

**12th Lock Studios
Lucan
Co. Dublin**

**Flood Risk Assessment
Report**

February 2024

23764

Issue No. 1

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1 Flood Risk Assessment

1.1 Objectives

The objectives of this report are to inform the planning authority regarding flood risk for the potential development of the lands. The report will assess the site and development proposals in accordance with the requirements of “*The Planning System and Flood Risk Management Guidelines for Planning Authorities*”.

The report will provide the following;

- The site’s flood zone category.
- Information to allow an informed decision of the planning application in the context of flood risk.
- Appropriate flood risk mitigation and management measures for any residual flood risk.

1.2 Flood Risk Assessment Scope

This SSFRA relates only to the proposed development site in Lucan, Co Dublin and its immediate surroundings. This report uses information obtained from various sources, together with an assessment of flood risk for the existing land and proposed development. The report follows the requirements of ‘*The Planning System & Flood Risk Management – Guidelines for Planning Authorities*’, (referred to as the *Guidelines* for the remainder of this report) and the South Dublin County Council Development Plan 2022-2028 Strategic Flood Risk Assessment (SFRA).

1.3 Existing Site

The site is located in Lucan, South Dublin, between Lucan Pitch and putt club and Lucan GAA club, fronting onto Adamstown road and beside the Grand canal. The 12th lock of the Grand canal is next to the site also. The site is currently occupied by a large industrial unit with older, smaller units located at the rear of the site. Generally, the site is flat with all surfaces surrounding the buildings roof are impermeable with all storm water run-off discharged to the local public sewers.

