

SITE SPECIFIC FLOOD RISK ASSESSMENT

Munster Avenue, Galway

Draft Issue P03

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1 Introduction

1.1 Background

CORA Consulting Engineers were commissioned by Galway City Council to prepare a Site Specific Flood Risk Assessment (SSFRA) for the proposed residential development at Munster Avenue, Galway. This SSFRA was prepared to comply with current planning legislation and forms part of proposed planning application for the subject site.

1.2 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.

1.3 Flood Risk Assessment Scope

This SSFRA relates only to the proposed development site in the vicinity of the Munster Avenue, Galway 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 Galway City Council Development Plan 2023-2029 Strategic Flood Risk Assessment (SFRA).

1.4 Existing Site

The proposed site is located on the south eastern side of Munster Avenue. The subject site is located approximately 175m west of the River Corrib and circa 750m north of the Atlantic Sea. The site covers an area of approximately 375m² on plan and is currently occupied by a single, end of terrace residential building.

The site is bounded by Munster Avenue to the western boundary. A continuation of the residential terraced properties lies to the south of the site. Fr. Burke Park lies to the west along with a small commercial unit and associated carpark.

A pedestrian path extends the full length of the site boundary to the west along the length of Munster Avenue.

Generally, the site has a slight fall from east to west with a finished ground level of 3.75m to the east and 3.16m to the west of the site.

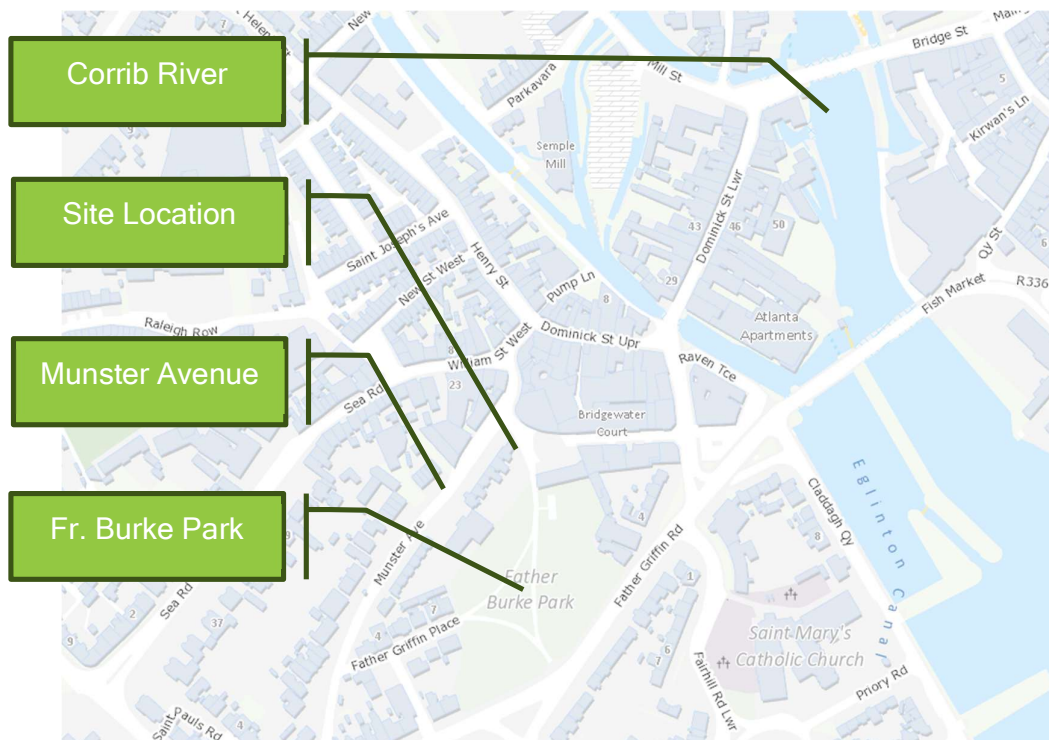


Figure 1 Site Location (OSI)

As per the Galway City Council City Centre Zoning Map, as part of the Galway City Council Development Plan 2023-2029 the site has been zoned “R”, “Residential”

Proposed Development

The development will consist of the partial demolition of the existing single storey extension to the northern gable of the parent building. The demolition will create the space required for a three storey residential development containing 3No. one bed roomed apartment units. Each apartment will be accessed by means of an external staircase.

The existing boundary wall to the north of the site will be demolished to provide bicycle storage along with pedestrian access to the existing and proposed units.

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 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).

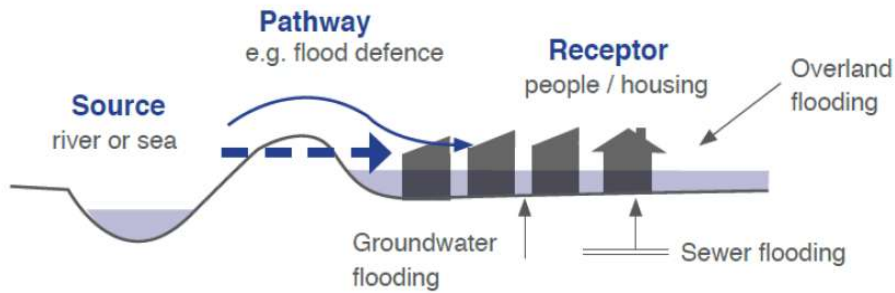


Figure 3 Source-Pathway-Receptor Model

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 FRM 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 zone 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 or between 0.1% AEP or 1 in 1000 and 0.5% AEP or 1 in 200 for coastal 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.

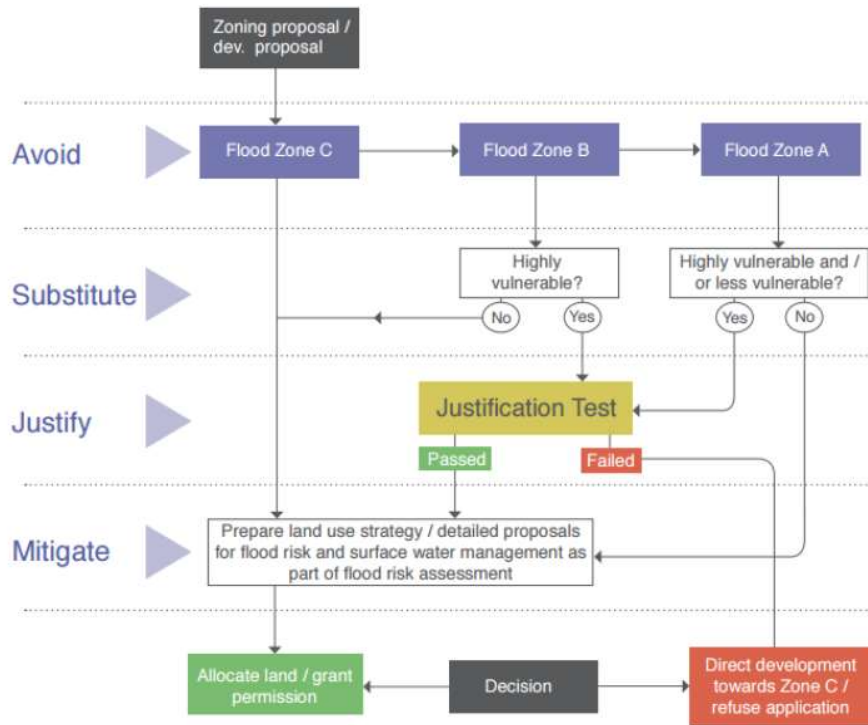


Figure 4 Sequential approach mechanism in the planning process

The Sequential Approach restricts development types to occur within the flood zone appropriate to their vulnerability class, see figure 2.4.

