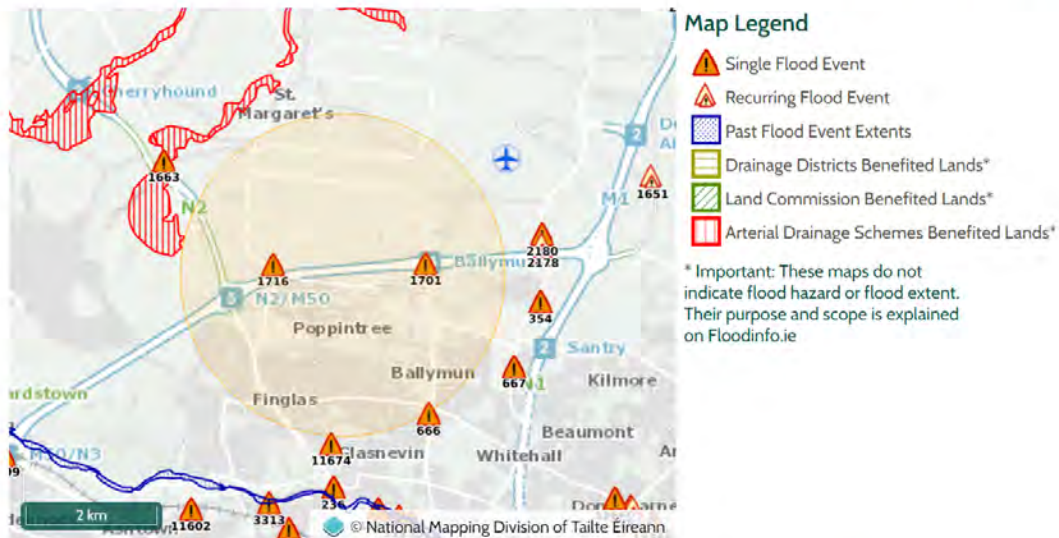


OPW
 Oifig na nOibreacha Poiblí
 Office of Public Works

Report Produced: 30/8/2023 9:28

This Past Flood Event Summary Report summarises all past flood events within 2.5 kilometres of the map centre.

This report has been downloaded from www.floodinfo.ie (the "Website"). The users should take account of the restrictions and limitations relating to the content and use of the Website that are explained in the Terms and Conditions. It is a condition of use of the Website that you agree to be bound by the disclaimer and other terms and conditions set out on the Website and to the privacy policy on the Website.



2 Results

| Name (Flood_ID) | Start Date | Event Location |
|--|------------|----------------|
| 1. M50 at Ballymun Exit Nov 2002 (ID-1701) Additional Information: Reports (1) Press Archive (0) | 13/11/2002 | Exact Point |
| 2. Dubber Cross Meakstown Swords Area Nov 2002 (ID-1716) Additional Information: Reports (1) Press Archive (0) | 14/11/2002 | Exact Point |

Figure 9 - Past flood event local area summary report from www.floodinfo.ie

5.3 Predictive Flood Events & Extents

Examination of the interactive flood maps on the OPW website www.floodinfo.ie revealed the extents of predictive flooding in the vicinity of the site – refer to Figure 10 below. The records of past flooding within 2.5km of the site in Figure 8 are remote from the site in question. The effects of climate change have been included in Figure 10 using the models available on www.floodinfo.ie applied to the critical duration storm events for the 1% and 0.1% AEP events for both the Mid Range (+20%) and High End (+30%) future scenarios as set out in the OPW's Climate Change Sectoral Adaption Plan – Flood Risk Management (2015 -2019). Based on the available OPW models, the site is not subject to predictive fluvial flooding and the effects of climate change are insignificant with respect to flood levels and extents in the vicinity of the site, and so have no discernible impact on the site in question.

The interactive mapping is consistent with the corresponding map provided in McCloy Consulting's Strategic Flood Risk Assessment (SFRA) commissioned by Fingal County Council as part of the preparation of the Fingal Development Plan 2023-2029 – refer to Figure 11.