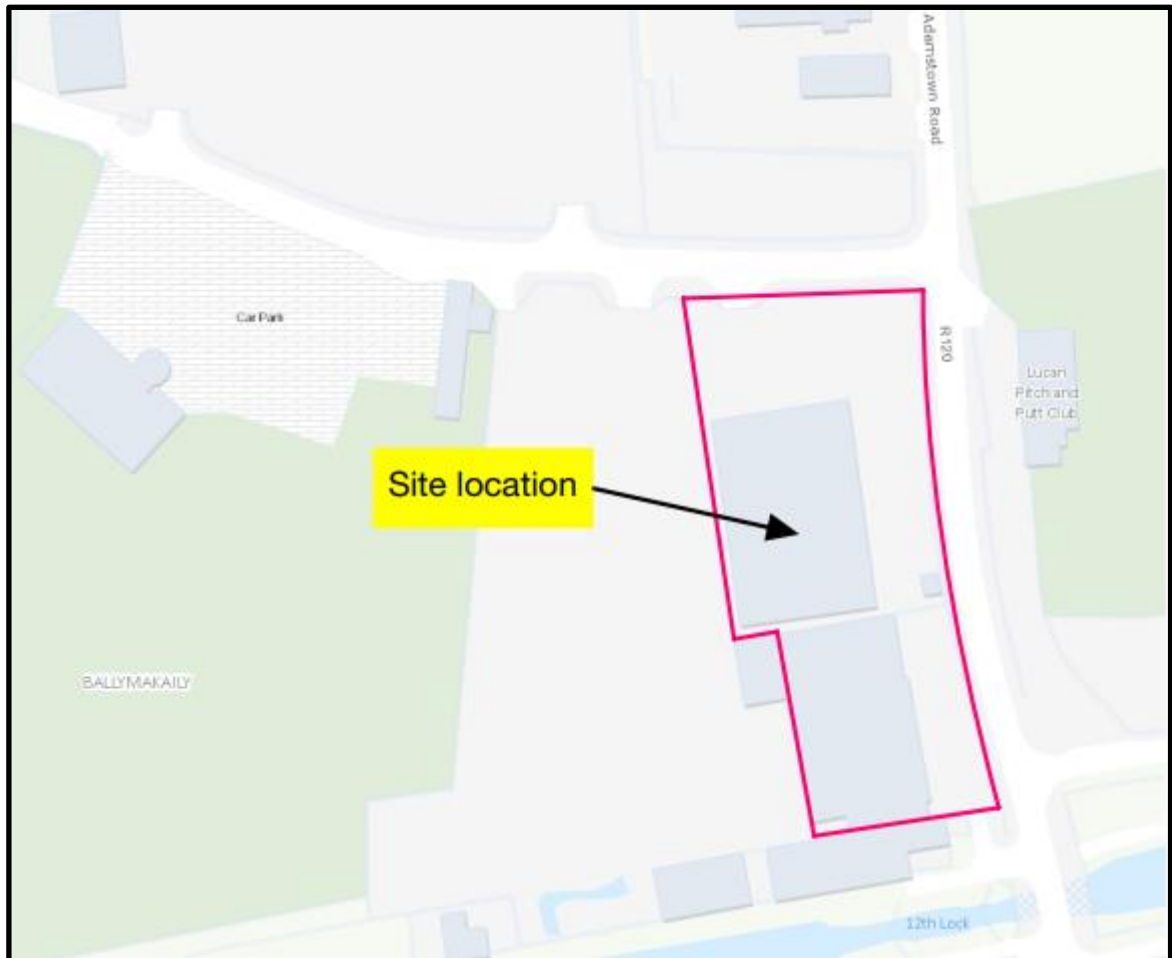


Figure 1.1 - Site Location

A description of the proposed uses of the site can be found in the Architectural design statement.

The grand canal is located adjacent to the site.

1.4 Proposed Development

A description of the proposed development is as follows:

- The demolition of the existing buildings to the south of the Main Industrial Units (refer to Architect's Demolition Plans)
- The internal fit out of the existing Industrial Unit as a Studio Facility.
- External site works including soft landscaping, permeable paving and improving the overall site area.

2 Planning Guidelines and Flood Risk Assessment

2.1 The Planning System and Flood Risk Management, Guidelines for Planning Authorities

The FRM Guidelines provide “mechanisms for the incorporation of flood risk identification, assessment and management into the planning process...” They ensure a consistent approach throughout the country requiring identification of flood risk and flood risk assessment to be key considerations when preparing development plans, local area plans and planned development.

“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;
- 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 the requirements of EU and national law in relation to the natural environment and nature conservation are complied with for flood risk management.”

The key principles of The FRM Guidelines are to apply the Sequential Approach to the planning process i.e.;

- “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.”

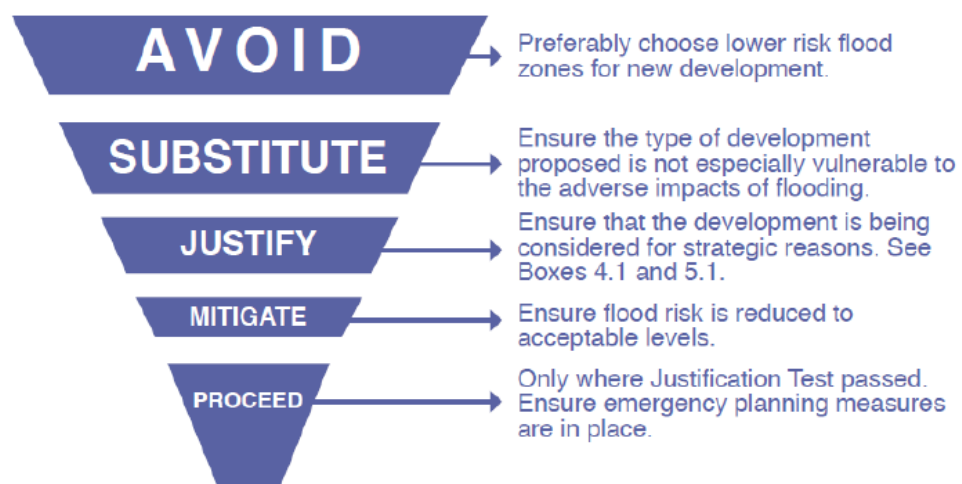


Figure 2.1. - Sequential Approach Principles in Flood Risk Management

Where the *Sequential Test's* **avoid** and **substitute** principals are not appropriate then the FRM Guidelines propose that a *Justification Test* be applied to assess the appropriateness, or otherwise, of particular developments that are being considered in areas of moderate or high flood risk.

2.1.1 Flood Risk Assessment

The assessment of flood risk requires an understanding of where water comes from (the source), how and where it flows (the pathways) and the people and assets affected by it (the receptors).

