Student Residence at 139-149 North King Street, Dublin 7

Flood Risk Assessment Report

September 2024

2340

Issue No. 2

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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 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 central 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 Dublin City Development Plan 2022-2028 Strategic Flood Risk Assessment (SFRA).

1.3 Existing Site

The proposed site is located between on North King Street between Bow Street and Brown Street North.

Generally, the site is flat with a level of +7.20AoD with gentle fall to the South and has been occupied with Building for centuries.



Figure 1.1 - Site Location

A detailed description of the proposed site is set out in the Architectural design statement.

1.4 Proposed Development

Ringline Investments Limited intend to apply for permission for development at 139-149 North King Street, Dublin 7. The development will consist of the demolition of existing structures on site, with the exception of the façade on North King Street (N) and Bow Street (E), which is a protected structure (RPS Ref. No. 8790 – north and east elevation only), which will be retained, improved and restored as part of the proposed development.

The proposal will provide a purpose-built student accommodation development in a 7-storey building over a partial existing basement with a setback at 5th floor and a further significant setback at the 6th floor level.

The proposal includes 361 no. student bedspaces, a ground level retail unit with frontage to both North King Street and Bow Street, communal facilities including a courtyard, external terrace at roof level at 5th and 6th floor and internal amenity spaces.

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 <u>less vulnerable developments</u> and appropriate to be located within Flood Zone B and C. Residential developments are categorised as <u>highly</u> <u>vulnerable</u> 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 <u>Justification Test</u> to be completed to justify development in this flood risk area.

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/m ap/floodmaps/	Regional	High	High	Flood maps indicate that the development is not at risk of Fluvial Flooding	Ν
	OPW ECFRAM – Tidal https://www.floodinfo.ie/m ap/floodmaps/	Regional	High	High	Tidal flood maps indicate that the subject site is outside the 0.1% AEP.	Ζ
	DCC Development Plan SFRA	Local	High	High	Development is located within Flood Zone C	Ν
Secondary Data Source	Walkover Survey	Local	Varies	Varies	Level site throughout. All drainage underground and very deep	Ν
	OPW Historic Flood Records	Nationwide	Varies	Varies	No records of site flooding.	N
	Historic OSI Maps	Nationwide	Moderate	Low	Site occupied with structure for over a century	Ν
	Drainage Records	Nationwide	Moderate	Moderate	Existing public sewers within the site all very deep.	Ν
	Geological Survey Ireland Maps	County	Moderate	Low	Made ground for up to 1.0m below ground with on cohesive deposits.	Ζ
	Topographic Surveys	Local	High	High	Flat site with constant level of +7.2m 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 th<u>https://www.floodinfo.ie/map/floodmaps/</u> 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 8.2. The site is located more than 2km from the Irish Sea.



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 City as part of the FloodResilienCity Project show the site has a low pluvial flood risk (refer to figure 3.2 below).



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



Figure 3.5– Pluvial Flood Depth Map

Legend

Appendix 7 of the Dublin City 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 3.6 - 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. The survey indicates existing ground floor level of +7.2 AOD.

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 There are no public sewers on the site and the site is served with combined Uisce Eireann Assets.

• Historic Maps – the area is part of the historic centre of Dublin for centuries.

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
Infrastructural – Human or Mechanical Error	Blockage of new drainage network	Ground Floor	Possible	Low	Low

Table 3.7 - 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 tidal or fluvial flooding.

Pluvial floor maps show that three are localised areas on the surrounding streets that pose a low risk, however the site itself is low risk from pluvial flooding. Local flood depths in the order of less than 100mm present at low points in the street kerb channels.

Furthermore the proposed surface water strategy shall improver 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 the following;

• The site is not subject to tidal or fluvial flooding given the topography and location of the site.