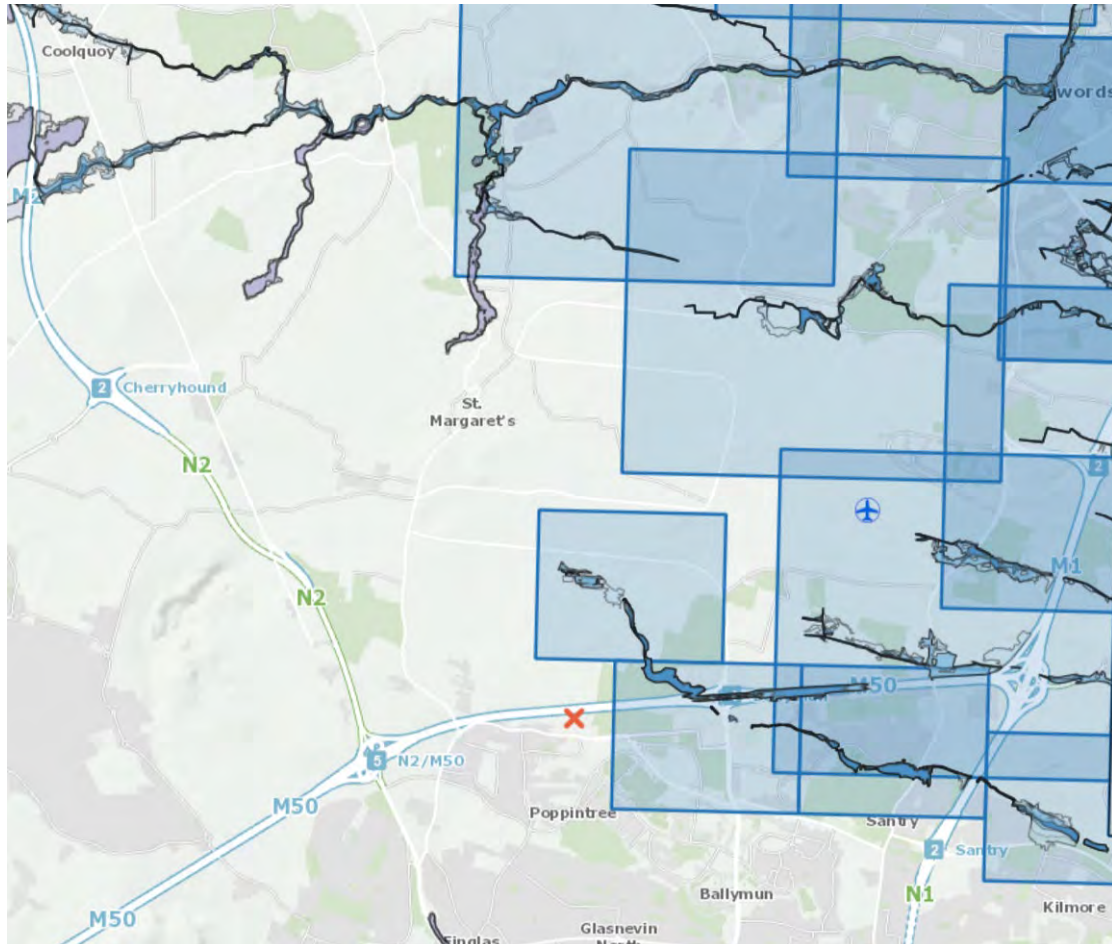


Figure 10 –Extent of CFRAM Predictive Fluvial Flooding (including mid-range and high-end future scenarios) and available CFRAM Maps from www.floodinfo.ie (site marked with red X)