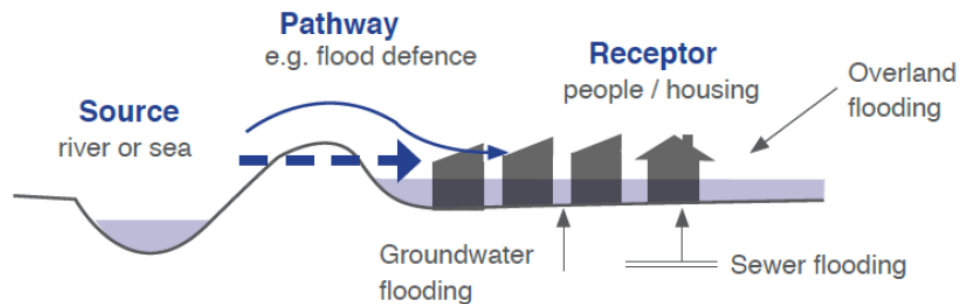


Figure 2.1 - Source - Pathway - Receptor Model

The principal sources are rainfall or higher than normal sea levels. The principal pathways are rivers, drains, sewers, overland flow and river and coastal floodplains and their defence assets. The receptors can include people, their property and the environment. All three elements are examined as part of the flood risk assessment including the vulnerability and exposure of receptors to determine potential consequences. Mitigation measures typically used in development management can reduce the impact of flooding on people and communities e.g. by blocking or impeding pathways. The planning process is primarily concerned with the location of receptors and potential sources and pathways that might put those receptors at risk.

Risks to people, property and the environment should be assessed over the full range of probabilities, including extreme events. Flood risk assessment should cover all sources of flooding, including effects of run-off from a development locally and beyond the development site.

2.2 Flood Risk Assessment Stages

The FRM Guidelines outline that a staged approach should be adopted when carrying out a flood risk appraisal or assessment. "These stages are:

- *Stage 1 Flood risk identification*
- *Stage 2 Initial flood risk assessment*
- *Stage 3 Detailed flood risk assessment*

The FRA Guidelines require a SSFRA be undertaken to assess flood risk for individual planning applications. This SSFRA comprises Stages 1, 2 and 3 involving both identification and more detailed assessment of flood risks and surface water management related to the planned development site.

2.3 Flood Zones

The FRM Guidelines use flood zones to determine the likelihood of flooding and for flood risk management within the planning process. The three flood zones levels are:

- Flood Zone A – where the probability of flooding from rivers and the sea is highest (greater than 1% AEP (Annual Exceedance Probability) or 1 in 100 for river flooding);
- Flood Zone B – where the probability of flooding from rivers and the sea is moderate (between 0.1% AEP or 1 in 1000 and 1% AEP or 1 in 100 for river flooding); and
- Flood Zone C – where the probability of flooding from rivers and the sea is low (less than 0.1% AEP or 1 in 1000 for both river and coastal flooding). Flood Zone C covers all areas outside zones A and B.

The FRM Guidelines categorises all types of development as either;

- Highly Vulnerable e.g. dwellings, hospitals, fire stations, essential infrastructure,
- Less Vulnerable e.g. retail, commercial or industrial buildings, local transport infrastructure.
- Water Compatible e.g. flood infrastructure, docks, amenity open space.