	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 5 table 3.2 from the FRM 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 in nature. Residential developments are categorised as **highly vulnerable** developments and appropriate to be located just within Flood Zone C without the requirement for a justification test. Highly vulnerable developments within Flood Zone A and B would be subject to a justification test, with the exception of "Minor Developments". "Minor Developments" includes "works associated with existing developments, such as extensions, renovations and rebuilding of the existing development, small scale infill and changes of use". The proposed development is considered "small scale infill" and therefore not subject to a justification test.

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 the 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 WCFRAM - Fluvial https://www.floodinfo.ie/map/floodmaps/	Regional	High	High	Site identified as subject to flooding as a result of the 0.1% AEP event. Flooding adjacent to site for 1% AEP event.	Y
	OPW WCFRAM - Coastal https://www.floodinfo.ie/map/floodmaps/	Regional	High	High	Site subject to flooding under 0.5% and 0.1% AEP event. Flooding adjacent for the 10% AEP event.	Y
	OPW WCFRAM - Pluvial https://www.floodinfo.ie/map/floodmaps/	Regional	Low	High	No records of pluvial flooding available	N
	Galway City Council Development Plan SFRA	Local	Moderate to High	Moderate to High	Development is located within Flood Zone A.	Y
	CFRAM River Flood Extents - Mid Range Future Study	Regional	High	High	Flooding extends into the site during the 1% AEP event.	Y
	National Coastal Flood Hazard Mapping 2021 - Present Day	National	High	High	Flooding extends into the site during the 0.5% AEP and 0.1% AEP event.	Y

	Walkover Survey	Local	Varies	Varies	Level site with gravel surface finish. All drainage underground.	N
Secondary Data Source	OPW Historic Flood Records	Nationwide	Varies	Varies	No records of site flooding.	N
	Historic OSI Maps	Nationwide	Moderate	Low	No record of site usage as part of the 6" or 25" historic map.	N
	EPA Ex. Rivers	Nationwide	Moderate	Moderate	Corrib River to the East of the site.	Y
	Drainage Records	Nationwide	Moderate	Moderate	Combined private drain to rear (east) of the existing building.	N
	Geotechnical Site Investigation	County	Moderate	Low	Suspected made ground.	N
	Topographic Surveys	Local	High	High	Site level varies from 3.16m to 3.75m. Site is low lying and may be susceptible to flooding.	

Table 1 Flood risk sources

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 floodmaps.ie website the site has not suffered from flooding in the past. Information from this source on previous flood events has been included in Appendix A which shows some flooding incidents in other areas of the locality. However, there are no records of the site itself having been flooded.

Development Plan SFRA

A Strategic Flood Risk Assessment has been prepared on behalf of Galway City Council by JBA Consulting (Dated January 2022). As part of the flood risk assessment, Galway City has been identified as a flood risk area, with the relevant flood zones indicated on "City Centre" mapping. An extract of the map is shown in Figure 6 below:

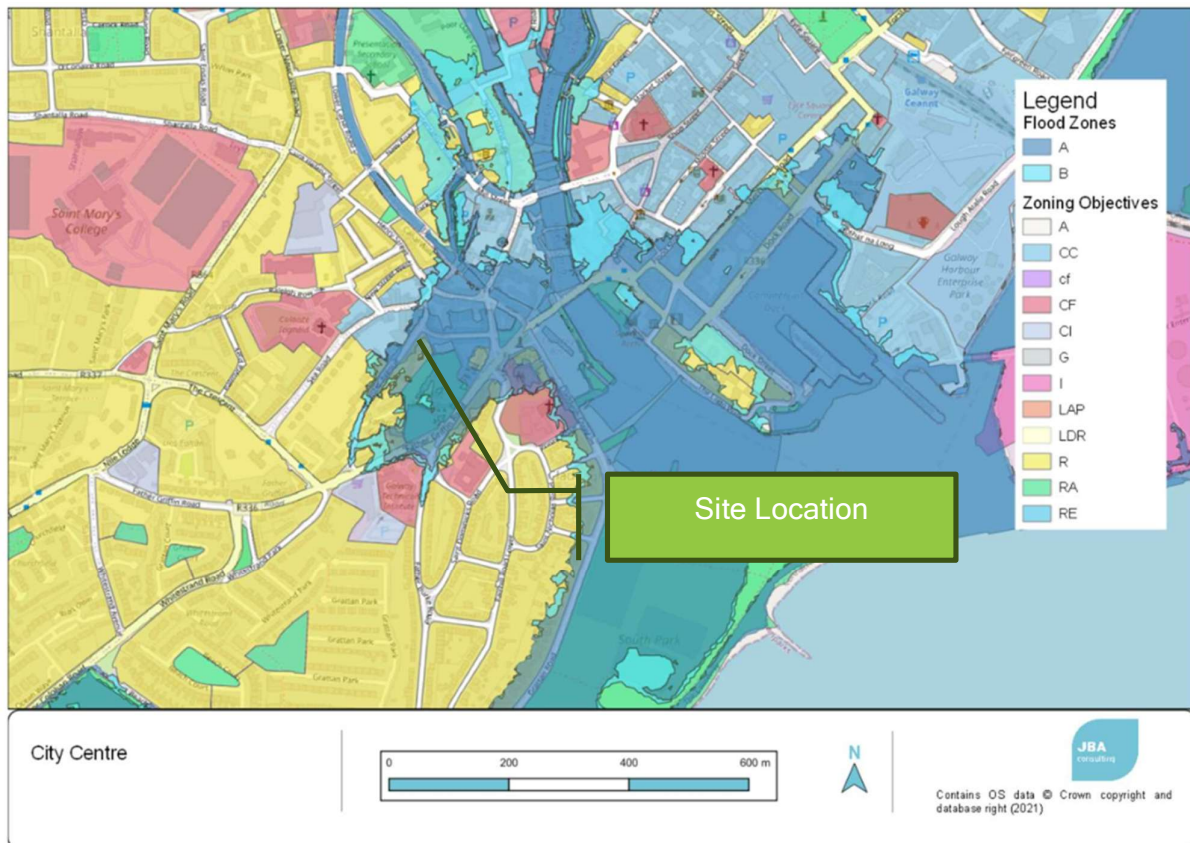


Figure 6 - SFRA Flood Zones

The strategic flood risk assessment identifies the site as within **Flood Zone A**.

Fluvial Flood Risk

The OPW's Western CFRAM mapping is available for the site, with the site flooding adjacent to the site noted for the 1% AEP event. This



Figure 7 - CFRAM River Flooding - 1% AEP - Current Day

The site does not appear to be impacted by the flood event, with flood water concentrated on Munster Avenue and adjacent access road to the north.

Tidal Flood Risk

Given the site is located approximately 175m from the Corrib River which is tidal and flows to the Atlantic Sea, coastal flooding is likely to be a source of potential flooding on the site.

The OPW WCFRAM coastal flood risk analysis for 10%, 0.5% and 0.1% AEP return periods show the site is inside all flood events.

Flood mapping for the 10% and 0.5% AEP events is shown in Figure 6 below.

Flood mapping for the 10% and 0.5% AEP events is shown in Figure 7 below.