21208 Proposed New Housing at Mayeston, Poppintree, Dublin 11
Flood Risk Assessment Report

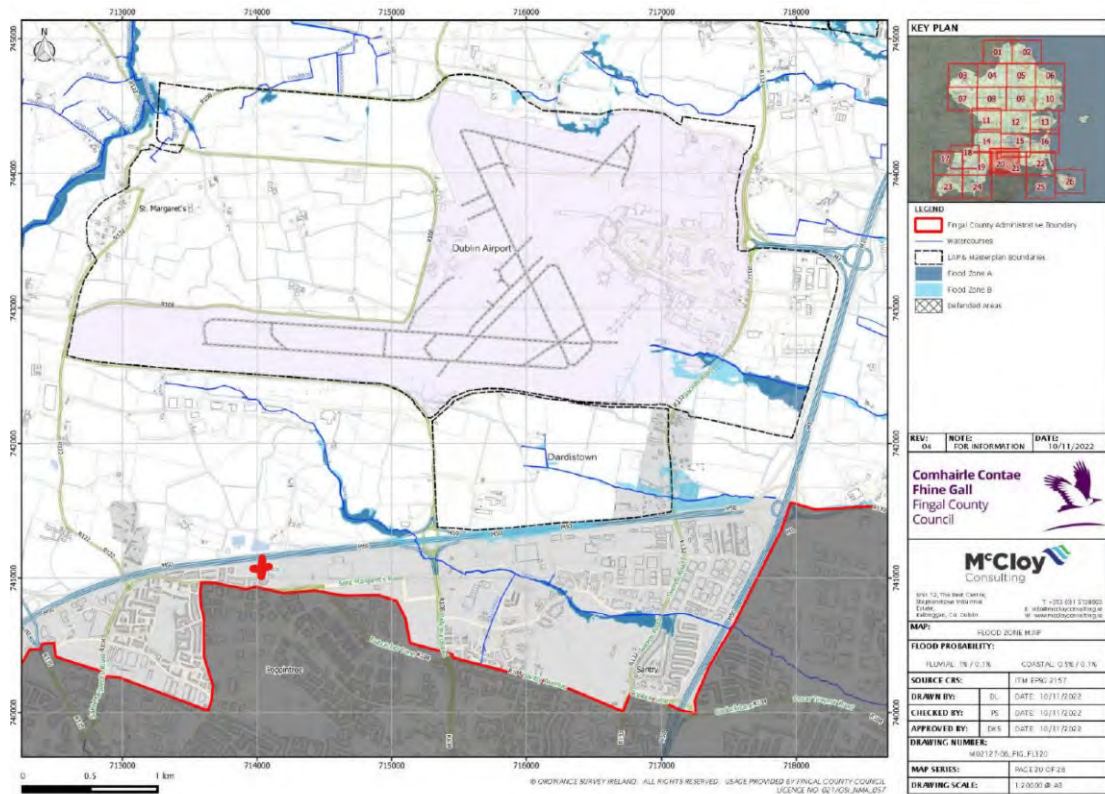


Figure 11 – Strategic Flood Risk Assessment Map for Fingal Development Plan 2023 – 2029, McClroy Consulting, November 2022 (site marked with red +).

6. FLOOD RISK ASSESSMENT

4.1 Sources of Flooding

The following potential flood risks and sources of flood water at the site have been considered.

4.1.1 Fluvial:

Fluvial flooding is the result of a river exceeding its capacity and excess water spilling out onto the adjacent floodplain. Based on the historical and predictive mapping and McCloy Consulting's SFRA, fluvial flooding associated with the existing watercourses in the vicinity of the site do not pose a risk to the development site.

4.1.2 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. During periods of extreme prolonged rainfall, pluvial flooding may occur through surcharging of the on-site and surrounding drainage systems and/or overland flooding during heavy rain events, both of which can lead to on site and off site flooding.

The existing Mayeston estate and the proposed development's surface water management comprises SuDS measures which are designed to cater for storm events up to the 1 in 100 year return period, including an allowance of 20% for climate change. In accordance with the GSDS level of service (flooding) requirements, the surface water modelling has been designed to prevent pipe surcharging and on-/off-site flooding for all rainfall events. Refer to Downes Associates Infrastructure Design Report for details of the proposed SuDS measures.

Based on records of previous flood events in the vicinity of the site as set out above, the likelihood of flooding from surrounding areas is considered to be low.

4.1.3 Coastal:

Coastal flooding is the result of sea levels which are higher than normal and result in sea water overflowing onto the land. Due to the inland location of the site, coastal flooding is not considered to be a risk for the proposed development.

4.1.4 Ground Water:

There are no known records of groundwater/ springs seeping through the ground in this area, and this is supported by the findings of the geotechnical site investigation carried out by Site Investigations Ltd. Ground water flooding is therefore not considered to be a risk for the proposed development.

4.2 Flood Zone

With reference to Section 2 above, it is assumed that the site lies within Flood Zone C (low probability of flooding).

4.3 Vulnerability

Table 3.1 of the FRM Guidelines for Planning Authorities gives a detailed classification of vulnerability of different types of development. As the proposed development will be predominantly for residential use (classified as “Highly vulnerable development”) it is suited to Flood Zone C. Therefore, we conclude that the proposed development is located in a suitable flood zone.

4.4 Potential Impact of Development on Flooding Elsewhere

It is not considered that the construction of the proposed development will impact on flooding elsewhere. The project is essentially completing an already partially-developed estate. The SuDS design adopted for the existing Mayeston Estate and the proposed development shall minimise the risk associated with any future pluvial flooding.

4.6 Flood Risk mitigation & Residual Risks

No mitigation measures are required with regard to fluvial, ground water or coastal flooding. The risk of pluvial flooding to the proposed buildings is mitigated by adequate sizing of the on-site surface water network and SuDS measures and by providing an adequate free-board above water levels. The risk from any surcharged surface water is also reduced due to finished floor levels being above the adjacent road levels and with overland flood routing incorporated into the development.

There is a low risk anticipated for the proposed development with regard to fluvial and coastal flooding. As a result of the design measures set out above, there is a low residual risk of flooding from the surface system, subject to regular inspection and maintenance of the SuDS components.

7. CONCLUSION

On the basis of the flood risk assessment undertaken, the site is elevated relative to and outside the predictive flood extents of any existing watercourses based on current available information. Based on the information, the subject site is considered not at risk of fluvial, ground water or tidal flooding. The site can therefore be considered to be in flood Zone C – where the probability of flooding from rivers and seas is low.

The vulnerability class of the development is dependent on the land use and type of development proposed. The “Planning Systems and Flood Risk Management: Guidelines for Planning Authorities” presents a matrix of vulnerability versus flood zone to illustrate appropriate development and the requirement of justification tests. The proposed residential development is classified as a combination of less vulnerable and highly vulnerable development. Vulnerable developments, such as the proposed development, at risk of Zone A and Zone B flooding require a justification test. Therefore, a justification test is not required for the proposed development as, based on the evidence outlined above, the development is considered to be located in Zone C, i.e. an area subject to a low probability of flooding.

Detailed proposals for surface water management SuDS associated with the development to mitigate on and off site pluvial flooding are provided in Downes Associate Infrastructure Design Report.