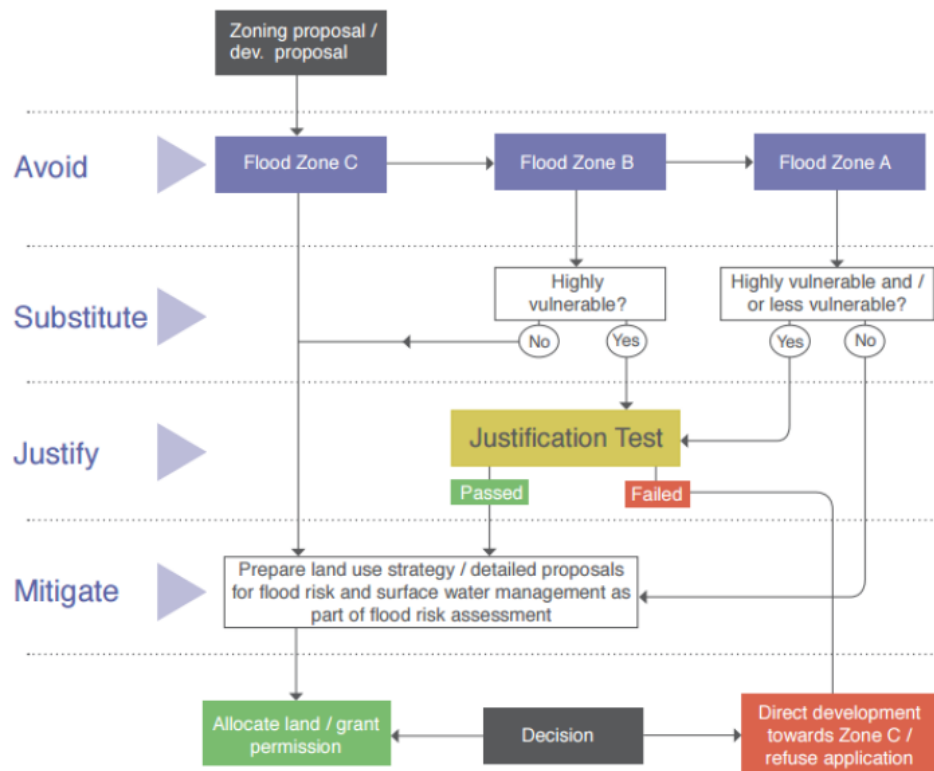


Figure 2.2 - Sequential Approach Mechanism in the Planning Process

The Sequential Approach restricts development types to occur within the flood zone appropriate to their vulnerability class, see Table 2.1.

| | 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 |

Figure 2.3 - Table 3.2 from the FRA guidelines - Matrix of Vulnerability versus Flood Zone to illustrate appropriate development and that required to meet the Justification Test

2.4 Proposed Development's Vulnerability

The proposed type of development for this site is to be wholly residential. Enterprise and commercial are categorised by the Guidelines as **less vulnerable developments** and appropriate to be located within Flood Zone B and C. Residential developments are categorised as **highly vulnerable** and appropriate to be located just within Flood Zone C. To provide highly vulnerable and less vulnerable type development within Flood Zone A requires a **Justification Test** to be completed to justify development in this flood risk area. For this development, it is categorised as Flood Zone C.

2.5 Site Specific Flood Risk Assessment for Development.

The FRM Guidelines require a SSFRA to “gather relevant information sufficient to identify and assess all sources of flood risk and the impact of drainage from the proposal”. It should “quantify the risks and the effects of any necessary mitigation, together with the measures needed or proposed to manage residual risks”. It considers the nature of flood hazard, taking account of the presence of any flood risk management measures such as flood protection schemes and how development will reduce the flood risk to acceptable levels. A detailed assessment for a development application should conclude that core flood risk elements of the Justification Test are passed and that residual risks can be successfully managed with no unacceptable impacts on adjacent lands.

2.6 SSFRA Key Outputs

Key outputs of an SSFRA are:

- Plans showing the site and development proposals including its relationship with watercourses and structures which may influence local hydraulics;
- Surveys of site levels and comparison of development levels relative to sources of flooding and likely flood water levels;
- Assessments of;
 - Potential sources of flood risk;

- Existing flood alleviation measures;
 - Potential impact of flooding on the site.
- How the layout and form of the development can reduce those impacts, including arrangements for safe access and egress.
 - Proposals for surface water management and sustainable drainage.
 - The effectiveness and impact of any mitigation measures.
 - The residual risks to the site after the construction of any necessary measures and the means of managing those risks; and
 - How flood risks are managed for occupants / employees of the site and its infrastructure.

3 Stage 1 Flood Risk Identification

3.1 Available Flood Risk Information

The initial flood risk identification stage uses existing information to identify and confirm whether there may be flooding or surface water management issues for the lands in question that may warrant further investigation.