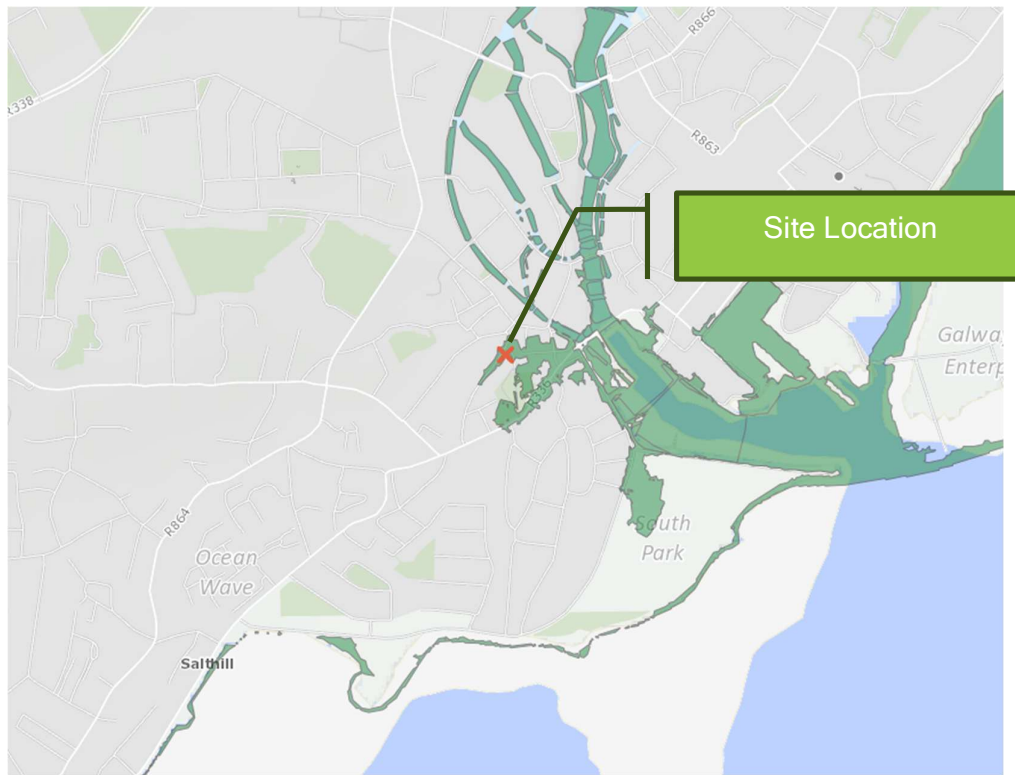


Figure 8 - CFRAM Coastal Flood Extents - 10% AEP Event

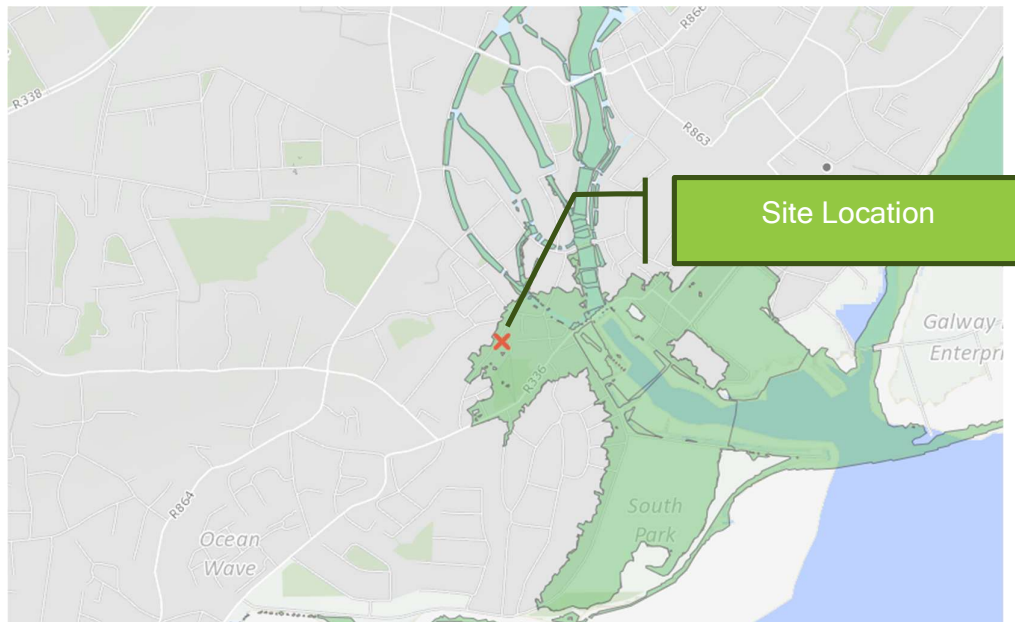


Figure 9- CFRAM Coastal Flood Extents - 0.5% AEP Event

Based on the National Coastal Flood Hazard Mapping 2021 - Present Day, the site is subject to flooding under the 10% and 0.5% and 0.1% AEP flood events.

A further review of the National Coastal Flood Hazard Mapping 2021 - Mid-Range Future Mapping was undertaken.

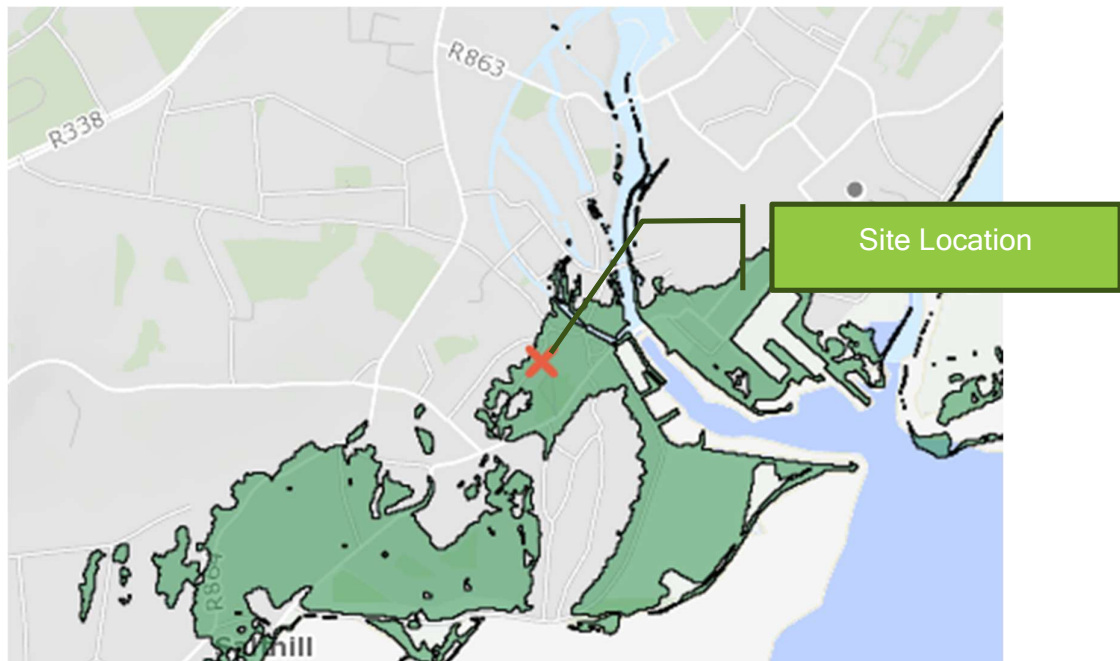


Figure 10 - NCFHM 2021 - Mid-Range Future - 10% AEP

The mapping reveals that the site is impacted by all events up to and including the 10% AEP flood event.

A further review of the flood depths associated with the 0.5% AEP mid-range future event, which includes an increase of 500mm in sea levels above the current scenario estimations was completed.

The mapping confirms potential flooding on the site of up to 0.5-1.0m in depth. This is displayed in Figure 8 below:

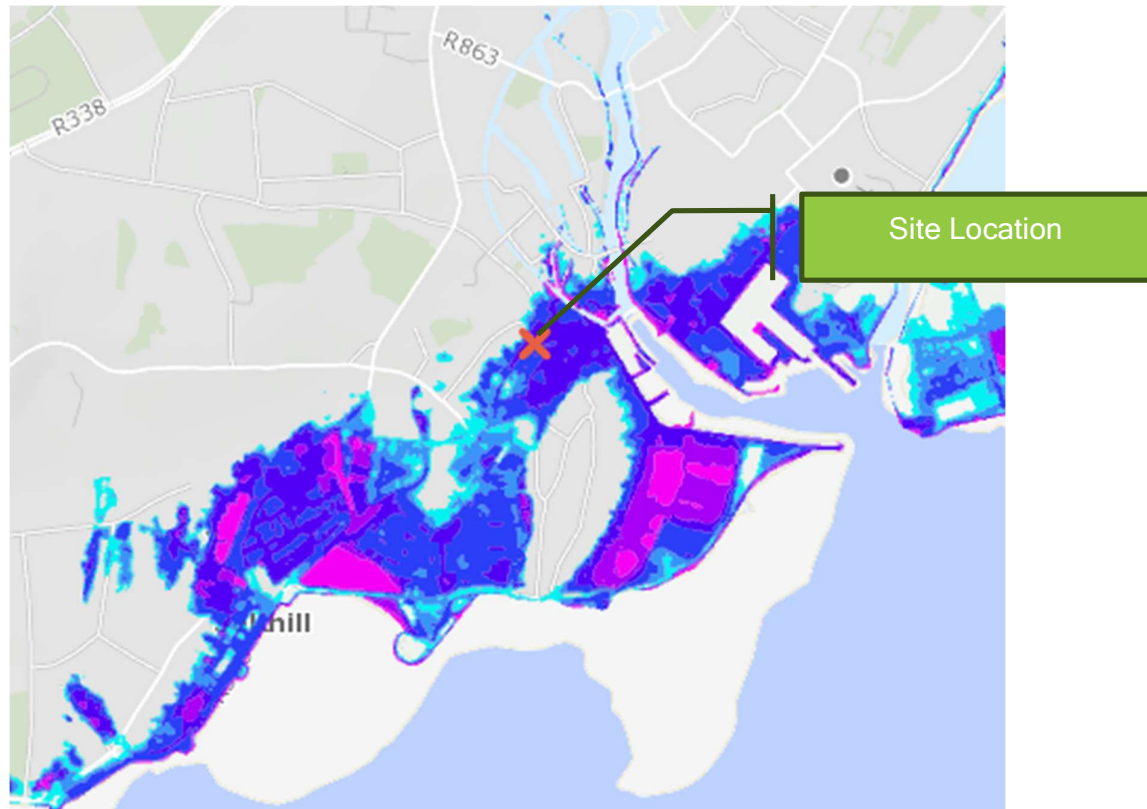


Figure 11 - NCFHM 2021 - Mid-Range Future - 0.5% AEP - Flood Depths

Given that flooding is predicted for the mid-range future 0.5% AEP flood event, with a proposal for “highly vulnerable” minor development, a justification test is not required, but “an assessment of the risks of flooding should accompany such applications”. This will be addressed further in subsequent sections.

Pluvial Flood Risk

No records for pluvial flooding are available for the subject site.

3.2.2 Irish Coastal Protection Strategy Study (ICPSS)

Flooding is noted on the site as part of the ICPSS (2010 - 2014) coastal flood extents - present day mapping.



Figure 12 - ICPSS (2010-2014) Coastal Flood Extents - Present Day

3.2.3 Galway City Council Development Plan 2023-2029

The Galway City Council Development Plan 2023-2029 contains a Strategic Flood Risk Assessment, which has been reviewed by CORA. The site has been identified as being within Flood Zone A - See Figure 6 above.

1.1.1 Topographical Survey

After reviewing the Topographical survey, the site has a slight fall from east to west with a finished ground level of 3.75m to the east and 3.16m to the west of the site.

1.1.2 Walkover Survey

From a walkover of the site it is clear that the subject site has a slight gradient with no evidence of flooding or flow paths are present on site. The walkover survey confirmed the proposed development site is as expected and ties in with the topographical survey.

1.1.3 *Other Sources*

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

- Existing Local Authority Drainage Records - The surrounding area is served by an existing below ground combined network. A 225mm diameter public combined sewer is present on the western side of Munster Avenue. No public surface water drainage network is present.
- An existing 150mm diameter combined surface water sewer runs under the existing extension to the rear which served adjoining properties on Munster Avenue. A CCTV survey has been commissioned to establish the extent and condition of the existing private sewer. The sewer discharges to the existing public 225mm diameter sewer under Munster Avenue.

1.2 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 3.2. 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 inside the 0.5% AEP Present day as well as the 10% AEP MRFS	Ground Floor	Medium	High	High
Fluvial	Flooding adjacent to the site as a result of the 1% AEP River Flooding Extents.	Ground Floor	Medium	High	High
Surface Water Drainage	Flooding from surcharging of the developments drainage system	Ground Floor	Low	Medium	Medium
Groundwater Flooding (Pluvial)	Rising ground water on the site	Ground Floor	Unlikely	Low	Low
Infrastructural - Human or Mechanical Error	Blockage of new drainage network	Ground Floor	Low	Low	Low

Table 3-2 - Source-Pathway-Receptor Analysis

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

1.3 Source-Pathway-Receptor Model Results

As it can be seen in the previous flooding analysis, the proposed development site is at possible risk of coastal flooding as a result of the 0.5% AEP flood event (present day) as well as the 10% AEP coastal flood event (MRFS). Coastal flooding would raise the level of the Corrib River with flood water entering the site.

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.

2 Stage 2- Initial Flood Risk Assessment Stage

The main sources of flood risk identified from Stage 1 are;

- A medium risk of coastal flooding associated with the overtopping of the Garavogue River

2.1 Initial Fluvial Flood Risk Assessment

As stated above, the 1 in 200-year (0.5% AEP) coastal mid-range future scenario (MRFS) flood extent map estimated as part of the National Coastal Flood Hazard Mapping shows flooding to 100% of the site.

Flood depths predicted during the 0.5% AEP event are predicted within the 0.5-1.0m range.