To initially identify potential flood risks for the existing Site and surrounding area a number of available data sources were consulted, these are listed in Table 3.1 below.

| | Information Source | Coverage | Quality | Confidence | Identified Flood Risks | Flood Risk |
|--|---|------------|----------|------------|--|------------|
| Primary Data Source and Modelled Data | OPW ECFRAM – Fluvial https://www.floodinfo.ie/map/floodmaps/ | Regional | High | High | Flood maps indicate that the development is not at risk of Fluvial Flooding | N |
| | OPW ECFRAM – Tidal https://www.floodinfo.ie/map/floodmaps/ | Regional | High | High | Tidal flood maps indicate that the subject site is outside the 0.1% AEP. | N |
| | SDCC Development Plan SFRA | Local | High | High | Development is located within Flood Zone C | N |
| Secondary Data Source | Walkover Survey | Local | Varies | Varies | Level Site The Grand Canal is near the site but site levels are well above the Canal Level | N |
| | OPW Historic Flood Records | Nationwide | Varies | Varies | No records of site flooding. | N |
| | Drainage Records | Nationwide | Moderate | Moderate | Existing public sewers within the site are lower | N |

| | | | | | | |
|--|--------------------------------|--------|----------|------|--|---|
| | | | | | than the ground floor level. | |
| | Geological Survey Ireland Maps | County | Moderate | Low | Made ground for up to 1.0m below ground with on cohesive deposits. | N |
| | Topographic Surveys | Local | High | High | Flat site with constant level of +65.50 AOD. | N |

Table 3-1 - Review of Available Information

3.2 Identified Flood Risks/ Flood Sources

3.2.1 OPW Predictive, Historic & Benefitting Land Maps and Flood Risk Information

From consultation of flood information from the OPW’s floodinfo.ie website the site has not suffered from flooding in the past.

Fluvial Flood Risk

The OPW’s Eastern CFRAM study produced flood risk maps and the assessment of fluvial flood plains over the eastern region of Ireland. The OPW have consolidated this information onto <https://www.floodinfo.ie/map/floodmaps/> website. The figures below show that the site is outside the 0.1% AEP, 1.0% AEP and 10% AEP fluvial flood events.