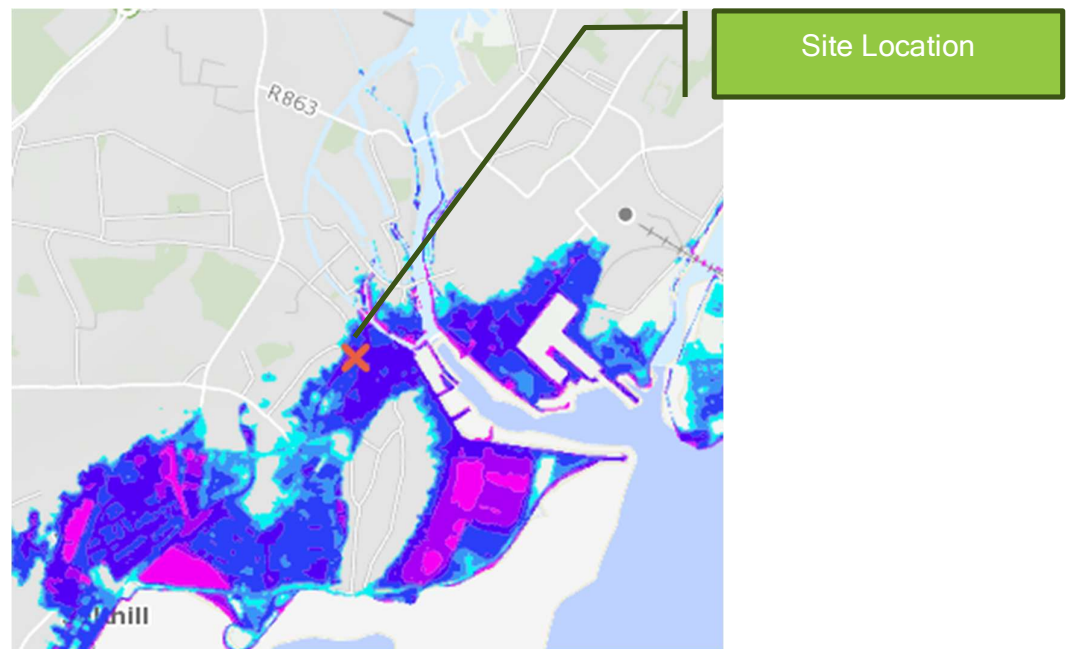


Figure 13 - NCFHM 2021 - Mid Range Future - 0.5% AEP Flood Depths

Adopting a minimum site level of 3.15m AOD, this would equate to a predicted flood level of up to 4.15m AOD during the 0.5%AEP mid-range future storm event.

2.2 Flood Zone Category

Following the assessment of the flood risk to the site and the available information it is considered that the proposed development site is located within Flood Zone A given the presence of Coastal Flooding.

2.3 Minimum Floor Levels

As stated in section 1.5, the proposed development includes the construction of highly vulnerable residential dwellings.

The initial flood risk assessment determined the risk associated with the 1 in 200-year coastal flood event as the principle source of the flooding on the site.

The predicted flood mapping indicates that the 200-year design fluvial water level in the vicinity of the subject site as +4.150m AOD.

0.5% AEP Flood Level (Fluvial)	Climate Change Allowance	Freeboard	Minimum FFL of 'Highly Vulnerable' Development
4.150m AOD	Included in MRFS	+300mm	4.45m AOD

Table 2-1 - Minimum FFL for Less Vulnerable Development (Flood defence includes for climate change)

Given the limited site area, coupled with the requirement for level access to the property, raising the floors to this extent is not desirable. For this reason, additional flood mitigation measures should be adopted.

2.4 Residual Risks

Remaining residual flood risks, following the justification test for flood risk assessment include the following;

- Site flooding as a result of coastal flooding for all events up to and including the 10% AEP MRFS Coastal Flood extents.
- Flooding as a result of back surging in the public sewers.

2.5 Mitigation Measures

Proposed mitigation measures to address residual flood risk are summarised below;

- Demountable flood barriers are to be installed to a minimum height of 4.450m AOD.
- No window openings to be installed below 4.450m AOD.
- Ground floor units to be of flood resilient construction.
- All electrical sockets and switches to be installed above 4.450m AOD.
- Anti-backflow valves to be installed on the outfall sewer pipes from the property.

Surface water flow paths from east to west are maintained to either side of the building.

2.5.1 Effectiveness of Mitigation Measures

It is considered that the flood risk mitigation measures once fully implemented are sufficient to provide a suitable level of protection to the proposed development.

The proposed development will not increase the run-off rates when compared with the existing site and satisfies the requirement of the SFRA to reduce flooding and improve water quality.

2.5.2 Flood Warning and Excavation

To facilitate an emergency warning and evacuation plan which will allow site users to leave the premises of the property in the event of a flood, the flood warning and evacuation plan should be prepared in liaison with the Local Authority and the Emergency Services.

The development's facility management can communicate with the Local Authority and the building users with regard to Flood Warning and any evacuation procedures that may be necessary.

2.5.3 Development Management Process

In order to justify the development of the site for residential usage, we have followed the Development Management Process, which has been adopted as part of the Strategic Flood Risk Assessment for Galway City Council Development Plan 2023-2029. It should be noted that "Flow Chart 4" was not included in the Galway City Council Development Plan SFRA, and a copy of same has been extracted from the Dublin City Council Development Plan SFRA which was also prepared by JBA Consulting.

As such we have completed the process in the subsequent sections:

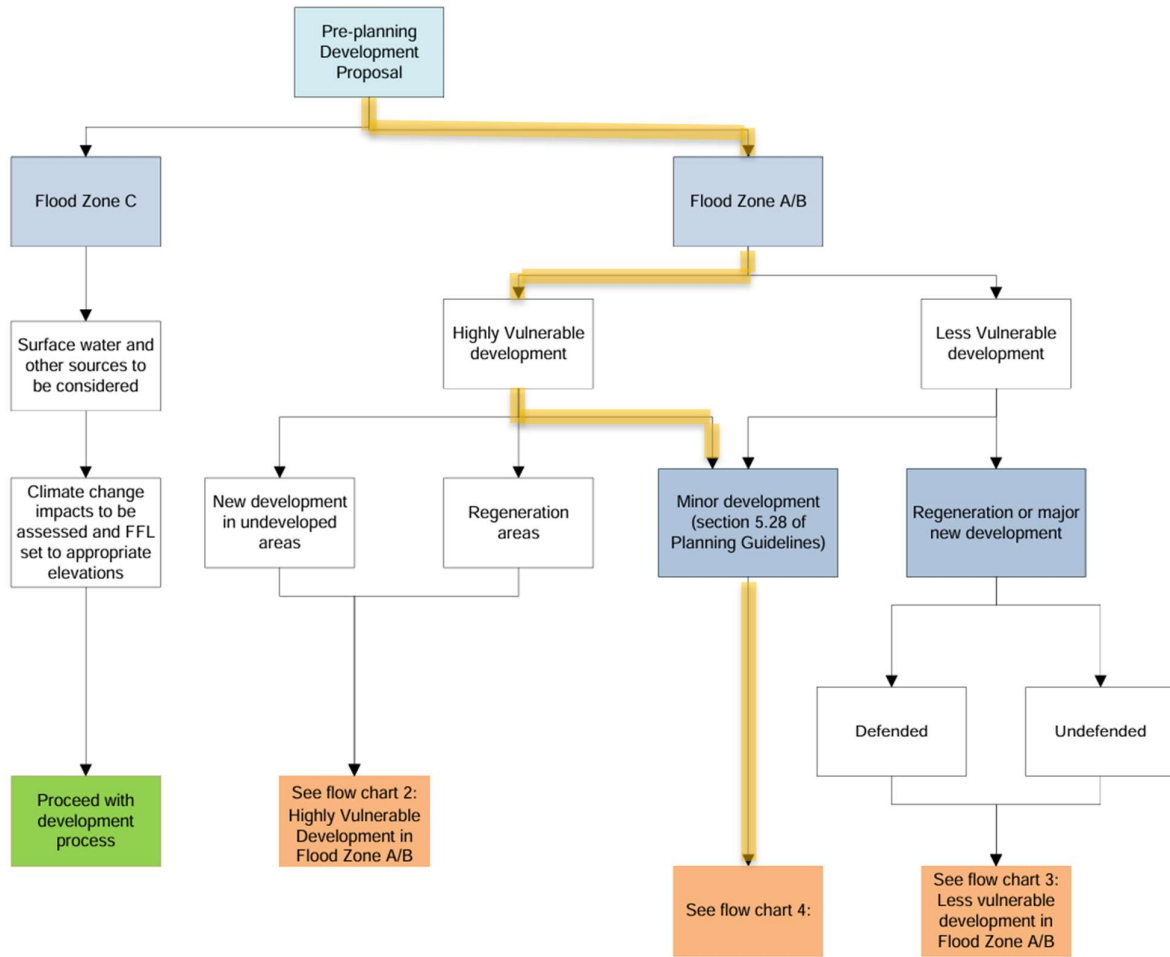


Figure 14 - Flow Chart 1 - Development Management Process

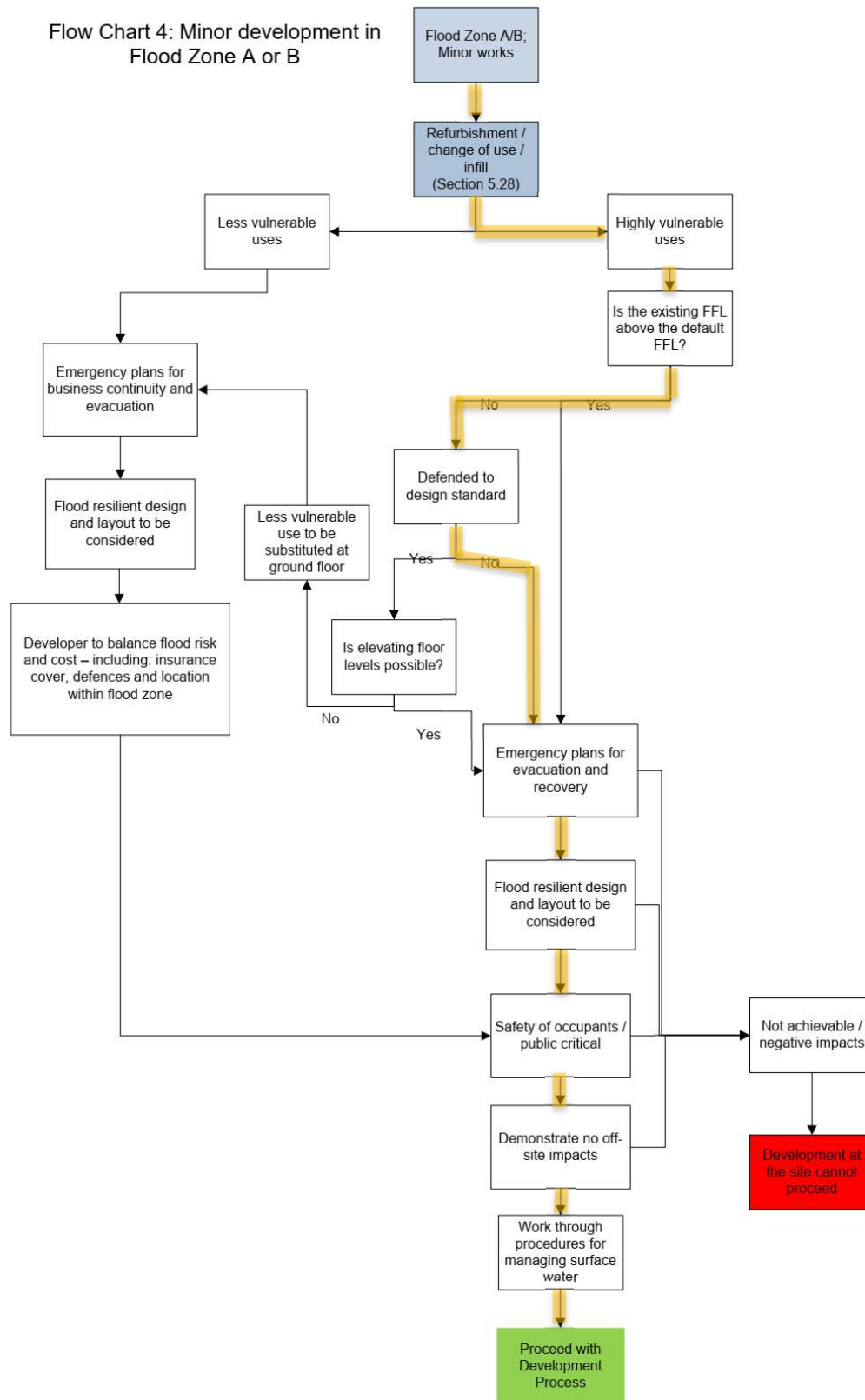


Figure 15 - Flow Chart 4 - Minor Development in Flood Zone A/B

Flood Zone A/B; Minor Works:

The works consist of minor in-fill development in place of an existing extension to the property. An increase in roof area from 82m² to 137m² will be negated by the implementation of permeable pavement surfaces along with the introduction of surface water attenuation which will restrict surface water outflow to 2.0L/sec.

Refurbishment/change of use/in-fill (Section 5.28)

The Planning System and Flood Risk Management - Guidelines for Planning Authorities - November 2009 as published by the Office of Public Works defines minor works as follows:

Applications for minor development, such as small extensions to houses, and most changes of use of existing buildings and or extensions and additions to existing commercial and industrial enterprises, are unlikely to raise significant flooding issues, unless they obstruct important flow paths introduce a significant additional number of people into flood risk areas or entail the storage of hazardous substances. Since such applications concern existing buildings, the sequential approach cannot be used to locate them in lower-risk areas and the Justification Test will not apply. However, a commensurate 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. These proposals should follow best practice in the management of health and safety for users and residents of the proposal.

The development at Munster Avenue complies with the above and will therefore be considered Minor Development.

Highly Vulnerable Uses:

The development consists of 4No. residential units which would be considered Highly Vulnerable with respect to Flood Risk.

Is the existing FFL above the default FFL?

No information is available with regard to a default finished floor level within Galway City. Given that the finished floor level is below the predicted 0.5% AEP MRFS coastal flood

event, it will be assumed that the proposed finished floor level of 3.750m AOD is below the default FFL. This would be a conservative approach.

Defended to Design Standard

The site does not benefit from any flood defence measures and is considered undefended with respect to flooding.

Emergency Plans for Evacuation and Recovery:

Outline evacuation measures have been included in this document. This will be developed further with the client in advance of occupation of the building.

Flood Resilient Design and layout to be considered:

The development at ground floor level will be constructed as “flood resilient” with some of the measures implemented noted in this report. Habitable bedroom spaces located at first floor level and above where possible.

Safety of occupants/public critical:

Flood mitigation measures including demountable flood barriers to all ground floor entrances/exits along with anti-backflow valves on outfall sewers will be adopted as part of the construction works to ensure safety of the occupants/public.

Work through procedures for managing surface water:

Surface water flow paths across the site will be maintained as part of the proposed works. The implementation of surface water attenuation will limit the discharge rate of surface water from the development reducing the load on the receiving public sewers.