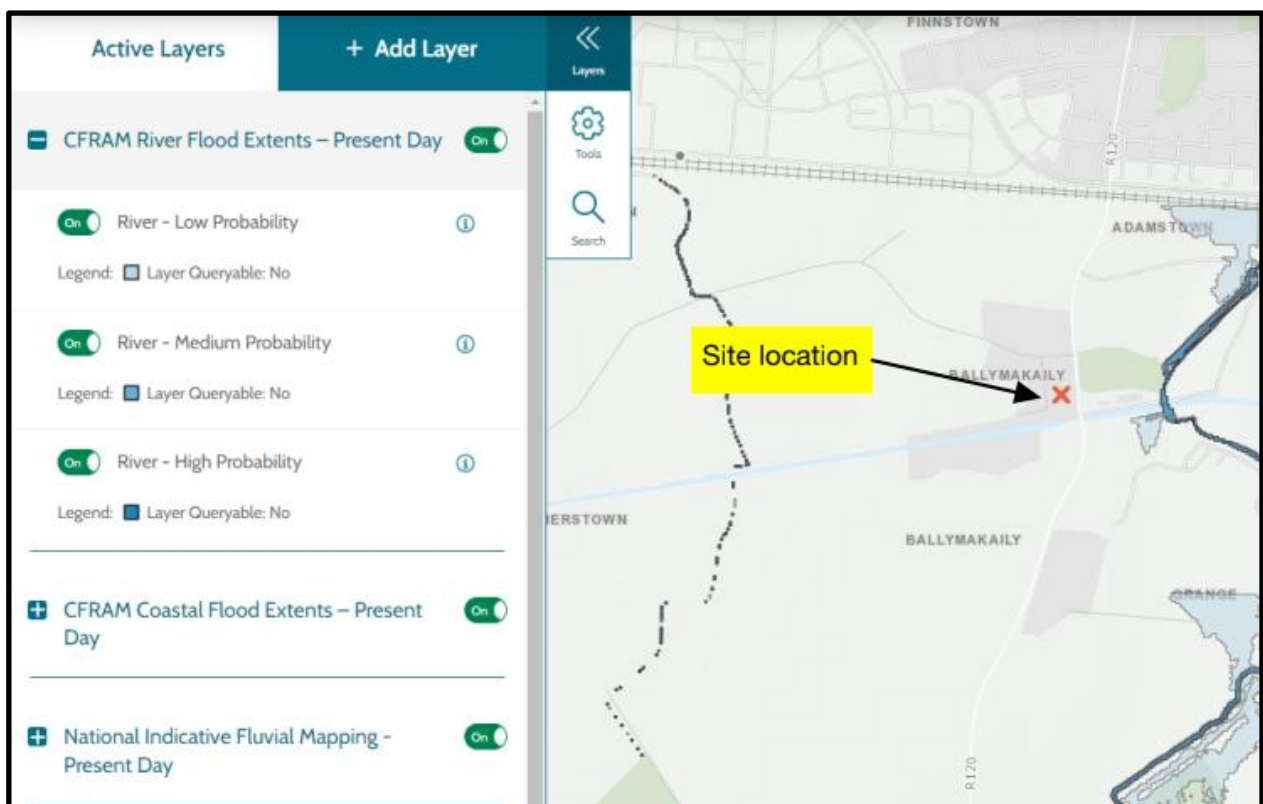


Figure 3.2 - Fluvial Flooding (0.1%, 1.0% and 10% AEP)

Tidal Flood Risk

The OPW ECFRAM coastal flood risk analysis for 10%, 0.5% and 0.1% AEP return periods show the site is outside the extents of the 0.1% AEP coastal flood event as seen in fig 3.3. The site is located around 10km from the tidal effects of the River Liffey.

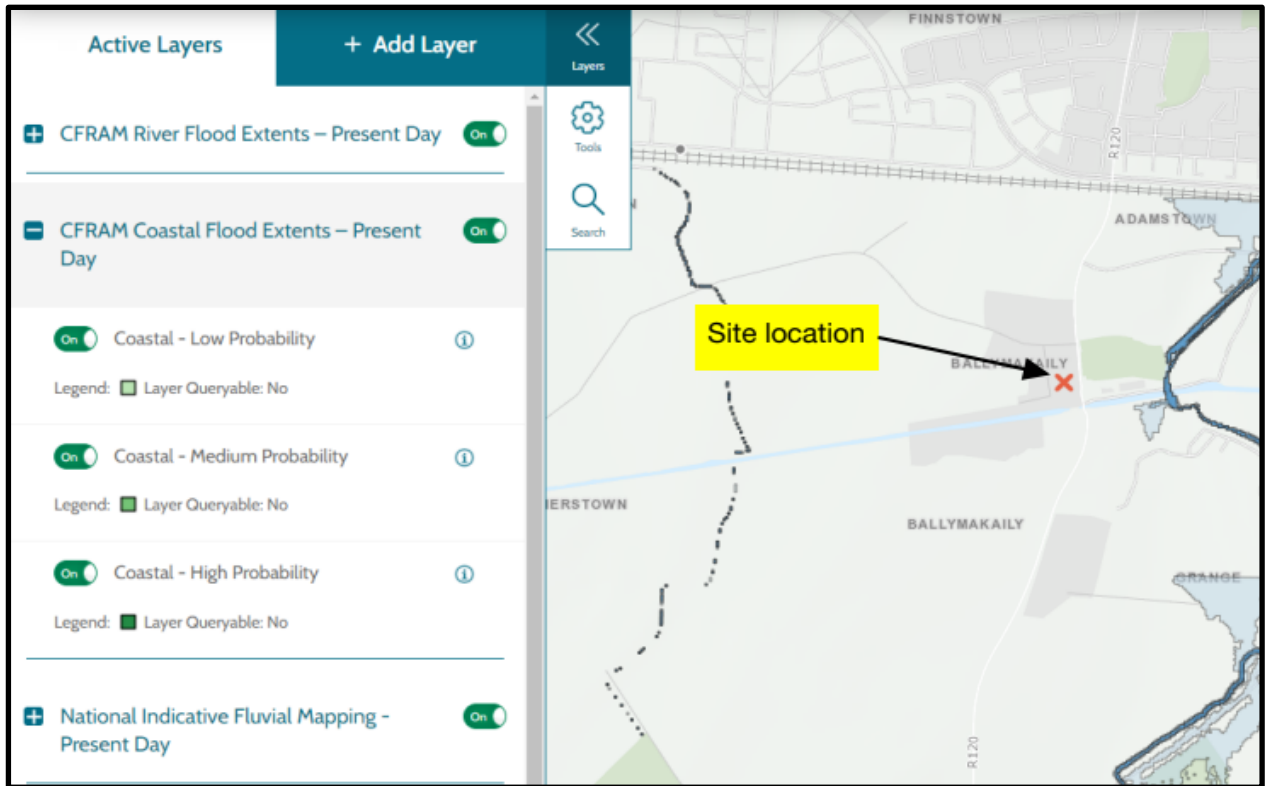


Figure 3.3 - Tidal Flooding (0.1%, 1.0% and 10% AEP)