Following the above flow path procedure, it has been demonstrated that it is compliant to “Proceed with Development Process”

3 Conclusion

This SSFRA concludes the following;

- This Site Specific Flood Risk Assessment for the proposed demolition of an existing single storey extension and the construction of a three storey residential extension was undertaken in accordance with the requirements of the “Planning System and Flood Risk Management Guidelines for Planning Authorities”, November 2009 and the Galway City Council Development Plan 2023-2029 Strategic Flood Risk Assessment.
- The proposed type of development for this site is to be residential. Residential developments are categorised by the Guidelines as *Highly Vulnerable Development* and may be appropriate to be located within Flood Zone A.
- The development does not require a justification test.
- The proposed development site is within *Flood Zone A* for coastal flooding.
- As part of the development proposals, a Flood Warning and Evacuation Plan can be implemented to ensure the site users are aware of the potential risks of flooding.
- A possible source of flood risk from the surcharging or blockage of the development’s drainage system has been identified. This risk is mitigated by suitable design of the drainage network, suitable site gradients to maintain existing flow paths, regular maintenance and inspection of the network and establishment of exceedance overland flow routes. An anti-backflow valve is to be incorporated into the outfall sewers from the properties.
- Demountable flood barriers are to be installed to a minimum height of 4.450m AOD.
- The development’s drainage design includes for a 20% climate change allowance along with a 500mm increase in sea level in accordance with the “Mid-Range Future Scenario”.

- The proposed development will not increase the surface water run-off rate when compared with the existing site and satisfies the requirement of the SFRA to reduce flooding and improve water quality.

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Appendix A

Past Flood Event Local Area Summary Report

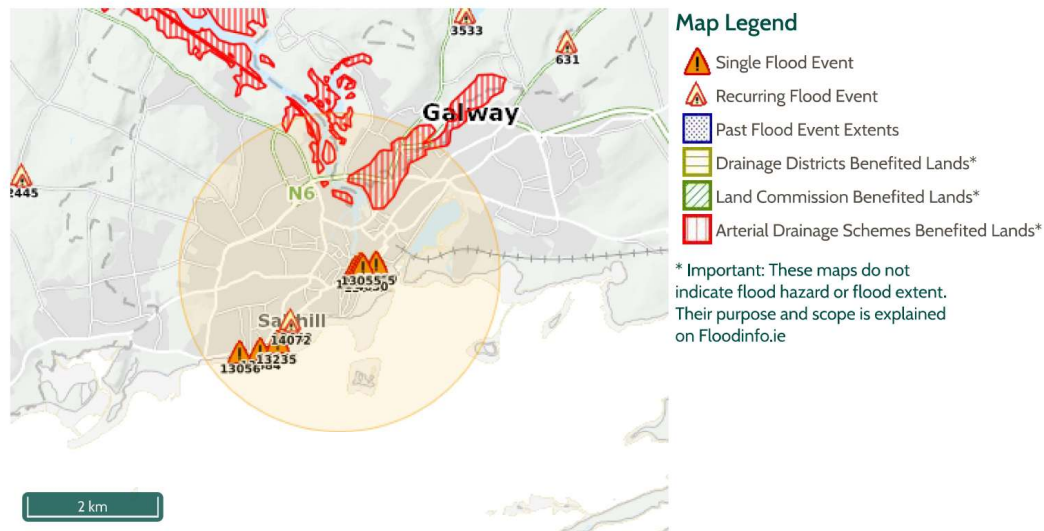


OPW
Oifig na nOibríochtaí Poiblí
Office of Public Works

Report Produced: 20/2/2024 17:13

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

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20 Results

Name (Flood_ID)	Start Date	Event Location
1. Flooding at Galway City on 01/02/2014 (ID-13055) Additional Information: Reports (0) Press Archive (0)	01/02/2014	Approximate Point
2. Flooding at Salthill on 01/12/2015 (ID-13235) Additional Information: Reports (0) Press Archive (0)	01/12/2015	Approximate Point
3. Coastal flooding in Galway and Salthill on 18th January 2014 (ID-12142) Additional Information: Reports (1) Press Archive (0)	18/12/2013	Approximate Point
4. Quay Street Galway Jan 1995 (ID-4628) Additional Information: Reports (1) Press Archive (0)	17/01/1995	Approximate Point
5. Flood Street Galway Jan 1995 (ID-4629) Additional Information: Reports (1) Press Archive (0)	17/01/1995	Approximate Point
6. Docks Galway Jan 1995 (ID-4630) Additional Information: Reports (1) Press Archive (0)	17/01/1995	Approximate Point

Name (Flood_ID)	Start Date	Event Location
7.  Flooding at Salthill Promenade Galway on 18/12/2019 (ID-14072) Additional Information: Reports (0) , Press Archive (0)	18/12/2019	Approximate Point
8.  Flooding at Spanish Arch Galway on 18/12/2019 (ID-14073) Additional Information: Reports (0) , Press Archive (0)	18/12/2019	Approximate Point
9.  Flooding at Salthill on 01/02/2014 (ID-13056) Additional Information: Reports (0) , Press Archive (0)	01/02/2014	Approximate Point
10.  Flooding at Galway City/Salthill on 13/01/2020 (ID-13684) Additional Information: Reports (0) , Press Archive (0)	13/01/2020	Approximate Point
11.  Flooding at Galway City and Salthill on 05/12/2015 (ID-13373) Additional Information: Reports (0) , Press Archive (0)	05/12/2015	Approximate Point
12.  Flooding at Galway City on 06/12/2015 (ID-13399) Additional Information: Reports (0) , Press Archive (0)	06/12/2015	Approximate Point
13.  Flooding at Galway City on 02/01/2016 (ID-13514) Additional Information: Reports (0) , Press Archive (0)	02/01/2016	Approximate Point
14.  Flooding at Galway City on 16/10/2017 (ID-13555) Additional Information: Reports (0) , Press Archive (0)	16/10/2017	Approximate Point
15.  Flooding at Galway City/ Salthill on 02/01/2018 (ID-13609) Additional Information: Reports (0) , Press Archive (0)	02/01/2018	Approximate Point
16.  Flooding at Galway City/Salthill on 11/10/2018 (ID-13628) Additional Information: Reports (0) , Press Archive (0)	11/10/2018	Approximate Point
17.  Flooding at Galway City on 08/02/2019 (ID-13643) Additional Information: Reports (0) , Press Archive (0)	08/02/2019	Approximate Point
18.  Coastal flooding in Galway and Salthill on 3rd January 2014 (ID-12144) Additional Information: Reports (1) , Press Archive (0)	03/01/2014	Approximate Point
19.  Flooding in Galway City on 28th January 2013 (ID-11900) Additional Information: Reports (1) , Press Archive (0)	28/01/2013	Approximate Point
20.  Coastal flooding in Galway and Salthill on 1st February 2014 (ID-12143) Additional Information: Reports (1) , Press Archive (0)	n/a	Approximate Point

Figure 9 - Historic Flood Events

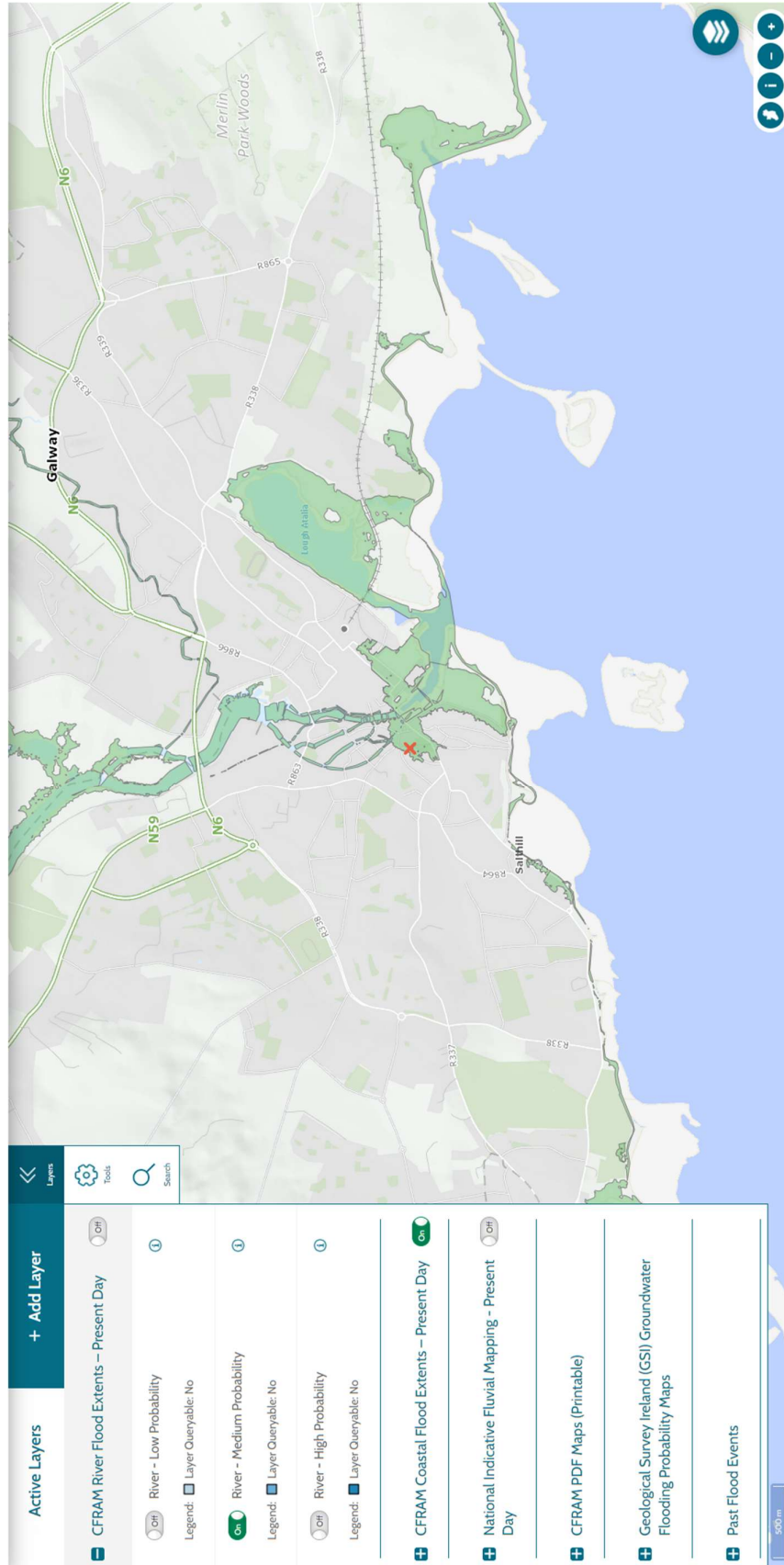


Figure 10 - CFRAM Coastal Flood Extents - Present Day - 0.5% AEP

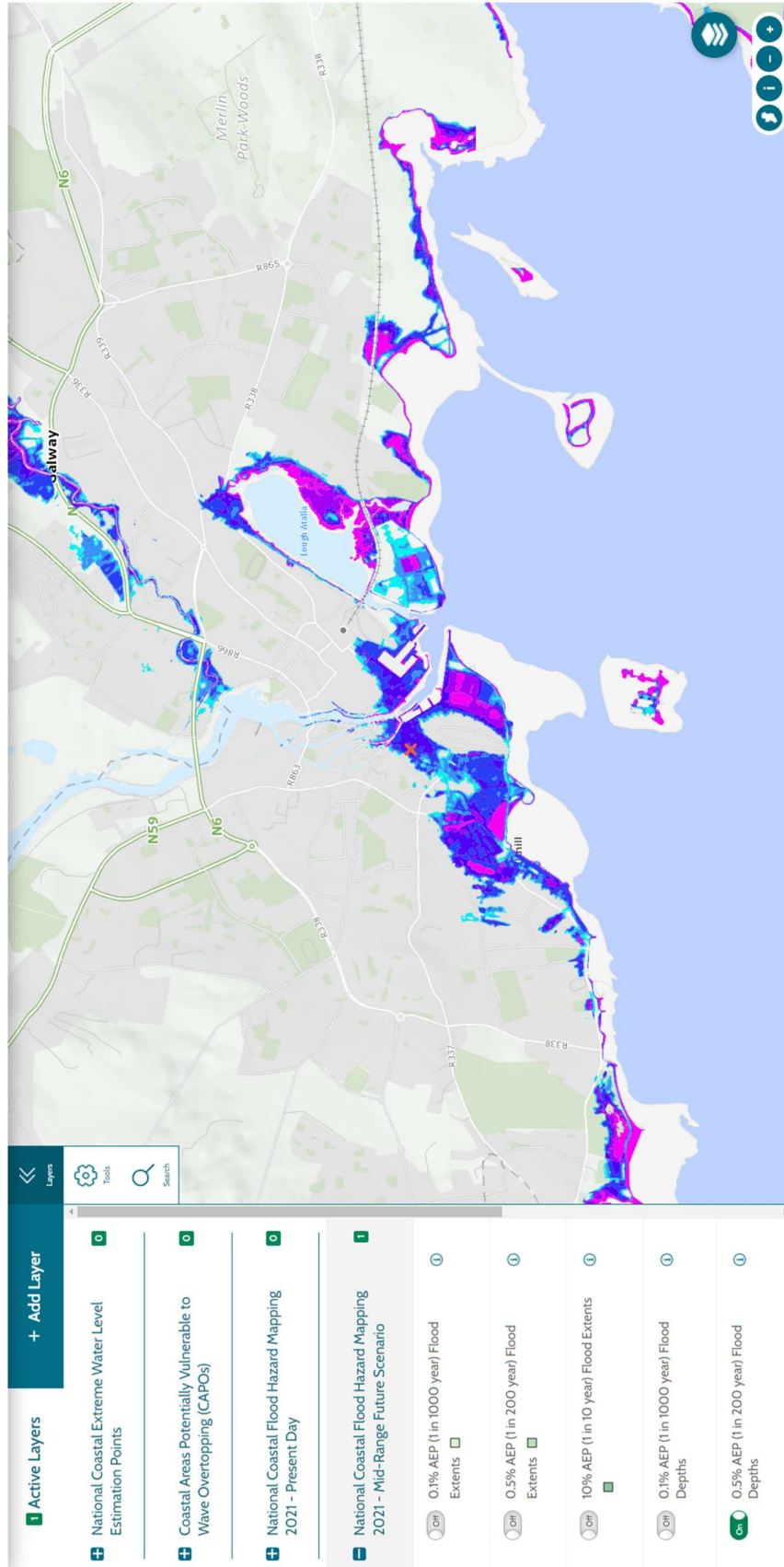


Figure 12 - National Coastal Flood Hazard Mapping 2021 - MRFS - 0.5% AEP - Flood Depth