Pluvial Flood Risk

Furthermore, the OPW’s ECFRAM Study also assessed effects of pluvial flooding in the area. The Pluvial maps of Dublin as part of the FloodResilienCity Project show the site has a low pluvial flood risk (refer to figure 3.4 below).

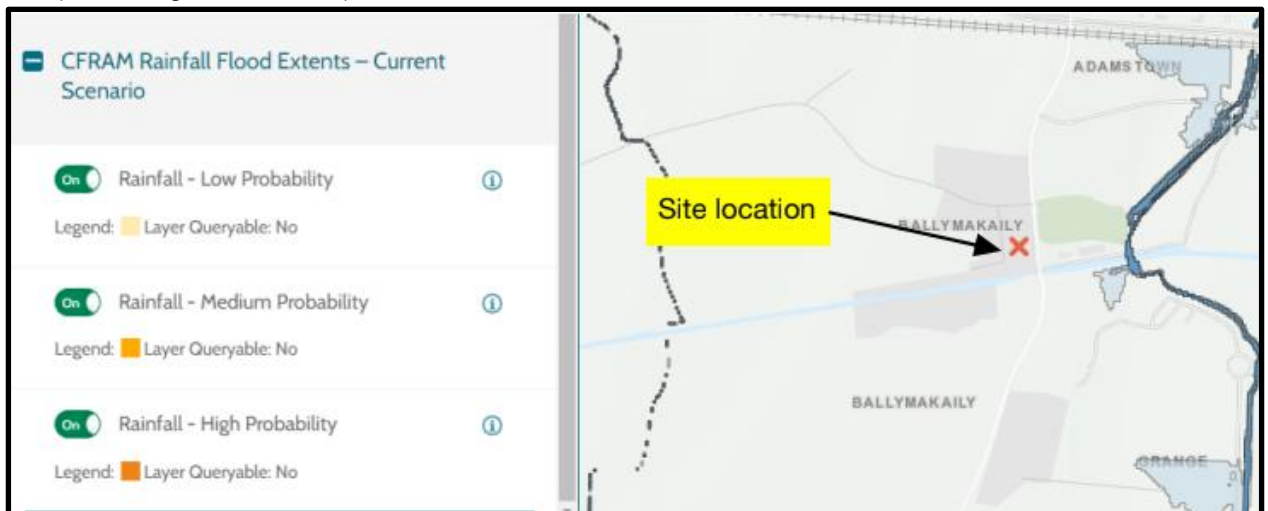


Figure 3.4 - Pluvial Flooding (0.1%, 1% and 10% AEP)

3.2.2 South Dublin County Council Strategic Flood Risk Assessment

The South Dublin County Development Plan 2022-2028 comprises the Strategic Flood Risk Assessment (SFRA) which uses the draft ECFRAM mapping as its basis for identifying areas at flood risk. The site is located in Flood Zone C where the proposed development is permitted.

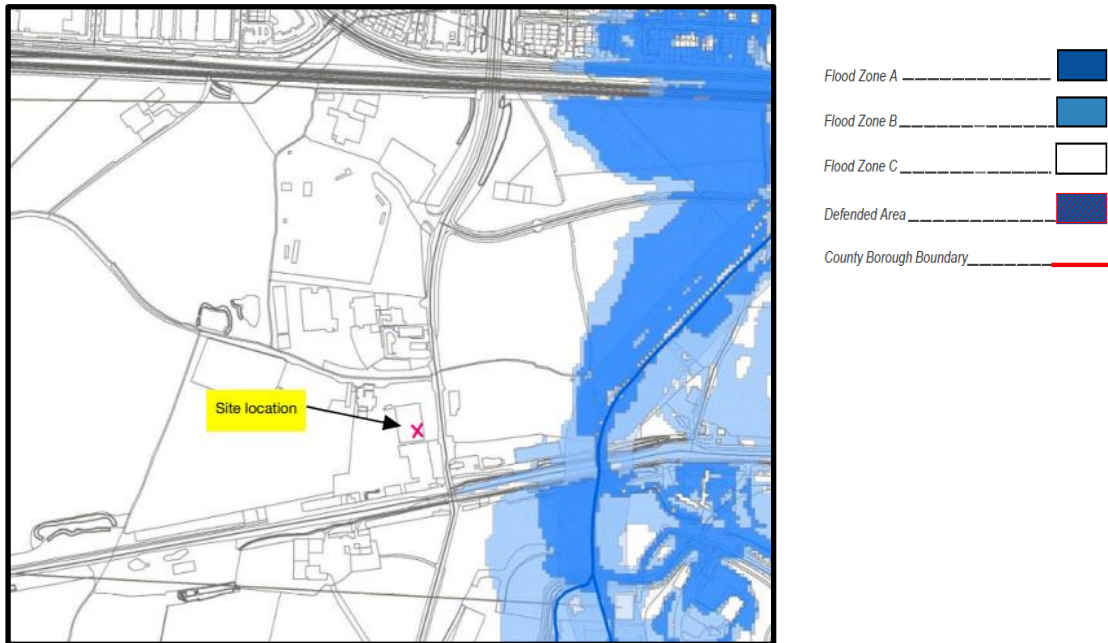


Figure 3.5 - Extract from DCC Strategic Flood Risk Assessment, Development Plan 2022-2028, Estimated Flood Events

3.2.3 Topographical Survey

After reviewing the Topographical survey, the subject site is level.

3.2.4 Walkover Survey

From a walkover of the site it is as expected and ties in with the topographical survey.

3.2.5 Other Sources

Other information sources were consulted to determine if there was any additional flood risk to the subject site, these included;

- Soil data from GSI – The entire site consists of made ground soils on gravelly clays
- Groundwater information from GSI – There is no record of evidence of groundwater flooding for the proposed site.
- Existing Local Authority Drainage Records – Public sewers are lower than the existing ground levels.

3.3 Source-Pathway-Receptor Model

A Source-Pathway-Receptor model was produced to summarise the possible sources of floodwater, the people and assets (receptors) that could be affected by potential flooding (with specific reference to the proposals), see Table 3.1. It provides the probability and magnitude of the sources, the performance and response of pathways and the consequences to the receptors in the context of the mixed-use development proposal. These sources, pathways and receptors will be assessed further in the initial flood risk assessment stage.

| Source | Pathway | Receptor | Likelihood | Impact | Risk |
|---|---|--------------|---------------|--------|------|
| Tidal | Subject Site is outside the Tidal Flood Zone | Ground Floor | Very unlikely | Medium | Low |
| Fluvial | Proposed development site outside fluvial flood zone | - | Very unlikely | Medium | Low |
| Surface Water Drainage (Pluvial) | Invert levels of local drainage is well below the site levels and adequate capacity is known to exist. | Ground Floor | Very Unlikely | Medium | Low |
| Groundwater Flooding | Ground water levels are known to be well below the proposed ground floor level and no basement is proposed. | Ground Floor | Very unlikely | Medium | Low |
| Infrastructure I – Human or Mechanical Error | Blockage of new drainage network | Ground Floor | Possible | Low | Low |

Table 3.6 - Source-Pathway-Receptor Analysis

The following paragraph provides a summary of the results of this Source-Pathway-Receptor flooding model for the subject site.

3.4 Source-Pathway-Receptor Model Results

As it can be seen in the above flooding analysis, the proposed development site is not at risk of flooding.

Furthermore the proposed surface water strategy shall lessen the local run-off to the public sewers.

Consequently, an initial flood risk assessment will follow to provide further detail on the causes, effects and possible mitigation measures for the sources of flood risk identified above.

4 Stage 2 – Initial Flood Risk Assessment

From stage 1 no flood risks were identified and so the site is not considered at risk of flooding from any source.

5 Conclusion

This Flood Risk Assessment concludes that there are no risk of flooding on the site.